Pennsylvania Chesapeake Watershed Implementation Plan
Phase 2

Prepared by the
Pennsylvania Department of Environmental Protection

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The policies and procedures outlined in this document are intended to supplement existing requirements. Nothing in the policies or procedures shall affect different statutory or regulatory requirements.

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Section 1. Introduction

Note: The Phase 2 Chesapeake Watershed Implementation Plan (WIP) updates on-going activities previously discussed in the Phase 1 WIP. This does not supersede or replace the majority of the discussion in the Phase 1 WIP. Pennsylvania will continue to implement the activities found in the Phase 1 WIP.

Since the publication of Pennsylvania's Phase 1 Chesapeake Watershed Implementation Plan (WIP) and the Chesapeake Bay TMDL in 2010, several activities have occurred that have shifted the course of the development of the Phase 2 WIP. Both the Phase 1 WIP and the Chesapeake Bay TMDL were developed based on the Phase 5.3.0 Chesapeake Bay Watershed Model. Based on concerns with how the model treated agriculture nutrient management and urban lands, the U.S. Environmental Protection Agency's (EPA) Chesapeake Bay Program Office revised the model (Phase 5.3.2) and issued to the states revised Phase 2 WIP Planning Targets on August 1, 2011.

According to EPA's current watershed model, when compared to 1985, Pennsylvania has achieved 27% of the nitrogen reductions, 31% of the phosphorus reductions, and 50% of the total suspended sediment reductions needed to reach Pennsylvania's 2025 restoration targets. This is real progress. When compared to current 2010 progress reported by the watershed model, Pennsylvania needs to achieve an additional 33.23 million pound reduction in nitrogen, 1.26 million pound reduction in phosphorus, and 524.4 million pound reduction in sediment by 2025. Pennsylvania is committed to protecting and enhancing our streams and watersheds. The efforts here in Pennsylvania will in turn help in further restoring the Chesapeake Bay by 2025.

Phase 5.3.2 Watershed Model Nitrogen, Phosphorus and Sediment Delivered Loads (Millions of Pounds)			
	Nitrogen	Phosphorus	Total Suspended Sediment
2010 Progress	112.06	4.858	2,469.4
August 1, 2011 Phase 2 WIP Planning Targets	78.83	3.60	1,945
Remaining Reductions	33.23	1.26	524.4

It should be noted that EPA's watershed model can be a useful tool to help guide management actions and project their results. It is not, however, sufficiently precise to measure actual progress or lack thereof. It should not be used in a regulatory context to determine whether an enforcement action or other penalty is appropriate.

Pennsylvania has submitted numerous comments to EPA regarding the inaccuracies of the watershed model which EPA acknowledged in an October 5, 2011 letter from EPA Region 3 Regional Administrator Shawn Garvin to DEP Secretary Mike Krancer. As EPA knows the watershed model is a good tool for planning purposes. However, it is also well known, that as the model is revised to a finer scale there are more inaccuracies and greater uncertainties in the model. From a planning perspective these recalibrations and the iterative process of the

refinements make sense. However, from a regulatory and enforcement perspective, this approach is difficult to justify. Pennsylvania is concerned that any increases in loads results in a moving target that makes planning extremely difficult. Moreover, these recalibrations demonstrate the inaccuracies in the model. As the Phase 2 WIP process begins and greater emphasis is placed on reductions at the county level, EPA has not provided the jurisdictions with a scientifically credible model to accurately measure reductions. For instance, models linking sediment yield exclusively with modern landuse are incomplete for watersheds impacted by milldams (Merritts, et. al. 2011). Furthermore, Pennsylvania has a number of legal concerns with this approach since EPA is using these models to measure progress and impose backstops and take other enforcement actions like modifying the TMDL to assume additional reductions from waste water treatment plants. Consequently, the use of an inaccurate watershed model to impose such legal consequences is arbitrary and legally suspect.

EPA initially instructed the states to sub-divide the Phase 2 WIP loads into local area targets. In consultation with its Chesapeake WIP Management Team, the Department of Environmental Protection (DEP) sub-divided the loads to the county level and developed Draft County Planning Targets for each of the 43 counties in the watershed. As the Chesapeake watershed states began to work with the watershed model at the county level, it was determined that the model results became less accurate at a smaller scale. Public input received at Pennsylvania Phase 2 WIP county meetings also verified this concern. Consequently, in its October 5, 2011 letter, EPA revised its Phase 2 WIP Guide to allow the states to submit watershed model input decks at the major basin scale (e.g. Susquehanna).

As the National Academy of Sciences ("NAS") notes in it publication *Achieving Nutrient and Sediment Reduction Goals in the Chesapeake Bay: An Evaluation of Program Strategies and Implementation*, (2011), the Bay TMDL should be approached as a process and not an endpoint. One way of achieving that goal is through the adaptive management process, which can be defined as "learning by doing." As the NAS report notes, one of the key elements of adaptive management is to have a clear understanding of model assumptions and limits so that model results are not equated with reality. This is especially true of the Bay watershed model where the NAS report finds that "even after years of application, testing, and validation, questions remain about uncertainty … ." Therefore, reliance of this model to implement a regulatory program that imposes enforcement consequences as those described in EPA's December 29, 2009 letter is wholly unjustified and arbitrary and capricious.

However, another key element of adaptive management is a collaborative structure for participation and learning. That collaborative effort entails comparing expectations with actuality, improving our understanding to reduce uncertainty and changing plans to improve water quality for the tidal segments of the Bay and its tidal tributaries and embayments. DEP is encouraged by language in the October 5 letter which states "that WIP implementation will be an adaptive process that continues to change both in the final Phase II WIP submitted on March 30, 2012 and in future two-year milestones." An approach that emphasizes adaptive management and cooperation is a far better approach than one based on consequences and enforcement. Pennsylvania intends to do its share fair, and work with the States, the District of Columbia, and EPA to achieve our mutual long time goal of restoring the ecosystem of the Bay.

Under the adaptive management process EPA must take a long-term approach to Bay ecosystem restoration recognizing the contributions that sound science and sound management play in this restoration effort. Model certainty is part of sound science and EPA must adequately address NAS's concerns that "issues of uncertainty largely are minimized or passed off" to the jurisdictions. This NAS concern about uncertainty arises from incomplete knowledge about the Bay model. On the other hand, EPA must recognize the sound management efforts that Pennsylvania has undertaken like the two laws were enacted that substantially assisted wastewater dischargers with potential upgrades to their systems to improve water quality. The first, Act 63 ("H2O PA Act") authorized the Commonwealth Financing Agency to incur indebtedness in an amount of up to $800,000,000, with proceeds from the sale of obligations to be allocated by grants to eligible applicants for, among other things, water or sewer projects. The second, Act 64, authorized indebtedness of $400,000,000 for grants and loans for water sewage treatment system expansion and improvement. EPA must weigh these concerns carefully as it reviews the Phase 2 WIP and determines if it should modify the TMDL to assume additional reductions from waste water treatment plants.

In its October 5 letter, EPA expects that the draft Phase 2 WIP will contain: an explanation of how jurisdictions are working with local partners; evidence that critical local partners are aware of their roles in the TMDL process; identification of targets or actions that local and federal partners would take; any changes to the Phase 1 WIP; and one input deck based on the basin level.

Additionally on October 17, 2011, EPA issued "Questions & Answers: Phase 2 WIPs." In the document, EPA says that the most important element of the Phase 2 WIP is the narrative, which explains how jurisdictions will work with key partners to get the necessary practices in place by 2025, with practices in place by 2017 that would achieve 60% of the necessary reductions between 2009 and 2025. The document further states: "Jurisdictions are expected to demonstrate in their WIP narratives that local partners (1) are aware of the WIP strategies, (2) understand their contribution to meeting the TMDL allocations, and (3) have been provided with the opportunity to suggest any refinements to the WIP strategies."

Pennsylvania's Phase 2 WIP documents an extensive public outreach process that addresses all of EPA's expectations identified above. The Phase 2 WIP narrative explains how Pennsylvania has and will work with its key partners to get the necessary practices in place by 2025, with practices in place by 2017 that would achieve 60% of the necessary reductions between 2009 and 2025. *Section 2. Local Partner Participation* describes Pennsylvania's County Planning Target exercise developed for the 43 Chesapeake basin counties. Eight regional county meetings were held covering the 43 counties in the Chesapeake watershed. Invitees included county conservation districts, county planning commissions and municipalities. *Section 3. County Initiatives* highlights four on-going initiatives in Lancaster, Lycoming and York counties and the Conewago watershed. DEP hopes that these model initiatives will be duplicated across the watershed in the future. Pennsylvania's Phase 2 WIP also provides greater detail on activities in the following areas: agriculture, stormwater, under-reported BMPs, wastewater treatment, federal agencies, and nutrient trading. Finally, the Phase 2 WIP provides additional information under the stormwater section, which provides strong support for why the "backstop" should be removed from this program.

Pursuant to comments received from the eight county regional meetings, DEP stated in the Draft Phase 2 WIP that it would not issue revised final County Planning Targets in the Final Phase 2 WIP. Instead, DEP would use the public comment received at the county workshops to inform the development of the Phase 2 WIP watershed model input deck for 2025 at the major basin-scale. It was learned that although the Chesapeake Bay watershed model may be appropriate to establish reduction targets at the major basin scale, there are limits to its application at a finer scale. The Draft Phase 2 WIP stated that the Draft County Planning Targets would be posted on DEP's Chesapeake Bay website to document DEP's extensive outreach effort, and to be available to counties if they seek to improve upon the watershed model generated targets.

DEP held a 45 day public comment period on the Draft Phase 2 WIP from December 17, 2011 to January 30, 2012. Many of the public comments received supported the issuance of local area targets to help inform county and municipal governments of the approximate level of effort necessary to reach Pennsylvania's TMDL allocations. In its formal evaluation of Pennsylvania's Draft Phase 2 WIP, EPA also called for local area targets. In response to these comments, DEP is modifying its approach to provide revised Draft County Planning Targets.

Shortly prior to issuing its Draft Phase 2 WIP, DEP learned that its Phase 1 WIP watershed model input deck distributed BMPs evenly across land-river segments, so some segments received implementation levels in the WIP that are less than what is reported historically. Consequently, many of the Draft County Planning Targets had 2010 BMP implementation levels that were less than what had been reported to DEP.

In developing its Final Phase 2 WIP watershed model input deck, DEP revised the 2010 county BMP levels to be consistent with historical data reported at the county-level. DEP additionally revised the Draft County Planning Targets to reflect 2010 county-level BMP implementation. The revised Draft County Planning Targets will be posted to DEP's Chesapeake Bay Program website. DEP acknowledges that the 2010 county BMP levels still do not account for unreported BMPs that were not cost-shared with government funds, but they are now a more accurate reflection of historical data reported by county to DEP. DEP will work over the coming year to develop a process to account for the unreported BMPs.

The schedule for the Phase 2 WIP development was as follows:

- November 1: Submit Draft 2012-2013 milestone commitments to EPA.
- November 30: WIP Management Team meeting to review Draft Phase 2 WIP.
- December 15: Submit Draft Phase 2 WIP to EPA.
- December 17 – January 30: PA Bulletin Public Comment Period (45 days).
- January 7: Submit Final 2012-2013 milestone commitments to EPA.
- February 15: Formal EPA comments on Draft Phase 2 WIPs due.
- February 15 – March 29: Revise Phase 2 WIP to address public and EPA comments.
- March 30: Submit Final Phase 2 WIP to EPA.

Section 2. Local Partner Participation

DEP successfully worked with local partners during the development of the Phase 2 Watershed Implementation Plan (WIP). This type of work will not stop with the completion of the Phase 2 WIP, however. Interacting with local partners will be an on-going effort because the work of local partners is critical to reaching Chesapeake Bay goals.

To effectively engage discussions during the Phase 2 WIP development process, DEP utilized various means, including:

- Conducted eight workshops that covered all 43 counties in the Pennsylvania portion of the Chesapeake Bay Watershed;
- Held a Chesapeake Bay WIP Summit;
- Participated in meetings of local government associations, Chesapeake Bay Commission and other organizations; and
- Built upon the success of Phase 1 by continuing to meet with the Chesapeake Bay WIP Management Team and its workgroups.

Phase 2 outreach efforts allowed DEP to raise awareness of the level of effort that is needed to meet TMDL planning targets and goals. It also allowed for discussions that are moving forward an understanding of state and local entity roles in the process. The outreach allowed DEP to better understand how local partners are contributing, and will continue to contribute to, protecting and restoring the Chesapeake Bay.

The remainder of this section provides additional details on the involvement of the local partners during the development of the Phase 2 WIP.

General Approach

The Phase 2 process provided a valuable opportunity for DEP to interact with Pennsylvania leaders from organizations at the local level such as conservation districts, municipalities, planning commissions and authorities. DEP's general approach was to engage groups in discussions about the level of effort needed to meet Chesapeake Bay TMDL goals. The discussions resulted in DEP receiving valuable new input and ideas that shaped the formation of this Phase 2 WIP.

The remaining sections of this chapter provide more details on the types of meetings or events that took place, such as the Chesapeake Bay WIP Summit.

Chesapeake Bay WIP Summit

On August 3, 2011, DEP and the Chesapeake Bay Funders Network (CBFN) co-sponsored the Pennsylvania Phase 2 Chesapeake Watershed Implementation Plan Summit: "Inviting Implementers and Funders to the Table." The Summit "kicked-off" the development of Pennsylvania's Phase 2 WIP. EPA participated and discussed planning targets for the TMDL and expectations for Phase 2 WIPs. DEP described the proposed process for developing the

Phase 2 WIPs at the county level. Pennsylvania project implementers highlighted their success stories, and the event ended with a roundtable discussion focused on how private philanthropies can help support priority activities.

Pennsylvania success stories were highlighted at the Summit, and included:

- No Till Farmer-to-Farmer Mentoring, Lebanon County - Capital RC&D and the Lebanon County Conservation District,
- EnergyWorks, BioPower, LLC,
- Warwick Township Conservation Partnerships - Lancaster County Conservation District,
- Lancaster City Stormwater - Lancaster Dept. of Public Works.

Roundtable Panel participants were from the following organizations: Chesapeake Bay Funders Network (CBFN); EPA; USDA Natural Resources Conservation Service (NRCS); Lancaster County Planning Commission; Chesapeake Bay Foundation; Pennsylvania Department of Agriculture; and DEP.

Chesapeake Watershed Implementation Plan Management Team

To help obtain input on the extensive number of issues and technical matters that needed to be addressed in the Phase 1 WIP, DEP employed a structure created in response to a suggestion made at a public meeting. A Management Team was formed, whose members include representatives of agriculture, wastewater, development, municipalities, business and environmental organizations. During Phase 2 WIP development, the Management Team again provided critical support and input by working through various components of the WIP. Management Team workgroups met as needed. In addition, for Phase 2, a new workgroup was formed to help focus on input decks for the Watershed Model. Following the completion of the Phase 2 WIP, the Management Team will continue to meet to provide input on Two-year Milestones, review annual Chesapeake watershed model progress runs, and to recommend adaptive management steps.

County Planning Targets and Workshops

The primary purpose of the Phase 2 WIP is to ensure that local partners who play a key role in cleaning up our waterways are engaged and ready to help implement the WIPs. To provide guidance to the states on their expectation for the Phase 2 WIPs, EPA issued the "Guide for Chesapeake Bay Jurisdictions for the Development of Phase 2 Watershed Implementation Plans" on March 30, 2011. In the Guide, EPA called on the states to divide the Bay TMDL allocations into local area targets. These local area targets were not finer scale wasteload and load allocations in the Bay TMDL but, when added together, were expected to equal the state-basin TMDL allocation caps. These local area targets were intended to help partners better understand their expected contribution to meet the TMDL allocations and assumptions.

Subsequent to receiving EPA's Phase 2 WIP Guide, DEP met with its WIP Management Team to discuss the local area target that would be most appropriate for Pennsylvania stakeholders. The WIP Management Team suggested that loads be sub-divided at the county-level because the

EPA Chesapeake Bay watershed model is based in part on county level data. They also recommended that the county planning targets would address only those loads that can be reduced by Best Management Practices (BMPs). This includes both regulatory and non-regulatory loads for agriculture, stormwater and forest. Wastewater treatment plant reductions were not included because they were previously addressed by the 2006 Chesapeake Bay Compliance Strategy.

The WIP Management Team also discussed DEP's outreach plan to engage with local stakeholders. It was agreed that DEP would convene eight regional county workshops covering the 43 counties in the watershed. Invitees to the workshops included 43 county conservation districts, 43 county planning commissions, and for each county, representatives from the PA Association of Township Supervisors, PA Association of Township Commissions, PA Association of Boroughs, and the PA League of Cities and Municipalities. Federal facilities were invited as well. Their involvement is described in Section 8. Although the workshops were invitational, the general public was welcome to participate, as well.

EPA provided the states with technical support from TetraTech to develop their Phase 2 WIPS. DEP obtained TetraTech support to develop Draft County Planning Targets for each of the 43 counties in Pennsylvania's Chesapeake Bay watershed. The Draft County Planning Targets were generated from EPA's Chesapeake Bay Watershed Model input deck developed for the Phase 1 WIP 2025 scenario. The County Planning Targets included a caution that they may not reflect actual 2010 conditions or possible 2025 conditions. The targets were for planning purposes only, and were not intended to become regulatory allocations at the county level. The identified Pollution Reduction Actions represented one scenario from the Watershed Model that met the planning targets. There were other equally valid combinations of actions that could also meet the planning target. It should also be noted that the Phase I WIP model 2025 input deck distributed BMPs evenly across land-river segments, so some segments received implementation levels in the WIP that are less than what is reported historically. The County Planning Target Template is provided in Appendix 2.

The public comment received at the county workshops was used to inform the development of the final Phase 2 WIP watershed model input deck for 2025. It was learned that although the Chesapeake Bay watershed model may be appropriate to establish reduction targets at the major basin scale, there are limits to its application at a finer scale.

DEP held a 45 day public comment period on the Draft Phase 2 WIP from December 17, 2011 to January 30, 2012. Public comments were received from nineteen organizations: The Cumberland County Planning Department (CCPD) and Cumberland County Conservation District; PA Fish & Boat Commission; Lancaster County Planning Commission; Citizens for Pennsylvania's Future; PennAg Industries Association; Clean Water Action; Chesapeake Bay Foundation (CBF); PA Municipal Authorities Association; Trout Unlimited; Department of Defense; American Rivers' Clean Water program in Pennsylvania; Lower Susquehanna River Keeper; World Resources Institute; Lycoming County Dept. of Planning and Community Development; PA Farm Bureau; PA Forest Products Association; PA Builders Association; Sierra Club, Pennsylvania Chapter; and Chester County. DEP reviewed the comments and, where appropriate, made revisions to the WIP.

Many of the public comments supported the issuance of local area targets to help inform county and municipal governments of the approximate level of effort necessary to reach Pennsylvania's TMDL allocations. In its formal evaluation of Pennsylvania's Draft Phase 2 WIP, EPA also called for local area targets. In response to these comments, DEP is modifying its approach to provide revised Draft County Planning Targets.

The Phase 1 WIP watershed model input deck distributed BMPs evenly across land-river segments, so some segments received implementation levels in the WIP that are less than what is reported historically. Consequently, many of the Draft County Planning Targets had 2010 BMP implementation levels that were less than what had been reported to DEP.

In developing its Final Phase 2 WIP watershed model input deck, DEP revised the 2010 county BMP levels to be consistent with historical data reported at the county-level. DEP additionally revised the Draft County Planning Targets to reflect 2010 county-level BMP implementation. The revised Draft County Planning Targets will be posted to DEP's Chesapeake Bay Program website. DEP acknowledges that the 2010 county BMP levels still do not account for unreported BMPs that were not cost-shared with government funds, but they are now a more accurate reflection of historical data reported by county to DEP. DEP will work over the coming year to develop a process to account for the unreported BMPs.

The revised Draft County Planning Targets document DEP's extensive outreach effort, and inform counties as they plan for nutrient and sediment reduction activities. DEP is initially working with Lancaster, Lycoming and York Counties to develop local strategies to implement the Phase 2 WIP. Through an adaptive management approach, DEP will apply lessons learned from these early initiatives to outreach efforts in counties across the Chesapeake watershed. Should a county want to improve upon the watershed model generated Draft County Planning Targets, DEP will support the county in the use of the Chesapeake Assessment and Scenario Tool (CAST). CAST is a new web-based tool designed to help states and counties assess the most effective ways to reduce pollution in the Chesapeake Bay watershed. Further discussion of this tool is included in Section 3. County Initiatives. Should counties want to join together to work in a regional effort, DEP will also support that activity.

Summary of Input from Outreach County Workshops

Public comment received at the County Workshops focused on concerns with under-reported BMPs, the Chesapeake Bay Watershed Model and the need for additional funding to support BMP implementation. A summary of the major comment themes for each workshop follows. A comprehensive summary of public comments received at each workshop is included in Appendix 1.

October 13, 2011 - Counties of Focus: Cumberland, Franklin, Adams, York, Perry

- The County Planning Target sheets under-report 2010 BMP implementation progress.
- There is interest at the county level to assist DEP in collecting under-reported BMPs.

- DEP needs to provide BMP reporting protocols so counties and municipalities can count non-cost shared or other un-reported BMPs.
- Municipalities are very interested in the new requirements for MS4s described in PAG-13, including the MS4 TMDL Plan and the Chesapeake Bay Pollutant Reduction Plan.
- From an urban, suburban perspective - development triggers implementation. Rate of development/redevelopment will dictate implementation rates.
- BMP planning targets will not be achieved without additional funding.

October 14, 2011 - Counties of Focus: Lancaster, Chester, Berks, Lebanon, Dauphin

- There is significant interest in helping report under reported BMPs.
- A BMP Tracking protocol needs to be developed so all partners can submit BMP data. Currently, only Conservation Districts report BMPs to DEP.
- Reductions are very ambitious, and not achievable under existing resources. Need to reconcile reality and need.
- Need more for Growing Greener funding. PENNVEST funding is needed to support agriculture BMP implementation. Any place that state can increase the availability of funding for qualifying projects is needed.
- There are limited staff resources to support tracking of un-reported BMPs. Additional staff is necessary to support this effort.
- Underscore the fiscal realities of municipalities. Urban/suburban BMPs will have to be supported by declining municipal budgets.

October 17, 2011 - Counties of Focus: Clinton, Tioga, Potter, Cameron, Elk, McKean

- The County Planning Target sheets under-report 2010 BMP implementation progress.
- There is interest at the county level to assist DEP in collecting under-reported BMPs.
- DEP needs to develop reporting protocols to get BMP information gathered.
- For the 2025 goal, greater emphasis is placed on #18, Off-Stream Watering without Fencing, than is given to #17, Off-Stream Watering with Fencing. This should be reversed, as there is a bigger bang for your buck on fencing projects.
- A program needs to be developed to address erosion of agricultural dirt and gravel roads.
- Much BMP funding is directed to targeted high priority counties. It is questionable whether non-priority counties will be able to accomplish BMP planning targets without additional resources.
- DEP's Stream Bank Fencing Program is excellent. Monies were shifted to other regions of the state and it is now not as easy to get the same level of funding. There are lots of small farmers with streams going through farms and fencing would help very much.

October 19, 2011 - Counties of Focus: Bradford, Susquehanna, Wyoming, Sullivan

- The 2010 progress BMPs do not reflect what people are doing, and the 2017 and 2025 goals are unrealistic. DEP should not promote the county planning targets as people will question their credibility.
- If the BMP verification process increases, it will be resource intensive and more expensive.

- Bradford and Sullivan Conservation Districts commented that they are losing more nutrients and sediments through inadequate stream bank stabilization, than from agriculture run off. The Legacy Sediment BMP under development should also address loads associated with historic logging on steep slopes.
- Funding and resources is needed to address needed stream bank stabilization.
- Concern was expressed that high quality/non-impaired streams and non-priority counties are not receiving as much funding as they had in the past. Concern was directed to DEP and NRCS programs.

October 20, 2011 - Counties of Focus: Luzerne, Schuylkill, Carbon, Lackawanna, Wayne

- The County Planning Target sheets under-report 2010 BMP implementation progress.
- There is interest at the county level to assist DEP in collecting under-reported BMPs.
- USDA Farm Services Agency (FSA) should provide more help in reporting BMPs.
- Participant noted that there are zero acres of urban nutrient management in 2010 and over 700 acres planned for 2025. Concern was expressed that without legislation to establish an urban nutrient management program, that this BMP cannot be tracked.
- There are many small horse operations that are not counted. Many of them are not "farms," but are in someone's backyard. There is concern that the land may not be considered agricultural land, which means that agricultural BMPs cannot be credited for land that is not considered agricultural.
- DEP's Chesapeake Bay Special Project Grant Program works well, money easy to use, efficient at getting projects on the ground, able to use faster than NRCS.
- Cost share money has been reduced and directed to high-priority counties. Understand targeting funds to hot spots, but that does not help lower priority counties.
- EPA needs to help. It is setting lofty goals. Concern was expressed over, given the economic conditions, what happens if goals are not met.

October 25, 2011 - Counties of Focus: Union, Lycoming, Northumberland, Columbia, Montour, Snyder

- Participants acknowledged that there is a problem with under-reporting of BMPs, but expressed concern over the work load associated with tracking them. It will not change water quality. They are more interested in real decreases in loadings, and not just in the model.
- Support was expressed for finding other ways to collect BMP information and using USDA data.
- Concern was expressed that NRCS Chesapeake Bay Watershed Initiative funding goes to high priority watersheds, and that farm bill funding may reduce in the future.
- There are staffing and funding gaps which will make it difficult to achieve BMP planning targets.

November 1, 2011 - Counties of Focus: Clearfield, Centre, Mifflin, Cambria, Indiana, Jefferson

- The County Planning Target sheets under-report 2010 BMP implementation progress.
- There is interest at the county level to assist DEP in collecting under-reported BMPs.
- DEP needs to develop reporting protocols to get BMP information gathered.

- Participant commented that a lot of farmers putting in no till conservation practices. FSA is reporting crops, but there is a disconnect when reporting conservation practices.
- Participant commented on the fact that information on urban BMPs are only coming from NPDES permits. County has Act 167 plan, but there is no NPDES permit. Problem/challenge: BMPs are below the threshold/minimum to be credited; also counties are not keeping track of BMPs. If not part of permit, how are they getting recorded?
- Concern was expressed regarding the timing of the Phase 2 WIP process, and commented that it will be very difficult to collect the BMP data by EPA's December 15 deadline.
- Interest was expressed in participating in the Nutrient Trading program.

November 2, 2011 - Counties of Focus: Huntingdon, Blair, Juniata, Somerset, Bedford, Fulton

- The County Planning Target sheets under-report 2010 BMP implementation progress, especially production agriculture.
- Numerous participants expressed interest in helping to collect unreported BMPs, but need DEP protocol for collecting BMP data.
- Participant mentioned that they use the Dirt and Gravel Program as a learning opportunity to teach others how to deal with unpaved roads. Once someone does the training, they are eligible for the funding. Participant is concerned that once the townships continue the process with different funding sources, they may not be included in reporting or tracking.
- There is concern that counties will be held accountable for numbers in the future, and be subject to fines and regulatory action if they fail to meet the numbers. They are not objecting to the overall mechanics of this process, but believe there is a disconnect between the real world, the model world, the regulatory world, and the political world.
- Significant concern was expressed by numerous participants that available funding to implement BMPs is being cut and they are concerned about ramifications if we fail to meet milestones. They are concerned repercussions will fall on municipalities and counties.
- A participant requested EPA to increase funding for BMP implementation.
- Funding for Act 167, Stormwater Management Act has been eliminated, thereby creating a disincentive for development of plans and ordinances. Some counties do not have county stormwater management plans.
- Participants expressed support for the Dirt and Gravel Road Program, but suggested funding was not adequate to support the expected level of implementation in 2025.

Examples of Other Outreach Conducted

As resources allowed and in response to invitations, DEP made presentations at meetings of interest groups, local governments, business, industry associations and other groups. Through these meetings, DEP discussed the approach to WIP development, answered questions pertaining to the drafting and implementation of the WIP, and listened to comments and suggestions. DEP presented information on the Phase 2 WIP at a number of meetings, including:

- November 3, 2011: SWEP Capital Chapter's Annual Regulatory Update Seminar,

- September 22, 2011: Pennsylvania/Department of Defense Environmental Partnership Meeting,
- September 6, 2011: Harrisburg Regional Chamber & CREDC Environmental & Energy Committee Meeting,
- August 15, 2011: County Commissioners Association of Pennsylvania (CCAP) Meeting,
- June 14, 2011: Water Resources Education Network (WREN) Conference,
- May 25, 2011: Local Government Advisory Committee of York County Awards Dinner,
- March 27, 2011: CCAP Energy, Environment and Land Use Committee.

Section 3. County Initiatives

This section highlights outstanding work taking place in Lancaster, Lycoming and York Counties, as well as the Conewago Creek Initiative. DEP will use lessons learned from these initiatives to apply to other counties across the Chesapeake watershed.

In addition to these highlighted county initiatives, DEP will maintain a close working relationship with the County Commissioners' Association of Pennsylvania. DEP also directly funds County Conservation Districts to support Chesapeake Bay Field Technician staff and implement agricultural BMPs. Should a county want to improve upon the watershed model generated Draft County Planning Targets, DEP will support the county in the use of the Chesapeake Assessment and Scenario Tool (CAST) developed by EPA.

CAST is a new web-based tool designed to help states and counties assess the most effective ways to reduce pollution in the Chesapeake Bay watershed. CAST allows users to develop and quickly receive feedback on various pollution reduction scenarios. Using CAST, users are able to see the implications of their specific actions and management decisions and gain an understanding of which Best Management Practices (BMPs) are most effective at reducing the nitrogen, phosphorus, and sediment loads reaching their local streams and entering the Bay. CAST can be found at www.casttool.org and is also available via the Bay TMDL website. CAST continues to be refined by the EPA Chesapeake Bay Program Office. Improvements under consideration will make the tool more useful at the county level in the near future. Should a county wish to pursue use of the CAST tool, it should contact DEP's Interstate Waters Office. It should be noted that the CAST tool is useful for county-level planning reductions targets and identification of BMPs that can meet the planning targets at the county-level. It is not designed to provide planning targets or BMPs for other forms of Pennsylvania local governments, including townships, boroughs or cities.

Lancaster County Clean Water Consortium

The Lancaster County Clean Water Consortium is a steering committee of the Lancaster County Conservation Foundation, a 501(c)(3) organization formed by the Lancaster County Conservation District Board of Directors. The mission of the Consortium is to facilitate the development of proactive, efficient and cohesive strategies to restore and maintain the waterways of Lancaster County, ultimately resulting in compliance with federal and state regulations intended to reduce pollution and accelerate restoration of the Chesapeake Bay. The Consortium is organized into five committees: Membership, Technology, Education, Grants, and Stormwater.

Steering Committee membership includes the following: Township Supervisors; Township Manager; Lancaster County Planning Commission member; Borough Environmental Resource Manager; Watershed Associations; Conservation Foundation of Lancaster County; Lancaster County Conservation District Board member; citizens active in county water quality issues for over 30 years; engineers; watershed consultant; nursery owner; legal practitioner; Building Industry Association of Lancaster; Lancaster County Conservation District Administrator; Biology Professor; Lancaster County Planning Commission Senior

Planner; Sustainability Coordinator; Professional hydrogeologist; County Watershed Coordinator; Lancaster County Agriculture Council; Executive Director of the Lancaster County Inter-municipal Committee.

Lancaster County is composed of 12 watersheds governed by 60 municipalities. The Consortium's 2012 top priority is to hold a countywide Clean Water Summit bringing together stakeholders to encourage the compilation of all local watershed implementation plans so that municipalities may satisfy their MS4 goals and address Chesapeake Bay TMDL pollution reduction goals. The idea is to stack multiple benefits for dollars spent. Since watersheds are not respecters of municipal boundaries, inter-municipal cooperation will be paramount. See www.lancasterwatersheds.org for detailed information about Lancaster County Watersheds.

In the past, municipalities have gone it alone. The Consortium's main goal in 2012 is to serve as an educator. The Consortium's educational efforts are to inform municipalities about the Phase 2 WIP and how it impacts them. The goal is to have a holistic approach so municipalities know what Best Management Practices (BMPs) are called for in their municipality based on the 303(d) impaired stream list. Lancaster has 700 miles of impaired streams. Plans are needed for the de-listing of all Lancaster County streams by 2025, in hopes of reaching both local and Chesapeake Bay TMDL requirements. DEP is supporting the Consortium's effort to develop a Strategic Action Plan through the allocation of TetraTech technical assistance hours. The Plan will be designed to coordinate the numerous watershed planning and BMP implementation efforts in Lancaster County. EPA is providing states a limited number of hours for TetraTech technical assistance.

Through education and strong municipal role models such as Warwick Township, the consortium is seeing a heightened interest by municipalities in fulfilling their obligations. The Consortium has been in existence since September of 2010. During that time, the Consortium has held eight seminars describing watersheds, hydrogeology, the Phase 1 and Phase 2 WIPs, and low impact stormwater methods. A website was created to disseminate information: www.lccwc.com.

The Consortium moderated a discussion about legacy sediment with Franklin & Marshall College, Stroud Water Research Center, DEP, Lancaster County Conservation District, Chesapeake Bay Foundation and other interested parties to better define how local watershed alliances should decide whether or not to remove legacy sediments before stream bank restoration takes place. The Consortium recognizes that these types of decisions will have a fundamental impact on the WIP Phase 2 progress in the long run. The Big Spring Run Restoration Project that addresses legacy sediment by restoring natural floodplains, streams and riparian wetlands is a unique collaboration of State, Federal, Municipal, academic, private, and other parties, including members of the Consortium's steering committee. Continued monitoring at the Big Spring Restoration Project will provide data to quantify the benefits of addressing legacy sediment and provide a better answer the question of what alternative strategies may be implemented at sites impaired by legacy sediment.

Lancaster County believes it can, given all the facts and resources needed, find the best local solution for its unique local problems to restore and preserve local streams. Local jurisdiction members have participated in the seminars as panel members and presenters. Municipal voting

members of the Consortium steering committee include Paradise Township, West Lampeter Township, East Hempfield Township, and Ephrata Borough. The Lancaster Inter-municipal Committee, which represents 12 of the largest municipalities, has a seat on the steering committee as a non-voting member.

Coordinating current planning efforts can accelerate watershed restoration and protection activities in our watersheds by filling gaps and eliminating overlaps. With grant money shrinking and less Section 319 money available, the municipalities will be asked to include watershed restoration in their budgets which, at this time, are seeing drastic shortfalls in these challenging economic times. Local municipal officials will be called upon to oversee the cleanup of local watersheds and see clean water as a valuable asset. Coordination of educational support as well as volunteer support from watershed alliances will be invaluable. Benefit stacking will become invaluable. Building partnerships when applying for and receiving available grant money to fill the gaps will be critical.

The Consortium worked behind the scenes through steering committee volunteer hours so that other local agencies have recently been the recipient of a $400,000 National Fish and Wildlife Foundation grant. This grant will be used to restore the Little Conestoga Watershed in partnership with Manor Township, the Lancaster County Conservancy, the Little Conestoga Watershed Alliance, HabitatMT, Lancaster County Conservation District and others. A county wide database will be developed to track installed engineering structures (BMPs) designed for water quality and quantity benefits. Manor Township is the largest land mass jurisdiction in Lancaster County and is approximately 75% agriculture. Conservation plans will be written and implemented and suburban property owners will be educated on lawn fertilizer use and the value of tree canopies. Brecknock Township, a 95% agricultural community, is also a Consortium member. The supervisors of Brecknock have implemented a program for its Plain Sect community to get conservation plans written and on the ground. The Lancaster Farmland Trust will also be getting involved in hopes of preserving the farmland while at the same time putting into place the necessary conservation BMPs.

The Consortium's purpose is to bring together all organizations in Lancaster County that focus on water quality and make a difference for comprehensive water resource management. This includes all the watershed alliances. Matt Kofroth, the Watershed Specialist from the Lancaster County Conservation District, is a non-voting member of the steering committee. Matt has been the countywide spokesperson for the watershed alliances for many years.

Lycoming County WIP Case Study

In 2008, the Lycoming County Commissioners made a bold decision. They chose to invest half a million County dollars to bring the whole community to the table to develop a plan for how to more cost-effectively meet water quality standards required to restore the Chesapeake Bay. Their decision led to a model County approach with important benefits for local residents, farmers, businesses, and the environment.

The impetus for taking this step was a staggering price tag: Seven wastewater treatment plants (WWTPs) in the county needed upgrades at an estimated cost of $225 million. The plants faced

tight deadlines, with the last upgrades due by 2013. The commissioners feared that putting that full burden on ratepayers might convince industries to leave the county and would exceed many residents' ability to absorb costs. At the same time, some urban communities being asked to make these investments pointed toward the impact of agricultural runoff, and talk began of a Chesapeake Bay TMDL that would impact all sources. Farmers began to worry that they would be next, with enhanced enforcement of Pennsylvania's nutrient management laws.

The County program began with a series of stakeholder meetings, including a large day-long workshop in spring 2008. An extensive local stakeholder network of more than 100 interested persons was developed, with approximately fifty individuals serving on three standing work groups that continue today. All aspects of the Bay challenge are discussed, and important relationships have been built that promote cross-sector understanding.

The goals of the County's program are as follows:

- Improve water quality in our local waterways,
- Contribute our fair share to the Chesapeake Bay recovery,
- Provide flexibility for WWTPs in meeting compliance,
- Preserve economic development opportunities by keeping costs reasonable,
- Integrate all sources of pollution into the solution.

The major initiative devised by Lycoming County's stakeholders was a County-based nutrient trading program, created within the boundaries of Pennsylvania's nutrient trading program, administered by DEP. Credit trading utilizes market-based principles to allow communities to work together to achieve the desired pollutant reductions through more cost-effective means. The cost to remove a pound of nitrogen or phosphorus through wastewater treatment is often far greater than doing so through agricultural BMPs (Best Management Practices). Rather than invest in expensive bricks-and-mortar upgrades, some wastewater authorities have opted instead to purchase credits created by less-costly nonpoint source projects, such as streambank fencing and riparian buffers installed on a farm to reduce pollution.

Lycoming County farmers whose farm operations exceed the state's baseline and threshold requirements can create certified nutrient credits. The number of nutrient credits, representing real pollution reductions, is calculated by the Lycoming County Conservation District. District staff utilize spreadsheets that combine information about established BMP efficiencies with information about the specific farm operation and its improvements. The credits, representing the additional nitrogen and phosphorus prevented from entering local waterways and the Bay, are then certified by DEP through the state nutrient trading program. The credits can be sold to permitted point sources, such as wastewater treatment plants (WWTPs). The credit sale reduces compliance costs for ratepayers and provides the farmer with an additional income source to sustain and improve the farm operation.

Wastewater treatment plant operators or other authorized NPDES permittees who need to reduce the amount of nitrogen they put in local waters can buy the credits to help meet their goals. Buying the credits may help the plants avoid upgrades entirely, or allow them to do less expensive upgrades and offset any shortfall in pollutant reduction with the credits. Buying credits can also gain the plants time to evaluate future needs or arrange capital.

For the County, the approach has many stacking benefits. Nutrient trading can:

- **Provide flexibility to wastewater treatment plants:** Credit trading enables the exploration of more cost-effective options for reducing pollution.
- **Improve financing options for local sewer authorities:** A regional approach increases the viability of funding from state and federal government sources that prefer to address environmental issues on a larger geographic scale. This helps to minimize impacts on ratepayers. Two wastewater regionalization success stories in Lycoming County have already attracted increased grant funding.
- **Multiply environmental benefits**: Investments in local agricultural BMPs improve the county's natural habitat, recreational uses and tourism, stormwater management and flood control, in a way that bricks-and-mortar plant upgrades often cannot.
- **Enable economic growth**: Businesses are attracted to a county that demonstrates innovative approaches to compliance. Controlling costs at existing wastewater treatment plants (WWTPs) in core communities enhances the feasibility of redeveloping old industrial sites and targeting economic growth to planned growth corridors served by existing infrastructure.
- **Drive cost-effective compliance and enable local control.**

Lycoming County has created a portfolio of nutrient credits generated on local farms. In 2010 and 2011, the first nutrient credit auctions were held, administered by the Pennsylvania Infrastructure Investment Authority (PENNVEST). These two auctions together generated more than $110,000 in revenue for nine county farmers and the County. As the program is scaled-up, more credits will be available for use by local WWTPs entering their compliance periods in 2012 and beyond. Already, one WWTP in Lycoming County has determined that it can save $1.2 million over a 20 year period by purchasing credits rather than upgrading for nutrient removal.

The County has received more than $860,000 in grants from public agencies and private foundations to support its ongoing work, including agricultural outreach, public education, water quality monitoring, and BMP demonstration projects. Two major grant-funded projects that will be implemented in 2012 are a floodplain restoration project on an eroding stream, and a water quality monitoring project to assess the impacts of streambank fencing on four farms. The grant awards recognize the County's work as a leading local government voice in the Bay recovery. The County's long-term strategy is to achieve program sustainability through credit revenues, as income from previous credit sales can be used to fund additional, innovative pollution reduction projects.

York County TMDL Workgroup

The mission of the York County TMDL Workgroup is to develop a meaningful and programmatic implementation strategy to reduce York County's contribution of nutrients and sediment entering local waters and ultimately the Chesapeake Bay.

The York County TMDL Workgroup was initiated by the Chesapeake Bay Circuit Rider operating in York County through the Alliance for the Chesapeake Bay. The Workgroup is

composed of local elected officials, planning commission staff, conservation district staff, waste water treatment representatives, local watershed groups, citizens, water authorities, farmers, and other stakeholders. The purpose of the TMDL Workgroup is to bring together representatives from all source sectors in York County to collectively and collaboratively develop an implementation strategy the makes sense to York County, is cost effective, meets or exceeds local targets, and is feasible. This strategy must be comprehensive enough to identify priority best management practices in priority watersheds where there is reasonable assurance that there is local support for implementation.

The TMDL Workgroup has met more than 6 times to discuss the State's Phase 1 and Phase 2 WIP. The Workgroup has decided to develop a unique implementation strategy for York County. To do so two short term committees have been created to aid the development of the implementation strategy. The first committee is the Implementation Strategy Outline Committees whose mission and purpose are to develop the outline and sections (i.e.: table of contents) of the strategy. The Communication and Outreach Committee will be developing professional education and outreach pieces to aid in the communication about the progress of the TMDL Workgroup and the status of the TMDL and WIP processes at the state and federal levels. To accomplish this task, DEP has requested, on behalf of the York County TMDL Workgroup, the use of a professional facilitator for the committees referenced above.

Once the outline has been developed and the communication pieces are complete, the short term committees will be disbanded and new committees formed to develop the plan content. Once again a professional facilitator will be used to direct and lead the committees during the development of the plan content. DEP is supporting the York County's effort to develop an Implementation Plan through the allocation of TetraTech technical assistance hours. EPA is providing states a limited number of hours for TetraTech technical assistance.

The main objective of the York County TMDL Workgroup is to allow York Countians to develop their own strategy of how best to reduce nutrients and sediment going to local waters. To avoid one source sector group pointing fingers or placing blame on another source sector group, every sector is represented equally. As a result, everyone involved knows the hardships of various BMPs on each individual source sector.

Conewago Creek Conservation Initiative

Project Description. Conewago Creek is a 52-square mile watershed in parts of Dauphin, Lancaster, and Lebanon Counties, Pennsylvania. It is a rural watershed in southcentral Pennsylvania. Agriculture is the predominant land use, but it also includes a mix of forest and urban/suburban residential and commercial land use types. Like many agricultural watersheds, the Conewago is impaired by nutrients and sediments carried by runoff from agriculture, septic systems, land and turf fertilizer applications, and other residential, commercial, and municipal activities. A local TMDL was developed by PADEP in 2001. In 2006, the local watershed group sponsored the development of a Section 319 Watershed Implementation Plan.

While the local watershed group and conservation districts were making incremental progress toward BMP implementation in the watershed, a greater partnership was needed to do more.

Through this project, Penn State Cooperative Extension is facilitating a broad-based partnership to build synergy and coordinate partner activities and focus resources within the targeted watershed. This work also dovetails with USDA's designation of the Conewago as Pennsylvania's Showcase Watershed for targeted Chesapeake Bay restoration efforts. Collaborating to pool resources, skills, and ideas, Initiative partners are working with watershed farmers, homeowners, business owners, and municipal officials to increase awareness of and interest in adopting land management practices that will improve water quality of local streams, ensure healthy farms, forests, and communities, and protect and maintain quality of life, with the ultimate end goal of restoring the water quality of the Conewago Creek.

Organization: Penn State Extension. Matt Royer, Conewago Creek Initiative Local Project Coordinator, (717) 948-6459, mroyer@psu.edu, www.extension.psu.edu/aec, www.conewagoinitiative.net.

Project Partners: Dauphin, Lancaster, Lebanon County Conservation Districts, USDA NRCS, DEP, Tri-County Conewago Creek Association, South Londonderry Township, Elizabethtown College, Chesapeake Bay Foundation, USGS, ZedX, Inc., and many others.
Grant Award: $750,000
Matching Funds: $750,000

Goals and Outcomes. The overarching goal of the project can best be described by the Vision for the Conewago, as developed by the residents of the watershed during the 2010 watershed visioning process:

> The Conewago Watershed Community has envisioned a future that establishes a restored Conewago and its tributaries as a centerpiece of pride and a treasured asset in a rural landscape. This vision includes a strong agricultural community and productive farmland, community recreation areas and vibrant, well-planned communities. Pristine landscapes will be protected while providing sustainable uses of natural resources, clean water and streams, and educational opportunities for generations to come.

Specific goals and outcomes in reaching this vision are as follows. Each goal is being implemented by a work team consisting of Initiative partners with expertise in the particular area:

1) **Increase outreach and education to watershed residents** so that all segments of the watershed (agriculture, forest, residential, commercial, municipal) are aware of and get excited about land management practices that can improve water quality. (Stewardship Development Team).
2) **Assist landowners in adoption of BMPs** so that motivated landowners are linked up with the financial and technical assistance resources they need to adopt BMPs that will result in significant sediment, phosphorus, and nitrogen reductions. (BMP Team)
3) **Develop and implement a monitoring plan** that will measure short and long term improvements toward environmental goals. (Monitoring Team)
4) **Increase local awareness of the ecosystem services** provided by well managed lands and waterways, their value, and the potential for environmental improvements to qualify for participation in environmental markets. (Environmental Markets Team)

Status. The following outcomes represent the progress to date in meeting the specific goals of the project:

1) Increase outreach and education to watershed residents.

- A facilitated Conewago visioning process was held whereby over 100 residents of the watershed were engaged and provided input into developing "A Vision for the Conewago." This vision provides a blueprint for Initiative partners for implementation as partners move forward with their collaborative work. A 32-page Vision Report was produced. Conewago Initiative partner WPSU (Penn State Public Broadcasting) also prepared a 7 minute vision video that accompanies the vision statement and has been used as an outreach and engagement tool at events in the Conewago watershed and beyond. A logo was developed by WPSU to help provide a unique brand for the Initiative.
- A Conewago Initiative website (www.conewagoinitiative.net) was developed and is maintained by Penn State intern. The Conewago Connection, a monthly e-news email, and Conewago Currents, a more detailed quarterly e-newsletter, were developed and are distributed to watershed residents and partners.
- A survey of watershed landowners was developed and mailed to all agricultural landowners and approximately 1500 randomly selected non-agricultural landowners in the watershed, in order to gauge attitudes about and understanding of clean water. Survey results are being analyzed by Dr. Kathy Brasier, Professor of Rural Sociology at Penn State, lead researcher on the project. Preliminary results reveal a high concern about water quality and a high conservation ethic among watershed residents, particularly farmers. Survey results will help Initiative partners prioritize further engagement efforts in the watershed. Conewago Initiative partners offered a total of 16 workshops or events over the last year for residents of the Conewago watershed and greater area. Examples include a forest landowner workshop, riparian buffer workshop, green stormwater solutions for homeowner workshop, and cover crops and manure injection field day.

  Penn State Extension's innovative 4-H Conewago Stream Teams program has reached over 2,350 youth in the Conewago watershed and surrounding region.

2) Assist landowners in adoption of BMPs.

- Conservation District partners conducted comprehensive farm surveys of over 90% of farms in the watershed to determine baseline level of conservation practices. Survey results were analyzed to develop priorities for conservation work.
- Agricultural technical assistance staff for Conservation Districts and NRCS continue to work with watershed farmers to adopt conservation BMPs, following the priorities established in the District farm surveys. In 2011 alone, applications were processed for funding 116 new agricultural conservation practices in the watershed, including more than 1,000 feet of new access roads, 120 feet of stream bank protection, three stream crossings, more than 2,000 feet of new diversions, almost 20,000 feet of new terraces and almost 5,000 feet of fencing, to name a few. Over the last year, a program to engage non-farmer residents of the watershed has been developed and is being implemented. Working with Tetra Tech Inc., Initiative partners are assessing stormwater impacts from developed areas in the watershed in order to prioritize areas for stormwater BMPs and urban stream restoration. Penn State Landscape Architecture and Engineering students worked with Conewago residents and presented a workshop on green infrastructure stormwater solutions for property owners. As a final work product of their class, Landscape Architecture students

developed a guide for Conewago homeowners entitled "Eco-landscaping for Water Quality" and presented it at the workshop. Conewago Initiative partners are also developing a conservation toolbox for municipal officials.

3) **Develop and implement a monitoring plan.**
   - The Conewago Monitoring Team developed a comprehensive, long term monitoring plan for the Conewago. Lead partners (USGS, Dauphin County Conservation District, PADEP, and Elizabethtown College) are presently implementing the plan.
   - A USGS gage station was installed in the Conewago along Sawmill Road and began collecting and providing real time, continuous monitoring data online.

4) **Increase local awareness of ecosystem services.**
   - Penn State students produced preliminary drafts of outreach materials to educate watershed residents about the value of ecosystem services.
   - Environmental Markets Team held several meetings to discuss Pennsylvania's PEACCE program and whether it could be piloted in the watershed to provide farmers with a third party assessment tool to determine farmers' baseline and threshold for participation in nutrient trading and other environmental market opportunities.

Challenges and Lessons Learned. Any broad-based partnership faces the challenge of ensuring that the many and varied partner actions are being taken collaboratively and avoiding duplication of efforts. The Conewago Initiative is no exception. To overcome these challenges, the Initiative has instituted regular meetings of the Conewago Project Advisory Team (consisting of representatives of all partners) and work teams so that partners have consistent opportunity to share relevant organizational updates. This has increased the level of cooperation and collaboration and has instilled a collegial working relationship among partners.

Readiness for Scale Up. Even at this early stage, the collaborative partnership process being employed in this project has proven to be successful in bringing together a multitude of stakeholders in a single watershed to focus on the singular goal of improving water quality. This has led to greater collaboration and thus more implementation than if the partners were "going it alone." By being intentional about making this about the partners and more importantly the watershed residents (as opposed to a particular organization), the Initiative has been able to gain traction and credibility within the community. The visioning process was a key early step that resulted in widespread community involvement and buy-in. The visioning video has been one particular tool that has received positive feedback from the watershed and neighboring communities. These engagement processes can easily be transferred to other watershed communities. Conewago Initiative partners are very willing to share their story of what processes have worked and lessons learned regarding the partnership model to date, and in fact have given presentations on the Initiative at several venues.

Susquehanna Greenway Partnership: *Linking Land Use and Water Quality; Incorporating Green Infrastructure Practices at the Municipal, Neighborhood and Site Scales*

The Susquehanna Greenway Partnership (SGP) is a 501(c)(3) non-profit organization and leading champion for the Susquehanna River Watershed. SGP works to advance public and

private efforts to connect people to the natural and cultural resources of the Susquehanna and promote a sustainable and healthy environment.

The Susquehanna Greenway is an evolving corridor of interconnected parks, trails, river access points, and conserved areas linking people to the natural and cultural treasures of the Susquehanna River and its West Branch. Nearly 500 miles in length, it is Pennsylvania's largest greenway embracing and protecting the state's longest river which contributes nearly half of the fresh water entering the Chesapeake Bay. The Susquehanna Greenway is a large landscape initiative that fosters smart growth, revitalization of river communities in order to *create healthy, sustainable Susquehanna communities.*

While gray infrastructure, such as water treatment facilities, protect water quality, green infrastructure protects water quality, and provides many other benefits to communities. Greenways contribute significantly to our quality of life, and increasingly are seen as a focal point for community design and land use strategies:

- Greenways enhance the sense of place in a community or region.
- Greenways accentuate the scenic beauty and majesty of our state.
- Greenways protect our state's water resources by buffering non-point sources of pollution.
- Greenways provide opportunities to protect and manage wildlife, forests and ecological systems.
- Greenways provide recreation opportunities for families and individuals of all ages and abilities.
- Greenways provide alternatives to automotive transportation, reducing traffic congestion.
- Greenways add positively to our economic climate.
- Greenways are a core component of strategies to foster health and wellness, especially as our population ages.

SGP provides technical assistance to river towns along the Susquehanna River for incorporating green infrastructure practices at the municipal, neighborhood, and site scales. Working collaboratively with EPA's Smart Growth/Sustainable Communities section, SGP has piloted and conducts *Linking Land Use and Water Quality* technical assistance programs for municipalities along the Susquehanna. The program is based on the EPA Water Quality Scorecard as guide for improving land use, stormwater management and other practices to protect and improve water quality.

Objectives:

1. Demonstrate to local government officials how they can meet water quality goals and requirements through proven innovative approaches to land use and development that will also save money, help spur economic growth, and improve their community's quality of life.

2. Explain the advantages of the comprehensive approaches to stormwater management featured in the US EPA Water Quality Scorecard (natural resource and open space protection, better management of the built environment [efficient compact development/redevelopment, complete smart streets, efficient parking provision], and green infrastructure stormwater management).

3. Create an understanding that many different local departments have a role to play in comprehensive stormwater management, particularly when it comes to new development. Help start conversations among these departments.

4. As part of a community tour, present hands-on examples of how land development and associated impervious cover can contribute to stormwater management problems or can be part of the solution.

5. Provide examples and data from other communities regarding economic, budgetary, and aesthetic benefits of alternative approaches.

6. Offer implementation strategies and practical tips/advice.

Anticipated Environmental Benefits:

At the municipal scale, decisions about where and how our towns, cities, and regions grow are the first and perhaps most import, development decisions related to water quality. Preserving and restoring natural landscape features (such as forests, floodplains, and wetlands) are critical components of green infrastructure. By choosing not to develop on and thereby protecting these ecologically sensitive areas, communities can improve water quality while providing wildlife habitat and opportunities for outdoor recreation. In addition, using land more efficiently reduces and better manages stormwater runoff by reducing total impervious areas. Perhaps the single most effective strategy for efficient land use is redevelopment of already degraded sites, such as abandoned shopping centers or underused parking lots, rather than paving greenfield sites.

At the intermediate or neighborhood scale, green infrastructure includes planning and design approaches such as compact, mixed-use development, narrowing streets and roads, parking reduction strategies, and urban forestry that reduce impervious surfaces and better integrate the natural and the built environment.

At the site scale, green infrastructure practices include rain gardens, porous pavements, green roofs, infiltration planters, trees and tree boxes and rainwater harvesting for non-potable uses such as toilets flushing and landscape irrigation.

These processes represent a new approach to stormwater management that is not only sustainable and environmentally friendly, but cost-effective as well.

Section 4. Agriculture

Evaluate and Modify Existing Regulatory Tools

Chapter 102 Regulations

Pennsylvania's Chapter 102 regulations became effective on November 19, 2010. These regulations establish clear regulatory requirements for agricultural erosion and sedimentation control on all agricultural operations. Activities to implement these regulations are on-going and include development of revised delegation agreement with county conservation districts, program staff training and outreach to the regulated community.

In July 2011, the Pennsylvania Office of the U.S. Natural Resources Conservation Service (NRCS) developed an outstanding compilation of conservation guidance. This guidance, the ***Conservation Planning and Regulatory Compliance Handbook,*** provides professional conservationists with easy access to information on the state and federal regulatory requirements and the planning assistance that are available across the state and federal spectrum. It includes references to the new Chapter 102 erosion and sedimentation control requirements. This guidance is valuable because it provides conservation planners with the most recent information on government regulations to ensure that conservation planner assistance is based on the most recent rules, requirements and information, including Pennsylvania's regulatory requirements for agriculture erosion and sedimentation control.

This document was an important component to training DEP, NRCS and PA Association of Conservation Districts (PACD) provided to conservation district staff in October 2011. DEP and NRCS, with the support of Penn State Extension, are planning to develop and present this information via a webinar in 2012.

Additional guidance materials will be developed to streamline the preparation of agriculture erosion and sedimentation plans for Pennsylvania's agricultural producers. The first of these materials, an outreach document titled *The Basics of Agricultural Erosion and Sedimentation Control*, was completed in July 2011. No timeline for these guidance materials has been established.

CAFO Activities

Phase 1 WIP indicates that DEP and EPA will complete the CAFO program review to ensure consistency with EPA regulatory requirements. DEP will work with EPA Region 3 to review the approved CAFO program and revised Pennsylvania CAFO General Permit. DEP continues to work with EPA Region 3 to review what EPA refers to as the "PA Technical Standards" and this review should be completed in the near future. Pennsylvania's Section 106 Work Plan includes an "Area of Focus: Concentrated Animal Feeding Operations (CAFOs)" with the stated goal to "Ensure that permitting and compliance activities meet environmental objectives and public expectations." This Work Plan includes several CAFO program objectives that compel both EPA and DEP work jointly to address the consistency requirement found in the Phase 1 WIP.

Specific objectives and activities for CAFO program will not be included as part of the Phase 2 WIP, as they are more appropriately addressed in the Section 106 Work Plan.

It should be noted that Pennsylvania's CAFO program manager's staff position is not funded out of the Section 106 Grant with EPA, as adequate funding is not available in that grant. Instead, this program manager is supported for five years under the EPA Chesapeake Bay Regulatory and Accountability Program grant. Pennsylvania is currently working with EPA and others to review and revise the CAFO general permit, known as PAG-12. This permit will be revised and implemented no later than March 2013.

EPA's evaluation of Pennsylvania's Phase 2 WIP stated that the proposed timeframe of 2013 is a prolonged time for Pennsylvania's CAFO program to be consistent with the EPA 2008 CAFO Rule, and called for DEP to identify interim steps and timeline to expedite Pennsylvania's CAFO Program's consistency with current federal regulations. This EPA comment is not consistent with Pennsylvania's 106 Grant Work Plan. As noted in the 106 Grant Work Plan (page 25) , Pennsylvania will "*Work with EPA to ensure that PA's CAFO program is consistent with the federal regulations for CAFOs, review the proposed schedule developed by EPA for revising its CAFO program, and work with EPA on addressing program consistency during revision of the CAFO general permit.*" Also, as noted in the 106 Grant Work Plan (page 26) "*EPA will complete the following: … Propose a schedule for PA DEP to revise its CAFO program and technical standards to address inconsistencies between the PA program, the PA standards, and federal requirements.*" It is DEP's understanding that EPA will propose a schedule for CAFO program consistency and then work with DEP to establish a mutually agreeable schedule. This proposed schedule could include the interim steps and timeline called for in these comments from EPA. DEP will work with EPA to establish this schedule for review of Pennsylvania's approved CAFO program, but the initial schedule for this, per the 106 Grant Work Plan, was to be drafted by EPA. Once this schedule is completed, it will be incorporated by reference into the Phase 2 WIP.

The October 2013 dates in the Milestones reflected the timeframe of the 106 Grant Work Plans – federal calendar year – and the desire to address Pennsylvania's approved CAFO program within the routine 106 Grant Work Plan process. This year, DEP establishes the schedule and begins to "work the plan;' Next year we complete the process of reviewing, and revising if necessary, Pennsylvania's approved CAFO program to be consistent with federal requirements. Also, the 2013 dates reflect the understanding that many of the potential consistency issues within the approved CAFO program will be addressed in the revision to the CAFO General Permit, which needs to be completed prior to March 2013 - the current date for the General Permit (GP) to expire. DEP expects to have the GP revisions completed prior to the March 2013 expiration date, but this is dependent upon the public review process and EPA comments on the draft GP. DEP expects to be able to provide EPA with a draft of this GP in April 2012.

On March 14, 2012, DEP received from EPA a draft schedule for CAFO Program revisions. Negotiations concerning the schedule began on March 26. Program revisions are expected to include a revised General Permit, Reporting Forms and other program modifications.

Manure Management Manual Outreach

Phase 1 WIP indicates that DEP will address Manure Management Manual Outreach (WIP Page 97) upon completion of the revisions to the Manure Management Manual. Revisions to the manual were published on October 29, 2011. These revisions updated the 1986 and 2001 versions of the manual and provide, for the first time, a "work book" for farm operators to develop a useful manure management plan. This tool should be invaluable to achieving compliance with the Chapter 91.36 requirements that all farm operations adequately management the manure they generate or utilize on their farms. The revisions to the manual are designed so that, with no or minimal professional support, many farmers should be able to develop their own manure management plans.

Beginning in late 2011 and going through 2012, DEP and others will use this new manual to engage the farm community in adequately planning for manure utilization and management. Initially, conservation district staff, Penn State Extension, DEP staff and other government staff will be trained on the new Manure Management Manual revisions. Using DEP, State Conservation Commission and Penn State professionals, a "train-the-trainer" course was offered across the state, and Bay watershed, to educate conservation professionals on both the content of the new manual and the best ways to communicate the content to farm operators. Penn State has been very involved in the development of the revisions to the manure management manual and has developed the training course for this effort. The expectation is that, upon completion of the "train-the-trainer" session, staff will be well equipped to provide education and outreach to the agriculture community.

After the "train-the-trainer" sessions, Pennsylvania will engage multiple organizations and professionals to engage the regulated community and begin to develop manure management plans for all operations. To assist this effort, DEP has entered into an agreement with the PA Association of Conservation Districts to make funding available to all 66 conservation districts to hold local sessions for the regulated community. Utilizing the training and support materials provided through the "train-the-trainer" efforts, these sessions held by conservation districts should result in a large number of manure management plans being developed and utilized by the farm community.

Basin-wide Component to Achieve Agricultural Compliance with State Regulatory Requirements

Outreach Activities

Phase 1 WIP indicates "Conservation District Chesapeake Bay staff can address 18,000 farm operations – about half of the farms in the watershed – and inform them about compliance with their regulatory requirements." By 2012, DEP expects over 4,000 site visits will be made by these staff. The requirement for these site visits was included with the annual Bay Technician contracts between DEP and the Bay conservation districts, which began July 1, 2011. DEP, working with the Lancaster County Ag Ombudsman, developed informational items in 2011. The first document - the "***Am I in Compliance***" brochure - was completed in January 2011 and was distributed by DEP staff, conservation districts, USDA, Penn State and others, including the

Chesapeake Bay Foundation and Penn Ag Industries. The brochure was distributed at the PA Farm Show and the York Farm Show in January 2011, Ag Progress Days in August 2011, as well as, producer meetings and agriculture professional conferences (e.g. Keystone Crops Conference in October 2011.) This brochure provides information on the regulatory requirements for erosion and sedimentation control and manure management. It was also included as part of Pennsylvania NRCS' ***Conservation Planning and Regulatory Compliance Handbook***. The "***Basics of Agricultural Erosion and Sedimentation Control Requirements***" barn sheet was completed in July 2011. This one-page document provides specific information on the requirements of Pennsylvania's Chapter 102 regulations as they address agriculture. This "barn sheet" includes the general components of the required agriculture erosion and sedimentation plans, as contained in the regulatory revision of November 2010. A third item – the "***Basics of Manure Management Requirements***" barn sheet – was completed in November 2011 and the first printing of this document was available in December 2011. This document outlines the components of the manure management plan, as established in the October 2011 revision of the Manure Management Manual. Distribution of the manure barn sheet will occur during the Manure Management Plan training session to be held December 14, 2011 through January 24, 2012, as well as, other meetings and conferences. Conservation district staff utilized the "***Am I in Compliance***" brochure, the "***Basics of Agricultural Erosion and Sedimentation Control Requirements***" barn sheet and other handout materials describing the regulatory requirements in Pennsylvania Chapter 102 and Chapter 91.36. Pennsylvania has two regulatory programs that address all farming operation, not just the large CAFOs, under the Chapter 102 regulations, which address agricultural erosion and sedimentation control requirements, and the Chapter 91.36 regulations, which addresses manure management. As of December 2011, conservation district staff accomplished over 1,100 site visits. The remaining site visits are expected to be completed by June 2012.

In addition to the required 100 site visits, each technician contract included the requirement to establish a county-wide Outreach Plan that would indicate for these conservation districts how all farm operations in the county will be contacted 2015. These outreach plans were submitted by November 2011 and included a variety of methods that the conservation districts will use to ensure that the estimated 40,000 farm operations will be addressed. These outreach plans identified a variety of mechanisms, and include:

- 26 Counties plan to continue site visits past FY 2011,
- 20 Counties plan workshops on Manure Management, No-till, soil health, pasture management, etc.,
- 11 Counties plan to develop/use GIS system for tracking purposes, and
- 9 Counties plan to coordinate this outreach with County Farm Bureau.

The submitted outreach plans vary in nature due to the different complexities and composition of the individual counties. DEP will analyze the plans to see if they are effective in reaching out to all agricultural operations within Pennsylvania's portion of the Chesapeake Bay watershed.

In addition to the "***Am I in Compliance***" brochures and barn sheets, DEP is working with the Lancaster County Ag Ombudsman to develop a "mailer" on the basic agricultural regulatory requirements. This "mailer" will be another short, easy-to-read information piece that will be provided to the Pennsylvania USDA-NASS office for distribution to all 80,000 addresses on the

USDA-NASS mailing list of Pennsylvania farms and agriculture industry contacts. Through this significant effort, all farm operations in Pennsylvania will be made aware of the existing environmental regulatory requirements.

Model Agriculture Compliance Policy

Phase 1 WIP indicates that Pennsylvania will develop a "Model Agriculture Compliance Policy" for use by conservation districts (WIP Page 99). This model policy will identify specific steps conservation districts will take to address compliance activities on agricultural operations, particularly how conservation districts will respond to complaints, correct problems and refer operations in violation to DEP. Beginning in 2010, DEP required that all conservation districts that received funding for a Chesapeake Bay Technician provide DEP with a written policy or guidance document on how their conservation district responds to complaints they receive regarding agricultural operations. By September 2010, all conservation districts that receive Bay technician funds provided these documents. The compliance documents received from the 38 conservation districts that receive these funds were not consistent and varied from very specific step-by-step policies to a simple referral to DEP. These documents were reviewed by DEP staff and used to develop a draft "Model Agriculture Compliance Policy". This draft document was reviewed by the Agriculture Water Quality Initiative Workgroup in July and November 2011. The Agriculture Water Quality Initiative Workgroup was established under the Phase 1 WIP and includes members of DEP's Agriculture Advisory Board, EPA, and others.

The draft Model Agriculture Compliance Policy, based on a successful compliance strategy used by Pennsylvania's nutrient management program, establishes an approach that allows the conservation district to work with the farm operator to achieve compliance prior to formal enforcement actions. Basing this effort on an existing protocol currently used and accepted by many conservation districts may lead to more successful adoption of the model policy. The model policy also recognizes biosecurity protocols to protect animal health, which was greatly appreciated by animal agriculture industry in Pennsylvania. This may also aid in adoption of the final policy.

In 2012, the draft Model Agricultural Compliance Policy document will be reviewed by the Conservation District Manager's Advisory Committee and others. The expectation is that this Model Agriculture Compliance Policy will be presented to the State Conservation Commission in July 2012 for their action and, if approved, be made available to every conservation district for adoption. Each conservation district is an independent entity and DEP does not have the authority to require adoption. However, it is expected that adoption of this model policy, or another policy consistent with this model policy, will be a requirement for Chesapeake Bay technician funding as part of the 2013-2014 contract. (As this model policy will not be approved prior to the beginning of the 2012-2013 Bay contract process, it is not practical to include adoption of this policy for the 2012 contract.)

Nutrient Management Delegation Agreement

Phase 1 WIP indicates that DEP will create a revised nutrient management delegation agreement with county conservation districts to implement manure management requirements (WIP

Page 98). Pennsylvania, through the State Conservation Commission, currently contracts with 36 counties in the Chesapeake Bay watershed to implement the Nutrient Management Program. The delegation agreements provide funds from the Nutrient Management Fund to support staff positions, or portions of a staff position, in conservation districts across Pennsylvania. These staff positions are trained/certified nutrient management technicians and are very knowledgeable in manure management. The existing delegation agreement expires on July 1, 2012.

Pennsylvania's 2011-2012 Chesapeake Bay Regulatory and Accountability Program grant (CBRAP) application requested $2,566,000 in federal funds for improved enforcement and compliance assurance through supplementation and/or enhancement of the existing conservation district Nutrient Management Technician capabilities to implement Pennsylvania's existing regulatory requirements and the Manure Management Manual. This request would increase staff resources for compliance monitoring, complaint assessment, non-compliance follow-up, referrals of enforcement cases, reviews, reporting, inspections, and corrective actions. Working with the State Conservation Commission and county conservation districts, DEP will revise the existing Nutrient Management Delegation Agreement to specifically include Chapter 91.36 activities. This $2,566,000 would be spread out over five years, making approximately $20,000/year available for each conservation district in the Bay watershed.

DEP's CBRAP proposal was approved by EPA in December 2011 and will be used to provide additional funds to conservation districts that would accept additional responsibilities for manure management regulatory oversight. These new delegation responsibilities would be included with the delegation agreements that would replace the delegation agreements expiring in July 2012. It is expected that many, but not all, conservation districts would accept this new delegation on Chapter 91.36 responsibilities. This would provide a significant number of additional field staff to support the implementation of manure management requirements.

Enhanced Compliance Activities

Utilizing 2010-2011 CBRAP grant, DEP created four new DEP staff positions to provide regional compliance and inspection actions for Pennsylvania's CAFO, stormwater and agriculture regulatory programs. These positions will support increased field presence for additional inspections of non-CAFO agricultural operations. These positions will also support increased compliance activities under Chapter 102 Erosion & Sediment Control regulations, Chapter 91.36 relating to manure management, and local stormwater complaints. Three of these staff positions were not hired by January 2011, as discussed in the Phase 1 WIP, due to administrative difficulties in creating new DEP positions. Three of these staff positions – 2 in the Southcentral regional office; 1 in the Northeast regional office – were hired by July, 2011 and began conducting compliance inspections of agricultural operations, follow-up inspection of non-compliant operations and enforcement actions in the first half of 2011. The fourth position, in the Northcentral regional office, was hired in December 2011. Once fully trained, these new staff are expected to result in an increase of 450 agricultural inspections annually, as well as 50 stormwater inspections and 100 compliance actions per year. The enforcement activities of these staff will be consistent with existing DEP compliance procedures.

These staff will also begin to implement certain aspects of the Chesapeake Bay Agricultural Water Quality Initiative. In calendar year 2012, some of these staff will be engaged in targeted watershed efforts.

The Phase 1 WIP includes a reference to DEP Chesapeake Bay Field Representatives performing 2,500 compliance inspections in the first five years of this plan. These staff are currently engaged in outreach/education and the installation of agriculture best management practices, specifically, the installation of stream bank fencing projects. The Chesapeake Bay Field Representatives are not routinely involved in compliance activities. Current DEP staffing includes 4 Chesapeake Bay Field Representatives, not the 5 positions calculated in the Phase 1 WIP. Using the assumptions of 100 inspections per staff, only 2,000 compliance inspections will be estimated for these Chesapeake Bay Field Representatives. The remaining compliance inspections will be made by other DEP field staff in the regional offices as part of the routine field activities of staff. This does not decrease the targeted number of additional compliance inspections (2,500), but does change the staff that address these targets. Chesapeake Bay Field Representatives may continue to engage in additional education and outreach, similar to the site visits undertaken by conservation district staff, as well as, their routine development of conservation district special projects and support of conservation district Bay technicians.

Additional Assurance regarding Conservation District Compliance Activities

Pennsylvania's conservation districts are local organizations, supported by state and county government, established under the Conservation District Law (Act 217 of 1945). There are 66 conservation districts in Pennsylvania. Each conservation district is created by the county governing body, but is governed by an independent conservation district board. Each conservation district is organized differently - some are a unit of county government, some are an independent local government entity, and others have components of both. Each conservation district has different levels of staffing and differing priority areas of focus. District staffing ranges for 20+ staff to offices of five or fewer. Each district receives direct funding from state government, most districts receive funds from their county government, and many have sought out other sources of public or private funding. State government supports conservation districts through contractual agreements, delegation agreement and direct grants. A district can choose to participate, or not, based on the decision of its governing body.

The Chesapeake Bay Program in Pennsylvania began with six conservation districts and currently involves 38 conservation districts in 2012. Since 1986, conservation districts have been a critical component of Pennsylvania's Chesapeake Bay effort. Contractual arrangements between DEP and conservation districts have supported staff and BMPs projects since 1986. Pennsylvania's WIP articulated specific activities for conservation districts to inform the agricultural community about compliance. The conservation districts are currently engaged in this effort to inform the agricultural community about compliance under the 2011-12 Chesapeake Bay technician agreement. To date, about 1,200 site visits have occurred. There is a similar requirement in the 2012-2013 Chesapeake Bay technician grant announcement. We expect conservation districts will continue to support the outreach effort.

Delegation agreements with conservation districts have allowed Pennsylvania DEP to implement the Chapter 102 erosion and sedimentation control regulations and the State Conservation Commission to implement the nutrient management program. Pennsylvania's WIP includes specific language to expand conservation districts role in manure management through the nutrient management delegation agreements. Pennsylvania is currently engaged in revisions to the nutrient management delegation to achieve this. Pennsylvania is working with the State Conservation Commissions nutrient management workgroup, comprised of several conservation districts, DEP and SCC staff, to revise the delegation agreement. This new delegation agreement will be completed by July 2012, when the existing delegation agreement expires. DEP anticipates that Pennsylvania's conservation districts will enter into this delegation agreement.

Grant agreements are another mechanism through which Pennsylvania supports conservation districts. Grant funds from Pennsylvania's Growing Greener program have been utilized by conservation districts to address a wide variety of environmental projects, including agricultural best management practices. DEP expects that conservation districts will continue to engage in the grant opportunities to install agricultural best management practices.

As noted above, Pennsylvania's conservation districts are unique organizations governed by their individual county conservation districts boards. DEP does not expect all conservation districts to engage at the same level, given the disparate levels of staffing and differing level of Board expectations. However, DEP does expect that conservation districts will continue to engage in the appropriate contracted programs, delegation agreements and grant opportunities that are included in the WIP.

At the March 14, 2012 WIP Management Team meeting, EPA staff stated that DEP's compliance initiative was a good plan and recognized that the Phase 2 WIP should not have to include a Plan B in the event that Conservation Districts do not fully engage. EPA did ask for additional detail on potential DEP action. DEP's CBRAP activity through December 2011 demonstrates DEP's commitment to meet its agricultural compliance commitments. DEP's target for agriculture compliance activities was 50, but 104 were actually completed. This demonstrates that DEP is prepared to perform additional compliance activities should it become necessary. DEP's commitment to develop a Model Agriculture Compliance Policy and its exceedance of DEP agricultural compliance CBRAP targets provide sufficient assurance to enable EPA to remove its "enhanced oversight" over the agriculture sector.

Manure Technology

A core element of Pennsylvania's Phase 1 WIP is the implementation of technology projects, such as manure-to-energy facilities. Significant progress has been made in this area since the development of the Phase 1 WIP. For example:

- ElectroCell Technologies Inc. has generated nitrogen credits that were registered for use in meeting NPDES permit limit requirements;
- Under a Water Quality Management Experimental Permit, Bion Technologies has constructed and operated a biological process for treating manure in Lancaster County; and

- EnergyWorks BioPower has initiated construction of the Gettysburg Energy and Nutrient Recovery Facility in Adams County.

These examples help demonstrate that progress is being made in efforts to deploy technology that can reduce nutrients reaching the Chesapeake Bay.

Advancing Technologies

Continuing to advance technology in Pennsylvania and across the Chesapeake Bay watershed will require a multi-pronged approach. Various efforts will be undertaken as part of the Phase 2 WIP to continue to allow progress to be made and help implement additional projects:

Financing

While new technologies provide opportunities to better manage nutrients, reduce nutrient loading from runoff, and provide additional environmental benefits, financing the projects can be a challenge. Pennsylvania will continue to pursue any and all funding opportunities to advance technology in Pennsylvania and across the Chesapeake Bay watershed. As part of the Phase 2 WIP, Pennsylvania plans to pursue the following opportunities to help enhance the general capacity for funding:

- Working with the Chesapeake Bay Commission and other sponsors of the 2011 Manure to Energy Summit. A report with policy options can be accessed at : http://www.chesbay.us/Publications/manure-to-energy%20report.pdf ;

- Partnering with PennVEST to pursue funding opportunities. For example, in January 2012, PennVEST announced that it had provided $620,885 to help construct a boiler for chicken manure at a farm in Lancaster County;

- Monitoring the Farm to Energy Initiative, whose project partners include the Lancaster County Conservation District. This project was funded by a USDA Conservation Innovation Grant, the National Fish and Wildlife Foundation and EPA, with match funding from the Chesapeake Bay Funders Network and participating farms. The project has five goals, one of which is to expand financing options for manure to energy technology development in the region.

Quantifying Nutrient Reductions

Pennsylvania has been a leader in working to quantify the reductions associated with new technologies. As part of implementing the Phase 2 WIP, Pennsylvania will be working with other states to share its experiences with quantifying these important projects. Included will be two activities:

- Working with the Chesapeake Bay Program's Trading and Offsets Workgroup to develop a protocol for the review of "non-traditional" credit generating approaches. Discussions on how to approach this have begun within the workgroup.

- Pennsylvania is developing draft definitions for Manure Technology BMPs for treatment systems that are currently being developed and implemented at Pennsylvania farms. These BMPs are being developed with assistance from the Chesapeake Bay Program (CBP) and will be vetted through CBP panels and workgroups as a first step in reviewing possible options for recognizing load reductions in the Watershed Model. The technologies include both "wet" and "dry" manure treatment technologies which are typically proprietary and funded through public and private partnership opportunities. Nutrient reductions associated with these systems likely will need to be credited individually due to the variability of each system design and based on data obtained through the Nutrient Trading Program.

Section 5. Stormwater

Background

In this Phase 2 WIP Stormwater Section, DEP includes actions being undertaken to follow through with the Phase I WIP commitments, including partnerships at the local level to facilitate implementation. It further provides supplemental information to address EPA's concerns related to reasonable assurance that Pennsylvania's obligations under the Chesapeake Bay TMDL will be achieved and maintained, and the means by which any new or increased pollutant loadings not accommodated in the TMDL will be avoided or alleviated.

In the Phase I WIP, EPA asserted that Pennsylvania did not provide reasonable assurance that the urban storm water allocations will be achieved and maintained and applied backstop adjustments for the following reasons: Pennsylvania's Phase I WIP lacked clear strategies to achieve the almost 40% reduction in urban loads included in in the WIP input deck; Pennsylvania asserts that the scope of the MS4 program is limited to the conveyance system only; Pennsylvania's small MS4 permit program does not include construction and post-construction requirements; the requirement for an MS4 to have a TMDL Implementation Plan does not include the Chesapeake Bay TMDL and there is no supporting documentation to quantify how local TMDL implementation plans will meet Bay targets; and Pennsylvania is assuming high compliance levels, but has not demonstrated a high level of compliance assurance activities nor enhanced the field resources available to support an enforcement presence. While many of these issues are more fully discussed in the specific programmatic section below, Pennsylvania wants to highlight this information and demonstration of reasonable assurance here to prevent the necessity for EPA to implement, and to facilitate the removal of, the "backstop allocations or adjustments" identified in the final Bay TMDL for Pennsylvania's stormwater program.

DEP believes that EPA's conclusion relative to reasonable assurance for this sector is incorrect for the following reasons.

1. Strategies to Achieve Reduction in Urban Loads. The percent reduction target in the TMDL for this sector is based upon modeling. Since issuance of the TMDL one year ago, EPA and the jurisdictions generally have continued to refine the model and the application of the model to the various sectors in the TMDL. The framework for implementation of the TMDL should reflect these refinements, and EPA's recent approval of the Pennsylvania NPDES General Permit for Stormwater Discharges from Municipal Separate Storm Sewer Systems ("PAG-13") demonstrates reasonable assurance.

   DEP efforts to establish a BMP efficiency for Floodplain restoration (a.k.a. legacy sediments) will additionally provide a new strategy to address urban stormwater loads. DEP is additionally participating in the Chesapeake Bay Program's Urban Stormwater Workgroup expert panels to define removal rates for new state stormwater performance standards and stormwater retrofits. These panels will provide recommendations to EPA regarding the adoption of state BMP performance standards and removal rates for retrofit BMPs. This should eliminate the need to establish a detailed urban stormwater BMP tracking program.

2. Scope of the MS4 program. EPA lifted the objection to PAG-13 associated with the MS4 program scope issue and DEP did include the federally regulatory language in the final permit. DEP and EPA have agreed to work together on the training provided to MS4s related to this implementation issue. This progress by the agencies demonstrates reasonable assurance.

3. Pennsylvania's MS4 Program Includes Construction and Post Construction Requirements. While the MS4 program is more fully explained below, it is important to note that Pennsylvania's MS4 permitting program does include Minimum Control Measures (MCMs) 4 and 5, and Pennsylvania's statewide stormwater program requires the implementation of best management practices to 'reclaim and restore" surface waters, including the Chesapeake Bay, any time that DEP issues an NPDES permit under the Chapter 102 regulations governing construction and post-construction runoff. See 25 Pa. Code §§ 102.1, 102.4(b)(1), 102.8(b)(8), and 102.11(b)(1). Permits are required for all earth disturbance activities of one acre or greater, regardless of whether the activity is in an MS4 permitted locality. See 25 Pa. Code Section 102.5(a). EPA approved PAG-13 and the approach to MCMs 4 and 5 therein which allows MS4s to rely on the existing statewide program to meet most of the construction and post construction requirements. Again, EPA has recognized the relationship of the statewide stormwater program to the MS4 MCM 4 and 5 obligations in its review and approval of PAG-13. The resolution of this issue also should demonstrate reasonable assurance related to the urban lands sector of the TMDL.

4. Chesapeake Bay Pollutant Reduction Plan Requirement. Pennsylvania's MS4 permitting program now expressly includes a requirement for MS4s in the Chesapeake Bay watershed to develop and implement a Chesapeake Bay Pollutant Reduction Plan. These MS4s must develop and submit to DEP for approval a Chesapeake Bay Pollutant Reduction Plan, including a schedule to implement BMPs to reduce nitrogen, phosphorus, and sediment associated with existing stormwater discharges into regulated small MS4s discharging to receiving waters tributary to the Chesapeake Bay. The resolution of this issue also should demonstrate reasonable assurance related to the urban lands sector of the TMDL.

5. Pennsylvania Compliance Assurance Activities. As previously noted, DEP has a robust stormwater regulatory program under Chapter 102. NPDES Stormwater Construction permittees are required by the revised general ("PAG-02") and individual permits to provide MS4 municipalities with information identifying post construction BMPs, their location, and the associated operation and maintenance requirements. Likewise, Pennsylvania's revised stormwater regulations also require NPDES stormwater construction permittees to ensure long-term operation and maintenance of post construction BMPs, as well as to record an instrument with the recorder of deeds that assures disclosure of the PCSM BMPs and the related obligations for operation and maintenance in the ordinary course of a title search for the subject properties. See 25 Pa. Code § 102.8. These requirements will facilitate MS4 compliance with the MCM 5 BMP inventory and inspection obligations and generally enhance compliance and

facilitate enforcement. Lastly, Pennsylvania will continue to work with EPA in updating its Compliance Monitoring Strategy (CMS) for the implementation of the MS4 program.

In addition, EPA also stated that upon review of Pennsylvania's Phase 2 WIP, EPA will revisit the Waste Load Allocations for Waste Water Treatment Plants in the event that Pennsylvania does not reissue PAG-13 and PAG-2 general permits for Phase II MS4s and construction activities that are protective of water quality by achieving the load reductions called for in Pennsylvania's final Phase 1 WIP. As more fully discussed below, Pennsylvania did reissue both of these general permits and as a result the Waste Load Allocations for Waste Water Treatment Plants should remain unchanged. The current PAG-02 permit was scheduled to expire on December 7, 2011. DEP extended PAG-02 for an additional 1-year (PAG-02, 2009 amendment). The extension was effective on December 8, 2011, and will expire on December 7, 2012, unless rescinded by DEP at an earlier date. DEP extended the availability of this permit to complete the adequate preparation of the renewal of PAG-02. The draft permit for renewal of PAG-02 was submitted to EPA for review under the MOA. EPA provided minor comments but no objections. DEP anticipates issuance of the final general permit renewal after public notice and opportunity for public comment in 2012.

EPA's evaluation of the Draft Phase 2 WIP additionally called for DEP to identify a strategy and timeline to evaluate resource needs and procure the staff and funding necessary to support enforcement of all urban stormwater programs. DEP will evaluate options and resource needs should funding become available. Pennsylvania is committed to working collaboratively with EPA to identify sources of funding such as CBRAP, Section 106 Grant, or other federal funds to support existing and additional staff or other resources to support the implementation and enforcement of urban stormwater programs.

Pennsylvania's delegation to the Chesapeake Bay Commission recently met to discuss proposed legislation to enhance Pennsylvania municipalities' capacity to fund stormwater management obligations: SB 1261 and SB 452. SB 1261 would amend the Pennsylvania Municipal Authorities Act to expressly authorize municipal authorities to address "storm water management planning and projects." This bill passed the Pennsylvania Senate on March 26, 2012. To become law it will also need to be passed by the Pennsylvania House. SB 452 is broader in scope and proposes: 1) amendments to the Pennsylvania Stormwater Management Act to address stormwater problems associated with existing land uses; 2) to authorize the integration of multiple statutory municipal water management obligations; and 3) to expressly authorize the creation of municipal stormwater authorities. This bill has not moved out of committee.

Outreach Opportunities

DEP has an established relationship with local county and municipal government regarding the management of stormwater. Thirty-seven counties within Pennsylvania's portion of the Chesapeake Bay watershed have prepared an Act 167 Stormwater Management Plan, along with municipalities that are involved in Act 167 planning and implementation. In addition, municipalities, state government, and institutions that are regulated small MS4s have coverage under the PAG-13 Municipal Separate Storm Sewer System (MS4) NPDES general and

individual permits. DEP also included Post Construction Stormwater Management (PCSM) requirements in the 25 Pennsylvania Code Chapter 102 regulations, effective on November 19, 2010. This action codifies the PCSM requirements to facilitate implementation of the federal stormwater construction and MS4 permit requirements related to PCSM. The Chapter 102 revisions also provide benefits through the restructuring and clarification of planning and permit application requirements, as well as the codification of the existing PCSM requirements. This approach reflects a continuing commitment to integrate regulatory obligations for stormwater management including requirements pursuant to Act 167, the NPDES Municipal Separate Storm Sewer Systems (MS4) program and permitting of earth disturbance activities. Local governments with state Act 167 or NPDES MS4 regulatory obligations may rely on the regulatory structure provided by this rulemaking. This reliance on existing state stormwater programs provides an opportunity for consistency throughout the watershed, provides a significant cost savings to local governments, and ensures the protection against adverse impacts from stormwater runoff through provisions for long-term operation and maintenance of PCSM facilities.

DEP will continue working with local government agencies on opportunities for improved stormwater management and expanded communication for upcoming activities related to the WIP.

Regulation, Permitting, Technical Assistance and Programmatic Activities

Some of the key revisions to the Chapter 102 regulations include the following:

- codification of PCSM requirements;
- long-term operation and maintenance of PCSM BMPs;
- antidegradation implementation provisions for PCSM;
- update agricultural planning and implementation requirements for animal heavy use areas; and
- establish requirements for riparian buffer and riparian forest buffer provisions in High Quality (HQ) and Exceptional Value (EV) watersheds.

The regulations define long-term operation as the routine inspection, maintenance, repair or replacement of a BMP to ensure proper function for the duration of time that the BMP is needed. The operation and maintenance requirement found in Chapter 102 is for the PCSM BMPs that are installed as part of the PCSM Plan. The responsibility for long-term operation and maintenance rests with the permittee or co-permittee, unless they identify another person and that person has agreed to be responsible for the long-term operation and maintenance at the time of the notice of termination. The regulations also require that a licensed professional regularly inspect the implementation of critical stages of PCSM BMP construction and to submit a certification that the BMPs are properly constructed. This certification will acknowledge that the BMPs have been properly constructed and are in working order and therefore there will be an improved expectation of optimal performance for the long-term operation. DEP or the conservation district will also conduct a final inspection and approve or deny the request for termination of the permit. In order for these BMPs to function efficiently, they must be maintained in perpetuity or until the land use changes. This maintenance responsibility would remain if the property transfers, through a legal instrument such as a covenant that runs with the

land. These provisions, as any state regulatory requirement, are enforceable provisions under the regulation. In addition, the Clean Streams Law provides DEP with the authority to undertake the appropriate compliance and enforcement mechanisms for preventing pollution to waters of the Commonwealth. As a result, DEP will use that enforcement authority, as appropriate.

The discharges regulated under Chapter 102 involve wet weather driven, primarily overland diffuse runoff, which is controlled with BMPs rather than numeric effluent limitations. A literal read of the traditional point source antidegradation non-discharge requirements could require no discharge from a construction site which would in fact be inimical to the health of waters of Pennsylvania and the Chesapeake Bay. Simply put, there are existing stormwater discharges that occur at sites before any earth disturbance activity occurs that are the basis of the hydrologic cycle on which stream base flow and quality is dependent. To protect and maintain waters of Pennsylvania, this pre-existing meadow condition will account for the maintenance of natural stormwater discharges.

Antidegradation and water quality standards apply to all Department permit decisions. Section 301(b)(1)(C) of the Clean Water Act, 33 U.S.C. Section 1311(b)(1)(C), requires that all NPDES permitted discharges meet limitations to implement any applicable water quality standard established under the Clean Water Act. EPA's regulations, 40 CFR Section 122.4(k)(2) and (3), also provide that NPDES permits shall, when applicable, include best management practices ("BMPs") to control or abate the discharge of pollutants when numeric effluent limitations are infeasible or the practices are reasonably necessary to achieve effluent limitations and standards. Pennsylvania uses the requirements of its Chapter 102 Erosion and Sediment Control regulations, and NPDES stormwater permits to manage stormwater discharges under the Clean Water Act's NPDES requirements. Under Pennsylvania regulations, all earth disturbance activities are required to implement and maintain stormwater BMPs. For purposes of the stormwater permitting, BMPs are defined under Chapter 102 as "Activities, facilities, measures, planning or procedures used to minimize accelerated erosion and sedimentation and manage stormwater to protect, maintain, reclaim, and restore the quality of waters and the existing and designated uses of waters within this Commonwealth before, during, and after earth disturbance activities." The cornerstone of antidegradation implementation in Pennsylvania's stormwater program is the preservation of that natural, existing stormwater regime. For Pennsylvania's high quality and exceptional value waters, the antidegradation analysis must demonstrate no net change from preconstruction discharge volume, rate and water quality when compared to post construction discharge volume, rate and water quality, and recognizes the need to preserve the pre-existing stormwater discharges (meadow or better condition), in order to protect and maintain waters of Pennsylvania and the Chesapeake Bay. The 2-year/24-hour storm event is the storm event that is utilized to demonstrate antidegradation compliance. DEP has included these specific antidegradation implementation provisions in Chapter 102 to provide the regulatory framework that is needed for appropriate evaluation of compliance with the antidegradation requirements for this stormwater program.

Act 167 Stormwater Management Planning

Stormwater management plans developed by counties under the Pennsylvania Stormwater Management Act (Act 167) and approved by DEP include water quality and quantity protection

requirements to be implemented by municipalities. In 2011, DEP approved the York County Planning Commission's Act 167 Planning and the Integrated Water Resources Plan (IWRP) that will provide York County with a comprehensive plan to guide the restoration and protection of County's water resources. Through this plan, 72 municipalities will develop local ordinances to implement and enforce these stormwater and water resource requirements. More information regarding this plan is provided under "Key Local Partnerships" found later in this Stormwater Section. All York County stakeholders are encouraged to make use of the inventories, maps, and data/information contained in the IWRP. Water resources are defined and identified, water management facilities are inventoried and mapped, laws and policies are summarized, and studies, reports, and assessments are identified on a watershed level.

DEP also continues to work with Adams, Chester, Clearfield, Franklin, Lancaster, Lebanon, Northumberland, and Pike Counties in the development of a county-wide Act 167 Stormwater Management Plan (SMP) [a county-wide plan includes all watersheds within a county] and associated stormwater model ordinance. Adams County Commissioners adopted their plan on November 23, 2011. They have informed DEP of their intentions to submit their plan for approval by the end of December 2012. Lancaster County expects to submit their county-wide Act 167 Plan by the spring of 2012, which will be integrated with the Water Resources element of the County Comprehensive Plan (Act 247). A listing of Department approved Act 167 stormwater management plans can be found in Pennsylvania's Phase I WIP. The list is also located on DEP's website, which is periodically updated. This website is currently located at: http://www.depweb.state.pa.us/portal/server.pt/community/technical_information/10629 . The stormwater management plans must be developed by counties, and the measures in the stormwater management plans must be implemented by local municipalities through the adoption of ordinances and regulations regardless of the availability of funding provided by the General Assembly.
Act 167 provides DEP with the authority to undertake the appropriate compliance and enforcement actions necessary to ensure that counties conduct the necessary planning and that municipalities adopt ordinances consistent with DEP approved plan. Consequently, DEP will exercise that authority, as appropriate.

PAG-2 NPDES Permit for Stormwater Discharges Associated with Construction Activities

The renewal of PAG-2 NPDES Permit for Stormwater Discharges Associated with Construction Activities is currently underway. This permit applies to earth disturbance activities that disturb equal to or greater than one (1) acre, or an earth disturbance on any portion, part, or during any stage of, a larger common plan of development or sale that involves equal to or greater than one (1) acre of earth disturbance. DEP has worked closely with EPA Region III staff in the development of a draft permit, including provisions for meeting the Chesapeake Bay TMDL. DEP expects to have the draft permit published for public comment in early spring of 2012, and reissue the PAG-2 permit prior to the current versions expiration in December 2012.

PAG-13 NPDES Permit for Stormwater Discharges from MS4s

PAG-13 – Renewal of NPDES Permit for Stormwater from MS4s, Notice of Intent (NOI) and accompanying documents were published as final in the Pennsylvania Bulletin on September 17, 2011. Municipalities will be required to submit NOIs or applications to DEP not later than September 14, 2012, a minimum of 180 days prior to the expiration date of the current PAG-13, March 15, 2013. A summary of the revisions to PAG-13 are as follows:

- the title of the protocol has been changed to the stormwater management program; field inspection of outfalls has been modified;
- inspection of outfalls for permittees renewing coverage has been changed to once within the permit term for areas where there are no reports of problems and no outfalls with dry weather flows;
- a requirement for preparation of an MS4 Total Maximum Daily Load (TMDL) Plan by permittees with regulated small MS4s that discharge to impaired waters with an applicable Waste Load Allocation in an approved TMDL;
- and preparation of a Chesapeake Bay Pollutant Reduction Plan for permittees with regulated small MS4s that are located in and discharge to receiving watersheds that drain to the Chesapeake Bay.

The PAG-13 permit requires permittees to implement a written stormwater management program designed to satisfy each of the six MCMs to protect water quality standards and to reduce the discharge of pollutants to the Maximum Extent Practicable (MEP). The Stormwater Management Program in Appendix A of the PAG-13 Authorization to Discharge shall be used to satisfy the requirement. DEP is responsible for implementation of the statewide program for issuing NPDES Permits for Stormwater Discharges Associated with Construction Activities (NPDES Construction Permit), which requires implementation of post-construction stormwater management BMPs. Municipalities may rely on this program to satisfy all requirements for MCM #4 and all requirements and BMPs #1 through #3 for MCM #5, or they may develop and implement their own program to meet all requirements for MCMs #4 and #5.

Twelve MS4 permittees must develop and submit to DEP for approval, and ensure implementation of, an MS4 TMDL Plan that is designed to achieve the pollution reduction requirements of the applicable waste load allocations in the approved TMDL (see table below). Once the MS4 permittee determines a TMDL is allocated for them, a narrative is developed that provides a strategy for reducing the pollutant to the prescribed loads. The strategy provides the concepts planned to be applied to mitigate the pollutant loads. The strategy also contains a schedule of milestones to meet the interim established reductions. To help with the development of the MS4 TMDL Plan, DEP provided nine example TMDL Control Measures for MS4 permittees to consider during preparation of the plan to achieve pollutant reductions in the discharges from their regulated MS4s consistent with applicable waste load allocations in approved TMDLs. These measures include: riparian forest buffers, impervious surface disconnection, stormwater basin retrofits, green infrastructure, stream restoration, modified ordinances, and trading and offsetting. Whenever possible, the TMDL Control Measures will be implemented in a manner consistent with the guidance provided by the Pennsylvania Stormwater Best Management Practices Manual (Document No. 363-0300-002) as amended and updated. In

addition, municipalities must implement measures to achieve reductions in the discharge of pollutants from their regulated small MS4 consistent with the reductions required by the TMDL.

A majority of the 270 municipalities and institutions (maybe less if waiver granted) that are MS4s within the Chesapeake Bay must also develop a Chesapeake Bay Pollutant Reduction Plan. The MS4 must develop and submit to DEP for approval a Chesapeake Bay Pollutant Reduction Plan, including a schedule to implement BMPs to reduce nitrogen, phosphorus, and sediment associated with existing stormwater discharges into regulated small MS4s discharging to receiving waters tributary to the Chesapeake Bay. The Chesapeake Bay Pollutant Reduction Plan required under this permit must include a narrative description of the estimated area, including impervious cover, draining to the regulated small MS4, identify areas where municipal infrastructure upgrades are planned and include an evaluation of the suitability for incorporation of green infrastructure, environmental site design (ESD), or low impact development (LID) BMPs into the planned municipal infrastructure upgrades. Where feasible, such practices should be incorporated into the municipal infrastructure upgrades and the included in the Chesapeake Bay Pollutant Reduction Plan BMP implementation schedule. The Department will develop, with EPA's assistance, a Chesapeake Bay Nutrient Reduction Plan template. This template can be utilized by Bay MS4 jurisdictions to meet these additional MS4 permit obligations. The municipality may also rely on and incorporate into the Chesapeake Bay Pollutant Reduction Plan the portions of such MS4 TMDL Plans that address nitrogen, phosphorus, and sediment associated with existing stormwater discharges.

Annual reports must include a summary of the municipality's progress with developing, submitting to DEP for approval, and ensuring implementation of the Chesapeake Bay Pollutant Reduction Plan. If the municipality is required to develop, submit to DEP for approval, and ensure implementation of an MS4 TMDL Plan, then the annual report also must summarize their progress with the MS4 TMDL Plan.
Since DEP is responsible for implementation of the statewide program for issuing NPDES Permits for Stormwater Discharges Associated with Construction Activities, permittees may rely on DEP's program to satisfy requirements under MCMs 4 and 5 relating to Construction Site Stormwater Runoff Control and Post-Construction Stormwater Management in New Development and Redevelopment, respectively. In the Notice of Intent (NOI) for PAG-13 or application for individual permit coverage, MS4 permit applicants can indicate whether they will rely on DEP's program to satisfy these MCMs or whether they will operate their own program to meet all applicable requirements under these MCMs. Permittees may rely on DEP's state-wide program for issuing NPDES Permits for Stormwater Discharges Associated with Construction Activities to meet requirements since the state program fully satisfies the federal regulatory requirements established at 40 CFR §122.34(b)(4) for construction site stormwater runoff control. The state regulations at Chapter 102 and the state permitting program are designed to reduce pollutants in stormwater runoff from all construction sites in Pennsylvania that are greater than or equal to one acre, including projects that are less than one acre when such projects are part of a larger common plan or development or sale that involves one or more acres.

EPA Region 3 has indicated that they will assist DEP by coordinating efforts with federal agencies and assisting in providing outreach and training. EPA also indicated that they will also ensure that commitments by federal agencies on federal lands and facilities ensure that the

development of Federal Facility Implementation Plans (FFIPs) along with two-year milestones will be reported and complied with, and they will assist with the resolution of any disputes between federal agencies and Pennsylvania.

Stormwater Offsetting Policy Workgroup

DEP has formed a diverse stakeholder group, including members from industry, environmental organizations, county and municipal officials, EPA and DEP, to develop a policy regarding stormwater offsetting. This effort has grown from discussion that DEP has had with various stakeholders and EPA regarding compliance alternatives to meeting stormwater requirements. The workgroup has been evaluating strengths of and reasons for an offsetting policy, the definition of offsetting, and identifying regulatory and other difficulties that exist as obstacles to developing a stormwater offsetting policy. The workgroup will meet to provide the framework for a guidance document that DEP will develop. Workgroup meetings are anticipated to go into the early winter, with DEP drafting the guidance during the spring of 2012. The guidance will be reviewed by the workgroup, and then will be opened to public comment during the summer of 2012. If developed, a final guidance document is expected to be completed by the fall 2012 or early 2013.

Key Local Partnerships

York County Integrated Water Resource Plan

As previously discussed, the York County Planning Commission has embarked on an effort to take the Act 167 Planning and the Integrated Water Resources Plan (IWRP) component of the County Comprehensive Plan to "the next level." The IWRP was a joint effort between the York County Planning Commission and DEP in an attempt to develop a model IWRP that could be used by other counties state-wide. This effort will provide County stakeholders with a resource which will guide the restoration and protection of not only the County's water resources, but also the Chesapeake Bay. The purpose of the IWRP is to develop a long-range integrated water resources planning document that will be used by the entities who share watershed boundaries within and around York County. The IWRP ties together the issues that are related to water resources, provides a usable and understandable process which incorporates existing laws, data, reports, plans, and organizations, as well as providing the user with data, information and analysis concerning the future of York County water resources. This IWRP also serves as the County’s Act 167 Stormwater Management Plan which includes model ordinances. The IWRP has been developed on a watershed level, dividing the County into four main watersheds: the Codorus Creek, the Conewago Creek, the Yellow Breeches Creek, and the Kreutz-Muddy Creek.

York County's IWRP will accomplish three main objectives. First, it will tie all water related issues together in an easy to comprehend and usable manner. This is accomplished through a flowchart tool that eliminates redundancy of information and establishes a process that incorporates all water related issues into decision making. The flowchart tool is accompanied by a document which provides explanation and information about each flowchart step. Second, the IWRP will be credited with achieving the Act 247 requirement for York County's Comprehensive Plan to include "a plan for the reliable supply of water". Third, the IWRP will

contain the requirements of Act 167 and will therefore become the County-wide Stormwater Management Plan. This achievement will require all York County municipalities to adopt a stormwater management ordinance consistent with the Plan.

In March 2012, DEP awarded $35,000 to the York County Planning Commission to "web enable" the flow-chart tool and make it available as a model and template to all Pennsylvania counties. Specifically, the flow chart component provides a step-by-step guide for public or private entities implementing activities such as the placement of stormwater controls or the design and planning of large construction projects. The IWRP helps provide information on project needs from beginning to end, while ensuring that necessary plans are referenced; appropriate agencies are contacted; pertinent issues are considered; and that the applicant applies for all required permits. Education and outreach will be provided to get as many as five counties using the tool by the end of 2012.

Lancaster County

Numerous organizations in Lancaster County are working to improve stormwater management. The Lancaster County Clean Water Initiative is developing a series of programs around clean water which in part has being funded by a Pennsylvania Department of Labor and Industry grant awarded to the Lancaster County Workforce Investment Board. The Lancaster County Roof Greening Project (developed by the Lancaster County Planning Commission in collaboration with LIVE Green, Millersville University and others), has converted more than 51,000 square feet of impervious area (roof tops) to pervious area by installing vegetated roofs. LIVE Green developed a residential stormwater outreach and education program which is conducting rain barrel workshops in an effort to educate residents about the nature of stormwater pollution. Lancaster City developed a Green Infrastructure Plan including a comprehensive strategy for managing stormwater. Warwick Township and the Lititz Run Watershed Alliance established stormwater BMP demonstration sites at the Warwick Township Municipal Campus. The expansion of stormwater BMP demonstration sites is a project of the Lancaster County Planning Commission, with assistance from the Center for Watershed Protection. Watershed implementation plans/restoration plans have been developed by a variety of groups, including the Lancaster County Conservancy.

Lancaster County is preparing an Integrated Water Resources Plan (IWRP) to meet the requirements of the Pennsylvania Municipalities Planning Code (Act 247) and Storm Water Management Act (Act 167). A key goal of the plan is to establish a foundation for an integrated or holistic approach to water resources planning and management for Lancaster County. The IWRP addresses many issues including water supply and demand, source water protection, wastewater disposal, watershed protection, stream restoration and stormwater runoff.

The IWRP, which is being developed with the understanding that a new approach to water resources planning and management is needed, identifies three Key Catalytic Actions that, when implemented, will support and facilitate the implementation of the County growth management strategies; facilitate implementation of other elements of the County comprehensive plan, including Greenscapes, the Green Infrastructure element; protect, conserve, and improve surface and groundwater resources for human and non-human use; and, move municipalities towards more efficient delivery of essential infrastructure services. The following were identified as Key Catalytic Actions: (1) Improve planning and design; (2) Accelerate implementation of existing

plans; and (3) Collaborate. The IWRP will include approximately twelve detailed strategies that will initiate the process of true integrated water resources planning and management in Lancaster County. The IWRP is being developed with sensitivity to current conditions, including the evolving regulatory environment, ever increasing demands being placed on all levels of government, and the decrease in available resources due to current economic conditions.

While the Chesapeake Bay TMDL was not a central driver in the development of Lancaster County's IWRP, it did inform the development of several strategies. Proposed strategies that are directly related to the CB TMDL include: establish county and local tree canopy targets; develop stormwater BMP demonstration sites; conduct regional stormwater management planning; amend/adopt local ordinances; pursue local nutrient credit trades; support Lancaster County Conservation District's "Plan for Every Farm" program; amend Capital Improvement Plans to incorporate water quality improvements; and align funding criteria in support of water quality improvement. The IWRP is scheduled for adoption in June 2012.

Quantitative Goals

Programmatic Activities

- MS4s required to prepare Chesapeake Bay Nutrient Pollutant Reduction Plan by April 2014;
- MS4s required to prepare a TMDL Implementation Plan within the Chesapeake Bay Watershed by September 2012;
- Report on Stormwater BMP implementation-ongoing;
- Report on Stormwater BMPs not previously reported – ongoing;
- Number of redevelopment acres with stormwater BMP retrofits-ongoing.
- Acquiring support to gather and enter data regarding stormwater BMPs that have been installed for permitted activities in the Commonwealth.
- Reissue PAG-2 NPDES Permit for Stormwater Discharges Associated with Construction Activities.
- DEP and EPA will work collaboratively regarding grants, grant work plans, technical assistance, outreach, compliance, enforcement, and other efforts to achieve joint commitments and expectations.

Training and outreach

- Provide ongoing technical assistance for professional stormwater staff, elected officials and the regulated community to assist in identifying opportunities for innovative approaches to new development, or redevelopment retrofit opportunities to address existing stormwater problems;
- Provide training for municipal officials, consultants, and other interested parties on MS4 permit requirements by March 2012;
- Provide training for municipal officials, consultants, and other interested parties on the MS4 Chesapeake Bay Pollutant Reduction Plan requirements by April 2013.
- Provide training on the revisions to the Erosion and Sediment Control Manual (E&S Manual)
- Number of stakeholders provided training and outreach-ongoing.

Identify and implement new BMPs

- Department will finalize revisions to the Erosion and Sediment Control Manual (E&S Manual) by April 2012.
- Department will be initiating revisions to the PA Stormwater BMP Manual which would provide a process for adopting new, modified, or improved BMPs or innovative technologies as technical guidance by September 2012.
- Department is continuing to develop sediment and nutrient reduction efficiencies for the Natural Floodplain, Stream and Riparian Wetland Restoration BMP to address legacy sediment and provide Stormwater Management strategies with multiple benefits.

Other WIP solutions

- Adoption of a state-wide performance standard for new development and redevelopment;
- Development of a stormwater management offsetting policy by December 2013.

Section 6. Under-reported BMPs

During the development of the Phase 1 WIP, important progress was made regarding the establishment of a plan to capture agricultural and urban BMPs that do not receive federal or state financial assistance that were on the ground but not reported by DEP for use in EPA's Chesapeake Bay Watershed Model. The Phase 1 WIP provided information on this topic (page 107). It also provided details on an "Under-reported BMP Initiative" that DEP has been working with partners to implement. The concept of working toward capturing under-reported BMPs is key to implementing the core "Milestone Implementation and Tracking" element of the Phase 1 WIP, as described on pages 3 through 5.

As the Phase 2 WIP was developed, participants in various workshop and meetings (described in Section 2.) expanded upon the concern that there are more BMPs on the ground than are currently reported. The comments and suggestions have provided DEP an opportunity to begin to improve the approach to collecting data for the "Under-reported BMP Initiative."

During the public comment period on the draft Phase 2 WIP, a significant number of comments were made on the subject of under-reported BMPs. There were a number of comments recognizing the need the collect under-reported BMP data. Also included in the comments was a concern that too much emphasis was being placed on the collection of under-reported BMPs, and that an equal or greater emphasis needed to be placed on the installation of new BMPs. DEP recognizes the importance of emphasizing the need for new BMPs, and will review its efforts to ensure that adequate emphasis is being placed on promoting that need.

General Approach

Key elements from the Phase 1 Under-reported BMP Initiative will remain in place as DEP and its partners will continue to work on implementation. However, as part of Phase 2 implementation, DEP will work with partners on opportunities to take a more holistic approach and build upon successes that have been realized from Phase 1. Public comments indicated a need to better communicate how external entities can assist with the process. As an example to help address this gap, DEP will employ lessons learned from the work done through the county initiatives described in Section 3 of this draft WIP. A second example will to be work closer with federal agencies to collect under-reported data from their facilities.

Generally, under-reported BMP information can be gathered in one or more of three ways: 1) surveys and/or site visits, 2) transect studies, or 3) permit information. The DEP's approach will be to work with partners to determine the most appropriate methodology for each BMP or category of BMPs.

Since the initiation of the Phase 2 process, a number of new groups have expressed interest in working on solutions for gathering under-reported BMP information. This builds on the interest that was expressed during Phase 1 and provides more opportunity for DEP to build capacity for this initiative. Key to this process will be the continuation of the success that has been achieved in the past few months.

Examples of Success

Section 8 of the Phase 1 WIP provided conservation tillage BMP information that had been gathered through a transect study conducted by the Capital Area Resource Conservation and Development (RC&D) Council. This survey was conducted using procedures developed by the Conservation Technology Information Center (CTIC) and refined for use in Pennsylvania. Section 8 also provided information from studies conducted by Lancaster and Bradford counties. DEP was able to work with EPA to gain acceptance of utilizing transect data to report tillage information for seven counties in the southcentral part of the watershed. This is a success story because it provides more accurate information on conservation tillage than had been previously reported by DEP.
DEP is engaged in discussions with EPA and the Capital Resource Conservation and Development Area Council (Capital RC&D) for a cropland tillage transect survey for the Pennsylvania bay counties. This survey will use CTIC protocols and data collection standards with the goal of collecting data that can be authenticated and provide a statistically valid statement of tillage BMPs in the survey area. The data collection will be organized so that county route maps and way-points will allow replication of the survey in future years. The survey will be implemented in late spring of 2012 within a five to eight week timeframe between planting and canopy closure of field crops.

An example of a success story regarding an urban BMP centers on the street sweeping BMP. Previously, DEP had been reporting zero acres for this BMP. DEP has begun to report data on this BMP, although more work remains.

The Phase 2 process also provided opportunities for successfully improving the communication tools needed to help improve BMP reporting. For example, a "cross-walk" was developed that links Chesapeake Bay Model BMPs to corresponding NRCS/FSA Practice codes.

Agricultural BMPs

Three different approaches are being considered for collecting agricultural BMPs.

1) "Data Collection" Visits

   This approach employs the selection of three to five specific BMPs. The BMPs would be based on a system that considers a farm survey focusing on:

   - Barn & Feed lots (e.g. Waste management systems, barnyards, animal concentration area BMPs),
   - Streams (e.g. Buffers and fencing),
   - Fields (e.g. Grazing systems, structural field practices).

   Simple and straight-forward protocols and checklists will be developed that would help clarify the data and information needed. The protocols and checklists will also differentiate whether BMPs on site were implemented utilizing cost-share funds. Since DEP has only been reporting cost-shared BMPs, this information would prevent double-

counting as only BMPs implemented with non-cost-share funds would be reported to EPA's Chesapeake Bay Watershed Model. Comments received at the county workshops have made it clear that there is a need for protocols and checklists. The county workshops that were held indicate that there is interest by conservation districts in participating in this process if funds are made available. DEP would work with districts on possibly using CBIG funds for this type of project beginning in July 2012.

Other approaches could also be employed for data collection visits. For example, a third party could be approved for collecting BMP information through a "Train-the-Trainer" program. A percentage of the third party's BMP data collection work could be "spot-checked" by an entity such as the Conservation District, for quality assurance purposes. Similarly, a self-reporting and self-verification process, with a quality assurance component, could also be considered.

2) Surveys

This approach would be initiated with a survey where farmers would be asked to voluntarily report BMPs. This would include all agricultural BMPs included in the Watershed Model. After the receipt of surveys, a determination would be made as to whether file reviews or a follow-up visit may be needed. If follow-up were to be conducted, then a "Data Collection" visit would need to be considered.

3) Other approaches

Other approaches to collecting un-reported BMPS will be considered. For example, some of the BMPs like phytase could be collected by partnering with producers of feed additives to obtain usage information. Product sales information could also be a helpful source of information.

Additional information on Protocols

Public comment supported the concept of developing protocols to collect under-reported BMP data. Public comment also indicated a need to develop protocols in a transparent manner.

In February 2012, the Principals' Staff Committee of the Chesapeake Bay Program (CBP) authorized EPA to work through the CBP sector workgroups to develop a framework to guide protocols for collecting BMP information. This project has the potential to support Pennsylvania's under-reported BMP initiative in the WIP, and would allow for transparent discussion through the CBP workgroups. The CBP Water Quality Goal Implementation Team (WGIT) BMP Verification Steering Committee was recently convened. DEP staff will participate in these discussions at all levels in the Chesapeake Bay Program.

Urban BMPs

There was support expressed during the Phase 2 WIP process to think more holistically and consider ways to report urban BMPs in terms of performance standards, as opposed to gathering

information on specific BMPs. For example, on properties that are under a stormwater construction permit, a measure could be determined that represents the efficiency of the resulting construction as required by permit.

This process could not be employed for all stormwater BMPs. DEP will gather historical data from permits, and work with partners to gather other information. To gather historical stormwater BMP data for submission to EPA in support of Phase 2 WIP activities, information will be incorporated into a database of stormwater BMPs implemented on NPDES stormwater construction permits for submission to EPA in support of Phase 2 WIP activities. During summer, 2011, DEP had an intern work on populating the database from information included on 2010 Stormwater NPDES Permits for construction activities applications. To continue on this effort, DEP is working with EPA to obtain contracting services. Pennsylvania will work with the EPA's contractor to ensure that the tasks needed to complete the BMP database. Pennsylvania will work with EPA to provide revised tasks, deadlines, and/or deliverables to the contractor. Support is needed to gather and enter data regarding stormwater BMPs that have been installed for permitted activities in the Commonwealth. Data entered will include location, type of BMPs, volume of stormwater treated, drainage area, and other metrics.

In the future, DEP will also report stormwater BMPs collected from Pennsylvania's NPDES MS4 renewal general permit (PAG-13). Coverage under PAG-13 runs from March 16, 2013, through March 15, 2018. Permittees with regulated small MS4s that discharge stormwater to areas that drain to the Chesapeake Bay are required as a condition of their MS4 permit to:

a. develop and submit to DEP for approval a Chesapeake Bay Pollutant Reduction Plan (CBPRP) during the first year of the permit term;
b. prepare and submit annual reports that include their progress with implementing their approved CBPRP.

Street sweeping is a non-structural stormwater management BMP that is highly effective in reducing the discharge of sediment, phosphorus, and nitrogen. Pennsylvania's NPDES MS4 reporting forms will be designed to collect information from permittees on their street sweeping activities and these data will be reported by DEP to the Chesapeake Bay Program.

Pennsylvania's delegation to the Chesapeake Bay Commission has also actively supported urban BMP implementation. On July 21, 2011, Senator Brubaker introduced legislation to regulate fertilizer for use on turf. Senate Bill 1191 was referred to the Senate Agriculture and Rural Affairs Committee. The bill provides for lawn fertilizer use restrictions and the certification of lawn care professions for the application of lawn fertilizers. This applies only to fertilizer applied to turf. None of the provisions in this bill apply to fertilizer used in agricultural production or commercial sod production. The bill applies to turf care at private residences, businesses, golf courses, public properties, and others. The bill limits the Nitrogen content of lawn fertilized sold in Pennsylvania, and prohibits the sale of lawn fertilizer containing Phosphorus, except in certain circumstances. This bill has the potential to reduce nutrient loads from the urban stormwater sector, which contribute about 15% of Pennsylvania's nitrogen load to the Bay.

Forestry BMPs

The DCNR Bureau of Forestry, through the PA Urban and Community Forestry Council (Council), received the US Forest Service Northeastern Area State and Private Forestry Competitive Redesign grant to complete the *Interactive Community Tree Canopy Mapping: A Tool for Urban and Rural Landowners and Planners*. The project expands the urban tree canopy (UTC) program the Bureau of Forestry has been implementing.

The UTC assessment uses imagery data to assess land cover, focusing on a community's existing and possible tree canopy. The extensive analysis provides data for those involved in rural and urban planning, analysis, and development. The Bureau's Chesapeake Bay forester identifies priority areas, establishes partners, and utilizes the urban tree canopy (UTC) data within GIS to meet the objectives of stakeholders.

The web mapping interface guides planning efforts and implementation, assists UTC goal setting, and encourages communities to increase tree planting and care. It will also include information and links regarding the Chesapeake Bay. All available UTC data will be displayed online allowing communities to easily review, download/upload data, calculate benefits (e.g. stormwater reduction, energy savings, air pollution reduction) of their tree plantings and canopy cover increase, locate areas at risk, and record community tree plantings. Outreach programs will direct residents to the user-friendly web mapping tool and encourage them to record their plantings, improving the accuracy of tree planting reporting by capturing non cost-share projects. This project is scheduled to be completed by March 2012.

Resource Gaps

Additional resources may be needed to help support this effort. Adaptive management will be employed to determine what additional resources may be needed to help organize and lead efforts to collect un-reported BMPs. It should be noted that the task of collecting additional BMP information results in benefits such as increasing the public's understanding of what is needed to reach Pennsylvania's Chesapeake Bay goals. These types of benefits help provide further justification for the consideration of utilizing additional resources for this task.

Section 7. Wastewater Facilities

Pennsylvania's 2006 Chesapeake Bay Point Source Compliance Strategy is described in the Phase I WIP. Following approval of the Phase II WIP, DEP will be working with EPA to address the following areas:

- Errors in the Chesapeake Bay TMDL Appendix Q, including TSS WLAs;
- Adjust cap loads to account for connection of on-lot sewage systems and wildcat sewers, and shift associated nonpoint load allocation (LA) to the point source waste load allocation (WLA);
- Shift facilities to Phase 3 when they expand their design flow to greater than or equal to 0.4 MGD, and transfer loads from the non-significant point source aggregate load to the significant point source aggregate load;
- Adjust the number of industrial waste (IW) facilities no longer considered significant due to background nutrients in the stream;
- Adjust final cap loads for significant IWs; and
- Management of remaining capacity for significant IW dischargers.

The following table presents the current and anticipated compliance with nutrient cap loads in NPDES permits through June 30, 2014.

Cap Load Compliance Start Date	No. of Facilities				
	Significant Sewage	Non-Significant Sewage	Significant IW	Non-Significant IW	Totals
10/1/2010 or before	47	9		6	62
10/1/2011	36	5	2		43
10/1/2012	51	3	3		57
10/1/2013	30	2	1		33
					195

The Chesapeake Bay TMDL identifies 183 significant sewage facilities in PA with wasteload allocations (WLAs). DEP has categorized significant sewage facilities into three phases. Following anticipated corrections to Appendix Q of the TMDL, the following aggregate WLAs are projected for significant sewage facilities:

Phase	No. Facilities	TN WLA (lbs/yr)	TP WLA (lbs/yr)
1	63	7,702,301	1,003,883
2	47	1,141,250	146,629
3	73	1,160,270	154,391
Totals:	**183**	**10,003,821**	**1,304,903**

DEP intends to expand the list of significant sewage facilities by adding those facilities whose design flows now exceed 0.4 MGD, in which case load will be moved from the non-significant aggregate load to the significant aggregate load, and remove those facilities that will not be

constructed or otherwise have been downgraded to below 0.4 MGD. As a result, there are now 190 significant sewage facilities, and all but 15 have nutrient cap loads in their permits. As a result of reallocation from the non-significant loads, the following aggregate loads are anticipated for significant sewage facilities:

Phase	No. Facilities	TN WLA (lbs/yr)	TP WLA (lbs/yr)
1	63	7,702,301	1,003,883
2	47	1,141,250	146,629
3	80	1,200,548	156,570
Totals:	**190**	**10,044,105**	**1,307,082**

Following issuance of permits to all significant sewage facilities, DEP anticipates the following cap loads in permits:

- 10,096,372 lbs/yr TN (52,267 lbs/yr greater than total revised WLAs for significant dischargers)
- 1,311,139 lbs/yr TP (4,057 lbs/yr greater than total revised WLAs for significant dischargers)

The difference between the loads established in permits and the revised WLAs is a result of the inclusion of offsets in cap loads for the retirement of on-lot systems and homes connected to wildcat sewers. DEP will shift 52,267 lbs/yr TN and 4,057 lbs/yr TP from the nonpoint source aggregate load (septic systems) to the point source aggregate load to account for this difference.

DEP will develop and maintain a spreadsheet file containing the number of retired on-lot septic systems, including community on-lot systems, for each facility and the number of offsets represented by this number that may be used toward compliance with cap loads, when we are made aware of such retirements during the permit review process.

There is one Phase 2 sewage facility and fifteen Phase 3 sewage facilities that do not yet have cap loads in their permits. DEP will attempt to amend or reissue permits for all of these facilities on or before January 1, 2013, and cap loads will become effective no later than October 1, 2016.

The Chesapeake Bay TMDL identifies 30 significant IW facilities in PA with wasteload allocations (WLAs). The TMDL provides aggregate WLAs of 1,820,139 lbs/yr TN and 64,684 lbs/yr TP to these facilities. DEP has identified one additional IW discharger that was overlooked, and has determined that nine facilities should not have been because of background nutrient concentrations and discharges to the same receiving waters as the withdrawals. Therefore, the revised list of significant IW facilities includes 23 facilities. The loads for the nine facilities previously considered significant will be moved to the non-significant WLAs, resulting in the following revised aggregate WLAs for significant IW facilities: 1,751,587 lbs/yr TN and 48,963 lbs/yr TP.

At this time, 12 of the 23 facilities have cap loads established in draft or final NPDES permits. DEP will attempt to issue permits to the remaining 11 on or before January 1, 2013, and cap loads will become effective no later than October 1, 2016.

Following the initial round of significant IW permitting, it is anticipated that the following cap loads will be issued in permits: 1,286,612 lbs/yr TN and 41,210 lbs/yr TP. Reserves of 464,975 lbs/yr TN and 7,753 lbs/yr TP are anticipated. These reserves will be managed in accordance with procedures that are outside the scope of this document.

Section 8. Federal Facilities

Federal facilities are an important part of Pennsylvania's diverse mix of land uses, properties and local governments in the Chesapeake Bay Basin. The facilities are not only important economic drivers but are significant landowners in their respective counties.

Phase 2 Chesapeake WIP

The Phase 2 WIP process provided an opportunity for DEP to work with individuals with various responsibilities for federal facilities within Pennsylvania. It provided an opportunity to identify federal lands and facilities, and to better understand opportunities for nutrient and sediment reductions. In order to improve communications between federal agencies and DEP on Chesapeake Bay issues, federal and state contact names were established during Phase 2 WIP discussions.

Federal agencies in charge of federal facilities were invited to, and attended, Phase 2 Chesapeake WIP County Workshops. As detailed in Section 2, a cross section of groups participated in the workshops, including county conservation districts, county planning commissions, and local governments.

Federal Facilities

During the development of the Phase 2 WIP, EPA coordinated the delivery of information on federal facilities to DEP. Based on a thorough analysis of the data, DEP estimated that over ninety percent of the federal acreage is on nine facilities located in the following counties: Adams, Dauphin, Cumberland, Franklin, Huntington Lebanon, York and Tioga. DEP's recommendation to federal facilities is to focus limited resources on these largest facilities first.

The largest facilities include:

Facility	Agency	County
Fort Indiantown Gap	US Dept. of the Army	Lebanon/Dauphin
Letterkenny Amy Depot	US Dept. of the Army	Franklin
Raystown Lake	US Corp of Engineers	Bedford/Huntington
Gettysburg National Military Park	National Park Service	Adams
Cowanesque Lake	US Corp of Engineers	Tioga
Tioga-Hammond Lakes	US Corp of Engineers	Tioga
Defense Distribution Susquehanna	Defense Logistics Agency	Cumberland/Dauphin/York
NAVSUPPACT-Mechanicsburg	US Dept. of the Navy	Cumberland
Eisenhower National Historic Site	National Park Service	Adams

Achieving Success

While DEP believes the Chesapeake Bay watershed model is not sufficiently robust enough to assign loads to federal facilities, DEP will welcome the opportunity to review any federally conducted property assessment for sources of nitrogen, phosphorus, sediment and opportunities for BMPs to mitigate loads. Examples would include urban stormwater retrofits, erosion repairs, non-structural practices, stream restoration, stream crossings and efforts to reduce, prevent and control erosion from unpaved dirt and gravel roads, trails and ditches. Of particular note is a pilot program being conducted by the Army to thoroughly analyze TMDL requirements and to begin implementing a plan that will result in new BMP installation.

DEP will continue to meet on a regular basis with the Department of Defense Environmental Partnership. These meetings provide opportunities to enhance communication for upcoming activities related to the WIP. They also provide staff an opportunity to learn what federal agencies are doing to implement the May 2009 Presidential Executive Order that directed them to take to take a leadership role in Chesapeake Bay protection and restoration efforts.

As previously mentioned, federal and state contact names have been established for communication purposes. This is an important first step in ensuring that BMPs being installed on federal facilities in Pennsylvania are being reported to the Chesapeake Bay Model through DEP. Additionally, information exchanged at regular meetings will help provide additional "reasonable assurance" and BMP implementation that results from the implementation of two-year milestones at the federal level.

Finally, federal agencies, specifically the Department of Defense, will also be invited to participate in upcoming MS4 training events. The Defense Distribution Depot Susquehanna (Cumberland, Dauphin/York County) and the Naval Support Activity Center (Cumberland County) are designated as operators of regulated small MS4s. Pennsylvania's MS4 permitting program now expressly includes a requirement for operators of regulated small MS4s in the Chesapeake Bay watershed to develop and implement a Chesapeake Bay Pollutant Reduction Plan. The operators of these regulated small MS4s must develop and submit to DEP for approval a Chesapeake Bay Pollutant Reduction Plan, including a schedule to implement BMPs to reduce nitrogen, phosphorus, and sediment associated with existing stormwater discharges. These federal facilities with regulated small MS4s and the other federal facilities are also expected to comply with PA Code 25, Chapter 102 requirements for erosion and sedimentation control and post-construction stormwater management.

DEP also encourages federal agencies to refer to the Draft County Planning Targets to gain an understanding of the level of effort necessary for a county to reduce its nutrient and sediment loadings. The Draft County Planning Targets also identify potential BMPs that an agency may choose to utilize to reduce loadings on their property. The Draft County Planning Targets will be made available on DEP's Chesapeake Bay Program website.

Section 9. Nutrient Trading

The second theme of Pennsylvania's Phase 1 WIP relates to Advanced Technology and Nutrient Trading. With the assistance of the DEP's partners, Pennsylvania has been able to build a model program that has generated interest across the country. Pennsylvania has learned that harnessing market forces can be an effective way to achieve environmental regulatory goals at less expense than traditional command and control regulations. An example of harnessing market forces occurred in 2008 when Fairview Township decided to use credits to meet its nutrient reduction obligation and in so doing announced a cost savings of approximately 75%.

Since 2005 the Commonwealth has been leading the way nationally in developing its nutrient trading program. The program is one of the first programs in the country to have both nonpoint sources and point sources participating in a nutrient credit trading program. Pennsylvania built its program with significant input from stakeholders – and those very stakeholders are now participants in the program. Pennsylvania built its program to meet Pennsylvania's needs with regard to the Chesapeake Bay. One key to the program's success is that it is voluntary. Another is that the amount of credits that can be traded annually is capped in order to protect the Bay.

The Phase 1 WIP highlighted that Pennsylvania's nutrient trading program is established and working well. Since publication of the Phase 1 WIP, 37 pollutant reduction activities were submitted for review and 39 pollutant reduction activities have been certified. Pennsylvania's 2006 *Chesapeake Bay Point Source Compliance Strategy* for permitting wastewater treatment facilities in the Chesapeake Bay Watershed was described in the Phase 1 WIP. In particular it was highlighted in the Phase 1 WIP that the strategy would be implemented in phases and the 2011 compliance year (October 1 2010- September 30, 2011) marked the first year for a number of wastewater facilities to show compliance with the effluent limits for nitrogen and phosphorus. For the 2011 compliance year, sixteen facilities purchased credits to obtain compliance. PENNVEST now has a track record of successful auctions to buy and sell credits. PENNVEST completed two auctions in 2010 and one in 2011. Auctions will continue in future years.

Future Activities

Maintaining the success of the trading program will require balancing on-going project approval activities with the need to respond to requests to enhance the program. In order to help improve the efficiency of the activities needed to support project review, oversight of the program will be integrated into the Bureau of Point and NonPoint Sources, which was established during the recent DEP re-organization. Responding to requests to enhance the program will be on-going and will follow the general plan of action as described in the next section titled "Plan of Action".

Plan of Action

On February 17, 2012, EPA provided an assessment report of Pennsylvania's Nutrient Trading Program. EPA's cover letter requested that DEP provide a plan of action to address their concerns.

As a first step in the plan of action to address EPA's assessment, DEP plans to gather stakeholders beginning April 2012 for their thoughts on program enhancements. EPA's assessment report will be made available for the stakeholder discussions. DEP anticipates input on streamlining and standardizing the program processes, such as those for certification and verification submissions. DEP also anticipates input on other enhancements that may look at broader program components stakeholders need to advance the program as a long-term compliance tool.

As a second step, DEP will review stakeholder input, along with the comments raised by EPA, and will employ adaptive management principles to determine more details for the plan of action. DEP anticipates having a refined plan of action by the end of 2012, with additional details including information on how the Tier 1 and Tier 2 recommendations in EPA's assessment were considered.

Appendix 1
Pennsylvania Phase 2 Chesapeake WIP County Workshop Schedule
& Summary of Public Comment

October 13, 2011, 1:00 – 4:00 p.m. Adams County Conservation District Lower Level Conference Room 670 Old Harrisburg Road Gettysburg, PA 17325 Counties of Focus: Cumberland, Franklin, Adams, York, Perry	October 20, 2011, 1:00 – 4:00 p.m. Schuylkill County Conservation District Lower Level Conference Room 1202 Ag Center Drive Pottsville, PA 17901 Counties of Focus: Luzerne, Schuylkill, Carbon, Lackawanna, Wayne
October 14, 2011, 1:00 – 4:00 p.m. Lancaster County Conservation District Large Conference Room 1383 Arcadia Road Lancaster, PA 17601-3149 Counties of Focus: Lancaster, Chester, Berks, Lebanon, Dauphin	October 25, 2011, 1:00 – 4:00 p.m. Union County Conservation District Conference Room 155 North 15th Street Lewisburg, PA 17837 Counties of Focus: Union, Lycoming, Northumberland, Columbia, Montour, Snyder
October 17, 2011, 1:00 – 4:00 p.m. Clinton County Conservation District Conference Room 45 Cooperation Lane Mill Hall, PA 17751-9543 Counties of Focus: Clinton, Tioga, Potter, Cameron, Elk, McKean	November 1, 2011, 1:00 – 4:00 p.m. Cambria County Extension Office Conference Room 499 Manor Drive Ebensburg, PA 15931 Counties of Focus: Clearfield, Centre, Mifflin, Cambria, Indiana, Jefferson
October 19, 2011, 1:00 – 4:00 p.m. Sullivan County Conservation District Conference Room 9219 Route 487 Dushore, PA 18614 Counties of Focus: Bradford, Susquehanna, Wyoming, Sullivan	November 2, 2011, 1:00 – 4:00 p.m. Somerset Rural Electric Cooperative Somerset Industrial Park 223 Industrial Park Road Somerset, PA 15501 Counties of Focus: Huntingdon, Blair, Juniata, Somerset, Bedford, Fulton

Pennsylvania Phase 2 Chesapeake WIP County Workshop
Adams County Conservation District
Gettysburg, PA
October 13, 2011

Counties of Focus:
Cumberland, Franklin, Adams, York, Perry

Under Reported BMPs/ EPA Chesapeake Bay Watershed Model

- There is a disconnect between on the ground BMPs and those that are reported in the Bay Model.
- There is great interest in tracking un-reported BMPs.
- One municipality suggested that street sweeping and inlet cleaning should be tracked by weight. It is measurable, quantifiable and reportable.
- DEP should use MS4 Annual Reports to collect urban BMPs such as street sweeping.
- County Planning Commission staff want to help with reporting, but first they need to understand 1) what DEP currently collects, 2) what DEP does not collect, and 3) what are the metrics and formats.
- DEP needs to identify BMP reporting gaps and follow--up action the counties can assist with.
- A recommendation was made for Capital RC&D transects survey to be done statewide. DEP acknowledged that they are pursuing this action.
- DEP needs to provide BMP reporting protocols so counties and municipalities can count non-cost shared or other un-reported BMPs.

MS4 TMDL Plan/Chesapeake Bay Pollutant Reduction Plan

- Municipalities are very interested in the new requirements for MS4s described in PAG-13, including the MS4 TMDL Plan and the Chesapeake Bay Pollutant Reduction Plan.
- DEP is currently developing PAG-13 guidance. Training will be held in January through March. Frequently Asked Questions will be issued soon.

Urban BMPs

- Older built-out municipalities want to receive graduated credit for such BMPs as Forest Buffers and Impervious Surface Reduction. Thirty-five foot buffers are not possible in dense urban areas. Partial credit should be provided for narrower buffers.
- From an urban, suburban perspective - development triggers implementation. Rate of development/redevelopment will dictate implementation rates. The exception would be implementation on government owned property. Or if there's a new ordinance.
- There is no incentive for municipalities to do retrofits. MS4 can't take credit for BMPs from others done under their own MS4 permits.
- Fall leaf removal and brush and limb collection should be credited as a BMP.

Program Gaps

- Agricultural BMP targets will not be achieved without additional funding.
- Phase 2 WIP planning targets sound like an unfunded mandate.

- The state should provide incentives and give funding prioritization for Chesapeake Bay WIP projects.
- DEP should allow nutrient trading credits to be moved between sub basins.
- The state should give incentives to steer BMP implementation towards more effective BMPs.

Pennsylvania Phase 2 Chesapeake WIP County Workshop
Lancaster County Conservation District
Lancaster, PA
October 14, 2011

Counties of Focus:
Lancaster, Chester, Berks, Lebanon, Dauphin

Under Reported BMPs/ EPA Chesapeake Bay Watershed Model

- There is significant interest in helping report under reported BMPs.
- Meeting participants were focused on understanding DEP's BMP tracking system and identifying which BMPs or programs are tracked or not tracked.
- A BMP Tracking protocol needs to be developed so all partners can submit BMP data. Currently, only Conservation Districts report BMPs to DEP.
- DEP needs to standardize forms to distribute. Must be simple.
- Municipalities are interested in submitting BMP data, but questioned whether they should submit the data to the county conservation district or planning commission, or submit it to DEP. DEP would prefer to have the counties collect municipal data if they choose to do so. DEP can also work with individual municipalities.
- Lancaster County received a grant to develop a geo-database of urban BMPs. They will figure out what it's going to take to collect all the BMPs. Then determine how to start surveying neighborhoods to find independent BMPs.
- York City BMPs are mapped geospatially. It's important to let people know what information is needed and the format. They would like the County conservation district to be a conduit for information to be transferred to DEP.
- Lancaster County conservation district commented that agriculture forested buffers are way out of the ballpark of possibility. Manure transport is way underestimated.
- Chester County commented that there are more #16 Nutrient Management BMP acres in their county planning targets than there are agriculture acres in the county.
- Chester County commented that precision feeding is being implemented without USDA support, and that this BMP data needs to be collected.
- County planning commission staff commented that the recycling program could be used as a model for BMP data collection. Industry didn't report recycling, so staff had to go out with a contact list and contact the people yourself. Need to contact farmers, municipalities, and ask for data.
- DEP should look into a mapping program to inventory BMPs so county/municipality can look at the map and see what's already on it or not. City of York inventories BMPs on development plans, then send to City GIS, so there's an interactive map of all BMPs in the City and it's used for inspection/enforcement programs.
- Street sweeping must be biweekly. Not everyone does biweekly sweeping and the % reduction is very little. Street sweeping metric is more effect when measuring tonnage. Need to report the most effective metric.
- City of Lancaster's Green Infrastructure plan was submitted to the DEP. That should be part of Lancaster County planning target.
- Need to relook at the county recycling coordinators program and perhaps use as a model.

Program Gaps

- One county commented that they would be lucky if urban BMPs get enough funding to do 10% of work done, maybe 20% maximum if you count load reductions from new development.
- Reductions are very ambitious, and not achievable under existing resources. Need to reconcile reality and need.
- Need more for Growing Greener funding. PENNVEST funding is needed to support agriculture BMP implementation. Any place that state can increase the availability of funding for qualifying projects is needed.
- County conservation districts want to keep money currently paid to the Clean Water Fund. (Clean Water Fund has been used for matching funds for NRCS funding to provide staff at conservation districts. Some is used for DEP lab costs.)
- With limited resources that we do have, staff is already spending half their time reporting on grants, etc. Need to have a county data entry person that enters all the data. Man hours or people do not exist.
- Underscore the fiscal realities of municipalities. Urban/suburban BMPs will have to be supported by declining municipal budgets.

Pennsylvania Phase 2 Chesapeake WIP County Workshop
Clinton County Conservation District
Mill Hall, PA
October 17, 2011

Counties of Focus:
Clinton, Tioga, Potter, Cameron, Elk, McKean

Under Reported BMPs/ EPA Chesapeake Bay Watershed Model

- Meeting participants want to know what type of documentation is needed to change 2010 numbers.
- DEP needs to develop better protocols to get BMP information gathered. (It was suggested that the CBP-23 form may be appropriate.)
- In Clinton County, continuous no-till acres are under-reported. There are 2 large dairy operations that have 2,600 acres with continuous no-till, but the 2010 number is only 1,300 acres.
- Corn silage fields should be counted as cover crops.
- This is a challenge for NRCS because there is information from several different sources which could lead to double counting. Proper documentation is needed.
- Meeting participants want to do farm visits to identify un-reported BMPs. DEP should move this process along.
- For urban/suburban BMPs, the 2010 numbers do not appear to take into account DEP permit activities.
- Elk County urban/suburban BMPs: We see lots of zeros. There is at least a little going on in metro areas that are not captured.
- For the 2025 goal, greater emphasis is placed on #18, Off-Stream Watering without Fencing, than is given to #17, Off=Stream Watering with Fencing. This should be reversed, as there is a bigger bang for your buck on fencing projects. (It was determined that this was done in error. DEP will re-check its model input decks to ensure higher acreages are applied to fencing projects.)

Program Gaps

- Cost share: There is not near the money for the programs now that there was before.
- In Clinton County, farm lanes in fields are a serious problem. Field lanes are used to go to the fields and they erode badly. Cost share programs would be great for this.
- There is no large-scale program that handles agricultural dirt and gravel roads. (It was suggested then that these could be covered under the 319 program.)
- Clinton has not been identified as high priority county. It is more difficult to get Chesapeake Bay special project money or cost share type money. The BMPs for 2017 goals, higher ticket price BMPs: there is a question as to whether non-priority counties are able to accomplish those goals. More successful implementation is likely for lower-cost BMPs.
- DEP's Stream Bank Fencing program is excellent. Monies were shifted to other regions of the state and it is now not as easy to get the same level of funding. There are lots of small farmers with streams going through farms and fencing would help very much.

Pennsylvania Phase 2 Chesapeake WIP County Workshop
Sullivan County Conservation District
Dushore, PA
October 19, 2011

Counties of Focus:
Bradford, Susquehanna, Wyoming, Sullivan

Under Reported BMPs/ EPA Chesapeake Bay Watershed Model

- 2010 BMP progress data does not appear to reflect reality.
- DEP should have utilized 2005 county BMP implementation plans to build the WIP.
- Sullivan County 2010 implementation for cover crops is zero. This is incorrect as they implemented cover crops with a DEP special project in 2006.
- Sullivan County 2025 goal for riparian forest buffers is absurdly high. Landowners don't want trees near streams because of flooding issues. Grass buffers are preferred.
- County conservation district needs real numbers and information to give to farmers. Bay watershed model is not relevant.
- Conservation district staff feels they are reporting BMPs, but they are rejected from the model because it may not exactly fit the BMP definition.
- Sullivan Conservation District staff stated that the 2010 number for mortality composters is incorrect because every farmer has to take care of deceased animals themselves.
- If the BMP verification process increases, it will be resource intensive and more expensive.
- The 2010 progress BMPs do not reflect what people are doing, and the 2017 and 2025 goals are unrealistic. DEP should not promote the county planning targets as people will question their credibility.

Program Gaps

- Sullivan County supports continued or increased funding for the Conservation Reserve Enhancement Program (CREP).
- Bradford and Sullivan Conservation Districts commented that they are losing more nutrients and sediments through inadequate stream bank stabilization, than from agriculture run off. The Legacy Sediment BMP under development should also address loads associated with logging on steep slopes.
- Funding and resources is needed to address needed stream bank stabilization. NRCS Cooperative Conservation Partnership Initiative (CCPI) grants can address agricultural stream banks.
- Sullivan conservation district expressed dissatisfaction that it is not recognized as a priority watershed and are not eligible for DEP Chesapeake Bay special projects grants. They had the same concern with NRCS funding.
- Lower delivery efficiencies in the upper watershed increase costs per pound reduced.

Local Efforts

- Bradford Conservation District will expand farm visits over the next year to promote manure management planning. They expect to reach 1,400 to 2,000 farms. Need to make sure manure management plans are accepted by the model.

- Sullivan Conservation District will also provide outreach to farmers to develop manure management plans. Districts are waiting for DEP's revised Manure Management Manual.

Pennsylvania Phase 2 Chesapeake WIP County Workshop
Schuylkill County Conservation District
Pottsville, PA
October 20, 2011

Counties of Focus:
Luzerne, Schuylkill, Carbon, Lackawanna, Wayne

Under Reported BMPs/ EPA Chesapeake Bay Watershed Model

- Participant stated that it is hard to say if conservation tillage acreage looks reasonable.
- Participant questioned the 2010 continuous no-till acreage reported to be zero.
- Participant wanted NRCS to report non-cost shared BMPs.
- Participant commented that 2010 BMP and Land Use acres do not seem accurate. It would be important to collect data and ensure its accuracy before making county projections for 2025.
- Participant commented that it appears that BMPs are under-reported.
- Schuylkill County expressed general confusion with the BMP acreage data, and concern that horse pasture management is reported as zero in 2010 and the future. Horse pasture is a big problem.
- Schuylkill County states that there are many small horse operations that are not counted. Many of them are not "farms," but are in someone's backyard. There is concern that the land may not be considered agricultural land, which means that agricultural BMPs cannot be credited for land that is not considered agricultural.
- Participants questioned how to report "voluntary" BMP acreage.
- Participant expressed confusion of the off stream watering and fencing BMPs (BMP #17, 18, 19). They usually get information reported differently.
- Participant expressed concern that bio-solid waste, and slaughter and food processing waste was not tracked for the nutrient management BMP. DEP noted that it was a small percentage of nutrient loading.
- Participant noted that there are zero acres of urban nutrient management in 2010 and over 700 acres planned for 2025. Concern was expressed that without legislation to establish an urban nutrient management program, that this BMP cannot be tracked.
- Participant commented that no one in their county does street sweeping, that the goal is unrealistic, and questioned who would track this information.
- Participant expressed concern that septic system data is reported to one office in DEP, but that information does not get reported to the model. There is a similar concern for animal wastes. Suggestion was made that there be sharing of data across agencies and offices.
- Luzerne County commented that the 2010 urban erosion and sediment control BMP acreage appeared low.
- Luzerne County commented that they have done urban stream restoration with Growing Greener, but zero feet are reported for 2010.
- Urban sprawl reduction BMP projections are high. Participant commented they believe that there will not be more than 5 acres.
- Pasture fencing (BMP #20) acres are low.

- Luzerne County commented that there will be more manure/litter being exported as part of race tracks.
- Luzerne and Lackawanna counties have developed a Bi-county comprehensive plan. This will drive development of local ordinances. Department of Community of Economic Development will use plans to direct funding for downtown revitalization projects, direct efforts how funding flows.
- Participant shares information with/reports to Farm Service Agency (FSA) – They only report crops information, not tillage practices. FSA funding is not good, they could be more beneficial. Lot more people reporting crop information to FSA (rather than cost share programs). Suggest working with FSA to collect more information [for example, such as tillage practices]. Have some reported information [for example the tillage practices] be a voluntary form.
- Participant doesn't believe that all the information that they are reporting as part of cost-share programs is included. Comment that reporting efforts/BMPS with FSA would be more convenient. (It was noted that there is a pilot project in Delaware, but currently FSA is not agreeing to participate or cooperate.)
- Schuylkill County commented that the cover crop numbers (BMP #7) are not correct.

Program Gaps

- Participant commented that they believe that Chesapeake Bay Program support was larger in the past, but it seems it has decreased over the years.
- Participant stated that cost-share money is being cut, rules change, and weather has impacts on farming. Planning deadlines and guidelines are a disincentive to get involved in some cost-share programs.
- Participant commented that there is a need for funding, especially with mandates that requires us reduce nutrients and sediments, and putting the responsibility on the districts.
- Chesapeake Bay Special Project grants – Program works well, money easy to use, efficient at getting projects on the ground, able to use faster than NRCS.
- Participant commented that the system is there, the people are there and willing, but the funding is not.
- The Chesapeake Bay Watershed Initiative (CBWI) is a good program, but funding will likely be decreased and there will be less money for projects.
- Participant is meeting with farmers, and commented that the farmers are having economic problem.
- Need more cost-share programs.
- Know that there will be a decrease in funding in some places, we are shifting focus to other sources (NRCS). Still going to work toward goals, but maybe using different funding sources. Understand money directed toward hot spots, but that doesn't help lower priority counties.
- There will need to be change in EPA expectations if funding isn't going to be there. Unable to get projects done/meet expectations without funding.
- Have noticed reductions in funding. Participant is focusing on no till and conservation practices, but still need to focus on manure storage. Still need structures.
- Question to EPA: What kind of hope can you offer? Seems like you are setting lofty goals. Based on economic conditions, what happens if we don't meet our goals?

Pennsylvania Phase 2 Chesapeake Bay WIP County Workshop
Union County Conservation District
Lewisburg, PA
October 25, 2011

Counties of Focus:
Union, Lycoming, Northumberland, Columbia, Montour, Snyder

Under Reported BMPs/ EPA Chesapeake Bay Watershed Model

- Union County commented that the targets for 2010 off stream watering with fencing (BMP #17) are low (zero).
- Participant suggested that it is important to clarify definitions of BMPs, lumping certain BMPs, and which BMPs work in a string. Suggested that BMPs be split rather than lumped together. BMP #19 Off-Stream Watering with Fencing and Rotational Grazing is reported as zero for 2010 and 2025. This BMP is under-reported, and the Conservation District wants to push this BMP.
- For BMP #21 – Poultry and Swine Phytase, DEP needs to work with industry to achieve the goal. Conservation Districts do not have control.
- Methodology of under reported BMPs is elusive. What about re-calibrating model rather than trying to capture all BMPs? Not sure if trying to track BMPs is going to work, seems like a lot of effort but in the end and will not change actual water quality.
- Concern that workshop participants and stakeholders will put a lot of effort into collecting information, but will not change the water quality that is going into the Chesapeake Bay. More interested in real decreases in loadings, and not just in model.
- Participant commented that they don't think that collecting information on under-reported BMPs] is an important part of the big picture. The real water quality is important. They understand that model is important tool. Question what is most efficient way to use resources? Does it make more sense to re-calibrate model for now, and then be more diligent about reporting on-the-ground practices. Have had increases in cover crops and no-till, the listed numbers are way off (BMP #5 and 6, not high enough), increase in on-the-ground practices. Recalibration seems better way to balance what is on ground vs. what is in model. What difference is it going to make to collect information (spending/using resources) when it won't change water quality, the real goal.
- A lot that the farmers are doing conservation practices on their own. Don't want information to be used as an exercise to reduce numbers in the model, need to improve water quality.
- Are there other ideas to extract BMP information? Participant asked about using the USDA agricultural census to help with information. Nutrient trading is another source.
- Are there other ways to collect information?
- Census process, any thought of using that as a tool to collect information? In order to reduce burden on farmers, could have an interim census or census for conservation practices from USDA, within 4-5 year period. This would help Pennsylvania farmers. We fill out the census because we are bound to, but if the process were marketed to the farmers as a way that would help them reduce burden/load, may get more responses/cooperation [incentive to fill out survey/census if farmers know it may

decrease their responsibility/burden]. Challenge: some may not fill out the census, or may input false data/information.

- A participant expressed concern that a county successful in meeting its goals could be penalized if another counted failed to do so.
- Is there consideration that due to highly managed farms in Union County, concentrations of nitrogen in underground aquifers exceed drinking water standards? Nitrogen goals have never had water quality focus. It may not be able to meet water quality goals based on agronomic rates.
- Union County expressed general concern– Looking at projections for 2025 and comparing to what is currently going on, the numbers were calculated at historic rate. Focusing on nutrient management (BMP # 16), there are 66,000 acres projected in 2025, but there are only 55,000 acres of agricultural land use in County. They believe that nutrient management acres are under-reported.
- Lycoming County commented that for BMP #2 – barnyard runoff controls –In 2010 there are 4 acres listed, and in 2025 there is 160 acres, too steep of increase.

Program Gaps

- Participant noted that there is NRCS funding available for BMPs, but expressed concern about the uncertainty of what future farm bills will look like. Noted that 10 years ago participants were relying on state for money and currently they rely on federal agencies.
- Participant noted that NRCS funding goes to priority watersheds.
- Participant noted that there are staffing and funding gaps, (and shortage of daylight hours).
- Conservation Districts are doing farm visits under Chesapeake Bay initiative, and farmers are feeling pressure. As manure and nutrient management plans are being developed, farmers will see that BMPs will need to be implemented. Farmers won't do it unless there is funding. Need more funding.
- Participant expressed concern about work load and farm bill. Districts may not be adequately staffed, especially for getting information from farms. Next step is for farms to request assistance.

Pennsylvania Phase 2 Chesapeake WIP County Workshop
Cambria County Extension Office
Ebensburg, PA
November 1, 2011

Counties of Focus:
Clearfield, Centre, Mifflin, Cambria, Indiana, Jefferson

Under Reported BMPs/ EPA Chesapeake Bay Watershed Model

- Participant commented that a lot of farmers putting in no till conservation practices. FSA is reporting crops, but there is a disconnect when reporting conservation practices.
- Participant commented on the fact that information on urban BMPs are only coming from NPDES permits. County has Act 167 plan, but there is no NPDES permit. Problem/challenge: BMPs are below the threshold/minimum to be credited; also counties are not keeping track of BMPs. If not part of permit, how are they getting recorded?
- Participant commented on performance of dry detention basins. They mentioned the poor performance of roughly half of the dry detention basins, and they cause channel degradation, however, the other half are well engineered. They also cautioned the use of general assumed efficiencies in the model. Lot of guess work and generalization in the process. Some infiltration practices don't work, and the performance is somewhat based on construction. At end of day, it's not about what model says, it's about the Bay and real water quality.
- Participant commented that unreported BMPs are on the ground, and we need to get credit for them.
- Centre County had questions about the definitions for combined sewer systems, public sanitary system, and septic system hook ups.
- Centre County is concerned that the model does not take into account carbonate watersheds. They also commented that the numbers for dry detention pond, BMP #28 and 29, are unreasonable/unrealistic. Centre County should not be expected to eliminate dry detention ponds and put in infiltration practices.
- Participant expressed that they want to make sure that when using cost-share programs/grants, they get credit, especially if it is not the typical cost share program.
- Cambria County expressed concern that they have zero 2010 acres for BMP #30, Erosion and Sediment Control, and requested guidance for reporting.
- Interest was expressed in participating in the Nutrient Trading program.
- Participants expressed interest in collecting data on unreported BMPs, but requested that DEP provide specific guidance.
- Cambria County expressed concerns with timing of the WIP Phase 2 process, and commented that it will be very difficult to collect the BMP data by EPA's December 15 deadline. They also commented that BMP #2, barnyard runoff, is significantly under counted.

Pennsylvania Phase 2 Chesapeake WIP County Workshop
Somerset Rural Electric Cooperative
Somerset, PA
November 2, 2011

Counties of Focus:
Huntingdon, Blair, Juniata, Somerset, Bedford, Fulton

Unreported BMPs/ EPA Chesapeake Bay Watershed Model

- Participant noted that the Predict model require a significant amount of BMP implementation to show load reductions.
- Participant noted that quite a few BMP implementation numbers, especially production agriculture, were incorrect.
- Participant mentioned that they use the Dirt and Gravel Program as a learning opportunity to teach others how to deal with unpaved roads. Once someone does the training, they are eligible for the funding. Participant is concerned that once the townships continue the process with different funding sources, they may not be included in reporting or tracking.
- Numerous participants expressed interest in helping to collect unreported BMPs, but need DEP protocol for collecting BMP data.
- County Planning Director commented that they were hesitant to complete the blank BMP planning target form without authorization from County Commissioners. There is concern that counties will be held accountable for numbers in the future, and be subject to fines and regulatory action if they fail to meet the numbers. They are not objecting to the overall mechanics of this process, but believe there is a disconnect between the real world, the model world, the regulatory world, and the political world.
- Participant commented that early verification efforts should focus on numbers that are more factual, such as the number of farms or CAFOs, and land use acres that can be collected from local planning departments and conservation districts. Until the model is recalibrated, we have time to be coming up other numbers of unreported BMPs.

Program Gaps

- Significant concern was expressed by numerous participants that available funding to implement BMPs is being cut and they are concerned about ramifications if we fail to meet milestones. They are concerned repercussions will fall on municipalities and counties.
- A participant requested EPA to increase funding for BMP implementation.
- Participants expressed concern that when the “pie in the sky plan” fails, that counties and municipalities will become responsible.
- Numerous participants expressed interest in examining water quality data to help target resources and doing water quality monitoring.
- Another participant noted it is expensive and difficult to develop good water quality monitoring data, and that local efforts are better focused on planting trees or implementing other BMPs.
- Participant expressed concern that townships will be required to pass ordinances to address Act 537 and stormwater management.

- Funding for Act 167, Stormwater Management Act has been eliminated, thereby creating a disincentive for development of plans and ordinances. Some counties do not have county stormwater management plans.
- Participant mentioned EQIP (Pennsylvania Environmental Quality Incentive Program, USDA/NRCS) as a favorable cost-share program.
- Participants expressed support for the Dirt and Gravel Road Program, but suggested funding was not adequate to support the expected level of implementation in 2025

Appendix 2
PA Chesapeake Watershed Implementation Plan
County Planning Targets

What are Planning Targets?
The Chesapeake Bay TMDL established regulatory waste load allocations and load allocations for nitrogen, phosphorus and total suspended solids (TSS) based in part on PA's Chesapeake Watershed Implementation Plan (WIP). To facilitate local implementation of necessary reduction actions to meet the allocations, EPA directed the Chesapeake watershed states to sub-divide the reductions by local areas. Pennsylvania chose to sub-divide loads at the county-level, as the EPA Chesapeake Bay watershed model is based in part on county level data. The county planning targets address only those loads that can be reduced by Best Management Practices (BMPs). This includes both regulatory and non-regulatory loads for agriculture, stormwater and forest. Wastewater treatment plant reductions are not addressed because they were previously addressed by the 2006 Chesapeake Bay Compliance Strategy.

The Draft County Planning Targets are generated from EPA's Chesapeake Bay Watershed Model input deck generated for the Phase 1 WIP, and may not reflect actual 2010 conditions or possible 2025 conditions. The targets are for planning purposes only, and do not become regulatory allocations at the county level. The identified Pollution Reduction Actions represent one scenario from the Watershed Model that meets the planning targets. There are other equally valid combinations of actions that could also meet the planning target. It should be noted that the Phase I WIP model input deck distributed BMPs evenly across land-river segments, so some segments may have received implementation levels in the WIP that are less than what is reported historically.

Nitrogen Planning Target	**Pounds**
2009 Progress Load	
2010 Current Load	
2017 Interim Planning Target – 60%*	
2017 Nitrogen Reductions (2010 – 2017)	
2025 Planning Target – 100%	
2025 Total Nitrogen Reductions (2010 – 2025)	

Phosphorus Planning Target	
2009 Progress Load	
2010 Current Load	
2017 Interim Planning Target – 60%*	
2017 Phosphorous Reductions (2010 – 2017)	
2025 Planning Target – 100%	
2025 Total Phosphorous Reductions (2010 –2025)	

Total Suspended Solids (TSS) Planning Target	
2009 Progress Load	
2010 Current Load	
2017 Interim Planning Target – 60%*	
2017 TSS Reductions (2010 – 2017)	
2025 Planning Target – 100%	
2025 Total TSS Reductions (2010 – 2025)	

NOTE: * 60% of reductions from the 2009 progress load.

Nonpoint Source Pollution Reductions by Sector

Load Reduction Bar Charts.

County Land Use Distribution

Agriculture	**2010 Acres**	**2025 Acres**
Conventional Till Row Crops		
Conservation Till Row Crops		
Hay		
Alfalfa		
Pasture		
Animal Feeding Operations		
Concentrated Animal Feeding Operations		
Nursery		
Total Agriculture:		
Urban		
Pervious Urban Land		
Impervious Urban Land		
Construction		
Extractive		
Combined Sewer System		
Total Urban:		
Forest		
Total Acreage:		

Pollution Reduction Actions

Agricultural Activities

BMP	Units	2010	2017*	2025
1. Animal Waste Management Systems	Systems			
2. Barnyard Runoff Controls	Acres			
3. Carbon Sequestration/Alternative Crops	Acres			
4. Conservation Plans/SCWQA	Acres			
5. Conservation Tillage	Acres			
6. Continuous No-Till **	Acres			
7. Cover Crops	Acres			
8. Forest Buffers	Ag Acres			
9. Grass Buffers	Ag Acres			
10. Horse Pasture Management	Acres			
11. Land Retirement/Environmental Planting	Acres			
12. Manure Injection	Acres			
13. Manure/Litter Transport	Tons			
14. Mortality Composters	Units			
15. Non-Urban Stream Restoration	Feet			
16. Nutrient Management	Acres			
17. Off-Stream Watering with Fencing	Acres			
18. Off-Stream Watering without Fencing	Acres			
19. Off-Stream Watering with Fencing and Rotational Grazing	Acres			
20. Pasture Fencing	Acres			
21. Poultry and Swine Phytase	Percent			
22. Precision Agriculture	Acres			
23. Precision Feeding	Percent			
24. Tree Planting	Ag Acres			
25. Upland Precision Grazing	Acres			
26. Upland Precision Rotational Grazing	Acres			
27. Wetland Restoration	Acres			

Urban/Suburban Activities

BMP	Units	2010	2017*	2025
28. Dry Detention Ponds/Hydrodynamic Structures	Acres			
29. Dry Extended Detention Ponds	Acres			
30. Erosion and Sediment Control	Acres			
31. Filtering Practices ***	Acres			
32. Forest Buffers	Urban Acres			
33. Grass Buffers	Urban Acres			
34. Impervious Surface Reduction	Acres			
35. Infiltration Practices ***	Acres			
36. Septic System Hook-ups	Units			
37. Street Sweeping	Acres			
38. Tree Planting	Urban Acres			
39. Urban Nutrient Management	Acres			
40. Urban Sprawl Reduction	Acres			
41. Urban Stream Restoration	Feet			
42. Wet Ponds & Wetlands	Acres			

Other Activities

BMP	Units	2010	2017*	2025
43. Abandoned Mine Reclamation	Acres			
44. Dirt and Gravel Road Erosion and Sediment Control	Feet			
45. Forest Harvesting Practices	Acres			

NOTES:

*2017: 60% of 2025 BMPs.

**Continuous No-Till (CNT): This BMP was under projected in the 2025 WIP watershed model input deck because the EPA model does not recognize other BMPs when CNT is applied on conservation tillage acres.

***Filtering Practices & *** Infiltration Practices: These BMPs were over projected in the 2025 WIP watershed model input deck to compensate for the EPA model's inability to address stormwater treatment trains.

Pollution Reduction Actions

Agricultural Activities

1. Animal Waste Management Systems
Animal waste management systems are practices designed for proper handling, storage, and utilization of wastes generated from confined animal operations and include a means of collecting, scraping or washing wastes and contaminated runoff from confinement areas into appropriate waste storage structures. Lagoons, ponds, or steel or concrete tanks are used for the treatment and/or storage of liquid wastes. Storage sheds or pits are common storage structures for solid wastes. Controlling runoff from roofs, feedlots and "loafing" areas are an integral part of these systems.

2. Barnyard Runoff Controls
Barnyard Runoff Controls are designed to improve water quality, reduce soil erosion, increase infiltration, and protect structures. Controls may include structures that collect, control, and transport precipitation from roofs and additional structures or diversions to direct runoff away from barnyards, as well as to control runoff generated by barnyards. Vegetated treatment area may be included to improve water quality by reducing loading of nutrients, organics, pathogens, and other contaminants associated with barnyards.

3. Carbon Sequestration/Alternative Crops
Carbon Sequestration refers to the conversion of cropland to hay land (warm season grasses). The hay land is managed as a permanent hay land providing a mechanism for sequestering carbon within the soil.

4. Conservation Plans/SCWQA
Farm conservation plans are a combination of agronomic, management and engineered practices that protect and improve soil productivity and water quality, and prevent deterioration of natural resources on all or part of a farm. Plans may be prepared by staff working in conservation districts, natural resource conservation field offices or a certified private consultant. In all cases the plan must meet technical standards. Conservation plans are reported as total acres or on a specified landuse.

5. Conservation Tillage
Conservation tillage involves planting and growing crops with minimal disturbance of the surface soil. Conservation tillage requires two components, (a) a minimum 30% residue coverage at the time of planting, and (b) a non-inversion tillage method. No-till farming is a form of conservation tillage in which the crop is seeded directly into vegetative cover or crop residue with little disturbance of the surface soil. Minimum tillage farming involves some disturbance of the soil, but uses tillage equipment that leaves much of the vegetation cover or crop residue on the surface.

6. Continuous No-Till
The Continuous No-Till BMP is a more comprehensive type of conservation tillage practice in which soil disturbance by plows, disk or other tillage equipment is eliminated. In most cases

large amounts of crop residue are left on the surface to protect the soil from storm events. To be considered as no-till a minimum of 50% residue must be maintained. Continuous No-Till involves no-till methods on all crops in a multi-year rotation.

7. Cover Crops

Cereal cover crops reduce erosion and the leaching of nutrients to groundwater by maintaining a vegetative cover on cropland and holding nutrients within the root zone. This practice involves the planting and growing of cereal crops (non-harvested) with minimal disturbance of the surface soil. The crop is seeded directly into vegetative cover or crop residue with little disturbance of the surface soil. These crops capture or "trap" nitrogen in their tissues as they grow. By timing the cover crop burn or plow-down in spring, the trapped nitrogen can be released and used by the following crop. Cover crops may be considered to be either" Early" or "Late" Season types.

Early: To be eligible for level 1-reduction credits, the cover crop must be planted earlier than 7 days prior to the long-term published average date of the first killing frost in the fall.
Late: To be eligible for level 2-reduction credit, the cover crop must be planted within 7 days after the long-term published average date of the first killing frost in the fall.

Commodity cover crops differ from cereal cover crops in that they may be harvested for grain, hay or silage and they may receive nutrient applications, but only after March 1 of the spring following their establishment. The intent of the practice is to modify normal small grain production practices by eliminating fall and winter fertilization so that crops function similarly to cover crops by scavenging available soil nitrogen for part of their production cycle. This practice can encourage planting of more acreage of cereal grains by providing farmers with the flexibility of planting an inexpensive crop in the fall and delaying the decision to either kill or harvest the crop based on crop prices, silage needs, weather conditions, etc.

8. Forest Buffers - Agriculture

Agricultural riparian forest buffers are linear wooded areas along rivers, stream and shorelines. Forest buffers help filter nutrients, sediments and other pollutants from runoff as well as remove nutrients from shallow groundwater. The recommended buffer width for riparian forest buffers (agriculture) is 100 feet, with a 35 feet minimum width required.

9. Grass Buffers - Agriculture

Agricultural riparian grass buffers are linear strips of grass or other non-woody vegetation maintained between the edge of fields and streams, rivers or tidal waters that help filter nutrients, sediment and other pollutant from runoff. The recommended buffer width for riparian forests buffers (agriculture) is 100 feet, with a 35 feet minimum width required.

10. Horse Pasture Management

Horse pasture management includes maintaining a 50% pasture cover with managed grass species and managing high traffic areas. High traffic area management is utilized to reduce the highest load contributing areas associated with pasture lands, and maintaining a 50% cover will improve the pasture so erosion and nutrient loss is further reduced. High traffic areas are concentration areas within the pasture where the grass is sparse or nonexistent. These often are feeding areas, such as hay deposits around fence lines. These areas are treated as sacrifice areas.

11. Land Retirement/Environmental Planting
Agricultural land retirement takes marginal and highly erosive cropland out of production by planting permanent vegetative cover such as shrubs, grasses, and/or trees. Agricultural agencies have a program to assist farmers in land retirement procedures. Land retired and planted to trees is typically reported under "Tree Planting".

12. Manure Injection
This practice involves the direct injection of manure slurry into soil. Direct injection is applicable to swine, dairy and beef species. Manure can be successfully injected in both conventional tillage and most no-till systems. This method allows a more precise application of manure to the fields so farmers are less likely to apply more manure than crops can utilize. Direct injection of manure slurry also provides a significant reduction in land application odor and ammonia emissions release when compared to conventional manure surface broadcasting.

13. Manure/Litter Transport
Alternative uses of manure/litter and manure/litter transport are practices that reduce or eliminate excess nutrient applications within the Chesapeake Bay by either transporting the manure/litter outside of the state's portion of the Chesapeake Bay watershed, reducing the import of manure/litter into the Bay watershed, or finding an alternative use for the excess manure/litter. Excess manure is defined as manure nutrients produced within an area that exceeds the recommended application rates associated with the crops grown. Examples include fertilization of commercial tree plantations, research and development of new fuel technologies, pelletizing for fertilizer, transport out of the watershed to other areas that need it, and electric generation.

14. Mortality Composters
A structure or device to contain and facilitate the controlled aerobic decomposition of manure or other organic material by micro-organisms into a biologically stable organic material that is suitable for use as a soil amendment. Mortality composters involve composting of dead animals (typically poultry, swine and bovine) in a designed, on-farm facility, with subsequent land application of the compost. This prevents the necessity to bury dead animals that could result in nutrient leachate, or rendering of dead animals for processing into animal feeds or incineration.

15. Non-Urban Stream Restoration
This practice involves treatments used to stabilize and protect banks of streams or constructed channels to prevent the loss of land, damage to land uses and to reduce offsite or downstream effects of sediment from bank erosion. This may include additional practices to stabilize the bed or bottom of a channel to prevent damaging aggradation of sediment or degradation of the stream bed by grazing animals.

16. Nutrient Management
Nutrient management involves implementation of a comprehensive plan that describes the optimum use of nutrients to minimize nutrient loss while maintaining yield. This activity details the type, rate, timing, and placement of nutrients for each crop. Soil, plant tissue, manure and/or sludge tests are used to assure optimal application rates. Plans should be revised every 2 to 3 years.

17. Off-Stream Watering with Fencing
Stream protection with fencing and off-stream watering incorporates both alternative watering and installation of fencing that involves narrow strips of land along streams to exclude livestock. The fenced areas may be planted with trees or grass, but are typically not wide enough to provide the benefits of buffers. The implementation of stream fencing should substantially limit livestock access to streams, but can allow for the use of limited hardened crossing areas where necessary to accommodate access to additional pastures or for livestock watering.

18. Off-Stream Watering without Fencing
Off stream watering in pasture without fencing requires the use of alternative drinking water troughs or tanks away from streams. This BMP may also include options to provide shade for livestock away from streams. Limited research has been conducted for this practice that documents changes in livestock behavior resulting in significantly less time spent near streambanks and in streams. The net effectiveness of the practice must reflect partial removal of livestock from near stream areas and relocation of animal waste deposition areas and heavy traffic areas surrounding water sources to more upland locations. This activity may include alternative water sources, tree plantings away from the stream, and stream crossings

19. Off-Stream Watering with Fencing and Rotational Grazing
Off stream watering with stream fencing and rotational grazing (pasture) combines stream fencing and alternative watering with cross fencing systems to create paddocks to enable rapid grazing of small areas in sequence. Once an area is intensively grazed of most vegetative matter, the animals are moved to another paddock to enable recovery of the pasture grasses. This BMP is beneficial in removing animals from stream areas, but may be offset by an increased animal stocking rate per acre. This increases the concentration of animal manure per acre and may adversely impact the quality of surface water runoff.

20. Pasture Fencing
Pasture fence involves installation of fencing that excludes narrow strips of land along streams from pastures and livestock. The implementation of stream fencing should substantially limit livestock access to streams but can allow for the use of limited hardened crossing areas where necessary to accommodate access to additional pastures or for livestock watering. Where no access to the stream is allowed, alternative off-stream watering may be provided. The fenced areas may be planted with trees or grass.

21. Poultry and Swine Phytase
Phytase can be included in poultry and swine diets by an integrator or other feed supplier. Manure phosphorous reductions occur because less phosphorous needs to be blended into feed rations, resulting in a phosphorous source reduction.

22. Precision Agriculture
An agricultural management system that promotes variable monitoring of field crop yield to determine areas of the field where actual yield may be more or less due to variable field conditions. Nutrient applications are then adjusted to match areas of consistently low yield by applying less fertilizer and applying more fertilizer in areas that consistently provide a higher

yield. The result is more efficient use of fertilizer. The goal is to improve farmers' profits and harvest yields while reducing the negative impacts of farming on the environment that come from over-application of fertilizers.

23. Precision Feeding

Precision feeding involves reduction in overfeeding of dairy and swine livestock through the formulation of improved feed rations to meet specific nutrient needs of individual operations. The practice includes the targeting of minimum nitrogen and phosphorus feed concentrations while maintaining acceptable production levels so as to minimize the quantity and nutrient content of animal manures.

24. Tree Planting - Agriculture

The tree planting BMP includes any tree planting on agricultural lands (particularly row crops), except those used to establish riparian forest buffers, targeting lands that are highly erodible or identified as critical resource areas. Tree planting is also called afforestation because it involves growing trees and converting the land use from agricultural to forest. This BMP results in a landuse conversion from row crop to forest. It is assumed that the density of the plantings is sufficient to produce a forest like condition over time.

25. Upland Precision Grazing

This practice (also known as prescribed grazing) utilizes a range of pasture management and grazing techniques to improve the quality and quantity of the forages grown on pastures and reduce the impact of animal travel lanes, animal concentration areas or other degraded areas. This practice can be applied to pastures intersected by streams or upland pastures outside of the degraded stream corridor (35 feet width from top of bank). The modeled benefits of prescribed grazing practices can be applied to pasture acres in association with or without alternative watering facilities. They can also be applied in conjunction with or without stream access control. Pastures under such systems are defined as having a vegetative cover of 60% or greater.

26. Upland Precision Rotational Grazing

This practice utilizes more intensive forms of pasture management and grazing techniques (in comparison to prescribed grazing) to improve the quality and quantity of the forages grown on pastures and reduce the impact of animal travel lanes, animal concentration areas or other degraded areas of upland pastures. This activity can be applied to pastures intersected by streams or upland pastures outside of the degraded stream corridor (35 feet width from top of bank). The modeled benefits of this practice can be applied to pasture acres in association with or without alternative watering facilities. They can also be applied in conjunction with or without stream access control. This practice requires intensive management of livestock rotation, also known as Managed Intensive Grazing systems (MIG), that have very short rotation schedules. Pastures are defined as having a vegetative cover of 60% or greater.

27. Wetland Restoration

Agricultural wetland restoration activities re-establish the natural hydraulic condition in a field that existed prior to the installation of subsurface or surface drainage. Projects may include restoration, creation and enhancement acreage. Restored wetlands may be any wetland classification including forested, scrub-shrub or emergent marsh.

Urban/Suburban Activities

28. Dry Detention Ponds/Hydrodynamic Structures
Dry detention ponds are depressions or basins created by excavation or berm construction that temporarily store runoff and release it slowly via surface flow or groundwater infiltration following storms. Hydrodynamic structures are devices designed to improve quality of stormwater using features such as swirl concentrators, grit chambers, oil barriers, baffles, micro-pools, and absorbent pads that are designed to remove sediments, nutrients, metals, organic chemicals, or oil and grease from urban runoff.

29. Dry Extended Detention Ponds
Dry extended detention ponds are storm water design features that provide a gradual release of a specific volume of water in order to increase the settling of pollutants and protect downstream channels from frequent storm events. Dry extended detention ponds are often designed with small pools at the inlet and outlet of the pond. These BMPs can also be used to provide flood control by including additional detention storage above the extended detention level.

30. Erosion and Sediment Control
Erosion and sediment control practices protect water resources from sediment pollution and increases in runoff associated with land development activities. By retaining soil on-site, sediment and attached nutrients are prevented from leaving disturbed areas and polluting streams. This activity may include the use of features such as a silt fence, slope drain, and permanent vegetation.

31. Filtering Practices
Filtering Practices capture and temporarily store the water quality volume and pass it through a filter of sand, organic matter and vegetation, promoting pollutant treatment and recharge. Examples practices include surface sand filters, swales, porous pavement, and bioretention areas (raingardens)

32. Forest Buffers – Urban
Urban riparian forest buffers are linear strips of maintained woody vegetation that buffer streams, rivers or tidal waters from urban and suburban activity. Forest buffers help filter nutrients, sediments and other pollutants from runoff, as well as remove nutrients from groundwater. The recommended width for riparian forest buffers (urban) is 50 feet with a 35 feet minimum.

33. Grass Buffers - Urban
Riparian grass buffers planted in urban areas are linear strips of grass or other non-woody vegetation maintained between the edge of fields and streams, rivers or tidal waters that help filter nutrients, sediment and other pollutant from runoff. The recommended buffer width for riparian grass buffers is 100 feet, with a 35 feet minimum width required.

34. Impervious Surface Reduction
This includes practices that reduce the total area of impervious cover and practices that capture stormwater and divert it to pervious areas, subsequently encouraging storm water infiltration. Example activities include natural area conservation, disconnection of rooftop runoff, porous pavement and rain barrels.

35. Infiltration Practices
Infiltration practices are used to capture and temporarily store the water quality volume before allowing it to infiltrate into the soil, promoting pollutant treatment and groundwater recharge. Examples include **i**nfiltration trenches, infiltration basins, and porous pavement.

36. Septic System Hook-ups
Septic connections/hookups represent the replacement of traditional septic systems with connection to wastewater treatment plants (WWTPs).

37. Street Sweeping
This practice involves routines sweeping of municipal streets on a repetitive basis using various motorized mechanical devices. Street sweeping ranks among the oldest practices used by communities for a variety of purposes to provide a clean and healthy environment, and more recently to comply with their National Pollutant Discharge Elimination System stormwater permits.

38. Tree Planting - Urban
Urban tree planting involves planting of trees on urban pervious areas at a density that would produce a forest-like condition over time. The intent of the planting is to eventually convert the pervious portion of urban area to forest. If the trees are planted as part of the urban landscape, with no intention to covert the area to forest, then this would not count as urban tree planting.

The “Mixed Open” land category is a combination of low intensity development, recreation areas, battlefields, golf courses, school recreation areas and other large tracts of herbaceous lands that are not directly associated with impervious acres, but are clearly not available as, or associated with, agricultural land. Mixed open tree planting includes any tree plantings on any site except those along rivers and streams, which are considered forested buffers and are treated differently. The definition of tree planting does not include reforestation.

39. Urban Nutrient Management
Urban nutrient management involves the reduction of fertilizer to grass lawns and other urban areas. The implementation of urban nutrient management is based on public education and awareness, targeting suburban residences and businesses, with emphasis on reducing excessive fertilizer use.

40. Urban Sprawl Reduction
This activity involves a change from urban to non-urban landuse in forecasted conditions. This is also known as urban growth reduction.

41. Urban Stream Restoration
Stream restoration in urban areas is used to restore the urban stream ecosystem by restoring the natural hydrology and landscape of a stream. Stream restoration in urban areas is used to help improve habitat and water quality conditions in degraded streams. Typically, streams in need of restoring have watershed conditions that have destabilized the stream channel and accelerated the erosion of stream banks. The objectives for stream restoration in urban areas include, but are not limited to, reducing stream channel erosion, promoting physical channel stability, reducing the transport of pollutants downstream, and working towards a stable habitat with a self-sustaining, diverse aquatic community.

42. Wet Ponds & Wetlands
Wet ponds and wetland practices implemented in urban areas collect and increase the settling of pollutants, and protect downstream channels from frequent storm events. Wet ponds retain a permanent pool of water. Examples include wet ponds, wet extended detention ponds, retention ponds and constructed wetlands.

Other Activities

43. Abandoned Mine Reclamation
Abandoned mine reclamation stabilizes the soil on lands mined for coal or affected by mining, such as wastebanks, coal processing, or other coal mining processes. Example activities include land grading, re-vegetation, tree planting, wetland development and the installation of surface water control measures such as diversions, waterways, and retention ponds

44. Dirt and Gravel Road Erosion and Sediment Control
This practice includes implementation of practices to stabilize dirt and gravel roads adjacent to streams. The purpose of this BMP is to significantly reduce the erosion of sediment and associated nutrients from the road and adjacent areas into the stream. Reduction in sediment runoff from dirt and gravel roads is accomplished through a combination of driving surface aggregates (DSA) to provide an erosion resistant surface, berm removal to eliminate channeling of water, additional drainage outlets to remove excess water, raising the road profile to promote drainage, and grade breaks to slow runoff.

45. Forest Harvesting Practices
Forest harvesting practices are a suite of BMPs that minimize the environmental impacts of road building, log removal, site preparation and forest management. These practices help reduce suspended sediments and associated nutrients that can result from forest operations. Example activities include Innovative road design, bridged stream crossings, preservation of stream and wetland buffers, soil stabilization, water bars, logging mats, road surfacing, broad-based dips and avoiding operations when very wet.