EXECUTIVE SUMMARY

Since 1972, Section 303(d) of the federal Clean Water Act has required states to identify waters that do not meet water quality standards and publically report them on a list published every two years. For each of the listed waters, states are to determine the maximum amount of pollution that the waters can withstand and still meet standards. This maximum amount of pollution is called a Total Maximum Daily Load (TMDL).

In 1996, the U.S. Environmental Protection Agency (EPA) listed certain sections of the Virginia portion of the Chesapeake Bay as "impaired." That is, water quality, most notably dissolved oxygen, was insufficient to fully support aquatic life. Recognizing the low dissolved oxygen in portions of the upper Bay, Maryland listed all of the upper Chesapeake Bay tidal water segments as not meeting standards for phosphorus, nitrogen (nutrients) and sediments.

In 2000, the Bay watershed partners signed the *Chesapeake 2000 Agreement* to clearly identify the actions needed to achieve water quality standards. With this Agreement came the understanding that if the voluntary actions taken were not successful in reaching the water quality goals, EPA would complete a TMDL by the end of 2010. Although much progress has been accomplished, it has not been enough reach the pollution reduction goals. For the past several years, EPA has led a process to develop TMDLs for the Chesapeake Bay.

A multi-jurisdictional TMDL on the scale of the Chesapeake Bay watershed has never been completed before. There will actually be 294 TMDLs, one for each of the three pollutants (nitrogen, phosphorus and sediment) for 98 impaired Bay segments (Maryland drains to 58 of the segments and will be subject to 174 TMDLs).

In recognition of the complexity and scope of this set of TMDLs, EPA determined that the part of the TMDL known as "reasonable assurance of implementation" needed to be significantly enhanced. "Reasonable assurance" is a demonstration that achieving the load reductions required by the TMDL can reasonably be met, that is, current or anticipated resources and commitments are expected to be sufficient.

This Watershed Implementation Plan (Plan), to be referenced by EPA's TMDL for Chesapeake Bay, supports the reasonable assurance of implementation for Maryland's part of the TMDL.

It contains, consistent with EPA guidance, the following elements:

1. Interim and Final Nutrient and Sediment Target Loads
2. Current Baseline Loading and Program Capacity
3. Account for Growth in Loads
4. Gap Analysis
5. Commitment & Strategy to Fill Gaps
6. Tracking and Reporting Protocols
7. Contingencies for Slow or Incomplete Implementation
8. Detailed Tables of Interim and Final Nutrient and Sediment Target Loads

The current draft version of this Plan is expressly written to solicit public comments on a wide range of pollution control strategy options to restore and maintain the Bay. The Plan will be finalized based on those comments and will serve as a starting point for a Phase II planning process, which will occur in 2011. The table of strategies presented below are options, not final selections, and the options chosen to implement the needed reductions will be selected with the benefit of the public comments received in the coming months.

Given significant time constraints and limitations of current data and models, it is almost certain that the TMDL allocations associated with this Phase I Plan will change during Phase II. This will give interested parties opportunity to comment on the allocations in the Bay TMDL and the implementation strategies needed to achieve a healthy Bay for our families and for future generations.

This Executive Summary provides the context for the Phase I Watershed Implementation Plan (Plan), several "Key Highlights" and brief synopses of the seven elements that make up the Plan.

Purpose of Phase I Watershed Implementation Plan

In general, TMDLs set pollutant limits from all sources and divide, or "allocate," the maximum allowable pollutant loads among sources.

As a means of gathering allocation information from states for the Bay TMDLs, EPA has requested that states develop Watershed Implementation Plans (Plans). A key function of the Plan is to identify final target loads to be achieved by various pollution source sectors and in different geographic areas. The final target loads will be used by EPA in setting TMDL allocations.

As noted above, the states' Plans also help to provide "reasonable assurance" that sources of pollution will be cleaned up, which is a basic requirement of all TMDLs. In addition, the Plans are part of a new "accountability framework" that EPA is establishing to ensure the TMDL goals are reached in a reasonable timeframe.

A Three-Phased Planning Process

EPA has laid out a three-phased planning process designed to ensure the involvement of interested parties and offer multiple opportunities to refine the Plan over time.

EPA's primary guidance to the states came in the form of two letters to the Chair of the Chesapeake Bay Principal's Staff Committee (PSC), comprised of the state agencies responsible for Bay related restoration programs. The first, "Expectations Letter," signed November 4, 2009, laid out EPA's expectations for the three-phased planning process, including the eight elements of the Phase I Plan. The second, "Consequences Letter," signed December 29, 2010, laid out the key actions and deadlines for the states to meet and the regulatory and other consequences that could be triggered if they are not met.

The Phase I Plan is to be developed at the same time as the Bay TMDLs, which are to be completed by December 31, 2010. In addition to setting final target loads that provide EPA the necessary information to establish TMDL allocations, the Plan also sets "interim target loads." EPA has set the year 2017 to achieve 60% of the needed implementation and 2025 as the deadline for achieving final target loads. Maryland committed to achieve the final target loads by 2020. Consistent with this accelerated implementation date, Maryland's Plan is designed to achieve 70% of the Final Target by 2017, which is reflected in this Phase I Plan. It is recognized that the pollutant reductions and full benefits to the Bay from many of those controls, such as tree plantings, will likely not occur until some time after 2017.

A Phase II Plan, to be developed in 2011, will refine the details of the Phase I Plan by providing more geographic specificity regarding target loads. The Phase II Plan will also include greater detail about pollution controls that the State and partners will implement by the end of 2017. The time allotted for the Phase II planning process will allow significantly more interaction between the State and interested partners to refine the Phase I Plan. As part of the Phase II planning process, EPA will allow states to revise the TMDL allocations established in the Phase I Plan, subject to public review.

A Phase III Plan will be developed in 2017 and will address reductions needed from 2018 to 2020 in Maryland. The TMDL allocations may again be revised to reflect better data, a greater understanding of the natural systems and to make use of enhanced analytical tools, such as updated watershed and water quality models.

Key Components

Maryland's Phase I Plan builds on its precedent setting programs to date. Maryland has been the leader in the Bay restoration. Since 1985 we have reduced nitrogen pollution by 33% and phosphorous pollution by 38%. These reductions were realized, even as a 29% increase in population (1.28 million) occurred in the State between 1985 and 2009. Maryland continues to be a leader – the first State to require nutrient management plans on all farms, the first to commit to implement state-of-the-art technology on all of the State's 67 largest wastewater treatment plants, accounting for 95% of our wastewater flow, and the first State to place stringent air pollution controls on power plants required by Maryland's nationally groundbreaking Healthy Air Act, reducing nitrogen emissions by over 75% from coal fired power plants by 2013.

Over the past four years, Maryland has continued its leadership. We have committed to accomplish Maryland's nutrient reduction goals by 2020 and initiated the switch to measuring progress on the Bay in two year increments instead of once a decade. To ensure that progress is transparent, we have established BayStat to measure this progress in real time – allowing all Marylanders to monitor the restoration of the Chesapeake Bay. We were the first state in the watershed to receive federal approval for our Concentrated Animal Feeding Operation program that meets the new EPA regulations and requires comprehensive nutrient management on poultry farms for the first time. Maryland is also the first State in the watershed to require nutrient removal technology for new and failing septic systems in its critical area – the land within1000 feet of the Bay. Maryland created the Chesapeake Bay 2010 Trust Fund to fund cost-effective projects to reduce non-point source pollution. Together with Virginia, we restricted the female

crab harvest yielding a tremendous increase in recent catches. We recently achieved a record setting commitment by farmers to plant cover crops – one of the most cost effective nutrient reduction practices available. We were the first state in the Watershed to require environmental site design to reduce stormwater runoff on all new development approved after May of 2010 and implemented one of the most progressive set of stormwater requirements for a stormwater (MS4) permit in the Bay Watershed. The hallmark of Maryland's proposed Plan is that it continues and accelerates implementation of these state-of-the-art practices and programs to achieve the needed pollution reductions.

- **Loading and Capacity Gaps:** Loading gaps are estimated for the Interim and Final target loads. Maryland's Interim Target goal is 70% of the Final Target by 2017. These loading gaps reflect resource capacity gaps to meet the load reductions. Although they have significant uncertainty, they reflect the scale of challenge:

  - **Interim Target by 2017:**
    - Nitrogen: Current actions are expected to achieve about 53% of the Interim Target.
    - Phosphorus: Current actions are expected to achieve 80% of the Interim Target.
    - Completing upgrades of the major municipal treatment plants will substantially close these gaps.
    - The Plan details a list of strategy options that is estimated to exceed the 70% reduction for nitrogen by 2017; this estimate will need to be confirmed by planned model runs.

  - **Final Target:**
    - There is greater uncertainty regarding this Target, due to the longer timeframe and associated anticipated changes in technology and programs beyond 2017.
    - Because reductions from point sources will be credited between now and 2017, achieving the remaining 30% reduction will largely be accomplished in the non-point source sectors.
    - Using the current pace of reductions for nitrogen as a measure of "capacity," the Plan estimates at least a 3 fold increase in capacity is needed by 2020.

- **Nutrient Offsets:** The Plan commits to adopting nutrient offset policies and programs for septic system and land development loads. Although the approach is not fixed, the Plan proposes a framework that would create incentives for smart growth and a schedule for development and implementation beginning in 2013.

- **Trading Programs:** To enable offsets, a policy framework and technical and administrative implementation systems are needed to ensure nutrient reductions are achieved. The State's point source to point source trading policy was published in April 2008 (http://www.mde.maryland.gov/water/nutrientcap.asp) and complementary programs under development to administer trading and offsets between point sources and agricultural non-point sources will serve as a foundation for development of an appropriate framework for other point to nonpoint trades. In addition, the State proposes integrating that framework with broader trading of "ecological services."

- **Strategy for Achieving the 2017 Interim Target:** The Plan lists strategy options that exceed a 70% reduction of the final target load by 2017. These strategies encompass extensions of current 2-year Milestone commitments and additional proposed strategies. Based on public comments, a subset of strategies that meet the Interim Target will be reflected in the final Phase I Plan.

- **Strategy for Achieving the Final Target**: Three approaches are proposed for achieving the final target by 2020:

    - Develop new technology and approaches prior to 2017. Examples of innovations might include development of seeds and crops that require less fertilizer and processes to reduce ammonia released from poultry manure.
    - Increase the scope of implementation of existing strategies. Examples include upgrading additional small WWTPs, increasing acres retrofitted with stormwater controls; and more efficient urban runoff controls.
    - Improve regulatory requirements to increase reductions achieved.

- **Sediments:** Maryland received draft sediment loading targets on August 13, 2010. Maryland believes that, because of the close relationship between sediment and phosphorus loads, initial nonpoint source strategy options to achieve phosphorus goals will likely also achieve sediment goals. Consequently, limited attention is given to sediments in this draft of the Plan.

The remainder of the summary presents highlights of the seven key sections of the Plan.

Element 1: Interim and Final Target Loads

Based on analyses conducted by the EPA Chesapeake Bay Program, in consultation with the states and other interested parties, nutrient and sediment load limits have been set that are intended to meet water quality standards. These loads have been divided among the Bay states with the understanding that the states will, in turn, allocate them geographically and among source sectors, such as waste water treatment plants, agricultural sources, septic systems and storm water from developed land.

Maryland has used a similar process to divide the loads among regions and source sectors. Briefly, the allocation process first set waste water treatment plant load allocations at levels equal to Maryland's Enhanced Removal Strategy for major wastewater treatment plant and to caps set in the 2004 Tributary Strategies for minor facilities. Then, nonpoint sources were reduced by equal percentages between "no action" loads and maximum-feasible-reduction loads. In addition, the sources closest to the Bay are to do slightly more than the sources further from the Bay. This is more cost effective, because the control of sources closer to the Bay has a greater beneficial impact on the Bay water quality.

The allocations described above are referred to as "initial" allocations because the models used by EPA are undergoing significant revision this year, which is likely to influence the distribution of loads among source sectors.

The following tables summarize the statewide final target loads for nitrogen, phosphorus, and sediment by major source sector. Interim target loads will be based on a model input deck submitted to EPA on September 1, 2010 and the table will be completed when the results of this strategy submission have been modeled. This input deck reflects the load reductions from strategies listed within this document. Following the public comment process, a selection of reduction strategies that meet the 2017 goal will be made, resulting in the development of revised interim target loads that reflect those strategies. The selected strategies and revised interim target loads will be presented in Maryland's final Phase I Watershed Implementation Plan.

Total Nitrogen - By Sector			
Sector	**2009 Progress**	**Final Target Load**	**% Reduction from 2009 Progress**
Urban Regulated	5.098	4.099	20%
Urban Non Regulated	0.551	0.459	17%
Agriculture	17.713	13.603	23%
CAFO	0.080	0.079	0%
Septic	4.007	2.479	38%
Forest	7.133	7.133	0%
Air	0.691	0.686	1%
WWTP & CSO	14.148	10.547	25%
Total	**49.421**	**39.086**	**21%**

Total Phosphorus - By Sector			
Sector	**2009 Progress**	**Final Target Load**	**% Reduction from 2009 Progress**
Urban Regulated	0.581	0.386	34%
Urban Non Regulated	0.091	0.056	38%
Agriculture	1.364	1.200	12%
CAFO	0.007	0.005	29%
Forest	0.349	0.349	0%
Air	0.041	0.040	2%
WWTP & CSO	0.871	0.679	22%
Total	**3.304**	**2.715**	**18%**

Total Suspended Solids - By Sector			
Sector	**2009 Progress**	**Final Target Load**	**% Reduction from 2009 Progress**
Urban Regulated	382	242	37%
Urban Non Regulated	18	9	48%
Agriculture	787	703	11%
CAFO	0.11	0.04	65%
Forest	191	191	0%
WWTP & CSO	8	77	-879%
Total	**1,387**	**1,222**	**12%**

Perhaps the most important element of the Phase I Plan is the set of control strategy options and associated Interim Target Loads. The control strategy options are estimated to be more than sufficient to achieve the 2017 Interim Target achieving 70% of the Final Target load. The options, load reductions by sector and Interim Target Loads are summarized for nitrogen in Element 5 of this Executive Summary.

Element 2: Current Baseline Loading and Program Capacity

The Phase I Plan is required to identify the current baseline loads, the current capacity to reduce pollution and, while accounting for future growth in loads, determine the "gap" in capacity needed to attain the interim and final target loads.

The following table summarizes the most recent baseline loads relative to Maryland's target loads for nitrogen and phosphorus. Reductions of atmospheric deposition from implementation of the federal Clean Air Act were "taken off the top" before states were given their allocations by EPA. Maryland will separately take credit for the Healthy Air Act and adoption of the California low emission vehicle standards.

Maryland's Estimated 2009 Baseline Compared to Target Loads
(Millions of pounds per year)

Nitrogen			**Phosphorus**		
2009 Progress	Draft Allocation	% Reduction	2009 Progress	Draft Allocation	% Reduction
49.42	39.09	20.9%	3.30	2.72	17.6%

The Plan describes current legal, regulatory, programmatic, financial, staffing and technical capacity for each of the major source sectors accounted for in the Bay TMDL. These sectors are itemized below:

- Wastewater (including federal facilities):
  - Major Municipal Treatment Plants (design flow equal to or greater than 500,000 gallons/day flow)
  - Minor Municipal Treatment Plants (design flow less than 500,000 gallons/day flow)
  - Major Industrial Plants (load equal to a major municipal plant)
  - Minor Industrial Plants
- On Site Sewage Disposal Systems (Septic Systems)
- Regulated Stormwater
- Sediment and Erosion Control
- Concentrated Animal Feeding Operations (CAFOs)
- Agriculture
- Atmospheric Sources
- Other Sources

The capacity analysis for the Phase I Plan is limited to primarily State resources. For programs administered by local governments, substantial additional analyses will be necessary as part of the Phase II Plan. However, a broad quantitative sense of the current capacity, relative to the reduction goals, can be gained from the loading gap analysis described below.

Element 3: Accounting for Growth in Loads

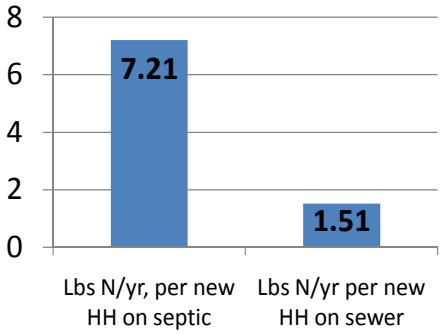
In determining the pollutant load reductions to meet the interim and final target loads, it is necessary to account for future growth. Broadly speaking this can be done in two ways. First, future loads can be estimated and included in quantitative load reduction analyses. Second, policies and programs can be adopted to ensure all future load increases are offset by commensurate load reductions on an as-needed basis.

This Plan uses both approaches. The Plan uses future projections of loads in the calculations used to set strategies for achieving the interim target loads by 2017. This is described further in the next section on the gap analysis.

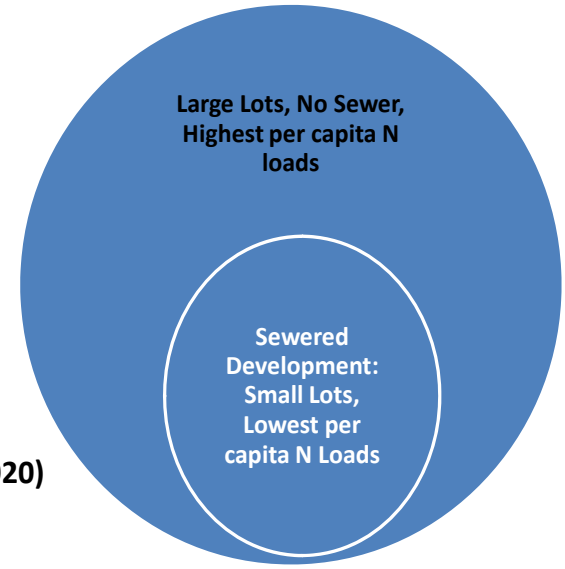
The Plan also offers a schedule for adopting nutrient offset programs for septic system and land development loads. This will build on existing nutrient trading policies and programs. Current trading programs include point-to-point trading and point-to-nonpoint (primarily agricultural sector). The Plan also includes pursuing multi-ecosystem services trading. These approaches would strengthen the market for a more robust trading program for nutrient and sediment management for the Bay.

The proposed approach for offsetting future loads would use different degrees of offsets in three different types of places. Areas with high loads per capita would need to offset loads to a higher degree than areas with low loads per capita. A third category would fall in between. Areas with sewer service and higher density of homes and jobs, served by state of the art sewage treatment, will tend to have lower per capita loads. Areas with low density development on well and septic systems would tend to have higher per capita loads.

In addition to the federal requirement to off-set loads, a quantitative analysis of the potential implications of not offsetting future loads in the following example provided by the Maryland Department of Planning, shows that off-setting is needed to accomplish the necessary loading reductions. The example shows that, per household, the load from new development on well and septic is almost 5 times higher than new loads from sewered areas.



263,225 Additional Households Forecasted in Maryland (2010 -2020)
29% served by septic tanks
71% served by ENR WWTP



Element 4: Gap Analysis

The gap analysis addresses several issues. It estimates the loading gap in achieving 70% of the target load by 2017, and the loading gap in achieving the final target load, both of which account for future projected growth in loads. It also provides a broad estimate of the gap in resources, or "capacity," to achieve these target loads.

It is important to understand that these estimates are general and subject to potentially significant changes due to anticipated changes in EPA's watershed model and the underlying data. In addition, the "gaps" depend on which pollution control strategies are ultimately selected, which influence the source sector allocations. The gaps reported in this draft are based on the initial allocation described above.

The Bay TMDL calls for reductions of 21% in nitrogen and 13.7% in phosphorus from the 2009 baseline load.

The gap analysis for the 2017 interim goal is summarized in Table A. The edge-of-stream (EOS) loads reflect local loading, whereas, the "delivered" loads account for transport losses as nutrients work their way to the Bay.

Table A
Nitrogen
Key Statewide Gap Analysis Results

Summary Values (million lbs/yr)	Delivered	EOS
Statewide Target	39.09	53.99
2009 Baseline Load	49.42	68.20
2017 70% Goal	42.19	58.22
2017 Reduction Needed	7.23	9.98
2017 Current Capacity Reduction	3.85	5.31
2017 Remaining Reduction Gap	3.39	4.68

The broad implication is that an 88 percent increase in capacity is needed to meet the Interim Target for nitrogen. That is, we have the capacity to reduce about 3.85 million pounds of the 7.23 million pound 2017 reduction goal, leaving a 3.39 million pound reduction gap for which additional capacity is needed (3.39/3.85 = 0.70). Most of this capacity need would be filled by upgrading the major WWTPs. The Bay Restoration Advisory Committee projected a deficit beginning in FY 2012 and has begun developing options to close this deficit.

Table B provides the key statewide findings for phosphorus.

Table B
Phosphorus
Key Statewide Gap Analysis Results

Summary Values (million lbs/yr)	Delivered	EOS
Statewide Target	2.72	3.43
2009 Baseline Load	3.30	4.16
2017 70% Goal	2.89	3.64
2017 Reduction Needed	0.412	0.519
2017 Current Capacity Reduction	0.328	0.413
2017 Remaining Reduction Gap	0.084	0.106

The broad implication is that a 26 percent increase in capacity is needed to meet the Interim Target for phosphorus. That is, we have the capacity to reduce about 0.328 million pounds of the 0.412 million pound 2017 reduction goal, leaving a 0.084 million pound reduction gap for which additional capacity is needed (0.084/0.328 = 0.41). As with nitrogen, most of this capacity need would be filled by upgrading the major WWTPs.

These findings mask the implications for nonpoint source sectors which need greater capacity enhancements than indicated above. Because the point source sector is on track to achieve most of the reduction needed by 2017, the remainder of the gap to achieve the final 2020 Target must be addressed by nonpoint sources. The dominant role of the point source sector in achieving the 2017 goal is depicted in Figure A. Even without accounting for reductions that will be achieved

by upgrading the 67 major WWTPs with ENR, the point source reductions are by far the most significant.

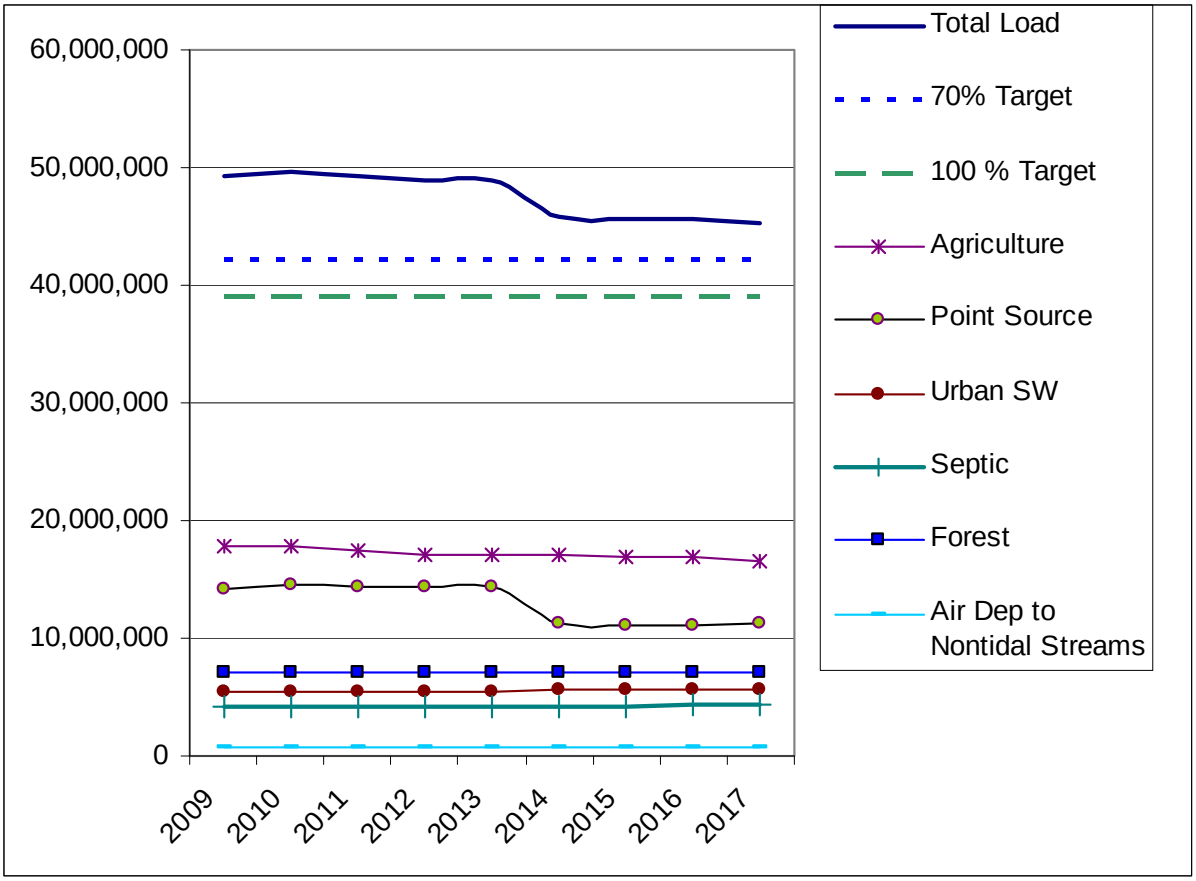


Figure A: Statewide Nitrogen Gap Analysis Projected Reductions (Delivered Loads)

Beyond achieving the 2017 Interim Targets, gaps for nitrogen and phosphorus remain between 2017 and 2020. This additional gap is 3.07 million lbs for nitrogen and 0.166 million lbs phosphorus. As noted above, the nonpoint source sectors will need to close this gap, because most of the point source strategies to reduce loads will be implemented by 2017.

The notion of "Bay Restoration" implies two key factors. First, excessive pollutants must be reduced. Second, load caps must be maintained. Additional resource capacity will be needed for both. The following estimate addresses the resource implications for reductions and notes qualitative implications for maintaining load caps.

Table C
Capacity Increase Needed to Meet Nitrogen Final Target

Source Sector	Number of Years to Meet Final Target with Current Capacity	Multiple of Current Capacity Needed to Meet the Final Target Goal by 2020
Agriculture[1]	75	5 - 7.5
Urban Stormwater[2]	40	3 - 4.0
Septic Systems[3]	46	4.6

1 This assumes a reduction in delivered load from 17.7 million to 13.8 million at 100,000 lbs EOS reduced per year.
2 This assumes a reduction in delivered load from 5.6 million to 4.5 million at about 16,000 lbs EOS per year.
3 This assumes a 15% reduction goal for septic systems thus reducing the delivered load from 4 to 3.4 million.

Although these are coarse estimates, they give a sense of the scale of effort needed to achieve the nitrogen loading goals in the given time-frame. These investments will significantly improve the Bay and the many rivers draining to the Bay. Investments of this scale will likely generate efficiencies that lower some costs, septic system upgrades being one example. Last, the scale of this endeavor must be viewed at a larger economic context – the economic value of a restored Bay and the job generation associated with the work to restore it.

Element 5: Commitment & Strategy to Fill Gaps

This section of the Plan identifies a broad range of reduction strategy options for achieving the 2017 Interim Target (70% of the Final Target Load). These strategy options are being presented for public review, but also serve to demonstrate assurance that there are multiple possible means of achieving the Interim Target.

The estimated nitrogen reductions from the strategy options are presented in Table D. The 70% Interim Target for nitrogen is a 7.22 million pound reduction. The estimated reductions from the strategy options is 9.48 million pounds, which exceeds the 70% goal (These estimated reductions would achieve 131% of the Interim Goal).

The Plan describes enforceable and otherwise binding means to ensure controls are implemented, the primary resource needs both for implementation and compliance verification. This is described further in the Tracking and Reporting section (Element 6).

Table D
Estimated Nitrogen Reductions from Strategy Options

Source Category	(millions of pounds per year)	Interim Target by 2017 (70% of Final)	% of Interim Target Achieved
All Sources	**9.48**	**7.22**	**131%**
Point Sources	5.47		
Urban	0.65		
Septic Systems	0.26		
Agriculture	3.10		

For the Final Target loads, a wide range of proposals for pollution reduction, beyond the strategies considered in the 2017 load reduction estimate, are included in this draft Plan. Many of these are not quantified and would require additional research to determine their viability. The options were generated through State agencies and the public through comments at regional exchanges, an on-line "suggestion box," listening sessions, correspondence and other forums. They provide additional reasonable assurance that the Final Target load can be achieved.

Maryland Watershed Implementation Plan: Summary Table of Actions

Planned Activity	Description	Existing 2-Year Milestone
Point Sources		
ENR Upgrades at Major WWTPs	Upgrade 67 Wastewater Treatment Plants to Maryland's Enhanced Nutrient Removal (ENR) standards. At the current rate of implementation, 24 plants will be operational by June 30, 2011, accounting for an estimated 780,000 lbs/year reduction in nitrogen. Full funding is available for implementation of the 2011 Milestone. The State Bay Restoration Fund Advisory Committee projected a deficit beginning in FY 2012 and has begun developing options to close this deficit.	Yes
Blue Plains Upgrades	Enhance Biological Nutrient Removal (BNR) facilities at the Blue Plains Wastewater Treatment Plant. Maryland has funded a capital project that is expected to be complete in 2011 and result in a nitrogen reduction of 190,000 lbs/yr.	Yes
Major Industrial	Continue Retrofits and Optimization at Major Industrial Treatment Plants to meet the Tributary Strategy load cap.	
Minor Industrial	A preliminary evaluation of 462 minor industrial sources suggests a nutrient reduction potential of approximately 26% by 2017, representing approximately 190,000 lb reduction.	
Federal facilities - major	Continue ENR Retrofits at Major Federal WWTPs in accordance with July 2006 MOU with DOD.	
Federal facilities - minor	Evaluate the largest minor federal WWTPs for potential upgrade.	
Upgrade Large Minor Municipal WWTPs (0.1-0.5 MGD)	Evaluate feasibility of the largest minor municipal WWTPs for potential upgrade based on flow, load, capacity needs, community interest, technical feasibility and cost-effectiveness. Select 5 plants, with approximately 1.0 million gallons per day discharge flow for upgrade by 2017, with estimated nitrogen load reduction of about 45,000 lbs/yr. Cost of upgrade to ENR roughly $58 M.	
Retrofit minor municipal (<0.1)	The smallest WWTPs contribute very little nutrient load, but may have impacts locally. Upgrades will be implemented where needed and cost-effective to meet local nutrient reduction milestones; they are listed as a local, rather than statewide option.	

Planned Activity	Description	Existing 2-Year Milestone
Eliminate Sewer Overflows	Older combined sewer systems designed to collect and transport sewage to treatment plants during dry weather also serve as stormwater drains during rain events. Once combined sewers are full, the blended effluent is discharged to waterways resulting in Combined Sewer Overflows. Sanitary sewer overflows occur when pipes or pumping stations fail and let sewage spill into waterways. These overflows are being addressed by regulatory requirements for reporting, consent orders requiring system repair and upgrades and penalties assessed when failures occur. Long-term control plans are in place.	
Urban Stormwater		
Option 1: MS4 Phase I – including State Highways Administration (SHA) in those counties	Require 30% retrofit/restoration for MD's largest counties and the State Highways Administration subject to Phase I Municipal Separate Storm Sewer System (MS4) Permits.	Yes
Option 2: Increase MS4 Phase I permit implementation to 40%	Increase MS4 permit requirement for MD's largest counties and the State Highways Administration to require installation of stormwater controls on 40% of their impervious surface in their jurisdictions that do not already have stormwater controls.	
Option 3: Increase MS4 Phase I permit implementation to 50%	Increase MS4 permit requirement for MD's largest counties and the State Highways Administration to require installation of stormwater controls on 50% of their impervious surface in their jurisdictions that do not already have stormwater controls.	
MS4 Phase II (CE and WA Co and SHA in those counties), larger municipalities, federal facilities)	Require 20% restoration/retrofit of the impervious surface that does not already have stormwater controls in smaller jurisdictions (less populated counties and municipalities) subject to Phase II MS4 permits.	
Non-MS4 areas	Extend MS4 type permits to smaller urban areas and to retrofit/restore 20% of the impervious surface that does not already have stormwater controls.	
Existing Urban Nutrient Management Law	Regulate fertilizer applications on 220,000 acres of managed lawns (for example, golf courses and athletic fields) through Maryland's Nutrient Management Law.	

Planned Activity	Description	Existing 2-Year Milestone
Refined Urban Nutrient Management	Increasing the types of non-agricultural land that must meet urban nutrient management standards.	
Regenerative Stormwater Conveyance	Implement stream restoration and connection to the flood plain to mimic natural stream conditions and provide a nutrient and sediment reduction	
Rural Residential Tree Planting	Increase rural resident tree planting and homeowner association property including conversion of turf grass to tree covers. May also consider mandatory stream and waterway buffers.	
Forest Conservation Act Enforcement	Strengthen Maryland's Forest Conservation Act by requiring State and local programs be amended to require a "no net loss of forest" approach. The recommended approach would use forest mitigation banks and eliminate fee in lieu of payments to meet no annual loss of forest through development. Use forest mitigation banks to encourage the creation and retention of forests in areas providing the greatest benefit to local ecosystems and the Bay.	
Urban Tree Canopy	State is implementing urban tree canopy goals based on reasonable expectations in gains by accounting for available lands and hydrologic flow paths in urban areas. The intent of the urban tree canopy was to target half of the older developed areas, particularly those developed prior to stormwater management, where urban trees may be particularly valuable for water and air quality. Urban tree canopy is defined as at least 100 trees to an acre.	
Septics		
Retrofitting existing septic systems in the critical area	Projected upgrade of 535 septic systems per year in Maryland's Critical Area. State law requires new and replacement septic systems in the Critical Area (the land within 1000 feet of tidal waters) use best available technology for nitrogen removal. The Bay Restoration Fund pays for grants to homeowners to upgrade septic systems.	Yes

Planned Activity	Description	Existing 2-Year Milestone
Voluntarily upgrades with BRF	Projected upgrade of 90 systems a year with BRF funds remaining after Critical Area retrofits based on the current level of implementation with existing grant funding of 600 upgrades per year.	Yes
Septic hookups to ENR plants	Connect failing septic systems to Wastewater Treatment Plants with advanced nutrient removal technologies.	Yes
All systems in the Critical Area	Require all septic systems in the Critical Area (the land within 1000 feet of tidal waters) use best available technology for nitrogen removal. Cannot complete by 2017, but shows potential or can accelerate as contingency.	
All systems within 1,000 feet of a stream	Require that all septic systems within 1000 feet of a stream use best available technology for nitrogen removal.	
Best Farming Practices		
Cover Crops – Option 1	Plant 180,000 acres of commodity and 175,000 acres of traditional cover crops. Cover crops are small grains such as wheat or rye that are planted in the fall after the harvest of corn, soybeans and other summer crops to absorb unused fertilizers that may remain in the soil. Cover crops also provide a ground cover to prevent soil erosion in the winter. The Maryland Agricultural Water Quality Cost Share Program implements this program with funding from the Chesapeake Bay Restoration Funds, 2010 Trust Fund and targeted Federal grants.	Yes
Cover Crops – Option 2	Plant up to an additional 145,000 acres of cover crops over Option 1 for a total of 500,000 acres.	
Nutrient Management Enforcement	Nutrient Management Plans enforcement on 100,000 acres from 2010-2011. Maryland Department of Agriculture enforces state law requiring farmers to implement Nutrient Management Plans that require they efficiently use manure or fertilizer needed to grow a healthy crop and ensure that excess nutrients are not lost to the environment. Although over 1.2 million acres are in compliance with nutrient management requirements, MDA enforcement actions will address the remaining 100,000 acres.	Yes

Planned Activity	Description	Existing 2-Year Milestone
Soil Conservation & Water Quality Plans	Develop Soil Conservation and Water Quality Plans on 257,049 acres. Develop a comprehensive plan for a farm that addresses natural resource management on agricultural lands and recommends best management practices (BMPs) that control erosion and sediment loss and manage nutrient runoff. 764,630 acres of Maryland farm land will be managed under a current SCWQP. Farmers may receive technical and financial assistance to install BMPs.	Yes
Conservation Tillage	Conservation Tillage involves planting and growing crops with minimal disturbance of the surface soil. No-till farming, a form of conservation tillage, is used to seed the crop directly into vegetative cover or crop residue with no disturbance of the soil surface. Minimum tillage farming involves some disturbance of the soil, but uses tillage equipment that leaves much of the vegetative cover or crop residue on the surface, the potential is 614,630 acres.	
Continuous No-Till Conservation	Of the 764,630 acres in conservation tillage maintain 150,000 acres of continuous no-till farming, a form of conservation tillage in which seed is applied into the vegetative cover or crop residue with no disturbance of the surface soil. Conservation Tillage involves planting and growing crops with minimal disturbance of the surface soil. No-till farming, a form of conservation tillage, is used to seed the crop directly into vegetative cover or crop residue with no disturbance of the soil surface. Minimum tillage farming involves some disturbance of the soil, but uses tillage equipment that leaves much of the vegetative cover or crop residue on the surface.	Yes
CAFO / MAFO	Fully implement concentrated animal feeding operations with comprehensive nutrient management plans in place and fully implement Maryland Animal Feeding Operation permits with nutrient management and soil and water conservation plans in place.	
Decision/Precision Agriculture	Use Precision Agriculture on 100,000 acres of farmland from 2010-2011 and an additional 120,000 acres from 2012-2017. Precision agriculture seeks to maximize the efficiency of nutrient application to cropland, thereby minimizing waste and nutrient runoff to the Bay.	Yes
Heavy Use Poultry Area Concrete Pads	Construct Heavy Use Poultry Area Concrete Pads on 400 farms for 2010-2011 and an additional 200 pads for 2012-2017. Establishing a pad structure stabilizes areas frequently and intensively used by people, animals or vehicles to prevent nutrient movement into surface and groundwater. Cost-Share funds are available for the installation of these structures through the Maryland Agricultural Water Quality Cost-Share (MACS) program and USDA's Environmental Quality Incentives Program (EQIP).	Yes

Planned Activity	Description	Existing 2-Year Milestone
Livestock Waste Structures	Construct 145 Livestock Waste Structures. Animal waste is stored in structures to protect it from the weather until it can be used as a crop fertilizer when conditions are right or transported to another location. Cost-Share funds are available for the installation of these costly systems through the Maryland Agricultural Water Quality Cost-Share (MACS) program and USDA's Environmental Quality Incentives Program (EQIP).	Yes
Water Control Structures	Construct Water Control Structures on 7,250 acres. These structures are used in constructed drainage systems to control water depth and flow rates. They also increase water retention and decrease the quantity and quality of pollutants downstream. Cost-Share funds are available for the installation of these structures through the Maryland Agricultural Water Quality Cost-Share (MACS) program and USDA's Environmental Quality Incentives Program (EQIP).	Yes
Dairy Manure Incorporation Technology	Implement Dairy Manure Incorporation Technology on 2,500 acres for 2010-2011 and an additional 2,500 acres for 2012-2017. Dairy manure is incorporated into the soil at the time of application utilizing low disturbance technology. Ammonia loss from incorporation will be reduced up to 95% compared to surface application. Initial cost-share funding is through a demonstration grant supported by the Chesapeake Bay Trust (CBT). Evaluation by MDA and NRCS technical workgroups for cost-share funding will be done to determine eligibility for cost-share funding through the Maryland Agricultural Water Quality Cost-Share (MACS) program and USDA's Environmental Quality Incentives Program (EQIP).	Yes
Stream Protection with Fencing	Protect 3,000 acres of Pastureland Using Fencing. Pasture fencing keeps farm animals out of streams and prevents streambank erosion. Cost-Share funds are available for the installation of these systems through the Maryland Agricultural Water Quality Cost-Share (MACS) program and USDA's Environmental Quality Incentives Program (EQIP).	Yes
Manure Transport	Transport an additional 10,000 tons of manure out of the watershed for 2010-2011 and an additional 25,000 tons for 2012-2017. Excess manure is transported away from farms with high soil phosphorus levels to other farms or locations that can use the manure safely. 50% of the funding for this program is available through the Maryland Agricultural Water Quality Cost Share Program (MACS). The remaining 50% of the funds is provided by Special Funds (Poultry Companies match). Cost-share is also provided for transporting excess manure from Dairy operations.	Yes
Poultry Manure Incorporation Technology	Use Poultry Manure Incorporation Technology on 2,500 acres. Poultry litter is incorporated into the soil at the time of application utilizing minimum disturbance technology which significantly reduces ammonia loss. Initial 2 years of funding through USDA Conservation Innovative Grants (CIG) and National Fish and Wildlife Foundation (NFWF) grant sources.	Yes

Planned Activity	Description	Existing 2-Year Milestone
Poultry Waste Structures	Construct 53 Poultry Waste Structures. These structures protect poultry waste from rain so that it can be used as a crop fertilizer when conditions are right or transported to another location. Cost-Share funds are available for the installation of these structures through the Maryland Agricultural Water Quality Cost-Share (MACS) program and USDA's Environmental Quality Incentives Program (EQIP).	Yes
Stream Protection without Fencing	Utilize Stream Protection without Fencing on 3,000 acres. Watering troughs provide a safe, reliable source of water for livestock that is away from streams. The troughs help protects stream banks from erosion that may be caused by farm animals. Cost-Share funds are available for the installation of these systems through the Maryland Agricultural Water Quality Cost-Share (MACS) program and USDA's Environmental Quality Incentives Program (EQIP).	Yes
Runoff Control Systems	Construct 75 Runoff Control Systems. Runoff control systems use a variety of techniques to direct rainwater to places where it won't cause nutrient runoff or soil erosion. Gutters and downspouts on barns and grading of the land are examples of ways to direct runoff from rainfall. Cost-Share funds are available for the installation of these systems through the Maryland Agricultural Water Quality Cost-Share (MACS) program and USDA's Environmental Quality Incentives Program (EQIP).	Yes
Phytase	With the advent of phytase addition to the diet and feed for all poultry in Maryland we have seen a steady reduction in the phosphorus levels in the manure. In early 2004 the Bay Program documented a 16% reduction in P. More recent results show a 24% reduction. The research shows up to a 33% reduction is easily achievable. 16% current model 32% proposed reduction in P in poultry manure.	
Mortality Composters	This option falls under the regulation of CAFOs and MAFO with a potential of 145 structures.	
Natural Filters on Private Land		
Streamside Grass Buffers	Plant 7,000 acres of Streamside Grass Buffers on Private Lands. Grasses planted next to waterways filter and take up nutrients coming off the land, stabilize the soil and provide wildlife habitat. Cost-Share funds are available for the implementation of grassed buffers on agricultural land through the Maryland Agricultural Water Quality Cost-Share (MACS) program, 2010 Chesapeake Bay Trust Fund and USDA's Conservation Reserve Enhancement Program (CREP).	Yes

Planned Activity	Description	Existing 2-Year Milestone
Streamside Forest Buffers	Plant 3,000 acres of Streamside Forest Buffers on Private Lands. Trees planted next to waterways filter and take up nutrients coming off the land, stabilize the soil and provide wildlife habitat. Cost-Share funds are available for the implementation of riparian forest buffers on agricultural land through the Maryland Agricultural Water Quality Cost-Share (MACS) program, 2010 Trust Fund and USDA's Conservation Reserve Enhancement Program (CREP).	Yes
Wetland Restoration	Construct 1,000 acres of Wetland Restoration on Private Lands. A wetland is an area of land where the soil is wet or covered with water. Wetlands are often called swamps, marshes, or bogs. Cost-Share funds are available for the implementation of wetlands on eligible agricultural land through the Maryland Agricultural Water Quality Cost-Share (MACS) program, 2010 Chesapeake Bay Trust Fund and USDA's Conservation Reserve Enhancement Program (CREP). Funding for wetlands creation, restoration, and enhancement is also available from various federal sources, State and local governments and nonprofit organizations.	Yes
Shoreline Erosion Control	Shore stabilization projects on private agricultural land that reduces erosion and stabilizes shorelines. Climate change and rising sea level are impacting certain areas of the state. Mitigation options to protect shorelines provide nutrient and sediment reductions.	
Retire Highly Erodible Land	Retire 1,800 acres of Highly Erodible Land on Private Lands. Land that is especially vulnerable to erosion is removed from crop or hay production and is planted in either grass or forest. This land usually is not disturbed for at least 10 years. Cost-Share funds are available for the retirement of highly erodible agricultural land through the Maryland Agricultural Water Quality Cost-Share (MACS) program, 2010 Chesapeake Bay Trust Fund and USDA's Conservation Reserve Enhancement Program (CREP).	Yes
Natural Filters on Public Land		
Tree Planting - Forest Brigade	Plant one million trees on public lands by 2011 through the Department of Public Safety and Corrections Forest Brigade.	Yes
Wetland Restoration	Implement 555 acres of Wetland Restoration on public land. A wetland is an area of land where the soil wet or covered with water. Wetlands are often called swamps, marshes, or bogs. Dedicated funding is available through Maryland's Tributary and Wetland Restoration fund. Other potential funding sources include Maryland's Ecosystem Enhancement Program, Program Open Space, Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, as well as competitive funding programs such as the Transportation Enhancement Program and Corporate Wetlands Restoration Partnership.	Yes

Planned Activity	Description	Existing 2-Year Milestone
Streamside Forest Buffers	Plant 345 acres of Streamside Forest Buffers on public land. Trees planted next to waterways filter and take up nutrients coming off the land, stabilize the soil and provide wildlife habitat. Dedicated funding is available through Maryland's Tributary and Wetland Restoration fund. Other potential funding sources include Maryland's Ecosystem Enhancement Program, Program Open Space, Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, as well as competitive funding programs such as the Transportation Enhancement Program and Corporate Wetlands Restoration Partnership.	Yes
Tree Planting - Other	Plant 450 acres of trees on public lands. Trees planted next to waterways filter and take up nutrients coming off the land, stabilize the soil and provide wildlife habitat. Potential funding sources include Maryland's Ecosystem Enhancement Program, Program Open Space, Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, as well as competitive funding programs such as the Transportation Enhancement Program and Corporate Wetlands Restoration Partnership.	Yes
Streamside Grass Buffers	Plant 29 acres of Streamside Grass Buffers on public land. Grasses planted next to waterways filter and take up nutrients coming off the land, stabilize the soil and provide wildlife habitat. Dedicated funding is available through Maryland's Tributary and Wetland Restoration fund. Other potential funding sources include Maryland's Ecosystem Enhancement Program, Program Open Space, Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, as well as competitive funding programs such as the Transportation Enhancement Program and Corporate Wetlands Restoration Partnership.	Yes
Grassland	Restore 45 acres of Grassland on public land. Grass planted next to waterways filter and takes up nutrients coming off the land, stabilizes the soil and provides wildlife habitat. Potential funding sources include Maryland's Ecosystem Enhancement Program, Program Open Space, Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, as well as competitive funding programs such as the Transportation Enhancement Program and Corporate Wetlands Restoration Partnership.	Yes
Agricultural strategies on DNR land	Adopt applicable actions and practices from President Obama's Chesapeake Bay Executive Order section 502 to DNR properties, e.g. cover crops.	
Natural Filters on Other Public Lands	Maryland will increase partnerships with local governments, non-profits, universities, other state agencies to implement natural filters.	
New Farming BMPs		
100-ft CAFO setbacks	100 foot setback or 35 foot vegetative buffer is required for CAFO manure application on a potential of 2,500 acres. Based upon EPA regulations for CAFOs the infield spreading of manure is restricted.	

Planned Activity	Description	Existing 2-Year Milestone
10-ft riparian setbacks for fertilizers	Will bring consistency to several programs regulating nutrients on a potential of 5,280 acres.	
P-sorbing Materials	"Phosphorus-sorbing" materials soak up dissolved phosphorus, keeping it from flowing downstream on a potential of 1,000 acres. Engineered systems in which drainage water passes through phosphorus-sorbing materials, such as gypsum, drinking water treatment residuals , or acid mine drainage residuals, can potentially remove large percentages of phosphorus as well as sediment, heavy metals, and other pollutants.	
Alum Addition at Poultry Houses	A surface application of alum, an acidifier, is added to poultry litter to acidify poultry litter and maintain ammonia in the non-volatile ionized form (ammonium) for a potential 0f 96,000 tons. Consider use of the Chesapeake and Coastal Bays Trust Fund for support. Limited funding through Farm Bill programs.	
In-house Poultry Ammonia Emission Control	Ammonia emission reductions could be achieved by constructing and retrofitting poultry houses with flooring that helps reduce the creation of ammonia. Companies are researching new ventilated plenum flooring (patent pending) for poultry houses that will result in drier litter thus reducing the volume of waste by using less bedding material, lowers ammonia emissions, and promotes faster-growing and healthier chickens.	
Cropland Irrigation Management	Crop irrigation is used to decrease climatic variability and maximize crop yields. This results in a decrease in runoff and an increase in the crop's ability to uptake nutrients therefore less available for nutrient runoff. Yields are 20% to 25% higher than in un-irrigated fields. Nutrient uptake of irrigated acres is greater, resulting in less residual nutrients remaining in the soil for runoff.	
Vegetated Environmental Buffers	A vegetative environmental buffer, or VEB, is the strategic planting of combinations of trees and shrubs around poultry houses to address environmental, production, and public relations issues by providing a vegetative filter to lower emissions of ammonia, dust, odor, feathers, and noise on a potential of 75 acres. In addition to offering a practical, efficient, and cost-effective means of capturing emissions, a properly designed VEB program can help to conserve energy and reduce air-borne pathogens by offering shade and slowing wind speeds, as well as create a more attractive landscape and screen routine operations from view.	
Agronomic Improvements	New seed varieties are being developed for additional nutrient efficiency. Current seed varieties are only 40% to 50% efficient at utilizing and up-taking nutrients. Current test varieties of some new seeds will provide up to 60% efficiency in utilizing available fertilizer	

Planned Activity	Description	Existing 2-Year Milestone
MD-specific Plant Nutrient Uptake/Research	Chesapeake Bay Program model utilizes a blended potential yield for crop uptake rates. Maryland crop yields are 15 to 30 bushels higher within the 5 basins, Bay Program yield 109 bushels/ac and Maryland average yield 130 bushels/ac. Additional nutrient uptake is equivalent to yield.	
Voluntary BMPS	A program to conduct on farm assessments and inventory of voluntary conservation practices that have been installed by farmers and landowners, since 2005, that are not part of the MDA Conservation Tracker reported inventory of conservation practices.	
Vegetated Open Channels	A suite of innovative alternative practices designed to enhance the removal of nutrients once they leave the field. These include increasing vegetative buffers that protect ditches from sediment and nutrient runoff. This may include reengineering of drainage channels to reestablish floodplains or redirect storm flows to wetland areas.	
Stream Restoration Non-Coastal Plain	Restoration of drainage channels and streams utilizing stream recreation techniques. Options include instream and riparian wetlands, designing channels to reestablish natural flow paths, and establishing habitat.	
Alternative uses of manure	Livestock manure (primarily poultry litter) generated on Maryland farms is currently applied as fertilizer to Maryland crop fields or trucked out of watershed through the manure transport program. A small amount is also pelletized and sold as organic fertilizer for residential and commercial use through the Perdue AgriRecylce effort. Developing alternative uses for manure produced in the Bay watershed represents a potentially large opportunity for both farmers and the Bay. Primary among these are a variety of technologies (ex. biofuel gasification) that can turn manure into electricity and concentrated fertilizer. The electricity produced can be used to power local farms with the excess sold back to the grid. The by-products of the process can also be sold as a precision, organic fertilizer. In one model, farmer co-ops would own the production facilities, pay individual farmers for the manure, create electricity that reduces farmer fuel needs, and share the profits form selling advanced fertilizer. The resulting benefits include reduced operating costs to farmers, reduced nutrient inputs to the Bay, and increases in Maryland's renewable energy portfolio. Similar efforts are already underway in other states and an existing, privately funded project in Maryland (The Chesapeake Bay Manure Management Project) has already explored initial opportunities with scientists and the farming community. The opportunity now is to initiate a pilot project in Maryland to test and demonstrate its viability. (O2 free charcoaling) of animal and plant wastes, such as poultry litter, cattle manure, and sewage sludge produces heat, befoul and pure carbon matrix which chemically holds NOX, POX< COX and SOX. The pyrolysis product is "biochar". Biochar can be incorporated into soil to improve structure, water holding capacity, caution exchange capacity. The carbon remains in soils for years. The N and P are removed from the water going into the Bay yet are available to plants. Biochar plants are in WV, GA, IL, IN, and in Australia, Germany, etc.	

Planned Activity	Description	Existing 2-Year Milestone
Revise P-index for nutrient management	The **P-Index** is a site-specific assessment tool that identifies the relative risk for phosphorus losses from agricultural production fields to nearby bodies of water. The P-Index is currently used in the development of agricultural nutrient management plans. The State of Maryland will support development of a revised P-Index that incorporates the best available science in an effort to more appropriately identify the risk for phosphorus loss from agricultural lands. The revised P-Index will offer site-specific management options for reducing off-site phosphorus transport. The process of revising the current P-Index will begin in late 2010/early 2011 with convening a technical workshop, hosted by the University of Maryland's College of Agriculture and Natural Resources, that will provide a forum for discussion of relevant recent scientific advances, evaluation of the performance of the current P-Index, and evaluation of alternative approaches for revision of the P-Index. Maryland anticipates this process will take six months to yield recommendations. Maryland's BayStat will then begin reviewing recommendations from the workshop for inclusion as state policy.	
Air		
Maryland Healthy Air Act	Implement Maryland's Healthy Air Act (effective January 1, 2009). More than one-third of the pollution entering the Chesapeake Bay comes from the air. Pollutants released into the air (primarily from power plants and vehicle emissions) eventually make their way back down to the earth's surface and are dispersed onto the land and transported into waterways. The emission controls on power plants will reduce nitrogen entering the Bay by over 300,000 pounds each year and will reduce mercury significantly.	Yes
Expand Diesel Engine Retrofit Program	Currently the Port of Baltimore is partnering with the Environmental Finance Center to use stimulus money to retrofit dirty diesel truck engines to 'clean diesel' technologies. One possible strategy is to expand this program to reduce emissions and ultimately a portion of deposition.	
Low Emission Vehicle Requirement	In 2007, Maryland passed Clean Cars Legislation that requires by 2011 that all new cars meet the strictest emissions standards allowed under federal law. While the purpose of this legislation is to meet air quality and carbon reduction goals, MDE estimates that this will result in 2,000 lbs/yr reduction in nitrogen loading to the Bay as well.	

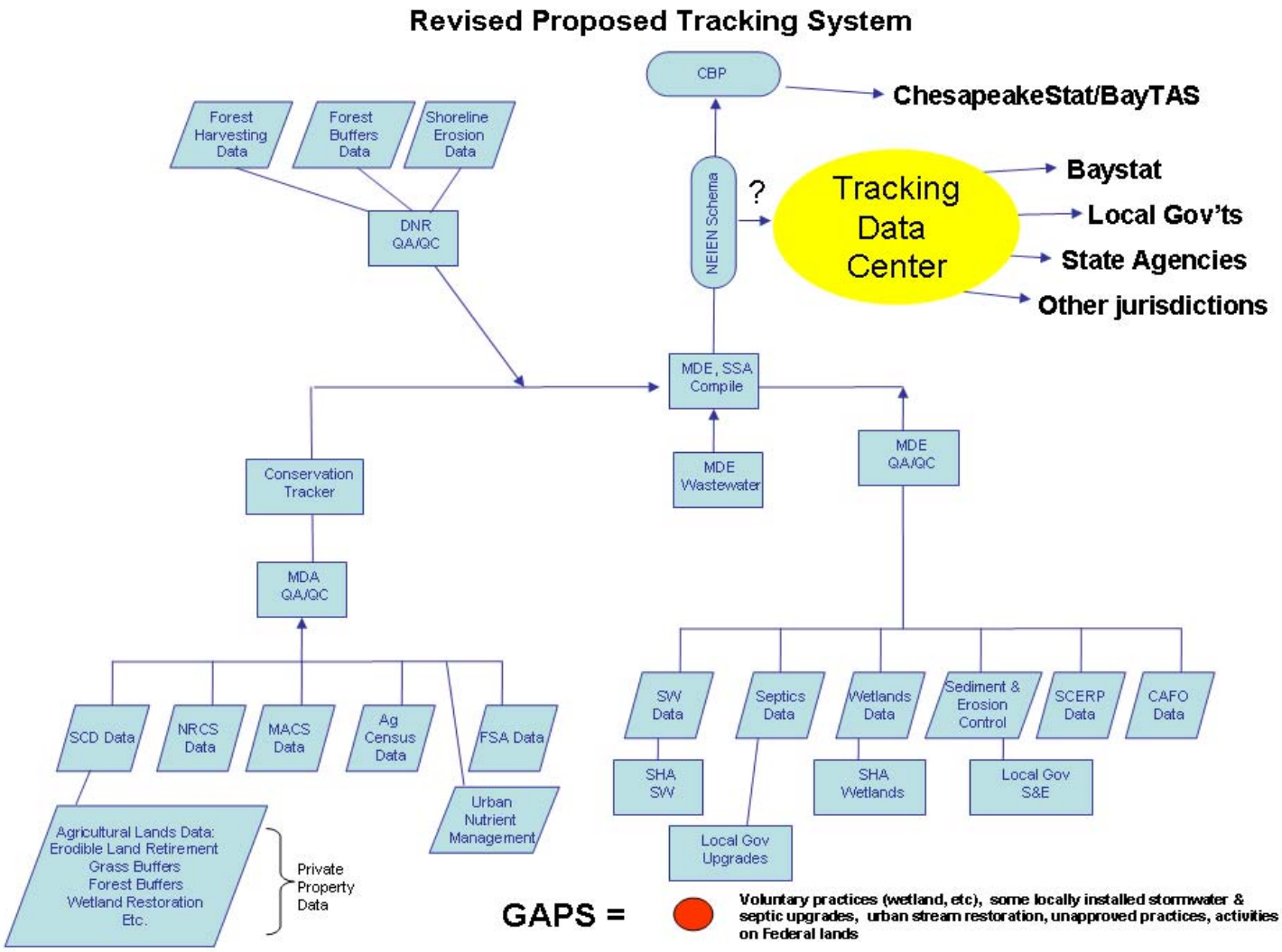
Element 6: Tracking and Reporting Protocols

This section of the Plan is organized in two main categories, point sources regulated under NPDES permits and non-point sources including regulated stormwater. It describes the current implementation tracking and reporting procedures for each of the source sectors. It also describes procedures for verifying the practices are actually installed. The information being tracked supports the Bay Program annual evaluations of implementation (model inputs), Maryland's BayStat, and other information needs. An overview of the key elements of the system, with proposed enhancements, is reflected in the chart on the next page.

A key need is improved acquisition of information from the source. In many cases the source of data is locally administered programs that face resource limitations in performing primary functions and view tracking and reporting as a secondary priority. The Bay TMDL limits and new nutrient offset requirements will create strong incentives to track and report control practices; however, staffing levels and funding are challenges.

The Chesapeake Bay Regulatory and Accountability Program (CBRAP) grant is providing resources to enhance the State's programs. A portion of the CBRAP funding is being directed toward the tracking and reporting function, notably for urban stormwater management, Concentrated Animal Feeding Operations (CAFOs) and nutrient management planning.

A third priority is enhancement of tracking data management after the work is done and the results are reported to the State. The Plan considers the establishment of a tracking data process, which is identified in the chart below. These functions are still being evaluated among the State agencies in coordination with similar federal systems under development that might serve some of the needs envisioned by the tracking data proposal.


Revised Proposed Tracking System
CBP
ChesapeakeStat/BayTAS
Forest Harvesting Data
Forest Buffers Data
Shoreline Erosion Data
DNR QA/QC
NEIEN Schema
?
Tracking Data Center
Baystat
Local Gov'ts
State Agencies
Other jurisdictions
MDE, SSA Compile
Conservation Tracker
MDE Wastewater
MDE QA/QC
MDA QA/QC
SCD Data
NRCS Data
MACS Data
Ag Census Data
FSA Data
Urban Nutrient Management
Agricultural Lands Data:
Erodible Land Retirement
Grass Buffers
Forest Buffers
Wetland Restoration
Etc.
Private Property Data
SW Data
Septics Data
Wetlands Data
Sediment & Erosion Control
SCERP Data
CAFO Data
SHA SW
SHA Wetlands
Local Gov S&E
Local Gov Upgrades
GAPS =
Voluntary practices (wetland, etc), some locally installed stormwater & septic upgrades, urban stream restoration, unapproved practices, activities on Federal lands

Element 7: Contingencies for Slow or Incomplete Implementation

Maryland's Phase I Plan presents a list of potential strategy options for public consideration. With this in mind, the public draft of Phase I Plan has collapsed Element 7 into Element 5 until public comments can be considered. Following public review, the strategy options will be divided into strategies for achieving the 2017 Interim Target and contingencies. At that point, Element 7 will be incorporated into the Plan.

Conclusion

By building this Plan on strategies to accelerate Maryland's proven and precedent setting programs to date; by proposing a set of strategies that exceed the reductions required by 31%; and by soliciting public comment on these strategies and then refining the strategies to selections and contingencies in a Final Plan to be submitted in November, Maryland is proposing a Plan based on reduction programs known to work, maximizing public input into and support for the Plan, and providing the strongest assurance that these critical reductions can be achieved by 2020.

It is important to note the calculations made to estimate loadings, reductions, and percentage of progress will change based on changes to EPA's Bay model. The model is currently being refined. We expect that estimates may change *prior* to the EPA publication for draft Phase I Plans of September 24, 2010. It is also important to note that the strategies ultimately selected for Maryland's Final Phase I Plan will change after the public comment period. For these reasons, this Plan should be viewed as a first draft.

This Draft Phase I Plan addresses challenging and difficult issues such as, reducing further pollution from point source and non-point source sectors, offsetting new pollution loads, and seeks to create incentives for best management practices and restoration. It is not possible to meet Maryland's pollution reduction requirements without each of these elements in the Plan.

This draft Phase I Watershed Implementation Plan, and the Final Plan to be submitted later this year, outline the basis for the strategy necessary to reduce Maryland's pollution loads by the amount required to restore water quality and will provide the foundation for a more detailed Phase 2 Plan in 2011 and the Phase 3 Plan in 2017.