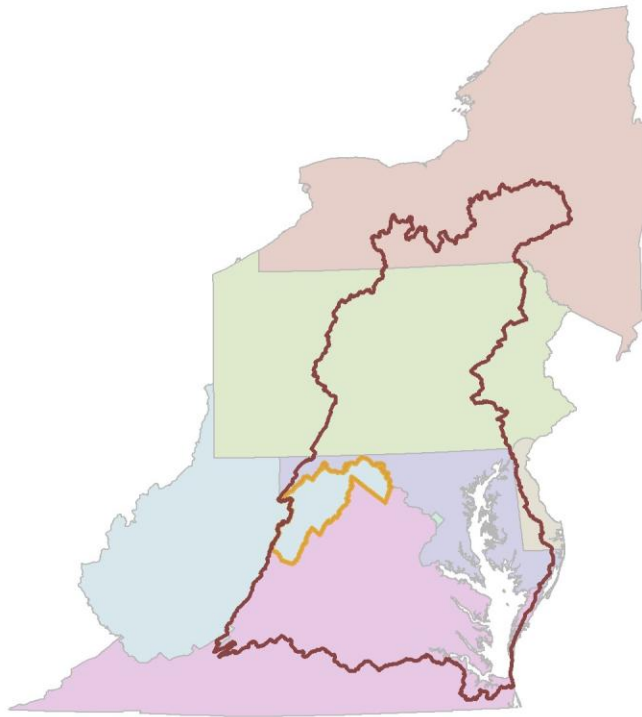


**West Virginia's
Chesapeake Bay TMDL
Final Phase II Watershed Implementation Plan**

**A product of the
West Virginia WIP Development Team**



**In cooperation with the
WV Department of Environmental Protection
WV Conservation Agency
WV Department of Agriculture**

Submitted to the Chesapeake Bay Program
on March 30, 2012

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SECTION 2. EXECUTIVE SUMMARY

The Chesapeake Bay is a national and local treasure, and an important source of livelihood, recreation and cultural heritage for the region. However, after receiving pollution from the atmosphere and surrounding landscape for many years, the Bay is in trouble. The states in the Chesapeake Bay Watershed – Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia – along with the District of Columbia and the U.S. Environmental Protection Agency (EPA) are working together to find solutions to the Bay’s problems. They determined that the key to restoring the Bay’s health entails reducing the flow of nutrients (nitrogen and phosphorus) and sediment flowing from the Bay states into the Bay, and have set maximum amounts for nitrogen, phosphorus and sediment, known as Cap Load Allocations (hereafter referred to as CLAs or Cap Loads), for each of the jurisdictions. **The efforts by West Virginia to help restore the distant Chesapeake Bay to health will also improve the quality of West Virginia’s rivers and streams.**

In 2004, Bay Program Partners developed and began to implement cooperative and voluntary Tributary Strategies to reduce current pollutant loads to the CLA levels by the year 2010. The Chesapeake Bay Program determined that load reductions of 33% for nitrogen, 35% for phosphorus, and 6% for sediment were required of West Virginia. It was understood that, if this effort was not successful, the U.S. Environmental Protection Agency would begin developing a Total Maximum Daily Load (TMDL) for the Chesapeake Bay, a process that would place significant additional restrictions on pollution sources in all the Bay States. A TMDL sets forth a pollution budget for a watershed that allocates the amount each pollutant source is allowed to release while still attaining water quality standards.

In 2008, in recognition that pollution reduction goals were not being met, the federal and state governments determined that shorter-term milestones would improve accountability, accelerate pollution reductions, and increase the likelihood of meeting pollution reduction targets. The first milestones were announced in May 2009. Plans to meet these commitments were laid out over the three years between January 1, 2009 and December 31, 2011.

In May 2009, President Obama issued an Executive Order that substantially expanded the federal commitment to the Chesapeake Bay region. Many of the federal actions will directly support restoration efforts by local governments, nonprofit groups and citizens. The Order also requires that federal lands and facilities lead by example in environmental stewardship. Integral to the Order was the decision for the EPA to proceed with the Chesapeake Bay TMDL, which would expand regulation of urban and suburban stormwater and concentrated animal feeding operations and increase enforcement activities and funding for state regulatory programs. Finally, the Order gives the EPA enforcement authority if states miss established goals.

The Order required the six watershed states and the District of Columbia to develop and submit **Watershed Implementation Plans** (WIP) as a key element of this approach. WIP strategies are

directed to have controls in place by 2025 that would achieve target loads, and by 2017 that would result in 60% of necessary nutrient and sediment reductions compared to current loads. The WIP strategies address existing as well as new or expanded sources of nutrients and sediment. The Bay States and DC were directed by EPA to develop their WIPs in two phases.

West Virginia submitted draft and final Phase I WIPs on September 1, 2010 and November 29, 2010, respectively. The Final Phase I WIP was based upon allocation scenarios that the Chesapeake Bay Watershed Model (CBWM) predicted would achieve 2017 and 2025 goals for West Virginia. The CBWM uses **peer-reviewed** mathematical models to simulate changes in the Bay ecosystem due to changes in population, land use, or pollution management. These simulations are not the same as actual conditions, but represent the best scientific estimate of what average loadings are likely to be. **Ultimate success will, of course, depend on achieving actual, not modeled, reductions.**

The Final Phase I WIP incorporated many changes from the Draft that mostly satisfied EPA and eliminated the need for all but one of the federal backstops (described in Section 3). The targeted federal backstop that remained for West Virginia was in the agriculture sector. EPA shifted 75 percent of West Virginia's animal feeding operation load into the part of the TMDL reserved for *regulated* pollution sources, and assumed implementation of certain practices on these operations. The shift signaled that any of these operations could potentially be subject to state or federal permits as necessary to protect water quality. EPA also increased oversight of the agriculture, stormwater, and wastewater sectors and progress toward West Virginia's two-year milestones to ensure the load reductions outlined in West Virginia's WIP were on track for implementation.

This document is the Final Phase II Watershed Implementation Plan, which was required to be developed and submitted in draft form to EPA December 15, 2011 and in this final form on March 30, 2012. Specifically, this document adds local detail, as well as increased specificity and accountability over the Phase I WIP. In order to make this document readily accessible for both agency and public review, the WV WIP Development Team elected to build the Phase II WIP by modifying the Phase I WIP document rather than producing a document that referred to the Phase I document. **Significant wording and content changes between the Draft and this Final Phase II WIP are highlighted with green font.**

Future CBWM refinement and reassessment are again planned in 2017. At that time, the jurisdictions will develop Phase III WIPs to ensure attainment of Cap Loads by 2025.

This document provides a detailed description of how WIP strategies will be undertaken in West Virginia's major load sectors: Wastewater, Developed Lands and Industrial (**sometimes called "Urban Runoff"**), Agriculture, Forest, and Other (see Appendix C). Some of these sectors are regulated and some are not.

Wastewater

- Significant Municipal Facilities
- Nonsignificant Municipal Facilities
- Combined Sewer Overflows
- Significant Industrial Facilities
- Nonsignificant Industrial Facilities
- Negligible Industrial Wastewater Discharges

Developed Lands & Industrial

- Regulated Sectors – Stormwater - Associated with Industrial Activity
- Regulated Sectors – Stormwater - Mining Discharges
- Regulated Sectors – Stormwater - Construction Stormwater General Permit
- Regulated Sectors – Stormwater - Municipal Separate Storm Sewer Systems (MS4s)
- Non-regulated Sectors – Developed Lands

Agriculture

- Agriculture -- General
- Regulated Sectors: CAFO/AFO

Forestry

Each sector includes the following subjects: Current Programs and Capacities, Accounting for Growth, Gap Analysis, Strategy to Fill the Gaps, Contingencies, and Tracking and Reporting Protocols.

SECTION 3. INTRODUCTION

The Chesapeake Bay is a national and local treasure, and an important source of livelihood, recreation and cultural heritage for the region. However, after receiving pollution from the atmosphere and surrounding landscape for many years, the Bay is in trouble. The states in the Chesapeake Bay Watershed – Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia – along with the District of Columbia and the U.S. Environmental Protection Agency (EPA) have come together to find solutions to the Bay’s problems. They have determined that the key to restoring the Bay’s health entails reducing the flow of nutrients (nitrogen and phosphorus) and sediment flowing from the Bay states into the Bay.

Excess nutrients and sediment impact the health of the Bay by increasing algal growth and reducing the transmission of light through the water. Excess nutrients fuel the growth of dense algal blooms. These blooms may become so dense that they, along with fine sediment, block sunlight that underwater bay grasses need to grow. Bay grasses provide food for waterfowl and shelter for blue crabs and juvenile fish. Without sufficient light, these grasses cannot produce oxygen through photosynthesis. Unconsumed algae and phytoplankton will eventually die and be decomposed by bacteria in a process that further depletes the bottom waters of the oxygen that fish, shellfish and other species require to live.

The EPA has set maximum amounts for nitrogen, phosphorus and sediment, known as Cap Load Allocations (hereafter referred to as CLAs or Cap Loads), for each of the jurisdictions.

West Virginia’s role in this process began when Governor Bob Wise signed the Chesapeake Bay Program Water Quality Initiative Memorandum of Understanding on June 18, 2002, making West Virginia, along with New York and Delaware, a Headwaters Partner in the Chesapeake Bay Program. With the agreement, West Virginia gained a seat at the Chesapeake Executive Council, a voice in deciding how best to achieve the Program’s goals, and demonstrated its intent to significantly improve water quality by establishing and implementing strategies to meet voluntary goals and objectives to reduce nutrient and sediment loads. The efforts by West Virginia to help restore the distant Chesapeake Bay to health will also improve the quality of West Virginia’s rivers and streams.

Bay Program partners agreed at that time to develop and carry out cooperative and voluntary Tributary Strategies to reduce existing pollutant loads to the CLA levels by the year 2010. The Chesapeake Bay Program determined that load reductions of 33% for nitrogen, 35% for phosphorus, and 6% for sediment would be required of West Virginia.

It was understood that failure to achieve the necessary reductions by 2010 would lead the EPA to begin developing a Total Maximum Daily Load (TMDL) for the Chesapeake Bay, a process that would place significant additional restrictions on pollution sources in all the Bay States, including headwaters states like West Virginia. A TMDL sets forth a pollution budget for a watershed that allocates the amount each pollutant source is allowed to release while still

attaining water quality standards.

The West Virginia Potomac Tributary Strategy was developed in 2003-2004 using a Potomac Basin stakeholder process. Anyone with a “stake” in the outcome was invited to take part, and individuals representing counties, municipalities, industry, agriculture, developers, environmental organizations, and state and regional governments all participated. This Tributary Strategy provided the framework for a comprehensive planning process to equitably reduce the flow of nutrients and sediment loads to the Potomac River, and ultimately to the Chesapeake Bay. The WV Potomac Tributary Strategy document also provided substantial background information that is not repeated in this document; it is available for download at: <http://www.wvca.us/bay/documents.cfm>. The implementation deck associated with the strategy included pollution reduction practices implemented from 1985 through those expected to be implemented by 2010.

Following development of West Virginia’s Strategy document and proposed implementation deck, the WV Potomac Tributary Strategy Team moved into an implementation phase designed to refine the original proposal, begin actively implementing the Tributary Strategy, and enhance support for and input on the process through a series of public meetings. One result of that public process was the WV Potomac Tributary Strategy Implementation Plan, first submitted to EPA in December 2005, and last revised in June 2007. The Implementation Plan summarized actions to be taken from 2004 through 2010 to meet West Virginia’s Cap Load, plus a “Cap maintenance strategy” that explains how Cap Loads will continue to be honored in the face of population growth and other expected changes in the region.

In 2008, in recognition that pollution reduction goals were not being met, the federal and state governments determined that shorter-term milestones would improve accountability, accelerate pollution reductions, and increase the likelihood of meeting pollution reduction targets. The first milestones were announced in May 2009. Plans to meet these commitments were laid out over the three years between January 1, 2009 and December 31, 2011.

In May 2009, President Obama issued Executive Order 13508: Chesapeake Bay Protection and Restoration, which ushered in a new era of shared federal leadership, action and accountability. The Order expanded the federal commitment to the Chesapeake region in a move that led agencies to dedicate unprecedented resources to the effort, targeting actions where they can have the most impact. Many of the federal actions will directly support restoration efforts by local governments, nonprofit groups and citizens. The Order also requires that federal lands and facilities lead by example in environmental stewardship. Integral to the Order was the decision for the EPA to proceed with the Chesapeake Bay TMDL, which would expand regulation of urban and suburban stormwater and concentrated animal feeding operations and increase enforcement activities and funding for state regulatory programs. Finally, the Order gives the EPA enforcement authority if states miss established goals.

The Order highlighted the need for acceleration of progress, sharpened emphasis on explicit actions, and required greater transparency and accountability in these efforts. The six watershed states and the District of Columbia were required to develop and submit **Watershed Implementation Plans (WIP)** as a key element of this approach and in support of the development of the draft and final Chesapeake Bay TMDL. The WIPs will show how the states and the District, in partnership with federal and local governments, will achieve and maintain the TMDL nitrogen, phosphorus, and sediment allocations necessary to meet Bay water quality standards.

The six Chesapeake Bay Watershed states and the District of Columbia developed draft Phase I WIPs that were submitted to EPA by September 1, 2010. In combination with the two-year milestones and follow-up progress reports to the public, these plans responded to the heightened expectation within Executive Order 13508 to create a new accountability framework that guides local, state and federal water quality restoration efforts. WIP strategies are directed to have controls in place by 2025 that will achieve target loads, and by 2017 that will result in 60% of necessary nutrient and sediment reductions compared to current loads. The WIP strategies address existing as well as new or expanded sources of nutrients and sediment.

West Virginia submitted an incomplete Draft Phase I WIP on September 1, 2010 that was advertised by EPA concurrently with the Draft TMDL. The EPA review of the draft Phase I WIP found it lacking in several areas. EPA required strengthening certain parts of the WIP in order to avoid high level federal **backstops**, which would have mandated even tighter pollution limits on wastewater permits and even broader coverage of permits for stormwater and animal feeding operations.

In contrast to the Draft Phase I WIP, the Final Phase I WIP was based upon allocation scenarios that the Chesapeake Bay Watershed Model (CBWM) predicted will achieve 2017 and 2025 goals for West Virginia. The CBWM uses **peer-reviewed** mathematical models to simulate changes in the Bay ecosystem due to changes in population, land use, or pollution management. These simulations are not the same as actual conditions, but represent the best scientific estimate of what average loadings are likely to be. **Ultimate success will, of course, depend on achieving actual, not modeled, reductions.** The Final Phase I WIP also included more detailed descriptions of planned actions and contingencies necessary to demonstrate reasonable assurance that proposed pollutant reductions will be achieved.

The Final Phase I WIP incorporated changes that eliminated the need for all but one of the federal backstops. The sole targeted federal backstop that remained for West Virginia was in the agriculture sector. EPA shifted 75 percent of West Virginia's animal feeding operation load into the part of the TMDL reserved for *regulated* pollution sources, and assumed implementation of certain practices on these operations. The shift signaled that any of these operations could potentially be subject to state or federal permits as necessary to protect water quality. EPA also increased oversight of the agriculture, stormwater, and wastewater sectors

along with progress toward West Virginia's two-year milestones to ensure the load reductions outlined in West Virginia's WIP were on track for implementation.

Various model revisions were accomplished prior to the initiation of the Phase II process. CBWM version 5.3.2 is the current modeling tool available to EPA and the jurisdictions to evaluate current performance, two-year milestones, and Phase II WIP strategies to achieve 2017 and 2025 goals. Future CBWM refinement and reassessment are again planned in 2017. At that time, the jurisdictions will develop Phase III WIPs to ensure attainment of Cap Loads by 2025.

In preparation for developing the Phase II WIP, WV sought significant input on local feasibility of Phase I WIP strategies from local governments, watershed groups, farmers, and other "stakeholders." During this period, the Phase I WIP was also being implemented across all sectors. For example, positions were filled that broadly expanded West Virginia's capacity to engage the public and implement programs. In addition, wastewater treatment plant designs were sought, agricultural Best Management Practices (BMPs) were put in place, and the WV state legislature passed a funding bill for infrastructure support.

This document is the Final Phase II Watershed Implementation Plan (WIP), which was required to be developed and submitted to EPA March 30, 2012. It continues the process of defining how West Virginia, in partnership with federal and local governments, will achieve the pollution load reductions required of the state of West Virginia to support the TMDL. Specifically, this document adds local detail, as well as increased specificity and accountability over the Phase I WIP. In order to make this document readily accessible to both agency and public review, the WV WIP Development Team elected to build the Phase II WIP by modifying the Phase I WIP document rather than producing a document that referred to the Phase I document.

Significant wording and content changes between the Draft and this Final Phase II WIP are highlighted with green font.

SECTION 4. DEVELOPMENT OF WATERSHED IMPLEMENTATION PLANS

The WV WIP Development Team (WV-WIPDT) is comprised primarily of representatives from WV Department of Environmental Protection (WVDEP), WV Department of Agriculture (WVDA), WV Conservation Agency, WV Division of Forestry, Cacapon Institute, and The Conservation Fund's Freshwater Institute. This core group has been directing the development and implementation of strategies since the first Potomac Tributary Strategy was completed in 2005. While the entire WV-WIPDT was responsible for developing the Watershed Implementation Plan in cooperation with other organizations in the state, the creation of the "input deck" that outlines WV's responsibilities for reducing and maintaining their Cap Load was the responsibility of WVDEP along with WVDA and related agricultural organizations. WVDEP's Potomac Basin Coordinator led this effort and was responsible for coordinating outreach to all the sectors impacted by the WIP.

Along with all of the other jurisdictions with waters flowing into the Chesapeake Bay, WV has been assigned a Cap Load (see Figures 1, 2 & 3). The combined Cap Load for all the jurisdictions represents an overall pollution "diet" that the Chesapeake Bay requires to become healthy again. WV's Cap Load is a budget for nitrogen, phosphorus, and sediment limits for WV's portion of the Potomac Basin. For each of these pollutants WV has to develop a strategy to reduce the current pollutant load down to the level of the Cap Load as well as derive a strategy on how that Cap Load will be maintained. To do this, we must first know what the current load is (2009 Progress), what the future loads will be, and which pollutant sources are responsible for generating those loads.

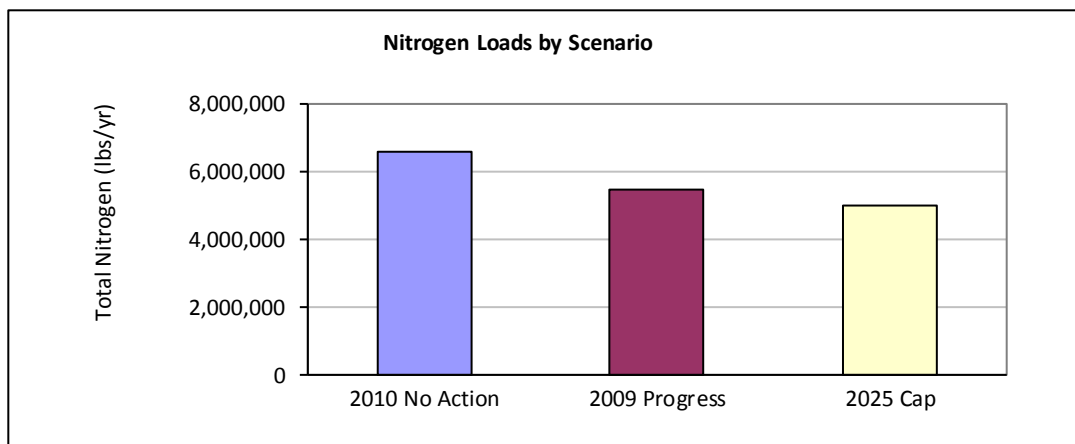


Figure 1. Nitrogen loads delivered to the Chesapeake Bay from West Virginia. 2010 No Action is the nitrogen load that would have been delivered to the Bay by West Virginia without past and current programs. 2009 Progress is the progress made by West Virginia in reducing nitrogen loads through 2009. 2025 Cap is the target delivered load. Based on results from 5.3.2 CBWM.

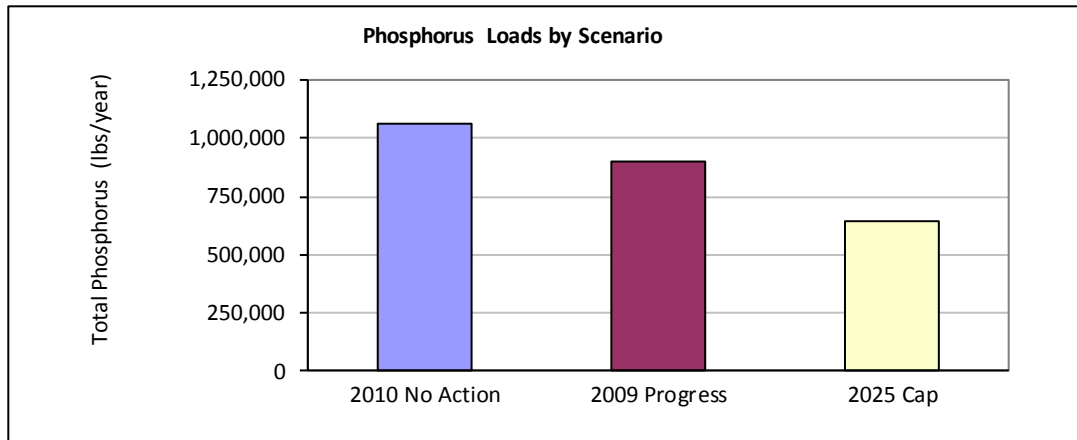


Figure 2. Phosphorus loads delivered to the Chesapeake Bay from West Virginia. 2010 No Action is the phosphorus load that would have been delivered to the Bay by West Virginia without past and current programs. 2009 Progress is the progress made by West Virginia in reducing phosphorus loads through 2009. 2025 Cap is the target delivered load. Based on results from 5.3.2 CBWM.

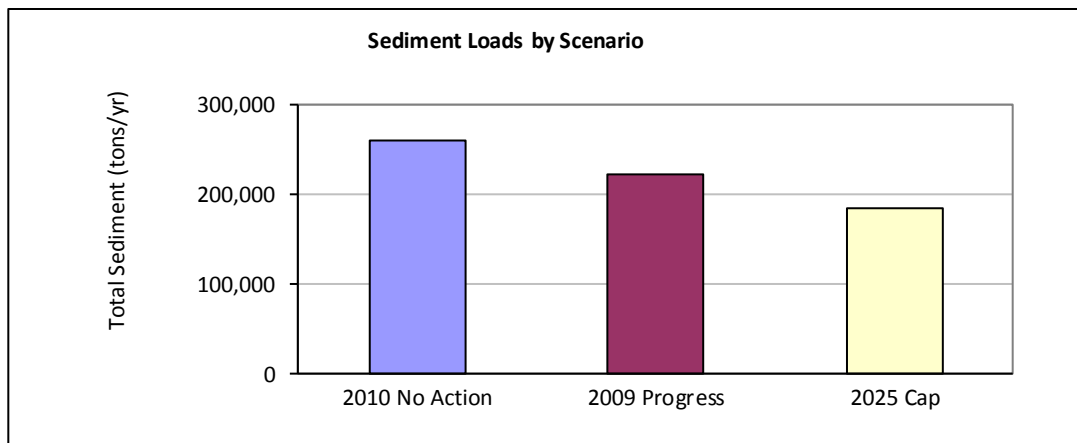


Figure 3. Sediment loads delivered to the Chesapeake Bay from West Virginia. 2010 No Action is the sediment load that would have been delivered to the Bay by West Virginia without past and current programs. 2009 Progress is the progress made by West Virginia in reducing sediment loads through 2009. 2025 Cap is the target delivered load. Based on results from 5.3.2 CBWM.

The Chesapeake Bay Program has determined that many of the actions West Virginia is taking to attain the nitrogen and phosphorus Cap Loads will also reduce sediment pollution in West Virginia's rivers and streams sufficiently to achieve the sediment Cap Load for the Bay. Therefore, West Virginia WIP strategies are provided only for nitrogen and phosphorus.

Current and future pollutant load estimates are generated by the Chesapeake Bay Watershed Model (CBWM) and broken down into land uses (sources) and locations. Examples of land use are pasture and developed land. Each of these land uses has a pollution load associated with it. The location part of the equation can best be thought of as a watershed, or all the land area that drains to a particular body of water. The CBWM breaks the Potomac Basin down into numerous watersheds each having their own unique characteristics that reflect how they impact the Bay.

The pollutant sources which are responsible for generating loads are grouped into “sectors” (Figure 4). For the purposes of this document, the major load sectors in West Virginia are Wastewater, Developed Lands and Industrial (sometimes called “Urban Runoff”), Agriculture, Forest, and Other (see introductions to Sections 6-9, and Appendix C). Sources within sectors may be regulated or unregulated. Typically, point sources are regulated by National Pollutant Discharge Elimination System (NPDES) permits and nonpoint sources are unregulated. However, certain functionally similar sources are alternatively classified as point and nonpoint sources. One example is the subset of animal feeding operations identified as Concentrated Animal Feeding Operations (CAFOs) that require NPDES permits, and the subset of animal feeding operations that do not meet the CAFO size threshold and do not require permits. Another example is permitted urban areas that have been designated as municipal separate storm sewer system (MS4) sources based on population density, and non-permitted urban areas that do not meet the population density threshold for MS4 designation. TMDLs must establish “wasteload allocations” for point sources and “load allocations” for nonpoint sources and background loads.

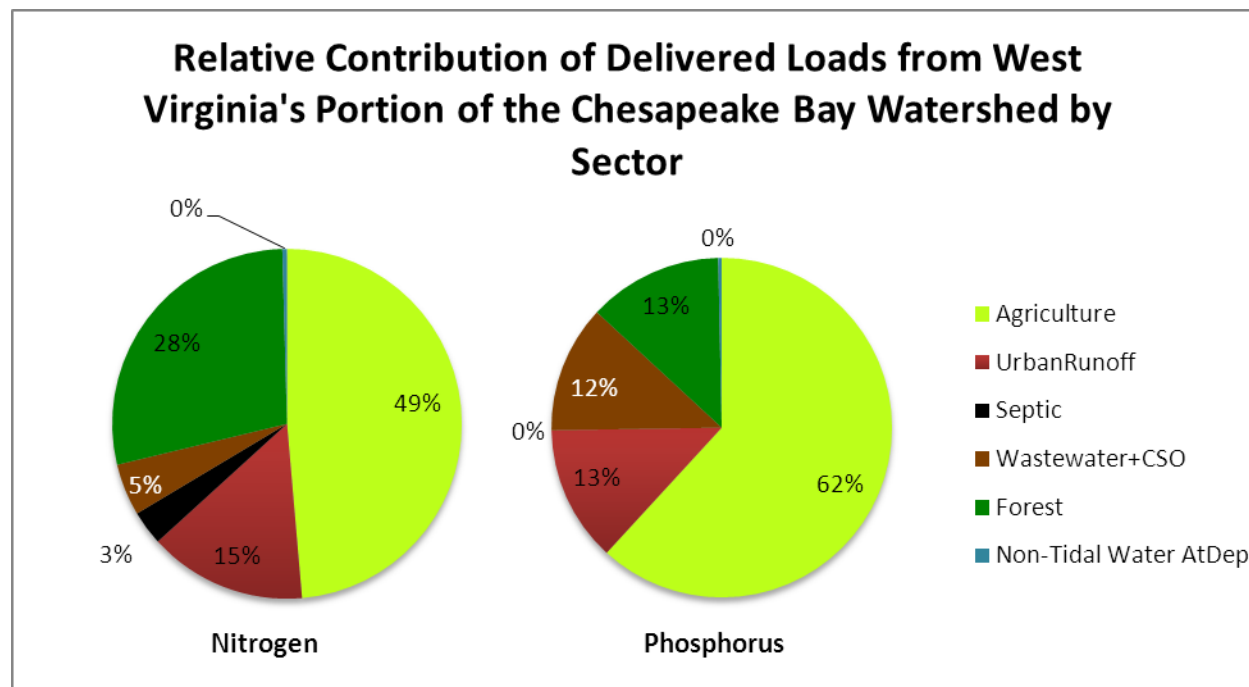


Figure 4. Delivered nitrogen and phosphorus loads from major load sectors in West Virginia. Estimates are generated by the Chesapeake Bay Watershed Model (CBWM), results used: v5.3.2, 2009AA Scenario for this and all other figures in this document.

The Chesapeake Bay Watershed Model categorizes loads into “edge-of-stream” and “delivered”. An edge-of-stream load, as the term suggests, is the amount of pollutant that enters the stream in the locality of the pollutant source. A delivered load is the proportion of the edge-of-stream load that ultimately reaches the Chesapeake Bay. For nitrogen, the delivered load decreases as you get farther away from the Bay due to in-stream biological

processes that convert available nitrogen to gaseous elemental nitrogen. Thus, one pound of edge-of-stream load from Jefferson County has a much greater impact to downstream tidal waters than a pound of edge-of-stream load from Hardy County (see delivery factor maps in Appendix D). The difference between edge-of-stream and delivered loads affects the overall cost and efficiency of implementing pollution reductions. Because of its proximity to the Chesapeake Bay, it is much more cost effective to reduce nitrogen from Jefferson County than it is from counties farther away from the Bay. Looked at another way, Berkeley and Jefferson counties have a much greater impact on the Bay than other counties in the Potomac Basin because of their proximity to the Bay.

Figure 4 provides the relative delivered loads of nitrogen and phosphorus from the major load sectors in West Virginia, based on load estimates generated by the Chesapeake Bay Watershed Model (CBWM). That portion of the total load delivered from forested lands is, for the most part, un-addressable, which means that the necessary reductions in pollutant loads must come from the other load sectors.

Once the Cap Load and current loads are known an “input deck,” or scenario, is developed. The input deck takes current loads provided by the CBWM and then assigns controls or practices to these loads that will result in pollution reduction. Each of the controls entered in the input deck reduces the pollutant load by an amount specific to that particular control. The challenge in developing an input deck is to come up with a suite of practices that can realistically be implemented by 2025 and that will attain the assigned Cap Loads.

EPA developed Phase II WIP target loads by evaluating each jurisdiction’s TMDL level of effort in the revised CBWM. In the preparation of the final Phase II WIP, West Virginia developed two separate input decks for model evaluation. A “WV 2025 scenario” included all controls intended to be implemented to achieve nitrogen and phosphorus target loads and a “WV 2017 scenario” included controls planned to be accomplished by 2017. The CBWM output for those scenarios indicated that accomplishment of the planned controls would result in attainment of 2017 and 2025 goals. Tables 1 and 2 display the scenario results with respect to the goals.

Prior to the finalization of the Phase II WIP, WV-WIPDT developed a revised WV 2017 scenario that reduced interim implementation expectations for CAFO production area controls. The previous 100% implementation rate was lowered to 75% because WVDEP and WVDA were not confident that 100% of the necessary concentrated animal feeding operation (CAFO, see Section 8F) controls would be in place and verified by 2017. WV-WIPDT did not alter the WV 2025 scenario.

The revision of the 2017 scenario should not be construed as a lack of resolve to properly implement the CAFO program. Facilities that must obtain permits will be required to do so and any compliance schedules provided will allow only the shortest time necessary to install controls. During this interim period, West Virginia will also be evaluating existing production

area controls at medium and large operations and coordinating with EPA and NRCS to ensure that all verified controls are properly credited in annual progress reports.

The CBWM output for the revised 2017 scenario demonstrates pollutant reductions that will surpass 2017 goals. Tables 1 and 2 display the results of the 2017 and 2025 scenarios with respect to the goals.

Table 1: WV 2017 Scenario (2010WVWIP717N022412)

Pollutant	Planning Target	2009 Progress	2017 Goal	2017 Scenario Result	Surplus	Progress to Target
	#/yr	#/yr	#/yr	#/yr	#/yr	% 2009-2025
Nitrogen	4,998,783	5,465,048	5,185,295	5,137,181	48,114	70
Phosphorus	639,429	899,433	743,431	662,730	80,701	91
Sediment	372,586,544	445,408,160	401,715,190	320,738,828	80,976,362	171

Table 2: WV 2025 Scenario (2010WVP2WIP525N122011)

Pollutant	Planning Target	Scenario Result	Deficit / Surplus	Used for P:N Exchange @ 1 P : 5.3 N	Surplus*
	#/yr	#/yr	#/yr	#/yr	#/yr
Nitrogen	4,998,783	5,039,728	40,945	NA	0
Phosphorus	639,429	627,684	11,745	7725**	4020
Sediment	372,586,544	305,595,496	66,991,048	NA	66,991,048

* Display represents P exchange to the extent necessary to meet 2025 N target; the exchange amount can be varied to ensure Cap Load attainment for both parameters

** Phosphorus exchange at 5.3N:1P offsets 40,945 #N/Yr

Table 1 demonstrates that if controls planned through 2017 are accomplished, West Virginia will far exceed the 60% statewide interim goals established for the jurisdictions. Similarly, Table 2 demonstrates that if controls planned through 2025 are accomplished, West Virginia will reduce delivered loads below TMDL targets. The Table 2 assessment of 2025 performance utilizes the nutrient exchange that EPA made available for minor adjustment of cap targets. West Virginia’s planned controls deliver less load than allowed by the phosphorus target, but fall short of attaining the nitrogen target. Table 2 demonstrates cap attainment by converting

surplus phosphorus progress for relaxed nitrogen performance at rates established for this purpose.

As far back as Tributary Strategy development in 2004, West Virginia has never targeted pollutant reductions in the small, remote, rural area associated with the West Virginia portion of the James River watershed. In that watershed, 88% of the approximate 49,000 acres are forested, with the remaining area primarily comprised of hay and pasture land uses. The pollutant loadings from the West Virginia James watershed are a very small component of West Virginia Cap Loads and have negligible impacts to water quality of the tidal James River and the Chesapeake Bay mainstem. For those reasons, the WV Phase I WIP did not prescribe pollutant reductions in the James watershed. Instead, WVDEP more practically focused efforts in the Potomac watershed that, when accomplished, achieve statewide Cap Loads.

In Phase II WIP development, West Virginia quantified expected pollutant reductions associated with local TMDL implementation in the James watershed and included additional watershed-specific Best Management Practices (BMPs) in the 2025 scenario. Local TMDL implementation will involve new controls applied to a large percentage of available pasture and hay lands. BMPs will include livestock fencing, stream crossings, alternative water sources, riparian buffer establishment, stream channel stabilization, prescribed grazing, and conservation plans. James watershed implementation is generally targeted for the 2017 to 2025 time period. See Section 8D.3.b for additional information.

The WIP strategies outlined below provide an overview of how loads will be reduced to meet West Virginia's statewide Cap Load by 2025 and then maintain our pollutant loads at that Cap Load going into the future. Maintaining Cap Loads will be challenging for any sector that grows in the future. For example, the Developed Lands sector is likely to continue to grow, and significant acreage that has been previously approved for development and platted will not be required to comply with new local stormwater regulations. As new lands are developed this increases the amount of pollution reaching the Bay. Therefore, if we are to maintain our Cap Load, newly developed lands will be required to comply with new higher regulatory standards where adopted, thus managing any potential pollutants to maintain their pre-developed rates. In general, WV must offset new loads either by improved management or by reducing loads somewhere else on the landscape. In other words, once our Cap Load is met, we must manage West Virginia's existing and new pollution loads so they do not exceed the Cap levels prescribed by the TMDL.

Local involvement in the Phase II WIP Development Process

Throughout 2011, the WV-WIPDT employed many methods to seek feedback on the WIP process from local stakeholders, and incorporate their thoughts into the Phase II WIP. WVDEP and other WV-WIPDT partners met with all eight county commissions to present the major strategies of the Phase I WIP and invite their involvement in the Phase II WIP development. Similar meetings occurred with Morgan County's planning commission, the Northern

Shenandoah Valley Regional Commission's Water Resources Policy Committee, and other groups.

Another major effort focused in West Virginia's Eastern Panhandle (Berkeley, Jefferson and Morgan Counties) is described in Appendix E.1. "Region 9 Local Partner Involvement Process." This involved regular meetings of several stakeholder workgroups, culminating in a multi-sector "Summit" on August 31. Additional e-mail communication was conducted with members of the Developed Lands & Industrial Workgroup and the Elected Officials Workgroup to further rank and clarify strategies they could best support. The new Region 9 Chesapeake Bay Coordinator, hired during this process, played a vital role in incorporating input from workgroup participants into the Phase II WIP.

The WVDEP distributed a brochure listing Phase II WIP information and related upcoming events at a Tri-County Fair and a Scenario Builder training in August. Stakeholders were reminded of the effort through the WV-WIPDT's quarterly e-newsletter and website. A meeting of watershed groups and environmental non-profits was held on August 24th where these topics constituted the entire agenda.

Outreach to agricultural producers was coordinated by WVU Extension, with county meetings held in September and October. These meetings were attended by, and gathered feedback from, local conservation professionals, producers, and elected officials or their representatives. Other local partners were involved in a series of strategy-forming meetings for the agriculture sector (August 29 and November 1). West Virginia Department of Agriculture exhibited a Chesapeake Bay display, spoke to citizens and provided brochures at Berkeley, Morgan, Jefferson, Hampshire, Mineral, and Tri-County Fairs, as well as at WV Farm Bureau and watershed group meetings, WV Envirothon teachers training, WV Envirothon contest, Inwood Farmer's Market open house, and WV Poultry Festival dinner meetings. WVDA had articles in various publications regarding the TMDL. WVDA also assisted in hosting "Farmer Feedback" meetings throughout the Eastern Panhandle and provided those who attended information on the WIP process.

Several stakeholders were trained on the use of the new Chesapeake Assessment Scenario Tool (CAST) on September 1 and October 13. CAST users were encouraged to submit strategy ideas to the WV-WIPDT if they devised particularly successful strategies using CAST which differed greatly from the Phase I WIP.

A Public Comment period on the Draft Phase II WIP was held from January 18, 2012 through February 20, 2012. Comments were incorporated into the Final Phase II WIP as appropriate. The WV-WIPDT continued to coordinate throughout this period to consider the public comments and feedback from EPA.

SECTION 5. Point and Nonpoint Sources

Pollution is usually described as coming from either a point source or a nonpoint source. Point source pollution comes from an easily identifiable place - like a factory or a sewage treatment plant, and enters the environment at a clearly identifiable location – like a pipe or a smokestack. The flow of pollutants from point sources is regulated by the state and federal governments by means of National Pollutant Discharge Elimination System (NPDES) permits, is fairly constant and predictable, and control measures can be applied at the source.

Nonpoint sources of pollution are more difficult to control and assess than point sources because they are everywhere - they include streets, **dirt and gravel roads**, parking lots, lawns, farm fields, barnyards, and **small** construction sites. The flow of pollutants from nonpoint sources is less predictable than point sources, and mostly occurs when rain and snowmelt wash the surface of the land and carry pollutants via surface runoff and groundwater paths to streams, rivers, lakes, and oceans.

Certain types of precipitation-driven pollution sources, such as large animal feeding areas and stormwater runoff from sizeable cities **and construction sites (greater than or equal to one acre)**, are also regulated using NPDES permits.

Within the Chesapeake Bay TMDL, wasteload allocations must be granted for the pollutant loads associated with the WV/NPDES permitted point source discharges from a myriad of activities, including:

- Individual WV/NPDES permits for the effluents of sewage treatment facilities and authorized collection system overflows
- Individual WV/NPDES permits for discharges from industrial facilities with potential to discharge nitrogen and phosphorus
- Individual and general WV/NPDES permits (and associated SMCRA based permits) for discharges from mining activity
- Registrations under General WV/NPDES permits for small sewage treatment facilities
- Registrations under the Multi-Sector Stormwater General Permit (stormwater associated with industrial activity)
- Registrations under the Construction Stormwater General Permit (stormwater associated with construction activity)
- Registrations under the MS4 General Permit (stormwater associated with Municipal Separate Storm Sewer Systems)
- Individual permits for discharges from the production areas of Concentrated Animal Feeding Operations (CAFO)

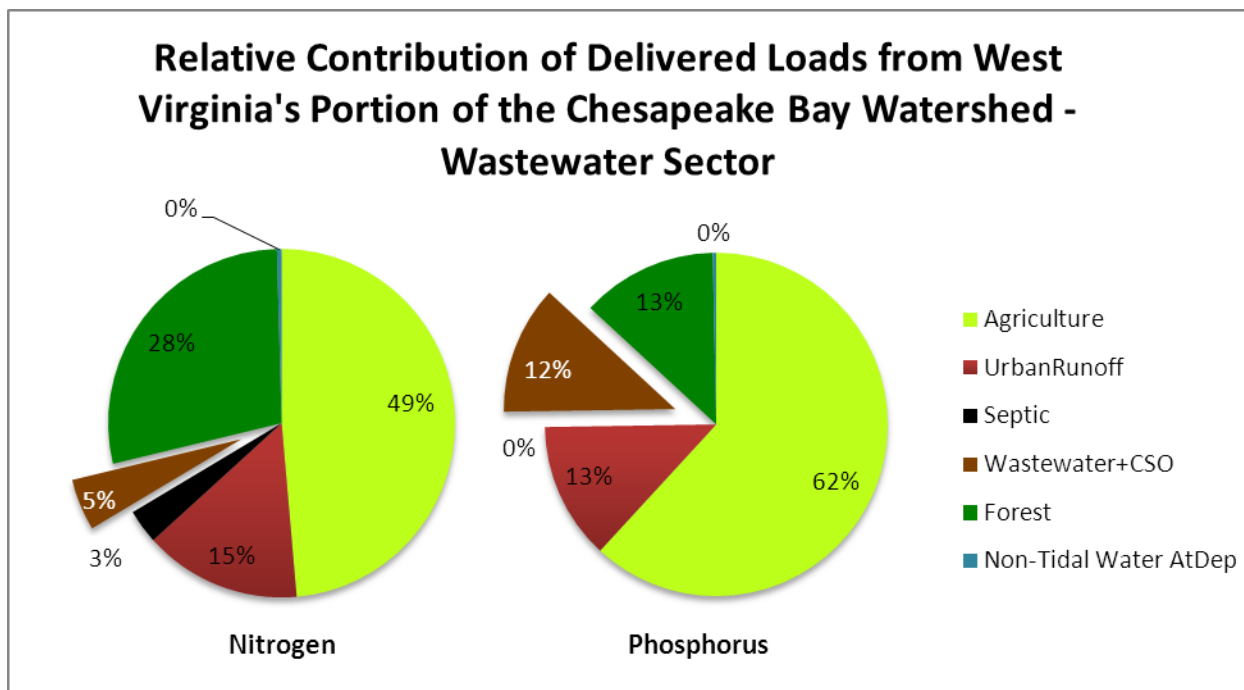
The following sections provide a description of the various permit types, TMDL allocations and implementation approaches to reduce both point and nonpoint nutrient and sediment sources from West Virginia that impact the Chesapeake Bay.

SECTION 6. Wastewater

Wastewater Section at a Glance

For the purposes of this document, “wastewater” refers to the wastewater from municipal and industrial point sources that is controlled via National Pollutant Discharge Elimination System (NPDES) permits. It includes: Significant Municipal Facilities; Nonsignificant Municipal Facilities, Combined Sewer Overflows (CSO), Significant Industrial Facilities, Nonsignificant Industrial Facilities, and Negligible Industrial Wastewater Discharges.

According to the Chesapeake Bay Watershed Model, the “wastewater” sector is responsible for five percent of the total delivered nitrogen load and twelve percent of the total delivered phosphorus load.



Summary Actions:

Wastewater- Allocation

- Significant facilities to reduce loads based upon existing design flow and 5 mg/l N and 0.5 mg/l P (Apps. A.1 and B.1)
- Significant facility implementation via individual wasteload allocation
- Nonsignificant facilities held to existing loads (Apps. A.4 and B.2); implementation via grouped wasteload allocation
- Eliminate anhydrous ammonia use as a treatment chemical by mining sources (App. B.4)
- 85% Combined Sewer Overflows reduction (App. A.5)

Wastewater - Accounting for growth

- 100% offset for all new loads for permitted facilities of any size
- Can offset by:
 - Better treatment of existing source
 - Assimilation of other sources
 - Other mechanisms under future trading program or case-by-case offset evaluation

Tracking and Reporting

- Significant facilities compliance status via Discharge Monitoring Reports through Permit Compliance System (PCS)
- Existing nonsignificant compliance status assumed = baseline condition, simply verify a component wasteload allocation at reissuance and report baseline condition
- All new/increased facilities' compliance status individually tracked
- CSO via number of overflows in annual reports
 - 0 = 100% reduction from 2010NA
 - < 6 = 85% reduction from 2010NA
 - >6 = 0% reduction

SECTION 6A. Significant Municipal Facilities

Significant municipal facilities are those sewage treatment systems with existing permitted flows greater than or equal to 0.4 million gallons per day (MGD). Appendix A.1 provides a list of facilities and includes pertinent location and loading information. Individual, edge-of stream, average annual, wasteload allocations are prescribed based upon each facility's current permitted discharge flow and total nitrogen and total phosphorus effluent concentrations of 5 mg/l and 0.5 mg/l, respectively.

6A.a. Current Programs and Capacity

In 2005, WVDEP began imposing permit conditions in WV/NPDES permits as dictated by the provisions of West Virginia's Potomac Tributary Strategy. For significant municipal facilities, the TMDL wasteload allocations are equal to the Tributary Strategy expectations. As such, facilities in this category are currently subject to permit requirements that are generally consistent with the prescribed wasteload allocations. WVDEP will continue implementation of established NPDES permitting, compliance assessment and enforcement protocols to compel compliance with the wasteload allocations. Compliance will be required in the shortest time possible but not later than 2017.

All existing permits contain flow, total nitrogen and total phosphorus effluent self-monitoring and reporting requirements that will provide the primary basis for compliance assessment. Appendix A.3 displays example permit conditions intended for self-monitoring and reporting pursuant to the nitrogen and phosphorus effluent limitations resulting from the Chesapeake Bay TMDL. WVDEP will conduct regular Compliance Evaluation Inspections and Compliance

Sampling Inspections to ensure permittees are properly self-monitoring and reporting. WVDEP will address noncompliance with enforcement actions escalated as necessary to compel compliance in the shortest time period possible.

Wastewater and Developed Lands stakeholders that participated in the Region 9 Local Partner Involvement Process stated that the West Virginia Public Service Commission (PSC) has not recognized the urgency and timeliness of meeting wasteload allocation goals and has denied rate increases that would have enabled upgrades to be made to meet Bay TMDL requirements. The stakeholders requested WVDEP assistance in communicating with the PSC on the importance and timing of complying with Bay TMDL wasteload allocations. WVDEP regularly communicates with the PSC and believes that they are fully aware of Bay TMDL requirements. The PSC relies on WV/NPDES permit requirements and WVDEP enforcement actions in its determination of project necessity. Those things are in place for affected entities. To date, Frankfort PSD, Charles Town, Shepherdstown and Moorefield have all received Certificates of Convenience and Necessity from the PSC that enable the upgrades needed for Bay TMDL compliance. The PSC denied a certificate for a new facility to be operated by Jefferson County PSD, but the denial was not based on the timeline for Bay compliance. In this case, the PSC deemed the project to no longer be necessary because of the economic downturn and the long-term strategic planning of neighboring Charles Town.

WV/NPDES permit reissuance protocols provide an additional mechanism for WVDEP to review individual facility performance, reevaluate/revise permit conditions and initiate enforcement actions. WVDEP's NPDES permitting program for existing sources is organized under the West Virginia Watershed Management Framework. All of the 8-digit HUC watersheds in West Virginia are classified into five hydrologic groups. Within each hydrologic group all existing permits expire during the same West Virginia fiscal year (July 1- June 30). Appendix A.2 displays the permitting schedule for significant municipal facilities pursuant to the Watershed Management Framework cycle.

During the 2009 Legislative Session, the West Virginia Legislature passed Senate Bill 715, which amended Chapter 22 of the West Virginia Code by adding a new section designated §22-11-30, the Chesapeake Bay Restoration Initiative. Senate Bill 715 charged the WVDEP to consider and recommend to the Legislature a program establishing a new and independent source of funding for capital improvements for public facilities made necessary by the imposition of nutrient removal requirements. In collaboration with local stakeholders, WVDEP considered multiple funding mechanisms and made recommendations to the Legislature in June, 2010.

Subsequently, the 2011 Legislature enacted Senate Bill 245 (SB245) which provided a new funding source that is anticipated to greatly facilitate the timely upgrades of publicly-owned treatment works. Wastewater stakeholders that participated in the Region 9 Local Partner Involvement Process requested WVDEP assistance in facilitating a timely resolution and understanding of SB245's funding allocations so they can be incorporated into capital improvements planning. Due to the format of the legislation, the specific grant amounts that

will be available to individual facilities cannot be determined at this time. SB245 requires potential participants to develop and submit capital funding plans to the West Virginia Infrastructure and Jobs Development Council by June 30, 2012. After validation, the Water Development Authority is charged with reporting the total eligible costs to the Joint Committee on Government and Finance and the allocations for individual projects will be determined under an equal percentage of eligible cost methodology. Even though exact grant amounts cannot be determined in the interim, conservative estimates of anticipated amounts can be included in funding packages through a Grant Anticipation Note.

At this time, the most critical activity for an eligible grantee to accomplish is the timely submission of a capital funding plan. In November 2011, WVDEP advised each affected party, in writing, of the importance of this action and offered any agency assistance that may be needed to accomplish plan development. WVDEP remains committed to help permittees secure all available financial assistance so that they may succeed in achieving Chesapeake Bay goals.

6A.b. Accounting for Growth

No wasteload allocations are provided for new or expanded discharges from sewage treatment facilities of any size. All such discharges must offset 100% of new loadings and WV/NPDES permits must include enforceable provisions to implement offsets. All offsets should be based upon delivered loads rather than edge-of-stream loads to ensure accurate accounting. Significant municipal facilities may add treatment processes to mitigate new or expanded discharges within the terms of the TMDL allocation and their NPDES permit. They may also secure offsets by assimilation of existing onsite systems and other existing wastewater treatment systems for which wasteload allocations have been provided. Additional offset mechanisms may be available upon the development and approval of a comprehensive trading program or through case-by-case offset evaluations as discussed in Section 11.

6A.f. Tracking and Reporting Protocols

WVDEP has historically used the Permit Compliance System (PCS) to assess the performance of NPDES permittees with respect to effluent limitations. PCS will facilitate efficient and transparent tracking and reporting of significant municipal facility performance pursuant to this effort. Compliance will be assessed simply and regularly by comparing individual facility performance to effluent limitations that are consistent with the prescribed individual wasteload allocations.

Where WVDEP must pursue administrative enforcement actions to compel compliance, that information will also be entered into PCS. This will allow transparent tracking of compliance schedule interim milestones and the attainment of compliance.

6A.g. Compliance

Appendix A.2 provides anticipated compliance dates for all significant facilities. Certain facilities are already compliant and others have projects underway such that compliance is expected in the near future. WVDEP's implementation strategy is to ensure installation of necessary nutrient reduction treatment technology at all facilities by December 31, 2015, and all are anticipated to be compliant by the end date of the period for the 2017 progress assessment (6/30/2017). For facilities/projects that will accomplish earlier installation, the Appendix A.2 anticipated compliance date is also based upon Chesapeake Bay TMDL progress reporting periods and the identified date affords at least a prior year of new technology operation.

SECTION 6B. Nonsignificant Municipal Facilities

Nonsignificant municipal facilities are those sewage treatment systems with existing permitted flows less than 0.4 MGD. Appendix A.4 displays the nonsignificant municipal facilities in the Chesapeake Bay Watershed and provides pertinent location and loading information. Grouped, edge-of-stream, annual average wasteload allocations are prescribed at the county scale for non-significant municipal facilities. The grouped wasteload allocations are based upon the summation of individual facility loads at current permitted flow. For the majority of facilities, the total nitrogen and total phosphorus default concentrations of the "2010 No Action" (2010NA) model scenario (18 mg N/l and 3 mg P/l) were used in the individual facility load calculations. Total nitrogen and total phosphorus concentrations of 5 mg/l and 0.5 mg/l, respectively, were used in the individual facility load calculations for seven facilities. Those facilities were initially permitted after WVDEP began Tributary Strategy implementation and their initial WV/NPDES permits included mass limitations based upon those concentrations and required installation and operation of treatment facilities necessary to achieve them. Pollutant reductions are not prescribed by the wasteload allocations for any existing facilities in this subcategory.

6B.a. Current Programs and Capacity

A small number of facilities in this subcategory operate pursuant to individual WV/NPDES permits. The remaining facilities, representing the vast majority of sources, are regulated under two General WV/NPDES permits. General Permit WV0103110 regulates small, privately owned sewage treatment plants ("package plants") that have a design flow of less than 50,000 gpd and General Permit WV0107000 regulates home aeration units (HAUs), with typical design flows less than 1000 gpd.

WVDEP performed a detailed evaluation of the existing permitted facilities meeting the nonsignificant municipal definition and provided wasteload allocations that are intended to

allow continued permitting of those existing sources without pollutant reductions. TMDL implementation will simply be accomplished through the verification of an Appendix A.4 component loading for existing discharges at the time of permit reissuance.

After the Chesapeake Bay TMDL was issued, certain permit omissions and characterization mistakes were identified in the West Virginia Phase I WIP. A comprehensive review of all wastewater sources was accomplished in the Phase II process which led to corrections of WIP appendices and also to substantive revision of the wastewater model input deck. Appendix A.4 is the most accurate accounting of existing nonsignificant municipal facilities and is consistent with CBWM 5.3.2 input for this source category.

The level of performance associated with the wasteload allocations for nonsignificant municipal facilities is different than Tributary Strategy expectations for existing facilities sized between 0.05 MGD and 0.4 MGD. Nitrogen and phosphorus effluent limitations have been imposed in existing permits for seven facilities based upon Tributary Strategy implementation. Permit requirements may be modified (relaxed) so as to be consistent with each facility's component load identified in Appendix A.4.

6B.b. Accounting for Growth

No wasteload allocations are provided for new or expanded discharges from sewage treatment facilities of any size. All such discharges must offset 100% of new loadings and WV/NPDES permits must include enforceable provisions to implement offsets. Nonsignificant municipal facilities may secure offsets by improved treatment of existing discharges and/or by assimilation of existing onsite systems and other existing wastewater treatment systems for which wasteload allocations have been provided. Additional offset mechanisms may be available upon the development and approval of a comprehensive trading program or through case-by-case offset evaluations as discussed in Section 11. New or expanded municipal discharges of any size will require regulation under an individual WV/NPDES permit to implement offset provisions and allow tracking and reporting.

6B.f. Tracking and Reporting Protocols

Because existing facilities are provided wasteload allocations based upon the default concentrations of the 2010 No Action (2010NA) scenario and pollutant reductions are not required, individual facility performance tracking and load reporting is not generally intended. Without expansion, all facilities will be assumed to be contributing loadings authorized by the wasteload allocations and reported as such. If new or expanded sources with discharges less than 0.4 MGD are permitted in the future, they will be classified as significant facilities and subjected to individual tracking and reporting consistent with the provisions for existing significant facilities. Upon the request of permittees or future trading/offset partners, existing individual nonsignificant municipal facilities may be classified and tracked as significant municipal facilities, provided that acceptable flow measurement and nutrient self-monitoring

capability is demonstrated. If existing sources are reclassified or eliminated through assimilation by another facility, then their component loads will no longer be included in reported nonsignificant municipal loadings.

SECTION 6C. Combined Sewer Overflows

Appendix A.5 displays Combined Sewer Overflow (CSO) facilities in the Chesapeake Bay Watershed and provides location, loading and delivery information. Individual, edge-of stream, average annual, wasteload allocations are prescribed based upon an 85% reduction of the loads represented in the 2010NA scenario.

6C.a. Current Programs and Capacity

WVDEP implements the national Combined Sewer Overflow Control Policy and the state Combined Sewer Overflow Strategy to control discharges from CSOs. Under those protocols, facilities must ultimately implement controls to ensure that CSOs do not cause or contribute to any violation of water quality standards. The policies recognize that comprehensive CSO control may require significant resources and provide mechanisms for permitting an extended period of time to accomplish necessary controls. All facilities are required to implement six “minimum controls” and to develop Long Term Control Plans that lead to compliance. Many facilities pursue an “assumptive approach” with interim goals of 85% CSO reduction and/or controls that result in less than six overflows per year. After attainment of interim goals, facilities assess water quality impacts and pursue further controls if necessary.

The subject facilities have implemented significant CSO controls and all are recently reporting activity at less than six overflows per year. Only maintenance of existing conditions is necessary pursuant to Chesapeake Bay TMDL implementation.

6C.b. Accounting for Growth

Not applicable as CSO loading will only decrease in the future. WVDEP will not authorize construction of combined collection systems nor permit overflows from newly constructed systems.

6C.f. Tracking and Reporting Protocols

WV/NPDES permits require the submission of quarterly reports regarding CSO control performance and overflow activity that may be used for tracking and reporting. Because of the episodic nature of overflows and lack of flow monitoring capability, measurement of actual CSO loadings is not practical. Reporting will be based upon an assumption that control that achieves less than six overflows per year is commensurate with an 85% reduction of CSO load. Facilities that report less than six overflows per year will be reported at the wasteload allocation loads

displayed in Appendix A.5. Zero loads will be reported if a facility reports zero overflows. 2010NA loads will be reported if more than six overflows are reported.

SECTION 6D. Significant Industrial Facilities

Appendix B.1 provides a list of significant industrial facilities and includes all pertinent location, loading and Bay delivery information. Individual, edge-of stream, average annual wasteload allocations are prescribed based upon 2010NA flows and total nitrogen and total phosphorus effluent concentrations of 5 mg/l and 0.5 mg/l, respectively.

6D.a. Current Programs and Capacity

In 2005, WVDEP began imposing permit conditions in WV/NPDES permits as dictated by the provisions of West Virginia's Potomac Tributary Strategy. For significant industrial facilities, the TMDL wasteload allocations are equal to the Tributary Strategy expectations. As such, facilities in this category are currently subject to permit requirements that are generally consistent with the prescribed wasteload allocations. WVDEP will continue implementation of established NPDES permitting, compliance assessment and enforcement protocols to compel compliance with the wasteload allocations. Compliance will be required in the shortest time possible but not later than 2017.

All existing permits contain flow, total nitrogen and total phosphorus effluent self-monitoring and reporting requirements that will provide the primary basis for compliance assessment. Appendix A.3 displays example permit conditions intended for self-monitoring and reporting pursuant to the nitrogen and phosphorus effluent limitations resulting from the Chesapeake Bay TMDL. WVDEP will conduct regular Compliance Evaluation Inspections and Compliance Sampling Inspections to ensure permittees are properly self-monitoring and reporting. WVDEP will address noncompliance with enforcement actions escalated as necessary to compel compliance in the shortest time period possible.

WV/NPDES Permit reissuance protocols provide an additional mechanism for WVDEP to review individual facility performance, reevaluate/revise permit conditions and initiate enforcement actions. WVDEP's NPDES permitting program for existing sources is organized under the West Virginia Watershed Management Framework. All of the 8-digit HUC watersheds in West Virginia are classified into five hydrologic groups. Within each hydrologic group all existing permits expire during the same West Virginia fiscal year (July 1- June 30). Appendix A.2 displays the permitting schedule for significant facilities pursuant to the Watershed Management Framework cycle.

A comprehensive review of all wastewater sources was accomplished in the Phase II process which led to corrections of WIP appendices and also to substantive revision of the wastewater model input deck. Significant errors regarding [WV/NPDES Permits WV0005495 and WV0005525](#) were corrected such that wasteload allocations are consistent with CBWM 5.3.2

input. The revised allocations more accurately reflect existing conditions and WIP expectations. Although greater than the individual wasteload allocations for those permits in the TMDL, coupling with the allocations and pollutant reductions prescribed in the WIP for all other sources allows attainment of West Virginia 2017 and 2025 targets.

WV/NPDES Permit No. WV0005495

The Chesapeake Bay TMDL individual wasteload allocations for this facility were calculated using an incorrect wastewater flow rate. The revised allocations are based upon the measured average flow of process wastewater discharges between 2005 and 2010 (2.2 MGD) and N, P and TSS effluent concentrations of 5 mg/l, 0.5 mg/l and 30 mg/l, respectively.

WV/NPDES Permit No. WV0005525

The Chesapeake Bay TMDL incorrectly allocates zero loads for this permit. The revised allocations were derived through application of professional judgment in determining the maximum annual loads expected from this source. All available data for nutrient concentrations and discharge flow were considered. The allocations are intended to afford loads that can be attained under existing conditions.

This permit uniquely regulates the discharge from Mt. Storm Lake as a permitted outlet. The permittee monitors nitrogen and phosphorus concentrations at the lake outlet monthly. Continuous flow measurement data are available from 2009 to present. Nutrient concentrations are extremely low (N < 1.0 mg/l; P < 0.05 mg/l) but due to the large amount of water naturally draining from the 30 square mile upstream watershed, associated annual loads are appreciable.

In contrast to other “significant” sources, pollutant reductions have never been expected from this source in the TMDL process. Existing nutrient quality is very much less than the treated quality expected of other significant sources and the permittee’s discharges into the lake do not contain substantive nutrient loads. Annual nutrient loads exiting the lake are highly dependent upon watershed hydrology and largely beyond the permittee’s control. Past performance, as documented in WV/NPDES permit discharge monitoring reports, has been continuously compliant with allocated loads and average nitrogen and phosphorus concentrations are less than the criteria established for Negligible Industrial Wastewater Discharges (Section 6F). For those reasons Permit No. WV0005525 has also been reclassified as a nonsignificant source in the Phase II WIP process.

6D.b. Accounting for Growth

No wasteload allocations are provided for new or expanded discharges from industrial facilities of any size. All such discharges must offset 100% of new loadings and WV/NPDES permits must include enforceable provisions to implement offsets. All offsets should be based upon

delivered loads rather than edge-of-stream loads to ensure accurate accounting. Significant industrial facilities may add treatment processes to mitigate new or expanded discharges within the terms of the TMDL allocation and their NPDES permit. Additional offset mechanisms may be available upon the development and approval of a comprehensive trading program or through case-by-case offset evaluations as discussed in Section 11.

6D.f. Tracking and Reporting Protocols

WVDEP has historically used the Permit Compliance System to assess the performance of NPDES permittees with respect to effluent limitations. PCS will facilitate efficient and transparent tracking and reporting of significant industrial facility performance pursuant to this effort. Although the intended federal mechanisms for reporting Chesapeake Bay TMDL implementation progress are incomplete at this time, it is assumed that significant industrial facility tracking will incorporate entry of Discharge Monitoring Report data by WVDEP into PCS and the uploading of PCS data into the system ultimately established. Compliance will be assessed simply and regularly by comparing individual facility performance to effluent limitations that are consistent with the prescribed individual wasteload allocations.

Where WVDEP must pursue administrative enforcement actions to compel compliance, that information will also be entered into PCS. This will allow transparent tracking of compliance schedule interim milestones and the attainment of compliance.

6D.g. Compliance

Appendix A.2 provides anticipated compliance dates for all significant facilities. Certain facilities are currently compliant and others have projects underway such that compliance is expected in the near future. WVDEP's implementation strategy is to ensure installation of necessary nutrient reduction treatment technology at all facilities by December 31, 2015 and all are anticipated to be compliant by the end date of the period for the 2017 progress assessment (6/30/2017). For facilities/projects that will accomplish earlier installation, the Appendix A.2 anticipated compliance date is also based upon Chesapeake Bay TMDL progress reporting periods and the identified date affords at least a prior year of new technology operation.

SECTION 6E. Nonsignificant Industrial Facilities

Nonsignificant industrial facilities are those estimated to discharge non-negligible loads of nitrogen and phosphorus less than the thresholds defining significant industrial facilities. Appendix B.2 provides a list of facilities and includes all pertinent location, loading and Bay delivery information. Grouped, edge-of-stream, annual average wasteload allocations are prescribed at the county scale for non-significant industrial facilities. The grouped wasteload allocations are based upon the summation of individual facility loads. Individual facility loads are equal to 2010NA representation except where, based upon the judgment of permitting staff, the existing condition is substantively different from 2010NA representation. Pollutant

reductions are not prescribed by the wasteload allocations for any existing facilities in this subcategory.

6E.a. Current Programs and Capacity

Some facilities in this subcategory operate pursuant to individual WV/NPDES permits and others are registered under general WV/NPDES permits. WVDEP performed a detailed evaluation of the existing permitted facilities and provided wasteload allocations that are intended to allow continued permitting of those existing sources without pollutant reductions. TMDL implementation will simply be accomplished through the verification of an Appendix B.2 component loading for existing discharges at the time of permit reissuance.

6E.b. Accounting for Growth

No wasteload allocations are provided for new or expanded discharges from industrial facilities of any size. Except as provided in the Negligible Industrial Sources section, all new sources must offset 100% of new loadings and WV/NPDES permits must include enforceable provisions to implement offsets. Existing facilities may add treatment processes to mitigate new or expanded discharges within the terms of the TMDL allocation and their NPDES permit. Additional offset mechanisms may be available upon the development and approval of a comprehensive trading program or through case-by-case offset evaluations as discussed in Section 11.

6E.f. Tracking and Reporting Protocols

Because existing facilities are provided wasteload allocations that do not require pollutant reductions, individual facility performance tracking and load reporting is not generally intended. Without expansion, all facilities will be assumed to be contributing loadings authorized by the wasteload allocations and reported as such. If new or expanded non-negligible sources are permitted in the future, they will be classified as significant facilities and subjected to individual tracking and reporting consistent with the provisions for existing significant facilities. Upon the request of permittees or future trading partners, existing individual nonsignificant industrial facilities may be classified and tracked as significant industrial facilities, provided that acceptable flow measurement and nutrient self-monitoring capability is demonstrated. If existing sources are reclassified or eliminated through assimilation by another facility, then their component loads will no longer be included in reported nonsignificant industrial facility loadings.

SECTION 6F. Negligible Industrial Wastewater Discharges

WVDEP has determined that nitrogen and phosphorus are not pollutants of concern for certain industrial WV/NPDES permit types and/or discharge types because they contain negligible nitrogen and phosphorus loadings. Continued discharge is authorized without specific

wasteload allocations. Future new discharges of similar types/characteristics are also allowable without specific wasteload allocations. This provision is necessary to avoid use of limited resources in permitting and/or tracking of sources for which no substantive water quality improvement opportunities exist and to avoid unpredictable complications relative to trading and offsets.

Discharges regulated by registrations under the Hydrostatic Testing, Groundwater Remediation and Water Treatment Plant general permits are assumed to contribute negligible total nitrogen and total phosphorus loads, as are boiler blow down, water softener and filter backwash, once through cooling water, and cooling tower blow down waste streams.

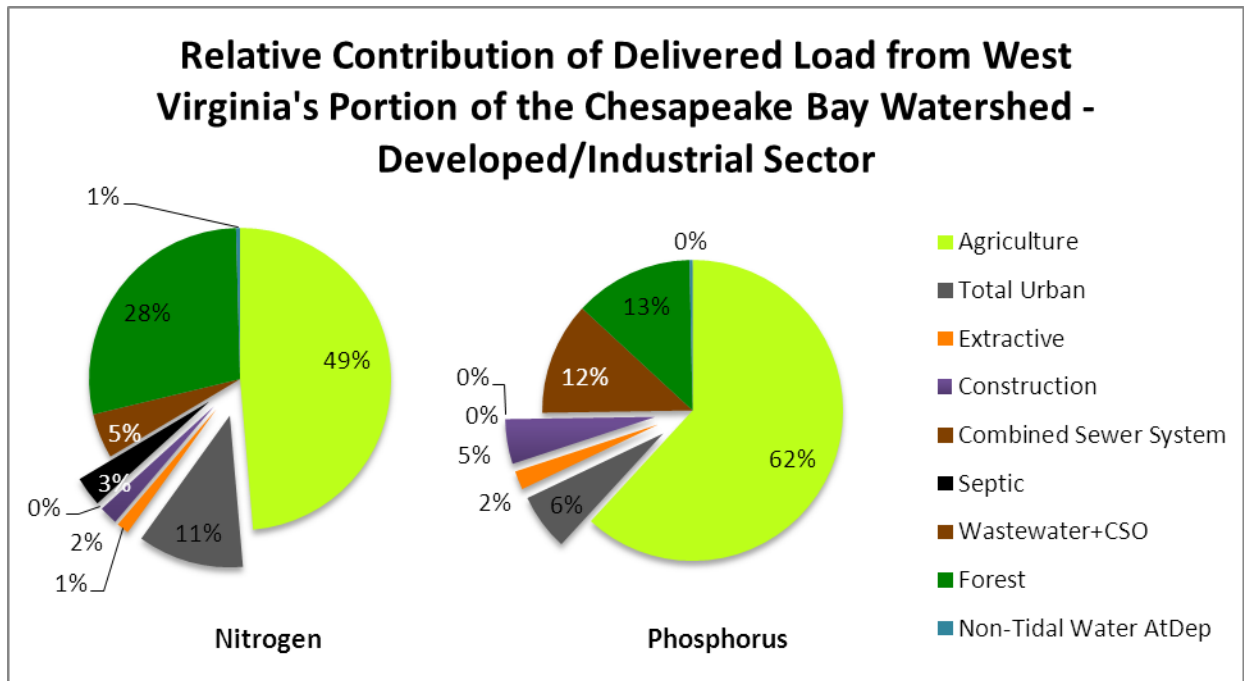
In addition to the permit and discharge types identified above, any discharge for which the maximum expected total nitrogen and total phosphorus effluent concentrations are less than 1.3 mg/l and 0.04 mg/l, respectively, may be considered as a negligible source. The thresholds are based upon the average total nitrogen and total phosphorus concentration for West Virginia waters and a general assumption that discharge at or below those levels would reflect no net increase above the pollutant loads expected in intake water.

SECTION 7. Developed Lands & Industrial

Developed Lands & Industrial Section at a Glance

For the purposes of this document, Developed Lands & Industrial constitutes that portion of the load from developed lands that does not include the “wastewater” load described in Section 6. It includes stormwater from regulated sources subject to NPDES permits, including: industrial, mining, construction stormwater General Permit, and Municipal Separate Storm Sewer Systems (MS4s). It also includes non-regulated loads delivered from developed lands, including residential lawns and septic tanks.

According to the Chesapeake Bay Watershed Model, the “developed lands & industrial” sector is responsible for eighteen percent of the total delivered nitrogen load and thirteen percent of the total delivered phosphorus load.



Summary Actions:

Regulated Stormwater

- Stormwater Associated with Industrial Activity (Appendix B.3)
 - N/P loads similar to urban/residential land use (because of SWPP, GPP, SPCC permit requirements)
 - Obtained location, area, % pervious/impervious info from permitting staff
 - Cropped appropriate areas from urban pervious and urban impervious modeled land uses
 - Allocations = 2010 NA - No reduction required

- Mining NPDES permits (Appendix B.4 and B.5)
 - Reconfigured model land use to accurately portray existing permitted area (surface coal mines and quarries)
 - Loading reductions from “No Action” commensurate with existing permit requirements
 - Eliminate anhydrous ammonia use as a treatment chemical by mining sources (Appendix B.4)
- Construction Stormwater (Appendix B.6)
 - Reconfigured model land use to accurately portray existing permitted area
 - Loading reductions from “No Action” commensurate with BMPs associated with existing permit requirements
 - Decreased acreage over time (2 year milestones)
- Municipal Separate Storm Sewer Systems (MS4)
 - Existing = Martinsburg, Berkeley County, WVDOH, VA Medical Center in Martinsburg
 - Allocations for existing MS4s = 2010 NA loads - No reduction required
 - Rainfall capture requirements for new and redevelopment expected to offset new urban stormwater loads from development within MS4 and elsewhere in Potomac watershed
 - Future (depending upon 2010 census) – Ranson, Charles Town, Shepherdstown will possibly become MS4s

Non-regulated Developed Lands

- Allocations = 2010 NA - No reduction required
- Future growth anticipated to be offset by required MS4 controls and voluntary BMPs in non-regulated areas – No net increase from 2010NA from urban lands in Potomac watershed
- LID encouraged in Construction Stormwater General Permit review
- Track area, location, pre-development land use and BMPs associated with new/redevelopment by MS4 annual reports and by CSGP program
- Contingencies (if “no net increase” not achieved; 2015 assessment)
 - Use Residual Designation Authority to designate Charles Town, Ranson and Shepherdstown as MS4s if they do not meet population thresholds using 2010 census data
 - Pursue statewide Stormwater Management Program with post-construction requirements if EPA Nationwide regulations not finalized
 - Required retrofits for MS4
 - Modify Construction Stormwater General Permit to require post-construction controls in Bay Watershed
- WV WIP provides a “menu” of strategies on the community level for:
 - Local governments
 - Homeowners
 - Institutions

SECTION 7A. Regulated Sectors – Stormwater - Associated with Industrial Activity

Point source discharges of stormwater associated with industrial activity are regulated by the Multi-Sector Stormwater General Permit (WV011457) and by individual WV/NPDES permits issued to industrial facilities. Whether individually permitted or controlled by registration under the general permit, industrial facilities are required to develop and implement Groundwater Protection Plans, Stormwater Pollution Prevention Plans and Spill Prevention Control and Countermeasures Plans. Proper implementation renders stormwater discharges of quality similar to urban stormwater. The wastewater input deck for the previous version of the CBWM inappropriately included loadings from a number of industrial stormwater sources such that their loadings were in effect double-counted. In preparation for the Phase II WIP, WVDEP performed a comprehensive reevaluation of existing sources and provided EPA with the updated information to support their revision of the wastewater input deck to remove industrial stormwater sources.

WVDEP permitting staff provided detailed information for all Chesapeake Bay drainage facilities registered under the Multi-Sector Stormwater General Permit and for the stormwater components of individually permitted industrial facilities. Appendix B.3 displays the industrial facilities in the Chesapeake Bay Watershed with stormwater regulated by an NPDES permit and provides location and drainage area information and land cover characteristics. At the county scale, WVDEP has assigned appropriate areas of urban pervious and urban impervious land uses to this source category. Load-based wasteload allocations are not displayed. If the allocated loadings for an individual facility's component are needed, they can be calculated by multiplying displayed areas by the 2010NA unit area edge-of-stream loads for the pervious and impervious land uses in the land river segment in which the facility is located. Pollutant reductions are not prescribed by the wasteload allocations for any existing facilities in this subcategory.

7A.b. Accounting for Growth

Significant growth in this category is not expected. During construction, new stormwater loads would be controlled via the Construction Stormwater General Permit area allowances (see Section 7C). No wasteload allocations are provided for new post-construction loads and all new industrial/commercial post-construction stormwater loading will be included in the 2015 urban stormwater loading assessment. That assessment will document the new urban development that occurs in the Potomac watershed after January 1, 2011, pre-development land uses, and applied post-construction controls. The assessment will evaluate the success or failure of the WIP strategy to not increase delivered loading from Potomac watershed urban stormwater sources beyond 2010NA levels. All new sources in this category that are located in MS4 jurisdictions will be subject to the one inch capture and onsite management requirements (see Section 7D) and regardless of size or location, WVDEP will encourage implementation of post-construction controls and will track installation of implemented qualified BMPs.

7A.f. Tracking and Reporting Protocols

DEP will track areas of industrial stormwater sources in the format of Appendix B.3.

Because most new industrial stormwater sources that disturb an acre or more of land register under the Construction Stormwater General Permit, the Construction Stormwater permitting staff will track location, developed area, pre- and post-construction land use and qualified BMPs for post-construction control as described in Section 7F. In very limited instances, new industrial development activity may occur without registration under the Construction Stormwater General Permit. Some of those activities may be subject to NPDES permitting under the Multi-sector Stormwater General permit or individual WV/NPDES permits. Various permitting staff will coordinate the tracking of associated land use change and post construction BMP verification and reporting.

WVDEP is currently working with a contractor to develop and implement a database for managing all of our urban stormwater BMP and land use change data including those for industrial sources. This database is expected to be complete by December 2012.

SECTION 7B. Regulated Sectors – Stormwater - Mining Discharges

The existing stormwater contributions of nitrogen and phosphorus from this subcategory of point sources are generally not appreciable in regard to Chesapeake Bay impacts. However, certain coal mining facilities use anhydrous ammonia as a treatment chemical for pH adjustment which results in nitrogen discharges greater than those of other facilities. Appendix B.4 identifies mining related WV/NPDES permits and outlets for which anhydrous ammonia is currently in use. Zero wasteload allocations are provided for the nitrogen additions associated with the use of anhydrous ammonia. The zero wasteload allocations will be achieved by 2017 by documenting cessation of anhydrous ammonia use. These facilities, and all other mining facilities, are indirectly granted additional, non-zero wasteload allocations for nitrogen and phosphorus under the stormwater-based protocols described in the following sections.

At the time of Phase II WIP development, as indicated in Appendix B.4, anhydrous ammonia use as a treatment chemical has ceased at all sources where it was being used.

7B.a. Current Programs and Capacity

Mining activities are regulated by two separate permitting programs in West Virginia. Permits issued pursuant to West Virginia Code §22-3 and §22-4 (commonly referred to as Article 3 and Article 4 permits) implement the requirements of the federal Surface Mining Control and Reclamation Act of 1977 (SMCRA) in relation to coal and non-coal (quarries) mining,

respectively. WV/NPDES permits are also issued to coal and non-coal mining activities pursuant to West Virginia Code §22-11.

The CBWM provides an “extractive” land use to facilitate representation of mining activity. WVDEP queried available permit information to quantify the permitted acreage associated with active mining operations. This was accomplished using the PERBD shapefile maintained by the Division of Mining and Reclamation, which spatially locates and provides area information for Article 3 and 4 permits. Appendix B.5 identifies the permitted facilities included in the assessment and provides location and permit bonded area information.

The area of extractive land use provided in the updated land use for CBWM 5.3.2 is consistent with the PERBD derived “permit bonded areas” at the county scale. Because of contemporaneous reclamation permit requirements, it is not realistic to portray all permitted bonded area as disturbed when, in fact, at any point in time the permitted area includes undisturbed, disturbed and reclaimed components. Furthermore, the stormwater runoff from disturbed areas is treated by sedimentation basins subject to technology-based TSS limitations under the NPDES program.

Since existing permit bonded area is mapped to the extractive land uses and since the permitted area is either undisturbed forest, reclaimed, or disturbed and subject to stringent TSS controls, loadings from NPDES permitted area is commensurate with the application of the Abandoned Minelands Reclamation (AMR) BMP to extractive land uses. As such, the WIP II allocation process applies the AMR BMP to 100% of the West Virginia extractive land uses. This operation results in extractive land uses pollutant loadings approximately equal to forest loading. Other than the aforementioned cessation of anhydrous ammonia use, pollutant reductions are not prescribed for any existing facilities in this subcategory.

7B.b. Accounting for Growth

In general, the rate of reclamation and permit release is expected to outpace any new coal mining activity. With the majority of existing permit activity associated with operations in western Grant and Mineral counties (land segments A54057 and A54023) where delivery factors for both nitrogen and phosphorus are extremely low, delivered new load impacts will be negligible. New and expanded quarry operations are a possibility and may need to offset new loads.

7B.f. Tracking and Reporting Protocols

WVDEP will provide annual reports of permit activity for mining sources. Reports will document cessation of anhydrous ammonia use at targeted NPDES outlets as it occurs. Total permit bonded area associated with Article 3 and Article 4 permits will be reported at the county scale. The reporting process will subtract areas associated with completely released

permits and add areas associated with new permits to the baseline condition shown in Appendix B.5.

SECTION 7C. Regulated Sectors – Stormwater - Construction Stormwater General Permit

The wasteload allocations for this subcategory of sources are based upon the total concurrently disturbed area registered under the Construction Stormwater General Permit (CSGP) and are prescribed at the county scale. Implementation is intended to be accomplished by maintaining total registered disturbed areas equal to or less than the area provided for each county (Appendix B.6). This may be accomplished by requiring phasing of the total disturbed area in the approved Stormwater Pollution Prevention Plan (SWPPP). This mechanism is consistent with the approach used in local TMDLs, where construction activities in parts of the Chesapeake Bay Watershed have restrictions applicable to the amount of concurrently registered area.

7C.a. Current Programs and Capacity

The Construction Stormwater General Permit (WV0115924) is used to regulate point source discharges of stormwater associated with construction activity. Operators of construction sites that disturb one (1) acre or greater, including smaller sites that are part of a larger common plan of development, register under the general permit and maintain permit coverage through the construction and reclamation period. The permit requires the development of SWPPPs that identify site-specific sediment and erosion controls that will be implemented to achieve the following goals:

- Limiting the amount of total disturbance
- Diverting upslope water around disturbed areas of the site
- Limiting the exposure of disturbed areas to the shortest duration possible
- Controlling internal water and runoff
- Removing sediment from stormwater before it leaves the site

SWPPPs for all sites that are three acres or larger are individually reviewed and approved. When construction activities are complete and all disturbed areas are stabilized, registrants are required to submit a Notice of Termination (NOT) to end permit coverage.

The CBWM provides “construction” land uses to facilitate representation of construction activity. At the time of the TMDL, WVDEP permitting staff documented that more than 14,000 disturbed acres were concurrently registered under the Construction Stormwater General Permit in the Potomac watershed, whereas the land use associated with the previous model version provided less than 500 acres of construction. This has been revised in the land use for CBWM 5.3.2 such that the area provided in the model more closely approximates 2010 permit registered area.

Permitting staff projected future intended decreases in concurrent permitted disturbed area, with implementation goals provided for 2013, 2015, 2017 and 2025. Those goals served as the basis for the wasteload allocations. Appendix B.6 displays summarized current disturbed area, pre-construction land use types, and future goals for active registrations under the permit.

The longer term reduction goals are substantive and recognize that various existing large scale construction projects (highways, pipe lines) will be completed. Also, current oversight resource constraints allow some sites to continue registration under the permit even though their registered area is not actually disturbed. The operators of some sites accomplish stabilization of disturbed areas that would allow termination of permit coverage but nonetheless do not submit NOTs. Permit coverage for some sites is speculatively attained but construction is not pursued. Future implementation will address those issues and will pursue all available mechanisms to maintain the area caps, including the possibility of delaying registrations of new activity until area becomes available via termination of existing registrations.

Certain mine land reclamation projects conducted by Abandoned Mine Lands and Special Reclamation sections of WVDEP obtain CSGP registration. As the base activity is included in the extractive land use, the associated areas need not be considered in the CSGP area cap assessment.

The reissuance of West Virginia's Construction Stormwater General Permit will take place by the December 4, 2012 expiration date of the current permit. A draft copy will be given to EPA as outlined in the MOA for NPDES Permitting between EPA and DWR/WVDNR (now DWWM/WVDEP).

7C.b. Accounting for Growth

Growth is not expected within this subcategory, as the implementation plan envisions reduction of the total areas existing in 2010.

7C.f. Tracking and Reporting Protocols

WVDEP will annually submit information on the level of activity under the Construction Stormwater General Permit. Annual reporting will provide the maximum disturbed concurrently registered area by county that occurred during each calendar year. The Construction Stormwater permitting program will also be used to gather valuable information to monitor urban stormwater sector growth, as discussed in Section 7F.

SECTION 7D. Regulated Sectors – Stormwater - Municipal Separate Storm Sewer Systems (MS4s)

West Virginia has an established NPDES program that governs discharges of waste into waters of the state. West Virginia's Municipal Separate Storm Sewer System (MS4) program is funded

through NPDES permit fees and regulates small MS4s under a General Permit reissued on June 22, 2009, and effective July 22, 2009. The MS4 General Permit represents a strong effort to address existing and potential water quality issues.

There are no Phase I MS4 municipalities in West Virginia. The MS4 General Permit regulates four MS4s in the Chesapeake Bay Watershed: the City of Martinsburg, Berkeley County, the West Virginia Division of Highways, and the VA Medical Center in Martinsburg. Data from the 2010 U.S. Census will likely trigger the designation of several additional MS4 operators in the Chesapeake Bay Watershed moving heretofore non-regulated urban stormwater sectors into the regulated arena. These possible areas include Jefferson County's Ranson, Charles Town, and Shepherdstown. It is also possible that the urbanized area for the City of Martinsburg may be expanded after the 2010 Census data is released. If this happens, the 167th Airlift Wing could possibly be an additional MS4 in the Chesapeake Bay Watershed. However, quantifiable details on new designations will not be available until after the 2010 Census data is released. Upon designation, any future MS4 entities will be granted an offset equal to 2010 No Action (NA) loadings for all areas that will be subject to MS4 regulation.

WVDEP is not prescribing pollutant reductions from existing urban stormwater sources, but intends to control new development and redevelopment in MS4 areas to counter increased urban stormwater loads from growth throughout the watershed.

7D.a. Current Programs and Capacity

Statewide Program

West Virginia's MS4 General Permit required that MS4s develop and submit stormwater management programs (SWMPs) to WVDEP for approval no later than January 22, 2011. The SWMP includes minimum control measures in each of six categories outlined in the Federal Phase II stormwater rule [40 CFR § 122.32(a)], along with measurable goals and milestones for each measure. The minimum control measure categories are public education and outreach, public involvement and participation, illicit discharge detection and elimination, controlling runoff from construction sites, controlling runoff from new development and redevelopment, and pollution prevention and good housekeeping for municipal operations. MS4s must be fully implementing their SWMPs by 2015.

EPA has recognized that West Virginia's MS4 General Permit is particularly progressive with regard to its post-construction requirements. The post-construction minimum control of the General Permit directs MS4s to develop ordinances requiring all new development and redevelopment of one acre or greater to capture and manage the first one inch of rainfall by utilizing runoff reduction stormwater practices. Runoff reduction practices include: canopy interception, soil amendments, evaporation, rainfall harvesting, engineered infiltration, extended filtration and/or evapotranspiration and any combination of these practices. The MS4 General Permit also contains a section with strong watershed protection elements that

includes non-structural practices to protect water quality. For the remaining, most difficult sites, the permit allows for the MS4 to develop a payment-in-lieu program or offset mitigation to address the runoff reductions.

Redevelopment sites including brownfields, high density, vertical density and mixed use and transit oriented development are provided the incentive (reduction in amount of capture) to capture the first 0.80 inches of rainfall on site with no discharge to surface waters. Each incentive will allow the developer to reduce the amount of stormwater that is required to be managed on site. A maximum reduction of 0.75 inches is allowed (Permit section Part II.C.b.5.ii.A.3.).

West Virginia's current MS4 program consists of the MS4 General Permit and one full time staff person who oversees statewide implementation of that permit, along with all of the programmatic elements of the MS4 program. One additional person will review (as needed) SWMPs submitted to WVDEP for approval under the reissued permit.

WVDEP prioritized review of SWMPs for MS4s in the Chesapeake Bay Watershed. The City of Martinsburg is approved and permitted under their new SWMP. WVDEP has completed review of WVDOH and Berkeley County's SWMPs and is awaiting further information. The Martinsburg VA Medical Center's SWMP is currently being reviewed. WVDEP has required inclusion in each SWMP a plan to accelerate implementation of capture requirements and to track land use conversion that results from development on or after January 1, 2011.

WVDEP employs EPA's Compliance Monitoring Strategy (CMS) to determine the number and type of facilities that will be targeted for inspections. The number and frequency of inspections performed will be in conformance with the guidance provided by the CMS. The first MS4 audit by WVDEP Environmental Enforcement in the Chesapeake Bay Watershed took place in August 2010. Audits will be performed once every 5 years thereafter for all MS4s in the state. Permit noncompliance identified in audits will be addressed through appropriate enforcement actions.

Local MS4 Programs

Regulated municipal MS4s in West Virginia have been granted authority by state law to form stormwater utilities in order to finance the implementation of their stormwater programs and the MS4 program. The City of Martinsburg is the only municipally operated MS4 located in the Chesapeake Bay Watershed and, to date, has not formed a utility. Berkeley County is currently investigating the establishment of a utility and stormwater fee. A stormwater utility could be a means of achieving TMDL targets.

Lack of adequate resources and support for MS4 staff is a statewide issue. In many MS4 entities, the public works director or the chief operator of the wastewater treatment plant is tasked with managing stormwater in addition to their existing duties. In addition, the reissued MS4 General Permit requires a certain level of understanding of runoff reduction practices to

manage stormwater. Stormwater management is new to most West Virginia communities, and runoff reduction practices are even newer. MS4 operators have little training in the science of stormwater management, much less implementation of effective stormwater practices. WVDEP does provide some training, but there is much more available from other institutions and organizations. In response to this, WVDEP initiated the following:

- Training workshops sponsored by WVDEP that are open to all parties interested in managing stormwater or implementing the MS4 General Permit.
- Contracted with the Center for Watershed Protection to develop a compliance spreadsheet tool for stormwater designers/engineers and MS4s that will ascertain compliance with the one inch capture performance standard. Two workshops conducted in 2010 provided instruction on using the spreadsheet tool.
- Development of a statewide stormwater management guidance manual that will provide design specifications of runoff reduction practices. Runoff reduction practices are the primary method to meet the one inch capture performance standard. The completed scope of work for the manual specifies that each stormwater practice design include a discussion of removal of nutrients, and how the practice can best remove nutrients from stormwater consistent with Chesapeake Bay approved runoff reduction practices. The contract for the manual was awarded to the Center for Watershed Protection on November 30, 2010. The manual is anticipated to be complete by fall of 2012. During the interim before WV's manual becomes available, WVDEP is recommending that the *Northern Kentucky Stormwater Management Handbook* and *The Prince George's County Bioretention Manual* be consulted.
- Filled a position at WVDEP to provide compliance assistance to MS4 communities in the Chesapeake Bay drainage. This employee promotes utilization of stormwater practices that encompass green infrastructure including infiltration, extended filtration, canopy interception, soil amendments, evaporation, evapotranspiration, reuse and any other practices that reduce stormwater volume. The employee assists the four existing MS4s, counties and consulting engineers in meeting MS4 permit criteria for stormwater management.

7D.b. Accounting for Growth

See Section 7F.

7D.c. Gap Analysis and Strategy to Fill Gaps

There will be a period of time between MS4s submitting their SWMPs to WVDEP for review and approval before the runoff reduction practices are put into full implementation. The reissued MS4 General Permit required that SWMPs be submitted to WVDEP for approval no later than January 22, 2011. Statewide, MS4s are required to implement the runoff reduction one inch capture performance standard within four years of SWMP approval. However, the MS4

General Permit also includes a requirement for MS4s to consider TMDLs and ensure their stormwater management program includes measures specifically targeted to achieving any applicable wasteload allocations. The Chesapeake Bay TMDL wasteload allocations (no increase to 2010 NA loads) will require existing MS4 entities to accelerate implementation of their SWMPs.

Berkeley County has already enacted an ordinance that requires one inch capture, so development occurring in their jurisdiction is already subject to this standard.

Newly designated MS4s will be subject to the same runoff reduction requirements of the current permit. Jefferson County and several of the incorporated cities in Jefferson County have ordinances in place to address post-construction stormwater discharges. Jefferson County is considering revising their ordinance at this time and is working with WVDEP on this revision. For the time period where stormwater discharges from Jefferson County entities are not covered by the WV/NPDES MS4 permit, WVDEP will track qualified BMPs that are installed through the WVDEP's General Permit for Construction Stormwater.

WVDEP's General Permit for Construction Stormwater has a statement which says *"when a permittee is developing structural practices for stormwater control, the permittee shall consider the use of but not limited to: infiltration of runoff onsite; flow attenuation by use of open vegetated swales and natural depressions; stormwater retention structures and stormwater detention structures. The permittee should consider low impact development (LID) in the design of the site and the best management practices. This will allow the site to retain its natural hydrology and infiltrate stormwater within the boundary of the site"*. As part of the review process of the Stormwater Pollution Prevention Plan in areas not subject to MS4 regulation, the WVDEP will encourage practices that reduce post-construction stormwater impacts and will track installation of implemented qualified BMPs. In fact, many of the post-construction controls previously reported and encompassed in the 2009 progress scenario resulted from voluntary implementation encouraged and tracked under the Construction Stormwater permitting program.

WVDEP will develop a statewide stormwater management guidance manual that will provide design specifications of runoff reduction practices by the fall of 2012. Runoff reduction practices are the primary method to meet the one inch capture performance standard. The completed scope of work for the manual specifies that each stormwater practice design include a discussion of removal of nutrients and how the practice can best remove nutrients from stormwater consistent with Chesapeake Bay approved runoff reduction practices. WVDEP plans to offer at least one training on the completed manual within the Chesapeake Bay Watershed.

7D.e. Contingencies

[See Section 7F.](#)

7D.f. Tracking and Reporting Protocols

[See Section 7F.](#)

SECTION 7E. Non-regulated Sectors – Developed Lands

The land uses and sources considered by the Chesapeake Bay Watershed Model (CBWM) and in this section include non-regulated pervious and impervious urban land uses, and septic systems. Successful reduction of priority pollutants from the non-regulated sector of developed lands depends on voluntary adoption of new land use practices, adoption of new laws and ordinances by state and local governments and an increase in both personnel and financial resources to enable implementation and enforcement. As this non-regulated sector has limited capacity to either deliver programs or enforce actions, we are not calling for a reduction from it at the current time. This section of the WIP will stress holding the line, i.e. no net increase in nutrients generated by new development. However, the need to reduce loads from this sector to meet our Cap Load obligations may necessitate a move from voluntary to mandatory practices in the future, effectively moving some non-regulated lands into the regulated arena. Actions that will be taken in the event that the non-regulated developed lands sector fails to meet the “no net increase” goal are discussed below in the Contingencies section. Any reductions made by this sector on existing developed lands will help offset loads from future development, ultimately aiding in meeting the “no net increase” goal.

On the positive side, West Virginia is well suited to enable success through voluntary action. It is very effective at building partnerships across the spectrum of government and non-government organizations. The relative small size of the WV Potomac Basin facilitates outreach as well. Outreach efforts made, for example, at one high school, will, in many cases, reach that age group and many of their families for an entire county.

7E.a. Current Programs and Capacity

Laws and Regulations

West Virginia’s Land Use Planning regulations provide for regional planning entities that cross jurisdictional boundaries. Regular updates of Comprehensive Plans are required as well by these regulations. WVDEP in collaboration with the Eastern Panhandle Regional Planning and Development Council (Region 9), which includes Berkeley, Morgan, and Jefferson Counties, engaged in a Phase II WIP local partner involvement process, described in Appendix E.1. The process resulted in an inventory of existing stormwater-related regulations, as well as policies, procedures, and best management practices (BMP), that have been enacted among the Region 9 counties and municipalities. This inventory is provided in Appendix E.2., discussed in Section 7E.d, Strategy to Fill Gaps, and continually updated on the Region 9 Chesapeake Bay Update’s webpage (Stormwater Management Matrix <http://www.region9wv.com/ChesapeakeBayUpdates.aspx>).

Staffing & Technical Capacity

This section of the WIP is being developed and will be implemented by professional staff from a wide range of state and local governments and NGOs. These include: WVDEP, West Virginia Conservation Agency (WVCA), West Virginia Department of Agriculture (WVDA), Cacapon Institute, The Conservation Fund's Freshwater Institute, Regions 8 and 9 Planning and Development Councils, as well as county/municipality planning & engineering staff. Within state agencies the WVDEP Potomac Basin Coordinator, funded by WV's State Implementation Grant, facilitates the partnership of agencies, non-profits, and other entities that implement these strategies and report to the Chesapeake Bay Program Office. That position has also been able to focus mainly on the Eastern Panhandle counties, where developed lands are expected to increase, and to focus on the developed lands sector and septic systems.

In addition, Region 9 has hired a full-time Chesapeake Bay Program Coordinator, for one year subject to extension, to provide increased technical capacity and support for county and municipal WIP implementation efforts by:

- Utilizing the Region 9 Model Stormwater Ordinance that was completed after submission of the Phase I WIP to recommend amendments to existing stormwater regulations or enact new ones. This ordinance is available for review on the web at <http://www.region9wv.com/ChesapeakeBayUpdates.aspx>.
- Inventorying and tracking stormwater best management practices and maintaining and enhancing the Stormwater Management BMP Inventory provided as Appendix E.2 (Section 7E.d).
- Participating in the Scenario Builder Training.
- Participating in Bay-related meetings across the region and identifying local efforts to meet EPA's TMDL requirements.
- Assisting with the local partner involvement components of the Phase II WIP.
- Assisting counties and municipalities with developing the necessary policy and legislative decisions to meet the Chesapeake Bay TMDL requirements based on the outcomes from the Phase II WIP local partner involvement process.
- Developing and maintaining a spatial database (GIS) and webpages to quantify the efforts being done to address water quality restoration goals and maintain public awareness of the Phase II WIP Strategies.
- Assisting Ranson and Charles Town (and Shepherdstown, if needed) with meeting MS4 Stormwater Program requirements.
- Assisting counties and municipalities with developing a prioritized list of retrofit opportunities.
- Performing other duties and activities as related to the implementation of the Chesapeake Bay Executive Order.

Programs

West Virginia's current programs include voluntary outreach and education. There is limited financial and technical support to get developed lands BMPs on the ground. Specific examples are outlined below. The BMPs installed with these programs and the associated load reductions will help to achieve a no net increase in nitrogen and phosphorus from non-regulated developed lands.

- The Region 9 Chesapeake Bay Coordinator will work with communities looking to revitalize their existing urbanized streets. "Street Scape" revitalization projects can incorporate stormwater management BMPs to handle runoff from previously unregulated development. These stormwater management facilities will not be buried beneath the ground in the form of hard infrastructure such as storm inlets and pipes, but in a softer, natural method known as green infrastructure for all to see. The green infrastructure approach utilizes the root system to capture excess runoff while providing nutrient uptake which is essential for the survival of the vegetation. The lush plants slow the surface waters peak discharge rate reducing flash floods and erosion problems further downstream. These multi-beneficial revitalization projects can boost an area's economy, quality of life, and transportation system while instituting stormwater management retrofits for citizens to appreciate on sunny days while providing environmental benefits on rainy ones.
- West Virginia's Section 319 program supports a volunteer monitoring coordinator who conducts several workshops and special monitoring projects in the Potomac Basin annually. His outreach to school groups, watershed associations, and other communities results in better understanding about best practices for landscapes and stream corridors. The 319 program also makes funding available for nonpoint source pollution reduction in streams, through Incremental grants and other opportunities described below. The Potomac Basin Coordinator is WVDEP's local representative for this program in the Potomac Basin.
- In several priority watersheds, fecal coliform bacteria TMDLs have enabled agencies and partners to apply 319 Incremental funding to incentives for homeowners to pump, repair and replace septic systems. These watersheds include Sleepy Creek, Mill Creek of the South Branch Potomac, Mill Creek of Opequon, Tuscarora Creek of Opequon, Elks Run, and Lost River. These actions are reducing nitrogen reaching surface water in some cases. Note: to the extent that these actions rehabilitate drainfields, they may reduce nitrogen in groundwater as well, but in areas with limestone geology, we believe failures to groundwater pose a difficult challenge. Participating agencies and partners include WVCA, CVI, Potomac Valley and Eastern Panhandle Conservation Districts and WVDEP.
- The current 319 Incremental Project in Mill Creek of Opequon watershed includes a number of residential/commercial BMP demonstrations, including rain barrel workshops and a pet waste reduction campaign. All of the above activities are included in the 319 proposal because of their ability to reduce sediment and bacteria from developed lands.

They will have the added effect of reducing nutrients in runoff, and educating the public about best practices for residential and commercial areas.

- Portions of WV's 319 Base grants are periodically made available by WVDEP to groups through an Announcement of Grant Opportunity (AGO). These do not have to be linked to TMDLs or Watershed Based Plans. They have been used recently to install wetland and rain garden demonstrations, and will be used to revegetate streambanks. Warm Springs Watershed Association and the Eastern Panhandle Conservation District are currently participating.
- Annually, about three groups from the Potomac Basin receive West Virginia Stream Partners grants of up to \$5000 that support the Chesapeake Bay restoration effort by encouraging citizens to partner and implement projects that reduce nonpoint source pollution and educate the public. This program is a partnership of WVDEP, WVCA, West Virginia Division of Forestry (WVDOP), and West Virginia Division of Natural Resources (WVDNR).
- One of the most challenging outreach problems facing the Bay restoration effort is engaging the widely dispersed, individual home-owning and renting community in adopting Bay-friendly practices around their homes. In 2011, Region 9 conducted an online survey of the 8-county Potomac region to better understand lawn and garden care practices. Based on the results, Region 9, WVDEP and partners developed a brochure, "Gardening and Lawn Care in WV's Eastern Panhandle," recommending best chemical and non-chemical practices. Partners distributed the brochure at fairs and other outreach events throughout summer and fall 2011. The project will continue in 2012 with a follow-up survey to assess changes in attitudes and actions that might have occurred as a result of this program.
- Public schools provide an opportunity for urban runoff mitigation that has practical stormwater management implications *and* public education potential. The WV-WIPDT partner Cacapon Institute (CI) has inventoried all public school facilities in the WV Potomac Basin and conducted a "schoolyard-watershed" survey. The inventory reflects a uniform listing of rain water management facilities (such as storm drains and culverts, etc.). The resulting inventory, and pending dissemination of information on stormwater management BMPs, provides a foundation for comprehensive planning and implementation of future BMPs for stormwater runoff and nonpoint source pollution mitigation at each school.
- In 2009, WV-WIPDT partners began an Urban Tree Canopy (UTC) project in Berkeley and Jefferson counties to foster wider acceptance of voluntary BMPs for urban tree conservation and plantings to reduce storm water runoff and address the Chesapeake Bay Program goals. A high resolution UTC assessment was completed for Jefferson County. County planners, in coordination with planners in Charles Town, Harpers Ferry, Ranson, and Shepherdstown are currently developing UTC goals. Cacapon Institute is leading a similar effort in Berkeley County. In addition, Jefferson County and a number of county municipalities working with WVDOP and CI received funding for the purpose

of an aggressive urban tree planting program in the county. Further, WVDOF and CI have received a three-year US Department of Agriculture-Forest Service (USDA-FS) grant for UTC assessment and implementation in the Potomac Headwaters.

- In recent years, an effort by WV WIP partners to promote better stormwater management began under the name of “West Virginia Stormwater Network” but quickly grew to include nearby Virginia and other states. It is now called the Great Valley Stormwater Alliance (GVSA). The GVSA is an informal group open to all stormwater practitioners seeking to promote runoff reduction* practices and foster practical management of stormwater in karst terrain. One of its first activities was to develop “West Virginia’s Stormwater Strategy for the Potomac Basin” (2009). *Runoff reduction is defined in section 7.D.a “Current Programs and Capacity”.
- The Conservation Fund’s Freshwater Institute works closely with local governments in the Eastern Panhandle to increase understanding of the environmental impacts of growth as well as the benefits of green infrastructure. Their Rockymarsh Run Watershed Initiative serves to promote an awareness of the local benefits of Chesapeake Bay restoration.
- WVDEP is currently developing a statewide stormwater management guidance manual that will provide design specifications of runoff reduction practices. The scope of work for the manual has been completed, and it specifies that each stormwater practice design include a discussion of removal of nutrients, and how the practice can best remove nutrients from stormwater consistent with Bay-approved runoff reduction practices. The manual is under development and anticipated to be complete by fall of 2012.

Financial

The sustainability of most of the current programs and capacity relies primarily on short-term grants. Dedicated funding streams such as fees would ensure their long-term viability.

Funding from the Chesapeake Bay Program is vital to maintain the capacity we have built, and to adaptively manage to increase capacity as needed. Grant funds seem to be sufficient for demonstration projects, and we have noticed National Fish and Wildlife Foundation (NFWF) Chesapeake Stewardship Funds being awarded for the top stormwater retrofit projects in communities where prioritized lists exist. One of our communities, the City of Romney, recently developed such a list. Moving forward, the Region 9 Chesapeake Bay Coordinator will be instrumental in assisting counties and municipalities with developing a prioritized list of retrofit opportunities. Romney’s process will serve as an example.

Since the receipt of the Chesapeake Bay Regulatory and Accountability Program (CBRAP) funds, WVDEP has been providing funding to local governments for the purpose of developing or enhancing regulatory and accountability programs. This funding is available to help counties adapt and adopt the Region 9 Model Stormwater Ordinance, and to reconcile existing codes

and ordinances to remove barriers and make regulations complementary. Morgan County and Jefferson County submitted proposals that were approved by EPA in 2011 and 2012, respectively, for funding through WV's CBRAP grant.

A NFWF planning grant was used in Jefferson County to understand the stormwater and wastewater issues in the Blue Ridge Communities. That effort shows promise for future implementation, targeted according to the recommendations of this current project. Region 9 secured a federal grant for the Towns of Bolivar and Harpers Ferry to conduct a stormwater design study and to utilize the Region 9 Model Stormwater Ordinance to prepare specific stormwater ordinances for each town's respective enactment.

In July 2011 the WVDOF and CI received a three-year grant from the USDA-FS for "Urban Tree Canopy Assessment and Enhancement in the Potomac Tributaries." This grant provides support for UTC assessment and implementation in municipalities, on school grounds, and along major roads in the Potomac Headwaters. It will also support WV Project CommuniTree (WV CTree), a cooperative effort among WVDOF, CI & WVCA that promotes urban tree planting and public education through volunteerism on a regional scale. A second, regional grant from the USDA-FS will provide funding to support "Healthy Forests and Trees for TMDLs in the Potomac"; this grant will be managed by WVDOF's Chesapeake Bay Forester.

Limited funding (such as WV Stream Partners, Clean Water Act Section 106 and 319 grants, WVDEP Stormwater Program) for this sector is available for demonstration projects. Each of these projects includes significant in-kind match from partners involved, including homeowners who buy, install and maintain the practices.

7E.b. Accounting for Growth

West Virginia's strategy for non-regulated developed lands is based on enhancing voluntary actions for already developed lands, and working with state, county and municipal governments to implement policies that result in no net increase in nutrients generated by new development. Several options for new local laws and regulations that require both nutrient control practices in new developments and additional mitigating offsets that result in zero net increase in nutrients are outlined below. [Impediments to stormwater control in non-regulated areas and potential mitigation strategies are discussed in the following two sections and additional information about West Virginia's comprehensive plan to address growth in the urban stormwater sector is provided in Section 7F.](#)

7E.c. Gap Analysis

West Virginia has many gaps between the existing and needed capacity to reduce loads from developed lands. Implementing stormwater controls when developing or redeveloping a property is less costly than attempting to retrofit a site with stormwater controls. However, there is currently no requirement at the state or county level to regulate post-construction

stormwater on new or redeveloped sites outside of MS4 areas or to retrofit existing developed areas to better treat stormwater runoff. In addition, there is no regulation of residential lawn fertilizer and no limits of oversized lawns. Excess runoff coupled with over-fertilization can lead to nutrients entering our local waterways.

To better understand the ability and activities of local partners to address gaps in stormwater management, a Stormwater Management BMP Inventory was distributed to the planning and engineering departments of the Region 9 counties and municipalities. They listed their activities or capacity in the Inventory. See Appendix E.2 for the results. The following capacity gaps were revealed in the counties' and municipalities' contributions to the Stormwater Management BMP Inventory:

- Only two of the twelve reported having a stormwater ordinance enacted that meets the performance standard of having a one-inch capture of stormwater onsite with no discharge to surface waters. Five other counties or municipalities report that they have initiated the process of considering and incorporating this performance standard into a new or existing stormwater ordinance.
- Some are tracking land use and changes in land use. For those that are collecting land use data, there is no consistency and therefore limited ability to standardize land uses, document changes in land use, and track applicable stormwater performance standards for types of land use.
- A consistent methodology has not been established yet to track and report the implementation of stormwater BMPs. The current method is that of voluntarily reporting BMPs to WVDEP annually.
- Dry detention ponds are the predominantly used stormwater BMP. Their efficiency of reducing pollutant loading is significantly lower than most other stormwater BMPs.
- Most have regulations that prohibit or limit development in floodplains. A standard clause in floodplain ordinances requires that a Flood Protection Setback equal to twice the width of the watercourse channel measuring from the top of one bank to the top of the opposite bank or 50 feet, whichever is less, shall be maintained from the top of the banks of all watercourses. To reduce erosion, natural vegetation shall be maintained in this area. Where natural vegetation does not exist along the watercourse and conditions for replanting are suitable, high priority shall be given to planting vegetation in the setback area to stabilize banks and enhance aquatic resources. Enforcement of these regulations is a challenge.
- None require advanced nitrogen removal technology for onsite septic systems.
- Comprehensive public education and participation regarding stormwater is occurring only when required by MS4 regulations. Some are not educating landowners about the importance of careful use of fertilizers.

The Region 9 Chesapeake Bay Program Coordinator, in collaboration with WVDEP, will utilize the Stormwater Management BMP Inventory, Appendix E.2 to further determine the extent to which existing county and municipally-enacted land use regulations and stormwater management controls complement the WIP strategy. This technical assistance will also include

recommendations for strengthening existing land use regulations to better align with the WIP strategy and to assist with various stormwater implementation strategies.

Regulatory

West Virginia is in the process of developing nutrient criteria for select streams. When completed, this will make it easier to directly connect the nutrient problem to local conditions and document that a local problem exists, as opposed to the more distant issue of nutrient loads delivered to the Chesapeake Bay.

There are currently no stormwater utilities in the Potomac basin. Enabling the creation of stormwater utilities will facilitate the establishment of a dedicated funding stream to address stormwater priorities such as maintenance and installation of stormwater management retrofits.

Very little of West Virginia's Potomac Basin is currently covered by MS4s. Increasing coverage of MS4s would increase regulatory oversight on stormwater management. Charles Town, Ranson, and possibly Shepherdstown, are likely to be designated as MS4 communities following publication of the 2010 Census urbanized area results. Such new designations will greatly increase the regulatory oversight for stormwater management within Region 9. Moreover, creating these new designations within Jefferson County is significant because the county's close proximity to the Chesapeake Bay will have a greater impact on nutrient loading. As previously stated, one pound of edge-of-stream nitrogen load from Jefferson County has a much greater impact on the Bay than an equivalent load from Hardy County.

In addition, if promulgated, either EPA's proposed National Stormwater Rule-Making or the WV statewide stormwater management regulations will also provide significant regulatory oversight for non-MS4 communities.

There is a legacy of conventionally platted subdivisions that do not have to be developed according to current local regulations. These subdivisions were grandfathered under the regulations which were in place at the time they were platted.

There are no requirements for stormwater retrofits or enhanced stormwater management at re-development sites.

Programmatic, Staffing & Technical Capacity

Region 9's Phase II WIP development process included an extensive local partner engagement and education process, which has significantly increased the level of awareness and understanding among the local WIP stakeholders. An ongoing engagement, outreach, and technical assistance program is being implemented through West Virginia's Chesapeake Bay Implementation Team, led by the Region 9 Chesapeake Bay Coordinator and WVDEP's Potomac

Basin Coordinator. The Team understands the need to sustain a vigorous outreach and engagement effort with elected officials, county and municipal staff, private sector partners and special interest groups, including homeowners and watershed protection organizations.

While Comprehensive Plans are required to be updated at regular intervals, there are no requirements for inclusion of elements concerning natural resources or the environment. In addition, provisions for the requirements and processes of Chesapeake Bay TMDL implementation are also not a required component of Comprehensive Plans.

Local jurisdictions generally lack the capacity (staffing, funding, and information, particularly accurate land use data) to manage nutrients in stormwater:

- Voluntary, individual actions are often not associated with government programs where they will be tallied. For example, rain barrel workshops' attendance may be counted, but implementation remains unknown.
- As local governments are generally unaware of what is required of them, they are unable to assess capacity or account for practices because they are not aware of what they can get "credit" for.

Historically, Chesapeake Bay implementation has yet to become institutionalized on a local level. However, Morgan County, Jefferson County, Charles Town, Harpers Ferry and Bolivar are using the Region 9 Model Stormwater Ordinance to prepare new or update existing stormwater regulations for enactment and enforcement. WVDEP and the Region 9 Chesapeake Bay Coordinator are encouraging other county and municipal governments in the region to utilize the model ordinance performance standards to achieve Chesapeake Bay water quality and quantity objectives.

There is a lack of management of septic systems. While county health departments have the authority to check the function of septic systems, this activity is generally limited to following up on complaints for anything but new installations. There are few siting requirements and no requirements for denitrifying systems on new installations or retrofitting existing septic systems with denitrifying technology.

Voluntary participation at the local level is insufficient to result in substantial BMP installation on the ground. Successful reduction of priority pollutants from the non-regulated sector of developed lands depends on voluntary adoption of new land use practices.

There are many opportunities for BMPs to be installed on developing lands in West Virginia to prevent an increase in nutrient loads from this sector. These include tree buffers, grass buffers, urban tree planting, infiltration or filtering practices, urban stream restoration, and denitrifying septic systems.

Financial

Currently, none of the towns or counties in the Potomac Basin of West Virginia has a stormwater fee that could be used for local government staff dedicated to reducing stormwater impacts; to retrofit, install and maintain practices described in this section; or to pay for broad-based homeowner BMP incentive programs. This is largely due to the fact that stormwater fees can only be enacted pursuant to the provisions of the West Virginia Code, which stipulates that only municipalities or sanitary districts that own and maintain a stormwater system may enact a stormwater fee.

Institutional

Most public and institutional facilities including schools and other federal, state and local government buildings in West Virginia lack sufficient stormwater management to adequately reduce runoff. Public facilities that implement good stormwater management serve as good examples that result in nutrient load reductions and should be rewarded for their efforts.

- *Golf Courses* - The WV Chesapeake Bay Implementation Team periodically surveys the fourteen golf courses in the area. They report that half of the golf courses implement voluntary nutrient management on their property. A seminar program will be developed to build capacity for nutrient management within the golf course community.

7E.d. Strategy to Fill Gaps

As described in Appendix E.1 “Region 9 Local Partner Involvement Process - Description,” the counties and municipalities of Region 9 have come to a better understanding of the strategies that they could be implementing over the next several years to offset new pollutant loading and maintain or reduce their existing loading. Four two-hour sessions during the summer of 2011 and one day-long summit educated them and provided feedback for the WV-WIPDT on reasonable strategies. Discussion on the need for implementing stormwater BMPs, asking for information to complete the Stormwater BMP Inventory (Appendix E.2), and presentations on Bay scenario tools, all reinforced the importance of tracking BMPs.

For the counties and municipalities of Region 9 that are not regulated by MS4 permits, implementation of strategies to fill gaps will be voluntary. It is recommended that these non-MS4 counties and municipalities focus on two key strategies:

- Educate anyone that owns or manages a lawn on the avoidance of over-fertilizing. This would apply to golf course managers, business owners, and institutional facility caretakers, as well as homeowners.
- Review and understand the performance standards of the Region 9 Model Stormwater Ordinance that was finalized in February 2011. Develop and adopt a new (or revise an existing) stormwater ordinance that incorporates these performance standards.

When surveyed, the counties and municipalities of Region 9 agreed that, to address these key strategies, they would benefit from the following resources, authorities, or assistance:

- A dedicated funding source to ensure the Region 9 Chesapeake Bay Program Coordinator position is funded through the WIP milestone period of 2025.
- The development of a publication that could be distributed by counties and municipalities on the importance of avoiding over-fertilizing lawns.
- Standard protocols for collecting data, mapping, and reporting land uses and changes in land use. This effort could be institutionalized by the WV Legislature, providing technical assistance and incentives to counties and municipalities to track land uses and changes. In conjunction with this effort, the WV Legislature may need to address the concerns of local assessor's offices in the sharing of land use data.
- Funding and technical assistance to counties and municipalities seeking to review and adopt stormwater ordinances with the performance standards contained in the Region 9 Model Stormwater Ordinance.
- WVDEP could provide an incentive for counties and municipalities seeking to adopt a stormwater ordinance with the performance standards of those contained in the Region 9 Model Stormwater Ordinance by researching and establishing the reduction efficiency level that can be achieved by these performance standards and asking counties and municipalities to simply track acreage of new development/redevelopment that has been regulated by the Ordinance rather than tracking various types, locations, efficiencies, and eras of BMPs. This is similar to Maryland's proposal to track urban BMPs by Era.
- Amendments to the WV Code to expand the authority for municipalities and sanitary districts to create stormwater utilities accordingly.

Ranked lower by the counties and municipalities of Region 9 were actions that entailed restrictive legislation that set limits on the amount of phosphorus in consumer cleaning products, that set limits on the amount of nutrients in fertilizer, and that mandated regular pumping of septic tanks.

Outlined below are the strategies that West Virginia's Chesapeake Bay Implementation Team will undertake between 2012 and 2017 to reduce and/or maintain no net increase in nutrients from the unregulated, developed lands sector. Implementation of these strategies is largely contingent upon continued federal funding from the Chesapeake Bay Program.

Local Governments/Land Use Planning

- Encourage stormwater BMPs with highest nutrient reductions
- At the county level, incentivize runoff reduction practices for new and existing developments, using methods such as:
 - Assessing lower impact fees or local permit review fees for subdivisions designed to minimize runoff

- Assisting communities in applying for the Federal Emergency Management Agency's Community Rating System (CRS). This Program provides Flood insurance policy discounts for citizens who have flood policies in jurisdictions that enforce higher regulatory standards for land development, stormwater management, preserve open space easements in Environmentally Sensitive areas, and properly maintain stormwater drainage systems.
- Explore development of an incentive program to encourage grandfathered legacy platted subdivisions to meet current and new local regulations
- Redesign parking lot regulations to reduce impervious footprint and maximize BMP installation.

Implementation of Specific BMPs

- Tree buffers and tree plantings:
 - Use Conservation Districts' tree sales, which are very important to maintaining current rate of implementation, along with 319, Bay Implementation, and Stream Partners grants to fund individual projects at minimal or partial cost to landowner
 - Urban Tree Canopy programs in each county with overall goals would also have the effect of achieving more acreage of these BMPs
- Infiltration and filtering practices:
 - Use 319, Bay Implementation, and Stream Partners grants to fund individual projects at minimal or partial cost to landowner
 - See some of the projects listed under "Institutional," below
 - Some communities would benefit from formal prioritized inventories of retrofit opportunities, to enable them to qualify for NFWF grants, etc.

Homeowner Engagement

- Actively recruit residential landowners of several acres in visible places to reduce mowed area
- Install homeowner rain gardens in several of these sites along well-traveled routes
- Build local capacity (social infrastructure) for voluntary implementation in the form of watershed associations and Community Environmental Management (CEM). Choose several communities to pilot the CEM concept, and support them with a facilitator for meetings once or twice monthly for two years, plus start-up funding for projects. Other communities could mimic this model with volunteer or agency staff facilitators, and seek their own funding for projects. Foster the ability of local communities to identify and report violations and resolve stormwater-related problems. Build capacity for citizen monitoring of implementation efforts
- Institute homeowner runoff reduction campaign to recruit homeowners to disconnect downspouts, help them install rain barrels, create swales, rain gardens and other small-

scale runoff reduction practices. Voluntary pledges of maintenance would be encouraged

- Expand technical assistance for homeowners by working with university extension offices, homeowner associations, watershed groups, and others
- Promote grass buffers through lawn care outreach programs that include education about not mowing, or only cutting once per year, along streams

Education, Outreach & Technical Assistance

- Train builders and developers, etc. on runoff reduction principles
- Promote “Runoff Reduction Toolkit” website as a clearinghouse for guidance and publications related to runoff reduction methods (<http://www.region9wv.com/bay/LIDtools.html>)
- Conduct education and outreach at all levels of society – press, ads, workshops, white papers, pamphlets, booklets, articles, web, meetings with community groups, etc. In particular:
 - Encourage installation of more stormwater retrofits
 - Encourage installation of enhanced stormwater management practices at re-development sites
- Provide assistance to local governments in developing stormwater management guidelines and plans, training, and information on the latest stormwater management techniques to the community at large
- Develop an appropriate nutrient management workshop for golf courses.

Institutional

- Recommend stormwater performance standards for new public facilities in terms of “runoff volumes and pollutant loads.” Focus on schools because of the future societal impact, and use the resulting practices in environmental education curriculum
- Encourage existing public facilities to decrease runoff, e.g. reduce turf cover, increase trees
 - Counties having economic development Business or Industrial Parks market toward industries wanting to locate in the area. Since there is a high chance of these lands eventually being developed, they could be partners for proactive stormwater management techniques. Tree plantings become a feasible solution to achieve this goal by requiring little to no maintenance, are inexpensive to plant, and significantly reduce stormwater runoff. This proactive stormwater management approach makes the land much more attractive to potential leasees of the business park when compared to other jurisdictions by reducing a portion of their stormwater and screening requirements which saves time and cost on the development of their facility.
- Encourage school boards to attend training on managing wet weather with green infrastructure and charge them with promoting resulting successes

Onsite Wastewater Treatment

- Build capacity, preferably through Responsible Management Entities, to fully manage onsite and decentralized wastewater treatment (e.g. regular pumping of septic tanks, use of filters on tank outlets)
 - Encourage increased capacity at wastewater treatment plants for septage reception and treatment that minimizes nutrient release
- Reduce number of failing septic systems through the following initiatives, targeting areas that have concentrations of failing septic systems:
 - Fats/oil/grease education program and grease collection centers
 - Disseminate homeowner education packets that cover operation and maintenance of septic systems
 - Pursue incentives to fix failing septic systems
- Request credit in the Chesapeake Bay Watershed Model for repaired/replaced septic systems
- Encourage/incentivize existing septic system owners to have advanced nitrogen removal technology installed. Write more of these into future 319 project proposals, publicize demonstration sites so that septic system owners with the means may begin to voluntarily opt for this type of system.
- Promote adoption by health departments of Morgan County's policy to disallow new septic systems in the 100-year floodplain
- Promote adoption by health departments of a strategy to require structures that are closer to streams to have more rigorous pollution prevention controls on septic systems

Other regulatory actions

- Continued work by WVDEP in developing and implementing nutrient criteria
- More stringent enforcement of ordinances and regulations that protect water quality. This will require increased staffing.

Financial

New programs and initiatives are not possible without an attendant funding stream for costs such as increased staff, technical assistance, and enforcement. It would be beneficial for all eight Potomac counties to have the authority to create stormwater utilities so that a funding base would be in place to address state and community stormwater priorities. The local governments, in cooperation with WVDEP, will work with their elected officials and WV Legislature to encourage the evaluation of amendments to the WV Code to expand the authority for municipalities and sanitary districts to create stormwater utilities accordingly.

7E.e. Contingencies

See Section 7F.

7E.f. Tracking and Reporting Protocols

See Section 7F.

SECTION 7F. Urban Stormwater: Future Growth, Tracking and Reporting, and Contingencies

The West Virginia Phase II WIP does not prescribe pollutant reductions from existing urban stormwater sources. CBWM WIP scenarios establish 2010 No Action loading as the 2017 and 2025 targets for the pervious and impervious urban model land uses (RIP, RPD, NID, NPD, CID and CPD). In aggregate, the existing nutrient loadings from those land uses are less than target loads due to BMPs that have been reported. West Virginia recognizes that new development will occur, the area of the urban land uses will increase in the future and increased loads from new development must be accommodated while maintaining established nutrient caps. West Virginia will require post construction controls under the MS4 permitting program in regulated areas and will encourage voluntary measures in non-regulated areas. All verified BMPs will be tracked and reported.

Berkeley County and the City of Martinsburg have enjoyed robust growth over the last few decades. Jefferson County has similarly grown and it is anticipated that the 2010 U.S. Census will trigger the designation of several new MS4 entities in this county. Growth is much more limited in other parts of the West Virginia Chesapeake Bay watershed. Recent development in Berkeley and Jefferson counties accounts for the majority of urban growth and that trend is expected to continue in the foreseeable future. Jefferson and Berkeley counties are closest to the Bay impaired segments and have the highest associated West Virginia nitrogen delivery factors.

Data from WVDEP's construction stormwater permitting program indicates that virtually no development in Berkeley or Jefferson County is occurring on forested lands. In Berkeley County, 75% of new construction is occurring on pasture, 15% on crop land and 10% on low intensity urban land. In Jefferson County, 70% of new construction is occurring on pasture, 20% on low intensity urban land, and 10% on crop land.

Because the pre-development land uses already contribute non-negligible loads, it is reasonable to assume that the implementation of the one inch capture performance standard

will, over time, reduce baseline conditions in MS4 areas of responsibility. The relatively higher delivery factors and development rates in those areas will further counter growth in non-regulated areas. WVDEP believes that the MS4 requirements coupled with other BMPs implemented in non-regulated areas and pre-development land use accounting will be sufficient to attain no net increase in 2010NA delivered nitrogen and phosphorus loads from urban stormwater sources.

In the process of reviewing registrations under the Construction Stormwater General Permit, the Construction Stormwater staff will track location, developed area and pre- and post-construction land use in the Chesapeake Bay Watershed. Any qualified BMPs for post-construction control that are identified in the Construction Stormwater General Permitting process will also be tracked. The compliance assistance person, in conjunction with the WVDEP's Potomac Basin Coordinator, will communicate with local government entities that are not currently regulated MS4s but nonetheless implement post-construction regulations to capture BMP information that may have been missed in the Construction Stormwater General Permit registration process. Once verified, these BMPs will be reported to the Chesapeake Bay Program through the National Environmental Information Exchange Network (NEIEN).

Currently regulated MS4s are required to submit annual reports detailing their progress and implementation of their stormwater management program. The MS4 permit requires permittees to inventory and track stormwater management practices deployed at new development and redevelopment projects. Furthermore, Part III.D.b. of the permit requires MS4s discharging into a water body with an approved TMDL to include monitoring to assess the effectiveness of the BMPs in achieving the wasteload allocations.

WVDEP is developing a standardized form for Chesapeake Bay MS4s. This form includes additional information regarding monitoring and tracking of implementation of their runoff reduction practices. Chesapeake Bay MS4s will report the number of acres newly developed/redeveloped, the land use on which the new development/redevelopment occurred, and the list of runoff reduction practices installed to meet the one inch capture requirement. Retrofits would also be included in this reporting. WVDEP will compile, QA/QC the data, and report verified BMPs to EPA through the National Environmental Information Exchange Network. QA/QC will be accomplished by comparing MS4 data submitted to WVDEP with the land use and post construction stormwater BMP data being gathered through WV's Construction Stormwater General Permit.

WVDEP is working with a contractor to develop and implement a database for managing all of our urban stormwater BMP and land use change data. This database is expected to be complete by December 2012. Concurrently, WVDEP, in coordination with Region 9 Planning

and Development Council, is developing and documenting an urban stormwater BMP verification protocol to verify that new and existing regulated and non-regulated urban stormwater BMPs are in place and functioning as designed. This protocol is also expected to be completed by December of 2012 and intended to be in conformance with the BMP verification framework principles and protocols ultimately established by the Chesapeake Bay Program partnership.

West Virginia will perform a comprehensive assessment of new growth and nutrient loadings from the urban stormwater sector in 2015. The assessment will be based on information obtained under Construction Stormwater and MS4 permitting programs. The programs are implemented across the Chesapeake Bay watershed. All new activity under the programs occurring after January 1, 2011 will be tracked. If the assessment indicates that the urban stormwater sector goals will not be attained then West Virginia will implement these contingencies by 2017:

- If the incorporated areas of Charles Town, Ranson and Shepherdstown in Jefferson County do not qualify as MS4s after the most current census data is released, WVDEP will pursue residual designation authority for those areas.
- WVDEP will encourage the WV Legislature to enact statewide stormwater management regulations that address post-construction impacts outside of MS4 areas. This would ensure a level playing field for all new development across the watershed and help to prevent sprawl in areas where there are no stormwater management regulations. If EPA's nationwide stormwater management regulations are not finalized, the WVDEP will pursue a statewide program. WVDEP will evaluate provisions needed to attain "no net increase" goals and propose an appropriate program to the 2017 West Virginia Legislature.
- WVDEP will require the necessary level of retrofits in Chesapeake Bay Watershed MS4s it determines are necessary to attain wasteload allocations. These retrofits will meet the capture requirement of 0.80 inches of rainfall on site with no discharge to surface waters. Pursuant to Part III.D.1 and D.2 of the existing permit, permittees are required to achieve wasteload allocations of any applicable TMDLs. Upon demonstration of noncompliance, WVDEP will require SWMP modification to include retrofits. No modification to the MS4 general permit is necessary to implement this contingency.
- As a final contingency, and if statewide post-construction stormwater management requirements are not realized, the WVDEP will pursue expansion of the General Permit for Construction Stormwater to require post-construction controls as necessary to comply with the Chesapeake Bay TMDL. Pursuant to Section G.5 of the Construction Stormwater General Permit, this contingency may be implemented without permit

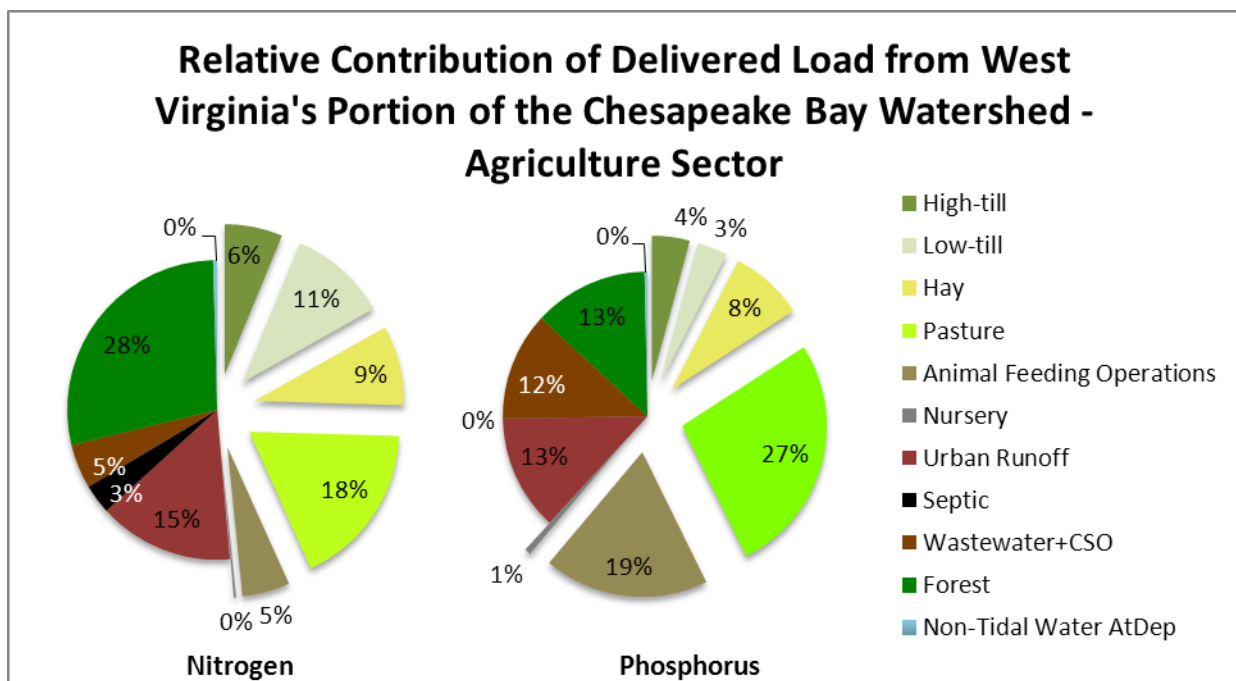
modification. Alternatively, new construction activities may be regulated under an individual permit. Finally, the Construction Stormwater General Permit is scheduled for reissuance in 2017 and the WVDEP will be able to include more specific requirements that it determines are necessary.

SECTION 8. Agriculture

SECTION 8A. Introduction

According to the Chesapeake Bay Watershed Model (CBWM), the agriculture sector is responsible for forty-nine percent of the total delivered nitrogen load and sixty-two percent of the total delivered phosphorus load to the Chesapeake Bay. To this end, the West Virginia agricultural community has been involved in recent educational efforts delivering information to them, and asking for their input on how to formulate a plan to reduce nutrients and sediment to a level that meets the goals of the Chesapeake Bay TMDL.

As a result of this outreach, local stakeholders are aware of the magnitude of the TMDL goal, and have clearly expressed that with reasonable scientific basis they are willing to make changes to their farming operations to meet the goals of the TMDL.



West Virginia's farmers have a proven history of being good stewards of the land. Over the past several years an impressive, voluntary, incentive based, agriculture nutrient and sediment reduction program has unfolded in West Virginia and significant progress has been made. Much of this progress has been documented and credited toward Chesapeake Bay nutrient and sediment reduction goals, but much of it has not. The State of West Virginia is now working to document as many of the non-cost-share BMPs that have been implemented by agricultural producers as possible over the next several years. The State is also committed to working with universities, other researchers and agricultural experts to strengthen the science of BMP implementation and effectiveness as it relates specifically to West Virginia.

With documented stakeholder input, the following agencies have convened to develop West Virginia's Phase II WIP:

- USDA Natural Resources Conservation Service
- USDA Farm Service Agency
- West Virginia Department of Agriculture
- West Virginia Conservation Agency
- West Virginia University Extension Service
- West Virginia Department of Environmental Protection
- Tetra Tech, Inc.

This group will continue to coordinate, implement, track and adapt the agricultural portion of West Virginia's WIP through 2025.

Summary Actions - Phase II WIP Highlights

West Virginia's Phase II WIP has undergone significant revisions specifically to build reasonable assurance. **The result is a realistic plan** that includes agriculture BMPs such as nutrient management, animal waste storage, litter transfer, cover crops, conservation tillage, riparian buffers, and limiting livestock access to streams. With continued funding for agency staff and funding for cost-share programs for producers, West Virginia has a high level of confidence that it can accomplish the goals that are set in the Phase II WIP.

Many agricultural BMP implementation levels expressed in WV's Phase I WIP remain unchanged. However, a number of significant modifications in implementation strategy have been made in the Phase II WIP.

Notable changes to the Phase I WIP:

- Cover Crops - 2025 goal increased by 68% due to farmer acceptability and increased funding levels. This translates to a 2025 goal of 8,400 acres, compared to the goal of 5,000 acres in the Phase I WIP. In addition, the distribution of cover crop types was shifted from one single variety to five separate varieties and planting times and methods to better reflect actual management.
- Nutrient Management Plans - Due to increased capacity, the 2025 goal for acres of farmland under a Nutrient Management Plan has increased by 15,000 acres over the Phase I WIP goal to a total of 90,000 acres.
- Stream Access Control w/ Fencing - A study of sample watersheds using most current land use estimates and past implementation levels resulted in a new 2025 goal of 5,200 acres.

- Alternative Pasture Watering Systems - 2025 goal was increased to 3,015 acres, as the goal of 1,298 acres in Phase I WIP was already surpassed in 2010 through current programs.
- Land Retirement - Similarly, the 2025 goal was increased to 5,018 acres, as the goal of 1,878 acres in Phase I WIP was already surpassed in 2010 through current programs.
- Forest Buffers- Increased 2025 goal of riparian area buffer establishment in pastures by 1,570 acres based upon projections from past CREP adoption, farmer feedback, acceptability and additional state funding opportunities.
- Non-urban Stream Restoration - Increased substantially from 4,036 feet to 19,618 feet. This is an increase of 486% from Phase I WIP and is projected based upon Section 319 Nonpoint Source Program, Farm Bill and state funding opportunities.
- Poultry Litter Transfer - 2025 goal of 40,000 tons was decreased to 12,000 tons to more efficiently focus resources on programs and actions that result in greater reductions in delivered nutrients to the Bay.

In addition to the above modifications in numerical 2025 goals for BMP implementation, a number of other actions and approaches designed to improve 'reasonable assurance' are included in WV's Phase II WIP:

- **“Farmer Feedback Nights”** - This effort, which was sponsored by WVU Extension, gave local farmers an update on TMDL expectations, engaged stakeholders, and utilized feedback from farmers to design the Phase II WIP.
- **The James River Watershed Based Plan** - The West Virginia Conservation Agency (WVCA) has completed the watershed plan and is awaiting incremental funding from EPA for implementation.
- **CAFO Outreach** - West Virginia Department of Agriculture's (WVDA) Confined Animal Feeding Operation (CAFO) Specialist is focusing educational efforts to help West Virginia's producers comply with State CAFO regulations. WVDA staff also developed a technical standard for West Virginia's CAFO Nutrient Management Plans.
- **Nutrient Management** - West Virginia is committed to maintaining a significant number of acres under Nutrient Management Plans in a manner that is sustainable into the future. The WVDA has increased staffing for this effort and has also joined forces with USDA Natural Resources Conservation Service (NRCS) to create a shared, online database to accurately track all Nutrient Management Plans written in West Virginia. This will guarantee that no “double counting” of Nutrient Management Plans will occur.
- **Improved Tracking of Nutrient Management Plans** – The West Virginia Legislature passed a rule during the 2012 Session requiring West Virginia Certified Nutrient Management Planners to report all acres planned on an annual basis. This rule will eliminate any possibility of double counting.
- **Cover Crops** - Through the systematic gathering of reliable stakeholder feedback, West Virginia's committed level of implementation of cover crops by 2025 has increased by 68 percent. In addition, the accuracy of the selected type of cover crop has also improved. Our cover crop portfolio has realistically increased to include five specific

types that are widely employed on West Virginia farms. West Virginia is using State funding to target cover crop adoption.

- **Stream Fencing** - West Virginia is committed to fencing significant acreage on pastures adjacent to streams. This practice, which converts the “TRP” land use to a grass or forest buffer, is a “heavy hitter” for West Virginia with significant backing and commitment from agricultural producers and our funding sources.
- **Waste Management and Mortality Composting Historical Documentation**- West Virginia has entered into a cooperative agreement with USDA Natural Resources Conservation Service to develop a program to assess needs, processes and resources for the State and NRCS to work together to obtain specific information on these practices and aggregate to the county level to be reported to the Chesapeake Bay Program to ensure proper credit. It is anticipated that a sharp increase in the number of animal waste management systems and mortality composters will be reported as a result of this documentation and the implementation of West Virginia’s new CAFO rule.
- **Tracking and reporting previously unreported “non-cost-share” Best Management Practices (BMPs)** - WVDA has one full time equivalent Tracking and Reporting position that will be focused on documenting non-cost-share BMPs that have never been reported and credited in the Chesapeake Bay Watershed Model (CBWM). This effort will also include formerly cost-shared/expired cost-shared BMPs, those that will drop out of the CBWM if the cost sharing agency no longer reports the practice after it has performed its lifespan.
- **Additional 319 Grant Funding Acquisition** - WVCA has successfully secured additional 319 grant funding to target priority watersheds for agricultural implementation and will continue this process with their increased and targeted staffing.
- **Expansion of Agricultural Enhancement Program** - WVCA has expanded the Agricultural Enhancement Program into the Potomac Valley Conservation District and will utilize these state funds for targeted implementation.
- **Region 9 Agriculture Workgroup & Summit** – The Eastern Panhandle Regional Planning and Development Council (Region 9), with the help of Delta Development Group, Inc., brought together stakeholders to learn more about West Virginia’s Watershed Implementation Plan (WIP) and collaborate on ideas that helped to shape the Phase II WIP. All sectors including agriculture, wastewater and urban, then came together in a Summit to share progress and challenges. This effort greatly increased communication among leaders in each sector that will have a significant impact on how the Phase II WIP is designed.
- **Alternative Uses of Poultry Litter** - West Virginia has numerous ongoing projects that are evaluating alternative uses and new technology for poultry litter.
- **Natural Stream Restoration** - WVCA has focused on natural stream restoration in the Bay drainage over the past five years resulting in significant reduction in sediment loss.
- **WVDA/WVCA/NRCS Cooperative Positions to Increase Farm Bill Implementation** -The West Virginia Department of Agriculture, West Virginia Conservation Agency and the USDA Natural Resources Conservation Service have recently partnered to hire three (3)

individuals who will be stationed in NRCS offices and will focus on increasing implementation of Farm Bill BMPs in West Virginia's Bay drainage.

SECTION 8B. Stakeholder Engagement

8B.1 Region 9 Agriculture Workgroup and Chesapeake Bay Summit

Region 9 convened an agriculture stakeholder working group to verify CBWM base assumptions and to see where West Virginia can realistically make future headway. The workgroup consisted of local producers and staff members from various agencies (NRCS, Farm Service Agency, Eastern Panhandle Conservation District, WVCA, WVDA, and Division of Forestry) who met three times between May and August 2011.

During the initial meeting, West Virginia's Phase I WIP was explained, and stakeholder feedback was gathered. The stakeholders' feeling was that the magnitude of certain modeled land uses was incorrectly represented in the model, and that local producers were implementing BMPs that were not being accounted for. A survey was generated and distributed to assess the most significant of these concerns in four pilot subwatersheds of various land use compositions located throughout Region 9 (Berkeley, Jefferson and Morgan Counties). The survey was designed to assess: pasture fencing and area of degraded riparian corridor land use; CAFO; cover crop use; and the relative distribution of areas under high and low tillage.

The most significant result of this process was the demonstration that West Virginia's degraded riparian corridor (TRP) land use was greatly exaggerated. While the Phase 5.3.2 CBWM sets TRP at approximately 8% of the number of acres of the pasture land use, in reality it is closer to 1% in areas characterized by topography with low relief, a significant portion of which is already fenced. West Virginia and EPA are working together to address this issue both in the current model and in future updates. Not only will these changes serve to more accurately represent conditions in West Virginia, but equally as important, they will help increase local stakeholder buy-in concerning both the model and the WIP development process.

On August 31, 2011, Region 9 hosted a Chesapeake Bay Summit in Martinsburg, WV. The program was facilitated by Delta Development Group, Inc. and brought together representatives from agriculture, forestry, wastewater, developed and industrial lands, elected officials, municipalities and local watershed associations to discuss progress, challenges and planning for cleaning up local waterways and the Bay. The preliminary findings from the previously-convened Agriculture Workgroup's BMP/land use survey were briefly presented and the concept of nutrient trading and related concerns were addressed by some of the members of that Workgroup. This one-day summit provided an exceptional opportunity for the various sectors to learn and understand how complex and daunting the future pollution-reduction challenges are for one another.

8B.2 “Farmer Feedback” Meetings

To properly garner stakeholder feedback within the agriculture sector, a multi-agency effort was initiated in August 2011 and continued through late October. This project, led by West Virginia University-Extension in cooperation with the West Virginia Department of Agriculture, sought to strategically survey producers within all of WV’s Chesapeake Bay Watershed counties regarding current and future Best Management Practice (BMP) implementation and water quality attitudes. This effort utilized anonymous survey technology, as well as open verbal and written comment opportunities, during local two-hour ‘Farmer Feedback’ meetings. The stated intent of these stakeholder meetings was to gather useful, accurate information from producers that could be used to shape the writing of WV’s Phase II WIP and the development of BMP input decks.

During these meetings, program speakers also further educated attending conservation professionals and agricultural producers regarding the science of BMPs and how BMP implementation can fit within existing operations and management systems, while also helping to meet the goals of the Chesapeake Bay TMDL. Presentations and survey questions focused specifically on six BMPs that were selected due to their high modeled nutrient reduction efficiencies and their perceived acceptance by WV producers: cover crops, continuous no-till, conservation tillage, stream access control, riparian buffers, and Nutrient Management Plans. Questions pertaining to poultry litter transport were also included in relevant counties. BMP technical assistance and cost-share opportunities available through the USDA-NRCS and the USDA-FSA were also addressed by staff from the respective agencies. Conservation Districts and the West Virginia Conservation Agency staff contributed to the organization and logistics of the meetings, as well as highlighting their cost-share programs. When available, prior arrangements were made for a local producer to briefly recount his or her positive experiences with BMP implementation and participation in cost-share programs. Record keeping handbooks for small livestock producers were produced, printed, and distributed, as well as literature concerning cost-share programs, BMPs, and nonpoint source pollution.

Specifically, individual meetings were held in Mineral, Hampshire, and Pendleton counties. Grant and Hardy counties had one combined meeting, as did Morgan, Berkeley, and Jefferson counties. Overall, 79 individual farming operations were surveyed. In general, farmers were first asked questions regarding relevant farm characteristics, such as length of streams/waterfront within pastures and within cropland, acres of cropland, and land area of managed farmland and rented farmland. Next, producers were asked what current levels of BMPs were being implemented on land that they managed, including existing length of livestock stream-access fence, length of existing riparian buffers on cropland and in pasture land, up-to-date Nutrient Management Plans, and acres normally in cover crops, continuous no-till, and conservation tillage. These were followed by questions gauging willingness to increase implementation of each BMP during the next 10 years. In poultry-producing counties, producers were asked how much poultry litter they produced each year, how much was transported out of the Bay Watershed, opinions on fair prices per ton, and how/if land was

fertilized if litter was sold off the farm. Questions concerning water quality attitudes and reasons for not implementing each BMP were also asked within each section of the survey. The responses indicating why producers do not implement more of a specific type of BMP will be used to shape WVU-Extension programs, outreach efforts, and other programmatic decisions of the state agencies. A sample survey question and a summary of the answers for that particular question are displayed below in Figure 8.2.

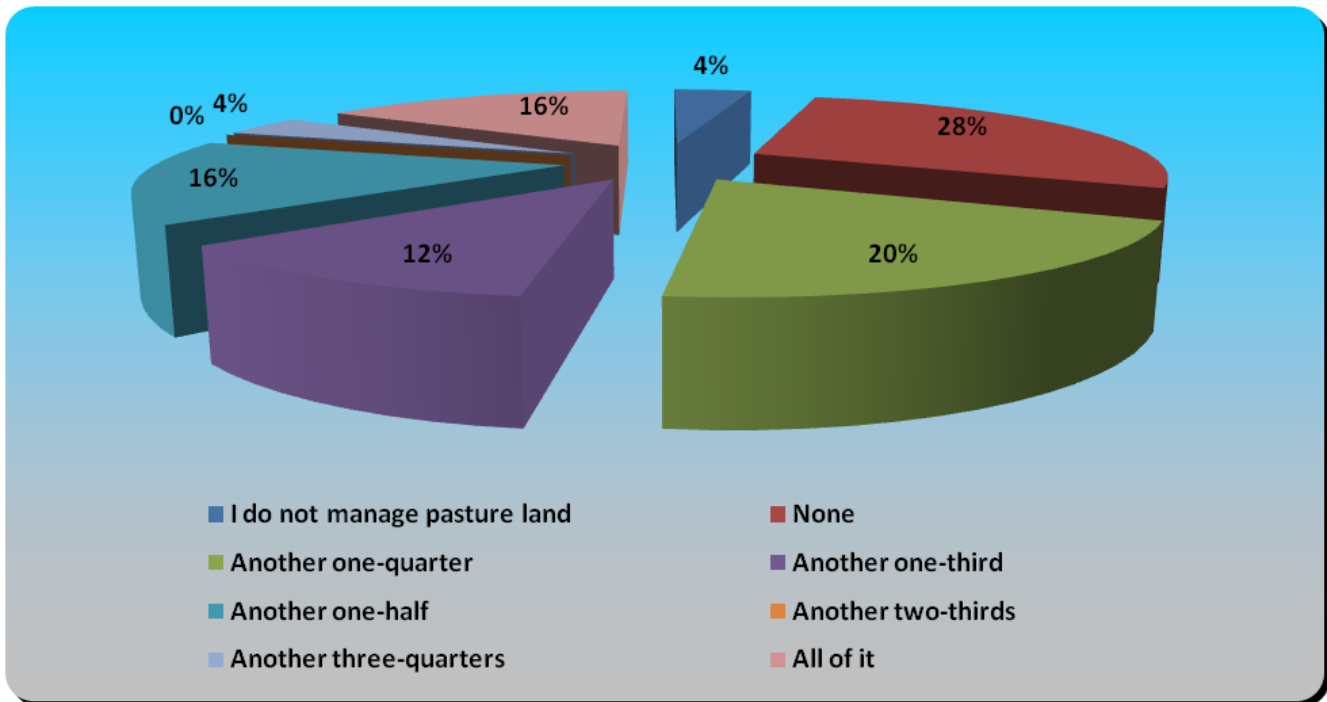


FIGURE 8.2: Sample ‘Farmer Feedback’ question and results from a county meeting. *What additional fraction of stream length in the pastures that you manage would you be willing to fence with 75% or greater cost-share to exclude cattle access in the next 10 years? (multiple choice)*

In addition to summarizing results for each individual question, which was useful as a guide to qualitatively judge, or confirm, farmer attitudes, preferences, and BMP implementation levels, an in-depth analysis using survey software reports was performed to distill information useful for developing specific BMP implementation goals. As an example, it was determined that within a specific three county area, cover crops were currently being planted on approximately 65% of available cropland. Within the next ten years, producers were willing to increase cover crops to cover 83% of available cropland. Furthermore, typical cover crop types and preferences were determined to be 29% barley double-cropped with corn, 32% early rye, 16% early wheat, 13% late rye, and 10% late wheat.

When setting goals, crafting the Phase II WIP document, and creating BMP input decks, this county and conservation district-level data was reliable and informative. When considered along with personal stakeholder communications and programmatic expectations and funding levels, these results helped guide WV's WIP Agriculture Workgroup, and are critical to WV agriculture's approach to providing increased reasonable assurance of meeting pollution reduction expectations.

8B.3 CAFO Outreach

WVDA has employed a CAFO Specialist to assist the agricultural community in complying with West Virginia's CAFO regulations. The Specialist has begun working with producers in the community: assisting them with inspection reports, permit applications, record keeping and annual reporting. The Specialist will work with WVDA Nutrient Management Specialists to advise producers on Nutrient Management requirements relating specifically to CAFOs and will coordinate efforts with State and Federal agencies when CAFO operators need assistance with BMP implementation.

SECTION 8C. Agency Capacity

TABLE 8.1: Current West Virginia Agricultural Agency Staffing Levels in support of implementation of West Virginia's Phase II WIP

Agency	Position	Berkeley/ Morgan	Jefferson	Grant	Hampshire	Hardy	Mineral	Pendleton	Total (2011)
NRCS	Soil Conservationist	1	1	1	1	1	1	1	7
	Soil Conservation/Eng. Technician	1		1		1	1	1	5
	District Conservationist	0.5	0.5	0.33	1	0.33	0.33	1	4
	Soil Scientist serving 8 counties	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	Part Time FRPP serving 8 counties	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.5
	Additional Soil Conservation Technician/	0	0	1	0	0	0	0	1
	Biologist	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	Resource Con./Soil Con. serving 8 counties (2011)	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	Additional Soil Con./ serving 8 counties (2011)			0.2	0.2	0.2	0.2	0.2	1
	Forester serving 8 counties	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
FSA	CED	1	1	1	1	1	1	1	7
	PT	1	1	1	1	1	1	1	7
	Temporary	1	1	0	1	0	0	0	3
	Loan Mgr/of CR	0	0	2	0	0	0	0	2
	FLPT	1	0	1	0	0	0	0	2
WVU	ANR County Extension Agent	1	1	1	1	1	1	1	7
	Ext. Spec. Bio-Systems Eng.	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	Ext. Spec. Nutrient Management	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	Ext. Spec. Forage Agronomist	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1

Agency	Position	Berkeley/ Morgan	Jefferson	Grant	Hampshire	Hardy	Mineral	Pendleton	Total (2011)
	Assoc. Director Org. Dev.	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	Farm Manager WVU Exp. Station	0	0	0	0	0.2	0	0	0.2
WVDA	Nutrient Management Specialists	0.5	1.5	0.6	0.6	0.6	0.6	0.6	5
	CAFO Specialist	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	Tracking and Reporting Specialist	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	Environmental Technicians	0.29	0.29	0.29	0.29	0.29	0.29	0.29	2
	Assistant Director – Environmental Laboratories	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	Chemist	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	Microbiologist	0.29	0.29	0.29	0.29	0.29	0.29	0.29	2
	Environmental Specialist	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	Assistant Director – Environmental Programs	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
WVCA	Conservation Specialist	0.71	0.71	0.71	0.71	0.71	0.71	0.71	5
	Outreach Specialist (Morgan, Jefferson and Berkeley Counties)	0.33	0.33	0.33	0	0	0	0	1
	Administrative Officers	0.29	0.29	0.29	0.29	0.29	0.29	0.29	2
	Watershed Clerk	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	District Crew	0.29	0.29	0.29	0.29	0.29	0.29	0.29	2
	Conservation District Supervisors	2.29	2.29	2.29	2.29	2.29	2.29	2.29	16
	Associate Supervisors (EPCD)	0	1	0	0	0	1	0.43	2
	Watershed Program Coordinator	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1
	Agricultural Engineer								0.3
								TOTAL	100

SECTION 8D. Agency Involvement and Participation

8D.1 USDA-Natural Resources Conservation Service

The USDA-Natural Resources Conservation Service (NRCS) is supporting West Virginia’s goal of improved nutrient management in the Chesapeake Bay. NRCS staff and technical expertise complements the efforts of the other state and local conservation partners who are committed to meeting West Virginia’s WIP goals. NRCS has committed substantial funds and staff to ongoing and accelerated efforts in the Bay. Since 2010, approximately \$8 million in financial assistance funds have been committed through Farm Bill Programs such as the Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentives Program (WHIP), Agricultural Management Assistance (AMA) and Chesapeake Bay Watershed Initiative (CBWI). These programs help to implement many of the high priority BMPs identified by the state as goals in the WIP such as Nutrient Management Planning, animal waste storage facilities and cover crops. An additional \$3.8 million dollars in technical assistance funds have been committed to support staff and technical expertise to agricultural producers in the area, which is equivalent

to 19 additional staff members. It is anticipated that funding will continue to be available through federal conservation programs as long as the Chesapeake Bay remains a national priority. NRCS will support and assist the State of West Virginia in meeting their stated 2 year milestone goals.

A recent report, "Assessment of the Effects of Conservation Practices on Cultivated Cropland in the Chesapeake Bay Region," suggests that conservation practices in the Chesapeake Bay are working. Through partnerships with local landowners, good progress has been made to reduce sediment, nutrient and pesticide losses from farm fields by implementing various conservation approaches. Adoption of erosion-control practices has reduced edge-of-field losses for sediment by 64 percent, for nitrogen by 36 percent, and for phosphorus by 43 percent. Despite these accomplishments, more work remains to be done to ensure that producers are implementing complete and consistent nutrient management on cropland in the Chesapeake Bay basin. Data collected on the effects of conservation practices will assist the NRCS and its federal, state, local and private partners in identifying and treating critical areas that will yield maximum results and achieve a cleaner and healthier watershed. NRCS and the State of West Virginia anticipate a continued partnership to identify where and how much assistance, both technical and financial, is needed to help agricultural producers manage sediment and nutrients on-farm and limit their movement to waters of the state. NRCS will pay for or develop with its own staff an estimated 30 Nutrient Management Plans per year. These plans include new plans as well as updated plans. The cost per plan ranges from \$3,100 to \$8,700 per plan depending on the size and type of operation. It is further anticipated that comprehensive nutrient management and enhanced nutrient management will be key practices promoted for cropland in the state. West Virginia's approximately 200,000 acres of cultivated cropland on farms will be a target of increased program and technical assistance.

There has been a coordinated effort between NRCS and other agricultural partners to target Chesapeake Bay funding to the most crucial areas identified by the state. For FY 2012 the NRCS has identified targeted funds from EQIP to support the installation of crucial practices in the selected priority watersheds.

8D.1.a Farm Bill Program funding for West Virginia

Environmental Quality Incentives Program (EQIP) funding is anticipated to double by FY 2012 and additional funds may be available on a request basis to support accelerated practice implementation in the Bay region and in West Virginia. The NRCS is poised to work with landowners through the EQIP and WHIP Programs to augment streamside buffers and natural stream stabilization techniques to reduce soil loss from critically eroding streambanks in the watershed. As mentioned above, NRCS is committed to increasing planning and application of nutrient management on lands of the watershed with participating farmers. Additional staff is being sought by NRCS to assist with the increased planning, contracting, and implementing to meet the producers' needs.

8D.1.b Poultry Litter Transfer Program

The USDA Natural Resources Conservation Service has finalized a Litter Transfer Program that will help facilitate transport of poultry litter out of the Chesapeake Bay Watershed. NRCS has committed funds for this program for the next two years. NRCS is currently offering a payment rate of \$10.00 per ton for producers of poultry litter within the priority watersheds of the WV Bay drainage area. With this and other voluntary transfer, WV has set a realistic goal of annual poultry litter transfer of 12,000 tons by 2025.

Since the 1990s, NRCS and the WVCA have worked together to implement a successful litter value added and litter transfer program for the Potomac Valley and Eastern Panhandle. A variety of approaches have been promoted with variable successes. The success of any litter transfer program is directly influenced by the continuously fluctuating commercial fertilizer market and equally so the cost of fuel and transportation. Government programs lack the flexibility to rapidly adjust to outside market forces. Additionally, fluctuation in supply of and demand for litter, depending on the season, add an additional variable to manage within the context of a government program.

To help compensate for this variability, federal, state and local agencies are exploring the concept of a centralized storage facility in north central West Virginia that could be operated by a non-governmental entity. There may be an opportunity to partner with a private business that could offer litter along with other commercial fertilizer products. This would facilitate the movement of litter from the Chesapeake Bay Watershed to western areas of the state. The ability to store litter in a large, centralized location could also bridge the supply and demand gaps. There are opportunities within existing NRCS programs to offer differential incentive payments to the producer and receiver if some of the marketing externalities could be minimized. NRCS will continue to develop this concept as well as other litter transfer opportunities including the promotion and evaluation of a bagging system as utilized in northwest Arkansas and eastern Oklahoma to transfer raw litter or to produce and transfer composted product out of the watershed.

8D.1.c Animal Waste Management Structures

Animal waste storage facilities are present and being fully utilized on the majority of the dairy operations in West Virginia's Potomac Basin. Herd sizes have increased over the years, making these facilities less able to hold liquid manure for the prescribed number of storage days in the Nutrient Management Plans.

To alleviate this growth factor that has occurred, USDA NRCS has prioritized EQIP funds to target the dairy farms with undersized liquid manure storage systems and will add capacity to meet the required number of storage days. While there will be continued work on poultry operations, capacity at poultry operations was largely addressed by the Potomac Headwaters Watershed Plan in the 1990's.

8D.1.d Conservation Tillage and No-Till on Crop Land

Conventional tillage has been identified as a major cause of nitrogen loss in WV. During the next three years the actual tillage methods used on all crop land will be quantified by cooperating farmers using Nutrient Management Plans and record keeping systems describing actual field activities. Our goal is to increase conservation tillage, including no-till, by an additional 7,000 acres by 2025. Combining conservation tillage with increased nutrient management acres will result in less nutrient delivery to local streams and thus the Bay.

NRCS will seek additional funding and staffing to serve the needs of the Chesapeake Bay. Our ability to deliver technical services to the public is dependent upon adequate funds and staff.

NRCS practices must be installed according to strict engineering and agronomic standards. Once installed, practices are monitored for the life of the contract, plus one additional year. However, many practices have a physical lifespan that lasts much longer than the financial contract period: a period of up to 15 to 20 years on some structural measures. These practices continue to function as long as their physical lifespan allows.

8D.2 USDA – Farm Service Agency

The Farm Service Agency (FSA) originated during the mid-1930s and provides America's farmers with a variety of support and assistance programs. FSA provides a strong safety net through the administration of farm commodity programs, implements and carries out various agricultural disaster programs, provides credit to agricultural producers with special emphasis on providing loans to beginning, minority, women farmers and ranchers, and also continues the long-standing tradition of conserving the nation's natural resources through the Conservation Reserve Program (CRP).

8D.2.a Conservation Reserve Program (CRP)

Across the nation, CRP protects millions of acres of topsoil from erosion and is designed to safeguard the nation's natural resources. By reducing water runoff and sedimentation, CRP protects groundwater and helps improve the condition of lakes, rivers, ponds, and streams. Acreage enrolled in the CRP is planted to resource-conserving vegetative covers and numerous benefits are attained through this process.

8D.2.b Conservation Reserve Enhancement Program (CREP)

CREP is a unique part of the Conservation Reserve Program where State and Federal agencies may partner together to improve the natural resources of a given watershed or other environmentally sensitive or environmentally important area/s. FSA administers CREP, while technical support functions are typically provided by NRCS, state forestry, local Conservation

Districts, and other federal and state partnering agencies. Contracts are available for 10 to 15 years and the requirement to maintain the established practice (lifespan) is for the duration of the contract. Participation in CREP enables a contract holder to obtain extra incentives and other benefits that may not be available through other CRP opportunities.

Specific to West Virginia, the CRP Conservation Practice (CP) of Riparian Buffer (CP22) on cropland and marginal pastureland is proving to be the most popular among the available CRP practices. This was confirmed during the fall of 2011 through ‘Farmer Feedback’ meetings, where producers were surveyed concerning their willingness to implement additional riparian buffers. Of land managed by producers surveyed, willingness existed to place riparian buffers on 55% of pasture stream miles and 45% of cropland stream miles. Based on this stakeholder feedback, and FSA’s documented implementation rates, a portion (i.e., 1,570 acres) of the forest buffer BMP goal was shifted to the ‘TRP’ land use, which is located in riparian areas in pastures.

TABLE 8.2. CREP Acceleration									
Riparian Buffers (CP22), Filter Strips (CP21), Hardwood tree planting (CP3A), Establish permanent introduced grasses & legumes (CP1)									
		Hardy	Grant	Hampshire	Mineral	Pendleton	Berkeley	Jefferson	Morgan
2003	Contracts	0	1/*	13	0	0	0	0	0
	Acres	0	0	513.5	0	0	0	0	0
2004	Contracts	1/	1/	30	1/	0	1/	0	0
	Acres	0	0	239.1	0	0	0	0	0
2005	Contracts	1/	0	23	0	0	3	0	0
	Acres	0	0	228	0	0	9.6	0	0
2006	Contracts	4	1/	30	0	0	1/	0	0
	Acres	47	0	472.8	0	0	0	0	0
2007	Contracts	1/	21	19	0	1/	1/	1/	0
	Acres	0	486.8	178.2	0	0	0	0	0
2008	Contracts	10	12	8	0	6	0	1/	0
	Acres	30.2	432.8	40.2	0	53	0	0	0
2009	Contracts	4	14	4	0	0	0	0	0
	Acres	6.7	276.8	15.4	0	0	0	0	0
2010	Contracts	8	6	5	1/	0	1/	0	0
	Acres	32.8	23.6	21.5	0	0	0	0	0
2011	Contracts	7	9	5	0	0	0	1/	0
	Acres	73.8	69.5	43.6	0	0	0	0	0
2012 to date	Contracts	1/	5	0	1/	1/	1/	1/	0
	Acres	0	177.9	0	0	0	0	0	0
*1/ indicates less than 3 contracts. Data not available due to privacy restrictions required by the farm Security and Rural Investment Act of 2002.									

Component practices to help establish the Riparian Buffer cover include tree and shrub plantings, buffer/stream fencing, heavy use area protection, stream crossing, and water developments/facilities for “out of stream” livestock watering. Other popular practices for the state include Filter Strip (CP21), Hardwood Tree Planting (CP3A), and the Establishment of Permanent Introduced Grasses and Legumes (CP1).

In WV, the US Fish and Wildlife Service (USFWS, a strong CREP partner) has joined up with Trout Unlimited (TU) to offer a special service to build fence for our CREP contract recipients, as well as with the many NRCS contract recipients (EQIP, WHIP, WRP, AMA, etc.). Working through the USFWS “Partners for Wildlife Program”, USFWS and TU have strategized and are now employing 2 fencing crews, purchased extensive fencing equipment, and are currently completing fencing jobs for our riparian buffers and other program practices. (Fencing within the topographical and geographical complexities of WV makes it difficult to get jobs completed).

This special arrangement between USFWS and TU has created the ability for our County Offices to more easily promote CREP and ease the burden on the landowner to comply with keeping livestock out of the buffer area (and away from the stream).

It is anticipated that with the permanency and popularity of the tree planting practice, producers will continue maintaining the practice and associated components for many years into the future. Although not required, the benefits offered through and beyond the contract period heavily outweigh the alternatives to returning to conventional agricultural uses. Table 8.2 reflects the increased acceptance of this program over the years.

Other agencies are also able to achieve environmental benefits through CRP/CREP. An example includes USFWS. USFWS’s partnership in West Virginia with FSA through CREP has afforded USFWS a unique opportunity to couple enrolled CRP/CREP acres into their environmental program, Partners for Wildlife. Furthermore, USFWS’, aforementioned partnering with Trout Unlimited (outside of CREP), has resulted in more agencies working together and has also led to further reaching environmental benefits through other organizations’ activities. This represents a win-win situation for everyone involved, especially the environment.

8D.3 West Virginia Conservation Agency (WVCA), Potomac Valley Conservation District (PVCD), and Eastern Panhandle Conservation District (EPCD)

The West Virginia Conservation Agency (WVCA) provides resources to local communities and land users to address a broad range of priority conservation issues. The WVCA provides administrative, technical and financial assistance to the citizens of West Virginia through the 14 Conservation Districts. The counties of the Eastern Panhandle Conservation District (EPCD) and Potomac Valley Conservation District (PVCD) comprise fourteen percent of the State of West Virginia that drains into the Potomac River and on to the Chesapeake Bay. The James River

accounts for 0.02 percent of West Virginia's Chesapeake Bay drainage and entails a small section of Monroe County.

The EPCD is comprised of Morgan, Jefferson and Berkeley counties and has a six person Board of Supervisors with one Associate Supervisor, one Administrative Officer and one Outreach and Education Specialist. The EPCD offers four no-till seeders, a lime spreader, a weed wiper and a litter spreader for lease to the producers within that area.

The PVCD is comprised of Hardy, Grant, Hampshire, Mineral and Pendleton Counties and has a ten person Board of Supervisors with one Associate Supervisor and one Administrative Officer. The PVCD offers the following equipment for rental to cooperators: a no-till seeder, two Brillion seeders, two litter spreaders, and one lime spreader.

Both the EPCD and PVCD rent litter spreader equipment out to farmers for manure application as a fertilizer. Both Districts have recently instituted a policy to refrain from rental during the months of December through February to prevent agricultural runoff of manure on frozen ground.

Our Conservation Districts offer cost-share assistance through state and federal programming including cost-share match on Conservation Reserve Enhancement Program, with cost-share funding up to 50 percent on bulk lime and delivery. The EPCD and PVCD manage the administrative and monetary components of the 319 and other cost-share programs within their respective counties.

8D.3.a Agricultural Enhancement Program

The Agricultural Enhancement Program (AEP) was developed as a pilot project in West Virginia in 2008 through special state legislative funding. The EPCD was one of the first priority Conservation Districts chosen throughout the state to launch the initiative. The program was successfully expanded into the Potomac Valley during 2010. It focuses on agricultural BMP installation with the goal being to entice producers to participate by lessening the administrative element of contract development. The programs currently focus on lime for cropland, fencing, cover crops, alternative water, riparian buffers, reseeding and litter exportation.

Each Conservation District has developed a working group which has the responsibility of prioritizing the practices that will most impact water quality efforts within their respective area. These working groups will continue to target high priority agricultural areas and areas where there are gaps in Farm Bill funding to increase implementation. Both districts have shown success with the program, which has been well received by landowners. It will continue to be an important part of making water quality improvements within the drainage as West Virginia moves forward with agricultural implementation and striving to make reductions in nutrient and sediment loading.

Cost-share percentage and limitations vary according to the practice, and can be as high as 90 percent. WVCA has formed a 10-member committee to review the AEP and lime programs with an eye toward expanding the program statewide. If successful, a formal request will be made that special consideration be given for increased funding within West Virginia's Bay counties. During the 2012 gap in funding, WVCA is proposing to utilize a secured 319 grant in the amount of \$125,000 to target high efficiency BMPs. WVCA will also be directing grant dollars from the 2012 Chesapeake Bay Implementation Grant (CBIG) to assist in agricultural implementation.

8D.3.b Nonpoint Source 319 & Agricultural Technical Service Providers

The WVCA is the primary entity responsible for the implementation of the West Virginia agriculture and construction components of the Section 319 Nonpoint Source Program for coordinating and implementing water quality improvement projects. Much of the agency's work involves cooperation with a variety of other state, federal, and local agencies, as well as private sector citizens and businesses. This cooperative approach provides benefits such as: various funding sources for projects, technical expertise, and citizen input to help the WVCA identify and target problems in specific areas. This approach will be instrumental in addressing the nutrient and sediment resource concerns as West Virginia strives to meet its reductions. Currently WVCA employs four full-time conservation field program planners in the Potomac Valley & Eastern Panhandle Conservation Districts. The agency is in the process of hiring two additional Conservation Technicians in cooperation with NRCS to increase applied conservation within the Bay Watershed. This will be an increase of three staff since the original Phase I WIP was submitted. These conservation professionals are nutrient management certified planners and are charged with the implementation of BMPs on agricultural land. This is inclusive of cost-shared practices and providing technical assistance on non-cost-shared practices. These staff members are working with our local partners to prioritize high agricultural watersheds, develop additional watershed based plans and seek funding to implement the plans. WVCA is currently reviewing field staff priorities with the goal of increasing efficiency.

Section 319 funds are used to voluntarily target TMDL reduction of pollutants from nonpoint sources. The watershed based plan for the James River watershed in West Virginia was recently completed by WVCA staff. This watershed lies along the Potts Valley and Sweet Springs Valley in Monroe County. The North Fork of Potts Creek, South Fork of Potts Creek and Sweet Springs Creek are small headwater streams that flow into the James River and eventually into the Chesapeake Bay. Due to previous land use activities including logging and agriculture, streams within the watershed exhibit impaired water quality, degraded fish and wildlife habitat and decreased stream structure and function. The most prominent threat to the watershed currently is degraded water quality from livestock agricultural production. Specifically, this threat is from agricultural practices allowing grazing animal's direct access to streams as well as runoff from production areas thereby increasing fecal coliform, nutrient and sediment loads. The primary agricultural enterprise in this watershed is beef cattle production. The goal of this project will be to encourage agricultural producers to install BMPs that will reduce livestock

access to streams and distribute grazing pressure more evenly across the landscape to reduce areas of livestock concentration. BMPs will include livestock fencing, stream crossings, alternative water sources, riparian buffer establishment, stream channel stabilization, prescribed grazing, and conservation plans. Two additional Conservation Specialists in the Greenbrier Conservation District have prioritized this project in response to EPA's feedback on the Phase I WIP. Incremental funding is expected to be procured by June 2012. WVCA received a grant from Fish America and will be using these funds to target fencing, crossings and alternative watering for livestock on Pott's Creek to fill gaps until the incremental funds become available.

Recently two existing 319 grant programs were successfully closed out. Conservation planners will be pursuing Phase 2 on both the Sleepy Creek (Morgan Co.) and Lost River (Hardy Co.) watershed based plans and submitting incremental proposals for additional practices that will assist in meeting the local TMDLs as well as fulfilling obligations under the Phase II WIP.

Funding has also been secured to develop a protection plan on the Back Creek (Berkeley Co.) watershed. Staff will be developing an outreach program to engage local stakeholders within that watershed and initiate the process of developing the protection plan. There is every intention of seeking funding to carry this project out through the 319 program as the process evolves.

The Elks Run 319 Incremental Water Quality Project funding was secured in September of 2011 and is intended to reduce fecal coliform and sediment loads in Elks Run watershed, Jefferson County, WV. This will be accomplished through repair or replacement of 11 onsite sewage systems (septic systems). This project will also provide funding for The Conservation Fund-Freshwater Institute (TCF-FI) to continue using the GIS and septic risk model it has developed to help determine where to implement these and other BMPs with the most success. Surveys of the streambanks of Elks Run, and a small streambank stabilization project will also provide partners with better information about load reductions that can be expected from future streambank restoration projects in the watershed.

WVCA, in cooperation with the Districts, employed two nutrient management technicians during the summers of 2010 and 2011 to assist local producers with soil sampling for Nutrient Management Plan development. The college students were responsible for pulling samples on 15,393 acres within the eight counties.

8D.3.c Agriculture Water Quality Loan Program

The Agriculture Water Quality Loan Program works cooperatively with the WVCA and the State Revolving Fund Program (SRF) to provide low-interest loans through local banks for agricultural and conservation improvements.

8D.3.d Waste Management and Mortality Composting Historical Documentation

West Virginia's agricultural community believes that historical documentation of animal waste management (AWMS) and mortality disposal systems (MDS) has been under-reported. The West Virginia Conservation Agency has entered into a cooperative agreement with USDA Natural Resources Conservation Service as of March 1, 2012 to develop a program to assess needs, processes and resources for WVCA and NRCS to work together to obtain specific information on these practices and aggregate it to the county level to be reported to the Chesapeake Bay Program to ensure proper credit is obtained. WVCA will be utilizing CBRAP funds to hire a temporary summer employee to work in local NRCS field offices to obtain the following information on animal waste management systems and mortality disposal systems in the 8 counties of the Potomac drainage:

- Type of AWMS and MDS: poultry, beef, dairy
- Number of animals for which the facility was built
- Date installed
- County

Data will be collected on practices installed under both the PL-534 program and EQIP (1996-present). The data will be aggregated to the county level to ensure privacy of all producers as required by the agreement currently in place between WVCA and NRCS concerning Section 1619 of the 2008 Farm Bill. It is expected that this data collection project will be completed by September of 2012.

8D.3.e Alternative Uses of Poultry Litter

The Potomac Valley Conservation District, in cooperation with NRCS and the WVCA, established and continues to maintain a poultry litter composting demonstration site to showcase and study composting methods and the uniformity of the final product as a method to reduce nitrogen content, bacteria and viruses, and to stabilize the P content of the end product. Additionally demonstrated is the value of creating consistent physical properties of the compost, an important consideration for uniform, calibrated spreading on land as a soil amendment. The demonstration is responsible for the start-up of two private composting businesses that bag and market the finished product out of state. More than 50,000 tons of poultry litter have been processed and exported through these businesses over the past seven years. Technical assistance and support will continue to be directed toward these efforts as well as expanding into other innovative areas of alternative uses, including: pelletization, baling and energy conversion.

In 2008, the demonstration composting project entered into a partnership with the Hampshire County Special Services (HCSS) which operates out of Romney, WV and provides a day program to over 100 mentally disabled adults from the surrounding area. HCSS employs these clients to perform jobs within the community and allows for a sense of purpose and involvement while

providing compensation for their services. The center has been providing shredded paper to the composting demonstration as a carbon source for over three years and the clients are involved in the composting process. The composted poultry litter end-product is purchased by the center and is bagged and sold to local businesses as a stable soil amendment. This endeavor will continue and additional markets will be explored.

8D.3.f Natural Stream Restoration

Natural Stream Restoration (NSR) is an evolving technology within West Virginia. The intent of NSR design is to restore conditions that will allow natural fluvial processes to create a stream bed that is both stable and complex. Natural stream design allows a stream system to naturally “heal” itself by allowing more efficient water and sediment transport within the channel to reduce bank erosion problems, and has the potential to provide a lower cost alternative to installation of rip-rap. The WVCA is a strong proponent of this emerging technology and has successfully installed numerous projects within the Bay drainage. Combined projects have resulted in the restoration of over 15,701 linear feet of stabilized streambanks and reduced sediment loading into local waterways and the Potomac River by 1,483 tons. West Virginia will continue to support this technology and promote funding opportunities that will have a significant impact upon sediment loading to the Bay.

8D.3.g Outreach, Planning & Communication

The Eastern Panhandle Conservation District, WVCA and WVDEP entered in a contractual agreement with Tetra Tech during the summer of 2011 to form a local working group to identify areas of existing streambank fencing and cover crop adoption in pilot watersheds and also identify opportunities for BMP implementation. A similar exercise will occur beginning the winter of 2012 within the Potomac Valley with a group of locally identified farming leaders. This stakeholder group will be used as “ground-truthers” to evaluate existing acres of riparian pasture and inventory what opportunities exist for fencing and riparian corridors over the next few years. This will allow planners to target staff and funding for future improvements. WVCA will partner with Tetra Tech in this effort.

The Eastern Panhandle Conservation District will be conducting farmer outreach meetings to promote cover crop adoption during the winter of 2012. Featured speakers will include Steve Groff with Cover Crop Solutions and leaders in the field of crop research. These workshops will also cover the importance of appropriate nutrient management record keeping, Animal Feeding Operations and Confined Animal Feeding Operations updates and information promoting participation in the West Virginia Department of Agriculture’s non-cost-share BMP data collection initiative.

WVCA will also be initiating a monthly conference call between our conservation partners to better open the lines of communication on program updates beginning January 2012.

WVCA will continue to strive to recognize poultry producers within the Potomac Valley who do an exemplary job of practicing conservation and environmental protection on their farms. This will be accomplished through nominations for the US Egg and Poultry Family Farm Excellence Award Program.

Agriculture education plays a vital role in the health of our environment and it is the goal of the Eastern Panhandle Conservation District to provide opportunities for farmers to increase their awareness of new legislation and regulations as well as a channel for new and innovative conservation practices in agriculture. The District has hired a full-time outreach specialist in response to this goal. The District provides the opportunities by working cooperatively with other agencies to provide publications and workshops. It is a priority to include articles relating to nutrient management and cover crops in quarterly newsletters, which are distributed to area farmers. Information is also provided in the District's newsletter regarding educational opportunities that may be beneficial to this sector. Recently a cover crop roller was acquired and is rented to farmers. EPCD works with WVU Extension to provide educational demonstrations to local agriculturists. Presentations are regularly given at local FFA Alumni meetings on the importance of the Chesapeake Bay and the positive impact that the Eastern Panhandle can have on its future. EPCD also cooperates with USDA, WVCA, and WVDA. Starting winter 2011/12 it is anticipated that a new aspect will be added to the quarterly newsletter where a farmer who exhibits environmentally friendly practices will be featured and interviewed. The goal is to encourage other agricultural producers in the panhandle to be proactive. Along with the concrete goals listed above, EPCD hopes to always be available to answer any questions pertaining to agriculture education and conservation and to strive to provide the farmers of the Eastern Panhandle with the educational tools they need to be successful conservationists.

The West Virginia Conservation Agency and the Conservation District's ability to provide deliver and fund all programs and staffing is dependent upon sufficient funding.

8D.4 West Virginia Department of Agriculture (WVDA)

The West Virginia Department of Agriculture has been actively involved in the Chesapeake Bay Program for many years but has lacked the staff necessary to cover every angle. Through various grants and additional State funding, the Department has been able to expand its staff to the size necessary to meet the challenges that the current TMDL presents. This expansion has included a new Environmental Specialist, a Concentrated Animal Feeding Operation (CAFO) Specialist, five Nutrient Management Specialists and a Tracking and Reporting Specialist.

The WVDA has worked with the agricultural community for years promoting educational opportunities and voluntary participation in programs that will benefit farming operations and water quality. The WVDA has participated in countless state and federal committee meetings, workshops, webinars, and training sessions to better understand the needs of the Chesapeake Bay Program and pass this information on to farmers.

Education and Outreach

The WVDA will continue participating in outreach and education through the WV Poultry Association Newsletter, WVCA WaterNet web newsletter, and various other publications. WVDA has and will continue to produce and distribute educational materials to inform the public about the Department's role in environment, agriculture and Chesapeake Bay Program at various outreach opportunities. WVDA staff will assist and host educational programs presented at schools, 4-H youth summer camps, farmer and landowner forums, county fairs within the Bay Watershed, meetings with city and county officials, presentations to watershed groups, environmental fairs, and other public events to inform the public about what they can do to help the environment as well as the Chesapeake Bay and local water quality. WVDA plans to continue to work with teachers to assist in introducing and implementing agricultural and environmental lessons to be taught to their students in a classroom or a lab setting. This goal will be accomplished by providing teachers with educational materials, lesson plans, and supplies as well as going into the schools and working with teachers and students. Currently, WVDA is in the early process of developing the E.A.T.S. Initiative (Environment, Agriculture, Teachers & Students) to help reach teachers and students in West Virginia's portion of the Chesapeake Bay Watershed. Education and outreach will continue to be a priority for WVDA to ensure that the public within the Bay Watershed understands the importance of both agricultural and environmental issues.

The WVDA has a robust water quality monitoring program. WVDA has analyzed data and delivered presentations or publications to inform the public about local water quality. Over the past year, WVDA has given analyses on Bullskin Run, South Branch of the Potomac River, Opequon Creek and Sleepy Creek to the public or government agencies. Each year, WVDA publishes an annual water quality report highlighting sample amount, tests run and other updates. The WVDA will continue to urge the public to become aware of the watershed that they live in and the affect that they can have on local streams and the Chesapeake Bay.

Nutrient Management

The WVDA has a robust Nutrient Management Program. This program has grown rapidly over the last couple of years. From July 1, 2010 to June 30, 2011, the three Nutrient Management Specialists that were employed by the Department worked with 152 farmers, took 1,010 soil samples, took 65 manure/litter samples and completed 97 Nutrient Management Plans on 22,406 acres. There are now five full time equivalent Nutrient Management Specialist positions which will ensure that West Virginia's goal of 90,000 acres under Nutrient Management Plans will be met. These Specialists have the unique position of spending time with farmers helping them understand the importance of their plan and the benefits that come with closely following the plan.

The majority of soil samples collected by the Nutrient Management Specialists are sent to the West Virginia University Soil Test Lab for analysis and recommendations. The information obtained from the analysis is critical to the development of an accurate and site specific Nutrient Management Plan. Soil sampling is performed every three years in order to have Nutrient Management Plans that accurately reflect the conditions in the soil so that sound environmentally friendly farming decisions can be made.

Nutrient Management Specialists attend educational seminars to stay abreast of the most current science and to maintain Nutrient Management, Conservation Planning and Certified Crop Advisor certifications. By continuing their education, they are better able to serve West Virginia's farmers and make farming operations more productive and environmentally sound.

Manure Laboratory

The WVDA also has a Nutrient Management laboratory in Moorefield that analyzes manure/litter for ammonia, phosphorus, total Kjeldahl nitrogen, calcium, magnesium, copper, potassium, and percent moisture. These results are a key component of Nutrient Management Plans written in West Virginia. **Soil sample collection and analysis, Nutrient Management planning and manure analysis are offered free of charge to ALL West Virginia agricultural producers.** Approximately 140-150 litter, manure and compost samples are analyzed each year, and generate approximately 2,800 determinations each year.

WVDA CAFO Program

The WVDA's CAFO Specialist will work with animal feeding operations to help them comply with current NPDES/CAFO rules that were enacted by the West Virginia Legislature in 2010. Activities will include:

- Assist producers in correcting discharges
- Assist producers with applications for NPDES permits when necessary
- Assist producers with CAFO related record keeping
- Assist producers with annual reporting
- Write Nutrient Management Plans for producers

WVDA's CAFO Specialist will continue to educate producers and agency personnel on the rule. They will also answer questions and provide direct assistance to the producer or refer them to partner agencies that may be able to provide cost-share money for implementation of BMPs that will have a positive environmental impact or bring the farm into compliance.

The WVDA has also developed a technical standard for "CAFO Nutrient Management Plans". This technical standard is currently under review by EPA and WVDEP.

Poultry Program

WVDA's Poultry Program has been essential in helping inform the public about issues in relation to the poultry industry. The Poultry & Environmental Specialist serves as primary contact between the poultry industry and the WVDA. The Poultry & Environmental Specialist focuses on issues regarding general poultry production relating to both West Virginia water quality and the Chesapeake Bay Program. The Specialist provides assistance with development, implementation and tracking of poultry litter movement and will continue to provide educational opportunities for farmers on poultry issues. This position addresses all poultry concerns and is instrumental in keeping producers in compliance with local, state and federal regulations.

Water Quality Monitoring

The WVDA has a robust water quality monitoring program which is perhaps the most intensive program of its kind in the state. This program, which began in 1998, now includes water quality samples three times per month on the South Branch of the Potomac River with 11 collection sites, five times per month on Lost River with 9 collection sites, one time per month on Patterson Creek with 10 collection sites, one time per month on the North Fork of the South Branch of the Potomac River with 5 collection sites, one time per month on the South Fork of the South Branch of the Potomac River with 10 collection sites, one time per month on Mill Creek (Grant Co.) with 14 collection sites, five times per month on Mill Creek (Hampshire Co.) with 7 collection sites, three times per month on Anderson Run with 7 collection sites, one time per month on Bear's Hell Run with 2 collection sites, one time per month on Opequon Creek with 7 collection sites, one time per month on Sleepy Creek with 6 collection sites, one time per month on Rockymarsh Run with 3 collection sites, one time per month on Elks Run with 2 collection sites, one time per month on Elk Branch with 2 collection sites and Bullskin Run with 3 collection sites (see Figure 8.4). The WVDA collects and tests approximately 2,900 water samples each year.

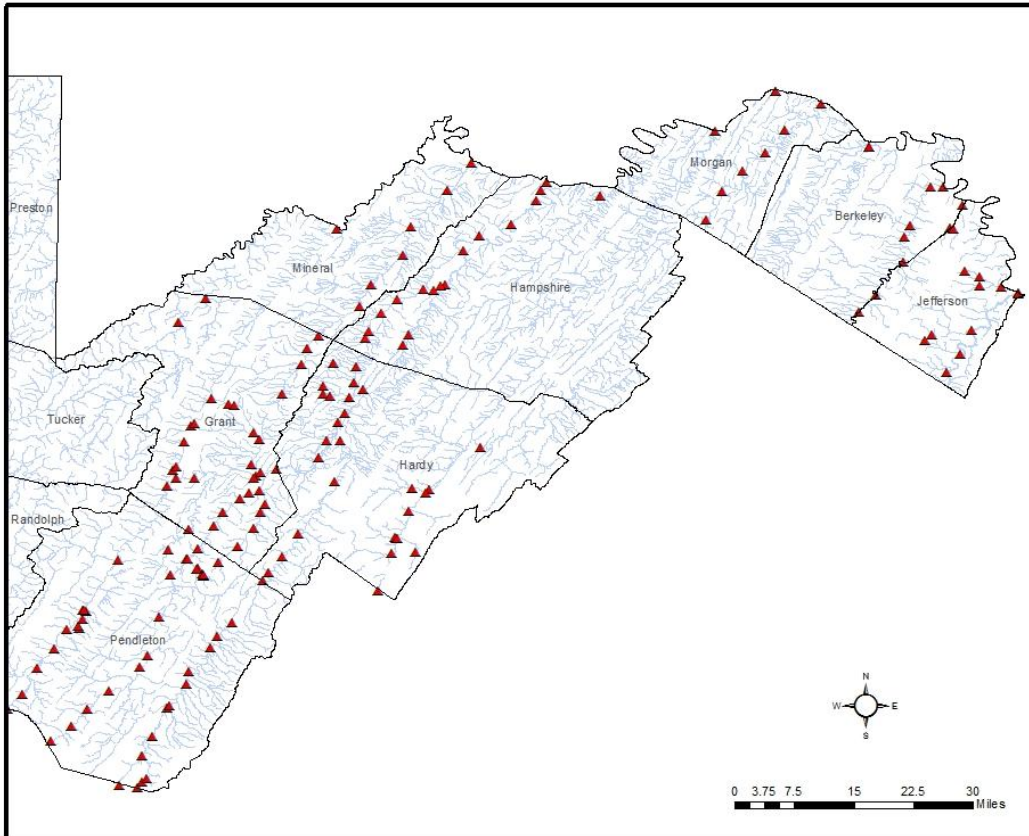


Figure 8.4. WVDA Water Quality Monitoring Stations.

All water samples are analyzed at the WVDA Moorefield Laboratory for the following parameters:

- pH
- Conductivity
- Temperature
- Dissolved Oxygen
- Nitrate
- Nitrite
- Ammonia
- Total Phosphorus
- Orthophosphate
- Turbidity
- Total Suspended Solids
- Fecal Coliform Bacteria

Data collected by this robust program has been and will be used, by a variety of groups including the WVDEP, Chesapeake Bay Program, Elks Run Study Committee, and West Virginia University for assessing water quality trends over a long period of time as well as prioritizing installation of nutrient and sediment reducing BMPs.

One good example of assessing water quality trends is the WVCA/WVDA project on Bear's Hell Run (Hardy Co.). The Department will collect and analyze water samples at two sites in this watershed, once per month, to calculate nutrient reductions as a result of BMPs installed during this multi-year project.

Another example is seen in the Mill Creek (Grant Co.) watershed. The WVDA collected baseline water quality monitoring samples in this watershed from 1998 to 2005. After a sufficient baseline was established water quality monitoring was suspended. In 2008, this watershed was named as a priority watershed for Chesapeake Bay restoration and WVDA resumed water quality monitoring in the Mill Creek watershed to determine nutrient and sediment reductions in the watershed as a result of increased installation of BMPs.

Non-Tidal Monitoring

The WVDA, WVDEP, U.S. Geological Survey (USGS), and Chesapeake Bay Program/Non-Tidal Water Quality Workgroup developed a list of sampling sites in West Virginia. The monitoring results from these sites are used to calibrate the Chesapeake Bay model with trend and load estimates. In June 2005, a cooperative program among WVDA, WVDEP, and the USGS West Virginia Water Science Center was initiated to collect and analyze water samples at four sites, South Branch of the Potomac River, Patterson Creek, Cacapon River, and Opequon Creek, for this project. The sampling includes monthly samples as well as eight storm samples throughout the year. All samples are analyzed for nutrient and suspended sediment concentrations. WVDA Environmental Technicians and WVDEP Environmental Resource Specialists are assisting USGS Hydrologic Technicians in the collection of monthly samples. Additionally, this program was expanded in July 2011 to include samples from Warm Springs Run, Mill Creek, and Rockymarsh Run.

Depending on continued funding from the State of West Virginia, Chesapeake Bay Implementation Grant (CBIG), Chesapeake Bay Regulatory and Accountability Program Grant (CBRAP) and other sources, WVDA programs will continue to serve agricultural producers in the Bay Watershed which will translate into water quality improvements in West Virginia and the Chesapeake Bay.

Tracking and Reporting

The WVDA is committed to tracking and reporting non cost-shared BMPs as well as formerly cost-shared/expired cost-shared BMPs in order to credit farmers who have installed practices without federal or state cost-share dollars and use the data collected in the CBWM. However, the development of a protocol and database for this purpose does not yet exist in WV. Collaboration with various agencies such as the National Association of Conservation Districts (NACD), USDA, EPA, WVCA, WVDEP, and other state departments of agriculture has taken place over the past several months to develop a protocol that collects information accurately and consistently within the state.

The WVDA has hired a Tracking and Reporting Specialist to focus on tracking and reporting of BMPs. In particular, this person is developing protocols for capturing the details of previously unreported or non-cost-share BMPs that contribute to water quality; this was identified as a

high priority action in the Phase I WIP. See Appendix G for details on this process. The WVDA also plans to utilize currently employed nutrient management planners to take part in tracking and reporting activities while they are in the field. Development of a tracking and reporting protocol has already been accomplished with the help and direction of the NACD, the University of Maryland Agricultural Technical Coordinator and EPA staff. The collection method that is being utilized in West Virginia is a farm by farm voluntary approach. This method will accurately gather as much BMP data as possible in a consistent way and foster farmer cooperation in the future with this program.

8D.5 West Virginia University Extension and Davis College

West Virginia University is prepared to provide educational, research, demonstration and service activities to improve water quality in the WV portion of the Chesapeake Bay Watershed. County agents will provide record keeping training to farmers that are adding nutrient management planning and implementation of Nutrient Management Plans to their farming operations. CAFO and AFO record keeping will also be a major educational effort for the county faculty along with field days that demonstrate BMP effects to encourage adoption. Other field day and workshop activities will demonstrate cover crops, adaptive nutrient management methods, and manure application equipment calibration to local farmers and nutrient management planners. Precision agriculture methods, funded from a USDA Conservation Innovation Grant, have been evaluated in the Eastern Panhandle Conservation District. This incentive program included precision soil sampling, variable rate application of P, K, lime, distance hauling of animal manures, split N application, precision software on the farm and precision hardware for the commercial applicator. The evaluation of these conservation practices is ongoing, and will include demonstration at the WVU research farm and on cooperator farms across the watershed. If any of these are effective and readily adopted by landowners, USDA NRCS has the option of adding them to their Conservation Practice Standard list and Farm Bill cost sharing.

The WVU Davis College Experiment Station in Hardy County will be used as a demonstration site for enhanced nutrient management systems, precision agriculture technology, examples of CAFO record keeping, nutrient management planning and implementation of nutrient management planning systems.

State specialists will provide assistance with the WV certified nutrient management planners program, and will develop and evaluate new BMP systems to mitigate nutrient losses from crop and pasture land. Extension leadership will continue to work with State elected officials to encourage additional funding to provide assistance to farmers to install additional BMPs.

8D.6 Collaborative Efforts

8D.6.a Education

The size and scope of educational programs within the Chesapeake Bay Watershed areas are vast, but conducted by relatively few personnel within a limited number of producer and government organizations. By working together, farmers and support agencies enable agriculture to remain competitive and profitable, thus ensuring the sustainability of the family farm and the rural way of life. West Virginia leads the nation in the percentage of family farms and recognizes the value of sustaining this tradition.

Through the efforts of the NRCS, Conservation Districts, WVDA, WVCA, WVU Extension Service and producer organizations, West Virginia has had a very strong educational initiative for agriculture throughout the Potomac Headwaters region. Farmers have voluntarily participated in federal and state cost-share programs that have been recognized as success stories both regionally and nationally. Educational outreach provided by the technical agencies was instrumental in the success of these programs.

The agricultural sector promotes increased educational opportunities for development and implementation of agriculture nutrient management plans and new BMPs. Therefore, support through additional financial resources for agencies developing nutrient management plans and encouraging BMP installation would help in reducing nutrients to the Chesapeake Bay. Continued outreach to producers with existing nutrient management plans on the importance of maintaining and following their plans will be invaluable in limiting the over-application of nutrients.

West Virginia can also turn to other states and organizations to find programs that are beneficial to the agriculture community and continue to educate them on the importance of being good stewards of the land. Programs such as Ohio's Livestock Environmental Assurance Program, The National Pork Producers, Cattleman's Association Programs and Grazing schools are all important tools that can be utilized for farmer education.

Moving forward to meet the goals set forth in WV's Phase II WIP to meet the Chesapeake Bay TMDL, West Virginia's agency partners will continue to work collaboratively to bring the most pertinent education and outreach activities to agricultural producers, private industry and technical support staff. These programs will focus on the nutrient and sediment reductions that the State has committed to within this document as well as the applicable milestones.

- WVU Extension Service is the leader in building and helping sustain collaborations and partnerships with people and organizations in West Virginia, to improve their lives and communities. Extension will be the lead in the coordination and delivery of multi-agency collaborations to meet our goals. Specific examples of such initiatives,

both multi-agency and agency specific, are outlined below: Convene a management level round table to bring all agricultural agencies together to discuss and update on the Watershed Implementation Plan, goals, and future of the program.

- Conduct quarterly field staff conference calls to ensure service providers are kept informed of program decisions, goals, funding opportunities, challenges and successes.
- West Virginia is currently partnering with the US Egg and Poultry Association and EPA to develop a series of modules that will serve as educational tools for poultry producers, industry, and technical staff to evaluate operations and need for CAFO permits. The first module will visually illustrate appropriately functioning BMPs and include an assessment and evaluation tool to determine the necessity of a permit.
- A comprehensive Conservation Reserve Enhancement Program (CREP) inter-agency training will be conducted to train new staff and bring cooperating agency partners together to review the program guidelines and goals and to evaluate challenges to implementation.
- West Virginia will continue facilitating CAFO round table discussions which began in January 2012. The goal is a coordinated approach to information sharing between agriculture associations and agencies on current CAFO issues.
 - 'Horse Management and the Environment' workshops for horse owners in the Bay watershed to help raise awareness of the TMDL and environmental management in the equine community.
 - NE SARE Professional Development Grant awarded to WVU Extension to train WV agricultural service providers to effectively assist AFOs in improving environmental management.
- **Cover Crop Demonstration and Educational Program - Potomac Valley Conservation District and the Eastern Panhandle Conservation District, FY-2012 -**
The establishment of winter cover crops and the use of roller/crimper and no-tillage planting technology is to be demonstrated on four farms in the Potomac Valley Conservation District and on two farms in the Eastern Panhandle Conservation District in 2012 and 2013. Up to 2 acres are to be planted on these six farms in late August or early September 2012 with combinations of cereal grain and legumes. The roller/crimper is to be used to kill the cover crop and press it onto the soil surface just prior to planting a crop with a no-till planter in the spring of 2013.

The purpose of these demonstrations is to transfer the technology that has been developed on cover crops and this technique of planting from the Appalachian Plant Materials Center, to real farms in eastern WV. So as to best represent these

techniques on a variety of farms that grow annual crops, we hope to select corn growers in Pendleton County, along the South Branch of the Potomac River in Grant or Hardy County, and along the Lost River in Hardy County. We would like to select a vegetable grower in Mineral County as well as a corn grower in Jefferson County and a vegetable grower in Berkeley or Morgan County.

A set of workshops targeted to Agricultural Service Providers, including County Extension Agents NRCS, WVCA and WVDA nutrient management planners to improve their knowledge of nitrogen cycling in cropping systems will be conducted with these cover crop demonstrations. Demonstration of how, when and why to use the Pre-Sidedress Nitrogen soil test and the Late Season Corn stalk Nitrate Test will be incorporated into the cover crop field days to improve adoption of these soil nitrogen evaluation tools.

- Precision Agriculture Technology - Applying fertilizer and manures at the right time, at the right amount and in the right location can be enhanced using GPS guidance systems that are placed on the tractor pulling the manure spreader or in the truck cab that is spreading fertilizer. WVU extension has purchased guidance systems that can be easily moved from tractor to tractor. These guidance systems will be incorporated into farm field days to improve farmer and Agricultural Service Provider awareness of the capability to improve application accuracy, reduce applicator fatigue, generate application maps of fields areas treated and improve the nutrient record keeping systems within implemented nutrient management plans.

8D.6.b Nutrient Management/Conservation Planning

To make the greatest strides in meeting Chesapeake Bay goals, West Virginia has committed to maintaining 90,000 acres in West Virginia under Nutrient Management Plans. This is accomplished by agencies such as WVDA, WVCA and NRCS working together. In West Virginia, all services including soil sampling, soil analysis and Nutrient Management Plan writing are offered to farmers free of charge.

West Virginia has developed a new strategy to track and report Nutrient Management Plans and Conservation Plans utilizing improved collaboration between the agricultural agencies. Implementing this strategy will likely take three to five years. As a result, acres reported annually after 2010 will appear to decrease, however the acres reported will be increasingly accurate.

The West Virginia Legislature passed a rule during the 2012 Session requiring West Virginia Certified Nutrient Management Planners to report all acres planned on an annual basis, which will eliminate any possibility of double counting. This addition to State Code will designate

Nutrient Management committee membership and determine requirements for awarding of and maintaining a nutrient management certification. To enable nutrient management planners to collect BMP adoption, operation and maintenance information, new record keeping systems have been developed and will be introduced to all certified planners in the next 12 months during continuing education programs. This record keeping system has already been introduced to landowners during watershed educational workshops in the Chesapeake Bay counties during the past year. This record keeping system will be a key self-reporting mechanism for individual farmers to demonstrate BMP adoption and implementation of the added BMPs. Record keeping systems will be reviewed by nutrient management planners during development of Nutrient Management Plans and then at three year intervals during updating of Nutrient Management Plans. The planner will collect BMP adoption rates, which will then be tabulated and published on a county basis.

One of the key components of the state's WIP to manage nutrients from agricultural operations is the implementation of the Nutrient Management (590) practice on farms that have potential to discharge nutrients in stormwater runoff. The WVDA developed a Certified Nutrient Management Planner program over ten years ago to insure that Nutrient Management Plans on farms were done by professionals trained in the science and art of nutrient management. Concurrently, the NRCS, Conservation Districts and the WVCA began to develop a cadre of certified conservation planners also certified as Nutrient Management Planners under the WVDA program to assist producers with nutrient management. Currently there are 85 certified nutrient managers in the state working to assist farmers with this practice. WVDA has recently hired several full-time planners to help in the Potomac Headwaters region of the Chesapeake Bay Watershed. The NRCS and WVDA have cooperated to jointly fund an increased number of these certified nutrient management planners to increase the implementation of nutrient management in the watershed as a major joint initiative.

Additionally, NRCS standards are being updated to include the use of time release and slow release fertilizer formulations that help fine tune nutrient availability and movement. Through targeted efforts the state is working with operations that have the highest potential to discharge nutrients and developing conservation plans that include nutrient management as a focus of the pollution prevention effort.

Recommended soil amendments and nutrient application rates are based on WVU soil tests for pH, P₂O₅ and K₂O. Nitrogen application is based upon realistic yield goals. All land application of manure and commercial fertilizers are based on the newly developed technical standards for WV CAFO Nutrient Management Planning document. This document can be found at: http://anr.ext.wvu.edu/soil_water_conservation. The following are nutrient management criteria included in this document: phosphorus management, nitrogen management, record keeping, manure calibration, soil test method calibration, soil sampling and testing, sample collection procedures for manure analysis, crop nutrient needs, soil productivity grouping for WV soils, estimated nitrogen availability to succeeding crops from legumes, manure residual factors and manure nitrogen availability coefficients.

Any Nutrient Management Plan developed in West Virginia will describe the requirements to achieve its intended purpose; that of using nutrients to achieve production goals and to prevent and minimize water quality impairment. A typical Nutrient Management Plan will include the following:

- Aerial photograph/and or map, and a soil map of the site
- Current and/or planned plant production
- Sequence of crop rotation
- Results of soil, plant, water, manure sample analyses
- Realistic yield goals for the crops in the rotation
- Quantification of nutrient sources for N, P and K
- Recommended nutrient rates, timing, form, and method of application and incorporation
- Location of designated sensitive areas or resources and the associated nutrient management restriction
- Guidance for implementation, operation, maintenance, and recordkeeping
- Complete nutrient budget for nitrogen, phosphorus, and potassium for the rotation or crop sequence
- Manure or litter spreader rate calibrations and the desired application rate
- A statement that the plan was developed based on the requirements of the current standard and any applicable federal, state or local regulations or policies; and that changes in any of these requirements may necessitate a revision of the plan
- Signature of a West Virginia Certified Nutrient Management Planner and certificate number

The land owner/operator is responsible for safe operation and maintenance of any practice including all equipment. Operation and maintenance requires the following:

- Periodic (3 years maximum) plan review to determine if adjustments or modifications to the plan are needed
- Protection of fertilizer storage facilities from weather and accidental leakage or spillage
- Calibration of all fertilizer application equipment to ensure uniform distribution of material at planned rates
- Maintaining records to document plan implementation
- Records include: (a) soil test results and recommendations for nutrient application (b) quantities (c) analyses and sources of nutrients applied (d) dates and method of nutrient applications (e) crops planted (f) planting and harvest dates (g) yields, and crop residues removed (h) application rate of nutrients (i) results of water and plant heavy metal analyses (if applicable) (k) dates of review and person performing the review, and recommendations that resulted from the review
- Records should be maintained for a minimum of five years or longer if required by other federal, state, or local ordinances

8D.6.c Phosphorus Management

When animal manures or other organic by-products are applied and the current soil test indicates soil phosphorus levels greater than 80 lbs/ac, a field-specific assessment of the potential for phosphorus transport from the field may be completed. The assessment will be completed using the current Phosphorus Index, which is included in the NRCS CPS# 590.

After assessment with the P-Index, fields with 'low' or 'medium' risk of phosphorus loss shall receive manure nutrients using nitrogen-based application. Fields with a 'high' risk of phosphorus loss shall receive manure nutrients based on plant phosphorus needs. Fields with a 'very high' risk of phosphorus loss shall receive no further phosphorus applications. Appropriate conservation practices identified through the use of RUSLE2 and visual assessment should be considered to improve site index values and reduce the vulnerability to off-site phosphorus transport. A record of the assessment rating for each field or sub-field, and information about conservation practices and management activities that can reduce the potential for phosphorus movement from the site, will be included in the Nutrient Management Plan. When such assessments are done, the results of the assessment and recommendations shall be discussed with the producer during the development of the plan.

In situations where a phosphorus based plan is being implemented, an additional application of inorganic nitrogen may be required, N application will be based upon PSNT or estimated crop needs.

Technical review and update of the WV P-Index is currently being performed by WVU's College of Agriculture, Division of Plant and Soil Sciences, NRCS, and WVU-Extension to ensure that current phosphorus land management science is being used. *Collaboration with a group of scientists representing Mid-Atlantic land-grant institutions (i.e., 'Mule Barn Group') has also been integrated into the revision process. As a result of this collaboration, a cross-state comparison process will be performed, as well as an external peer-review of the new P-Index by a peer institution. This review and update is expected to be completed by May 2012.* The revised P-Index will be added to the WV-NRCS Nutrient Management (590) Conservation Practice Standard in 2012 and will serve as guidance for all nutrient management plans. The standard will include nutrient management strategies that offer the no-application recommendation when soil test results indicate a high level of phosphorus. It is anticipated that an updated P-Index will further reduce the amount of phosphorus loss to surface water within the state.

8D.6.e Cover Crops

The West Virginia Potomac Headwaters crop acres reported for 2007 by the National Agricultural Statistics Service (NASS) are as follows: Corn for silage, 11,200 acres, Corn for Grain, 15,800 acres, Soybeans 9,800 acres, Wheat for Grain 5,200 acres, all Hay 120,400 acres,

and Alfalfa 8,500 acres. The potential acres that could have a cover crop incorporated into a crop rotation would be approximately 42,000 acres or 7.2 % of agricultural land.

Currently, a high percentage of the corn for grain crop is left fallow. This is approximately 15,800 acres that could have an improved cover crop management system developed. 80% of the corn silage acres are left fallow. This is 4,480 acres that could have improved cover crop programs. 80% of soybean acres are left fallow and 80% of winter wheat that is harvested for grain, straw is then harvested and the fields are left fallow. If both the soybean and wheat crop could have a cover crop system included, the potential acres would be 5,840. The total potential additional cover crop acres of all crops would be 26,120. Recognizing the cropland acreage that could potentially include cover crops, and stakeholder feedback (i.e., 'Farmer Feedback' meetings) that indicated producers were willing to implement cover crops on over 80% cropland, WV's commitment to cover crops was increased within the Phase II WIP BMP input deck by 60% over Phase I WIP levels. In addition, specific stakeholder feedback allowed WV to more accurately reflect cover crop types in BMP input decks.

Incentive payments to promote cover crop adoption are available through EQIP and an increased emphasis to add this BMP will be made by agricultural agency staff. Furthermore, the WVCA, in cooperation with West Virginia University (WVU) Extension Service and NRCS has successfully secured grant funding through a nationwide opportunity with the Agricultural Water Enhancement Program. This grant is tied to EQIP through NRCS and provides special state funding for water quality improvements. The program is administered through NRCS with the state/local role being served by WVCA and WVU Extension Service with technical planning assistance. Currently, West Virginia is in year four of a five year grant and provides additional funding for cover crops within both Conservation Districts.

8D.6f Alternative Poultry Litter Use Programs & Technology

Composting Feasibility Study

Downstream Strategies was awarded a grant through the Blue Moon Fund in September of 2011 to conduct a six-month poultry litter composting feasibility study. *The following information was taken from their project website at*

<https://sites.google.com/site/poultrylittercomposting/home>

Nutrient management in the Chesapeake Bay Watershed is an issue of national importance, given the executive mandate for cleaning up the Bay and spreading acknowledgement of its ecological function. At the same time, farmer livelihoods are challenged by the increasing burden of complying with water quality standards and finding cost-effective uses for their manure. Livestock farmers want to spread manure on their fields to fertilize their crops, avoid the expense of synthetic fertilizers, and get rid of their accumulated manure. Environmentalists and regulatory agencies want to decrease the amount of manure applied to fields to reduce runoff of excess phosphorus and nitrogen, the primary constituents of an over-abundant nutrient load in the Chesapeake Bay. Given these conflicting goals, members of the farming

and environmental communities have begun to realize the importance of an inclusive response to the Chesapeake Bay, especially given the phosphorus contribution of poultry farmers in the Eastern Panhandle of West Virginia and the Shenandoah Valley of Virginia. In addition to being inclusive, any long-term solution must also be economically viable. Inclusivity and market viability must be experienced on the individual level; already regulatory agencies grasp at solutions and culpability while farmers feel accused and powerless. While various groups have implemented pilot projects related to subsidized litter transport and nutrient credit trading, these two strategies lack long-term viability because of limited economic returns. Therefore, we will complete a feasibility study of a poultry litter composting facility for poultry farmers in the Eastern Panhandle of West Virginia and Shenandoah Valley of Virginia. This study will evaluate the feasibility of a poultry litter composting operation, including its economic viability, long-term staying power, and receptivity among community members.

Completing this project is the core project team, which includes: Laura Hartz of Downstream Strategies, Mike Weaver of the Contract Poultry Growers Association, Suzy Friedman of the Environmental Defense Fund, Carla Castagnero of Ag Recycle, and Connie Musgrove of the Chesapeake Bay Funders Network Agriculture Initiative. This project is also advised by a project advisory group consisting of members from the following groups: research, government, poultry, and non-profits.

The goal of this feasibility study is to establish whether poultry litter composting would be a long-term, economically-viable solution to area farmer needs and Chesapeake Bay standards. The feasibility study will take place over six months. Should the feasibility study provide a favorable result, applicable public and private funding venues will be approached for project planning and implementation. This feasibility study is the precursor to the development of a project plan.

Litter to Energy

A small scale gasification unit has been constructed by Coaltec Energy on a poultry farm owned by Josh Frye in Wardensville, WV. The purpose of this demonstration project is to prove the economic viability and feasibility of converting poultry litter into energy using a gasifier unit. The system on the Frye farm is a fixed bed gasification unit that is used to produce heat from poultry manure in order to provide heating for the farm. Although this unit will only be heating three houses, it has the ability to heat up to a total of six houses. In addition to saving the farmer money on propane costs, heating the chicken houses with heat generated by this unit rather than by propane is expected to improve bird health since it provides dryer heat to the houses, thus reducing the humidity level in the house and lowering ammonia generation and exhaust.

New Loading Ramp Standards Adopted

A new conservation practice standard has been added in WV. For many poultry producers, participation in litter transfer on a large scale is limited by their ability to load large high-sided trailers with conventional farm equipment. To solve this problem, and increase the volume of

litter and nutrients transported out of the Chesapeake Bay Watershed, a new standard design for a structure to aid in loading of commercial trucks by typical farm tractors has been developed and approved by the WV NRCS State Conservation Engineer. This loading-dock type structure is intended to be constructed near existing and future litter storage sheds and will be cost-shareable through a number of programs (e.g., EQIP, 319, and WVCA's AEP). The structure falls under the NRCS Conservation Practice Standard #634 (Manure Transfer), and will further facilitate litter transfer and complement a proposed litter transfer program. The Potomac Valley Conservation District has approved the funding of six of these structures during 2011-2012 through AEP. To date, a full design for one structure has been completed.

While the litter loading ramp does not have an efficiency associated with it, the objective is that these structures will increase participation in litter transfer. Therefore, the effectiveness of these BMPs will be reflected in the increased amount of poultry litter transferred after installation.

Region 9- Alternative Litter Uses Project

Delta Development Group, Inc. is currently working with Region 9, Region 8, Region 1 and state and federal agencies to coordinate a litter management feasibility study.

Objectives:

Primary Objective: Conduct a Poultry Litter Management Cooperative Feasibility Study and prepare a five year strategic business plan for the poultry litter management cooperative enterprise.

Phase 1 Objective: Evaluate the market and financial viability of establishing a value added business cooperative comprising participating member poultry farm operators.

Phase 1 Purpose: To determine whether the proposed cooperative business enterprise is economically viable.

Phase 2 Objective: Utilize the feasibility study results to formulate a five year business plan for the cooperative which will manage and operate the collection, storage, production, marketing, selling and distribution of the co-op- member producer's poultry litter and by-products (baled litter, compost, bio-char, etc.).

Phase 2 Purpose: To document in detail how the cooperative business enterprise will operate and how it will be organized and financed.

Litter Baling Technology

West Virginia is exploring the feasibility of a litter baling system to facilitate the movement of nutrients outside of the watershed. Recently, WVU Extension Service partnered with Virginia Cooperative Extension and state and federal agencies to host a one-day workshop showcasing

the baling technology. This information was shared with both the West Virginia Poultry Association and the Contract Growers Association. The program focused on the transportation, environmental and storage benefits as well as the marketability of the practice. This technology will continue to be explored by West Virginia.

Phytase

West Virginia will continue the use of enzyme feed additives to reduce phosphorus in feed formulations. Recent West Virginia Department of Agriculture Nutrient Laboratory results show a definitive reduction of 25.5% reduction for broilers and a 23.6% reduction for layers.

8D.6.g Permanent Farmland Conservation Easements

West Virginia has an active and thriving Farmland Protection Board created in 1995 by the West Virginia Legislature with the passage of the Conservation and Preservation Easements Act which recognized “the importance and significant public benefit of conservation and preservation easements in its ongoing efforts to protect the natural, historic, agricultural, open-space and scenic resources of the state” (West Virginia Farmland Protection-Berkeley County).

In 2000, the West Virginia Legislature passed the Voluntary Farmland Protection Act which:

“declares that agriculture is a unique life support industry and that a need exists to assist those agricultural areas of the state which are experiencing the irreversible loss of agricultural land. The Act further authorized the creation of county farmland protection boards and programs and creation of the WV Agricultural Land Protection Authority; detailed the contents and requirements of the farmland protection programs; outlined the powers and duties of the farmland protection boards and the authority; detailed the methods of farmland protection; detailed the value of conservation easements; outlined the criteria for acquisition of easements; outlined the use of land after a conservation easement is acquired; outlined the funding for the farmland protection programs; and authorized the commission of agriculture to promulgate rules” (West Virginia Farmland Protection- Berkeley County).

The West Virginia Farmland Protection partners with NRCS’s Farm and Ranch Land Protection Program (FRPP) which:

“provides matching funds to help purchase development rights to keep productive farm and ranch land in agricultural uses. Working through existing programs, USDA partners with State, tribal, or local governments and non-governmental organizations to acquire conservation easements or other interests in land from landowners. USDA provides up to 50 percent of the fair market easement value of the conservation easement. To qualify, farmland must: be part of a pending offer from a State, tribe, or local farmland protection program; be privately owned; have a conservation plan for highly erodible land; be large enough to sustain agricultural production; be accessible to markets for what the land produces; have adequate infrastructure and agricultural support services;

and have surrounding parcels of land that can support long-term agricultural production” (NRCS 2011).

West Virginia has 19 County Farmland Protection Boards actively working to protect farms from development and helping to protect the natural, scenic, and source water protection value of agricultural lands. These acres have met all the specific criteria outlined by the Farmland Protection Board including environmental site assessments and the implementation of conservation plans developed by professionals which help to curb soil erosion and nutrient runoff as well as annual inspections to ensure compliance with the standards and criteria of the easement.

At the end of 2010, in the eight county Chesapeake Bay Watershed, there were 89 easements and 10,080 acres protected. The following is the breakdown per county:

County	Number of Easements	Acreage
Berkeley	33	3,335
Grant	2	429
Hampshire	7	1,210
Hardy	4	707
Jefferson	26	2,260
Mineral	3	236
Morgan	14	1,903
Pendleton	0	0

The Farmland Protection Program is expected to grow in the future as the state’s agricultural lands are increasingly threatened by development thus the need for protection of the state’s waterways through programs like conservation easements will continue to grow. In Jefferson County, the Farmland Protection Board has placed 28 property owners covering 2,606 acres in agricultural easement from July 1, 2010 to June 30, 2011. By calendar year end, an additional 7 property owners covering 1,015 acres will be placed under easement. It is estimated that of these 3,621 acres protected, 80% contain a stream, wetland or spring on the property that is protected from pollution by the standards of the conservation easement and annual inspections to ensure compliance with the standards of the easement. West Virginia’s Farmland Protection Program is working to conserve our soils, protect the landscapes of the community, provide open space in rapidly developing areas, protect our natural resources and protect source waters.

In addition to County Farmland Protection Boards and the FRPP, several non-governmental land trusts provide valuable resources to West Virginia landowners by maintaining healthy rivers, protecting forests and farmland, and preserving rural heritage for the enjoyment and well-being of present and future generations. These organizations hold easements and often partner with FRPP or sister land-trusts to co-hold easements. They include:

- *Cacapon & Lost River Land Trust-* www.cacapon.org
- *Potomac Conservancy-* www.potomac.org
- *Land Trust of the Eastern Panhandle-* www.landtrustepwv.org

SECTION 8E. Future Considerations

8E.1 Accounting for Growth

To account for growth within the agriculture sector of West Virginia’s portion of the Chesapeake Bay watershed, an analysis of documented trends in county-level agriculture census data was performed (i.e., NASS). While the exact future is uncertain, especially given recent economic conditions, these trends are sufficiently defensible and derived from public-accessible published data.

This analysis was based on trends of the following indicators:

- Land area used for agricultural production
- Poultry sector
- Inventory of cattle
- Other livestock

Land area used for agricultural production

This land area includes all cropland, whether it was harvested or used for crop production. It also includes pasture land, regardless of whether animals were actually pastured. A decrease in agricultural land is evident in Figure 8.5. This decrease has occurred every census year since 1987, with the rate of decline becoming more significant from 1997 to 2007. This decrease is perceived as a result of an aging farm population combined with increased pressure on open lands for residential development.

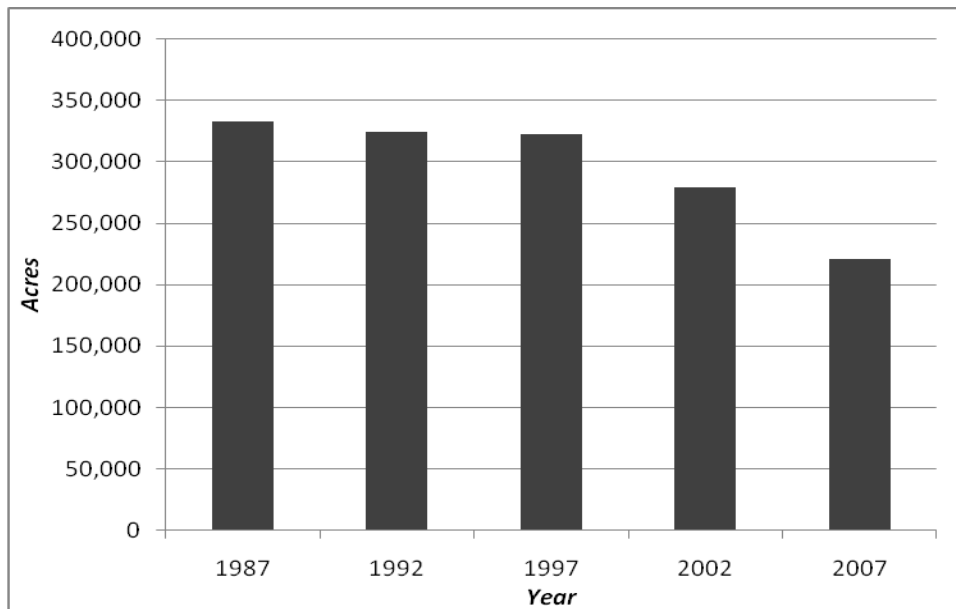


Figure 8.5: West Virginia Chesapeake Bay Watershed Cropland by Agriculture Census Year.

Poultry sector

The poultry sector is the dominant agricultural sector in the West Virginia counties located within the Chesapeake Bay watershed and accounts for a significant portion of modeled delivered agricultural nutrient loads. The metrics used to establish trends in this sector were the number of broilers, pullets, and turkeys sold, as well as the inventory of layers during each agriculture census year. Broilers and replacement pullets comprise the vast majority of poultry numbers within West Virginia, as can be seen in Figure 8.6. This sector experienced rapid growth in the 1980s and 1990s, but has since leveled off. Industry analysts predict a slight growth in U.S. production (i.e., 2% per year) over the next 15 years. Turkeys and layers are a much smaller portion of the poultry sector, and have both experienced a reduction in numbers from 2002 to 2007.

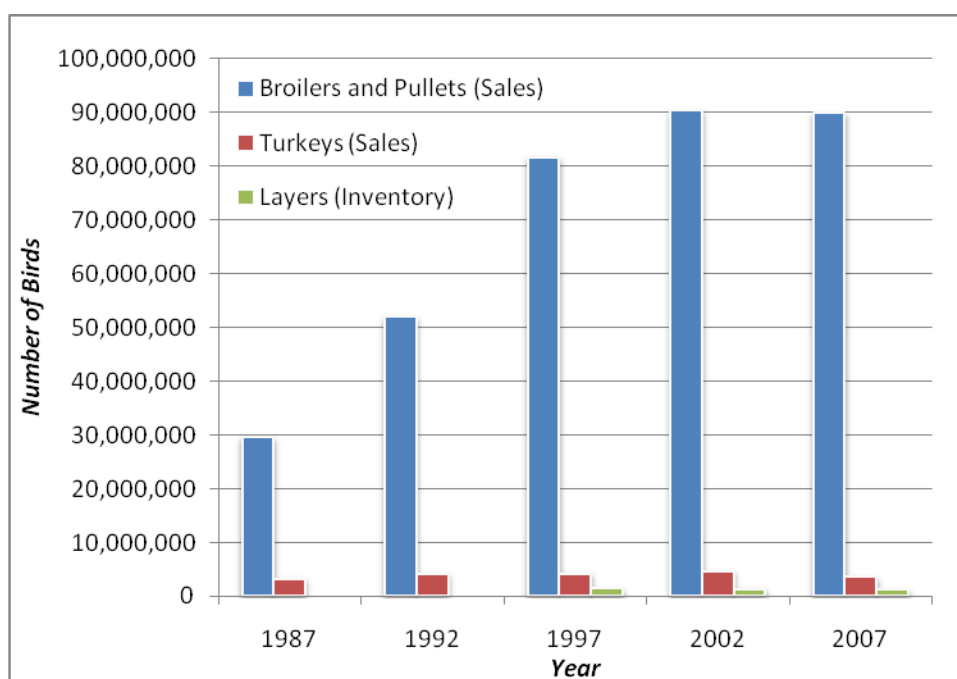


Figure 8.6: Poultry Sales and Inventory in West Virginia Chesapeake Bay Watershed by Agriculture Census Year (Layer data not available for 1987 and 1992) †

Inventory of cattle

The inventory of cattle includes dairy and beef, as well as all calves. In general, dairy is a very small part of the West Virginia agricultural industry, and was therefore combined with beef. The beef sector has remained fairly consistent over the past 20 years (Figure 8.7). No growth is expected within this sector; in contrast, a decrease in numbers may be realized as pasture acreage continues to decline.

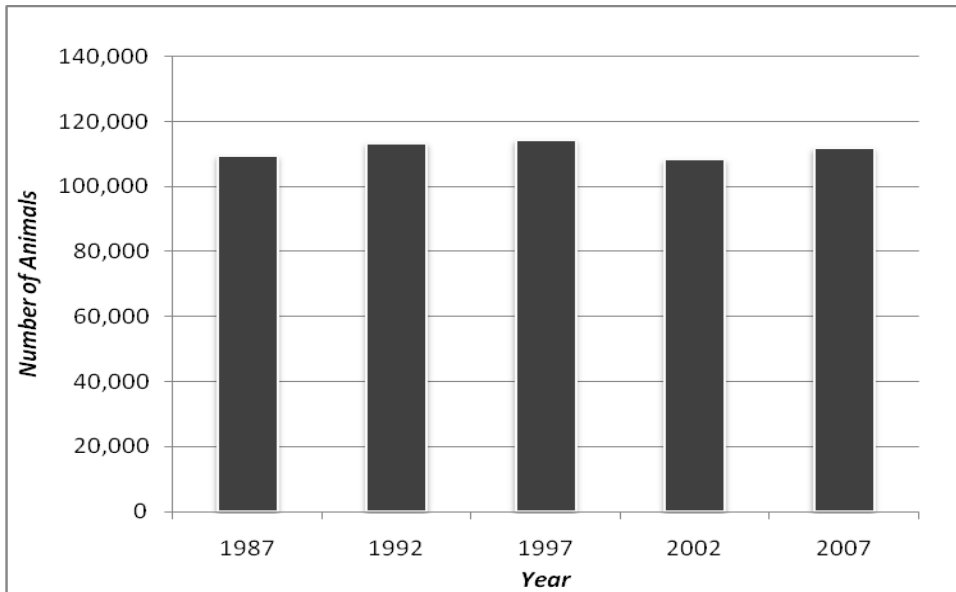


Figure 8.7: Inventory of Beef and Dairy Cattle and Calves in West Virginia Chesapeake Bay Watershed by Agriculture Census Year

Other livestock

The metrics used to establish trends in other livestock were sales of sheep, goats, and hogs during each agriculture census year. These sales are displayed in Figure 8.8. There has been a significant decline in hog and sheep sales over the past 20 years. It is not expected that sheep or hog sales will increase to previous levels. Goat sales increased from 2002 to 2007, but remain a very small portion of the agriculture industry.

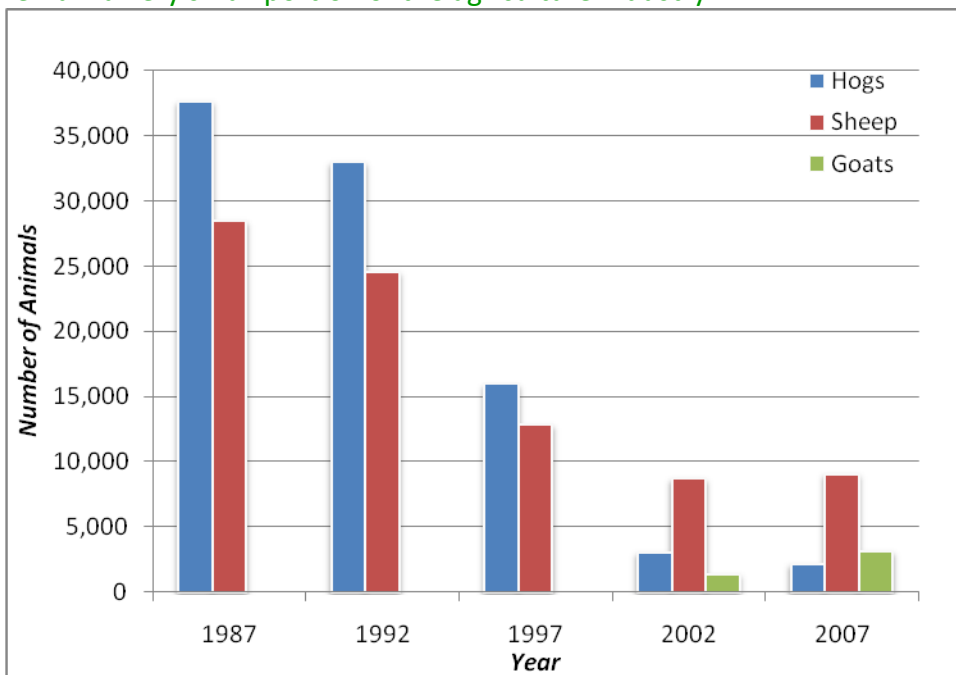


Figure 8.8: Sheep, Goat, and Hog Sales in West Virginia Chesapeake Bay Watershed by Agriculture Census Year (Goat data not available until 2002)†

After a brief investigation of trends, it is apparent that there is not likely to be any significant or meaningful growth or nutrient loading increases within the agriculture sector of the eight West Virginia counties that are located with the Chesapeake Bay watershed. As further evidence of decreased nutrient loads from agriculture, the Chesapeake Bay Model 5.3 'No Action' scenarios for 1985 and 2010 are referenced. These scenarios indicate that the edge-of-stream nutrient loads from agriculture decreased over this time period. Specifically, edge-of-stream total nitrogen loads decreased from 14.2 to 12.5 million lb/year, while edge-of-stream total phosphorus loads decreased by over 50,000 lb/yr. These 'No-Action' decreases were realized even though the broiler industry experienced significant growth over this time period. We hypothesize that these decreased loadings were a direct result of land-use change, and the decline in agricultural land area, a trend that is likely to continue. In conclusion, census and modeled data indicated that there may very well be a continued decline in agricultural activity across these counties that will result in an attrition of delivered agricultural-derived nutrient and sediment loads to the Chesapeake Bay.

†Animal numbers were not included if not disclosed in census for privacy reasons (i.e., counties that only contained a single farm of a specific animal type)

8E.2 Gap Analysis and Strategy to Fill Gaps

West Virginia's implementation plan meets all necessary reductions for nitrogen, phosphorus and sediment. The plan includes a variety of agriculture BMPs including nutrient management, cover crops, litter transfer, animal waste management, barnyard runoff and mortality composting for AFOs and CAFOs, conservation tillage, pasture management and limiting livestock access to streams. Given continued targeted funding for West Virginia it is our estimate at the current time that the technical and financial resources will be available to install and/or document the needed practices through 2025.

8E.3 Contingencies

West Virginia is counting on the continued success of past and current implementation rates of BMPs. The state will review its progress at the end of each two year period and make changes as necessary. This adaptive management approach will allow the state to redirect funds and programs to make them the most effective.

If West Virginia's progress is not keeping up with WIP goals, additional Federal and State funds will be requested. These funds will be used to increase cost-share rates for agricultural BMPs such as cover crop and fencing and increase staffing levels and educational and outreach efforts.

SECTION 8F. Agriculture -- Regulated Sectors: CAFO/AFO

In 2010, the West Virginia Legislature revised 47CSR10-13 to be consistent with the 2008 Federal CAFO Rule. Under the new rule, all concentrated animal feeding operations (CAFOs) are point sources subject to NPDES permitting requirements (47CSR10-13.1.a). CAFOs are animal feeding operations (AFOs) (47CSR10-13.1.b.1) that meet the definitions of large CAFO (47CSR10-13.1.b.4) or medium CAFO (47CSR10-13.1.b.6), or that are small AFOs that are designated as CAFOs because they are significant contributors of pollutants to the waters of West Virginia (47CSR10-13.1.c) or because they contribute to the impairment in a downstream water (47CSR10-13.1.c.1).

The owner or operator of any AFO that is defined or designated as a CAFO must provide substantive controls on the discharge of pollutants from production areas. Discharges from CAFO production areas are point sources and are to be classified within the wasteload allocation component of the TMDL.

47CSR10-13 also prohibits a CAFO from land application of manure, litter or production water unless a Nutrient Management Plan is implemented for all lands under its control. If a Nutrient Management Plan is implemented, then the precipitation-related discharges from land application areas are agricultural stormwater discharges that are not subject to NPDES requirements. Discharges from compliant CAFO land application areas are nonpoint sources and are to be classified in the load allocation component of the TMDL.

The Bay model establishes an AFO land use that is intended to represent the pollutant loadings from the production areas of all AFOs. The TMDL allocation process relative to AFO loadings must differentiate wasteload allocations for CAFO production areas and load allocations for non-CAFO production areas. The wasteload allocations for the discharges from the production areas of compliant CAFOs should represent the residual pollutant discharges after implementation of applicable BMPs.

Because the loading associated with all AFOs in the West Virginia Bay Watershed contributes to Bay impairments, 47CSR10-13.1.c.1 suggests that the EPA Regional Administrator could designate all Bay Watershed AFOs as CAFOs. West Virginia recognizes that many small AFO operations, although technically contributing to Bay impairments, are not significant contributors of pollutants to West Virginia waters or the Chesapeake Bay, and does not intend universal CAFO designation.

The production area discharge loadings of all defined large and medium CAFOs will need to be included in the wasteload allocations. Without BMP application, the production area loadings of some small AFOs would constitute a significant contribution of pollutants to West Virginia waters. A portion of those facilities may be designated as CAFOs, which would necessitate wasteload allocations for their production area loadings.

Because implementation of the new CAFO rules has only recently been initiated, the number of operations (or the percentages of animals, by type) that will ultimately constitute the universe of CAFOs cannot be determined with 100% accuracy at this time. However, improvements in model representation have occurred since release of the Phase I WIP. The WVDA provided best estimates of animal counts by county for operations with animals that exceed medium and large CAFO thresholds. Based upon that information, the CBWM 5.3.0 "AFO" land use was split into "CFO" and "AFO" components in version 5.3.2 so as to facilitate delineation of production area loadings between wasteload allocation and load allocation components.

The Phase I WIP strategy called for application of all available BMPs upon production areas of operations meeting medium or large CAFO animal thresholds. This philosophy is retained in Phase II by prescribing 100% application of animal waste management, barnyard runoff control, loafing lot management and mortality composting BMPs to the CFO land use. **Seventy-five percent of the pollutant reductions associated with the wasteload allocations are targeted to be accomplished prior to 2017.**

Comparison of the WV 2017 WIP scenario with the 2009 progress scenario reveals sharp implementation increases for the animal waste management system and mortality composting BMPs. The increases are related to West Virginia's planned efforts to implement CAFO regulations under which large and medium operations will have to implement those BMPs. Increased progress is expected to result from installation of new controls and verification of previously unreported existing controls.

The production area pollutant loadings from the remaining AFO acreage are initially classified as nonpoint sources. WVDA and partner agencies will focus technical assistance activities on BMP implementation and pollution abatement that will avoid CAFO designation and associated permitting requirements, and allow residual AFO loadings to be maintained within the load allocation component of the TMDL. The AFO load allocation component was derived by applying the animal waste management BMP to the proportion of the AFO land use area represented by:

- 100% of dairy heifers not included in the wasteload allocation
- 20% of beef heifers and other cattle
- 70% horses in Berkeley County and 80% of horses in Jefferson County that are not included in the wasteload allocation
- 5% of sheep and lambs

Attainment of the pollutant reductions associated with the load allocations is targeted prior to 2017, contingent upon our ability to document and count existing controls and to discount non-AFO operations as discussed below.

Many of the animal agriculture operations with AFOs, regardless of size or CAFO applicability, have implemented appropriate production area controls. Because verification protocols have

not been fully implemented, progress relative to production area controls has been under-reported in previous Chesapeake Bay BMP implementation progress reports. Future implementation tracking will couple verification of existing controls with installation of new controls in order to accurately characterize the pollutant loadings associated with these sources.

Through the use of the Chesapeake Bay Regulatory and Accountability Grant, Environmental Enforcement (EE) has hired a dedicated inspector to ensure compliance with West Virginia's CAFO rule and implementation of the CAFO portion of West Virginia's WIP in the Potomac watershed, in addition, the WVDEP and the WVDA have developed a Memorandum of Understanding to facilitate CAFO implementation. The MOU details the roles and responsibilities of each agency.

Like the permitting process, the WVDEP's compliance assessment and enforcement program relative to CAFO is in its infancy. WVDEP will be developing permitting and compliance and enforcement strategies by March 2012. In general, noncompliant facilities will be notified of violations and afforded a reasonable period to attain compliance. Significant instances of noncompliance and continued chronic noncompliance would subject permittees to escalating enforcement actions. At the outset, West Virginia will also focus on ensuring required permit coverage. In its execution of CAFO responsibilities, WVDEP will also note potential problematic AFOs that do not meet the CAFO definitions, but nonetheless present existing conditions that may warrant CAFO designation. WVDEP will initially coordinate with the WVDA and other agricultural agencies in the hope of timely corrective action that will avoid CAFO designation.

In the spring of 2011, WVDEP and EPA Region III conducted joint site reviews at five probable CAFO operations to ensure consistency of state reviews pursuant to federal expectations. EPA has conducted follow up with these five operations indicating they **have a discharge and** need to apply for a WV/NPDES permit. In November 2011, WVDEP inspection personnel began identifying potential CAFO facilities and conducting inspections to determine if those facilities discharge to waters of the State. In the case of those facilities that are determined to be discharging CAFOs, they are being directed to apply for a WV/NPDES permit.

Also during 2011, WVDA prepared and submitted a technical standard for CAFO Nutrient Management Plans. WVDEP has recently received comments from EPA on that standard. With a few revisions, it is likely that West Virginia's technical standard will be accepted by EPA and WVDA and partner agencies can proceed with the development of Nutrient Management Plans for CAFOs. Finalization of the technical standard will also allow for WVDA to review Nutrient Management Plans currently submitted to WVDEP for WV/NPDES permits.

In response to West Virginia's Draft Phase I WIP, EPA advised that it had not yet approved all of the proposed revisions of West Virginia Legislative Rules 47CSR10 that are necessary to implement the federal CAFO requirements. Of particular concern were the provisions of Sections 13.1.b.4.B, 13.1.b.4.B.1 and 13.1.b.4.B.2 that significantly narrow the federal definition

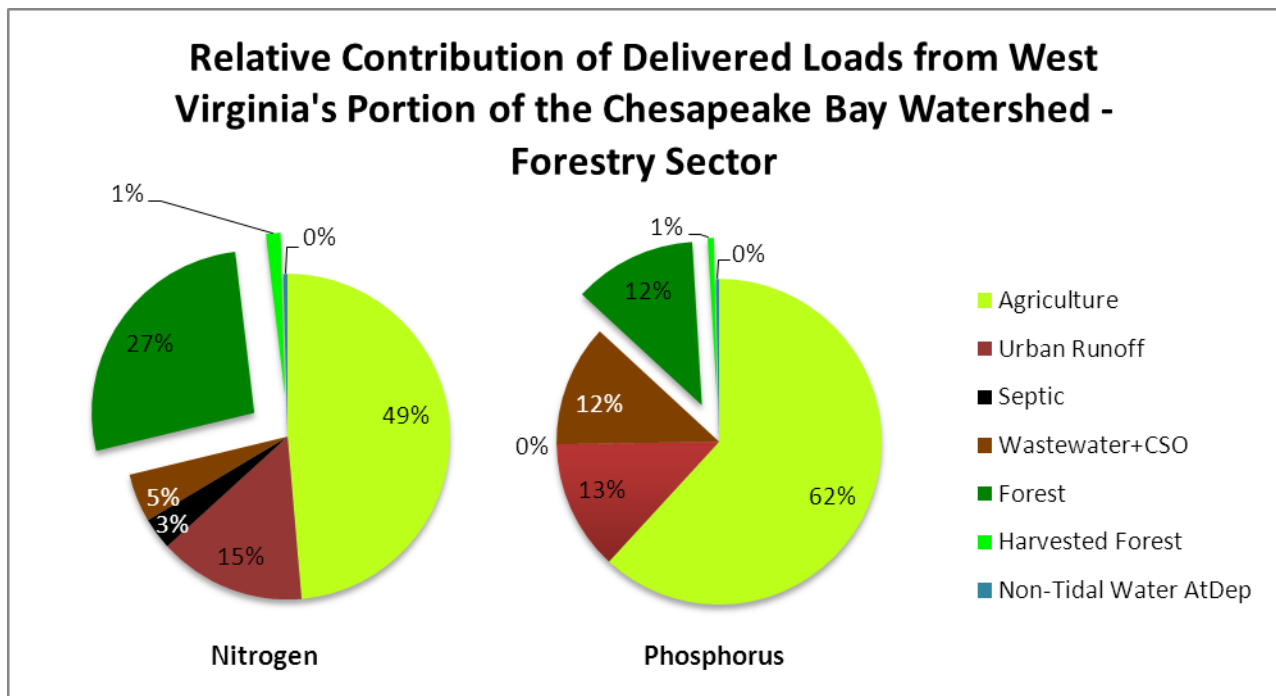
of “Large CAFO”. WVDEP agreed that the three subsections are inconsistent with the federal definition and amended 47CSR10 in the 2011 session of the WV Legislature. Subsequently, additional concerns were identified by EPA in Sections 10.2.6, 10.4.4.c.1.J and 13.1.f.2. In correspondence to EPA dated October 26, 2011, WVDEP agrees to address the 3 requested revisions as technical corrections during the 2012 Legislative Session. In the interim EPA has approved WV’s CAFO rule with the understanding that WVDEP will implement 47CSR10 as if these corrections have been made.

SECTION 9. Forestry

Forestry Section at a Glance

For the purposes of this document, Forestry constitutes that portion of the forest load from all forest harvesting activities in the Potomac Highlands of West Virginia. No new programs in addition to those already required are proposed for this section.

According to the Chesapeake Bay Watershed Model, the “forestry” sector is responsible for one percent of the total delivered nitrogen load and one percent of the total delivered phosphorus load.



Introduction

West Virginia contains 24,640 square miles, of which approximately 19,200 square miles (78%) are forested, making WV the third most heavily forested state in the nation. Eighty-eight percent (88%) of WV's timberland is held by private landowners, with the remaining 12% owned by local, state and federal governments.

Ninety-four percent (94%) of the state's forest is comprised of hardwoods. These forests contribute more than \$3.2 billion annually to the state's economy and are the only natural resource industry found in every West Virginia county. The Eastern Panhandle's eight counties consist of 3,574 square miles, with roughly 1,600 square miles in the non-industrial forest land base. A study done by WVU in 1995 indicated that the Eastern Panhandle's forest industry contributes \$374 million (12%) to the economy and 3,562 jobs (12% of area's total).

Between 2001 and 2010, the average annual timber harvest in WV's Potomac watershed was 17,980 acres per year. During the 10-year period, 12% of the region's forested lands were harvested, 90% by selection cutting. 2011 is on a pace to be less than 15,000 acres. Due to the present economic slowdown, low harvested acreages should be the trend for 3-5 more years before a slow recovery to 2005-2007 levels (17,000 to 18,000 acres per year). An estimated average of 14,048 acres per year from 2011-2025 equals a projected 210,720 acres harvested during that period.

West Virginia's forests remain critical to the health of the Bay. Forests capture rainfall, reduce runoff and filter nutrients and sediment. Mature trees are vital to holding soils in place. It is the harvesting operations that become the problem for water quality. Forestry's approach toward minimizing pollution from these operations and, therefore, their method for developing a forestry strategy, is best understood through a historical perspective.

9a. Current Programs and Capacities

Nearly all of West Virginia's Bay forests had been harvested by 1910, and the logging practices in common use at that time caused substantial erosion of WV's lands, which resulted in sedimentation problems for many WV streams. As the forest renewed itself and began to mature, sustainability of West Virginia's forest resource became a concern. During the 1960's, Forest Practice Standards were adopted and generally agreed upon by industry, academia (colleges and universities), federal, and state agencies in order to ensure the forest's future. These Forest Practice Standards were designed to ensure clean water and a healthy productive forest. In 1972, the Forest Practice Standards were revised and voluntary compliance was implemented until 1992.

While cutting trees itself does not typically cause erosion, activities associated with logging, such as haul roads, skid trails, and log landings, as well as silvicultural activities such as site preparation and mechanical tree planting, can cause erosion and thus sedimentation if not done properly. In 1992, the West Virginia Legislature enacted the **Logging Sediment Control Act (LSCA) -WV Code 19-1B-12**. This measure was passed to control nonpoint sources of sedimentation from logging operations. Public lands in the Eastern Panhandle, which include all State and Federal Forests, are also subject to the LSCA Best Management Practices (BMPs). The LSCA addresses these activities and is summarized as follows:

Best Management Practices (BMPs) are required by law in West Virginia to be used by timber operators. BMPs are reviewed every three years by a panel of experts to ensure the latest technology is being utilized:

- Timber Operators are required to be licensed and have a certified logger on site. Small landowners who operate are not required to have a license but must file for an exemption. The exemption process only excludes the operator from the licensing and certification but they must comply with BMPs to the same degree as those licensed.

- Timber Operators are required to be trained every three years in BMPs, chainsaw safety, and first aid. Recertification training covers subjects in reclamation, silviculture, business management, sustainable forestry, equipment safety, etc.
- Emphasis has been placed on Streamside Management Zones (SMZ) to prevent exposure of mineral soil and potential erosion. The minimum SMZ width for perennial or intermittent streams is 100 feet slope distance. On ephemeral streams the SMZ is 25 feet. Soil disturbance in these areas must be minimized.
- The WV Division of Forestry (WVDFO) is mandated to inspect and enforce regulations pertaining to logging operations. The law empowers the WVDFO to issue compliance orders, suspend logging activities, seek civil penalties to prevent sedimentation, and/or issues citations under 19-1B-12.
- BMP standards require roads to be seeded and mulched to control erosion once a logging operation has been completed.

Wildfires

Since 1949, approximately 3.5 million acres of West Virginia forest lands have burned. The destructive results of these fires include timber mortality and degraded value, wildlife habitat destruction and reduction of aesthetic appeal. Extensive erosion also results from these wildfires, caused by the loss of the forest understory and leaf litter that protects the underlying soil from rainfall. This results in a major avenue for sediment to enter stream channels following a rainfall event. Studies of stream sedimentation from nonpoint sources in West Virginia indicate that wildfires on land with a history of repeated burns can have a greater impact on water quality than other potential sources, such as oil and gas, agriculture, construction and logging operations. W.Va. Code Chapter 20-3 empowers the DOF to write citations and impose fines on individuals who violate this section of the Code.

The potential for sedimentation due to forest fires is tremendous, with erosion rates ranging from 55 tons/acre to over 250 tons/acre per year following forest fires. In the West Virginia counties of concern to the WV WIP, 754 fires burned 1,430 acres of forested land over the past five-years, an average of 150 fires and 290 acres burned per year. The number and magnitude of fires was fairly consistent from year to year. Historically, drought years such as 2000 and 2002 had severe fires that burned many acres of land (3,199 and 2,769 acres, respectively), while during 2003 unusually wet conditions suppressed the potential for fires and only 89 acres burned.

The WVDFO is mandated by law to enforce the State Code that relates to wildfires. WVDFO personnel work with the public to:

- prevent fires through the education of school children and landowners
- detect fires through aircraft detection and reporting by 911 centers
- suppress fires if they should occur
- investigate the cause of fires and
- enforce wildfire law violations; Chapter 20-3.

Although some forestry landowner incentive practices such as the fire line stabilization under the Forest Land Enhancement Program (FLEP) have been discontinued, EQIP (described below) still carries provisions for grading, seeding, and mulching of critical areas and access roads.

Landowner Assistance Programs In West Virginia

Nearly 80% of the private land holdings in West Virginia are owned by 260,000 non-industrial private woodland owners. Demographics indicate that ownership size is an average of less than 47 acres per parcel, many do not live on their property, and management objectives for the properties vary immensely.

The eastern counties of WV in the Chesapeake Bay drainage have approximately 1 million acres of private non industrial woodland. Landowners may choose from an offering of programs aimed as incentives for landowners wishing to manage their forest resource:

Environmental Quality Incentives Program (EQIP) provides forestry incentives to carry out “on the ground” practices relating to water quality measures in riparian zones, forest stand improvement, and tree planting.

Forest Legacy provides federal cost-share dollars to the state for the purchase of, in fee or by easement, private properties that are environmentally significant. The program assures that the forest resource will continue as a “working forest” forever.

Sustainable Forestry Initiative (SFI) A sustainable forest management and certification standard administered by industry to demonstrate that foresters, landowners, loggers, and wood and paper producers can operate and be an economically viable industry in an environmentally responsible manner.

Stewardship Program provides cost-share assistance to non- industrial private woodland owners for preparation of a comprehensive management plan for their forest land acreage. The plan incorporates the objectives of the landowner and provides a 10-year cycle of recommendations for managing and protecting the woodland acres. The Stewardship Plan qualifies the landowner for forestry incentives for cultural and water quality based practices and the Managed Timberland initiative which includes a potential tax base reduction. Currently, 1,143 Stewardship Plans for 224,130 acres are in place in WV’s Eastern Panhandle counties.

Managed Timberland Program provides a tax reduction for landowners who properly plan and manage their forestland. (The properties are certified prior to placement in the Program and are monitored and inspected for retention in the Program.) There are currently 286,256 acres under certified Managed Timberland protection in WV’s Eastern Panhandle counties, representing a total of 1,312 landowner contracts.

Tree Farm Program is comprised of industry, state agencies, consulting foresters, and landowners. The program, which recognizes landowner achievements to properly manage their forest land, relies on training and education of the public to do responsible forest management.

Cooperative Forest Management (CFM) Programs are derived from major forest products industries that conduct forest management programs which include reforestation. Since 1985, CFM programs plus mining reclamation plantings have reforested over 7,000 acres.

Current WV Division of Forestry Staffing

The WV Division of Forestry currently employs 11 foresters that work in the Bay drainage counties. Of these 11, three LSCA foresters actively inspect harvest operations and one LSCA specialist supervises these three foresters. This specialist also supervises the Chesapeake watershed forester who covers the eight counties in the Bay drainage.

There are two landowner assistance foresters who administer the stewardship and managed timberland programs. WV currently lacks a NRCS forester to work directly with the Farm Bill forestry programs in the Bay counties. Lastly there are three fire foresters who handle wildfire suppression in these counties, although every forester maintains fire proficiency and readiness.

Forest Land Conservation

In 2006, the Chesapeake Executive Council recognized that retaining, expanding, and sustainably managing forest lands is essential to restoring a healthy Bay. This resulted in Directive 06-01. In response to this Directive, specific actions were later written to conserve and restore forests in the watershed. Although not signers of this response, which lists states' commitment to certain acreages of forest protection through 2020, West Virginia has informally committed to protecting an additional 1,200 acres of forestland per year in the Potomac Basin. This cannot be achieved without the help of federal, state and local governments and non government organizations.

Subsequently, in 2008 and 2009 we have reported to the Bay Program, 2,886 forested acres that have been protected. This includes reports from Forest Legacy, Cacapon and Lost River Land Trust, Land Trust of the Eastern Panhandle, Potomac Conservancy, The Nature Conservancy, and Farm Land Preservation. Most of these forests were in areas considered "high-value" forests. WV will continue to commit to protecting 1,200 acres of forest land per year.

9b. Accounting for Growth

Harvesting Trends. Until 2007, the number of acres logged had been consistent over the past 20 years. However, due to the current economic slow down, trends indicate that timber harvest acreages utilizing BMPs over the past 2 years are at a 20 year low and are expected to continue through 2010. This trend of 12,836 average acreage harvested per year is expected to stay at this level through 2015, when a modest 4% growth will occur for at least three years. By 2017, harvested timber will equal 2008 levels. Then steady harvest levels through 2023 would

be a result of urban sprawl, change in landowner attitudes, the prohibitive high cost of doing business, and increased environmental regulation. We do not see 2000 – 2004 levels returning until possibly the 2020's.

In the 2020's many hardwoods will be entering their third growth cutting cycle. In addition, there will be several thousand acres of loblolly pine planted starting from 1985 that will be reaching maturity. We see a possible increase in logging sometime in the 2020's.

9c. Gap Analysis

We do not anticipate the forestry sector playing a major role in filling any gaps in capacity to achieve final nutrient reduction targets. Since our harvest BMPs are regulated by law, compliance is near 100% due to strict inspection standards. West Virginia's capacity to sustain this level of inspection is dependent on continued funding including that provided by Chesapeake Bay grants. We will report the Forest Harvesting BMP as a percent of the amount of harvested acreage registered each year. A 98% rate will be used to take into account an assumed amount of harvesting that may be occurring without proper notification to the WVDOF, i.e. "wildcat" operations. The WVDOF will work to minimize these instances further.

Currently there are studies that break down specific harvest BMPs that will allow more accurate reporting. For example, reporting will include how many water bars are installed, feet of haul road that have erosion control measures, or acreage of seed and mulch applied. When these studies are completed, more stringent reporting can be used to compute more specific reductions. An outcome would be that harvest operations on large flat tracts will have fewer reductions than smaller operations on mountainous tracts. Or harvesting on land that is to be developed may have fewer harvest BMPs applied.

9d. Strategy to Fill the Gaps

See previous section.

9e. Contingencies

Harvesting Improvement Strategy

- Maintain logger education regarding BMP standards and water quality
- Maintain technical assistance to timber operators
- Maintain current level of logging inspections by the WVDOF
- Maintain a toll free message center for loggers to easily notify the DOF of changes to the notification or harvest operation

Wildfire Hazard

Acres burned are directly influenced by weather and season of the year. Trends indicate that with the increase of urban sprawl, the landscape is becoming more fragmented. Landowner

attitudes in the Eastern Panhandle are shifting toward preservation rather than conservation of the resource, which will increase fuel loads leading to more hazardous situations. Even though acres burned in the Bay area are not significant, occurrence and risk are equal to or greater than any other part of the state. Therefore, the risk of a catastrophic conflagration cannot be ignored (see WVDOF Wildfire Hazard Chart). Fire danger will also increase due to insect and disease influence that is persistent in the area.

Legislative changes in the LSCA

Currently in West Virginia, harvesting can occur in the Streamside Management Zone (SMZ). Equipment operation in this area is limited to points where the stream must be crossed. If further reductions in nutrient and sediment are needed on harvested forests, a contingency exists for changing the law on a state level, by limiting the percent basal area cut in the SMZ, or by enacting this law for the Bay counties only. Another option is enacting an optional no-cut law in the SMZ during harvest operations, with tax incentives provided to land owners who choose not to cut. Changing the law would indeed be a difficult road and may take a few years to legislate.

9f. Tracking and Reporting

As mentioned above, we will report the Forest Harvesting BMP as a percent of the amount of harvested acreage registered each year. A 98% rate will be used to take into account an assumed amount of harvesting that may be occurring without proper notification to the WVDOF, i.e. "wildcat" operations. The total area of harvested forest registered is compiled by WVDOF staff from timber harvest notifications that are received. We also plan to report that number directly to the Chesapeake Bay Program Office annually for use in the CBWM, instead of the previous method of assuming 1% of available forested land in the watershed is harvested annually. This report includes harvesting done on federal land, e.g. National Forests.

Our standard operating procedures for tracking and reporting the Forest Harvesting BMP and other forestry BMPs like tree planting and riparian forest buffers is on file with the Chesapeake Bay Program Office. We will continue to work with the Forestry Workgroup to refine our methods as needed and as we are able.

SECTION 10. Air Deposition - 2013 SIP

Refer to the Chesapeake Bay TMDL Section 4.6.2 “Atmospheric Deposition” for a discussion of this source of nitrogen. West Virginia is complying with federal requirements for atmospheric controls that reduce nitrogen emissions. Appendix L of the Chesapeake Bay TMDL describes implementation for this sector:

“EPA included an explicit basin-wide nitrogen allocation, which was determined to be 15.7 million pounds of atmospheric deposition loads direct to Chesapeake Bay and tidal tributary surface waters. Activities associated with implementation of federal Clean Air Act regulations by EPA and the jurisdictions through 2020 will ensure achievement of this allocation. This nitrogen atmospheric deposition allocation is already accounted for within the jurisdiction and major river basin nitrogen allocations,” (p. L-24).

SECTION 11. Trading/Offset Overview

The WV Phase II WIP does not provide specific reservations of load for future growth. As such, loadings from new/expanded sources must be offset by controls on existing sources that reduce loadings beyond those required to achieve TMDL targets. This section defines the baseline loading reduction expectations for existing sources to achieve TMDL targets. Baseline definition is necessary for offset calculation in accordance with Appendix S of the TMDL **as are other provisions expected to be addressed by the jurisdictions to ensure that new loadings can be accommodated with credible and transparent offsets and that Chesapeake Bay TMDL goals are met.** The concepts described in this section may be used in case-by-case offset evaluations or as the foundation for a future comprehensive trading program.

At this time, a comprehensive trading program has not been demonstrated to be needed to accomplish WIP objectives for existing facilities. Nor are resources available for program development or implementation. The primary purchasers of trading credits would be traditional point sources subject to NPDES permitting requirements for which the allocation methodology provides modest mechanisms to address short term growth at existing facilities. Significant municipal facilities have been granted wasteload allocations based upon existing design flow and most have adequate capacity for the near future. Also the “no reduction” wasteload allocations provided for existing nonsignificant municipal facilities provide direct offset mechanisms if capacity expansion is coupled with improved treatment to maintain established allocations. All municipal facilities can be granted additional offsets if expansion involves the assimilation of other facilities or existing on-site systems. Nonetheless, circumstances may arise where new or expanding point sources need additional mechanisms to offset new loads. Such scenarios are intended to be evaluated case-by-case, with documentation and control requirements included in NPDES permits. Furthermore, the WVDEP will consider a comprehensive trading program if resources for administration become available. **West Virginia commits to work with EPA to address recommendations resulting from EPA’s assessment of the West Virginia’s planned offset protocols to ensure that future offsets adhere to the principles identified in Appendix S of the TMDL. West Virginia-specific recommendations will be addressed in calendar year 2012 by quantitative demonstrations of expected growth in the agriculture and developed lands sectors (including onsite wastewater systems) and evaluation of the need for additional actions. West Virginia will also address any applicable, unresolved recommendations common to all jurisdictions in calendar year 2013.**

Wastewater stakeholders that participated in the Region 9 Local Partner Involvement Process expressed concerns about the cost of making capital improvements to meet the TMDL wasteload allocations dictated in their NPDES permits and stated that a nutrient credit trading program would be an alternative cost effective approach. The stakeholders suggested a near term focus on point source-to-point source trading, definition of baselines for point sources and recognition that grouping of individual wasteload allocations is an acceptable compliance mechanism. The stakeholders suggested that a trading program gap analyses could be accomplished by comparing the results of EPA’s Offsets and Trading Program Review

Questionnaire to the previously developed draft nutrient trading framework (<http://www.wri.nrcce.wvu.edu/programs/pwqb/index.cfm>). They also suggested consideration of the Lycoming County, PA, Chesapeake Bay Nutrient Management Strategy as a potential trading model.

The following section proposes both point and nonpoint source baseline requirements. Coupled with the control authority provided by the NPDES permitting process, the baselines will facilitate case-by-case offset assessment and may allow the implementation of allocation adjustments between point source and nonpoint sources. Many scenarios are potentially viable provided the alternative under consideration results in the same delivered loads authorized by the TMDL and that implementation is ensured through NPDES permit requirements. Under those terms, the grouping of individual wasteload allocations is an acceptable mechanism.

The WVDEP remains committed to future pursuit of a comprehensive trading program if need is demonstrated and resources become available for development and implementation. Stakeholder recommendations will be considered in that process.

Offset Baselines

Wastewater and Septic

Individual wasteload allocations for existing significant municipal and industrial wastewater facilities are identified in Appendices A.1 and B.1. Similarly, wasteload allocation components are provided for existing nonsignificant municipal and industrial wastewater facilities in Appendices A.4 and B.2. The baselines for existing wastewater sources are the prescribed nitrogen and phosphorus wasteload allocations or components. The baselines for the four CSO communities are the loadings resulting from 85% reduction from 2010NA as represented in the watershed model and the wasteload allocations displayed in Appendix A.5 of the WV Phase II WIP.

The nitrogen baselines for existing on-site septic systems are the 2010NA nitrogen loadings.

Agriculture

The baseline for individual non-regulated agriculture operations, inclusive of manure transport, is 21 % N and 29 % P edge-of-stream reduction from 2010NA loadings. The specified reduction rates were determined by the average reduction from 2010 NA prescribed for the agriculture sector exclusive of the CFO land use in the final Phase II WIP 2025 model scenario (2010WVP2WIP525N122011).

The baselines for operations meeting medium or large CAFO animal thresholds are the loading reductions from 2010NA on production areas that result from the application of the Animal Waste Management System, Barnyard Runoff Control, Loafing Lot Management and Mortality Composting BMPs, as appropriate to the operation. Additionally, the baselines include

reductions associated with the development and implementation of Nutrient Management Plans for manure application to lands under the control of the owner/operator.

Stormwater

Except for redevelopment in MS4 areas, the baselines for existing regulated and non-regulated urban stormwater sources (including areas for which stormwater associated with industrial activity is regulated by NPDES permits) are the modeled 2010NA loadings. The MS4 General NPDES Permit capture requirements are the baseline expectation for redevelopment in MS4 areas. The baselines are the loading reductions from 2010NA associated with the BMPs applied to achieve capture requirements on the affected areas of urban pervious and impervious land.

The baselines for the harvested forest land use are the loading reductions from 2010NA associated with application of the Forest Harvest BMP.

The baselines for existing permitted extractive activities are the loading reductions from 2010NA on extractive land uses that result from the application of Abandoned Mine Reclamation BMP.

The baselines for construction activities are the loading reductions that result from conversion of construction land to pervious urban land in the 2010NA model scenario.

Offset Calculation/Implementation

The values of offsets are the pollutant reductions beyond baselines with the currency being delivered nitrogen and phosphorus loading. Exchanges between nitrogen and phosphorus are possible equal to the exchange rates established for the Phase II WIPs - 5.3 N : 1 P in the Potomac Basin and 1.6 N : 1 P in the James Basin. Offsets are not needed for TSS because TMDL TSS targets are model predicted loads associated with attainment of nitrogen and phosphorus caps.

In many instances, offset value calculation will necessitate evaluation by the 5.3.2 Chesapeake Bay Watershed Model. The existing model has documented flaws and case-by-case scenario evaluations may be somewhat cumbersome and time consuming. But the model is the primary tool available for evaluation of watershed loading until 2017 and the means by which TMDL implementation progress will be assessed. As such, alternative mechanisms for offset calculation will only be authorized if their pollutant reduction value can be scientifically documented by WVDEP with EPA concurrence.

Offset calculations will be described in the fact sheet associated with the draft NPDES permit that authorizes new or increased loadings and public notice and opportunity for comment will be afforded. The NPDES permit will also include requirements that ensure the actions by which offsets will be generated will be accomplished. **In addition to offset baselines and credit calculations, all other applicable Chesapeake Bay TMDL Appendix S provisions (“Common Elements”) will be addressed and documented in the permitting process. Most importantly, temporal consistency will be ensured between the offset generation and use periods, and the**

use of offsets will not be approved if the new source would cause or contribute to local water quality standard violations.

SECTION 12.
Reserved

SECTION 13. Federal Facilities

The WV-WIPDT has been working with the federal agency contacts to inform one another of plans in the WIP and the Executive Order 13508 Strategy, respectively. Our understanding is that federal strategies include:

- Milestones
- Stormwater Management requirements under EISA Section 438
- Current and future WV regulations that Federal lands would have to uphold, such as for stormwater management during and after construction, and timber harvesting.
- Identification of Wastewater Treatment Plants with permits that require upgrades.

Interaction with Department of Homeland Security (DHS) facility contacts began in spring 2011, Department of Defense (DoD) contacts began in early fall 2011, and USDA Forest Service has been reporting BMPs for the past 2 cycles. Additional contacts and information exchange has occurred through the Chesapeake Bay Program's Inter-Agency Federal Facilities Workgroup (IAFFW) since late fall 2011. The IAFFW provided a list of facilities with acreage within West Virginia's Potomac River watershed, responsible agencies, and contact information. The WV-WIPDT used these contacts to further refine the table (Appendix F) and the information in this section. The WV-WIPDT has also been discussing Chesapeake Bay TMDL plans with federal agencies to lay the groundwork for more efficient and complete coordination of tracking and reporting practices on federal lands. This work will continue beyond the deadline for the final Phase II WIP. An overview of WV Phase II WIP strategies relating to federal lands and permits, by source sector, follows.

Wastewater Sector

The Phase II WIP strategy for wastewater is basically to reduce loads from the significant facilities using concentration limits for nitrogen and phosphorus (see Section 6). Any new loads of this type, of any size, will need to seek offsets or make adjustments through plant upgrades to ensure permit compliance.

Significant facility – The federal leadership role has been achieved in the sense that the single federal permitted facility in this category, the U.S. Department of Interior – Leetown Hatchery, is currently in compliance (Appendix A.2).

Non-significant facilities – A small number of permitted facilities listed in Appendix A.4 are associated with federal lands. A list of such facilities is in draft form and will be reviewed by the WV-WIPDT and federal partners for accuracy and completeness.

Developed Lands Sector

The WIP strategy for WV's Potomac Basin is to keep loads from this sector equal to those in the 2010NA scenario, or in other words, to "hold the line" (see Section 7). This will be achieved through the stormwater permits administered by WVDEP, by the tracking of land use conversion to lower-loading land use types, and by other voluntary activities.

Regulated – One federal facility in WV's Chesapeake Bay drainage is permitted as a Municipal Storm Sewer System (MS4): VA Medical Center, Martinsburg (Department of Veterans Affairs), Berkeley County; submission of their stormwater management program was timely and is currently under review. Construction Stormwater General Permits are issued at times; likely a few registrations per year will represent federal facilities. Currently, DHS in Jefferson County and NIOC Sugar Grove Naval Facility in Pendleton County have open permits. A small number of Industrial Stormwater permits, as shown in Appendix B.3, are associated with federal lands.

Non-regulated - The EISA 438 (<http://www.epa.gov/oaintrnt/stormwater/requirements.htm>) requirements are currently generally considered by the stormwater community as adequate for maintaining current nutrient loads when a site is developed or re-developed. In this sense, when a federal facility experiences development in a non-regulated area that does not have a rainfall capture requirement, the federal facility will serve as a good example to non-federal development and re-development projects. They will achieve a level of stormwater management that is more strict than what is required in WV's WIP for non-regulated developed lands, and will help WV with reasonable assurance that TMDL levels will be achieved. Examples include the DHS Customs and Border Patrol facility in Jefferson County and NIOC Sugar Grove Naval Facility in Pendleton County. Environmental managers at both sites have incorporated the federal requirements and have in many cases implemented even more ambitious controls. For example, at the DHS facility, portions of the Global Borders College roof are green roofs, and bioretention was used to treat stormwater in the parking lot. This facility has to cope with sinkholes from the limestone geology, and the solutions it uses could serve as examples to the surrounding area.

Another example of leadership in green building practices is the US Fish and Wildlife Service (USFWS) National Conservation Training Center in Jefferson County. This facility has been the site of several recent workshops and trainings related to stormwater management, including the annual Chesapeake Bay Watershed Forum, Growing Communities on Karst workshops, and Chesapeake Bay Stormwater Partners retreats.

Although the WV Phase II WIP does not specifically prescribe stormwater retrofits on federal facilities in WV, it should be emphasized that any reductions made by this sector on existing developed lands will help offset loads from future development, ultimately aiding in meeting the "no net increase" goal and avoiding the use of contingencies.

Agriculture Sector

Many strategies for nutrient and sediment reductions are outlined [Section 8](#).

Regulated – [there are no CAFOs on federal land. The CBWM allocated some load to federal lands but in reality there are only grazing allotments on federal lands, not CAFOs.](#)

Non-regulated – When feasible, grazing allotments on USDA Forest Service lands should be evaluated and prioritized for stream protection BMPs, such as livestock exclusion fencing and grass and forest buffer plantings. [Management Directive RA12 of the Monongahela National Forest’s Land and Resource Management Plan states “\[s\]tream access points shall be selected for streambank and channel stability. Stabilization of the access points shall be accomplished if needed. When monitoring indicates that streambank stability is not being maintained, perennial or intermittent streams shall be fenced from livestock, and alternative crossings shall be designated.”](#) In addition, [SW56 says “\[d\]esignated livestock stream crossings and watering points should be located, sized, and maintained to minimize impacts to aquatic and riparian resources,” \(USDA Forest Service, 2011\).](#) USDA Forest Service is the largest federal landholder in WV’s Potomac Basin, with approximately 10% of the WV Potomac land area. Although grazing allotments make up only a small amount of the National Forests in this area (only 1,135.4 acres within the Monongahela National Forest in WV’s Potomac Basin and zero within the George Washington and Jefferson National Forests in WV), the USDA Forest Service is a leader in demonstrating the benefits and feasibility of these agricultural practices. As a notable example, from 2007 through 2009, the USDA Forest Service partnered with Trout Unlimited, the USFWS and other entities to improve water quality in Big Run in Pendleton County. On the Big Run Allotment, which is approximately 248 acres, over 7,200 feet of stream channel were fenced from cattle access, and 37 acres of buffer area were protected and planted with native species. The project also included cattle watering sites, gravel hardening for water protection, cattle crossings, and other Best Management Practices.

Forestry Sector

This sector was considered by WV-WIPDT to be non-actionable, [that is, the current strategy is not relying on reductions from this sector. However, the 2012 Forest Management Plan for the George Washington National Forest will refer to the Chesapeake Bay TMDL and its pollutants of concern \(USFS, Bailey, pers. comm.\). Chapter 2 \(“Forest-wide Management Direction”\) of the Monongahela National Forest’s Land and Resource Management Plan refers to local TMDLs and BMPs that reduce nonpoint source pollution, and includes specific Management Directions that support WV’s Phase II WIP. For example, SW20 says “\[m\]anage watersheds to sustain healthy aquatic systems, achieve desired conditions, and meet state designated water uses,” \(USDA Forest Service, 2011\).](#) Like the non-regulated developed lands sector, any reductions made by this sector will help WV to achieve its Cap Loads and avoid the need for contingencies.

[Any timber harvesting conducted on U.S. Forest Service property will be in compliance with WVDOF’s Logging and Sediment Control Act. This Act requires Best Management Practices on all timber harvesting operations \(as mentioned in Section 9a\).](#)

Tracking and Reporting

The WV-WIPDT anticipates federal partners providing the appropriate data for progress reporting to the CBPO. Federal agencies may submit their data directly through National Environmental Information Exchange Network or coordinate with WV staff to incorporate federal data into WV's annual BMP submission. WV will rely on federal partners to supply BMP data in a timely manner and with enough detail to avoid double-counting.

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Appendix L. Setting the Chesapeake Bay Atmospheric Nitrogen Deposition Allocations.

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also referenced from this same website:

APPENDIX A: West Virginia Potomac River Basin Water Quality Nutrient Trading Program

List of Appendices

Appendices are available on the web at www.wvca.us/bay.

Appendix A.1 Significant Municipal Facilities

Appendix A.2 Significant Facility Compliance Status

Appendix A.3 Typical Permit Requirements

Appendix A.4 Nonsignificant Municipal Facilities

Appendix A.5 Combined Sewer Overflow Facilities

Appendix B.1 Significant Industrial Facilities

Appendix B.2 Nonsignificant Industrial Facilities

Appendix B.3 Industrial Stormwater Summary

Appendix B.4 Anhydrous Ammonia (NH₃) Use

Appendix B.5 Mining Permits Summary

Appendix B.6 Construction Stormwater General Permit

Appendix C Sources of Nitrogen and Phosphorus in WV Potomac Counties.

Appendix D Delivery factors for nitrogen, phosphorus, and sediment for the West Virginia portion of the Chesapeake Bay watershed

Appendix E.1 Region 9 Local Partner Involvement Process – Description

Appendix E.2 Region 9 Stormwater Best Management Practices Inventory

Appendix E.3 Region 9 Local Partner Involvement Process – Wastewater Work Group

Appendix E.4 Region 9 Local Partner Involvement Process – Developed Lands and Industrial Work Group

Appendix E.5 Region 9 Local Partner Involvement Process – Elected Officials Work Group

Appendix E.6 Region 9 Local Partner Involvement Process – Chesapeake Bay Summit

Appendix F Federal Lands

Appendix G Tracking and Reporting Protocol (Agriculture)