



HARFORD COUNTY, MARYLAND PHASE II WATERSHED IMPLEMENTATION PLAN

July 2, 2012

I. OVERVIEW OF HARFORD COUNTY'S PROCESS

Harford County is located in northeastern Maryland at the headwaters of the Chesapeake Bay. It is bordered to the east by the Susquehanna River, a major tributary to the Bay contributing fifty percent of its freshwater input. To the north lies Pennsylvania and to the west Baltimore County. At its southern boundary the County borders Aberdeen Proving Grounds, a U.S. Army garrison occupying 72,500 acres of land and water in both Harford and Baltimore Counties. Three municipalities lie within Harford County: the Town of Bel Air, the City of Aberdeen, and the City of Havre de Grace. Harford County lies within two of the five major Chesapeake Bay basins in Maryland: Susquehanna River and Western Shore.

Harford County's approach to address the development of the Phase II Watershed Implementation Plan (WIP) was to establish a Core Team of County, municipal, State and federal staff with expertise in the various nutrient source sectors identified by the US EPA. The Core Team was composed of the Directors and Deputy Directors of the Departments of Planning & Zoning and Public Works for Harford County, Bel Air, Aberdeen and Havre de Grace; County staff administering the NPDES MS4 Permit, the Water & Sewer Program, and Environmental Planning; representatives of the Health Department, Harford Soil Conservation District, and Aberdeen Proving Grounds; and a State liaison. The Core Team met on a monthly basis to discuss current capacity, strategies to meet the nutrient load allocations, and two-year milestones.

Nutrient load allocations to meet the Chesapeake Bay TMDL were divided by the State among the various source sectors on an equity basis, so that each source sector in the County was given a nutrient load reduction to be met, notwithstanding costs. Nutrient reduction targets have been set for Harford County by the State for agriculture, urban stormwater, septic systems, forests and major wastewater treatment plants (see Tables 1 and 2). These delivered loads were calculated using delivery factors provided by EPA. The agricultural source sector was addressed through an Agricultural Workgroup in the County and reported through the Maryland Department of Agriculture. The Core Team addressed the remaining source sectors and developed strategies to reduce nutrient loadings.

Table 1: Harford County – Total Nitrogen Loads Delivered (lbs.)

Sector	2009 Baseline	2017 Target	2025 Goal
Agriculture	895,763	657,846	555,881
Urban	698,945	566,572	509,841
Septic	175,325	125,305	103,867
Forest	366,899	368,995	369,894
Wastewater	411,272	246,715	378,725

Table 2: Harford County – Total Phosphorus Loads Delivered (lbs.)

Sector	2009 Baseline	2017 Target	2025 Goal
Agriculture	48,600	40,447	36,953
Urban	42,058	31,159	26,488
Septic	0	0	0
Forest	8,953	9,015	9,042
Wastewater	36,342	19,865	31,362

PAST SUCCESSES

Harford County has a long history of smart growth since the establishment of a Development Envelope in the 1977 Master Plan and Land Use Element Plan. The Development Envelope was established in order to focus development within a defined area served by public water and sewer. Since that time approximately 80% of the growth in the County has occurred within this envelope. The major wastewater treatment plants (WWTPs) serving the Development Envelope have either been completed with ENR (enhanced nutrient removal) capabilities (City of Havre de Grace WWTP) or are currently operating with BNR (biological nutrient removal) and are under construction to install ENR by 2015 (Sod Run, City of Aberdeen, and Joppatowne WWTPs). Resource protection programs within the County include the Natural Resources District established in 1983, which requires a 75-foot buffer to nontidal wetlands and either a 75 or 150 foot buffer on streams at the time of subdivision and site plans; the Forest Conservation Program; floodplain regulations; and, the Chesapeake Bay Critical Area Program. In addition, the County has a very active land preservation program, with close to 46,000 acres preserved through various easement programs, such as Rural Legacy, and State and local agricultural land preservation programs.

The County has administered a NPDES/MS4 Phase 1 Permit since 1994, which covers stormwater management, sediment and erosion control, and watershed planning. Under the requirements of the MS4 permit, watershed assessments that prioritize capital improvement projects are performed that include stormwater retrofits and stream restorations. Other nutrient reduction activities include street sweeping, public outreach and tree planting incentives through the Growing Home Campaign.

Each of the municipalities in the County has a MS4 Phase II general permit, which includes compliance with stormwater management regulations, inspections of Best Management Practices (BMPs) for proper maintenance, and street sweeping. The City of Aberdeen has an extensive program for remediation of stormdrain inlets, pipes, and outfalls and also a dedicated funding source for this work. There is also an extensive inflow and infiltration abatement program aimed at removing stormwater from the collection system which allows the advanced wastewater treatment plant to operate more effectively and reduces the likelihood of wet weather sanitary sewer overflows.

A proactive approach to the use of best available technology (BAT) has been a standard of operations for the Harford County Health Department. The Health Department has had success in the installation of denitrifying septic systems using the Bay Restoration Fee. Forty (40) BAT units have been installed in the Critical Area in the County and 117 units have been upgraded outside of the Critical Area. In addition, the Health Department has worked to put existing large systems under Groundwater Discharge Permits (GDP) which require increased nitrogen reduction from the septic system effluent. In 2006 approximately 39 septic systems in the Campus Hills Estates and Campus Lakes subdivisions were required to be upgraded with nitrogen reducing technology in order to protect the Campus Hills Well Head Protection Area. The following commercial/institutional septic systems were upgraded with nitrogen reducing technology as well: Mountain Christian Church; Arena Club; Fallston High School; Fallston Middle School; Red Pump Elementary School; McDonalds on Schucks Road and Rt. 22; Bull on the Beach restaurant on Rt. 22; WaWa on Rt. 22; Food Lion in the Campus Hills Shopping Center; My Three Sons on Rt. 22 and Quick E Mart at Rts. 543 and 136. The Swan Creek Golf Course septic system in the Critical Area has been abandoned and 150 septic systems have been converted to holding tanks and routinely pumped.

The Harford Soil Conservation District has had much success in the implementation of BMPs on agricultural land in the County. All of the BMPs are tracked through Conservation Tracker through the Maryland Department of Agriculture.

II. COUNTY AREA PHASE II WIP STRATEGIES

The strategies presented herein are draft technical analysis developed by locality staff members. The strategies represent theoretically viable options that may prove to be not technically feasible and may be modified at the discretion of the locality. This document has not been adopted by the respective governing bodies for each locality. All commitments of resources to implement these strategies must be approved by those respective governing bodies.

Based on the inaccuracies in disaggregating the loads to a local level, it is difficult for the localities to develop effective management plans or to develop meaningful budget projections. The finalization of a plan to be presented to the governing bodies will not occur until the requirements and objectives are clearly outlined by the State and EPA.

AGRICULTURE

Nutrient load reduction strategies are being addressed through an Agricultural Workgroup in the County and being reported through the Maryland Department of Agriculture.

WASTEWATER TREATMENT PLANTS

Enhanced nutrient removal (ENR) will be installed at the County's major wastewater treatment plants. This advanced technology will significantly reduce nutrient loading in the effluent for both plants from approximately 9.2 mg/l (FY07 – FY11) to 3 mg/l for nitrogen, and from approximately 0.75 mg/l (FY07- FY11) to 0.3 mg/l for phosphorus. The largest wastewater treatment plant in Harford County, Sod Run, has a design capacity of 20 mgd. The Joppatowne wastewater treatment plant has a design capacity of .95 mgd. Construction of ENR began at Sod Run in February 2012 and is anticipated to be completed by March 2015. Construction of ENR at Joppatowne began in February 2012 and is anticipated to be completed by the end of 2014. The City of Havre de Grace's plant has a design capacity of 3.3 mgd. ENR was completed at this plant in 2009. The City of Aberdeen's plant has a design capacity of 4 mgd. The upgrade of its WWTP is expected by 2013. Nutrient loading from these WWTPs pre- and post-ENR is presented in Tables 3 and 4.

Table 3: Nitrogen Loading from WWTP (lbs/yr)

Loading	Sod Run	Joppatowne	Havre de Grace	Aberdeen
NPDES Limit - Current	487,056	23,135	27,715 (ENR)*	121,764
NPDES Limit - Future	243,645	11,573	27,715	48,705
2010 Loading	374,865	12,614	11,002	19,609
2025 Loading (projected)	205,523	10,959	27,715	22,100

* Prior to ENR at the Havre de Grace plant, the NPDES limit for N was 31,000 lbs.

Table 4: Phosphorus Loading from WWTP (lbs/yr)

Loading	Sod Run	Joppatowne	Havre de Grace	Aberdeen
NPDES Limit - Current	60,882	8,676	2,079 (ENR)*	7,914
NPDES Limit - Future	18,250	876	2,079	3,655
2010 Loading	25,029	1,665	2,062	650
2025 Loading (projected)	15,414	822	2,079	1,662

* Prior to ENR at the Havre de Grace plant, the NPDES limit for P was 20,790 lbs.

In addition, the County will pursue with the Board of Education the reconnection of the outfall of the minor wastewater treatment plant serving the North Harford High School to a nontidal wetland for tertiary treatment of wastewater. Several years ago when the wetland was established as a school project for treatment of the effluent the students at the school were able to demonstrate a significant reduction in nutrient levels.

Costs

The cost for the upgrade of the two major County wastewater treatment plants to ENR technology is \$50.6 million. Through the Bay Restoration Fund, the State has awarded \$41.3 million to the County to cover approximately 80 percent of the capital costs to upgrade these facilities. The remainder of the costs (\$9.3 million) will be funded as a “local share” by the customers served by the County’s two main wastewater treatment plants. Revenue for the local share will be through a special “ENR fee” approved by the Harford County Council in the spring of 2012 to be charged to the customer base through sewer billings. The ENR fee is in addition to the Bay Restoration Fund (BRF) fee imposed by the State.

The cost for the upgrade of the Havre de Grace WWTP to ENR technology, with an expansion of 1 million gallons per day capacity, was \$44 million. Through the Bay Restoration Fund, the State awarded \$16 million to the City to cover approximately 24 percent of the capital costs to upgrade the facility. \$26 million will be funded through the State Revolving Loan Fund to be repaid over 20 years with a debt service of \$1.7 million.

The cost of the upgrade of the City of Aberdeen’s wastewater treatment plant is \$24.7 million, including engineering and construction costs. The ENR portion (61%) of the cost is \$15.1 million.

SEPTIC SYSTEMS

Phase II WIP implementation strategies for septic systems will focus on two main practices: installation of denitrifying septic systems and connection of septic systems to public sewer where feasible inside the public sewer service area.

During the 2011 fiscal year Harford County used GIS to determine the number of improved properties serviced by septic systems in the County. Table 5 shows the number of improved properties with septic systems based on the GIS query compared to the number of systems listed for Harford County in the Maryland Assessment and Scenario Tool (MAST).

Table 5: Harford County Number of Septic Systems Comparison by Zone

Zone	Unit	2010 MAST	2011 Harford Analysis	Difference
Critical Area	Systems	270	205	65
Outside of the Critical Area, not within 1000 ft of a perennial stream	Systems	18,690	16,907	1,783
Within 1000 ft of a perennial stream	Systems	9,963	9,209	754
<i>Improved Properties with Septic System Total</i>		28,923	26,321	2,602

Based on the revised numbers of septic systems in the County, and before taking existing Best Management Practices (BMPs) into consideration, the nitrogen loads from septic systems in Harford County in 2011 should be adjusted to 161,070 lbs./year (a reduction of 14,255 lbs. from the 2009 baseline in the Bay Model).

Table 6 shows the existing BMPs as of 2011 and projected BMPs through 2017. The only BMPs shown in this table are septic denitrification systems, or BAT (best available technology) units. The numbers in the chart for the 2017 strategy are only estimates based on historical averages and current resources available to the County. The numbers listed under 2011 Progress represent the number of BAT units installed as of the end of 2011. The 2017 Interim Strategy column represents the number of projected BAT units to be installed based on the estimated amount of funding available under the Bay Restoration Fund. The 2025 “Final Strategy” figure was developed by the State for Harford County using MAST (Maryland Assessment and Scenario Tool) and represents the number of BAT unit upgrades needed to meet the 2025 target load of 103,867 lbs. of N/year. This figure does not take into account that additional reductions will occur from another strategy that will be used to address this goal.

In addition to septic denitrification, Harford County will continue to pursue the connection of septic systems within the sewer service area to public wastewater treatment plants with ENR technology. The Harford County Department of Public Works tracks the number of septic systems that are connected to public sewer. Between 2005 and 2011 there were 116 septic systems connected to the Sod Run WWTP and three systems connected to the Joppatowne WWTP. It is difficult to determine how many properties will be connected to public sewer by the 2017 and 2025 target dates due to the varying costs of connections and accessibility to sewer mains; however, the Harford County Health Department and Department of Public Works will work jointly to vigorously pursue connections as funding and opportunity occur.

Table 6: Harford County Septic System BMPs

Septic Denitrification				
Zone	Unit	2011 Progress	2017 Interim Strategy	2025 Final Strategy (MAST)
Critical Area	Systems	40	45	215
Outside of the Critical Area, not within 1,000 ft. of a perennial stream	Systems	59	120	9,905
Within 1,000 ft. of a perennial stream	Systems	58	93	9,209
<i>Septic Denitrification Total</i>		157	258	19,329

Costs

There is not sufficient funding at this time to meet the 2025 target. The estimated cost to install the number of BAT units to meet the 2025 MAST Target in Harford County is \$269,511,000. This estimated cost does not include long-term maintenance costs or the regulatory fiscal impact. However, with the passage of HB 446 in the 2012 Maryland General Assembly, there will be some additional funding for the Bay Restoration Fund to be used for the installation of denitrifying septic systems and connections to wastewater treatment plants with ENR technology.

URBAN STORMWATER

The County's and municipalities' strategy to address regulated urban stormwater is to continue implementation of the NPDES MS4 permit. Currently, the County is negotiating the conditions of the draft MS4 permit with MDE. Conditions should be clear and unambiguous, maximize water quality credits, and outline achievable goals considering costs. Subsequent to that renewal, the County will submit the required planning documents necessary to document restoration strategies to address the Chesapeake Bay TMDL.

Watershed Assessments

Harford County has been focusing on developing and implementing Small Watershed Action Plans (SWAPs). These plans help the County identify and prioritize projects within a small watershed and are a critical component of securing grant funding.

Table 7: Completed SWAPs

Name	Acres	% Impervious	Watershed	Basin
Wheel Creek	435	27	Winters Run	Bush River
Plumtree Run	1651	29	Winters Run	Bush River
Sam's Branch	373	24	Otter Point Creek	Bush River
Foster Branch	1429	13	Foster Branch	Little Gunpowder

Table 8: Planned SWAPs

Name	Acres	% Impervious	Watershed	Basin
Declaration Run	926	15	Church Creek	Bush River
Riverside Run	318	22	Church Creek	Bush River
Spenceola Run	3262	17	Bynum Run	Bush River
Mariner Run and Rumsey Island	711	21	Little Gunpowder	Little Gunpowder
Heavenly Waters	850	17	Winters Run	Bush River
Shamrock Run and Wright Creek	2241	19	Bynum Run	Bush River
Lower Winters Run	3216	19	Winters Run	Bush River

Capital Projects

Harford County has been constructing watershed restoration projects as required by the previous MS4 permits.

Table 9: Completed Capital Project

Name	Watershed	Basin	Completion
Mt Royal Shallow Marsh	Swan Creek	Upper Chesapeake Bay	2001
Stillmeadow Stream Stabilization	Foster Branch	Little Gunpowder	2001
Mt Royal Stream Restoration	Swan Creek	Upper Chesapeake Bay	2002
Box Hill South Tributary Stream Restoration	Bynum Run	Bush River	2003
Haverhill Stream Stabilization	Foster Branch	Little Gunpowder	2003
Harford Center Pocket Wetland	Swan Creek	Upper Chesapeake Bay	2004
Harford Center Bioretention	Swan Creek	Upper Chesapeake Bay	2004
Laurel Valley Stormwater Retrofit	Bynum Run	Bush River	2005
Laurel Valley Bioretention	Bynum Run	Bush River	2005
Laurel Valley Stream Restoration	Bynum Run	Bush River	2009
Abingdon Library Bioretention	Winters Run	Bush River	2010
Plumtree Run @ Tollgate Rd Stream Restoration	Winters Run	Bush River	2011
Forest Hill Elementary Bioretention	Deer Creek	Lower Susquehanna	2011
Hickory Elementary Bioretention	Deer Creek	Lower Susquehanna	2011
Bynum Ridge Stream Stabilization	Bynum Run	Bush River	2011
Friends Pond Stormwater Retrofit	Bynum Run	Bush River	2011

Table 10: Capital Projects Under Design

Name	Watershed	Basin	Completion
Sunnyview Drive Stream Restoration	Bynum Run	Bush River	2013
Wheel Creek @ Calverts Walk Stream Restoration	Winters Run	Bush River	2012
Wheel Creek @ Gardens of Bel Air Stormwater Retrofit	Winters Run	Bush River	2012
Lower Wheel Creek Stream Restoration	Winters Run	Bush River	2013
Woodbridge Stormwater Retrofit	Foster Branch	Little Gunpowder	2012
Woodbridge Stream Restoration	Foster Branch	Little Gunpowder	2013
Bynum Run @ St Andrews Way Stream Restoration	Bynum Run	Bush River	2013

Table 11: Planned Capital Projects

Name	Watershed	Basin
Edgewood Plaza Stormwater Retrofit	Otter Point Creek	Bush River
Edgewood Plaza Stream Restoration	Otter Point Creek	Bush River
Norrisville Elementary Rain Garden	Deer Creek	Lower Susquehanna
Plumtree Run @ Bel Air High School Stormwater Management	Winters Run	Bush River
Plumtree Run @ Double T Stormwater Management	Winters Run	Bush River
Wheel Creek @ County Walk Stormwater Retrofit	Winters Run	Bush River
Wheel Creek @ Festival of Bel Air Stormwater Retrofit	Winters Run	Bush River
Wheel Creek @ SHA Pond Stormwater Retrofit	Winters Run	Bush River
Foster Branch @ Copenhaver Stormwater Management	Foster Branch	Little Gunpowder
Foster Branch @ Joppa Farm Stream Restoration	Foster Branch	Little Gunpowder
Woodland Drive Stream Restoration	Bynum Run	Bush River
Willoughby Beach Rd Ext Stormwater Retrofit	Otter Point Creek	Bush River
Edgewood Elementary Bioretention	Otter Point Creek	Bush River

As each SWAP is completed, capital projects are identified, prioritized and entered into the County's Capital Improvement Plan (CIP). Harford County anticipates an additional 20 capital projects will be placed in the CIP within the next five years.

Urban Nutrient Management

Harford County is currently exploring opportunities to reduce the urban nutrient loads on County-owned property by assessing housekeeping practices and identifying methods to harvest and/or infiltrate stormwater and impervious cover reduction. Based on the findings for County-owned property, Harford County will investigate implementing a program for private properties.

Public Education and Outreach

Harford County has an active public education and outreach program, as required by the MS4 permit. Outreach includes the development of a website, educational booths at various outreach events, such as Earth Day and the Wade-In, signage, stormwater management facility maintenance workshops, school presentation, and capital project-specific outreach.

Tracking

Harford County will continue to track progress toward meeting the Chesapeake Bay Watershed Implementation Plan through the MS4 permit reporting process. The County will track treated impervious cover and nutrient reduction as described by MDE's guidance document "Accounting for Stormwater Wasteload Allocation and Impervious Acres Treated", June, 2011.

Challenges

Harford County recognizes there are many challenges to address to successfully implement and document progress toward meeting the urban nutrient load allocation of the Chesapeake Bay Implementation Plan.

Cost

Harford County has estimated the cost of capital projects alone will require approximately \$15 million per year. During the next year, Harford County will establish a method for developing a stormwater fee to help offset this cost per the requirements of HB 987 – Stormwater Management – Watershed Protection and Restoration Program – which passed the Maryland General Assembly in the spring of 2012. However, capital project investment is not the only cost associated with meeting the Implementation Plan and the MS4 permit. Other costs include increased staffing, monitoring, public education and outreach, and litter management.

Agency Coordination

With the increased volume of capital projects, agency coordination for permitting will be critical in achieving the goals according to the required schedule. Permit requirements need to be clear, consistent and cost-effective. In addition to permitting coordination, there needs to be an accounting methodology established to allow cost-effective projects to cross political boundaries and to credit the appropriate jurisdiction (County, municipality, State, or Federal).

Accounting Methodology

The County recognizes that the methodology of accounting for stormwater wasteload allocations is a difficult endeavor when applied at the County scale. Harford County will continue to document progress through the MS4 reporting requirements and will calculate impervious surface treatment and nutrient load reduction according to the guidance established by MDE for the MS4 permit.

Other Credits

MS4 jurisdictions, including Harford County, are required to provide public education and outreach. Quantifying the nutrient reduction benefits from these activities is difficult.

Divergent Goals

The Chesapeake Bay Implementation Plan focuses on nutrient removal. Oftentimes, Harford County has determined that quantity management is as important, if not more important, than quality management, because of the impact of erosive flow rates on streambank stability. However, site limitations in existing development may allow for quantity management or quality management, but not both.

OTHER/LAND USE PLANNING

Harford County updated and adopted its Master Plan and Land Use Element Plan in the spring of 2012. This plan incorporates sustainability as a major element of the plan, and incorporates references to the nutrient reduction goals of the Chesapeake Bay TMDL and the local Phase II Watershed Implementation Plan. Strategies in the Plan focus on targeting additional growth into the Development Envelope, enhancing the Transfer of Development Rights Program, and eliminating the Rural Residential land use classification in the rural area, thus eliminating the potential for a substantial number of septic systems. In addition, the Plan calls for the development of a tracking mechanism to monitor the BMPs being undertaken to improve water quality and meet nutrient and sediment reduction goals.

With the passage of the Sustainable Growth and Agricultural Preservation Act of 2012 by the Maryland General Assembly, the County will be designating tiers as specified in the legislation, which will reduce the number of septic systems permitted outside of designated growth areas.

At the same time, Plan Maryland planning areas will be identified to assure consistency with the tiers. These two efforts will further complement the County's goal to target development within designated growth areas.

III. 2012 – 2013 MILESTONES

AGRICULTURE

Milestones will be submitted separately through the Maryland Department of Agriculture.

WASTEWATER TREATMENT PLANTS

- Sod Run Wastewater Treatment Plant will be under construction for ENR. Construction began in February 2012 and is anticipated to be completed by March 2015.
- Joppatowne Wastewater Treatment Plant will be under construction for ENR. Construction began in February 2012 and is anticipated to be completed by the end of 2014.
- The County obtained legislative approval to implement an ENR fee to pay for the local share of the costs.
- North Harford High School minor wastewater treatment plant – pursue with the Board of Education the reconnection of the outfall to the wetlands for additional treatment of the effluent.
- The Enhanced Nutrient Removal Project at the Aberdeen Advanced Wastewater Treatment Plant will be completed by 2013.

SEPTIC SYSTEMS

Programmatic Milestones

- Create a detailed database (through a GIS parcel-specific query) on the number and location of septic systems in Harford County. This database will be used to report on actual nitrogen loads from septic systems in Harford County and to establish high priority areas to pursue BAT units.
- Establish a tracking system that records new BAT units inside the Critical Area, outside of the Critical Area not within 1,000 feet of a perennial stream, and outside the Critical Area within 1,000 feet of a stream. This tracking system will help assure a more accurate accounting of nitrogen loads and load reductions from septic systems.

Anticipated Septic System Nitrogen Removal Projects

- Harford Community College
Nitrogen Reducing Septic System Upgrade
- Harford Tech/Prospect Mill Elementary/John Archer
Nitrogen Reducing Septic System Upgrade
- Fallston High School/Fallston Middle School
Nitrogen Reducing Septic System Upgrade
- Father Martin Ashley
Nitrogen Reducing Septic System Upgrade *
** Timeframe for completion of the upgrade is unknown at this time (may be completed beyond 2013).*
- Red Pump Elementary School
Connection to public sewer (Sod Run WWTP)
- Wright's Mobile Home Park (60 mobile homes)
Connection to public sewer (effluent to be treated @ ENR plant)
- 25 Single Family Dwellings
Existing Septic Systems upgraded with BAT units
- 30 Single Family Dwellings
Existing Septic Systems connected to Public Sewer
- Freys Road Public Sewer Extension
Sewer petition project that will extend public sewer to approximately 8 existing residential properties in the Critical Area.

URBAN STORMWATER

Harford County

Programmatic

- Upgrade Water Resources portion of the County website.
- Continue to negotiate the conditions of the MS4 permit with MDE.

- Coordinate with MDE for the development of trading guidelines between other urban sectors within the County (non-regulated, municipalities, schools, and State Highway) (i.e. if SHA completes a project in Harford County, how is the credit assigned?)
- Upon approval of the MS4 permit, develop watershed assessment planning and restoration as required.
- Investigate implementation of Urban Nutrient Management Plans on County-owned and School-owned properties.
- Investigate budget needs to meet the requirements and develop strategies for funding gaps.
- Per the requirements of HB 987 – Stormwater Management – Watershed Protection and Restoration (2012) – develop a stormwater fee by June 30, 2013 to assist the County in meeting the requirements of the Phase I NPDES permit.
- Conduct an Urban Tree Canopy Assessment between April 2012 and August 2013 to determine the County’s current level of tree canopy coverage and to set goals for increasing the amount of coverage in the years to come.

Projects

- Complete two (2) watershed restoration plans for 1,800 acres (270 impervious acres).
- Initiate four (4) watershed restoration plans for 5,200 acres (900 impervious acres).
- Construct six (6) stream restoration projects for 13,000 linear feet (130 impervious acres).
- Construct four (4) stormwater retrofit projects (52 impervious acres).
- Complete four (4) restoration designs.
- Initiate three (3) restoration designs.
- Continue to coordinate with City of Havre de Grace on the Lilly Run project.
- Continue to coordinate with Town of Bel Air for restoration projects in Plumtree Run.
- Continue to coordinate with SHA for a stream restoration in Plumtree Run.

Town of Bel Air:

Programmatic

- Investigate budget needs to meet the requirements and develop strategies for funding gaps.

Projects

- Forest Conservation / Tree City USA
Continue street tree plantings with no net loss policy. Initiate in-street stormwater bio-retention projects as part of pedestrian walkway improvement projects.
- Plumtree Run daylighting project
Remove existing piped section of Plumtree Run through Plumtree Park as part of an aquatic restoration/stormwater management project.
- Complete FEMA approved flood mitigation plan.
- Partner with Harford County to plan and construct several watershed restoration projects on Plumtree Run.
- April through October – monthly (weekly in downtown district) street sweeping.
- October through December - weekly loose leaf pickup.

City of Havre de Grace

Programmatic

- Develop a complete data base of BMPs within the City.
- Begin the budget process to convert the data base to a GIS.
- Search for grants to complete retrofits and implement BMPs identified .
- Rectify with MDE inaccurate MAST data on the City's acreage and stormwater management facilities.

Projects

- The Community Legacy project that was recently passed by Council Resolution, which includes landscaping and environmental enhancements along tributaries at the north end of Juniata Street. Portions of this project are within the Chesapeake Bay Critical Area and will provide water quality benefits as well as beautification, signage to downtown, and improved pedestrian access. If funded through the State Community Legacy grant process, the project would proceed in FY13.
- The engineering design for Citizens Care Park (pending City Council approval). This has the potential to be a significant water quality retrofit project in old town Havre de Grace.
- Continued buffer enhancements in David Craig Park, ongoing at this time (may need to get a base-line on this site to get credit for current and near-future improvements; tree planting and 15- foot Critical Area Buffer as per City's Critical Area Program).
- Continued work for Lilly Run project, to include application for grant through Chesapeake Bay Trust for \$35,000 (Watershed Assistance Grant) to continue engineering for Joint Permit through MDE/Army Corps of Engineers. Also working through the Center for Watershed Protection to include the Lilly Run project in a piece through the Local Government Advisory Council to increase water quality benefits for proposed flood relief improvements for the Lilly Run stream system. This is a large, multifaceted project which will require a substantial amount of time to design, fund, and complete (a two-year milestone approach will be good to keep this project moving forward due to its complexity).
- Environmental Site Design (ESD) additions for the Old Bay Lane renovation and resurfacing project.
- Stormwater retrofit project on Jerry Foster Way.
- Rain gardens planned for a parking lot at the foot of Franklin Street where it meets the Susquehanna River.

City of Aberdeen

Programmatic

- Review current Road Code for reductions in impervious surface and the use of open section roadways where applicable.

- Work on a policy to offer stormwater credits on impervious area reductions throughout the City.
- Search for grants to complete retrofits and implement BMPs that will reduce nitrogen, phosphorus and sediment loadings. A City Grants Coordinator will be dedicated to this research.

Projects

- Upgrade of the Swan Meadows residential development (200 homes) infrastructure to include: roads, water, sewer, and stormdrains.
- Identify various water quality initiatives throughout the City that can be utilized by developers to offset stormwater management requirements.
- Forest management in the City's 64.08 acre well field to allow for increased infiltration and enhanced forest regeneration which will net reductions in nutrients.
- The City has one (1) current retrofit scheduled for construction and there are several retrofits in the planning stage but they need a funding source.

IV. TRACKING, VERIFICATION AND REPORTING METHODS

AGRICULTURE

Agricultural BMPs are tracked and reported through the Soil Conservation District's reporting to the Maryland Department of Agriculture.

WASTEWATER TREATMENT PLANTS

Implementation of ENR at the major wastewater treatment plants is tracked through the County and municipal Departments of Public Works and through the Maryland Department of Environment via the NPDES and funding programs.

SEPTIC SYSTEMS

The County Health Department will establish a tracking system that records new nitrogen loads and load reductions from septic systems. Connections to the County's public sewer system will continue to be tracked by the Harford County Department of Public Works.

URBAN STORMWATER

The County will continue to submit all of the tracking and reporting through annual submittals under the MS4 permit. The municipalities will continue to submit annual reports to the Maryland Department of Environment under the MS4 General Permit.

V. RELATIONSHIP OF LOCAL WATERSHED PLANNING FRAMEWORK TO PHASE II WIP

Watershed planning was initiated in Harford County in response to implementation of the County's NPDES MS4 permit. The first watershed management plan was completed in 2003 for the Bush River Watershed. This centrally-located, urbanized watershed covers over 30 percent of the land within Harford County. The Bush River and many of its tributaries are on the State's list of impaired waters for nutrient enrichment and suspended sediments. Strategies identified in the Bush River Watershed Management Plan have laid the foundation for pursuing best management practices to address the nutrient and sediment issues in the watershed. As described in the Urban Stormwater section, Small Watershed Action Plans (SWAP) have begun to be developed in order to identify and prioritize capital projects in smaller watersheds. Through the development of a SWAP for the Wheel Creek watershed, the County has been able to obtain Chesapeake Bay Trust Fund grants to pursue best management practices to address stream channel instability problems, reduce sediment loadings and improve overall water quality conditions in this small urbanized watershed. The Wheel Creek Restoration Project is intended to provide a template for small watershed plans for Harford County to implement in other areas within the Bush River Basin.

In 2007 the County completed a watershed plan for the Deer Creek watershed, a rural watershed in the northern half of the County covering close to 36 percent of the County's land area. Much of this largely agricultural and forested watershed is targeted for agricultural preservation, is a Rural Legacy area, and is the County's designated Priority Preservation Area. Through a grant from the US Department of Agriculture, Natural Resource Conservation Service, the County is working closely with the Soil Conservation District to implement agricultural best management practices and promote streamside forested buffers in order to improve water quality and maintain habitat.

Watershed planning efforts in the County have facilitated a targeted strategy to help meet the nutrient and sediment reduction goals of the Harford County Watershed Implementation Plan.

VI. IDENTIFICATION OF TECHNICAL DISCREPANCIES, SUCH AS DATA CONCERNS, AND RECOMMENDED FUTURE STEPS TO ADDRESS THESE CONCERNS

MAST

Because of the serious limitations of the current version of MAST, it is not a useful tool for local planning purposes. Some of these limitations are outlined below:

- Distribution of BMPs is applied as an equal percentage amongst all of the urban sectors within the baseline provided by MDE. Local implementation does not occur on a percentage basis. This makes the tool unhelpful in planning, from a local government perspective.
- Because local governments are still in the process of performing watershed evaluations, it is speculative to estimate the quantity of specific BMPs that can be implemented.
- The loads calculated from the baseline do not match those provided by EPA; therefore, the current version of MAST does not provide useful output to determine if load allocations are being met.
- Federal land has been disaggregated but State land has not.

VII. CONCLUSION

As indicated in this Phase II Watershed Implementation Plan, Harford County is committed to reducing its nutrient contribution to local waterways and the Chesapeake Bay. In the future, new technologies, new strategies and evolving processes will provide new opportunities to help Maryland meet the challenge of reaching the 2025 nutrient reduction goals. Harford County will continue to participate in these efforts and pursue nutrient reductions in cost-effective policies and programs.