Bay Restoration Fund Advisory Committee

Robert Warfield, Chairman

Annual Status Report

January 2007

Report to Governor Robert L. Ehrlich, Jr.
The Senate Education, Health, and Environmental Affairs Committee
And the House Environmental Matters Committee

EXECUTIVE SUMMARY

The Bay Restoration Advisory Committee is pleased to present to Governor Robert L. Ehrlich, Jr. and the Maryland Legislature, its second annual Legislative Update Report. Great strides have been made in implementing this historic Bay Restoration Fund, but many challenges remain as we begin the multi-year task of upgrading the State's wastewater treatment plants, onsite sewage disposal systems and plant cover crops to reduce nitrogen pollution in Chesapeake Bay.

The accomplishments we have to report so far are impressive, but many challenges remain as we move forward in implementing the nutrient controls that have been made possible by Maryland's Bay Restoration Fund.

Accomplishments

- The Comptroller's Office and the Maryland Department of the Environment, in cooperation with local government wastewater billing authorities implemented the Bay Restoration Fund fee collection process. Beginning January 1, 2005 the local billing authorities started collecting the fee from wastewater users and beginning October 1, 2005 from septic users.

- As of November 30, 2006, the Comptroller of Maryland has deposited $95,211,029 into the Maryland Department of the Environment for the Wastewater Treatment Plant fund, $9,017,027 to the Maryland Department of Environment for the Septic Systems Upgrade fund and $6,011,351 to the Maryland Department of Agriculture for Cover Crop Program.

- Enhanced Nutrient Removal (ENR) upgrades of the State's major sewage treatment plants are currently underway. Two facilities, Celanese in Allegany County and Hurlock in Dorchester County have been completed and are in operation. Ten facilities are under construction, 12 are under design and 23 are in planning. MDE is continuing to work to bring the remaining 19 major systems, which are in the pre-planning stages into the program.

- All 23 counties and Baltimore City now have an On-Site Sewage Disposal System (OSDS) billing plan in place. All Counties except for three counties (Anne Arundel, Baltimore and Montgomery) initiated their first OSDS billing during FY 2006 while these three Counties started billing in July 2006.

- BRF Advisory Committee has established a workgroup including local health and public works agencies and industry representatives, to develop specifications for approved OSDS technologies. Referred to as Best Available Technology (BAT) Workgroup, this group of professionals is responsible for establishing the procedures for determining what specific types of systems will be eligible for grants under the OSDS portion of the BRF. The BAT workgroup has adopted a protocol used by the Environmental Protection Agency/ Environmental Technology Verification (EPA/ETV) to establish a procedure to verify the performance of nitrogen reducing OSDS. Six proprietary technologies have been evaluated by the EPA/ETV program and are eligible for BRF funding in Maryland. Four additional proprietary technologies have submitted application to be eligible for BRF funds. A review team comprised of three engineers from MDE and one County Environmental Health Director are reviewing the applications to ensure that each technology has been third party evaluated to a standard at least as stringent as the EPA/ETV's.

- In cooperation with the Advisory Committee, MDE developed a Request for Proposals (RFP) for local governments to obtain funding through the BRF to support the planning, design and construction of BAT OSDS systems in targeted watersheds, with priority to failing systems in the Critical Area of the Chesapeake Bay and the Coastal Bays. A review panel consisting of personnel from MDE and the Governor's Advisory Committee evaluated and ranked the proposals. A project score sheet was developed to rate how well each proposal addressed elements that included: readiness to proceed, addressing failing systems in the critical area, addressing other health and environment based factors, identifying onsite sewage disposal systems to be upgraded, partnerships and available resources to implement the proposal and how long-term issues of management are to be addressed. Ten proposals were submitted to MDE prior to the stated deadline and proposed awards were based on their project scores. On December 6, 2006, the Board of Public Works approved MDE's request to fund the proposals and awarded 9 million dollars to ten different jurisdictions to upgrade approximately 700 septic systems.

- MDE produced the video, "Onsite Sewage Disposal Systems – Protecting Your System – Preserving the Bay". This video, which won a prestigious Aegis Award for video production, teaches homeowners about the care of septic systems and about the connection between septic systems and the Bay while also informing property owners about the availability of BRF funds to upgrade septic systems.

- The Maryland Department of Agriculture dedicates their portion of BRF funds to implementation of the statewide Cover Crop Program. This year farmers applied for a record 450,000 acres, 75% of Maryland's Chesapeake Bay Program 2010 goal. MDA approved 290,000 acres to stay within current budget allocation. Funds projected from BRF annually will support approximately 130,000 acres of cover crops in the program. Cover crops are planted in the fall to tie up nitrogen remaining from the previous crop. They are recognized as the single most cost effective best management practice (BMP) available to control nitrogen movement to groundwater and subsequently the Bay. Cover crops also prevent soil erosion and improve soil quality.

- MDE began negotiations with State agencies and universities to develop a statewide geographic information system (GIS) data layer that will provide the geographic location and significant information for all septic systems in the State. This data will allow for improved modeling on septic system impacts and help direct available funding to areas where upgrading septic system will make the biggest impact.

Challenges

- Wastewater treatment plant construction costs on recently opened bids are coming in significantly higher than the original planning-level estimates. As a result the total capital cost for the ENR Upgrades is likely to be much closer to the upper end of the $750 million to $ 1billion range estimated at the time of legislation. The escalating costs can be attributed to increasing energy, steel and concrete costs. Based on the estimated revenue projections and bond issuance, it is estimated the current fee schedule ($30/year) can help finance approximately $750 million in ENR upgrades. The Committee believes we should allow for a few more quarterly fee collection data cycles and get better cost estimates on some the larger ENR projects, before making any recommendation on how to address the anticipated funding shortfall.

- MDE is seeing increasing requests for allocation of BRF funding to assist minor facilities with upgrade costs and some have suggested that a portion of the funding be redirected to minor facilities, which are not as cost-effective in terms of nutrient removal.

- Following publication of an article in the Baltimore Sun reporting that BRF grants for sewage treatment upgrades were encouraging inappropriate development, on October 18. 2006 Water Management Administration Director Robert M. Summers presented testimony and answered questions before the House of Delegates' Environmental Matters Committee. Dr. Summers testified that MDE grant funds - including Bay Restoration Funds - are not used to fund new growth. By law, MDE may only use Bay Restoration Funds for wastewater treatment upgrades up to the design capacity approved by MDE. MDE meticulously applies engineering principles and cost accounting protocols to ensure that this requirement of the law is strictly enforced. Local jurisdictions must pay for any additional capacity expansions with their own funds or with loans from the State. Every project is reviewed through the State Clearinghouse by numerous State and local agencies to ensure that it complies with all State laws and regulations including smart growth laws. The 66 major sewage treatment plants slated to be upgraded first using BRF grants are the State's largest treatment plants serving the most densely populated areas of the State. In keeping with Maryland's Chesapeake Bay Restoration Strategy, MDE is using its regulatory authority to cap nutrient loads to the Bay and its tributaries based on design capacities at the levels approved as of April 30, 2003 to ensure that the Bay goals are achieved.

- There is concern that individuals having their septic upgraded with the BRF will be subject to taxation based on the value of the upgrade or grant. This serves as a deterrent to property owners who may otherwise want to participate in a voluntary program. The Federal tax code allows the Secretary of the U.S. Department of Agriculutre (USDA) to declare grant programs for the purpose of improving the environment that do not result in income for the property owner to as tax exempt. In a November 29, 2006 letter to the U.S. Secretaries of Agriculture and Treasury, Maryland Governor Robert L. Ehrlich, Jr. requested a ruling in favor of Maryland's position that these grants meet the requirements of federal law for a tax exemption. As of the date of this report the U.S. has not responded to this request.

- Advanced septic systems that remove nitrogen require electricity and have moving parts that require maintenance. The EPA strongly recommends that management systems be in place to ensure the long-term performance of advanced septic systems. The BRF has no provisions for ongoing management of nitrogen reducing septic systems.

Recommendations

The implementation of the Bay Restoration Fund program has been initiated successfully and is proceeding in the right direction at a good pace. The Committee believes it is still too early to determine what, if any, modifications should be made to the Bay Restoration Fund implementation effort.

Purpose of this Report

Section 1605.2 of Chapter 9 of Environment Article requires that beginning January 2006, and every year thereafter, the Bay Restoration Fund (BRF) Advisory Committee must provide an update to the Governor and the General Assembly on the implementation of the BRF program, and report on its findings and recommendations.

Programs and Administrative Functions

Comptroller's Office:

The role of the Comptroller of Maryland (CoM) is to act as the collection agent for the Bay Restoration Fund (BRF) and make distributions to the Maryland Department of the Environment (MDE) and the Maryland Department of Agriculture (MDA) as required.

In the second year of administering the BRF, the CoM is beginning the compliance phase of the fee administration. The law specifies that the BRF shall be administered under the same provisions allocable to administering the sales and use tax. Granted that authority, the CoM is beginning the audit process for both filers and non-filers of BRF quarterly reports.

For non-filers, CoM has begun contacting the billing authorities and users who have failed to file or pay the BRF and are obtaining sufficient documentation to make an assessment and begin collection activity. Federal government billing authorities and users have to date refused to participate in the BRF process. An agreement was obtained by MDE with several defense organizations having water treatment plants to upgrade their systems over a defined period of time and they were then exempted from the BRF by MDE. A copy of the agreement was provided by MDE to CoM, and those BRF accounts were subsequently placed in an inactive status. The CoM is now preparing to audit billing authorities who are not collecting the BRF from federal agencies and will make assessments as appropriate against those billing authorities for those uncollected fees.

Additionally, the CoM is working with MDE to obtain historical flow data from billing authorities and users, which will be compared to returns filed by billing authorities and users to ensure accurate BRF returns have been filed and paid.

The CoM will begin reporting the results of such compliance activities during CY2007.

Maryland Department of the Environment:

Three units within the Maryland Department of the Environment (MDE) are involved in the implementation of the Bay Restoration Fund.

I. *Maryland Water Quality Financing Administration:*

The Maryland Water Quality Financing Administration (MWQFA) was established under Annotated Code of Maryland, Title 9, Subtitle 16 with the primary responsibility for the financial management and fund accounting of the Water Quality Revolving Loan Fund, the Drinking Water Revolving Loan Fund

and the newly created Bay Restoration Fund. Specifically for the Bay Restoration Fund, the MWQFA is responsible for the issuance of revenue bonds, payment disbursements, and the overall financial accounting including audited financial statements.

II. *Water Quality Infrastructure Program:*

The Water Quality Infrastructure Program (WQIP) manages the engineering planning and project management of federal capital funds consisting of federal EPA construction grants, special federal appropriations grants, and state revolving loan funds for water quality and drinking water projects. The Program also manages State grant programs of $18-20 million annually including Special Water Quality/Health, Small Creeks and Estuaries Restoration, Stormwater, Biological Nutrient Removal, Water Supply Financial Assistance and the state match to the federal grants. There may be as many as 250 active capital projects ranging in levels of complexity at any given time. Individual projects range in value from $10,000 to $50 million. A single project may involve as many as eight different funding sources and multiple construction and engineering contracts over a period of years. WQIP is responsible for assuring compliance with the requirements for each funding source while achieving the maximum benefit of funds to the recipient and timely completion of the individual projects. WQIP consists of three divisions, Bay Restoration Fund Program Division, a Project Management Division, and a Planning division.

III. *Wastewater Permits Program:*

The Wastewater Permits Program (WWPP) issues permits for surface and groundwater discharges from municipal and industrial sources and oversees onsite sewage disposal and well construction programs delegated to local approving authorities. Large municipal and all industrial discharges to the groundwater are regulated through individual groundwater discharge permits. All surface water discharges are regulated through combined state and federal permits under the National Pollutant Discharge Elimination System (NPDES). These permits are issued for sewage treatment plants, some water treatment plants and industrial facilities that discharge to State surface waters. These permits are designed to protect the quality of the body of water receiving the discharge.

Anyone who discharges wastewater to surface waters needs a surface water discharge permit. Applicants include industrial facilities, municipalities, counties, federal facilities, schools, and commercial water and wastewater treatment plants, as well as, treatment systems for private residences that discharge to surface waters.

WWPP will ensure that the enhanced nutrient removal goals and/or limits are included in the discharge permit of facilities upgraded under the BRF. To accommodate the implementation of the Onsite Sewage Disposal System (OSDS) portion of the Bay Restoration Fund, the WWPP Deputy Program Manager has been designated as the lead for the onsite sewage disposal system upgrade program.

Maryland Department of Agriculture:

The Maryland Department of Agriculture (MDA) delivers soil conservation and water quality programs to agricultural landowners and operators using a number of mechanisms to promote and support the implementation of best management practices (BMPs). Programs include information, outreach, technical

assistance, financial assistance and regulatory requirements under the Water Quality Improvement Act. Soil Conservation Districts are the local delivery system for many of these programs.

The Chesapeake Bay Restoration Fund provides a dedicated fund source to support the Cover Crop Program. In prior years, funding fluctuated and program guidelines were modified accordingly to try to get the best return on public investment. A 2005 survey of 3000 farm operators, who have previously participated in MDA water quality incentive programs, indicated that changing Cover Crop Program guidelines and funding uncertainty discouraged participation. The survey was used to make program adjustments, with a goal to maximizing participation and water quality benefits. Program adjustments included increasing the acreage enrollment cap, on-line access to application forms, increased incentives for early planting and split payments. Since funding will be more predictable in the future and response to this year's program exceeded expectations, future program adjustments should be minimal. 2006 saw a record enrollment of 450,000 acres, far above the available funds. A pilot commodity cover crop program was also initiated allowing farmers to harvest the crop for a reduced payment provided they do not fertilize the acres in the fall.

In 2006, an agreement was reached with the Maryland Grain Producers Utilization Board (MGPUB) authorizing MDA and the MACS Office to administer the Hulless Barley Program. The purpose is to provide experience for producers who plant hulless barley as a cover crop and may be able to sell it in the future for use to produce ethanol. The MGPUB has initiated actions to construct an ethanol plant using hull less barley as a feedstock in Maryland. The pilot piggyback on the commodity cover crop option and provides an added incentive for operators who choose to grow hull less barley.

MDA administers the Cover Crop Program through the Maryland Agricultural Water Quality Cost Share Program or MACS. MACS provides financial assistance to farm operators to help them implement approximately 30 BMPs. Cover crops are one of the most cost effective methods for tying up excess nitrogen from the soil following the fall harvest of crops. They minimize nitrogen loss caused by leaching into nearby streams and aquifers, prevent soil erosion and improve soil quality.

Bay Restoration Fund Status

The Bay Restoration Fund (BRF) fees collected from wastewater treatment plant users are identified as "Wastewater" fees and those collected from users on individual onsite septic systems as "Septic" fees. These fees are collected by the State Comptroller's Office and deposited as follows:

- Wastewater fees (net of local administrative expenses) are deposited into MDE's "Wastewater Fund."
- Sixty percent (60%) of the Septic fees (net of local administrative expenses) are deposited into MDE's "Septic Fund."
- Forty percent (40%)of the Septic fees (net of local administrative expenses) are deposited into Maryland Department of Agriculture's (MDA) "Septic Fund."

The status of the cash deposits from the State Comptroller's Office to MDE and MDA for each of the sub-funds identified above, as of December 2006, is as follows:

Wastewater Fund (MDE 100% for ENR & Sewer Infrastructure)

Sources:		Uses:	
Cash Deposits	$95,211,029	Capital Grant Awards	$73,866,000
Cash Interest Earnings	$ 2,687,580	Admin. Expense Allowance	$ 1,428,165
Total	$97,898,609	Total	$75,294,165

ENR PROJECTS	BPW Date	$ Award
Kent Island/Queen Anne's	7/20/05	6,493,000
Crisfield	7/20/05	4,231,000
Salisbury	8/31/05	3,000,000
Hurlock	8/31/05	1,000,000
Easton	8/31/05	8,660,000
Celenese/Allegany County	8/31/05	2,500,000
St Michaels/Talbot County	9/21/05	2,000,000
Cambridge (Planning)	11/2/05	100,000
Chestertown	1/18/06	2,000,000
Federalsburg (Design)	2/1/06	360,000
Indian Head	2/15/06	6,484,000
Perryville (Planning/Design)	5/3/06	200,000
Bowie (Planning)	5/17/06	100,000
Mt. Airy (Planning/Design)	5/17/06	200,000
Elkton	5/17/06	7,500,000
Aberdeen (Planning /Design)	6/7/06	200,000
Brunswick	8/30/06	8,263,000
Back River/B-City (Design)	8/30/06	5,000,000
Patapsco/B-City (Design)	8/30/06	10,000,000
Havre de Grace (Design)	12/06/06	400,000
Bowie (Design)	12/06/06	500,000
	Sub-Total	69,191,000

SEWERAGE PROJECTS	BPW Date	$ Award
Baltimore City - Gwynns Run Sewer	11/2/05	1,575,000
Talbot County – PS Upgrade (1)	5/3/06	500,000
Emmitsburg Sewers	6/7/06	600,000
Talbot County – PS Upgrade (2)	9/20/06	500,000
Baltimore City - Greenmount Sewer	9/20/06	1,300,000
Washington County – Halfway I/I	10/18/06	200,000
	Sub-Total	4,675,000
	Total	73,866,000

Septic Fund (MDE 60% for On-Site Disposal System upgrades)

Sources:		Uses:	
Cash Deposits	$9,017,027	Capital Grant Awards	$9,002,000
Cash Interest Earnings	$ 189,551	Admin. Expense Allowance	$ 721,362
Total	$9,206,578	Total	$9,723,362

SEPTICS PROGRAM	BPW Date	$ Award
Anne Arundel Co. Health Department	12/6/06	$2,644,000
Calvert Co. Dept. of Planning/Zoning	12/6/06	$933,000
Charles Co. Health Department	12/6/06	$604,000
Frederick Co. Health Department	12/6/06	$712,000
Kent Co. Water and Wastewater Dept.	12/6/06	$597,000
State DNR (Queen Anne's Co. Corsica)	12/6/06	$287,000
Caroline Co. Health Department	12/6/06	$144,000
Talbot Co. Dept. of Public Works	12/6/06	$1,168,000
Wicomico Co. Health Department	12/6/06	$771,000
Worcester Co. - Environmental Program	12/6/06	$1,142,000
		$9,002,000

Septic Fund (MDA 40% for Cover Crops)

Sources:		Uses:	
Cash Deposits	$6,011,351	Grant Awards	$ 2,701,756
		Admin. Expense	$ 56,476
		Total	$ 2,758,241

Maryland farmers have submitted applications to plant over 450,000 acres of cover crops, which equates to a maximum funding demand of over $17M. Contracts with a total value of $12M were approved on a prorated basis due to funding limitations. Given the normal slippage (later plantings, fewer acres, etc.,

than planned), the anticipated actual expenditure this program year is $8M. MDA has committed to provide some level of payment to farmers who plant additional acres if funds are available following spring certification by all participants.

Update on Fees from Federal Facilities:

On July 19, 2006, the State of Maryland and the Department of Defense (DoD) signed a Memorandum of Understanding (MOU) to resolve a dispute regarding the applicability of the Bay Restoration Fee to DoD. The State's legal position is that the federal government is not exempt from paying the Bay Restoration Fund (BRF) fee; however, the DoD asserts that the BRF fee is a tax and that the State may not tax the federal government. With the advice of counsel, the State has chosen to settle the matter with DoD rather than to litigate. In the MOU, neither party concedes any legal position with respect to the BRF fee. The MDE has agreed to accept DoD's proposal to undertake nutrient removal upgrades at certain DoD-owned wastewater treatment plants at its own expense (estimated cost $22.5 million) in lieu of paying the BRF fee. No other Federal agency is exempt from paying the BRF fee.

Wastewater Treatment Plant Upgrades
With Enhanced Nutrient Removal (ENR)

Status of Upgrades:

The Maryland Department of the Environment (MDE) is implementing a strategy known as Enhanced Nutrient Removal (ENR) and is providing financial assistance to upgrade wastewater treatment facilities in order to achieve ENR. The ENR Strategy and the Bay Restoration Fund set forth annual average nutrient goals of WWTP effluent quality of Total Nitrogen (TN) at 3 mg/l as "N" and Total Phosphorus (TP) at 0.3 mg/l as "P", where feasible, for all significant wastewater treatment plants with a design capacity of 0.5 million gallons per day (MGD) or greater. Other wastewater treatment plants may be selected by the Department for upgrade on a case-by-case basis, based on the cost effectiveness of the upgrade, environmental benefits and other factors. Specifically, Maryland's 66 major sewage treatment facilities are targeted for the initial upgrades.

MDE has taken advantage of the momentum generated by the existing biological nutrient removal (BNR) program and has proceeded with the ENR strategy as a continuation to the BNR. Facilities that were in the planning or design phase to upgrade to BNR (achieving 8 mg/l total nitrogen) were asked to revise their plans to include ENR capability to achieve 3 mg/l total nitrogen and 0.3 mg/l total phosphorus. Consequently, ENR upgrades are underway at many plants, and to date, two facilities, Celanese in Allegany County and Hurlock in Dorchester County have initiated ENR operations, 10 facilities are under construction, 12 are under design, 23 are in planning and 19 are in pre-planning stage. Fact-sheets for projects, which have been awarded ENR grant funding to date approved by the Board of Public Works for planning, design and construction are attached.

Estimated Cost of the Upgrades:

Wastewater treatment plant construction costs on recently opened bids are coming in significantly higher than the original planning-level estimates. As a result, the total capital cost for the ENR upgrades is likely to be much closer to the upper end of the $750 million to $1 billion range estimated at the time of

legislation. The escalating costs can be attributed to increasing energy, steel and concrete costs. Based on the estimated revenue projections and bond issuance, it is estimated the current fee schedule ($30/year) can help finance approximately $750 million in ENR upgrades. MDE's staff is working with local officials and their consultant engineers to find ways to cut these costs. The Committee believes we should allow for a few more quarterly fee collection data cycles and get better cost estimates on some the larger ENR projects, before making any recommendation on how to address the anticipated funding shortfall.

Minor Facilities:

Under the ENR strategy, minor facilities (with design flow of less than 0.5 MGD) will be targeted for funding under the BRF only after the upgrade of the 66 targeted major facilities is completed. Likewise, minor facilities were not targeted for upgrade under the original BNR program. Most minor facilities are currently achieving the secondary treatment level of approximately 18 mg/l total nitrogen. Some of these minor facilities (more than 0.11 MGD flow) will be discharging more pounds of nitrogen per year than major facilities that have an average flow of 0.5 MGD and are upgraded to the ENR level of treatment. Accordingly, MDE in consultation with the Advisory Committee, the Department of Budget and Management and subject to the approval of the Governor's Office, is considering a policy to continue the BNR program in future years provided that the funding for BNR upgrades at these minor facilities becomes available.

Onsite Sewage Disposal System (OSDS) Upgrade Program

OSDS Identification and Billing

- There are an estimated 420,000 OSDS's in Maryland that needed to be identified by local jurisdictions and billed. Working with the Advisory Committee, Maryland Department of Planning and the State Department of Assessment and Taxation all jurisdictions now identified and bill septic system users.

Best Available Technology (BAT)

The Bay Restoration Fund legislation states that funds generated by the OSDS users fee may be used for the following:

" With priority given to failing systems and holding tanks located in the Chesapeake Bay and Atlantic Coastal Bays Critical Area, grants or loans for up to 100% of:

A. The costs attributable to upgrading an onsite sewage disposal system to the best available technology for removal of nitrogen; or
B. The cost difference between a conventional onsite sewage disposal system and a system that utilizes the best available technology for the removal of nitrogen;"

It was necessary to develop a procedure for determining which technologies should be considered grant eligible. The BRF Advisory Committee has established a workgroup including local health and public works agencies and industry representatives, to develop specifications for approved OSDS technologies.

Referred to as Best Available Technology (BAT) Workgroup, this group of professionals is responsible for establishing the procedures for determining what specific types of systems will be eligible for grants under the OSDS portion of the BRF. MDE and the BAT subcommittee reviewed programs in other states, published research and third party verification programs. Current research indicates that nitrogen discharges from OSDS's can be reduced by 50 to 60 percent.

The BAT workgroup has adopted a protocol used by the Environmental Protection Agency for Environmental Technology Verification (EPA/ETV) to establish a procedure to verify the performance of nitrogen reducing OSDS. Six proprietary technologies have been evaluated by the EPA/ETV program and are eligible for BRF funding in Maryland. Four addition proprietary technologies have submitted application to be eligible for BRF funds. A review team comprised of three engineers from MDE and one County Environmental Health Director are reviewing the applications to ensure that each technology has been third party evaluated to a standard at least as stringent as the EPA/ETV's.

The BAT protocol requires an application for technology review to be submitted to MDE. The technical review team with experts in the field will review each application for approval of a particular technology and information collected to verify the effectiveness of that technology. If the technology has undergone independent third-party verification or certification indicating consistent reduction of better than 50 percent of the nitrogen, the technology will be allowed an unlimited number of installations. These technologies will be monitored for a 2 to 3 year field evaluation period. After this period the technical review team will determine if the technology receives an unconditional approval, needs further field testing or is rejected from the program.

BAT Project Selection

The goal of the OSDS portion of the BRF is to curtail the amount of nitrogen discharged from OSDS into the waters of the State. This benefits the State by helping to restore the estuarine environment and provides for better protection of drinking water supplies. The Bay Restoration Fund statute states that funds may be used to provide grants for the incremental cost of upgrading OSDS to BAT for nitrogen removal. The BRF cannot provide funding for an entire OSDS replacement or repair and any material (gravel & pipe) and labor costs not directly associated with the BAT unit installation are not eligible. The Department recognizes that operation and maintenance, design review, installation inspection and project management are part of the costs of upgrading OSDS to BAT for nitrogen removal. The BRF grant funds will cover the initial cost of purchasing and installing the BAT unit. The cost for the initial 5 years of operation and maintenance may also be included in the cost of purchasing the BAT technology. The local implementing entity may also use a portion of the BRF funds for reasonable costs associated with identifying individual applicants, reviewing plans, and inspecting BAT unit installations.

The Department's intent is to outsource some elements of the BRF implementing OSDS upgrades using the BRF funds to county and municipal government agencies, state government agencies, academic institutions and non-profit agencies to make grants to OSDS users who agree to upgrade their systems and provide the necessary ongoing operation and maintenance. As mandated by the legislation, addressing failing systems in either the Chesapeake Bay Critical Area or the Maryland Coastal Bay's Critical Area is highest priority.

In cooperation with the Advisory Committee, MDE developed a Request for Proposals (RFP) for local governments to obtain funding through the BRF to support the planning, design and construction of BAT OSDS systems in targeted watersheds, with priority to failing systems in the Critical Area of the Chesapeake Bay and the Coastal Bays. The highest priority was given to proposals that directly address failing OSDS in either the Chesapeake Bay Critical Area or the Maryland Coastal Bay's Critical Area, although grants are not limited to these areas only. Other factors that received priority points included:

- Proximity to shellfish harvesting areas,
- Watersheds that are known to be nutrient impaired due to OSDS,
- Areas that are within 2500' of reservoirs or recreational lakes,
- Areas that are within wellhead protection zones,
- Areas where private wells and OSDS are concentrated on lots smaller than 1 acre,
- Areas that are underlain with karst (limestone) geology,
- Projects that create responsible management entities,
- Projects that utilize renewable operating permits,
- Projects that create management (sanitary) districts,
- Household income below median household income for the county of residence; and
- Readiness to proceed.

A key component of a successful proposal was the level of management the project will have. Without proper scheduled maintenance, the units will not produce a consistently high quality effluent. A responsible management entity, as defined by the U.S. Environmental Protection Agency (EPA), is "an entity responsible for managing a comprehensive set of activities delegated by the regulatory authority; a legal entity that has the managerial, financial, and technical capacity to ensure long-term, cost effective operation of onsite and/or cluster water treatment systems in accordance with applicable regulations and performance (e.g., a wastewater utility or wastewater management district)." Other management examples that were rewarded higher award points were the issuance of operating permits, similar to State Groundwater Discharge Permits that have reporting limits, or enforceable maintenance contracts to be recorded by some County authorized process.

A review panel consisting of personnel from MDE and the Governor's Advisory Committee evaluated and ranked the proposals. A project score sheet was developed to rate how well each proposal addressed elements that included: readiness to proceed, addressing failing systems in the critical area, addressing other health and environment based factors, identifying onsite sewage disposal systems to be upgraded, partnerships and available resources to implement the proposal and how long-term issues of management are to be addressed. Ten proposals were submitted to MDE prior to the stated deadline and proposed awards were based on their project scores. On December 6, 2006, the Board of Public Works approved MDE's request to fund the proposals and awarded a total of over 9 million dollars to ten different jurisdictions to upgrade approximately 700 septic systems.

The following table summarizes the awards:

Recipient	County	Grant Award
Anne Arundel County Health Department	Anne Arundel	$2,644,000
Calvert County Department of Planning and Zoning	Calvert	$933,000
Charles County Health Department	Charles	$604,000
Frederick County Health Department	Frederick	$712,000
Kent County Department of Water and Wastewater	Kent	$597,000

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Recipient	County	Grant Award
Maryland Department of Natural Resources	Queen Anne's	$287,000
Caroline County Health Department	Caroline	$144,000
Talbot County Department of Public Works	Talbot	$1,168,000
Wicomico County Health Department	Wicomico	$771,000
Worcester County Department of Environmental Programs	Worcester	$1,142,000
	Total	$9,002,000

Outreach

MDE staff is working with the Chesapeake Bay Tributary Teams, community groups and environmental groups to promote the onsite system upgrade program and has attended meetings, environmental fairs and other events organized by these groups to make presentations and distribute grant program materials.

MDE has developed a brochure entitled "The Bay Restoration Fund Onsite Sewage Disposal System User Information Guide". The brochure explains the Bay Restoration Fund and informs citizens how to apply for funding. The brochure is available on MDE's website, is being distributed to local health departments and is being distributed as part of MDE's inspection of onsite sewage disposal systems adjacent to shellfish harvesting waters.

MDE produced the video, "Onsite Sewage Disposal Systems – Protecting Your System – Preserving the Bay". This video, which won a prestigious Aegis Award for video production, teaches homeowners about the care of septic systems and about the connection between septic systems and the Bay while also informing property owners about the availability of BRF funds to upgrade septic systems. To date approximately 5,000 copies of this video have been distributed to homeowners and demand for the video remains high.

Cover Crop Activities (Maryland Department of Agriculture)

Recent Program Streamlining Activities in Preparation for the BRF Program:

In 2005, the Maryland Department of Agriculture engaged the Schaefer Center for Public Policy to assist with a series of focus groups across the state and questionnaires sent to over 3,000 agricultural operators across the state. The purpose was to assess the Cover Crop Program and identify improvements that would result in additional acreage enrolled in the program. The recommendations have been evaluated and many of the recommendations incorporated in the current program. Specific streamlining actions include putting the application and certification forms on the MDA website so they can be downloaded by the applicants and faxed into the local Soil Conservation District offices.

In 2006, a pilot commodity cover crop program was initiated allowing farmers to harvest the crop for sale in the spring in return for a reduced payment provided they do not fertilize the acres in the fall.

Also in 2006, an agreement was signed with the Maryland Grain Producers Utilization Board (MGPUB) authorizing MDA and the MACS Office to administer and provide additional incentives for participation in the Hulless Barley Program. Producers who plant hulless barley may sell it in the future to produce ethanol in a plant planned to be built by the MGPUB. This program gives operators an opportunity to see

how the barley grows and learn any special considerations needed in the planting, harvesting and management of the hulless barley.

Status of Implementation of BRF for Cover Crop Activities:

The Maryland Department of Agriculture has received $3,831,700 from the BRF to date. Since program demand has exceeded BRF grant availability, MDA has prorated application acres and will utilize federal funds in certain approved watersheds.

	APPLICATION ACRES	APPROVED %	APPROVED ACRES	IMPLEMENTATION PERCENTAGE	IMPLEMENTED ACRES	AMOUNT
CCC	130,000	50%	65,000	90%	58,500	$1.17M
TCC	300,000 **	75%	225,000	75%	168,750	$6.75M
						$7.92M *

* Grant funds targeted to specific watersheds account for difference between CBRF and general fund and projected expenditures.
** TCC total does not include 24,000 acres of standby signed up over and above acreage caps

Attachment 1

City of Aberdeen Advanced Wastewater Treatment Plant ENR Upgrade – Planning Phase
FACT SHEET

PROJECT DESCRIPTION:

The project involves planning and design phases for the Enhanced Nutrient Removal (ENR) at the existing 4.0 MGD City of Aberdeen Advanced Wastewater Treatment Plant to achieve effluent concentrations goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorous.

RECEIVING STREAM/BODIES OF WATER: Swan Creek

NUTRIENT REMOVAL (AT 4.0 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	8	3	
Loading (Lbs/year)	97,410	36,530	63%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	0.65	0.3	
Loading (Lbs/year)	7,915	3,650	54%

TOTAL COST AND FUNDING SOURCES:

Total Project Cost Estimate	$7,000,000
Bay Restoration Fund	$7,000,000

MILESTONES:

DESIGN START:	December 2006
DESIGN COMPLETION:	April 2008

Updated: November 15, 2006

Attachment 2

Back River Wastewater Treatment Plant Enhanced Nutrient Removal (ENR) Upgrade
– Planning and Design Phase
Fact Sheet

PROJECT DESCRIPTION:

As part of the planning and design phase for this project, these funds are for the evaluation of the nutrient removal capabilities and performance of existing Back River Wastewater Treatment Plants (WWTP) to identify changes in operation and/or process control to optimize the existing performance of the Biological Nutrient Removal (BNR) facilities. This phase of the project will also identify and design additional capital improvements needed to upgrade the existing BNR facilities to Enhanced Nutrient Removal (ENR) technology.

RECEIVING STREAM/BODIES OF WATER: Back River

NUTRIENT REMOVAL (AT 180.0 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	8	3	
Loading (Lbs/year)	4,383,500	1,643,810	63%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	0.2	0.2	
Loading (Lbs/year)	100,000	100,000	0%

TOTAL COST AND FUNDING SOURCES:

Total Planning and Design Costs:	$17,550,000
Bay Restoration Fund	$17,550,000

MILESTONES:

Planning Start:	August 2005
Planning Completion:	December 2006
Design Completion:	February 2009

Updated: November 15, 2006

Attachment 3

BOWIE WWTP ENR UPGRADE
FACT SHEET

PROJECT DESCRIPTION:
The project involves planning and design of Enhanced Nutrient Removal (ENR) facilities at the existing 3.30 mgd Bowie Wastewater Treatment Plant. The ENR improvements include conversion of the existing oxidation ditches to the 5-stage Bardenpho Process with mechanical aerators including new influent pumps, control building, effluent filter facility, secondary clarifier improvements, UV disinfection system, and supplemental Alkalinity feed system. Upon completion of the ENR upgrade, the Bowie WWTP will be capable of achieving an effluent with Total Nitrogen goal of 3 mg/l and a Total Phosphorous of 0.3 mg/l.
These improvements will help reduce nutrients discharged to the Patuxent River, and ultimately the Chesapeake Bay.

RECEVING STREAM/BODIES OF WATER: Patuxent River

NUTRIENT REMOVAL (AT 3.30 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	8	3	
Loading (Lbs/year)	80,364	30,137	62.5

Phosphorus

	Total Phosphorous (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	2	0.3	
Loadin (Lbs/year)	20,091	3,014	85

ESTIMATED COST AND FUNDING SOURCES:

Total Estimated Contract Construction Cost	$8,200,000
Bay Restoration Fund Eligible Cost (82.84 %)	$6,792,880
City of Bowie's Share (@17.16%)	$1,407,120

MILESTONES:

PLANNING & DESIGN START DATE:	October 2004
EST. DESIGN COMPLETION DATE:	August 2007
EST. CONSTRUCTION START:	November 2007
EST. CONSTRUCTION COMPLETION:	December 2009

Revised (11/15/2006)

Attachment 4

BRUNSWICK WWTP BNR/ENR UPGRADE & EXPANSION
FACT SHEET

PROJECT DESCRIPTION:
The proposed project entails the planning, design and construction of Biological Nutrient Removal (BNR) and Enhanced Nutrient Removal (ENR) facilities at the existing City of Brunswick Wastewater Treatment Plant. This project will also expand the existing Brunswick Wastewater Treatment Plant from 0.7 million gallons per day (mgd) to 1.4 mgd. The planning phase was completed, and included engineering evaluations of various technologies to determine the most appropriate and cost effective technology to upgrade the existing wastewater treatment plant to achieve an effluent with Total Nitrogen goal of 3 mg/l and a Total Phosphorous of 0.3 mg/l. Sequential Batch Reactors with post-equalization basins followed by denitrification filters, ultraviolet (UV) disinfection system and post aeration was selected as the most viable treatment process. Project design has been completed and the project is under construction. The BNR/ENR upgrade and expansion will significantly reduce the amount of nutrients discharged directly from the Brunswick Wastewater Treatment Plant into the Potomac River and ultimately the Chesapeake Bay.

RECEVING STREAM/BODIES OF WATER: Potomac River

NUTRIENT REMOVAL (AT 1.40 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	3	
Loading (Lbs/year)	76,711	12,785	83.3

Phosphorus

	Total Phosphorous (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	3	0.3	
Loadin (Lbs/year)	12,785	1,279	90

ESTIMATED COST AND FUNDING SOURCES:

Total Project Cost	$14,626,149.00
State BNR Grant NR 05.11	$ 2,706,611.75
Bay Restoration Fund BR-NR 02.11	$ 8,263,000.00
State Supplemental Grant SWQH 14.11	$ 1,199,344.22
Local Share	$ 2,457,193.03

MILESTONES:

PLANNING START DATE:	11/2002
PLANNING COMPLETION:	03/2003
DESIGN START DATE:	10/2005
DESIGN COMPLETION DATE:	04/2006
CONSTRUCTION START DATE:	09/2006
EST. CONSTRUCTION COMPLETION DATE:	12/2007

Revised (11/15/2006)

Attachment 5

Cambridge Wastewater Treatment Plant (WWTP) ENR Upgrade - Planning Phase
FACT SHEET

PROJECT DESCRIPTION:

The project involves planning and design phases for the Enhanced Nutrient Removal (ENR) at the existing 8.1 mgd Cambridge Wastewater Treatment Plant to achieve effluent concentrations goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorous.

RECEIVING STREAM/BODIES OF WATER: Lower Choptank River

NUTRIENT REMOVAL (AT 8.1 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	8	3	
Loading (Lbs/year)	197,260	73,970	63%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	2.0	0.3	
Loading (Lbs/year)	49,310	7,400	85%

TOTAL COST AND FUNDING SOURCES:

Total Project Cost Estimate (Planning & Study)	$100,000
Bay Restoration Fund	$100,000

MILESTONES:

PLANNING START:	December 2005
PLANNING COMPLETION:	December 2006

Updated: November 15, 2006

Attachment 6

CELANESE WASTEWATER TREATMENT PLANT (WWTP)
FACT SHEET

PROJECT DESCRIPTION:

The project involves planning, design, and construction of new activated sludge Enhanced Nutrient Removal (ENR) facility to replace the existing lagoon system, and achieve effluent concentration goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorous. The project also involves the expansion of the existing 1.25 million gallons per day (MGD) Celanese Wastewater Treatment Plant to 1.66 MGD. The upgrade also includes the installation of denitrification filters for additional nitrogen and phosphorous removal. The original project included only the upgrade with a biological nutrient removal (BNR). However, after the passage of the Bay Restoration Fund Bill, a change order to the construction contract was issued to include the ENR upgrade.

RECEIVING STREAM/BODIES OF WATER: Potomac River

NUTRIENT REMOVAL GOAL:

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	3	
Loading (Lbs/year)	91,000	15,200	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	3	0.3	
Loading (Lbs/year)	15,200	1,500	90%

BUDGET:	Total Project Cost	$15,833,000
	State BNR Grant	$3,566,000
	Bay Restoration Fund	$2,022,000
	State Supplemental Grant	$1,110,000
	SRF Loan	$8,910,000
	Other Local Funding	$225,000

MILESTONES:	**CONSTRUCTION START:**	March 2003
	CONSTRUCTION COMPLETION:	August 2005

Attachment 7

Chestertown Wastewater Treatment Plant (WWTP) BNR/ENR Improvements
FACT SHEET

PROJECT DESCRIPTION:

The project involves planning, design and construction for the Biological Nutrient Removal (BNR) and Enhanced Nutrient Removal (ENR) at the existing 0.9 mgd Chestertown Wastewater Treatment Plant to achieve effluent concentrations goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorous.

RECEIVING STREAM/BODIES OF WATER: Chester River

NUTRIENT REMOVAL (AT 0.9 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	3	
Loading (Lbs/year)	49,310	8,220	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	2	0.3	
Loading (Lbs/year)	5,480	820	85%

TOTAL COST AND FUNDING SOURCES:

Total Project Cost	$9,336,614
Bay Restoration Fund	$2,000,000
State BNR Grant	$2,845,280
State Revolving Loan Fund	$3,390,732
State Supplemental Grant	$ 435,000
EPA Grant	$ 482,100
Local Funds	$ 13,577
Kent County Share	$ 169,925

MILESTONES:

CONSTRUCTION START: March 2006
CONSTRUCTION COMPLETION: July 2007

Updated: November 15, 2006

Attachment 8

CRISFIELD WASTEWATER TREATMENT PLANT (WWTP)
FACT SHEET

PROJECT DESCRIPTION:

The project consists of the planning, design and construction to upgrade the existing activated sludge system with enhanced nutrient removal (ENR) facilities, including denitrification filters, at the existing 1.0 million gallons per day (MGD) wastewater treatment plant to achieve a goal of 3 mg/l total nitrogen and 0.3 mg/l total phosphorus in effluent water quality. The project also involves other improvements to the plant's disinfection and head works treatment systems.

RECEIVING STREAM/BODIES OF WATER: Chesapeake Bay

NUTRIENT REMOVAL GOAL:

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	3	
Loading (Lbs/year)	54,800	9,100	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	2	0.3	
Loading (Lbs/year)	6,100	900	85%

BUDGET:	Total Project Cost	$10,270,523
	State BNR Grant	$ 2,026,100
	Bay Restoration Fund	$ 4,231,000
	State Supplemental Grant	$ 1,013,050
	EPA Grant	$ 2,417,800
	Local Share (SRF Loan)	$ 582,573

MILESTONES: **CONSTRUCTION START:** July 2005
CONSTRUCTION COMPLETION: July 2007

Updated: November 15, 2006

Attachment 9

Town of Easton Wastewater Treatment Facility BNR/ENR Upgrade and Expansion
FACT SHEET

PROJECT DESCRIPTION:

This Project will improve the existing wastewater treatment system and enable the community to meet the goals established nutrient loads discharged to the Chesapeake Bay. Specifically, the wastewater treatment facility will be designed for enhanced nutrient removal (ENR) upgrade to achieve effluent concentrations goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorous. Also, the project involves the expanding the plant capacity from 2.35 to 4.0 million gallons per day (mgd). The BNR upgrade will be funded at the existing plant capacity of 2.35 mgd, while the ENR upgrade will be funded at the approved design capacity of 4.0 mgd.

RECEIVING STREAM/BODIES OF WATER: Choptank River

NUTRIENT REMOVAL (AT 4.0 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	4	
Loading (Lbs/year)	219,180	48,710	78%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	1.6	0.3	
Loading (Lbs/year)	19,480	3,650	81%

TOTAL COST AND FUNDING SOURCES:

Total Project Cost	$37,453,191
State BNR Grant	$ 8,930,000
Bay Restoration Fund	$ 8,000,000
Local Share/SRF Loan	$20,523,191

MILESTONES:

CONSTRUCTION START:	December 2004
CONSTRUCTION COMPLETION:	January 2007

Updated: November 15, 2006

Attachment 10

Elkton WWTP BNR/ENR Upgrade and Expansion
FACT SHEET

PROJECT DESCRIPTION:

This project involves planning, design and construction of replacement of the existing 2.7 million gallons per day (mgd) Rotating Biological Contactors (RBCs) wastewater treatment plant (WWTP) with Biological Nutrient Removal (BNR) and Enhanced Nutrient Removal (ENR) facilities to achieve effluent concentrations goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorous, and the expansion from 2.7 mgd to 3.2 mgd plant capacity.

RECEIVING STREAM/BODIES OF WATER: Big Elk River

NUTRIENT REMOVAL (AT 3.05 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	3.8	
Loading (Lbs/year)	167,120	37,140	79%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	2	0.29	
Loading (Lbs/year)	18,570	2,785	85%

TOTAL COST AND FUNDING SOURCES:

Total Project Cost	$40,710,912
Bay Restoration Fund	$ 7,954,912
State BNR Grant	$ 8,842,410
Federal EPA Grant	$ 626,600
Local Funding	$ 538,419
State Revolving Loan Fund	$22,748,571

MILESTONES:

CONSTRUCTION START: July 2006
CONSTRUCTION COMPLETION: October 2008

Updated: November 15, 2006

Attachment 11

Federalsburg WWTP BNR/ENR Improvements
FACT SHEET

PROJECT DESCRIPTION:

The project involves planning, design and construction for the Biological Nutrient Removal (BNR) and Enhanced Nutrient Removal (ENR) at the existing 0.75 mgd Federalsburg Wastewater Treatment Plant to achieve effluent concentrations goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorous. This Board action is for planning and design phases.

RECEIVING STREAM/BODIES OF WATER: Marshyhope River

NUTRIENT REMOVAL (AT 0.75 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	3	
Loading (Lbs/year)	41,000	6,850	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	2	0.3	
Loading (Lbs/year)	4,570	685	85%

TOTAL COST AND FUNDING SOURCES:

Estimated Total Project Cost	$5,030,000
Bay Restoration Fund	$2,274,000
State BNR Grant	$1,019,000
State Supplemental Grant	$ 325,000
EPA Grant	$ 450,000
Local Funds/ State Revolving Loan Fund	$ 962,000

MILESTONES:

DESIN START: January 2005
DESIGN COMPLETION: December 2006

Updated: November 15, 2006

Attachment 12

Havre de Grace Wastewater Treatment Plant ENR Upgrade and Expansion
FACT SHEET

PROJECT DESCRIPTION:

The project involves planning, design, and construction for the Enhanced Nutrient Removal (ENR) upgrade at the existing Havre de Grace Wastewater Treatment Plant to achieve effluent concentrations goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorous. The project will be built in one contract with two phases – an interim expansion phase from 1.89 mgd to 2.3 mgd (Phase I) followed by the ENR upgrade and expansion from 2.3 mgd to 3.3 mgd (Phase II). The ENR grant funding is limited to the ENR approved design capacity of 2.3 mgd.

RECEIVING STREAMS/BODIES OF WATER: Upper Chesapeake Bay

NUTRIENT REMOVAL (AT 3.03 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	8.0	3.0 (or 2.76 @3.3 mgd)	
Loading (Lbs/year)	73,790	27,715*	66%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	2.0	0.3 (0.21 @ 3.3 mgd)	
Loading (Lbs/year)	18,450	2,079*	90%

* Capped loading

TOTAL COST AND FUNDING SOURCES:

Total Project Cost	$38,145,000
Bay Restoration Fund	$13,600,000
State Revolving Loan Fund	$24,545,000

MILESTONES:

INITIATION OF CONSTRUCTION: April 2007
CONSTRUCTION COMPLETION: October 2009

Updated: December 11, 2006

Attachment 13

Hurlock Wastewater Treatment Plant (WWTP) BNR/ENR Upgrade
FACT SHEET

PROJECT DESCRIPTION:

The project consists of planning, design, and construction of facilities to upgrade the existing 2.0 MGD Hurlock WWTP for Biological Nutrient Removal (BNR) and Enhanced Nutrient Removal (ENR) to achieve effluent concentrations goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorous. The existing lagoons will be replaced with a 1.65 mgd activated sludge BNR system and tertiary filters ENR system.

RECEIVING STREAM/BODIES OF WATER: Wrights Branch

NUTRIENT REMOVAL (AT 1.65 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	3	
Loading (Lbs/year)	90,410	15,070	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	2	0.3	
Loading (Lbs/year)	10,050	1,510	85%

TOTAL COST AND FUNDING SOURCES:

Total Project Cost	$7,585,362
State Supplemental Grant	$ 300,000
State BNR Grant	$2,600,000
Bay Restoration Fund	$1,000,000
State Revolving Loan Fund	$2,734,552
EPA Grant	$ 950,810

MILESTONES:

CONSTRUCTION START: June 30, 2004
CONSTRUCTION COMPLETION: August 15, 2006

Updated: November 15, 2006

Attachment 14

INDIAN HEAD WWTP ENR UPGRADE
FACT SHEET

PROJECT DESCRIPTION:
The project entails the planning, design and construction for an upgrade to the Indian Head wastewater treatment plant for Enhanced Nutrient Removal (ENR) at the existing design capacity of 0.5 MGD. The planning phase was completed, and included engineering evaluations of various technologies to determine the most appropriate and cost effective technology to upgrade the existing wastewater treatment plant to achieve an effluent with Total Nitrogen goal of 3 mg/l and a Total Phosphorous of 0.3 mg/l. 5-stage Bardenpho process with new tankage & effluent filters was selected as the most viable treatment process. Project design has been completed and the project is under construction. The ENR upgrade will significantly reduce the amount of nutrients discharged directly from the Indian Head Wastewater Treatment Plant into Mattawoman Creek, the Potomac River and ultimately the Chesapeake Bay. The project also includes an equalization tank to address peak flow, which is occasionally magnified by the town's inflow/infiltration (I/I) problems.

RECEVING STREAM/BODIES OF WATER: Mattawoman Creek

NUTRIENT REMOVAL (AT 0.5 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	8	3	
Loading (Lbs/year)	12,176	4,566	62.5

Phosphorus

	Total Phosphorous (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	2	0.3	
Loadin (Lbs/year)	3,044	456	85

ESTIMATED COST AND FUNDING SOURCES:

Total Project Cost	$14,185,709
State BNR Grant NR 04.09	$ 3,191,451
Bay Restoration Fund BR-NR 04.09	$ 6,484,000
State Supplemental Grant	$ 627,950
State Revolving Fund (SRF) Loan	$ 3,614,028
EPA STAG Grant	$ 268,280

MILESTONES:
CONSTRUCTION START DATE: 05/2006
CONSTRUCTION COMPLETION DATE: 06/2008

Revised (11/15/2006)

Attachment 15

Kent Narrows/Stevensville/Grasonville WWTP BNR/ENR Upgrade and Expansion
FACT SHEET

PROJECT DESCRIPTION:

The project involves the planning, design and construction of enhanced nutrient removal (ENR) upgrade to achieve total nitrogen removal to a yearly average of 3 mg/l, and phosphorus of 0.3 mg/l. The upgrade also involves the expansion of the treatment capacity of the plant from 2.0 million gallon per day (MGD) to 3.0 MGD to accommodate growth within State designated Priority Funding Areas and serve existing homes currently using failing septic systems; thereby, averting a public health hazard and further reduce nitrogen loading to the Bay. A new activated sludge process will replace the existing rotating biological contactor (RBC) process with an increased capacity of 3.0 MGD. The treated wastewater from the KN/S/G WWTP will continue to be discharged directly into the Chesapeake Bay.

RECEIVING STREAM/BODIES OF WATER: Middle Chesapeake Bay

NUTRIENT REMOVAL (AT 3.0 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	3	
Loading (Lbs/year)	164,380	27,400	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	4	0.3	
Loading (Lbs/year)	36,530	2,740	93%

TOTAL COST AND FUNDING SOURCES:

Total Project Cost	$35,018,817
State BNR Grant	$ 8,525,817
Bay Restoration Fund	$ 6,493,000
Local Share/SRF Loan	$20,000,000

MILESTONES:

CONSTRUCTION START: January 2005
CONSTRUCTION COMPLETION: March 2007

Updated: November 15, 2006

Attachment 16

Mount Airy Wastewater Treatment Plant (WWTP) ENR Upgrade
FACT SHEET

PROJECT DESCRIPTION:

The project involves planning and design phases for the Enhanced Nutrient Removal (ENR) at the existing 1.2 mgd Mount Airy Wastewater Treatment Plant to achieve effluent concentrations goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorous.

RECEIVING STREAM/BODIES OF WATER: Patapsco River – South Branch

NUTRIENT REMOVAL (AT 1.2 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	8	3	
Loading (Lbs/year)	29,220	10,960	63%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	2	0.3	
Loading (Lbs/year)	7,300	1,100	85%

TOTAL COST AND FUNDING SOURCES:

Total Project Cost Estimate	$4,000,000
Bay Restoration Fund	$4,000,000

MILESTONES:

DESIGN START:	March 2006
DESIGN COMPLETION:	May 2007

Updated: November 15, 2006

Attachment 17

Patapsco Wastewater Treatment Plant BNR/ENR Upgrade – Planning and Design Phase
Fact Sheet

PROJECT DESCRIPTION:

As part of the planning and design phase, this project involves evaluation of the nutrient removal capabilities and performance of the existing Patapsco Wastewater Treatment Plant (WWTP) to identify changes in operation and/or process control to optimize the performance of the existing facilities. This phase of the project will also identify and design additional capital improvements needed to upgrade the existing facilities to Enhanced Nutrient Removal (ENR) technology.

RECEIVING STREAM/BODIES OF WATER: Patapsco River

NUTRIENT REMOVAL (AT 73 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	3	
Loading (Lbs/year)	4,000,000	666,700	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	2	0.3	
Loading (Lbs/year)	444,440	66,670	85%

TOTAL COST AND FUNDING SOURCES:

Total Planning and Design Costs:	$24,000,000
Bay Restoration Fund	$14,300,000
State BNR Grant	$ 4,850,000
Local Share	$ 4,850,000

MILESTONES:

Planning Start:	June 1992
Planning Completion:	December 2005
Design Start:	July 2006
Design Completion:	January 2008

Updated: November 15, 2006

Attachment 18

Perryville Wastewater Treatment Plant (WWTP) BNR/ENR Upgrade
FACT SHEET

PROJECT DESCRIPTION:

The project involves planning, design and construction for the Biological Nutrient Removal (BNR) and Enhanced Nutrient Removal (ENR) facilities at the existing 1.65-million gallon per day (MGD) Perryville Wastewater Treatment Plant (WWTP) to achieve effluent concentrations goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorous.

RECEIVING STREAM/BODIES OF WATER: Lower Susquehanna River

NUTRIENT REMOVAL (AT 1.65 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	3	
Loading (Lbs/year)	90,410	15,070	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	2	0.3	
Loading (Lbs/year)	10,050	1,510	85%

TOTAL COST AND FUNDING SOURCES:

Total Project Cost	$13,200,000
Bay Restoration Fund	$ 2,700,000
State BNR Grant	$ 2,500,000
Local Funds/ State Revolving Loan Fund	$ 8,000,000

MILESTONES:

CONSTRUCTION START:	May 2007
CONSTRUCTION COMPLETION:	November 2008

Updated: November 15, 2006

Attachment 19

Salisbury Wastewater Treatment Plant (WWTP) BNR/ENR Upgrade and Expansion
FACT SHEET

PROJECT DESCRIPTION:

This project consists of planning, design and construction of full-scale Biological Nutrient Removal (BNR) and Enhanced Nutrient Removal (ENR) facilities at the existing 6.8 million gallons per day (MGD) Salisbury WWTP and expansion of the plant to 8.5 MGD. In addition, upgrade of the North Side and South Side Pumping Station is necessary for the plant expansion.

RECEIVING STREAM/BODIES OF WATER: Wicomico River

NUTRIENT REMOVAL (AT 8.5 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	3	
Loading (Lbs/year)	465,750	77,620	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	1.6	0.3	
Loading (Lbs/year)	41,400	7,760	81%

TOTAL COST AND FUNDING SOURCES:

Total Project Cost	$78,020,887
State BNR Grant	$22,817,185
Bay Restoration Fund	$ 3,000,000
Federal EPA Grant	$ 7,031,000
Local Share (State Revolving Loan Fund)	$45,172,702

MILESTONES:

CONSTRUCTION START: August 2005
CONSTRUCTION COMPLETION: September 2008

Updated: November 15, 2006

Attachment 20

Talbot County Region II (St. Michaels) WWTP BNR/ENR Upgrade and Expansion
FACT SHEET

PROJECT DESCRIPTION:

The project involves the planning, design and construction of upgrade and expansion at the existing Region II (St. Michaels) Waste Water Treatment Plant (WWTP), including the construction of Biological Nutrient Removal (BNR) and Enhanced Nutrient Removal (ENR) facilities to achieve total nitrogen removal to a yearly average of 3 mg/l and phosphorus of 0.3 mg/l and the expansion from 0.5 million gallons per day (mgd) to 0.66 mgd plant capacity.

RECEIVING STREAMS/BODIES OF WATER: Miles River

NUTRIENT REMOVAL (AT 0.66 MGD):

Nitrogen

	Total Nitrogen (Without Upgrade)	**Total Nitrogen (With Upgrade)**	**% Reduction**
Concentration (mg/l)	18	3	
Loading (Lbs/year)	36,200	6,030	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	**Total Phosphorus (With Upgrade)**	**% Reduction**
Concentration (mg/l)	3	0.3	
Loading (Lbs/year)	6,030	600	90%

TOTAL COST AND FUNDING SOURCES:

Total Project Cost	$13,036,247
State BNR Grant	$ 2,747,247
Bay Restoration Fund	$ 2,000,000
State Revolving Loan Fund	$ 8,258,799
Local Share	$ 30,201

MILESTONES:

INITIATION OF CONSTRUCTION: October 2005
CONSTRUCTION COMPLETION: December 2007

Updated: November 15, 2006