

**Pennsylvania Nonpoint Source Management Program  
FFY2012 Annual Report**

**October 1, 2011 through September 30, 2012**



**Commonwealth of Pennsylvania  
Department of Environmental Protection**

**(Updated August 12, 2013)**

# TABLE OF CONTENTS

	Page
<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>SECTION ONE: Water Quality Improvements .....</b>	<b>8</b>
<b>PENNSYLVANIA 2012 Integrated List of All Waters</b>	
<b>Summary of Current Water Quality Information</b>	
<b>Nonpoint Source Impaired Water Delistings</b>	
<b>Fully Restored Waters and Improving Waters</b>	
<b>Improving Watershed Stories</b>	
<b>Nonpoint Source Pollutant Load Reductions</b>	
<b>SECTION TWO: Watershed Implementation Plan Status .....</b>	<b>44</b>
<b>Abandoned Mine Drainage WIPs</b>	
<b>Nutrient and Sediment WIPs</b>	
<b>Watershed Implementation Plans Being Developed Through September 2011</b>	
<b>SECTION THREE: PA NPS Management Program Plan Accomplishments.....</b>	<b>98</b>
<b>Background</b>	
<b>Accomplishments in Meeting the Five Long Term Goals</b>	
<b>Pennsylvania Nonpoint Source Management Program Funding</b>	

## **EXECUTIVE SUMMARY**

Pennsylvania's 2012 NPS Annual Report summarizes in general our efforts to implement the *NPS Management Program Plan-2008 Update* during the time frame October 1, 2011 through September 30, 2012, providing detail on 10 of our watersheds implementing EPA approved 319 Watershed Implementation Plans (WIPs).

Pennsylvania's NPS Management Program Plan-2008 Update incorporates goals to address the U.S. Environmental Protection Agency's Strategic Plan for Water (Strategic Plan). The EPA's Strategic Plan, published in September 2003, includes seven criteria which state NPS programs are to use to help document success and measure water quality improvements:

1. Number of waters restored from all NPS program actions
2. National goals are 250 water bodies by 2008 and 700 water bodies by 2012
3. Sediment load reductions
4. Nitrogen load reductions
5. Phosphorus load reductions
6. Section 319 funds used to restore water bodies
7. Watershed-based plans under development and being implemented, and
8. Watershed-based plans substantially implemented.

This report, in conjunction with the Grants Reporting and Tracking System (GRTS) database, provides information pertaining to these criteria.

This report provides information relating to Pennsylvania's progress in developing and implementing Watershed Implementation Plans (WIPs); progress in meeting the five goals listed in Pennsylvania's NPS Management Program Plan-2008 Update; improving watershed stories; a listing of waters which can be categorized as restored or significantly improving due to the implementation of NPS remediation efforts, and a listing of the program funding provided within Pennsylvania by each of our NPS partners.

### **NPS Pollution in Pennsylvania**

The 2012 Pennsylvania Integrated Water Quality Monitoring and Assessment Report (2012 Integrated List) provides the most comprehensive and up-to-date water quality information for Pennsylvania, relating to NPS impairments. The 2012 Integrated List includes information for the water quality assessments that have been completed for more than 84,571 miles of streams assessed for aquatic life uses, and 80,525 acres of lakes assessed for aquatic life uses.

A total of 67,972 assessed stream miles (80% of the total assessed miles) and 43,194 assessed lake acres (53% of the total assessed acres) meet the aquatic life use designation in Pennsylvania's water quality standards. Approximately 16,250 stream miles are identified as being impaired and not supporting the aquatic life use and require a TMDL; these represent about 19% of the total stream miles assessed.

A total of 16,786 acres of lakes are impaired by specific pollutants and require a TMDL. Another 20,544 acres of lakes are impaired for aquatic life but do not require a TMDL because the impairment is not related to a pollutant.

Abandoned mine drainage (AMD) and agricultural runoff continue to be the primary sources of NPS impairments in Pa waters.

## **Pennsylvania's NPS Management Program Plan**

The current NPS Management Program Plan-2008 Update (Plan) is the guide we are using to implement our NPS Program through 2013 and beyond. DEP is planning to initiate an effort in 2013 to update the Plan, with the final plan update expected to be approved by September 30, 2014. The NPS Management Program homepage on the DEP website, <http://www.dep.state.pa.us>, includes the most current version of the Plan.

There are five Goals in the Plan. These goals drive NPS Management Program implementation. They are the basis for reporting some of the accomplishments achieved and included in this report. Section 3 of this report provides an in-depth assessment of our efforts towards meeting these five major goals.

### **Goal 1**

Improve and protect water resources as a result of nonpoint source program implementation efforts. Show water resource improvements by measuring reductions in sediments, nutrients and metals or increases in aquatic life use, riparian habitat, wetlands, or public health benefits. By 2012, through combined program efforts, remove 500 miles of streams and 1,600 lake acres that are identified on the State's Integrated List of All Waters as being impaired because of nonpoint sources of pollution.

### **Goal 2**

Coordinate with conservation districts, watershed groups, local governments, and others in the development and implementation of 34 watershed implementation plans meeting EPA's Section 319 criteria to protect and restore surface and groundwater quality by 2012.

### **Goal 3**

Improve and develop monitoring efforts to determine how projects and programs improve water quality and/or meet target pollution reductions including Total Maximum Daily Loads (TMDLs).

### **Goal 4**

Encourage development and use of new technologies, tools, and technology transfer practices, to enhance understanding and use of techniques for addressing nonpoint source pollution.

## **Goal 5**

Assure implementation of appropriate best management practices to protect, improve and restore water quality by using or enhancing existing financial incentives, technical assistance, education and regulatory programs.

## **Restoring Lakes and Streams to Meet Designated Uses**

### **Success Stories/Fully Restored Waters**

Watershed Success Stories are written in consultation with EPA Region III and EPA headquarters NPS Program staff. Pennsylvania developed success stories on two restored waters over the past year (Pierceville Run and Lehigh River). The Pierceville Run success story was approved by EPA and the Lehigh River success story is currently under review by EPA. Over the past reporting period we have had success in moving seven impaired stream/river reaches into the Attaining Aquatic Life Uses category through the implementation of NPS restoration BMPs. This report provides details on two of those restored waters (totaling 4.9 stream miles), with the four additional restored waters to be further evaluated and possibly detailed and credited in a future report. DEP is preparing to begin developing success stories on the two stream reaches detailed in this report.

As of the publication date of the 2012 Integrated List, we have been able to document that the implementation of NPS remediation practices has resulted in revising the attainment category of 106 miles of streams (4.9 new miles added for FFY 2012 as detailed in the “*Fully Restored Waters*” table in Section 1) within the Integrated List from impaired to attaining Aquatic Life Uses. Also, as of the 2012 Integrated List publication date, we have been able to document that 1,862 lake acres, which had been impaired, are now are attaining aquatic life uses as shown in the Integrated List.

The two stream and river segments that we have included for FFY 2012 in the “*Fully Restored Waters*” table in Section 1 of this report include: Bear Run (3.1 miles), and Little Sacony Creek (1.8 miles). It should be noted that in Section 1 of this report we indicate that another 19.9 miles of impaired streams, on 4 additional stream reaches, have been restored through the implementation of NPS best management practices over this most recent reporting period. We are in the process of further evaluating these additional 5 stream reaches and will detail information on these reaches in a future report.

### **Improving Waters Stories**

Water quality improvements are also being documented in streams and lakes. Six new Improving Waters Stories have been written and are included in this report. These highlight restoration efforts where significant water quality improvements have been observed. Each is published initially in an internal DEP report and later provides the basis of a Success Story once the water body can be documented as fully meeting Pennsylvania’s Aquatic Life Uses designation. Pollutant load monitoring results for each improved stream reach are included in Section 1 of this report.

## Lakes

In the four year period between 2008 to 2012, Pennsylvania has documented that over 1,862 acres of lakes went from the impaired category, to meeting Aquatic Life uses on the 2012 Integrated List.

## Nonpoint Source Load Reductions

### Reductions attributed to 319 funded projects for the 2012 fiscal year

The Grants Reporting and Tracking System (GRTS) database is used to document load reductions for all Section 319-funded NPS implementation projects. It should be noted that the information input by Pennsylvania in the GRTS system only relates to projects directly funded by Section 319 monies, which are a small subset of all the NPS work done throughout the Commonwealth.

Nutrient, sediment and abandoned mine drainage (AMD) pollutant load reductions attributed to 319 funded projects are summarized in the two tables that follow.

### **FFY 2012 Nutrient and Sediment Load Reduction Estimates for 319 Projects Only**

<b>Nitrogen</b> (lbs./year)	<b>Phosphorus</b> (lbs./year)	<b>Sediment</b> (tons/year)
264,571	99,558	5,372

*\* Reductions attributed to 319 funded projects only, report 2b (2012) from GRTS OBI on 8/9/2013*

### **FFY 2012 AMD Load Reduction Estimates for 319 Projects Only**

<b>Units Reported</b>	<b>Iron</b>	<b>Aluminum</b>	<b>Manganese</b>
lbs./day	37	11	0
lbs./year	13,505	4,015	0

*\* Reductions attributed to 319 funded projects only, report 2a (2012) from GRTS OBI*

### Reductions attributed to all collected program data for the 2012 fiscal year

Pa DEP has recently completed a 319 grant project where we worked with Penn State staff to develop a methodology to collect nonpoint source BMP implementation data from a wide range of program partners throughout the state, and the necessary algorithms to estimate load reductions attributed to those implemented BMPs.

The following agencies and programs have provided data through this project for DEP use in estimating overall NPS load reductions from nonpoint source BMPs implemented over the 2012 fiscal year: DEP’s Growing Greener, 319, Abandoned Mine Lands, Chesapeake Bay, Dirt and Gravel Roads, Streambank Fencing, Urban Tree, Nutrient Management (plans and BMPs), and Waterways Engineering Programs; the USDA Natural Resources Conservation Service; the USDA Farm Service Agency; USDA Rural Development; PA’s Resource Enhancement and Protection (REAP) program; PENNVEST; and the “Grassroots” grazing program;. The fiscal year 2012 load reductions attributed to BMPs implemented by these agencies, organizations and programs for the 2012 fiscal year, are summarized in the below table.

**FFY 2012 Nutrient and Sediment Load Reduction Estimates for ALL Reported Programs**

<b>Nitrogen</b> (lbs/year)	<b>Phosphorus</b> (lbs/year)	<b>Sediment</b> (tons/year)
1,178,107	65,428	17,956

It should be noted that there are many NPS remediation practices implemented without the help of these reporting programs and organizations, so this number falls well short of the full extent of work being implemented in Pennsylvania over the given year.

**Watershed Implementation Plan Progress**

The report includes Watershed Implementation Plan (WIP) progress. Thirty-five WIPs have been prepared and accepted by the EPA to date. One more WIP has been completed but has yet to obtain EPA approval. An additional WIP will begin development in 2013 for the Beaverdam Creek watershed in Adams County.

**NPS Program Plan Accomplishments**

The NPS Management Program-2008 Update goals are listed in Section 3 of this report, along with a summary of our FFY2012 accomplishments relating to these goals. Several of the major accomplishments relating to each of these goals is included in Section 3 of this report.

**Nonpoint Source Program Funding**

Federal Clean Water Act Section 319 NPS program funding awarded to Pa’s NPS Program for FFY2012 was \$4.609 million (an 8% reduction from the previous year’s allocation). Total Section 319 funding received by the state to date is approximately \$89.6 million. For FFY2012 there was a total of \$206.3 million invested in non-point source activities statewide.

## **SECTION ONE:**

### **Water Quality Improvements**

An estimated 86,000 miles of streams and rivers, 1,420 lakes and 403,924 acres of fresh water wetlands are located within the Commonwealth of Pennsylvania.

A few of the state's NPS Management Program accomplishments over the past year are included here. The federal Clean Water Act (CWA) Section 319 NPS Management Program, the Commonwealth's Growing Greener Environmental Stewardship Initiative, and other local, state and federal programs all contribute to the successful NPS Program.

We have included both water bodies that have:

- Some verifiable documentation showing water quality improvement, and
- Fully restored water bodies (de-listed).

Water bodies that are showing signs of improvement and fully restored water bodies are two EPA Performance Measures that we continue to utilize. This provides us a measure to gage successful implementation of Pennsylvania's NPS Management Program Plan.

### **Introduction to PA Integrated List of All Waters**

The 2012 Integrated List of All Waters (Integrated List) will include all current water quality assessment program data. Water quality information in the Integrated List is included in several lists which show how streams are meeting or not meeting water quality standards. The Integrated List includes the following sub-lists:

List 1: All Uses Attained

List 2: At Least One Use Attained

List 3: Unassessed

List 4: Impaired for One of More Designated Uses, Not Needing a TMDL

List 5: Pollutants (and Needing a TMDL)

NPS restoration efforts are primarily focused on water bodies on Lists 4 and 5, including waters where:

- A TMDL is approved or needs to be developed, and
- Watersheds where a Watershed Implementation Plan (WIP) meeting the EPA's specific criteria for WIP development have been met.

Six sources of nonpoint source pollution continue to be the primary impairments which affect the Commonwealth's waters. These six sources of impairment include,

- Abandoned mine drainage (AMD);
- Agriculture;



- Urban runoff/storm sewers;
- Small residential runoff;
- Silviculture (Forestry), and
- Atmospheric deposition.

Impairments due to abandoned mine drainage, agriculture and urban runoff/storm sewers sources continue to be the big three in terms of Aquatic Life Use impairments to streams in the Commonwealth. Agricultural and atmospheric deposition (mercury) sources continue to be the two main Aquatic Life Use impairments to lakes in the Commonwealth.

## **Summary of Current Water Quality Information**

Pennsylvania's 2012 Integrated Water Quality Monitoring and Assessment Report includes current water quality assessment information. The Report is summarized by four Designated Use categories:

- Aquatic Life;
- Fish Consumption;
- Recreational; and
- Potable Water Supply.

The majority of nonpoint source restoration activities are targeted to water bodies which do not currently meet Aquatic Life designated uses.

## **Streams**

Pennsylvania's Clean Stream Law (1937) was one of the first state laws that directly related to water management and protection of aquatic resources. The Clean Streams Law Amendments (1970) consolidated previous Clean Streams Laws, providing more protection to the Commonwealth's surface water resources.

Approximately 16,353 of the 84,571 miles of streams in PA, or about 19%, have been assessed and are impaired for Aquatic life designated use. The 16,353 mile figure includes the Impaired, Approved TMDL and Compliance categories. Approximately 67,972 of 84,571 miles of streams in PA, or about 80.4%, support the aquatic life designated use.

The following table shows a *Summary of Use Support Status for Stream Assessments*.

**2012 Integrated List – Statewide Assessment Summary (Table 2, page 33 in report)**

	<b>Aquatic Life Use</b>	<b>Fish Consumption Use</b>	<b>Recreational Use</b>	<b>Potable Water Supply Use</b>
<b>Stream (miles)</b>				
Assessed	<b>84,571</b>	<b>5,345</b>	<b>2,422</b>	<b>3,357</b>
Supporting	<b>67,972</b>	<b>3,323</b>	<b>1,205</b>	<b>3,194</b>
Impaired	<b>9,801</b>	<b>1,318</b>	<b>1,209</b>	<b>151</b>
* Approved TMDL	<b>6,490</b>	<b>704</b>	<b>8</b>	<b>12</b>
Compliance	<b>62</b>	---	---	---
** Pollution	<b>2,709</b>	---	---	---

\* Note that TMDL miles refer to those stream miles that overlap with impaired stream segments; \*\* 1,755 miles have both pollution and pollutant problems.

Water quality improvements are documented by sampling stream chemistry and the return of aquatic species, i.e. macro-invertebrates or fish, to a stream ecosystem. Improvements can occur both through natural processes and as a result of long term restoration efforts. To verify whether water quality improvements are actually occurring in a stream one must refer the stream reach to the PA DEP, who then collects data, samples the stream, and makes the final determination for removal from the Integrated List of All Waters. Steps are outlined as follows:

**1. Referral and data collection**

DEP’s NPS Program staff works with conservation district watershed specialists, DEP regional offices, DEP district mining offices, DEP Bureau of Abandoned Mine Reclamation offices and the Eastern and Western Pennsylvania Coalitions for Abandoned Mine Reclamation, among others, to identify streams that may be improving as the result of local restoration efforts. Any available monitoring data is collected to allow a preliminary determination of the effectiveness of BMPs installed in the watershed. Following this initial review, a list of water bodies considered to be candidates for reassessment is provided to the DEP Water Quality Standards Division for their evaluation.

**2. Stream Sampling**

DEP water pollution biologists choose sampling locations and visit each water body on the list to determine if further sampling is warranted. Water bodies that appear to be minimally impaired are then subject to a chemical and biological sampling protocol that requires seven additional visits. After this sampling is completed and the data is analyzed, the water body is considered for removal from the State’s list of impaired waters.

**3. Removal from Impaired Waters Listing - Three Options:**

**(1) Stream conditions still exceed all water quality criteria.**

The stream will not be eligible for delisting. Streams that are not revisited will be tracked for a revisit in the future (up to 5 years later) to determine if water quality has improved. These water bodies do not appear on any of the following tables.

(2) Stream conditions still exceed some water quality criteria, but attain one or more. The stream may be eligible for delisting for one or more causes of impairment, and an “*Improving Watershed Story*” may be written to summarize the basic details of the case. New Improving Watershed Stories written by Pennsylvania NPS Program staff are included in another part of this report.

(3) Stream conditions attain all water quality criteria. The water body can be removed from the impaired streams list for all causes of impairment. At this point a “*Success Story*” will be written and submitted to EPA headquarters for posting on their web site at <http://www.epa.gov/nps/success/>.

## **Lakes**

The greatest challenges in lake management are to prevent nonpoint source pollution, maintain riparian habitat, identify and permit in-lake practices to mitigate lake problems during a restoration project. Stakeholder involvement is critical.

Approximately 1,500 lakes and reservoirs comprising approximately 161,000 acres exist in Pennsylvania. Of the 1,500 lakes and reservoirs there are about 379 that are open to the public and 150 in 72 of Pennsylvania’s State Parks. Boating, fishing, swimming and other recreational activities are typically integral to a lake community. Lakes need to be protected, restored and maintained for Aquatic Life, Recreational, Potable Water Supply, and Fish Consumption designated uses to be fully usable to the public in the future.

Pennsylvania’s lake management regulation is codified in the Department of Environmental Protection’s Rules and Regulations, Section 95.6-Discharges to Lakes, Ponds and Impoundments which set forth treatment requirements for point source discharges necessary to control eutrophication—an increase in nutrients which causes harmful algal blooms resulting in the depletion of dissolved oxygen and loss of aquatic life.

Lake restoration projects have been funded through Section 314 of the federal Clean Water Act (CWA) (no longer in existence) and Section 319 of the Clean Water Act since 1995. Lake restoration and assessment work has also been funded through Pennsylvania’s Growing Greener Initiative since its inception in 1999. The EPA’s Section 106 Assessment Program, Natural Resources Conservation Service (NRCS) PL566 program, Chesapeake Bay Program, and PENNVEST (Clean Water State Revolving Funds) have also supported lake restoration in Pennsylvania.

Approximately 1,862 acres of lakes that were listed as impaired on the 2008 Integrated List were meeting their assigned uses on the 2012 Integrated List. These reclassifications occurred as a result of reassessments that were completed on lakes, some of which were targeted for restoration work and BMP implementation.

References to Integrated List of All Waters:

To date, approximately 80,525 acres of Commonwealth lakes have been assessed for Aquatic Life designated uses.

About 37,331 of the 80,525 lake acres assessed, or 46%, are designated as impaired for Aquatic Life. About 43,194 lake acres assessed, or 54%, are supporting Aquatic Life designated uses.

The following is table of *Summary of Use Support Status for Lake Assessments*.

**2012 Integrated List – Statewide Lake Assessment Summary**  
(Table 5, page 39 in report)

	<b>Aquatic Life Use</b>	<b>Fish Consumption Use</b>	<b>Recreational Use</b>	<b>Potable Water Supply Use</b>
<b>Lake (acres)</b>				
Assessed	<b>80,525</b>	<b>74,835</b>	<b>81,959</b>	<b>58,013</b>
Supporting (Lists 1 and 2)	<b>43,194</b>	<b>28,765</b>	<b>76,836</b>	<b>57,941</b>
Impaired (List 5)	<b>5,420</b>	<b>40,405</b>	<b>5,123</b>	<b>12</b>
Impaired (List 4c)	<b>20,544</b>	---	---	---
Approved TMDL (List 4a)	<b>11,366*</b>	<b>5,664</b>	---	---

\* Lake Jean (248 acres) is now attaining use for pH and is no longer included in the TMDL total category.

Dutch Fork Lake (87 acres) has a completed TMDL but has been breached, so it is no longer impaired. However, the PA Fish and Boat Commission is currently working on reconstruction of this impoundment.

Presque Isle Bay with Lake Erie is included in the Fish Consumption and Recreational Use category totals. The remainder of Lake Erie is not included in the Fish Consumption and Recreational Use category totals.

Lakes that have been reclassified in the 2012 Integrated List of All Waters are shown in the table on the following page.

**Lakes Reclassification in 2012 Integrated List of All Waters**

<b>NHD Reach Code</b>	<b>Name of Lake (County)</b>	<b>List Change</b>	<b>Acres</b>	<b>Listing Date</b>
02050107001748	Elmhurst Reservoir (Lackawanna)	4c to 2	174	2002
02050306002293	Lake Redman (York)	4c to 2	252.5	2006
02040101001467	Duck Harbor Pond (Wayne)	5 to 1	210.2	2006
02050107001824	Lake Jean (Luzerne, Sullivan)	5 to 2	248.2	1996
02050302002569	Greenwood Lake (Huntingdon)	5 to 2	5.21	2008
02050306002248	Pinchot Lake (York)	5 to 2	357.64	2008
02040103001075	Promised Land Upper (Pike)	4c remove pH	468.2	2002
02050306002286	Muddy Run Reservoir (Lancaster)	5 to 2	98	2002
02040103001011	White Deer Lake (Pike)	5 to 4C	48.1	2006
Total Acres:			1,862.1	

## **Nonpoint Source Impaired Water Delistings**

There are two goals from the EPA Strategic Plan for Water (2006) which Pennsylvania uses to measure progress in meeting water body improvements. These goals are:

- **250 water bodies restored by 2008, and**
- **700 water bodies restored by 2012**

These numbers were derived using a baseline of 5,967 primarily nonpoint source impaired water bodies which were documented in the EPA Strategic Plan for Water .

Pennsylvania includes both fully restored and improving waters in their annual report to EPA. We have done this since the FFY2006 NPS Annual Report. Several tables are included in this section. These tables include information on both fully restored waters and improving waters in the Commonwealth.

We no longer track partially restored waters as we did in FFY2008 and earlier NPS Annual Reports. The length of time needed to accurately document and approve a partial delisting or partially restored water body is very uncertain.

## **Improving Waters**

Waters that are primarily NPS impaired and where water quality data shows that the aquatic life or chemistry is improving are identified as “improving waters.” Further water quality and macro-invertebrate data will document long-term improvements, and waters now classified as improving waters may eventually be removed from the 303(d) list of impaired streams and be termed “fully restored.”

## **Fully Restored Waters and Success Stories**

Water bodies fully restored from NPS pollution impacts are being tracked for purposes of helping to meet these goals. A fully restored water body is defined as a water body where all sources of impairment have been addressed and the water body has been fully restored. All designated uses are being achieved in a fully restored water body.

The Fully Restored Waters tables include 2006, 2008, 2009, 2010, 2011 and 2012 nonpoint source related de-listings. There are at least four additional water bodies where S. 319 and or Growing Greener funding have been used for restoration work and that are designated as being fully restored in the FFY2012 table.

Watershed Success stories are included on the DEP NPS Program website <http://www.portal.state.pa.us/portal/server.pt?open=514&objID=554277&mode=2>, the

EPA Region III NPS Program site <http://www.epa.gov/reg3wapd/nps/index.htm> and the EPA headquarters NPS Program site at <http://www.epa.gov/nps/success/>. The Pierceville Run Success Story was written and published during 2012. The Pierceville Run is a small tributary to the South Branch Codorus Creek and lies within Sub-basin 1 of the South Branch Codorus Creek TMDL. This stream reach was originally proposed for delisting in 2011 when the DRAFT 2012 Integrated List of All Streams was developed.

The Lehigh River Success Story was written for a 14.7 mile stream reach and has been submitted to the EPA for review and approval. Note that the 2012 Integrated List, Appendix E, mistakenly identified a 27 mile restored stream reach for the Lehigh River: Only 14.7 miles were actually fully restored consistent with the success story that was submitted for review. The 27 mile reach was originally proposed for delisting in 2011 when the DRAFT 2012 Integrated List of All Streams was developed.

**Fully Restored Waters**

<b>FFY2006</b>						
<b>Water body Name and (County)</b>	<b>S. 319 \$ (yes or no)</b>	<b>319 Grant / Project #</b>	<b>Impairment Source (Cause)</b>	<b>Year First Listed</b>	<b>HUC-8</b>	<b>NHD Reach Code</b>
Manatawney Creek (Berks, Montgomery)	Yes	2000/ 44	Agriculture (Nutrients, Organic Enrichment, Low D.O.)	1996	02040203	02040203000103
UNT to Manatawney Creek (Berks, Montgomery)	Yes	2000/ 44	Hydromodification (Thermal Modification)	1996	02040203	02040203002507
<b>FFY2008</b>						
Semiconon Run (Butler)	No	n/a	AMD (Metals)	2002	05030105	05030105000787
Step Run (Clarion)	No	n/a	AMD (pH)	2006	05010005	05010005000441
<b>FFY2009</b>						
Babb Creek (Tioga)	Yes	n/a	AMD (Metals & pH)	1996	02050205	02050205000064
Gumboot Run (McKean )	No	n/a	AMD (pH)	2004	05010005	05010005000738
Lloydville Run (UNT to Bells Gap Run) (Blair & Cambria)	No	n/a	AMD (Metals, pH & Siltation)	2002	02050302	02050302000621
Sterling Run (Centre)	No	n/a	AMD (Metals, pH & Siltation)	1996	02050201	02050201000511



**Fully Restored Waters**

<b>FFY2010</b>						
<b>Waterbody Name/ (County)</b>	<b>S. 319 \$ (yes or no)</b>	<b>Applicable 319 Grant / Project</b>	<b>NPS Impairment Source/ Cause</b>	<b>Year Listed</b>	<b>8-digit HUC</b>	<b>NHD Reach Code</b>
Lake Jean (Luzerne and Sullivan Counties)	No	n/a	Atmospheric Deposition/ pH	1996	02050107	02050107001824
Johnson Run (Elk County)	No	n/a	AMD/ Metals, pH	2004	05010005	05010005000766
Little Coon Run (Clarion County)	No	n/a	AMD/ Metals, pH	2004	05010003	05010003001084
Miller Run (Huntingdon County)	Yes	2002/ 17 2004/ 19 2005/ 21	AMD/ Metals, pH	1996	02050303	02050303000242
<b>FFY2011</b>						
Pierceville Run (York County)	Yes	2003/33	Agriculture/ Siltation, Flow Alterations	2002	02050306	02050306001164
Lehigh River (Carbon County)	Yes	2000/23	AMD/ Metals	1996	02040106	02040106000034

**Fully Restored Waters**

<b>FFY2012</b>							
<b>Waterbody Name/ (County)</b>	<b>S. 319 \$ (yes or no)</b>	<b>Applicable 319 Grant/ Project</b>	<b>NPS Impairment Source/Cause</b>	<b>Year Listed</b>	<b>8-digit HUC</b>	<b>Stream miles on 303(d) list</b>	<b>Assessment ID</b>
Little Sacony Creek (Berks)	Yes	1999/42	Agriculture/ Siltation	2004	02040203	1.8	3009
Bear Run (Indiana)	No	n/a; Growing Greener \$	AMD/Metals	1996	02050201	3.1	7534
Total:						4.9	

The 2012 Integrated List of All Waters *Appendix E: Listed as Impaired in 2010 but Attained in 2012* includes an additional 19.9 NPS impaired stream miles that are now attaining Designated Uses. These are UNT North Branch Calkins Creek (11.2 miles), Suabia Creek (3.2 miles), UNT Suabia Creek (1.0 miles), and Cherry Run (4.5 miles). These are in addition to the two water bodies in the *Fully Restored Waters FFY2012* table.

### Improving Waters

<b>FFY2011</b>						
<b>Water body Name/ (County)</b>	<b>S. 319 \$ (yes or no)</b>	<b>Applicable 319 Grant/ Project</b>	<b>NPS Impairment Source/Cause</b>	<b>Year Listed</b>	<b>8-digit HUC</b>	<b>NHD Reach Code</b>
Hubler Run (Clearfield County)	Yes	1999/ 62 2000/ 28 2005/ 17 2006/ 17, 30I 2007/ 23B, 26 2008/ 15 2010/ 13	AMD (pH & metals)	2004, 2006	01177539	02050201000656
Mill Creek (Lancaster County)	Yes	1995/ 17 1999/ 59 2005/ 28 2009/ 29, 23 2010/ 15 2011/ 20	Agriculture (nutrients and sediment)	2002	02050306	02050306000124
Sixmile Run (Bedford County)	Yes	2005/ 12,13 2006/ 12,13,14, 15,16,30B 2007/ 10,11,12 2009/ 14 2010/ 10	AMD (pH and metals)	1996	02050303	02050303000315

### Improving Waters

<b>FFY2012</b>						
<b>Waterbody Name/ County</b>	<b>S. 319 \$ (yes or no)</b>	<b>Applicable 319 Grant/ Project</b>	<b>NPS Impairment Source/Cause</b>	<b>Year Listed</b>	<b>8-digit HUC</b>	<b>Stream miles or Lake acres on 303(d) list</b>
Sandy Run/ Bedford *	Yes	2004/20 2006/30A 2008/10,11,12 2010/09	AMD/Metals, pH/	1996, 2006	02050303	4.09; 2.16
UNT Sandy Run						0.58
Bear Run/Indiana	No	n/a	AMD/Metals/	1996, 2006	02050201	3.23
UNT Bear Run						1.55
Little Fishing Creek/Centre	Yes	2006/22	Grazing Related Agric./Siltation/	2002, 2008	02050204	7.78
UNT Little Fishing Creek/Rock Run						0.51
Dents Run/Elk	No; DEP BAMR \$	n/a	AMD/Metals, pH/	2002	02050202	6.48; 1.33
UNT Latimore Creek/Adams	No	n/a	Grazing Related Agriculture/ Nutrients, Siltation	2006	02050306	1.25
Stephen Foster Lake/Bradford	Yes	2001/51 2007/22 2009/31K	Agriculture/ Suspended Solids, Nutrients	1996	02050106	75 acres

\*Completed and funded AMD remediation projects in Sandy Run / Longs Run are detailed in the table on the following page.

## **Improving Waters Summaries**

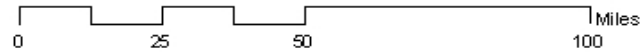
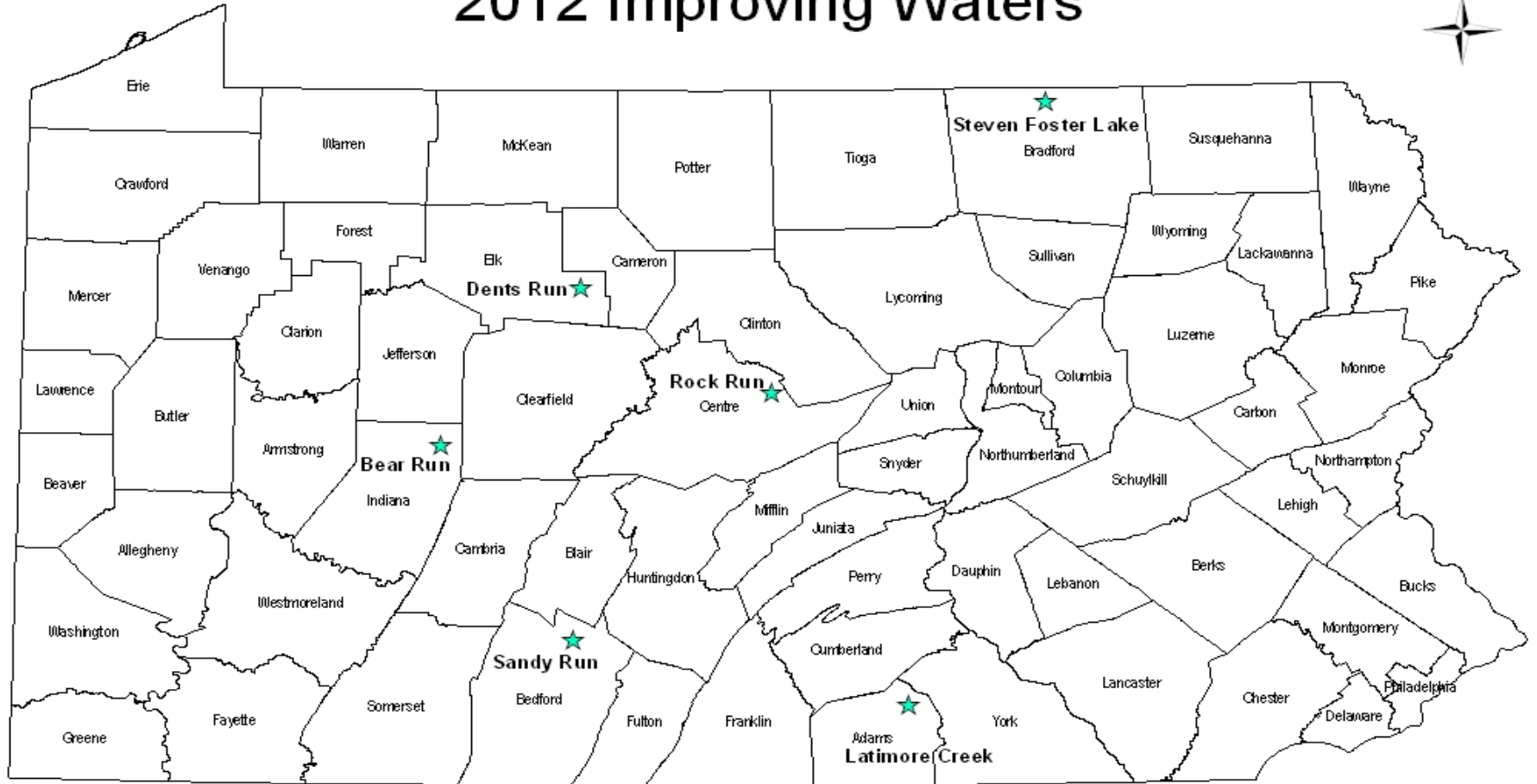
Pennsylvania's NPS Management Program is continuing to write and publicize stories related to watershed restoration projects, long-term monitoring efforts, and local watershed improvements. The DEP wants to bring more attention to these watershed restoration efforts through the publication of Improving Waters Stories. These summaries are used to both educate DEP staff on the NPS Program and Monitoring Program efforts to document improvements, and also to help inspire voluntary action to improve local waters. Pennsylvania has prepared four new Improving Watershed Stories for the FFY2012 report, and has updated another two Improving Watershed Stories.

Significant watershed restoration efforts have been made within each of the six watersheds included in this report. In most cases, water quality monitoring data has been included to help one understand what kinds of data are being collected. Water quality conditions are improving in each of these six watersheds as evidenced through our monitoring efforts.



Additional water quality monitoring data will allow the PA DEP and local partners to show that water quality standards are being met. This may result in a reassessment of the stream reach and its removal from an impaired status on the 2012 Integrated List of All Waters. In some cases a water body may be delisted for one of several pollutant sources or causes. In the long term an Improving Watershed Story may be expanded into a more comprehensive Watershed Success Story if a water body is fully removed from the impaired waters list.

See the map on the following page for PA's *FFY2012 Improving Waters* locations.

# 2012 Improving Waters



## Legend

-  County Boundaries
-  Improving Waters Story

## 2012 Improving Waters Summaries

### Improving Watersheds – Dents Run (Elk and Cameron Counties)

Dents Run flows north through Elk County until its confluence with the Bennett Branch of the Sinnemahoning Creek in Cameron County. This heavily forested north central part of the state has a history of coal mining that has often not been adequately restored once resource extraction was completed. The result is frequent water quality degraded by elevated metal loads and depressed pH. Dents Run was placed on the State's 303(d) "List of Impaired Waters" in 2002, which is now known as the "Integrated List of All Waters". Dents Run appears on list 4a because a TMDL was developed for the watershed and its tributaries. The source of impairment is Abandoned Mine Drainage (AMD), and the cause is metals and pH.

The Bennett Branch Watershed Association (BBWA), which formed in 1998, has worked with partners such as the U.S. Army Corps of Engineers, the Western Pennsylvania Conservancy, Pennsylvania Game Commission, DEP Bureau of Abandoned Mine Reclamation, DEP District Mining Operations, the U.S. Department of the Interior, Office of Surface Mining, Elk County Conservation District, Rocky Mountain Elk Foundation, the Elk County Commissioners, the U.S. Environmental Agency and local mining companies in its efforts to restore water quality throughout Dents Run. The lower part of the Dents Run watershed is most affected by AMD, especially below the Porcupine Hollow tributary.



Abandoned underground mine (Lower Kittanning Coal Seam) discharge located in the Porcupine Hollow sub-basin of Dents Run.

Completed projects include passive treatment systems, land reclamation and lime dosers. From 2002-2012 the following AML features were addressed. Ten hazardous water bodies and 30,850 linear feet of dangerous highwalls were reclaimed. A land reclamation project encompassing approximately 260 acres of abandoned mine lands and mine spoil was completed. Sixty acres of

abandoned mine lands were reclaimed providing some limestone that has been utilized to construct 4 passive treatment systems and for use in limestone channels. Twenty-three mine openings were reclaimed and 5 wet seals were installed at selected openings to direct drainage to the treatment systems. The passive treatment systems are treating a total of 14 different discharges. Two separate lime dosing systems were constructed along Dents Run in 2008 to treat 2 of the larger discharges. The lime dosers utilize a system that adds lime to the acidic mine water without the need of any external power source. Funding sources have included DEP-BAMR state funds, U.S. Army Corps of Engineers, Title IV and the coal industry. Returning Dents Run to the fishery it used to be is seen as an opportunity to enhance the habitat of Pennsylvania's wild elk herd.

Monitoring results from Dents Run has yielded mostly positive results. Water quality sampling at the mouth showed the average iron level before the projects were constructed was 0.23 milligrams per liter (mg/l), aluminum was 4.91 mg/l and manganese was 1.63 mg/l. The average pH was 4.20. Acidity had an average of 34.0 mg/L. Recent data taken in 2012 has shown an increase in iron to 1.3 mg/l, but aluminum was decreased to 1.4 mg/l and manganese to 1.2 mg/l. The pH has risen to an average of 6.67 and the stream is net alkaline. The stream will continue to be monitored. Pennsylvania won the 2012 Abandoned Mine Reclamation Award in 2012 for this project.



Tipping bucket lime doser treating AMD Discharge No. 17 PA 1934

Photographs were taken from *The Dents Run AML/AMD Ecosystem Restoration Project* report, PA DEP-BAMR, March 30, 2012.



## Improving Waters - Sandy Run AMD Treatment System (Bedford County)

The Sandy Run AMD treatment system addresses a mine discharge located in Broad Top Township, Bedford County. The discharge contributes abandoned mine drainage to Sandy Run which is a tributary to Juniata River. The AMD flows from three HDPE pipes that were previously installed as a wet mine seal into the collapsed mine entry of a deep mine. Recently, a passive treatment system was constructed to treat this discharge. Funding for the project in the amount of \$302,264 came from EPA's Nonpoint Source 319 Program.

The passive treatment system consists of three vertical flow wetlands and 2 settling ponds. The flow from the mine is split between 2 parallel vertical flow wetlands and then flows into a common settling pond. This is followed by another vertical flow wetland and another settling pond. Partners in this project include Broad Top Township, the project sponsor, Tussey Mountain High School and Skelly and Loy. Employees of Broad Top Township also constructed the systems.



View from the SAO-D4 treatment system site in Sandy Run watershed.

### Monitoring Results from Sandy Run through 2012:

Preliminary water quality data for the untreated discharge shows a pH of 3.1, aluminum at 38.0 mg/L, iron at 98.8 mg/L and acidity 476 mg/L but, after treatment, has a pH of 8.3, aluminum less than 0.25 mg/L, iron at 0.41 mg/L and acidity is a negative -340 mg/L with an alkalinity of 372 mg/L. Therefore, the treated water is now net alkaline, the acidity is buffered and is not negatively affecting the stream.

## Projects Funded in Sandy Run / Longs Run AMD Remediation Area

Program/ Sponsors	Project Location	Problem/Action	Date Completed
<b><i>SANDY RUN WATERSHED</i></b>			
RAMP	Heckman	Mine openings, 2 acres of deep mine refuse, and run-off into adjacent water supply. Closed and re-graded.	1980/81
OSM	T549 (Landfill Road)	Mine collapse restoration.	
OSM	T549 (Landfill Road)	Mine washout restoration.	
BAMR	Kimber Mountain (State Games Land #261)	Hazardous recreational water body; Dangerous highwall; Spoil area.	1990
BAMR, SCC5WA	BFHWA Landfill MP 10, 11, 12 SAPs	SAPs passive treatment systems installed for discharges at the Sandy Run Landfill (See Appendix A for water quality monitoring data).	2000
<b><i>LONGS RUN WATERSHED</i></b>			
RAMP	Mort	Highwall (500 ft. long) running behind several houses, 2 mine openings. Closed and re-graded.	1982-85
RAMP	Barton-Meck	Mine opening and small refuse pile, close to a house. Re-graded and seeded.	1986
RAMP	Figard	Big mine opening next to house, and a highwall. Closed and re-graded.	Before 1990
RAMP	Zelanko	Coke ovens. Re-graded.	1991
BAMR	North Langdondale	Regraded a highwall area.	1998
PADEP GG, BTT	Longs Run Watershed	AMD near spoil pile. Diversion of surface water away from mine spoil pile believed to be a source of water for AMD. Completed AMD project.	2001
PADEP GG, BTT	Longs Run Regional 1	Passive treatment of 7 AMDs along Longs Run. Completed AMD project.	2005
319 PGM, BTT	Longs Run Regional 2	Passive treatment of 6 AMDs along Longs Run. Completed AMD project.	2006
319 PGM, BTT	SAO-D4 Discharge	AMD discharge - constructed 3 vertical flow treatment systems.	2011
319 PGM, BTT	Sandy Run	AMD discharge – constructed 2 vertical flow passive treatment systems.	2011
319 PGM, BTT	Long Run Headwaters	AMD discharge – constructed 1 vertical flow treatment system	Ongoing

Acronyms:

RAMP: Rural Abandoned Mine Program; BAMR: Bureau of Abandoned Mine Reclamation; WPCAMR: Western Pennsylvania Coalition for Abandoned Mine Reclamation; OSM: Office of Surface Mining; 319 PGM: PADEP Section 319 Program; PADEP GG: Pennsylvania Department of Environmental Protection Growing Greener; PADEPDMO: Pennsylvania Department of Environmental Protection District Mining Office; BTT: Broad Top Township

## **Improving Waters - Bear Run (Indiana County)**

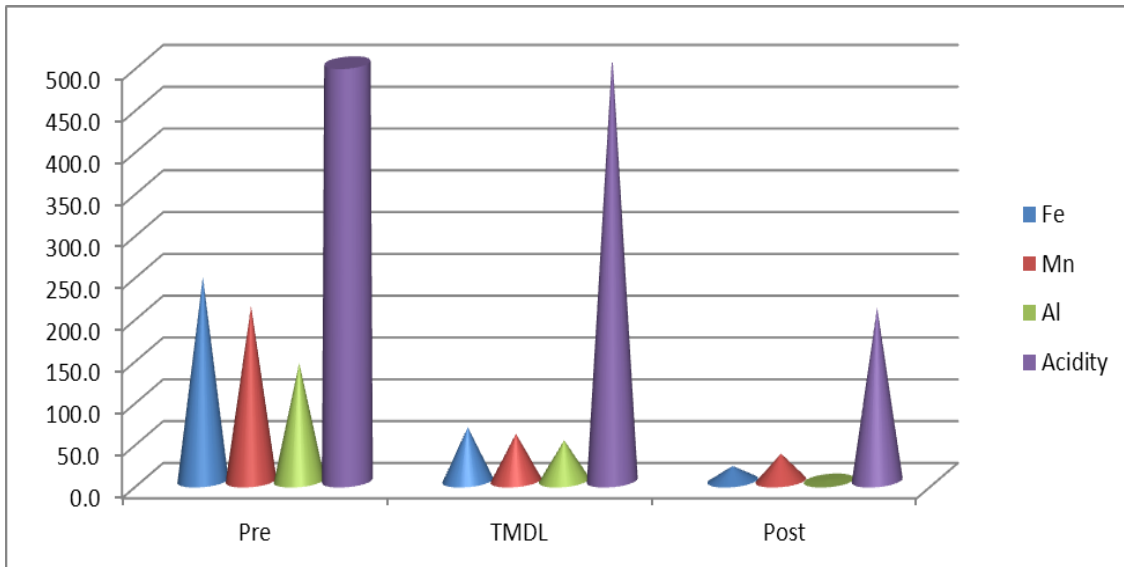
The Bear Run Watershed is designated as cold water fishes and is located in the head waters of the West Branch Susquehanna River Watershed, mostly located in Indiana County. Bear Run is impacted by legacy coal mining. Of the 46 stream miles in the Bear Run Watershed, 18 have been listed since 1996 as impaired by Abandoned Mine Drainage (AMD) for metals and pH. The impairments originate in the South Branch Bear Run Sub-watershed but cause impairments downstream in the main stem of Bear Run as well. A Total Maximum Daily Load (TMDL), or pollution diet, was developed in 2007 to set systematic load limits for acidity, aluminum, iron and manganese at key stations within the watershed. The TMDL segued into the restoration efforts within the watershed which began in 2007 as well.

Partners involved in the restoration work in the Bear Run Watershed include the Evergreen Conservancy, PA Game Commission, SRBC, Indiana CCD, Office of Surface Mining (OSM) and DEP. \$273,000 of Growing Greener funds, enhanced by a \$30,000 match from OSM via a Watershed Cooperative Agreement (WCA), were used in 2007-2008 to complete Phases I and III and treat the AMD discharges at those sites. A \$1.424 Million DEP Growing Greener Watershed Renaissance Initiative (WRI) Grant, enhanced by a \$100,000 WCA match, was awarded in 2008 to complete Phases II, IV, V, VI, VII and VIII. WRI is a watershed restoration tool used to rectify the water quality of an entire watershed. It is carried out by studying the sources of impairment in the watershed and then treating them all within five years. The intent of WRI is a complete delist of the targeted watershed in a relatively small timeframe, five years.

Of the eight Phases identified in the WRI, seven have been completed to date and are operational. The final Phase will be on line by the end of 2012. The treatment systems installed at AMD discharges included Aerobic Staggered Pond/Wetland Systems, Manual Flush Oxidation Limestone Drains, Swedish Bucket Lime Silo Dosers and Limestone Channels. Included in the construction was legacy coal-refuse removal of ~15,000 tons and ~40 acres of Abandoned Mine Lands (AML) reclamation. This work removed significant sources of contaminated leachate. Approximately 1,000 feet of stream channel restoration was conducted as well in an area that was formerly used as a refuse dump directly in and around the stream.

Water chemistry and fisheries have responded favorably because of the restoration efforts in the Bear Run Watershed. Water chemistry now exceeds the goals of the TMDL. For example, the TMDL goals for the mouth of Bear Run are 64.0 lbs/day Fe, 56.2 lbs/day Mn, 48.3 lbs/day Al and 510.7 lbs/day Acidity. The most recent sample taken on 9/10/2012 resulted in 17.4 lbs/day Fe, 32.4 lbs/day Mn, 1.3 lbs/day Al and 207.5 lbs/day Acidity, full attainment of the TMDL for this station.

Fish numbers and diversity have improved as well at this station from 1 species with 10 individuals captured in 2008 to 9 species with 51 individuals captured in 2012. In Bear Run, the extreme headwaters are mainly unimpaired thus will serve as reservoirs of aquatic life. Macroinvertebrates will drift downstream from these areas and recolonize the restored segments. Macroinvertebrate data however, are not yet available.



*This graph displays the daily loading in lbs/day (y axis) of Fe, Mn, Al and Acidity for Pre-construction sample results, TMDL goals and Post-construction/restoration sample results (x axis) at Bear 1.8, mouth of Bear Run. All parameters attained the goals of the TMDL. Of note, Acidity was 5,677.4 lbs/day Pre-construction and was cropped to display greater detail of the other parameters.*

In summary, the WRI was particularly effective in this watershed as it enabled the partners to identify and treat all of the sources of pollution simultaneously in the entire watershed, thus healing the aquatic ecosystem of the whole watershed within a five year window of activity. The WRI also provides for Operation and Maintenance (O&M) through a trust fund set up in part through Growing Greener. Long-term O&M is critical to the longevity and continued success of these projects. It is expected that the Bear Run watershed will improve in the not too distant future to the point of being delisted from the Integrated List of Impaired Waters; further evidence to the effectiveness of the Growing Greener DEP Watershed Renaissance Initiative.

## Improving Waters - Rock Run (Centre County)

Rock Run is the local name for an officially unnamed tributary to Little Fishing Creek. The entire tributary is in Walker Township, Centre County and it is listed in Chapter 93 of the Pennsylvania Code with a designated use of High Quality Cold Water Fishes (HQ-CWF). As a result of a CREP project put in place in 2005 on the property known as the Walizer Tree Farm, the stream has been evaluated yearly for improvements in water quality, habitat for macroinvertebrate organisms, bacteria load, and overall stream health. The Vonada Farm, just upstream of the Walizer farm, also entered into a similar stream protection effort in 2007. This updated report is based on data collected by field surveys conducted by the Department in 2006 through 2011.

This CREP Project encompasses an area of about 2.41 acres, wherein a riparian buffer zone consisting of grass and mostly natural woody shrub vegetation has been established. Grass in the riparian area near the Walizer barn, and later on the Vonada Farm was reestablished mostly naturally, by excluding cattle from the zone. The newly established riparian zone is minimally 35 feet in width on both sides of the stream and is estimated to be 1,500 feet in length. The segment of stream within the project totals approximately 1,700 feet in length, and is typically about 3-12 feet in width. The 200-foot reach near the mouth remains wooded with mature trees on the right side of the stream, facing upstream. A sampling site in the wooded area upstream of all agriculture is not part of the CREP project but is monitored as a reference to the project. This area was virtually undisturbed until late in 2009 when many of the hemlock trees nearby were cut down and sold for lumber because the owner was concerned about damage from the wooly adelgid, and feared a substantial financial loss if the trees were to die from the infestation.



The photos above show the extent of the lumbering activity in the headwaters area of Rock Run.

Since 2009, the Vonada barnyard area has been improved by establishing a limited access stream crossing site and grass plantings. The Vonada riparian area has been improved by establishing tree plantings in the riparian area and cattle exclusion from it. Each farm has installed an improved access to the water and stream crossing areas for the herds.

**In-stream Habitat** – In-stream Habitat was assessed from 2006 through 2011 using the EPA Habitat Assessment parameters. As hoped, and despite logging activity, there was no significant

change in total score for habitat at the headwaters site which served as a reference site. There was a 9% improvement in the final overall habitat score at the Vonada Farm site (going from 149/200 to 163/200) and a 5% improvement in the final overall habitat score at the Walizer Farm site (going from 132/200 to 138/200). Increased (worsening) embeddedness and sediment deposits near the mouth were observed near the end of the study in 2011. This actually lowered the final habitat score at the mouth by about 10% in 2011 when compared to earlier scores. The reason for the additional sediment is uncertain but it is possible that logging in the headwaters or project work that occurred upstream disturbed loose soil which was deposited near the mouth of the stream.

**Macroinvertebrate collections** – Macroinvertebrate collections were analyzed using five metrics: Taxa Richness, Modified EPT Index, Modified Hilsenhoff Biotic Index, Percent Dominant Taxa, and Percent Modified Mayflies. Over time some improvement in the number of sensitive taxa at the site on the Vonada farm and the site behind the barn on the Walizer farm occurred. Near the mouth of Rock Run the effects of sediment remain and macroinvertebrate scores have not improved there. Even with some improvements, when compared to the headwaters reference site, no downstream site is close to the 80% comparability that would indicate an unimpaired condition. The table below shows the macroinvertebrate scores and comparability of the monitored sites.

**Macroinvertebrate Metrics and Scores –**

		<b>METRIC</b>			
1.	TAXA RICHNESS	24	20	12	19
	Biol. Cond. Score	8	8	2	8
2.	MOD. EPT INDEX	10	9	3	13
	Biol. Cond. Score	7	5	0	8
3.	MOD. HBI	4.46	4.74	5.16	1.95
	Biol. Cond. Score	0	0	0	8
4.	% DOMINANT TAXA	23	44	69	56
	Biol. Cond. Score	8	8	6	8
5.	% MOD. MAYFLIES	21	18	10	72
	Biol. Cond. Score	0	0	0	8
<b>TOTAL BIOLOGICAL CONDITION SCORE</b>		23	21	8	40
<b>% COMPARABILITY TO REFERENCE</b>		58	53	20	

**Water Chemistry Improvements** - Over the course of five years of monitoring Rock Run, data shows significant improvements in ammonia, nitrate, and phosphorus. Overall, the bacteria counts have dropped significantly as have suspended solids. In the final analysis of this CREP project, water quality is showing improvement that is attributed to the exclusion of cattle from the stream and the establishment of riparian grasses on both the Walizer and Vonada farms. Due to two recent changes within the study area (logging and septage application) some effects on the stream could occur. Any future studies on Rock Run should find the data acquired in this study very useful for comparative purposes.

## Improving Waters – Stephen Foster Lake (Bradford County)

Stephen Foster Lake was first reported as an Improving Watershed in PA's 2010 NPS Annual Report. We are continuing to track water quality improvements in this lake and watershed. Stephen Foster is located in Mount Pisgah State Park in Bradford County west of Towanda. Mill Creek was dammed in 1977 to form the 78-acre lake; the watershed covers about 11 square miles of mostly agricultural lands (58%). The Park hosts approximately 150,000 annual visitors for the lake's recreational opportunities, including boating and an exceptional bass and panfish fishery.

Stephen Foster Lake was plagued with algae blooms and sedimentation just a few years after its impoundment in 1977. After a Clean Lakes Phase 1 Study was completed in 1995 identifying the source and extent of the pollution problems, the lake was placed on the State's List of Impaired Waters, and a TMDL document was completed in 2001. The watershed assessment indicated agricultural and stream bank Best Management Practices (BMPs) were needed to improve water quality and to reduce pollutant loads.

During the next 10 to 12 years of watershed improvements, stakeholders in the Mill Creek watershed had installed a wide variety of agricultural BMPs as well as a 2,500 foot stream channel restoration project. Ag BMPs included animal waste control, barnyard runoff management systems, and exclusion fencing. More recently, since 2003, riparian buffer plantings under the Conservation Reserve Program (CREP) were implemented on 20 sites (892 acres) amounting to 6.8 miles of stream buffered. Overall, more than \$1.5 million restoration funds were garnered from both state and federal sources including Growing Greener, EPA's 319 Program, Environmental Quality Incentive Program (EQIP), CREP, PA Act 6, and the Chesapeake Bay Program along with matching funds from landowners.

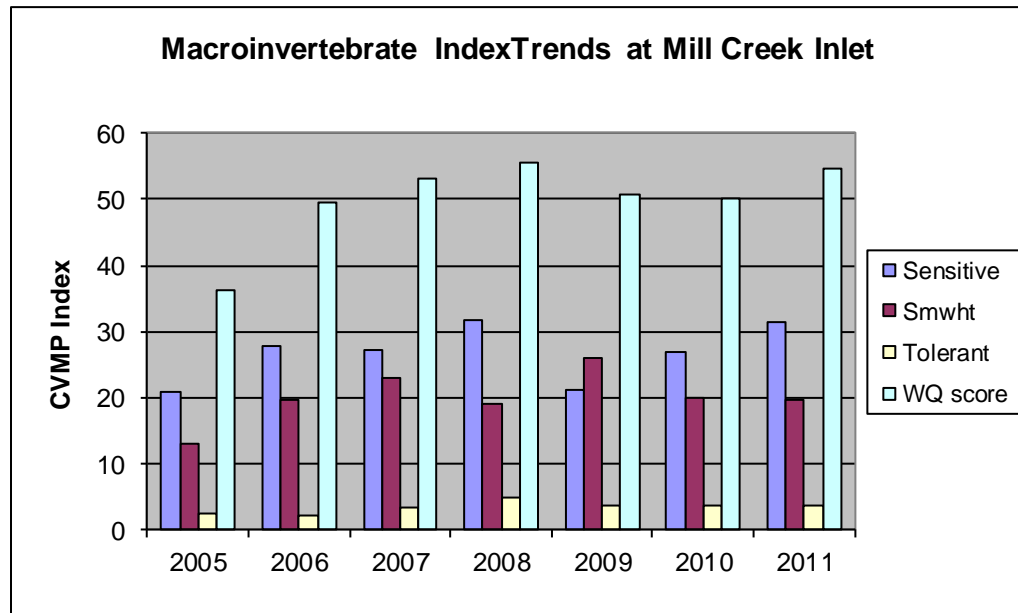


CREP Riparian Forest Buffer planting near Stephen Foster Lake



Efforts of the stakeholders have resulted in improved water quality conditions in Stephen Foster Lake as well as in Mill Creek. A significant reduction of phosphorus loading to the lake was detected by ongoing sampling of the watershed. A 2010 report completed by Princeton Hydro indicates that the total growing season phosphorus load has been reduced from a 1994 – 1995 average of approximately 3,750 lbs. to a 2005 – 2009 average of approximately 450 lbs.

Biological improvements are also notable at most of the monitored stations. Sensitive types of macro-invertebrates have increased at the lower end of Mill Creek where it flows into the lake (see chart). Monitoring results from 2007 – 2012 indicate that the numbers are improving. In this protocol, composite scores > 40 are considered “Good”. Since 2006, composite scores have been at 50 or above.



Since the successful implementation and observed water quality improvements in Mill Creek, in-lake BMPs were targeted to address the in-lake conditions. In 2011, two 15 ft. x 12 ft. artificial wetland islands were placed in the forebay to establish more wetland area for nutrient uptake in the area. The islands are a relatively new and innovative technology, and only a few have been installed statewide. Initial plantings were impacted by waterfowl but were replanted before winter set in. The consultant, Princeton Hydro, is monitoring nutrient uptake by established islands in another lake so that reductions may be applied to these islands in the future.



Launching newly planted wetland island in S.F. Lake (Summer2011)



Mid-summer floating wetland island growth (2011)

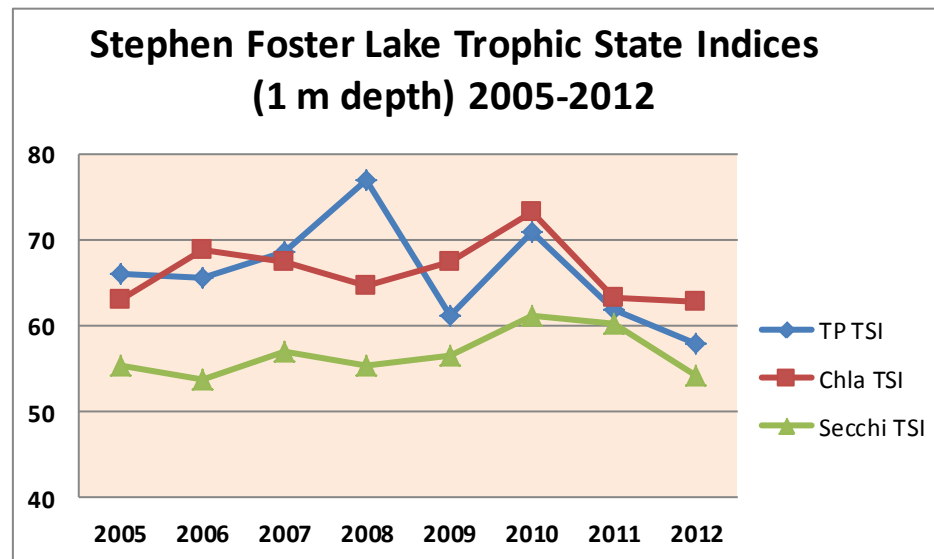
Also implemented in the spring of 2011 was an extensive buffered alum treatment in an effort to control internal nutrient loads from the lake sediments. Poly-aluminum chloride was used to combine with and lock up phosphorus in the water column and in the upper layers of lake sediments, with the net result of reducing available in-lake phosphorus, limiting algae blooms.



Alum treatment of Stephen Foster Lake (May 2011)

Lake water quality samples were collected over the 2011 and 2012 growing season to determine efficacy of the alum treatment. Unfortunately the second half of May 2011 was extremely wet in Northcentral PA. Rainfall was recorded every day from the 15<sup>th</sup> to the 31<sup>st</sup> of May 2011, and some storms were strong. Much sediment in the form of total suspended solids came into the lake from the watershed. Lake monitoring in June and August showed that high pHs in surface waters and low dissolved oxygen below 3m depth were pervasive in the lower lake. However four parameters showed improvements over pre-alum conditions (previous years): surface and bottom water total phosphorus (TP), Secchi depth, and chlorophyll-a levels. Post alum in-lake surface TP concentrations were from 33% to 46% lower than previous TP concentrations. Summer bottom water TP concentrations were from 14% to 64% lower than pre-treatment. Secchi depth values generally improved (i.e. showed greater clarity) in 2011 and 2012 data compared to earlier years (see chart). Chlorophyll-a concentrations were 42% lower during the first half of the season, and were lower than nuisance conditions observed in the past, particularly in 2010.

Inter-annual Trophic State Index (TSI) data were compared with historical data, to elucidate biological activity of the lake on a relative basis. The index was calculated on TP, Secchi, and chlorophyll-a values. TSI's greater than 50 indicate high productivity (eutrophic conditions) while values greater than 65 represent hypereutrophic conditions, typically associated with nuisance conditions such as algal scums and impaired aesthetics. The 2012 TSIs were the lowest on each parameter since 2005. Based on TP TSI values, the lake shifted from hypereutrophic in the mid-1990's to eutrophic conditions since 2005. After alum treatment, the seasonal average TP TSI was trending downward at 62 (2011) and 58 (2012). Secchi TSIs were lowest in 2012 at 53. Chlorophyll-a results also recorded the lowest TSI since 2005. The lake will continue to be sampled through 2013 to document efficacy and improvements.



## **Improving Waters - Unnamed Tributary to Latimore Creek (Adams County)**

This 3.7 mile long UNT to Latimore Creek, DEP stream code 08686, is part of the Conewago River watershed which drains into West Conewago Creek in the Susquehanna River Basin. The Latimore sub-watershed drains approximately 21 sq. miles while the Conewago watershed covers an area of 515 sq. miles. The UNT enters Latimore Creek at stream mile 3.7. Its headwaters are located in Latimore Township, York County. Land use in this drainage is mostly agricultural with scattered, wooded slopes and riparian areas. The unnamed tributary ranges in elevation from 640 feet near its headwaters to 600 feet at its confluence with Latimore Creek. Latimore Creek's respective elevation ranges from 755 to 472 feet. The tributary is described as a shallow, low gradient (<2%), freestone pasture stream. The designated use of Latimore Creek listed in Chapter 93 of the Pennsylvania Code is Cold Water Fishes (CWF).

Three monitoring sites were originally used for this study. The upstream monitoring site is located on UNT to Latimore Creek within the King Farm property and the upper part of the CREP application. The downstream monitoring site is also within the King Farm property below a cattle crossing within the lower part of the CREP application area. The reference site is on another UNT to Latimore Creek which is located in an adjacent watershed that has an existing riparian forest buffer. The upstream monitoring site coordinates are 40° 01' 24" N and 77° 08' 20" W and the downstream monitoring site coordinates are 40° 01' 34" N and 77° 08' 20" W. Coordinates for the reference monitoring site in the adjacent watershed are 40° 01' 54" N and 77° 08' 20" W.

Monitoring sites were chosen before the completion of the CREP practice in order to capture stream conditions prior to the installation of the stream bank fencing, cattle crossings and the riparian buffer. However, after reviewing three years of stream data, seeing impacts from cattle accessibility to the stream on cattle crossings and discussing property boundaries with Mr. King, it was decided in 2009 to change the locations of the monitoring sites. The original downstream site which was below the lower cattle crossing was moved further downstream to a location adjacent to Route 94 upstream of the bridge with coordinates of 40° 01' 37" N and 77° 07' 59" W. This location is at the lower end of the King property where the stream exits the CREP practice and King farm and should give a better indication of overall impacts from the CREP practice without the influence of the cattle using the cattle crossing. A new upstream monitoring site was designated after looking at the area covered by the CREP practice and the property boundary discussion with Mr. King. The upstream site is located further upstream along White Oak Road at the upper limit of the King property just above the start of the CREP practice with coordinates of 40° 01' 22" N and 77° 08' 44" W. This upstream site will give data on stream conditions before entering the CREP practice. The new upstream location will also be used as the new reference site because it characterizes stream conditions prior to impacts from the cattle and the pasture area as well as CREP practice impacts. The original reference site in the adjacent watershed has become unstable with areas of erosion and bank failure within the original monitoring site reach. A mid project monitoring project monitoring to an area just above the upper cattle crossing with coordinates of 40° 01' 53" N and 77° 08' 20" W. This site will characterize stream conditions within the CREP practice including potential impacts from cattle, pastureland, and the CREP practice.

Monitoring frequency for the three monitoring sites will increase in future to twice a year, early spring and fall, in order to collect more data about the effects of the CREP practice. Monitoring includes: habitat assessment (EPA Rapid Bio-assessment Protocol method), macro-invertebrate screening (presence/absence/abundance screening to order/some family level), flow measurements (flow meter or float method), pictures, bacteria sampling (lab analysis for E. coli, fecal coliforms and Enterococci) and water chemistry (field and lab analysis). After collecting data for an additional three –five years at the increased frequency, a final report will be written.

## **WATER QUALITY INDICATORS**

### **Surface Water – Physical/Chemical Parameters:**

#### **Results and Discussion**

Data are averaged over the 2004-2005 and 2006- 2010 sampling seasons as the practice was installed at the end of 2005. As data were not collected in 2011, data for 2012 are presented in the last column. The first set of data represents conditions prior to application of the CREP practice and the second set of data represents post application conditions. Data for the Mid Project site show improving trends for Alkalinity, Dissolved Oxygen, Nitrate, water temperature with the greatest percentage change (27%) for water temperature indicating that the riparian forest buffer is positively impacting the receiving stream. Data for the Downstream site show improving trends for Alkalinity, Conductivity, Nitrate, Total Phosphorus and water temperature with the greatest percentage change (21.5 %) for water temperature. Dissolved Oxygen remained high at 10 mg/l. These are all indications that the riparian forest buffer is positively impacting the receiving stream.

## **BIOLOGICAL INDICATORS**

### **Macroinvertebrates: Results and Discussion**

Water quality scores began a trend upward at the mid project and downstream sites in 2009 and 2010 indicating that treatment from the growing riparian buffer is having a positive impact on the aquatic biological community. With the use of a more rigorous protocol and the application of metrics that account for the presence of sensitive genera and species, a better evaluation of overall stream health as indicated by biological community is expected.

## **Fish: Results and Discussion**

At the reference site, a total of 13 different fish species were observed during the five year study period. The fish species composition was dominated by blacknose dace, longnose dace, creek chub, white sucker, and central stoneroller. Fish population estimates (N) ranged from 588 in 2005 to 1028 in 2007. Overall, it was judged that the fish populations at the reference site fluctuated but were similar during the 2004-2008 sampling period.

At the CREP application site within the King Farm, a total of 18 different fish species were observed during the five year study period. The fish species composition was dominated by blacknose dace, longnose dace, creek chub, white sucker, central stoneroller, tessellated darter, banded killifish, and bluntnose minnow. There were six additional fish species observed during the 2006-2008 sampling period, which is indicative of improved habitat conditions as a result of the riparian corridor treatment associated with the CREP project. Fish population estimates ranged from 1288 in 2006 to 2556 in 2005.

Both the stream width and fish population estimates generally declined subsequent to the riparian corridor improvement project at the King Farm. The narrowing of the stream channel is a common result once livestock are precluded from entering the waterway and the stream banks are given the time to re-vegetate and adjust themselves to address the natural morphology of the respective affected stream system. There are several explanations for the decline in fish numbers. First of all, the open and shallow habitat conditions prior to the stream bank fencing project supported large numbers of juvenile fish representing approximately eight different fish species. As the stream channel narrowed, deepened, and the fish habitat improved with the addition of overhead cover, it was observed that the percentage of adult fish representing these eight species increased while the percentage of the juvenile fish decreased. It should also be noted that the six additional fish species that were observed post-treatment probably replaced habitat space previously dominated by the common fish species at this sampling site. If similar fish studies are planned to assess riparian corridor improvement projects, it is recommended to collectively weigh the fish captured from each of the electrofishing passes in order to calculate biomass estimates. Fish biomass estimates would be an additional data result that may help explain any biological changes between pre and post project conditions.

## **Bacteria: Results and Discussion**

Data are averaged over the 2004-2005 and 2006- 2010 sampling seasons as the practice was installed at the end of 2005. As data were not collected in 2011, data for 2012 are presented in the last column. The first set of data represents conditions prior to application of the CREP practice and the second set of data represents post application conditions. The Bacterial numbers for the Reference/Upstream site indicate that there is a bacterial problem even before the stream reaches the King Farm. The Mid Project and Downstream Sites indicate that there is additional contamination entering the stream from the cattle on the King farm. The manure management plan that is being implemented currently on the King Farm should address this problem and affect future monitoring results.

## **Habitat: Method**

Habitat assessments, like biological samplings, were conducted at all three sites using the Environmental Protection Agency's "Rapid Bio-assessment Protocol for Use in Streams and Wadeable Rivers – Second Edition". The evaluator scores the stream, stream banks and riparian vegetative zone for a variety of 10 parameters that are integral to the protection and enhancement of habitat for aquatic species of macro-invertebrates and fish. Each parameter receives a between 0 and 20 for a total possible score of 200. The mid project and downstream sites show improvement in habitat due to the impact of the growing riparian forest buffer.

## **SUMMARY AND RECOMMENDATIONS**

Over the course of eight years of monitoring the UNT to Latimore, data for the Mid Project site shows improving trends for Alkalinity, Conductivity, Dissolved Oxygen, Nitrate, pH and water temperature with the greatest percentage change (27%) for water temperature indicating that the riparian forest buffer is positively impacting the receiving stream. Data for the Downstream site show improving trends for Alkalinity, Conductivity, Nitrate, Total Phosphorus and water temperature with the greatest percentage change (21.5 %) for water temperature. Dissolved Oxygen remained high at 10 mg/l. These are all indications that the riparian forest buffer is positively impacting the receiving stream.

Water quality scores based on the macro-invertebrate community, began a trend upward at the mid project and downstream sites in 2009 and 2010 indicating that treatment from the growing riparian buffer is having a positive impact on the aquatic biological community. With the use of a more rigorous protocol and the application of metrics that account for the presence of sensitive genera and species, a better evaluation of overall stream health as indicated by biological community is expected.

The Bacterial numbers for the Reference/Upstream site indicate that there is a bacterial problem even before the stream reaches the King Farm. The Mid Project and Downstream Sites indicate that there is additional bacterial contamination entering the stream on the King farm. The manure management plan that is being implemented currently on the King Farm should address this problem and affect future monitoring results.

The mid project and downstream sites show improvement in habitat due to the impact of the growing riparian forest buffer. Fish population estimates generally declined subsequent to the riparian corridor improvement project at the King Farm through 2008. No additional fish sampling was done after 2008. The narrowing of the stream channel is a common result once livestock are precluded from entering the waterway and the stream banks are given the time to re-vegetate and adjust themselves to address the natural morphology of the respective affected stream system. There are several explanations for the decline in fish numbers. First of all, the open and shallow habitat conditions prior to the stream bank fencing project supported large numbers of juvenile fish representing approximately eight different fish species. As the steam channel narrowed, deepened, and the fish habitat improved with the addition of overhead cover, it was observed that the percentage of adult fish representing these eight species increased while the percentage of the juvenile fish decreased. It should also be noted that the six additional fish species that were observed post-treatment probably replaced habitat space previously dominated by the common fish species at this sampling site. If similar fish studies are

planned to assess this project, it is recommended to collectively weigh the fish captured from each of the electrofishing passes in order to calculate biomass estimates. Fish biomass estimates would be an additional data result that may help explain any biological changes between pre and post project conditions.

Overall, water quality is showing improvement that is attributed to the exclusion of cattle from the stream and the establishment of a riparian forest buffer on both sides of the stream. Due to recent improvements within the study area (a comprehensive manure management plan on the King Farm) further positive impacts to the stream are expected.



Monitoring Site Before CREP Practice (2004)



Monitoring Site After CREP Practice (2006)



## Nonpoint Source Pollutant Load Reductions

### Reductions attributed to implemented 319 projects entered into GRTS in fiscal year 2012

The Grants Reporting and Tracking System (GRTS) database is used to document load reductions for all Section 319-funded NPS implementation projects. It should be noted that the information input by Pennsylvania into the GRTS system only relates to projects directly funded by Section 319 monies, which are a small subset of all the NPS work done throughout the Commonwealth. Also, Pennsylvania enters load reductions only after the project is completed in order to ensure the validity of the reductions entered, so load reduction figures for individual BMPs may be delayed in being entered into the GRTS database until the project scope is fully completed.

Nutrient, sediment and abandoned mine drainage (AMD) pollutant load reductions input into the GRTS system in FFY 2012 that can be attributed to 319 funded BMPs are summarized in the two tables that follow. The load reduction figures entered into these two tables were extracted from the GRTS OBI reporting module, using the Section 2 reports.

### **FFY 2012 Nutrient and Sediment Load Reduction Estimates for 319 Projects Only**

<b>Nitrogen</b> (lbs/year)	<b>Phosphorus</b> (lbs/year)	<b>Sediment</b> (tons/year)
264,571	99,558	5,372

*\* Reductions attributed to 319 funded projects only, report 2b (2012) from GRTS OBI on 8/9/2013*

### **FFY 2012 Abandoned Mine Drainage Load Reduction Estimates for 319 Projects Only**

<b>Units Reported</b>	<b>Iron</b>	<b>Aluminum</b>	<b>Manganese</b>
<b>lbs/day</b>	37	11	0
<b>lbs/year</b>	13,505	4,015	0

*\* Reductions attributed to 319 funded projects only, report 2a (2012) from GRTS OBI*

## **Reductions attributed to all collected program data for the 2012 fiscal year**

Pa DEP has recently initiated a grant with Penn State to assess practical methodologies to further collect load reductions attributed to NPS project implementation, including those projects funded by our various NPS program partners throughout the Commonwealth. Through this project we have studied what NPS related load reduction information is available throughout the state, how that information is to be interpreted, what is the usability of that information, and how that information may be able to be reported to EPA to document the overall efforts of all of our NPS program partners in Pennsylvania.

As a result of this 319 funded effort, a GIS-based tool (called BMP Tracker) was developed to enable DEP staff to compile and organize available BMP implementation data from a number of state and federal sources. This task was facilitated by the fact that a considerable amount of such data is already compiled and submitted via the National Environmental Information Exchange Network (NEIEN) to EPA's Chesapeake Bay Office in Annapolis for the purpose of simulating nutrient and sediment loads with the Bay watershed model. While BMP data used for this purpose is only submitted via NEIEN for the Chesapeake Bay portion of Pennsylvania, much of the data originally compiled for this purpose exists statewide (e.g., data from NRCS, FSA, Growing Greener, the REAP program, DEP's urban storm-water data, etc.). With this new tool, DEP staff can now organize BMP data contained in program-specific Excel files in a way that facilitates tracking and reporting for a variety of NPS-related reporting purposes such as GRTS reporting, WIP tracking, and annual statewide reporting.

This BMP Tracker data collection tool includes algorithms for estimating nutrient and sediment reductions that may be achieved via the implementation of a wide variety of BMPs and mitigation activities. These algorithms are similar to those used in other widely-used load estimation tools such as STEPL and Scenario Builder (the pre-processor for the Chesapeake Bay Watershed model). In this case, load reduction estimates are dependent on the types and units of BMPs implemented, the types of land on which those BMP types are used, the loading rates associated with the different land cover types, and the pollutant-specific reduction coefficients associated with each BMP type. For example, in the Chesapeake Bay watershed model, the utilization of conservation tillage on cropland is assumed to reduce nitrogen loss by an average of about 16% in Pennsylvania when compared with conventional tilled land. Therefore, if 100 acres of conventional tilled land (which has an average N loading rate of about 30 lbs/acre as simulated by the model) were treated with conservation tillage, the estimated N load reduction would be calculated as  $100 \text{ acres} \times 30.0 \text{ lbs/acre} \times 0.16 = 480 \text{ lbs of N}$ .

The following agencies and programs have provided data through this project for DEP use in estimating overall NPS load reductions from nonpoint source BMPs implemented over the past fiscal year: DEP's Growing Greener, 319, Abandoned Mine Lands, Chesapeake Bay, Dirt and Gravel Roads, Streambank Fencing, Urban Tree, Nutrient Management (planning and BMPs); and Waterways Engineering Programs; the USDA Natural Resources Conservation Service; the USDA Farm Service Agency; USDA Rural Development; PA's Resource Enhancement and Protection (REAP) program; PENNVEST; and the "Grassroots" grazing program. The fiscal year 2012 load reductions attributed to BMPs implemented by these agencies, organizations and programs for the 2012 fiscal year, are summarized in the below table.

**FFY 2012 Nutrient and Sediment Load Reduction Estimates for ALL Reported Programs**

<b>Nitrogen</b> (lbs/year)	<b>Phosphorus</b> (lbs/year)	<b>Sediment</b> (tons/year)
1,178,107	65,428	17,956

It should be noted that there are many NPS remediation practices implemented without the help of these reporting programs and organizations, so this number falls well short of the full extent of work being implemented in Pennsylvania over the given year. We continue to strive to find ways to collect a more comprehensive set of nonpoint source BMP implementation data so we can best represent the strong level of commitment our program partners in Pennsylvania have in addressing nonpoint source pollution.

## **SECTION TWO: Watershed Implementation Plan (WIP) Progress in meeting BMP and TMDL Load Reduction Goals**

Pennsylvania's NPS Management Program has supported a watershed-based planning effort since FFY2003 through the development of Watershed Implementation Plans (WIPs). All of the WIPs have been developed for watersheds with NPS impairments where there are active watershed groups and where data are available from previous studies.

This section of the report includes progress made to date in the implementation of all completed WIPs. Pa has been on a schedule for reporting on ten WIPs each year beginning with the FFY2010 NPS Annual Report. The number of WIPs developed and implemented through September 30, 2012 is reported as a measure of progress. Thirty-five WIPs have been completed and accepted by the EPA and are now being fully implemented.

The tables included in this section provide project specific estimated load reductions for each of the thirty-five completed WIPs. Project and load reduction information are included for the FFY2008 through FFY2012 S. 319 grants.

For FFY2012 the DEP and EPA agreed to report on ten new WIPs with more details on how they are meeting water quality goals. The following WIPs are included with a more detailed analysis of how they are meeting BMP and TMDL load reduction goals.

### Abandoned Mine Drainage (AMD)

Bear Creek (Dauphin County);  
Pine Run (Jefferson County);  
Johnson Creek (Tioga County);  
Montgomery Creek (Clearfield County); and  
Hartshorn Run (Clearfield County)

### Urban and Storm water NPS

Pine Creek (Allegheny County);  
Trout and Godfrey Runs (Erie County)

### Agriculture Nutrient and Sediment NPS

Hungry Run (Mifflin County);  
Buffalo Creek (Union County); and  
North Branch Neshaminy Creek/Lake Galena (Bucks County)

The new WIPs under development last year were Deer Creek (Clearfield County), Little Wiconisco Creek (Dauphin County), and the Quittapahilla Creek (Lebanon County).

The Deer Creek and Little Wiconisco Creek WIPs were completed using funding sources other than Section 319 funding. The proposed Quittapahilla Creek WIP has not yet been completed.

If you are interested in seeing final work products for the completed WIPs, please see the DEP Nonpoint Source Management Program web site. From the Pa DEP web site [www.dep.state.pa.us](http://www.dep.state.pa.us), first select the Nonpoint Source Management Program under the WATER topics tab and then look under 'Program Initiatives' for the list of 'Watershed Implementation Plans'. The locations of all completed and EPA-approved WIPs are shown on the following pages.

# 2012 EPA Section 319 Watershed Implementation Plans



**Legend**

- Watershed Planning Areas
- County Boundaries



**Nutrient and Sediment WIPs Completed and being Implemented – Future Tracking**

**Abrahams Creek/Francis Slocum Lake – Luzerne County**

Watershed	S. 319 Grant/Project # (Project Completion Date)	Pollutant Load Reductions (lbs./yr. of N and P; tons/yr. of Sediment)		
		Nitrogen	Phosphorus	Sediment
Abrahams Creek/ Francis Slocum Lake	2006 / 29 (3-31-2010)	PLAN DEVELOPMENT only.		
	Totals	0	0	0

**Implementation Progress:**

Francis Slocum Lake is a part of the Abrahams Creek watershed in Luzerne County. Francis Slocum Lake was designated as eutrophic in the early 1970s. Francis Slocum Lake had become hyper-eutrophic by the early 1990's. A comprehensive Watershed Implementation Plan (WIP) was completed for the Abrahams Creek watershed including Francis Slocum Lake by the Luzerne County Conservation District in March 2010. The WIP specifically targets excessive phosphorus loadings to the Francis Slocum Lake as the primary cause of impairments. Sources of impairment are included in PA's current 303(d) list of impaired waters. Efforts continue to strengthen existing watershed partnerships and secure funding to implement WIP recommendations. If S. 319 funding is provided in the future it will be targeted to priority restoration sites identified in the WIP.

**West Branch Antietam Creek – Franklin County**

Watershed	S. 319 Grant / Project # (Project Completion Date)	Pollutant Load Reductions (pounds/yr. N and P; tons/yr. of Sediment)		
		Nitrogen	Phosphorus	Sediment
West Branch Antietam Creek	2002 / 23 (9-30-2003)	444	222	222
	2007 / 27C (6-30-2009)	PLAN DEVELOPMENT only.		
	2012 / 15 (09-30-2015)	0	0	0
	Totals	444	222	222

**Implementation Progress:**

The West Branch Antietam Creek watershed is located in southern Franklin County. The majority the West Branch is included on PA’s 303(d) list of impaired waters for nutrient and sediment related impairments. The West Branch Antietam Creek Watershed Implementation Plan (WIP) was completed by the Antietam Creek Watershed Association in April 2008. The Plan identifies many project sites and prioritizes them for the greatest amount of restoration potential and nutrient and sediment reductions. Most of the project sites identified in the Plan are directed to restoring riparian areas and implementing agricultural BMPs. A TMDL for the West Branch Antietam Creek was written in 2011 and is awaiting final approval.

The Franklin County Conservation District, Chesapeake Bay Foundation and USDA-NRCS are working with landowners to implement stream restoration and agricultural best management practices on farms in the West Branch. Section 319-funded projects have been and are currently being completed to address stream bank degradation and riparian buffer restoration in the watershed. Current S. 319-funded work with the Chesapeake Bay Foundation is promoting both CREP practices and other agricultural BMPs.



**South Branch Plum Creek Watershed – Indiana County**

Watershed	S. 319 Grant/Project # (Project Completion Date)	Pollutant Load Reductions (pounds/yr. N and P; tons/yr. Sediment)		
		Nitrogen	Phosphorus	Sediment
South Branch Plum Creek				
	2007/27B (01-24-2012)	PLAN DEVELOPMENT only.		
	2011/ 19 (09-30-2013)	40	13	22
	2013 / 14 (Ongoing)	0	0	0
	Totals	40	13	22

**Implementation Progress:**

The South Branch Plum Creek is a tributary to the Crooked Creek watershed in Indiana and Armstrong Counties. The upper half of the South Branch is where the Indiana County Conservation District is actively working with landowners since the Watershed Implementation Plan (WIP) was completed in 2012. Only agricultural and stream hydro-modification impaired reaches of the South Branch are being addressed through the WIP. A TMDL was developed and completed for the South Branch Plum Creek sub-watershed within the larger Crooked Creek watershed in 2009.

Most of the existing water quality impairments are related to agricultural and stream bank erosion sources of nutrients and sediment. Unimproved roads are also a major contributor to sediment loading in the upper parts of the South Branch. The Indiana County CD has been working with municipalities to correct road problems through the state’s Dirt and Gravel Roads Program. S. 319 NPS funding is being provided to implement WIP priority sites, especially in some of the smaller impaired tributaries. Agricultural and stream restoration sites are also being targeted for improvements, and some Plain Sect farmers are participating in stream related BMP projects.

It is anticipated this WIP will be tracked further as BMP implementation progresses in the next few years.

**Little Wiconisco Creek – Dauphin County**

Watershed	S. 319 Grant/Project # (Project Completion Date)	Pollutant Load Reductions (pounds/yr. N and P; tons/yr. Sediment)		
		Nitrogen	Phosphorus	Sediment
Little Wiconisco Creek				
	2004 / 25 (06-30-2007)	14,811	4,053	354.4
	2010/02C (Ongoing)	Ag E&S Plan/MM Plan Development.		
	2013 / 17 (Ongoing)	0	0	0
	Totals	14,811	4,053	354.4

**Implementation Progress:**

The Little Wiconisco Creek is located in Dauphin County and is a tributary to the middle Susquehanna River. It is primarily agricultural land uses with some small towns. The Dauphin County Conservation District has been working with agricultural landowners in the watershed for many years. The Plan was developed by the Dauphin County Conservation District, and was completed in 2012. The primary focus is to assist the agricultural sector implement BMPs to reduce sediment and nutrient loadings to the creek. A large part of the watershed is 303(d) listed for nutrient and sediment related impairments. A TMDL for the Wiconisco Creek watershed was developed and approved in 2007. Phosphorus and sediment reduction goals are included for the Little Wiconisco Creek sub-basin. Several S. 319 projects have been or are being funded to help landowners comply with current agricultural regulations and implement the Little Wiconisco Creek Watershed Restoration Plan (WIP). A Quality Assurance Project Plan (QAPP) was also recently approved by the EPA so that the Dauphin County Conservation District can continue to do water quality monitoring throughout the county, with an emphasis on the Little Wiconisco Creek.

Significant load reductions have been achieved to date and current projects will increase compliance with agricultural plan requirements and help to implement WIP priority projects. It is anticipated this WIP will be tracked further as BMP implementation progresses in the next few years.

## **Nutrient and Sediment WIPs Completed and being Implemented - FFY2012 Tracking**

### **Buffalo Creek – Union County**

<b>Watershed</b>	<b>S. 319 grant / project # (Project completion date)</b>	<b>Pollutant Load Reductions *</b> <b>(pounds/yr. N and P; tons/yr. of Sediment)</b>		
		<b>Nitrogen</b>	<b>Phosphorus</b>	<b>Sediment</b>
<b>Buffalo Creek</b>	2006 / 07 (12-31-2008)	PLAN DEVELOPMENT only.		
	2008 / 20 (09/30/2012)	5,075	1,001	193
	2011/ 18 (Ongoing)	5,656	622	82.3
	2013 / 16 (09-30-2015)	0	0	0
	Totals	10,731	1,623	275.3

\* Load reduction estimates for some projects were derived using MapShed model.

### **Implementation Progress:**

The Buffalo Creek watershed is a major tributary to the Middle Susquehanna River basin in Union County. Both agricultural and forest land uses are dominant. The Lewisburg and Mifflinburg urban areas lie in the lower reaches. The UNT19034 sub-watershed has been the primary area of focus by the Union County Conservation District to date. The Buffalo Creek Watershed Association and Union County Conservation District are continuing a water quality monitoring program throughout the Buffalo Creek in cooperation with Bucknell University. The Union County Conservation District completed the Buffalo Creek Watershed Implementation Plan (WIP) in November 2008. A TMDL for Buffalo Creek Tributaries was completed in 2009. The TMDL targets phosphorus and sediment loadings primarily from agricultural land uses. S. 319-funded projects have been implemented to start the WIP implementation primarily for agricultural and stream restoration related BMPs. The Conservation District has considered WIP revisions to bring in 303(d) listed stream reaches included in the 2010 Integrated List of All Waters.

The Buffalo Creek WIP is included in the WIP Tracker Tool in 2012. A more detailed analysis of BMP and load reduction goal achievements is shown on the following page.

## Buffalo Creek BMP and Load Reduction Accomplishments

Sub Watershed	BMP/Action	Goal Amount	Implemented Amount	% BMP Implemented	Pollutant ID	TMDL Load Reduction	Target Load Reduction Amount	Load Reduction Achieved	Unit
PA BufMainE	Aggregated BMP Load Reductions				Phosphorus	N/A	6231		LBS/YR
					Sedimentation/ Siltation	N/A	1748		TONS/YR
	Conservation Tillage	2760	0	0					
	Cover Crop	N/A	212.4	100					
	Fence	91872	6900	7.5					
	Nutrient Management	8288	550.1	6.6					
	Prescribed Grazing	2076	0	0					
	Riparian Forest Buffer	131.5	0	0					
Stream Channel Stabilization	168432	0	0						
PA BC19034	Aggregated BMP Load Reductions				Nitrogen	N/A	0	10731	LBS/YR
					Phosphorus	N/A	298	1623.3	LBS/YR
					Sedimentation/ Siltation	N/A	346	275.3	TONS/YR
	Access Road	N/A	227						
	Animal Trails and Walkways	N/A	2760	>100					
	Barnyard Runoff Management	3	2	67					
	Cover Crop	211	0	0					
	Fence	11160	20510	183					
	Filter Strip	N/A	0.46	>100					
	Heavy Use Area Protection	N/A	0.22	>100					
	Nutrient Management	301	327	108					
	Prescribed Grazing	8	70	>100					
	Riparian Forest Buffer	14.4	4.7	33					
	Stream Crossing	6	6	100					
	Streambank & Shoreline Protection	245	1210	>100					
	Waste Management System	3	2	67					
Waste Storage Facility	1	1	100						

**Hungry Run – Mifflin County**

Watershed	S. 319 grant / project # (Project Completion Date)	Pollutant Load Reductions (pounds/yr. of N and P; tons/yr. of Sediment)		
		Nitrogen	Phosphorus	Sediment
Hungry Run	2008 /32A (09-30-2012)	8,617	1,968	567
	2011/ 17 (Ongoing)	7,234	1,226	196
	2011/ 21 (Ongoing)	DESIGN only.		
	2013 / 15 (09-30-2015)	0	0	0
Totals		15,851	3,194	763

**Implementation Progress:**

**Hungry Run is a tributary to the Kishacoquillas Creek watershed and the Susquehanna River basin in Mifflin County. The Hungry Run watershed is largely agricultural with urban areas around Burnham. Hungry Run is included on the State’s 303(d) list of impaired waters for nutrient and sediment related pollution. Water quality impairments are due to agricultural sources of nutrients and sediment throughout most of the watershed, while impairments in the lower part of the basin are related to storm water and urban runoff. The Hungry Run Watershed Implementation Plan (WIP) was completed by the Mifflin County Conservation District in 2008. A TMDL for the Kishacoquillas Creek watershed including the Hungry Run sub-basin is being completed.**

**The Mifflin County Conservation District is utilizing Section 319 funding to work with agricultural landowners to implement animal waste management BMPs and stream restoration projects, primarily with small livestock farms. BMPs will be completed on high priority project sites. The PA Fish and Boat Commission is also helping to design and oversee stream restoration projects in Hungry Run since it is trout fishery with natural reproduction.**

**The Hungry Run WIP was included in the WIP Tracker Tool in 2012. A more detailed analysis of BMP and load reduction goal achievements is shown on the following page.**

## Hungry Run BMP and Load Reduction Accomplishments

Sub Watershed	BMP/Action	Goal Amount	Implemented Amount	Units of Measure	% Action Implemented	Pollutant ID	Target Load Reduction Amount	Load Reduction Achieved	Units of Measure	% Load Reduction Achieved
PA Hungry Run	Access Road		100	FT						
	Aggregated BMP Load Reductions	1				Nitrogen	9383	15851	LBS/YR	169
						Sedimentation-Siltation	344	763	TONS/YR	222
						Phosphorus	1356	3194	LBS/YR	236
	Animal Trails and Walkways	200	200	FT	100					
	Barnyard Runoff Management	10	0.8	UNITS	8					
	Cover Crop	230	230	AC	100					
	Diversion	92	6	AC	7					
	Fence	35376	2580	FT	7					
	Grassed Waterway	400	400	FT	100					
	Heavy Use Area Protection	1.3	1.3	AC	100					
	Nutrient Management	1209	1216	AC	101					
	Residue Management, No-till & Strip Till	800	0	AC	0					
	Riparian Forest Buffer	57	0.6	AC	1					
	Stream Channel Stabilization	3584	2000	FT	56					
	Streambank & Shoreline Protection	4040	4040	FT	100					
Waste Management System			1	UNITS						
Waste Storage Facility	8	3	UNITS	38						

**North Branch Neshaminy Creek /Lake Galena – Bucks County**

Watershed	S. 319 Grant/Project # (Project Completion Date)	Pollutant Load Reductions (pounds/yr. of N and P; tons/yr. of Sediment)		
		Nitrogen	Phosphorus	Sediment
North Branch Neshaminy Creek / Lake Galena	1998 / 18 (12-30-2003)	NO DATA.		
	1999 / 39 (9-30-2000)	NO DATA.		
	2005 / 08 (12-31-2005)	NO DATA.		
	2006 / 07 (3-31-2010)	PLAN DEVELOPMENT only.		
	2010 / 17 (Ongoing)	916.8	471.9	453.9
	Totals	916.8	471.9	453.9

**Implementation Progress:**

**The North Branch Neshaminy Creek (NBNC) is a major stream in Bucks County and is tributary to the Delaware River. Water quality impairments are due to water flow variability and sediment. The NBNC is included on Pa's 303(d) list of impaired waters for sediment, nutrient and hydrologic modification related impairments.**

**A TMDL was completed in 2003 for the Neshaminy Creek watershed including the NBNC sub-basin. The TMDL addresses siltation and other sources of impairments. A Watershed Restoration Plan (WIP) was completed by the Bucks County Conservation District in March 2010. The WIP addresses sediment and phosphorus inputs to the watershed upstream of Lake Galena. The Bucks County Conservation District is utilizing S. 319 funding to implement the WIP. WIP priority sites will be targeted where agricultural and storm water BMPs can be implemented.**

**The North Branch Neshaminy Creek /Lake Galena WIP is included in the WIP Tracker Tool in 2012. A more detailed analysis of BMP and load reduction goal achievements is shown on the following page.**

## North Branch Neshaminy Creek /Lake Galena BMP and Load Reduction Accomplishments

Sub Watershed	BMP/Action	Goal Amount	Implemented Amount	Units of Measure	Pollutant ID	TMDL Load Reduction	Target Load Reduction Amount	Load Reduction Achieved	% Load Reduction Achieved
PA North Branch Neshaminy Creek	Aggregated BMP Load Reductions				Nitrogen	N/A	5975	916.8	15
					Phosphorus	1316	950	471.9	50
					Sedimentation-Siltation	N/A	332	453.9	137
	Conservation Tillage	220	0	acres					
	Contour Farming	15	0	acres					
	Cover Crop	205	0	acres					
	Diversion	0	1310	feet					
	Fence	2112	330	feet					
	Grassed Waterway	0	1010	feet					
	Lined Waterway or Outlet	0	745	feet					
	Nutrient Management	86	25	acres					
	Raingarden/ bioretention basin	254	0	units					
	Riparian Forest Buffer	26.3	0.7	acres					
	Riprap Shoreline	0	75	feet					
	Sediment Basin	1	1	units					
	Stream bank & Shoreline Protection	17424	1575	feet					
	Tree/Shrub Establishment	0	0.45	acres					
Wetland Creation	41.5	0	acres						
Wetland Restoration	2	1.7	acres						



**Pine Creek – Allegheny County**

Watershed	S. 319 Grant/Project # (Project Completion Date)	Pollutant Load Reductions (pounds/yr. of N and P; tons/yr. of Sediment)		
		Nitrogen	Phosphorus	Sediment
	2006 / 27 (03-31-2010)	PLAN DEVELOPMENT only.		
Pine Creek	2008/ 22 (01-13-2012)	0	0	20
	2008/32D (01-24-2012)	DESIGN only.		
	2009/ 31F (03-31-2012)	0	0	0
	2009/ 31L (Ongoing)	1	1	0.01
	2011/ 25 (Ongoing)	0	0	0
	2012/ 23 (Ongoing)	0	0	0
	Totals	1	1	20

**Implementation Progress:**

The Pine Creek watershed is a highly urbanized area located north of the City of Pittsburgh in Allegheny County. A Watershed Implementation Plan (WIP) was completed for the Pine Creek watershed by the Pa. Environmental Council and was approved in October 2009. The Plan focuses primarily on 303(d) impaired stream reaches that are impacted by urban and storm water runoff. The WIP targets sites where stream bank restoration and stream channel stabilization will decrease sediment loadings to the Pine Creek. There is no TMDL for the Pine Creek watershed. Several S. 319 funded implementation projects have been funded to implement the WIP. These projects focus on stream channel stabilization in high priority areas in the West Little Pine Creek and Crouse Run sub-watersheds, the installation of rain garden BMPs to limit storm water runoff into Combined Sewer Systems, rain garden installation at public properties in Shaler Township, and green streetscapes storm water management BMPs in the Borough of Etna. The Pine Creek WIP is included in the WIP Tracker Tool in 2012. A detailed analysis of BMP and load reduction goal achievements was not available on the GRTS Oracle Business Intelligence website as of February 2013. Therefore no table of accomplishments has been included here.

**Trout Run / Godfrey Run – Erie County**

Watershed	S. 319 grant/ project # (Project completion date)	Pollutant Load Reductions (pounds/yr. of N and P; tons/yr. of Sediment)		
		Nitrogen	Phosphorus	Sediment
Trout Run / Godfrey Run	2006 / 07 (12-31-2009)	PLAN DEVELOPMENT only.		
	2009 / 31C (Ongoing)	0	0	36.6
	2009 / 31J (09-30-2012)	93	46	55
	Totals	93	46	91.6

**Implementation Progress:**

The Trout Run / Godfrey Run watersheds are small tributaries to Lake Erie in Erie County. Trout / Godfrey Runs were linked with high levels of bacterial contamination from properties with poorly operating on-site septic systems, and high levels of nutrient and sediment loadings to Lake Erie. The watersheds are included on PA’s 303(d) list of impaired waters for bacterial, nutrient and sediment related impairments.

The Trout Run / Godfrey Run Watershed Implementation Plan (WIP) was completed and approved in 2009. The WIP identifies high priority sites for implementing a variety of water quality improvement practices, including agricultural BMPs, improved septic system management, riparian buffer restoration and stream bank restoration and stabilization. No TMDL has been completed for these watersheds. The Erie County Conservation District is taking the lead to implement projects identified as priority restoration sites in the WIP. Several S. 319-funded projects with the Conservation District are starting the process of WIP implementation.

The Trout Run / Godfrey Run WIP is included in the WIP Tracker Tool in 2012. A more detailed analysis of BMP and load reduction goal achievements is shown on the following page.

### Trout Run / Godfrey Run BMP and Load Reduction Accomplishments

Sub Watershed	BMP/Action	Goal Amount	Implemented Amount	% BMP Goal Achieved	Units of Measure	Pollutant ID	TMDL Load Reduction	Target Load Reduction Amount	Load Reduction Achieved	% Load Reduction Achieved	Units of Measure
PA Godfrey Run	Aggregated BMP Load Reductions					Nitrogen	N/A	5402	93	2	LBS/YR
						Phosphorus	N/A	288	46	16	LBS/YR
						Sedimentation-Siltation	N/A	83.5	91.6	110	TONS/YR
	Cover Crop	160	0	0	AC						
	Fish Raceway or Tank	5	0	0	UNITS						
	Nutrient Management	320	0	0	AC						
	Riparian Forest Buffer	0.75	1.3		AC						
	Storm Water Wet Detention/Chemical Treatment System	10.5	0	0	AC						
	Stream Channel Stabilization	3000	1,030	34	FT						
	Stream bank & Shoreline Protection	6336	1,790	21	FT						
PA Trout Run	Aggregated BMP Load Reductions					Nitrogen	N/A	2946	0	0	LBS/YR
						Phosphorus	N/A	237	0	0	LBS/YR
						Sedimentation-Siltation	N/A	284	0	0	TONS/YR
	Cover Crop	430	0	0	AC						
	Nutrient Management	860	0	0	AC						
	Onsite Waste Water Treatment System (pumpout)	100	0	0	UNITS						
	Storm Water Wet Detention/Chemical Treatment System	23	0	0	AC						
	Stream bank & Shoreline Protection	4752	0	0	FT						

## Nutrient and Sediment WIPs Completed and being Implemented – FFY2011 Tracking

### Codorus Creek – Adams and York Counties

Watershed	S. 319 grant / project # (Project Completion Date)	Pollutant Load Reductions (pounds/yr. N and P; tons/yr. Sediment)		
		Nitrogen	Phosphorus	Sediment
Codorus Creek	1999 / 22 (6-30-2001) SBCC*	0	0	43
	2000 / 39 (9-30-2002) EBCC*	ASSESSMENT and RESTORATION only.		
	2002 / 31 (7-31-2005) EBCC	0	0	350
	2002 / 33 (9-30-2005) SBCC	0	0	119
	2003 / 32 ( 9-30-2006) EBCC	DESIGN only.		
	2003 / 33 (9-30-2006) SBCC	0	0	5,300
	2004 / 26 (9-30-2007) OC*	DESIGN only.		
	2004 / 28 (9-30-2006) SBCC	0	0	300
	2005 / 32 (9-30-2006) EBCC	DESIGN only.		
	2005 / 42 (9-30-2006 ) S/EBCC	MONITORING and MAINTENANCE only.		
	2005 / 45B (9-30-2007) EBCC	0	0	981
	2006 / 30D (9-30-2008) SBCC	3,034	2,016	1,920
	2006 / 30E (9-30-2009) EBCC	0	0	750
	2006 / 30F (9-30-2009) OC	0	0	682
	2007 / 20 (9-30-2009) EBCC	0	0	3,115
	2009 / 31I (Ongoing) EBCC	0	0	0
	2010 / 22 (Ongoing) SBCC	0	0	0
	2011 / 24 (Ongoing) SBCC	0	0	0
	2012 / 19 (Ongoing) EBCC	0	0	0
2012 / 25 (Ongoing) SBCC	0	0	0	
	Totals	3,034	2,016	13,560

\* East Branch Codorus Creek (EBCC); South Branch Codorus Creek (SBCC); Oil Creek (OC)

**Implementation Progress:**

**The Codorus Creek is a major tributary to the lower Susquehanna River and is located primarily within York County. Portions of the Oil Creek sub-basin drain eastern Adams County and enter the West Branch sub-basin. The Codorus Creek is a major source of public drinking water for the City of York and surrounding communities. Several lakes lie within the watershed. Most restoration work completed to date revolves around stream bank and stream channel stabilization and riparian buffer restoration. Significant stream bank erosion problems exist due to severe urban and storm water runoff and unrestricted livestock access to streams. Local watershed organizations have been involved with restoration work since 1999-2000.**

**The South Branch Codorus Creek TMDL was developed and approved in August 2003. The TMDL allocates significant load reductions for both phosphorus and sediment. Following the TMDL development and the implementation of several restoration projects, the Codorus Creek Watershed Implementation Plan (WIP) was completed in July 2007 by the York County Conservation District. The Oil Creek TMDL was developed and completed in March 2003. Stream restoration projects have significantly decreased sediment and phosphorus loadings in both the East, South and Oil Creek sub-basins of the Codorus Creek watershed. Current S. 319-funded projects in the East and South Branches are working on priority sites identified in the WIP.**

**The Codorus Creek WIP was included in the FFY2011 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.**

**Core Creek/Lake Luxembourg – Bucks County**

Watershed	S. 319 grant / project # (Project Completion Date)	Pollutant Load Reductions (pounds/yr. N and P; tons/yr. Sediment)		
		Nitrogen	Phosphorus	Sediment
Core Creek/Lake Luxembourg	1995 / 13 (10-01-1996)	NO DATA.		
	1996 / 14 (03-31-1998)	NO DATA.		
	1997 / 14 (12-31-1998)	NO DATA.		
	1999 / 38 (12-31-2001)	NO DATA.		
	2004 / 29 (09-30-2007)	0	35	46.5
	2010 / 16 (Ongoing)	1,519	171	8.6
	2012 / 17 (Ongoing)	0	0	0
	Totals	1,519	206	55.1

**Implementation Progress:**

The lake is impaired by excessive phosphorus and sediment loadings to the Core Creek from both upstream sources and from sources flowing directly into the lake. The Lake Luxembourg watershed has received federal funding through the Section 314 Clean Lakes Program for Phase I Watershed Assessment and through the Section 319 NPS Program for Phase II watershed restoration projects since the mid-1990s.

A TMDL was developed for Lake Luxembourg and was completed in 1999. The Core Creek / Lake Luxembourg Restoration Plan was completed in March 2005 by the Bucks County Conservation District. The Plan prioritizes projects to minimize NPS pollutant loadings to the Core Creek watershed upstream of Lake Luxembourg. The Bucks County Conservation District is coordinating restoration project to reduce phosphorus and sediment loadings that will meet TMDL load reduction targets. Several projects are recently completed or ongoing to implement Plan restoration priorities.

The Core Creek/Lake Luxembourg WIP was included in the FFY2011 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.

**Harveys Lake – Luzerne County**

Watershed	S. 319 grant / project # (Project completion date)	Pollutant Load Reductions (pounds/yr. N and P; tons/yr. Sediment)		
		Nitrogen	Phosphorus	Sediment
Harveys Lake	2000 / 45 (9-30-2003)	0	11	0
	2001 / 45 (9-30-2003)	0	11	0
	2002 / 30 (9-30-2004)	0	5	0
	2005 / 36 (9-30-2008)	PLAN DEVELOPMENT only.		
	2006 / 30J (12-31-2009)	0	14	0
	2008 / 32C(09-30-2012)	0	5	0
	Growing Greener 2011	0	30	0
	2011 / 26 (Ongoing)	0	0	0
	2012 / 18 (Ongoing)	0	0	0
	Totals	0	76	0

**Implementation Progress:**

Harveys Lake is a large recreational lake in Luzerne County. The lake is impaired by excessive loadings of nutrients and suspended solids from on-site wastewater and urban storm water runoff. Stream bank and shore line erosion have also contributed to the impairments. A TMDL was completed for Harveys Lake in 2002 and approved by the EPA in 2003. The TMDL identified high total phosphorus levels and the load reductions needed to meet water quality goals. The Harveys Lake Watershed Implementation Plan (WIP) was completed in May 2009. The Plan addresses priority areas for reducing nutrient and sediment related impairments to the lake. Clean Lakes Program Phase I Assessment and Phase II Restoration projects and Section 319-funded projects have been completed and are reducing total phosphorus loadings to the lake. Current S. 319- funded projects continue WIP implementation.

The Harveys Lake WIP was included in the FFY2011 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.

**Jacobs Creek – Fayette and Westmoreland Counties**

Watershed	S. 319 grant / project # (Project completion date)	Pollutant Load Reductions (pounds/yr. N and P; tons/yr. Sediment)		
		Nitrogen	Phosphorus	Sediment
Jacobs Creek	2008 / 23 (11-18-2010)	0.73	1.46	0.23
	2009 / 28 (Ongoing)	0	0	0
	2009 / 29 (Ongoing)	0	0	0
	2009 / 31D (Ongoing)	0	0	0
	2009 / 31E (Ongoing)	0	0	0
	2010 / 18 (Ongoing)	0	0	0
	2010 / 19 (Ongoing)	0	0	0
	2010 / 20 (Ongoing)	0	0	0
	2010 / 26 (Ongoing)	0	0	0
	2012 / 22 (Ongoing)	0	0	0
Totals		0.73	1.46	0.23

**Implementation Progress:**

Jacobs Creek is a large watershed spanning parts of Fayette and Westmoreland Counties. It is impacted by both urban / storm water runoff, agricultural nutrient and sediment pollutants, and abandoned mine drainage discharges. The watershed is a high priority in southwestern PA for addressing NPS related pollutant problems.

A Watershed Implementation and Restoration Plan (WIP) was completed by the Jacobs Creek Watershed Association in June 2009. The plan addresses several major NPS problems within the Jacobs Creek watershed relating to agricultural practices, storm water from urban and developing areas and abandoned mine drainage discharges. One TMDL has been completed for the Stauffer Run sub-watershed, a small AMD-impaired tributary to Jacobs Creek. No TMDLs have been completed for any non-AMD impaired tributaries to the Jacobs Creek. The Section 319 NPS Program is funding several projects to address storm water and urban runoff in urban sub-watersheds. The Jacobs Creek Watershed Association is taking the lead role with WIP implementation.

The Jacobs Creek WIP was included in the FFY2011 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.



**Middle Spring Creek Sub-basin – Cumberland County**

Watershed	S. 319 grant/ project # (Project completion date)	Pollutant Load Reductions (pounds/yr. N and P; tons/yr. Sediment)		
		Nitrogen	Phosphorus	Sediment
Middle Spring Creek	2001 / 49 (09-30-2004)	34,405	9,085	2,076
	2001 / 50 (09-30-2004)	72,883	21,668	5,591
	2007 / 27A (09-31-2009)	PLAN DEVELOPMENT only.		
	2010/ 23C (Ongoing)	486	28	0
	Growing Greener 2011	301	145	169
	Totals	108,075	30,926	7,836

**Implementation Progress:**

The Middle Spring Creek is a small tributary to the Conodoguinet Creek in Cumberland and Franklin Counties. The Middle Spring Creek is included on the 303(d) list of impaired streams for agriculture and urban runoff/storm sewer sources of pollution.

A TMDL was completed for several sub-basins in the Conodoguinet Creek watershed, including the Middle Spring Creek sub-basin, in December 2000. Since 2001 the Section 319 NPS Program has provided funding for several projects through the Cumberland County Conservation District. These projects have focused primarily on agricultural BMPs within TMDL sub-basins in the Conodoguinet Creek watershed. A Watershed Implementation Plan (WIP) was completed for Middle Spring Creek by the Cumberland County Conservation District in December 2009. Since then the Section 319 program has provided funding for one additional project. This project was intended to address project sites in the Gum and Mains Run tributaries to the Middle Spring Creek. Sites outside of the original target area are now being considered. The Cumberland County Conservation District is taking the lead in WIP implementation.

The Middle Spring Creek WIP was included in the FFY2011 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.

**Upper Kishacoquillas Creek – Mifflin County**

Watershed	S. 319 grant / project # (Project Completion Date)	Pollutant Load Reductions (pounds/yr. N and P; tons/yr. Sediment)		
		Nitrogen	Phosphorus	Sediment
Upper Kishacoquillas Creek	2002 / 24 (09-30-2005)	101	22	12
	2002 / 28 (09-30-2005)	3,291	1,562	102
	2002 / 32 (09-30-2005)	410	204	204
	2005 / 26 and 27 (9-30-2008)	3,621	829	115
	2006 / 30C (03-31-2010)	1,565	437	115
	2007 / 23A (09-15-2011)	9,447	2,246	205
	2008 / 32B (09-30-2012)	6,792	1,242	86
	2012 / 14 (Ongoing)	0	0	0
	Totals	25,227	6,542	839

**Implementation Progress:**

The Upper Kishacoquillas Creek watershed is defined by the area from Belleville upstream to and including the headwaters areas. The majority of streams in the watershed are impaired from sediment and nutrient enrichment. This area of the Upper Kishacoquillas Creek was first included on the 2002 303(d) list for agricultural sources of nutrients and sediment.

The Upper Kishacoquillas Creek Watershed Restoration Plan (WIP) was completed in 2007 by the Mifflin County Conservation District. The Plan identifies all agricultural and stream bank restoration related projects in the watershed that have potential to reduce sediment and nutrient loadings. Several projects were completed prior to completion of the WIP. One new S. 319-funded project is ongoing. The Mifflin County Conservation District, USDA-NRCS and the agricultural community are taking the lead in WIP implementation. A TMDL is currently being developed by the SRBC for the impaired sections of the Kishacoquillas Creek watershed including the areas included in the WIP.

The Upper Kishacoquillas Creek WIP was included in the FFY2011 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.

## **Nutrient and Sediment WIPs Completed and being Implemented – FFY2010 Tracking**

### **Conewago Creek – Dauphin, Lancaster and Lebanon Counties**

<b>Watershed</b>	<b>S. 319 grant / project # (Project Completion Date)</b>	<b>Pollutant Load Reductions (pounds/yr. for N and P; tons/yr. for Sediment)</b>		
		<b>Nitrogen</b>	<b>Phosphorus</b>	<b>Sediment</b>
<b>Conewago Creek</b>	2007 / 19 (09-30-2011)	3,785	1,052	441
	2007 / 21 (06-30-2009)	DESIGN only.		
	2009 / 22 (Ongoing)	324	117	88.3
	2009 / 31B (Ongoing)	1,203	602	708
	2010 / 23D (Ongoing)	190	380	224
	2012 / 12 (Ongoing)	0	0	0
	Totals	5,502	2,151	1,461

#### **Implementation Progress:**

**The Conewago Creek is a tributary to the lower Susquehanna River and enters the river on the Dauphin –Lancaster County border. The watershed is located in parts of three counties and is primarily agricultural and forested. The Conewago Creek is impaired by nutrients and sediment from both agricultural and urban and storm-water runoff sources. A large portion of it is included on the current 303(d) list of impaired waters for these impairments. The Conewago Creek TMDL was originally approved in March 2001 and revised in June 2006. The TMDL addresses both phosphorus and sediment impairments in the watershed. The Conewago Creek Restoration Plan (WIP) was completed by the Tri-County Conewago Creek Association in 2006. Both agricultural and stream restoration practices are being implemented.**

**The Conewago Creek is a priority watershed for the USDA-NRCS under the Chesapeake Bay Program. Section 319 funding is being provided through the Dauphin, Lancaster and Lebanon County Conservation Districts. Several projects have been completed or are ongoing. Significant nutrient and sediment load reductions have been achieved to date.**

**The Conewago Creek WIP was included in the FFY2010 NPS Annual Report with a detailed BMP and load reduction goal analysis.**

**Conowingo Creek – Lancaster County**

Watershed	S. 319 grant / project # (Project Completion Date)	Pollutant Load Reductions (pounds/yr. for N and P; tons/yr. for Sediment)		
		Nitrogen	Phosphorus	Sediment
Conowingo Creek	2002 / 25 (9-30-2004)	536	535	132
	2006 / 30K (3-31-2010)	DESIGN only.		
	2008 / 21 (09-30-2012)	337	169	168
	2009 / 31A (09-30-2012)	0	750	884
	2012 / 13 (Ongoing)	2,065	1,032	1,215
	2013 / 23 (Ongoing)	DESIGN only.		
	Totals	2,938	2,486	2,399

**Implementation Progress:**

The Conowingo Creek watershed is located in southern Lancaster County and is tributary to the lower Susquehanna River near the Conowingo Dam. Much of the watershed is in agricultural land uses. The Conowingo Creek is included on the state’s 303 (d) list of impaired waters for both phosphorus and sediment pollutants.

The Conowingo Creek Watershed TMDL was completed and approved in April 2001. The TMDL identifies load reduction goals for both phosphorus and sediment pollutants due to agricultural and other sources. The Conowingo Creek TMDL Implementation Plan (WIP) was completed by Donegal Chapter Trout Unlimited in September 2006. The Plan identifies and prioritizes restoration sites throughout the watershed. The Trout Unlimited Chapter is working on stream restoration and riparian buffer projects, along with the PA Fish and Boat Commission. Agricultural projects are handled by the USDA-NRCS and Lancaster County Conservation District staff. Section 319 funding is being applied to priority WIP sites within the uppermost sub-basins in the Conowingo Creek watershed.

The Conowingo Creek WIP was included in the FFY2010 NPS Annual Report with a detailed BMP and load reduction goal analysis.

**Mill Creek – Lancaster County**

Watershed	S. 319 grant / project # (Project Completion Date)	Pollutant Load Reductions (pounds/yr. N and P; tons/yr. Sediment)		
		Nitrogen	Phosphorus	Sediment
Mill Creek	1995 / 17 (02-20-1998)	NO DATA.		
	1999 / 59 (08-30-2000)	NO DATA.		
	2005 / 28 (09-30-2008)	15,407	3,845	1,005
	2005 / 29 (09-30-2008)	864	431	431
	2009 / 23 (09-30-2011)	0	0	1,262
	2010 / 15 (06-30-2012)	536	268	315
	2011/ 20 (Ongoing)	868	434	511
	2012 / 16 (Ongoing)	0	0	0
	Totals	17,675	4,978	3,524

**Implementation Progress:**

The Mill Creek watershed is a tributary to the Pequea Creek and lower Susquehanna River in Lancaster County. The watershed is comprised of primarily agricultural land uses and has a large Plain Sect population. The Lancaster County Conservation District and USDA-NRCS have been working with the agricultural sector to implement BMPs on many farms in the watershed. The Mill Creek watershed is included on the 303(d) list of impaired waters for agricultural sources of nutrients and sediment. Two TMDLs have been completed in the Mill Creek, one for the Muddy Run tributary in 2001 and one for an UNT to Mill Creek in 2004. The Mill Creek Watershed Implementation Plan (WIP) was completed by the Lancaster County Conservation District in June 2006. Section 319 NPS Program, USDA-NRCS, and other sources of funding are assisting landowners with WIP implementation in the Mill Creek watershed. Since the Mill Creek WIP was completed the Lancaster County Conservation District and partners have focused primarily on stream bank restoration projects. The Mill Creek Preservation Association is assisting the Plain Sect community in the watershed to promote both stream bank restoration and agricultural BMPs.

The Mill Creek WIP was included in the FFY2010 NPS Annual Report with a detailed BMP and load reduction goal analysis.

**Mill Creek/Stephen Foster Lake – Bradford County**

Watershed	S. 319 grant / project # (Project Completion Date)	Pollutant Load Reductions (pounds/yr. of N and P; tons/yr. of Sediment)		
		Nitrogen	Phosphorus	Sediment
Mill Creek/Stephen Foster Lake	2001 / 51 (9-30-2004)	187,313	72,588	216
	2005 / 08 (12-31-2005)	LAKE ASSESSMENT only.		
	2006 / 08 (09-30-2006)	LAKE ASSESSMENT only.		
	2007 / 07 (12-31-2007)	LAKE ASSESSMENT only.		
	2007 / 22 (09-30-2011)	0	5	0
	2009/31K (Ongoing)	0	0	0
Totals		187,313	72,593	216

**Implementation Progress:**

The Mill Creek watershed is tributary to Sugar Creek and the North Branch Susquehanna River in Bradford County. Mill Creek includes a recreational lake in Stephen Foster Lake. The lake is included on PA’s 303(d) list of impaired waters for total suspended solids (TSS) and phosphorus loading impairments. The watershed has been the subject of long-term restoration efforts. BMP implementation has been completed by the agricultural community upstream of the lake with assistance from the Bradford County Conservation District since the early 2000’s.

A TMDL was developed for Stephen Foster Lake and was approved in April 2001. The Bradford County Conservation District completed the Mill Creek Watershed Implementation Plan (WIP) in July 2008. The WIP addresses Stephen Foster Lake in-lake nutrient loading problems and includes load reduction goals for both phosphorus and TSS. S. 319 grants have continued to provide funding for agricultural BMPs, stream restoration projects, and in-lake management measures to address existing water quality impairments.

The Mill Creek/Stephen Foster Lake WIP was included in the FFY2010 NPS Annual Report with a detailed BMP and load reduction goal analysis.

**Abandoned Mine Drainage Watershed Implementation Plans Being Developed Through September 2012 <sup>1</sup>**

**No new WIPS are being developed at this time.**

**Nutrient and Sediment Watershed Implementation Plans Being Developed Through September 2012 <sup>2</sup>**

<b>Watershed (County)</b>	<b>S. 319 Grant/Project # (Project Completion Date)</b>	<b>Status</b>
Quittapahilla Creek (Lebanon)	Not applicable.	Incomplete.

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<sup>1</sup> This includes plans in final revision, under DEP/EPA review or being prepared.

<sup>2</sup> This includes plans in final revision, under DEP/EPA review or being prepared.

**Abandoned Mine Drainage WIPs Completed and being Implemented – Future Tracking**

**Deer Creek Watershed – Clearfield County**

Watershed (County)	S. 319 Grant/Project # (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Aluminum	Iron	Manganese
Deer Creek	2012/11 (Ongoing)	DESIGN only			
	Totals	0	0	0	0

**Implementation Progress:**

Deer Creek is a tributary to the West Branch of the Susquehanna River, and is located in Clearfield County. A TMDL was prepared for Deer Creek and was approved in 2005. The TMDL requires load reductions in iron, aluminum, manganese and acidity. The Deer Creek Watershed Implementation Plan was completed in 2011 and project DESIGN has started since then. This project will be focused on one of the 16 priority AMD discharge points within Deer Creek. It is expected that implementation funding will follow upon DESIGN.



**Abandoned Mine Drainage WIPs Completed and being Implemented – FFY2012**

**Bear Creek Watershed – Dauphin County**

Watershed	S. 319 Grant/ Project #s (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Bear Creek	2004 / 18 (09-30-2007)	DESIGN only.			
	2006 / 30G (09-30-2009)	NO DATA.			
	2007 / 16 (09-30-2010)	DESIGN only			
	2009 / 20 (06-30-2010)	0	82	0	0
	2010 / 27A (06-30-2012)	WATER QUALITY MONITORING only.			
	Totals	0	82	0	0

**Implementation Progress:**

The Bear Creek watershed is impacted by AMD discharges which contribute metals, low pH and siltation from a variety of old mining sources. A TMDL for the Bear Creek watershed was developed by the Susquehanna River Basin Commission (SRBC) in March 2001 and approved by the EPA in April 2001. The Bear Creek TMDL includes pollutant reduction targets for metals, pH and siltation. The Bear Creek Watershed TMDL Implementation Plan was completed by the Dauphin County Conservation District and finalized in 2005. The Plan addresses known AMD pollutant sources in the watershed including those from the Lykens Water Level Tunnel. Section 319-funded projects are addressing the Lykens Tunnel AMD discharge site which is one of the largest AMD discharges in Bear Creek watershed.

A more detailed analysis of BMP and load reduction goal achievements for the Bear Creek WIP is shown on the following page.

## Bear Creek Implementation and Load Reductions Amounts

Sub Watershed	BMP/Action	Unit	Goal Amount	Implemented Amount	% Action Implemented	Pollutant ID	TMDL Load Reduction Needed	Load Reduction Achieved	Units	% Load Reduction Achieved
PA Bear Creek Alkaline	Aggregated BMP Load Reductions					Metals (Iron)	429.5	0	(LBS/DAY)	0
						Metals (Manganese)	32.2	0	(LBS/DAY)	0
	Constructed Wetland Aerobic	UNITS	4	0	0					
PA Bear Creek B1	Aggregated BMP Load Reductions					Acidity	80.8	0	(LBS/DAY)	0
						Metals (Aluminum)	2	0	(LBS/DAY)	0
						Metals (Iron)	6.3	0	(LBS/DAY)	0
Limestone Sanding	UNITS	1	0	0						
PA Bear Creek Lykens	Aggregated BMP Load Reductions					Acidity	444.3	0	(LBS/DAY)	0
						Metals (Aluminum)	2	0	(LBS/DAY)	0
						Metals (Iron)	40.6	82.2	(LBS/DAY)	100
	Pond - Construction	UNITS	3	3	100					
Vertical Flow Treatment System	UNITS	1	1	100						

**Hartshorn Run – Clearfield County**

Watershed	S. 319 Grant/Project # (Project Completion Date)	Pollutant Load Reduction (pounds/day)			
		Acidity	Fe	Al	Mn
<b>Hartshorn Run</b>	2006 / 21 (03-31-2010)	PLAN DEVELOPMENT only.			
	2007 / 26 (9/30/2011)	SOCIAL MARKETING INITIATIVE			
	2011/12 (Ongoing)	DESIGN only.			
	Totals	0	0	0	0

**Implementation Progress:**

**Hartshorn Run is a small tributary to the West Branch of the Susquehanna River, and is located in Clearfield County. This small watershed is located in between the Anderson Creek and Montgomery Creek watersheds. A TMDL was prepared for Hartshorn Run and was approved in April 2004. The TMDL requires load reductions in aluminum, manganese and acidity. The Hartshorn Run Watershed Implementation Plan was completed in 2010 and project DESIGN has started since then. This project will be focused on one of the high priority AMD discharge points within Hartshorn Run. It is expected that implementation funding will follow upon DESIGN and PERMITTING completion.**

**A more detailed analysis of BMP and load reduction goal achievements for the Hartshorn Run WIP is shown on the following page.**

### Hartshorn Run Implementation and Load Reductions Amounts

Sub Watershed	BMP/Action	Unit	Goal Amount	Implemented Amount	% Action Implemented	Pollutant ID	TMDL Load Reduction Needed	Load Reduction Achieved	Unit	% Load Reduction Achieved
PA HART 03	Aggregated BMP Load Reductions					Acidity	88.7	0	(LBS/DAY)	0
	Limestone Sanding	UNITS	1	0	0					
PA HART 04	Aggregated BMP Load Reductions					Metals (Manganese)	11	0	(LBS/DAY)	0
						Metals (Aluminum)	46.6	0	(LBS/DAY)	0
						Acidity	874.1	0	(LBS/DAY)	0
	Constructed Wetland Anaerobic	UNITS	1	0	0					
	Limestone Doser	UNITS	1	0	0					
	Watershed Management Plan	UNITS	1	1	100					

**Johnson Creek – Tioga County**

Watershed	S. 319 Grant./Project #s (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Johnson Creek	2000 / 25 (12-31-2000)	NO DATA			
	2003 / 18 (06-30-2004)	DESIGN only.			
	2005 / 16 (09-30-2008)	83	0	4	3
Totals		83	0	4	3

**Implementation Progress:**

**The Johnson Creek watershed is a tributary to the Tioga River watershed. Johnson Creek is impaired by AMD discharges which contribute high metals and acidity loadings to the creek. A TMDL for the Tioga River Watershed was completed in 2003. This TMDL includes metals and acidity reduction goals for the Johnson Creek sub-watershed. A Watershed Implementation Plan for the Johnson Creek sub-watershed was completed in February 2007. The Plan includes remediation measures for the priority AMD discharge sites within the watershed. AMD remediation work has been completed at the Arnot No. 2 Mine AMD discharge site. Continued remediation work in this watershed will be needed to meet TMDL load reduction goals.**

**A more detailed analysis of BMP and load reduction goal achievements for the Johnson Creek WIP is shown on the following page.**

### Johnson Creek Implementation and Load Reductions Amounts

Sub Watershed	BMP/Action	Unit	Goal Amount	Implemented Amount	% Action Implemented	Pollutant ID	TMDL Load Reduction Needed	Load Reduction Achieved	Unit	% Load Reduction Achieved
PA John 3.0	Aggregated BMP Load Reductions					Acidity	0	82.9	(LBS/DAY)	100
						Metals (Aluminum)	0	3.5	(LBS/DAY)	100
						Metals (Iron)	7.5	0	(LBS/DAY)	0
						Metals (Manganese)	1.4	3.1	(LBS/DAY)	100
	Limestone Leach Bed/Pond	UNITS	2	2	100					
PA John UNT 5.0	Aggregated BMP Load Reductions					Acidity	451.7	0	(LBS/DAY)	0
						Metals (Aluminum)	42.6	0	(LBS/DAY)	0
						Metals (Iron)	0.5	0	(LBS/DAY)	0
						Metals (Manganese)	36.1	0	(LBS/DAY)	0
	Vertical Flow Treatment System	UNITS	6	0	0					
PA John UNT 7.0	Aggregated BMP Load Reductions					Acidity	457.9	0	(LBS/DAY)	0
						Metals (Aluminum)	0	0	(LBS/DAY)	0
						Metals (Iron)	0	0	(LBS/DAY)	0
						Metals (Manganese)	0	0	(LBS/DAY)	0
	Constructed Wetland Aerobic	UNITS	1	0	0					
PA John1.0	Aggregated BMP Load Reductions					Acidity	884	0	(LBS/DAY)	0
						Metals (Aluminum)	0	0	(LBS/DAY)	0
						Metals (Iron)	0	0	(LBS/DAY)	0

Sub Watershed	BMP/Action	Unit	Goal Amount	Implemented Amount	% Action Implemented	Pollutant ID	TMDL Load Reduction Needed	Load Reduction Achieved	Unit	% Load Reduction Achieved
						Metals (Manganese)	0	0	(LBS/DAY)	0
	Limestone Open Channel	UNITS	1	0	0					

**Montgomery Creek – Clearfield County**

Watershed	S. 319 Grant / Project # (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Montgomery Creek	2007 / 26 (09-30-2011)	SOCIAL MARKETING INITIATIVE			
	2008 / 14 (12-31-2010)	DESIGN			
	2009 / 18 (Ongoing)	DESIGN			
	2011 / 12 (Ongoing)	DESIGN			
	2012/ 06 (Ongoing)	DESIGN & CONSTRUCTION			
Totals		0	0	0	0

**Implementation Progress:**

The Montgomery Creek is a small tributary to the West Branch Susquehanna River in Clearfield County. Montgomery Creek is impaired by AMD discharges that contribute high levels of metals and acidity to the stream. A TMDL was prepared for Montgomery Creek and was approved in April 2003. Development of a Watershed Implementation Plan for Montgomery Creek followed TMDL completion, and was completed in August 2008. The Plan identifies and prioritizes remediation sites where project work will need to take place to reduce metals and acidity loadings to the Montgomery Creek. Several projects which will complete AMD treatment system designs are ongoing.

A more detailed analysis of BMP and load reduction goal achievements for the Montgomery Creek WIP is shown on the following page.



## Montgomery Creek Implementation and Load Reductions Amounts

Sub Watershed	BMP/Action	Unit	Goal Amount	Implemented Amount	% Action Implemented	Pollutant ID	TMDL Load Reduction Needed	Load Reduction Achieved	Unit	% Load Reduction Achieved
PA MC MC1	Aggregated BMP Load Reductions					Acidity	0	0	(LBS/DAY)	0
						Metals (Aluminum)	0	0	(LBS/DAY)	0
						Metals (Iron)	0	0	(LBS/DAY)	0
						Metals (Manganese)	0	0	(LBS/DAY)	0
	Limestone Leach Bed/Pond	UNITS	1	0	0					
PA MC MC2	Aggregated BMP Load Reductions					Metals (Iron)	44.6	0	(LBS/DAY)	0
						Metals (Aluminum)	288.3	0	(LBS/DAY)	0
						Metals (Manganese)	770.5	0	(LBS/DAY)	0
						Acidity	3998	0	(LBS/DAY)	0
	Constructed Wetland Aerobic	UNITS	1	0	0					
PA MC UNT>MT1	Aggregated BMP Load Reductions					Metals (Aluminum)	7.1	0	(LBS/DAY)	0
						Metals (Iron)	8	0	(LBS/DAY)	0
						Metals (Manganese)	17.8	0	(LBS/DAY)	0
						Acidity	35.2	0	(LBS/DAY)	0
	Limestone Leach Bed/Pond	UNITS	1	0	0					
Limestone Open Channel	UNITS	1	0	0						
PA MC UNT>MT3	Aggregated BMP Load Reductions					Metals (Iron)	45.4	0	(LBS/DAY)	0
						Metals (Aluminum)	98.6	0	(LBS/DAY)	0
						Metals (Manganese)	332.8	0	(LBS/DAY)	0
						Acidity	1776.9	0	(LBS/DAY)	0
	Constructed Wetland Aerobic	UNITS	1	0	0					
Limestone Doser	UNITS	1	0	0						

Sub Watershed	BMP/Action	Unit	Goal Amount	Implemented Amount	% Action Implemented	Pollutant ID	TMDL Load Reduction Needed	Load Reduction Achieved	Unit	% Load Reduction Achieved
	Passive Treatment	UNITS	1	0	0					
	Sulfate Reducing Bioreactor	UNITS	1	0	0					
	Vertical Flow Treatment System	UNITS	1	0	0					
PA MC UNT>MT5	Aggregated BMP Load Reductions					Metals (Iron)	0.5	0	(LBS/DAY)	0
						Metals (Manganese)	15.7	0	(LBS/DAY)	0
						Metals (Aluminum)	15.9	0	(LBS/DAY)	0
						Acidity	191.2	0	(LBS/DAY)	0
	Limestone Leach Bed/Pond	UNITS	1	0	0					
	Vertical Flow Treatment System	UNITS	1	0	0					

**Pine Run – Armstrong and Jefferson Counties**

Watershed	S. 319 Grant/Project #s (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Pine Run	2005 / 23 (09-30-2008)	0	459	0	0
	2009 / 16 (09-30-2012)	Project Discontinued			
	2009 / 17 (Ongoing)	DESIGN			
Totals		0	459	0	0

**Implementation Progress:**

The Pine Run watershed is impaired by AMD discharges which contribute high levels of iron, aluminum, manganese and acidity to the stream. The Pine Run Watershed Implementation Plan was completed in May 2005. The Pine Run TMDL was completed and approved in March 2007. The Plan identifies all of the priority AMD remediation sites within the Pine Run watershed. One DESIGN projects is currently underway. This project addresses a high priority AMD remediation site in the watershed and will help meet TMDL reduction goals when implemented.

A more detailed analysis of BMP and load reduction goal achievements for the Pine Run WIP is shown on the following page.

## Pine Run Implementation and Load Reductions Amounts

Sub Watershed	BMP/Action	Unit	Goal Amount	Implemented Amount	% Action Implemented	Pollutant ID	TMDL Load Reduction Needed	Load Reduction Achieved	Unit	% Load Reduction Achieved
PA CYLR01	Aggregated BMP Load Reductions					Acidity	831.9	0	(LBS/DAY)	0
						Metals (Aluminum)	63.6	0	(LBS/DAY)	0
						Metals (Iron)	82	0	(LBS/DAY)	0
						Metals (Manganese)	50.2	0	(LBS/DAY)	0
	Land Reclamation, Toxic Discharge Control	AC	4	0	0					
Vertical Flow Treatment System	UNITS	3	0	0						
PA NYRN03	Aggregated BMP Load Reductions					Acidity	49.6	0	(LBS/DAY)	0
						Metals (Aluminum)	5	0	(LBS/DAY)	0
						Metals (Iron)	0	0	(LBS/DAY)	0
						Metals (Manganese)	5.5	0	(LBS/DAY)	0
	Vertical Flow Treatment System	UNITS	1	0	0					
PA Pine 11	Aggregated BMP Load Reductions					Acidity	216.8	0	(LBS/DAY)	0
						Metals (Aluminum)	23.1	0	(LBS/DAY)	0
						Metals (Iron)	14.7	0	(LBS/DAY)	0
						Metals (Manganese)	15	0	(LBS/DAY)	0
	Land Reclamation	AC	9	0	0					

Sub Watershed	BMP/Action	Unit	Goal Amount	Implemented Amount	% Action Implemented	Pollutant ID	TMDL Load Reduction Needed	Load Reduction Achieved	Unit	% Load Reduction Achieved
PA Pine 13	Aggregated BMP Load Reductions					Metals (Iron)	0	0	(LBS/DAY)	0
						Metals (Manganese)	0	0	(LBS/DAY)	0
	Anoxic Limestone Drain	UNITS	1	0	0					
PA Pine 20	Aggregated BMP Load Reductions					Acidity	301	0	(LBS/DAY)	0
						Metals (Aluminum)	10.4	0	(LBS/DAY)	0
						Metals (Iron)	298.2	458.64	(LBS/DAY)	100
						Metals (Manganese)	50.3	0	(LBS/DAY)	0
	Constructed Wetland Aerobic	UNITS	1	1	100					
PA Pine 30	Aggregated BMP Load Reductions					Acidity	144.7	0	(LBS/DAY)	0
						Metals (Aluminum)	1.7	0	(LBS/DAY)	0
						Metals (Iron)	534.5	0	(LBS/DAY)	0
						Metals (Manganese)	23.6	0	(LBS/DAY)	0
	Unknown - will be provided upon implementation		1	0	0					

**Abandoned Mine Drainage WIPs Completed and being Implemented – FFY2011**

**Anderson Creek – Clearfield County**

Watershed	S. 319 Grant/ Project #s (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Anderson Creek	1999 / 61 (09-01-2002)	NO DATA.			
	2003 / 16 (09-30-2006)	ASSESSMENT only.			
	2007 / 15 (09-30-2009)	6	1	0.3	0
	2007/ 26 (09-30-2011)	SOCIAL MARKETING INITIATIVE.			
	2008 / 13 (09-30-2012)	DESIGN only.			
	2009 / 19 (Ongoing)	DESIGN only.			
	2010 / 12 (Ongoing)	DESIGN only.			
	2011/ 7A (Ongoing)	Qualified Hydrologic Unit Development			
	2012/05 (Ongoing)	DESIGN only			
Totals		6	1	0.3	0

**Implementation Progress:**

**The Anderson Creek watershed is impaired by AMD discharges. The Anderson Creek TMDL was completed in 2005. The TMDL addresses high metals and acidity (pH) loadings. The Anderson Creek Assessment, Restoration and Implementation Plan was completed in September 2006. The Plan identifies priority restoration sites in the watershed. Several projects have been completed or have been initiated to address the high priority remediation sites in the Plan. These include the Bilger Run, Korb, Smouse and Reasinger AMD discharge sites. Some funding is also being used to acquire extra information needed to meet the qualifications of a Qualified Hydrologic Unit for Set-aside funds.**

**The Anderson Creek WIP was included in the FFY2011 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.**

**Blacks Creek – Butler County**

Watershed	S. 319 Grant /Project #s (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Blacks Creek	2005 / 24 (09-30-2008)	21	22	0	2
	2006 / 30H (12-31-2008)	NO DATA.			
	2008 / 32E (09-30-2012)	Included as part of Project 2009 / 15			
	2009 / 15 (09-30-2012)	321	63	22	27
Totals		342	85	22	29

**Implementation Progress:**

The Blacks Creek is tributary to the Slippery Rock Creek in northern Butler County and southern Venango County. It is impaired by AMD sources of pollution including high metals and acidity (pH) loadings. A TMDL for metals and acidity impairments was completed in January 2005. The Blacks Creek Restoration Plan followed TMDL completion, and was written and completed in April 2007. The Plan includes the priority remediation sites in the watershed. The Slippery Rock Creek Watershed Coalition, Butler County Conservation District and PA DEP are the primary partners involved with implementing the Plan. Several construction projects have been completed to target the highest priority AMD discharge sites.

The Blacks Creek WIP was included in the FFY2011 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.

**Jacobs Creek – Fayette County - AMD Only**

Watershed	S. 319 Grant /Project #s (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Jacobs Creek	2011 / 10 (Ongoing)	DESIGN only.			
Totals		0	0	0	0

**Implementation Progress:**

**The Jacobs Creek Watershed Implementation and Restoration Plan was completed for the Jacobs Creek Watershed Association in June 2009. The Plan addresses several major NPS problems within the Jacobs Creek watershed. The primary NPS problems are related to agricultural practices, storm water from urban and developing areas and abandoned mine drainage discharges. No TMDL has been completed for the Jacobs Creek watershed to date.**

**The S. 319 NPS Program has funded one AMD project to date. This project addresses AMD impacts in a small UNT to Jacobs Creek which are identified in the WIP. This project is providing funding for the DESIGN and PERMITTING of a passive treatment system that will increase the alkalinity of the water, thereby raising the pH and allowing the acidity, iron, and aluminum to precipitate out of solution.**

**The Jacobs Creek WIP was included in the FFY2011 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.**



**South Sandy Creek – Mercer and Venango Counties**

Watershed	S. 319 Grant / Project # (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
South Sandy Creek	2005 / 07 (09-30-2008)	PLAN DEVELOPMENT only.			
	2006 / 07 (09-30-2008)	PLAN DEVELOPMENT only.			
	2009 / 31H (Ongoing)	DESIGN only.			
Totals		0	0	0	0

**Implementation Progress:**

**The South Sandy Creek is an AMD impaired watershed located in Venango and Mercer Counties. Past mining practices have severely degraded water quality in the watershed. The primary causes of impairment are high metals and acidity (pH) loadings. A TMDL has not yet been completed for the South Sandy Creek watershed. The South Sandy Creek Watershed Assessment/Restoration Plan was completed for the South Sandy Creek Watershed Association in February 2009. The Plan includes water quality data and targets restoration priorities for all of the priority AMD discharge remediation sites within the watershed. The South Sandy Watershed Association is just starting to target some restoration sites by using Section 319 NPS funding on a DESIGN and PERMITTING project.**

**The South Sandy Creek WIP was included in the FFY2011 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.**

**Upper Schuylkill River – Carbon and Schuylkill Counties**

Watershed	S. 319 Grant / Project #s (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Upper Schuylkill River	1999 / 40 (03-31-2001)	ASSESSMENT only.			
	1999 / 41 (12-31-2002)	NO DATA.			
	2001 / 14 (01-31-2002)	ASSESSMENT only.			
	2002 / 15 (09-30-2004)	0	10	5	0
	2003 / 21 (09-30-2006)	82	38	4	0
	2004 / 16 (09-30-2007)	0	52	10	6
	2004 / 21 (09-30-2007)	0	538	31	153
	2007 / 28 (09-30-2011)	0	171	15	5
	2010 / 14 (Ongoing)	0	0	0	0
	2011 / 14 (Ongoing)	DESIGN only.			
	2011 / 15 (Ongoing)	DESIGN only.			
Totals		82	809	65	164

**Implementation Progress:**

The Upper Schuylkill River TMDL was developed and approved in April 2007. Several other AMD related TMDLs have been developed and approved for tributaries to the Upper Schuylkill River, including the Little Schuylkill River. The Upper Schuylkill River TMDL Watershed Implementation Plan was completed in May 2005. The upper reaches of the Schuylkill River watershed are largely impacted by abandoned mine drainage discharges. The AMD discharges contribute large amounts of metals (iron, aluminum and manganese) and acidity to the streams. Several Section 319-funded projects have both been completed and are ongoing. Initial assessments produced the WIP in 2005, and since then successive projects have addressed problem areas identified in the WIP. Some of these AMD discharge sites were addressed with DEP-BAMR and other funding sources in prior years.

The Upper Schuylkill River WIP was included in the FFY2011 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.

**Abandoned Mine Drainage WIPs Completed and being Implemented – FFY2010**

**Catawissa Creek – Columbia and Schuylkill Counties**

Watershed	S. 319 Grant/ Project #s (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Catawissa Creek	1999 / 17 (09-30-2001)	NO DATA.			
	2001 / 55 (02-28-2003)	DESIGN only.			
	2004 / 17 (09-30-2007)	DESIGN only.			
	2005 / 45A (09-30-2007)	3,366	16	229	29
	2006 / 19 (09-30-2007)	Included as part of Project 2005 / 45A			
	2007 / 17 (03-31-2010)	234	1	12	4
Totals		3,600	17	241	33

**Implementation Progress:**

The TMDL for Catawissa Creek developed by the Susquehanna River Basin Commission (SRBC) was approved by the EPA in May 2003. The Catawissa Creek TMDL identified load reduction goals for acidity, iron and aluminum in order to meet water quality objectives. The Addendum to the Catawissa Creek Watershed Restoration Plan (the WIP) was completed in 2005. Although some work had been done in the watershed prior to 2005 to address primary sources of AMD pollution, additional projects have been started since 2005. These have targeted high priority AMD discharges identified in the Catawissa Creek WIP. WIP priorities are being addressed both through the Section 319 NPS projects identified in the table above and through other AMD funding sources and projects.

The Catawissa Creek WIP was included in the FFY2010 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.

**Hubler Run – Clearfield County**

Watershed	S. 319 Grant / Project #s (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Hubler Run	1999 / 62 (12-31-2001)	NO DATA.			
	2000 / 28 (12-31-2001)	NO DATA.			
	2005 / 17 (09-30-2008)	175	0	21	0
	2006 / 17 (03-31-2010)	Included as part of Project 2007/23B			
	2006 / 30I (09-30-2009)	Included as part of Project 2005/17			
	2007 / 23B (09-30-2010)	14	2	1	1
	2007 / 26 (09-30-2011)	SOCIAL MARKETING INITIATIVE			
	2008 / 15 (09-30-2010)	ASSESSMENT only.			
	2010 / 13 (Ongoing)	0	0	0	0
Totals		189	2	22	1.0

**Implementation Progress:**

**Hubler Run is a tributary to Alder Run in the West Branch Susquehanna River basin in Clearfield County. The Alder Run TMDL includes the Hubler Run sub-basin and was completed in 2005 and approved in 2006. The Hubler Run TMDL documents impairments from high levels of metals and acidity. These are the primary water quality impairments in the Hubler Run headwaters. The Hubler Run Implementation Plan was developed following TMDL approval and was completed in August 2007. The Plan identifies and prioritizes AMD discharges in the Hubler Run sub-basin. Metals and acidity loadings have been reduced through the implementation of two Section 319-funded projects to date. One additional S. 319- funded implementation project is ongoing in Hubler Run.**

**The Hubler Run WIP was included in the FFY2010 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.**

**Little Laurel Run – Cambria County**

Watershed	S. 319 Grant/Project #s (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Little Laurel Run	2005 / 15 (09-30-2008)	166	30	1	0
	2007 / 14 (09-30-2009)	75	6	4	0
	2008 / 17 (09-30-2012)	DESIGN only.			
	2010 / 08 (Ongoing)	0	0	0	0
	2011/ 08 (Ongoing)	DESIGN only.			
	2011/ 09 (Ongoing)	0	0	0	0
	2012/ 09 (Ongoing)	0	0	0	0
Totals		241	36	5	0

**Implementation Progress:**

The Little Laurel Run is a small tributary to Clearfield Creek in Cambria County. Little Laurel Run is impaired by AMD discharges that contribute high levels of acidity, iron and aluminum to the stream. A TMDL was developed and approved for the larger Clearfield Creek watershed in 2007 but this TMDL does not include the Little Laurel Run sub-watershed. The Little Laurel Run Restoration Plan (WIP) was completed in October 2005. The Plan prescribes BMPs to reduce metals and acidity loading within the watershed. The Clearfield Creek Watershed Association is actively implementing priority remediation work recommended in the Plan. There is great potential to significantly improve water quality in the Little Laurel Run watershed since it is relatively small, and remediation projects are being implemented at the Klondike Mine and Ferris Wheel AMD discharge sites which are two of the largest in the watershed. Metals and acidity loadings to the watershed will be significantly reduced when these projects are completed.

The Little Laurel Run WIP was included in the FFY2010 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.

**Shoup Run – Huntingdon County**

Watershed	S. 319 Grant/ Project #s (Completed Projects)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Shoup Run	2002 / 17 (03-8-2004)	183	2	20	3
	2004 / 19 (09-30-2007)	144	1	11	4
	2005 / 18 (09-30-2008)	6	0	1	0
	2005 / 19 (09-30-2008)	27	0	3	0
	2005 / 21 (09-30-2008)	NO DATA.			
	2006 / 18 (03-31-2010)	94	0	1	1
	2007 / 13 (09-30-2010)	39	0	5	1
	2011/ 13 (Ongoing)	INVENTORY and PLAN DEVELOPMENT only.			
	2011/ 7B (Ongoing)	Qualified Hydrologic Unit Development			
Totals		494	3	41	9

**Implementation Progress:**

The Shoup Run watershed is listed on the state’s impaired streams list because it is impacted by high levels of metals and acidity. The TMDL for Shoup Run was completed in February 2001, along with TMDLs for several other small nearby watersheds, and was approved by the EPA in April 2001. The TMDL set load reduction goals for several AMD pollutants, including aluminum and acidity. The Shoup Run Watershed Restoration Plan (the WIP) was completed in 2005. Several Section 319-funded AMD remediation projects have implemented in the watershed to date. AMD remediation projects have been successful so far in addressing the TMDL and WIP pollutant reduction goals by reducing significant amounts of aluminum and acidity loadings in Shoup Run. Miller Run, a tributary of Shoup’s Run, is no longer impaired by AMD discharges. An additional project is ongoing and will update the WIP to set new goals to reduce pollution loadings. Some funding is also being used to acquire extra information needed to meet the qualifications of a Qualified Hydrologic Unit for Set-aside funds.

The Shoup Run WIP was included in the FFY2010 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.

**Six Mile Run/Sandy Run/Longs Run – Bedford County**

Watershed	S. 319 Grant/Project #s (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Six Mile Run/Sandy Run/Longs Run	2004 / 20 (09-30-2006)	143	67	5	0
	2005 / 12 (09-30-2008)	0	1	0	0
	2005 / 13 (09-30-2008)	18	1	2	0
	2006 / 12 (09-30-2008)	DESIGN only.			
	2006 / 13 (09-30-2009)	122	3	8	0
	2006 / 14 (09-30-2009)	DESIGN only.			
	2006 / 15 (09-30-2008)	22	1	2	0
	2006 / 16 (09-30-2008)	DESIGN only.			
	2006 / 30A (12-31-2009)	DESIGN only.			
	2006 / 30B (09-30-2009)	DESIGN only.			
	2007 / 10 (09-30-2009)	63	9	5	1
	2007 / 11 ( 01-21-2011)	DISCONTINUED			
	2007 / 12 ( 09-30-2009 )	15	3	2	1
	2008 / 10 ( 06-06-2011)	161	33	13	0
	2008 / 11 (10-31-2011)	162	12	12	0
	2008 / 12 ( 09-30-2011)	DESIGN only.			
	2009 / 14 (Ongoing)	DESIGN only.			
	2010 / 09 (Ongoing)	0	0	0	0
	2010 / 10 (Ongoing)	0	0	0	0
	2012/ 07 (Ongoing)	DESIGN only.			
2012/ 08 (Ongoing)	0	0	0	0	
Totals		706	130	49	2

**Implementation Progress:**

The Sandy Run/Longs Run TMDL was approved in 2003 and the Six Mile Run TMDL was approved in 2006. The Six Mile Run, Sandy Run and Long Run Restoration Plan (WIP) was completed in 2005 and amended in 2007. These watersheds are impacted

**by AMD pollutants which include high levels of iron, aluminum and acidity. Significant AMD remediation project implementation has occurred in the Six Mile Run, Sandy Run and Longs Run watersheds since WIP completion. TMDL load reduction goals for both the Longs and Sandy Run TMDL (metals and pH) and the Six Mile Run TMDL (metals and pH) are starting to be met through these projects. Several ongoing projects are in the DESIGN stage or beginning to start actual remediation work.**

**The Six Mile Run/Sandy Run/Longs Run Run WIP was included in the FFY2010 NPS Annual Report with a more detailed analysis of BMP and load reduction goal achievements.**



**Upper Swatara Creek – Schuylkill County**

Watershed	S. 319 Grant/Project #s (Project Completion Date)	Pollutant Load Reductions (pounds/day)			
		Acidity	Fe	Al	Mn
Upper Swatara Creek	2001 / 19 (9-30-2002)	NO DATA.			
	2003 / 20 (9-30-2005)	NO DATA.			
	2005 / 14 (9-30-2008)	0	231	0	14
	2010 / 27B (9-30-2012)	MONITORING only.			
Totals		0	231	0	14

**Implementation Progress:**

The Upper Swatara Creek watershed is largely impaired by AMD discharges from surface and deep mining operations. Many tributaries within the Upper Swatara Creek watershed are severely impacted from AMD sources. A TMDL for the Upper Swatara Creek watershed was developed by the DEP in the late 1990s. It focused primarily on the AMD-impacted tributaries in the upper part of the watershed and impairments including high levels of iron, aluminum and manganese and runoff from abandoned coal mines. The Upper Swatara Creek TMDL Watershed Implementation Plan was completed by the Schuylkill County Conservation District and finalized in May 2006.

One of three Section 319 funded projects has resulted in significant metals reductions. DEP-BAMR and federal OSM funding have completed additional projects. Most treatment systems are installed on tributaries in the Upper Swatara Creek basin, including Lorberry Creek and Good Hope Springs Creek which have been documented as having significant adverse impacts on water quality to the Swatara Creek main stem. Fish studies have been completed over the last few years in the watershed. The Swatara Creek National Monitoring Program project has collected ten years' worth of water quality monitoring data in order to evaluate AMD treatment system effectiveness in the AMD impacted reaches of the watershed. Significant water quality improvements have been documented in tributaries within the upper Swatara Creek watershed.

The Upper Swatara Creek WIP was included in the FFY2010 NPS Annual Report with more detailed BMP and load reduction goal analysis.

**SECTION THREE:**  
**Pennsylvania NPS Management Program Plan Accomplishments, FFY 2012**

Background

Pennsylvania's NPS Management Program Plan-2008 Update includes five long-term goals. These goals were developed during the writing of the 2008 Update. They are largely reflective of the U.S. Environmental Protection Agency's National Strategic Plan goals for watershed restoration which were published in September 2003.

**Goal 1**

**Improve and protect water resources as a result of nonpoint source program implementation efforts. Show water resource improvements by measuring reductions in sediments, nutrients and metals or increases in aquatic life use, riparian habitat, wetlands, or public health benefits. By 2012, through combined program efforts, remove 500 miles of streams and 1,600 lake acres that are identified on the State's Integrated List of All Waters as being impaired because of nonpoint sources of pollution.**

**Goal 2**

**Coordinate with county conservation districts, watershed groups, local governments, and others in the development and implementation of 34 watershed implementation plans (WIPs) meeting EPA's Section 319 criteria to protect and restore surface and groundwater quality by 2012.**

**Goal 3**

**Improve and develop monitoring efforts to determine how projects and programs improve water quality and/or meet target pollution reductions including TMDLs.**

**Goal 4**

**Encourage development and use of new technologies, tools, and technology transfer practices, to enhance understanding and use of techniques for addressing nonpoint source pollution.**

**Goal 5**

**Assure implementation of appropriate best management practices to protect, improve and restore water quality by using or enhancing the existing financial incentives, technical assistance, education and regulatory programs.**

## Accomplishments in meeting the five long term goals

The five long term goals established in Pennsylvania's NPS Management Program Plan-2008 Update are each addressed below providing a summary of the current progress in meeting those goals as well as some of the more relevant activities underway or completed to address these goals.

### **Goal 1:**

**Improve and protect water resources as a result of nonpoint source program implementation efforts. Show water resource improvements by measuring reductions in sediments, nutrients and metals or increases in aquatic life use, riparian habitat, wetlands, or public health benefits. By 2012, through combined program efforts, remove 500 miles of streams and 1,600 lake acres that are identified on the State's Integrated List of All Waters as being impaired because of nonpoint sources of pollution.**

#### **Accomplishments to date:**

Pennsylvania has been very active in implementing nonpoint source programs in an effort to reach this very ambitious goal. As of the publication date of the 2012 Pennsylvania Integrated Water Quality Monitoring and Assessment Report (2012 Integrated List), we have been able to document that the implementation of NPS remediation practices has resulted in revising the attainment category of **106 miles of streams** (4.9 new miles added for FFY 2012 as detailed in the "*Fully Restored Waters*" table in Section 1) within the Integrated List from impaired to attaining Aquatic Life Uses. Also, as of the 2012 Integrated List publication date, we have been able to document that **1,862 lake acres**, which had been impaired, are now attaining aquatic life uses as shown in the Integrated List. We are pleased to have eclipsed our lake goal, and to have reached our 100<sup>th</sup> mile of stream restoration. These are significant accomplishments of our integrated nonpoint source programs.

The three stream and river segments that we have detailed for FFY 2012 in the "*Fully Restored Waters*" table in Section 1 of this report include: Bear Run (3.1 miles), and Little Sacony Creek (1.8 miles). It should be noted that in Section 1 of this report we indicate that at least another 19.9 miles of impaired streams, in 4 additional stream reaches, have been restored through the implementation of NPS best management practices over this most recent reporting period. We are in the process of further evaluating these additional 4 stream reaches and will detail information on these reaches, and possibly credit this restoration, in a future report.

Although Pennsylvania has not met its 2012 goal of 500 miles of streams removed from the Integrated List, but it should be noted that we have been very active, as is summarized below, in working within nonpoint source impaired stream reaches. We continue to focus the major portion of our 319 grant funds in the nonpoint source impaired watersheds having approved Watershed Implementation Plans (WIPs). Funding from our partnering programs have, and continue to be supporting, in part, our efforts to implement practices identified in our approved WIPs, but their funding also goes outside of our WIP areas, addressing other impaired stream reaches and in some cases protecting important stream reaches that are not designated as impaired. State funding reductions in the most recent 3 years have severely reduced our funding levels for all environmental and other programs, and reductions in the 319 funding pool have further reduced our ability to meet these most ambitious goals. Over the past 3 years our 319 funding level has been reduced 19.3%. In the past 4 years, the Commonwealth's Growing Greener funding source

has been reduced by more than 67%. These severe funding reductions have significantly impacted our ability to meet the goals established in the 2008 revision of our management plan.

It should also be noted that studies have shown that there is likely to be significant lag time from the time an agricultural BMP is installed on upslope fields, until water quality improvements can be expected to show up in the stream. This lag time can be over 10 years in length. So the numerous improvements we are making in agricultural watersheds to address nutrient related impairments, may not be seen for more than a decade after the practice has been installed.

Lastly, it should be noted that there is commonly a lag time between when a stream has shown signs of improvement, until we can arrange for, fund and collect the needed data in order to document the necessary improvements to delist a stream reach. This lag time again makes it harder to reach the delisting goals established in the 2008 revision to the management plan.

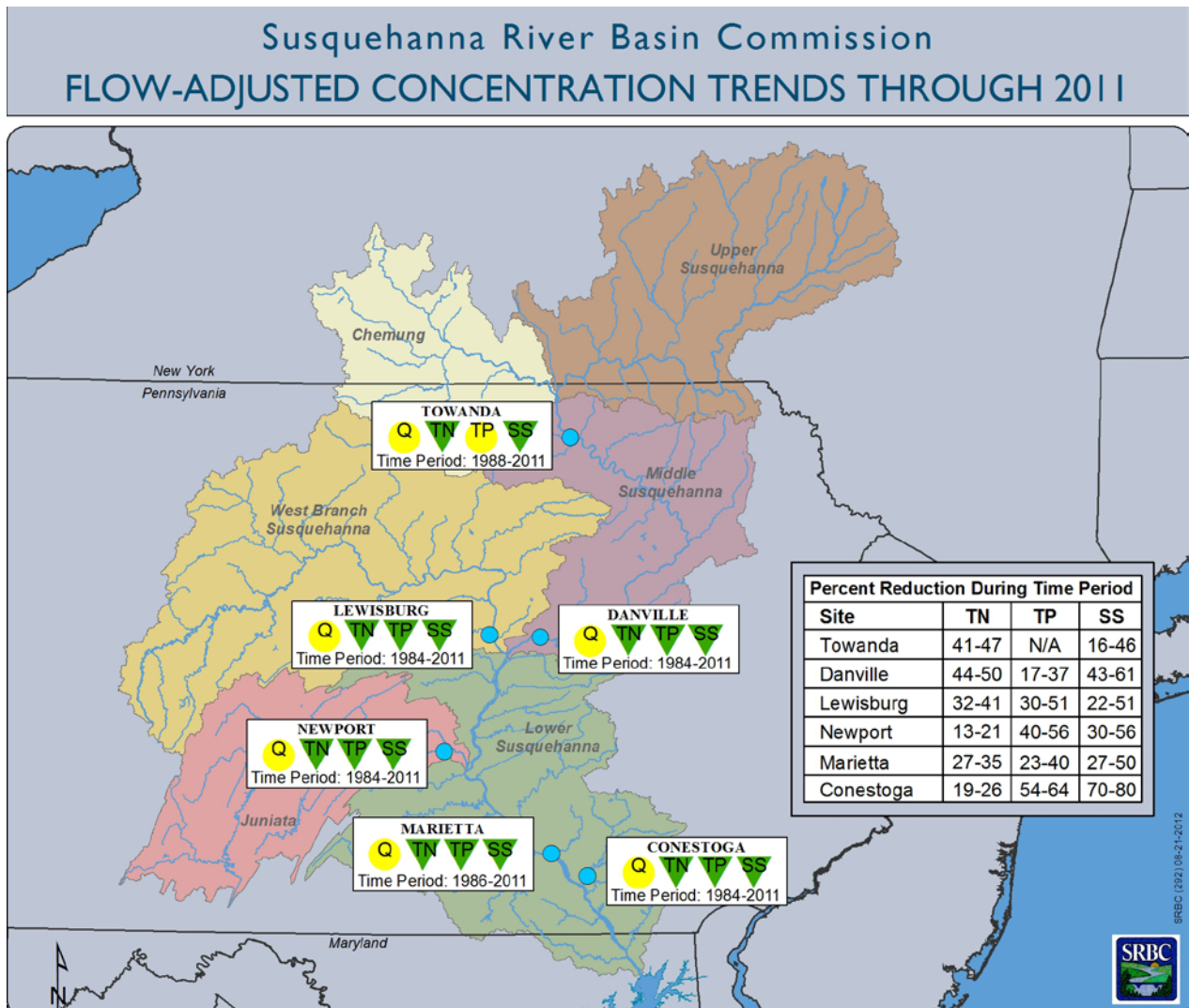
Below is a summary of some of the more major activities we continue to implement in order to help remove stream miles and lake acres from the Integrated List (Impaired Waters List):

- Pennsylvania entered into 22 agreements with various watershed restoration groups, totaling over \$3.69 million of Section 319 federal funds, to implement watershed protection/restoration projects in federal fiscal year 2012. These projects address identified needs outlined in the EPA approved 319 WIPs developed for the areas where these practices will be implemented. These projects address pollutant loadings relating to Abandoned Mine Drainage (AMD), Agricultural runoff, hydromodification and stormwater and urban runoff.
- In state fiscal year 2012, Pennsylvania's entered into Growing Greener watershed protection/restoration grants with 79 various entities, providing over \$13.2 million in state funds to implement Nonpoint Source restoration efforts intended to protect and improve surface water and linked groundwater water resources within Pennsylvania, with an emphasis on restoring impaired waters.
- In the past year, conservation districts and DEP Regional offices issued over 1,537 NPDES General Permits, and 292 NPDES Individual Permits relating to Erosion and Sedimentation Control and stormwater discharge associated with construction activities. They also conducted 14,142 site inspections and responded to over 2,330 complaints.
- Pennsylvania's Nutrient Management Program tracks Nutrient Management Plan (NMP) implementation for Concentrated Animal Operations (CAOs), Confined Animal Feeding Operations (CAFOs) and volunteer Act 38 operations. NMPs are being implemented on 1,140 CAOs through 2012. To date, 362 permitted CAFO's in Pennsylvania are implementing approved nutrient management plans as well as following their CAFO permit obligations. In addition to these above operations that have required planning elements under Act 38, there are an additional 1,837 volunteer operations that are not mandated under Act 38 or the CAFO program to develop an approved nutrient management plan, but have taken this step to get an approved nutrient management plan and open their farm for periodic inspections by program staff in order to better protect their environment.
- The total CREP enrollment for the Susquehanna, Potomac, Ohio Rivers and Lake Erie basins stands at 193,107 acres through the end of 2012 with a goal of 260,000 acres.

Through PA CREP landowners have planted 25,174 acres of riparian forest buffers and 37,143 acres of native grasses. The 2008 Farm Bill reauthorized CREP through December 2012. A Delaware River basin CREP that will have the potential to add 20,000 acres of conservation practices and bring the statewide goal to 280,000 acres is proposed and moving forward with an Environmental Assessment under the requirements of the National Environmental Policy Act.

- During 2011-12 FY, The PA Chesapeake Bay Implementation Grant (CBIG) distributed \$3,471,861 to 37 conservation districts in the Chesapeake Bay drainage basin. Of the total amount, \$2,671,368 funded technical and engineering assistance by employing 43 Bay Program technicians and 6 Bay Program engineers. In addition, \$800,493 funded special projects identified through county implementation plans (CIP). These CIP address and prioritize the multiple environmental concerns of the county and outline how the district's efforts will coordinate with the DEP's Watershed Implementation Plan.
- The current CBIG (2009-2012) grant will fund the installation of 12,000 acres of no-till planting, 27,000 acres of cover crop, and 15 miles of streambank stabilization, as well as many other nonpoint source BMP's.
- Pennsylvania's Chesapeake Bay Program Watershed Implementation Plan, or CB-WIP, calls for continuing existing programs that have proven effective and is looking to expand this effort by improving the capacity to track and expand those efforts; implementing new programs that take advantage of advanced and innovative technologies (such as manure treatment technologies); and enhancing common sense compliance efforts (such as the Core 4 practices for agricultural operations), particularly for nonpoint sources such as agriculture and stormwater runoff from development.
- The United States Environmental Protection Agency (EPA) directed Chesapeake Bay contributing states to develop Phase II CB-WIPs so that local partners (1) are aware of the CB-WIP strategies; (2) understand their contribution to meeting the TMDL allocations; and (3) are provided with the opportunity to suggest any refinements to the CB-WIP strategies. The final Phase 2 CB-WIP for Pennsylvania was completed on March 31, 2012 and was submitted to the EPA. DEP and EPA continue dialogue to address any issues of concern EPA may have with this document.

- SRBC Reports Positive Trends in Nutrient & Sediment Continue** - On December 1, 2012, Susquehanna River Basin Commission (SRBC) released its 2011 Nutrients and Suspended Sediment in the Susquehanna River Basin report. This is the annual “trends report” for water-quality data collected January 2011 through December 2011. This monitoring project is supported by DEP through the EPA Chesapeake Bay Implementation Grant. The data collection network includes 27 sites, of which trend analysis is completed on six long-term sites. The text of the trends report is “technically robust”, as expected of a scientifically valid technical report on water-quality monitoring data, but the results for the long-term stations continue to show positive progress. The “trend” of nutrients and sediment in the Susquehanna River continued to decrease. Since 1985, SRBC, USGS, DEP and EPA have supported this long-term project to quantify the amount of sediment and nutrients transported in the Susquehanna River basin. 2011 was a year of significant rainfall events throughout the year, historic high flows at lower basin monitoring sites, and drastic flooding due to Hurricane Irene and Tropical Storm Lee.



- As of December 2012, over 630 commercial manure haulers, applicators and brokers currently hold valid Commercial Manure Hauler/Broker Certification from the Pa. Dept. of Agriculture.
- 64 county conservation districts administered the Pa Dirt and Gravel Roads Pollution Prevention Program in 2011.
- The Penn State Center for Dirt and Gravel Road Studies provided 2-day training sessions for over 480 municipal employees and conservation district staff this past year addressing proper road construction and maintenance practices to protect stream health. Since the program's inception in 1997, this Center has trained over 6,500 municipal employees on proper dirt and gravel road construction and maintenance practices.
- 185 new Dirt and Gravel Road improvement worksites were funded last year, for a total of over 2,275 worksites funded throughout the 15 year life of this program. Program costs to implement those 185 new worksites were \$2.5 million. These projects are implemented to improve water quality and enhance aquatic habitat in the streams adjacent to these identified water quality problem sites.
- Information relating to removal of dams in Pennsylvania is maintained at the American Rivers website at: <http://www.americanrivers.org/site/PageServer?pagename=AR7>. During 2011 (the most recent year with a completed report) 14 in-stream dams were removed in Pennsylvania enhancing aquatic habitat and restoring these streams to their natural flow characteristics.
- Pennsylvania is very active in its lakes programs. Pennsylvania recently turned to corner on lake improvements where we currently have more acres of lakes that are meeting their designated use, than acres of Pennsylvania lakes that have impairment. Also, as was reported in our 2012 305(b) report, since our prior assessment we doubled the number of acres listed under Category 1 (meets all uses), from 3,002 acres in 2009 to 6,432 acres in 2011. The next 305(b) report will not be available until 2014.
- Six Growing Greener grants, six Section 319 NPS grants and one SMCRA grant were awarded for AMD related projects in 2012. BAMR completed 46 projects, 34 of which were surface reclamation, one passive treatment system, one active treatment system, and 10 other reclamation projects such as mine subsidence control and deep mine reclamation. BAMR also reclaimed 715 acres. DEP's Bureau of Oil and Gas plugged 63 abandoned wells.
- The District Mining Offices continue to facilitate the reclamation of AML including places of subsidence and elimination of dangerous highwalls.
- Under the new Full Cost Bonding system, the DEP District Mining Offices have required mine operators to post a separate bond or trust which will insure sufficient funds to continue annual operational, maintenance and replacement activities on AMD treatment facilities in perpetuity even if the operator should abandoned the facility. Some accomplishments this year have been the construction of four passive treatment systems and the final design for an active treatment system.
- The Western Pennsylvania Coalition on Abandoned Mine Reclamation (WPCAMR) continues to administer the Growing Greener funded "Quick Response" program to

provide emergency funding for treatment system repair. WPCAMR authorized 11 projects in 2012 and reimbursed 10 of those 11 projects. The eleventh was late in the year and isn't completed yet.

- Penn State Forest Resources Cooperative Extension continues to provide quarterly newsletters to the Forest Stewards relating to forest best management practices.
- Sixteen new Pennsylvania Forest Stewards (PAFSs) completed core training in 2011, taking the total number of volunteers trained since 1992 to over 520. PAFSs are trained volunteers who do outreach for the Forest Stewardship Program. PAFSs are active in all of Pennsylvania's woodland owner organizations (WOAs).
- The results of the 2011 PA Forest Stewards Biennial Survey show that, in one year's time, volunteers gave almost 15 full-time equivalents (FTEs) in outreach, reaching over 36,000 people. The next survey will not be completed until 2013.

## **Goal 2**

**Coordinate with county conservation districts, watershed groups, local governments, and others in the development and implementation of 34 watershed implementation plans (WIPs) meeting EPA's Section 319 criteria to protect and restore surface and groundwater quality by 2012.**

### **Accomplishments to date:**

Pennsylvania currently has 35 EPA approved Watershed Implementation Plans (WIPs). The approximate acreage covered by these 35 WIPs is 1.24 million acres. This represents slightly over 4.3% of the total 28.6 million acres of all lands within Pennsylvania. Since 19% of Pa stream miles are impaired, approximately 19% of Pa land area is within impaired watersheds. This equals about 5.43 million acres of land (19% of 28.6 million acres) that lie within impaired watersheds. This WIPs cover approximately 1.24 million acres, representing approximately 23% of the impaired watershed acres in the Commonwealth of Pa.

We have one additional WIP which has been reviewed by EPA and is currently being assessed by the watershed group to determine if they will be able to address the EPA comments on the plan, or if they will need to drop the development of this plan and revisit the process once the TMDL for the watershed is revised.

Pennsylvania has decided not to direct any new program funds into developing additional Section 319 WIPs recognizing the extensive work we still have to accomplish in our currently approved WIPs. If we were to encourage the expansion of the number of WIP covered acreage in the Commonwealth, we would be further reducing the funding available to our currently active WIP areas, and then further minimizing our hopes to obtain lake and stream delistings in these areas.

Pennsylvania continues to focus its 319 program implementation funding to those areas with approved Section 319 approved WIPs. We believe this is an appropriate action to take in order to provide the highest probability of documenting water quality success using such a limited funding pool. It should be noted that not only do we direct our Section 319 implementation funding to these areas, but we attempt to work with our program partners throughout the Commonwealth to encourage them to target their funding in these designated watershed areas as well.



Even without providing any program funds to this effort, there are various watershed groups and locally based environmental resource protection groups that continue to develop WIPs on their own in order to provide a new funding avenue to these impaired stream reaches in need of watershed improvements.

- To date, Pennsylvania has received EPA approval for 35 Watershed Implementation Plans (WIPs) covering approximately 1.24 million acres over parts of 30 counties.
- One additional WIP (for the Quittapahilla Creek, Lebanon County) was submitted to DEP, and eventually to EPA, by the Quittapahilla Creek Watershed Association for review and approval. Comments were developed and provided by EPA and those comments are currently being considered by the watershed group. One of the major issues with this draft WIP is that it was developed using a watershed modeling process that is consistent with the modeling process used in the TMDL. The TMDL for the Quittapahilla is planned to be revised in the near future. It is DEP's expectation and recommendation that the watershed group wait until the revised TMDL comes out, at which time they should rewrite the WIP to be consistent with the information in the revised TMDL.
- One additional WIP (Beaverdam Creek Watershed, Adams County) will begin development in 2013 thanks to a \$31,500 grant from Pennsylvania's Growing Greener program. Once that WIP is drafted, it will be reviewed by DEP and EPA for eventual approval by EPA for inclusion in Pennsylvania's Section 319 program. The Adams County Conservation District is the organization developing this WIP.
- Conservation groups are using the various 319 Watershed Implementation Plans and also other AMD Restoration plans as a planning tool to remediate AMD.
- In order to qualify for BAMR funding through SMCRA, watersheds must be considered a qualified hydrologic unit (QHU). Several groups continue to work towards this goal.
- SRBC and EPCAMR continues to work on the Anthracite Region Mine Drainage Remediation Strategy, which will guide SRBC mine drainage activities in the 4 Anthracite Coal Fields.
- EPCAMR staff completed a Coldwater Conservation Plan for Solomon Creek, Luzerne County, an AMD impacted watershed.
- Any construction projects for AMD treatment systems are required to have an OM&R plan as one of the deliverables. The plan needs to address basic maintenance issues along with a replacement schedule for the future, and who the responsible party is for each section of the plan. Also possible funding sources to implement the plan must be identified.
- Technical assistance grants from Growing Greener were awarded to Trout Unlimited and Stream Restoration Inc. to assist groups with AMD issues.

### **Goal 3**

**Improve and develop monitoring efforts to determine how projects and programs improve water quality and/or meet target pollution reductions including TMDLs.**

#### **Accomplishments to date:**

Pennsylvania continues to provide extensive efforts to continually assess the over 86,000 miles of streams and over 1,500 lakes and reservoirs in Pennsylvania, and to accelerate this effort in areas where we see evidence of an impaired water body showing signs of improving water quality. Our Section 319 grant provides funding to our DEP staff to assist in collecting stream data to develop TMDLs to support and direct the stream restoration work to be done on impaired water bodies. We recognize that continuing and follow up stream and lake monitoring efforts to be important for tracking our accomplishments in project areas but funding for these activities are often minimized in order to support more on-the-ground projects.

Pennsylvania's 319 and Growing Greener programs now require all grantees to provide to DEP, along with their final report, an assessment of the load reductions that can be attributed to the implementation of their project. This provides a critical step forward in our efforts to monitor load reductions attributed to all 319 and Growing Greener funded grants.

Pa DEP has recently initiated a grant with Penn State to assess practical methodologies we can use to further collect load reductions attributed to NPS project implementation, including those projects funded by our various NPS program partners throughout the Commonwealth. Through this project we have assessed what NPS related load reduction information is available throughout the state, how that information is to be interpreted, what is the usability of that information, and how that information may be able to be reported to EPA to document the overall efforts of all of our NPS program partners in Pennsylvania. **The result of this effort is the documentation of over 1.178 million lbs of Nitrogen, 65,400 lbs of Phosphorus, and 17,950 tons of sediment load reduced through the implementation of over 690 NPS Best Management Practices throughout the Commonwealth** by the wide range of public programs and organizations from which Penn State was able to obtain data. It should be noted that there are many NPS remediation practices implemented without the help of these reporting programs and organizations, so this number falls well short of the full extent of work being implemented in the state over the given year.

Pennsylvania carried out an extensive lake assessment effort this year on 16 lakes as part of the EPA National Lake Assessment effort for 2012. This level of lake assessment is carried out once every 5 years. Pennsylvania committed over 145 man-days to just the sample collection element of this initiative.

Pennsylvania initiated an "improving waters" effort where we actively canvas our county based watershed specialists and our locally based watershed associations for their input on where they are seeing signs of improving water quality in impaired stream reaches. Improving waters observations that show significant progress in improving an impaired stream reach or lake are then transferred to our DEP stream and lake assessment staff to visit the sites to formally document the quality of the watershed. DEP has enhanced their Conservation District Watershed Specialist reporting process to get more input from the watershed specialists in this effort to monitor improving and restored waters.

- Pre- and post-implementation water quality and BMP monitoring is being completed in agricultural impaired watersheds including the Mill Creek (Lancaster County), Conewago Creek and the Conowingo Creek. The EPA developed WIP Tracker Tool is being used to document progress in these three and other WIPs in the Commonwealth. WIP, BMP and load reduction tracking are ongoing.
- DEP monitors the S Br Codorus Creek, Grainery Road, assessing macroinvertebrates, habitat and pebble counts, in order to determine improvements associated with the implementation of the 319 stream restoration project. DEP also monitors water quality, habitat and flow on the Mill Creek in Bradford County for improvements associated with the implementation of CREP projects. Both of these two DEP priority watersheds have WIPs.
- DEP is also monitoring water quality and flow in the Catawissa Creek, Swatara Creek, Shoup Run and Six Mile Run watersheds which are WIP watersheds being treated to address AMD pollution.
- All new Growing Greener project agreements will obligate the grantee to provide pollutant load reduction figures attributed to the project being funded using these state funds. This information can then be collected by program staff to input into the WIP Tracker Tool tracking system.
- In July 2009, due to budget constraints, DEP began limiting its direct technical and financial support for volunteer monitors. Currently we can only support volunteer monitoring for specifically identified projects that result in the generation of quality assured data related to DEP's highest priorities. Projects related to DEP's priorities include monitoring sections of streams to assess impacts from stream restoration projects, best management practices and abandoned mine land reclamation projects, which are supported by 319 Non-point Source Program or DEP monies. Select Conservation Reserve Enhancement Program (CREP) activities are also being monitored to assess the effectiveness of these practices.
- Connections DEP made with individuals and groups skilled in volunteer monitoring will continue to help us in certain areas of the state to provide truly volunteer (no financial support provided) monitoring assistance for select project sites that continue to be a priority for the local community.
- Requests from volunteer monitors for services previously provided by DEP such as routine technical assistance and training on preparation and implementation of a locally driven monitoring plan are being directed to the Consortium for Scientific Assistance to Watersheds (CSAW) or Nature Abounds. The Consortium, a group of service providers, is funded through a state Growing Greener grant while Nature Abounds has a 319 Nonpoint Source Management grant to support the Pennsylvania Senior Environment Corps program and volunteer monitoring. These groups are providing requested monitoring assistance efforts where they have a sufficient number of volunteers to provide the local assistance.
- An additional 6,000 lake acres were assessed in 2010-11. Over 80,000 lake acres have been assessed in Pa as of the date of the publication of the last Integrated List. In next year's report we will be able to summarize the extent of newly assessed lake acres that will

go into the yet to be developed 2014 Pennsylvania Integrated Water Quality Monitoring and Assessment Report.

- Partnerships forged to accomplish statewide lake assessments include those with the Dept. of Conservation of Natural Resources, the County Conservation Districts, the Pennsylvania Lake Management Society (PALMS), the Consortium for Scientific Assistance to Watersheds (C-SAW), and private citizens.
- The Department's switch to the National Hydrography Data Layer (NHD) and new electronic data storage and retrieval systems based on GIS (SLIMS, ICE, eFacts, eMap, and WAVE) in 2006 allows for efficient data sharing, both internally and with the public. The ICE system will undergo further improvements and is slated to be internet accessible in the near future.
- Most TMDL lakes are being tracked using protocols designed to detect water quality improvements as soon as they are achieved:
  1. Stephen Foster Lake (Bradford County) has been intensely monitored since BMP implementation began in 2004, utilizing 319 funding. Monthly in-lake and tributary water quality grab samples and flow data are collected from April through October. The loading and comparative data analyses are compiled through consultant services, and also within DEP. To date, improvements of in-lake total phosphorus and chlorophyll have been noted, and the Trophic State Index (TSI) has lowered (improved). Also, as of 2009 data, the watershed loadings of both total phosphorus (TP) and total suspended solids (TSS) have met the targeted TMDL. It should be noted that three new BMP's were installed in 2011 that were targeting in-lake nutrients: 1) two 250sq.ft artificial floating wetland islands in the forebay, 2) a lake-wide alum treatment, and 3) a below-dam wetland treatment system to collect and treat nutrient-laden hypolimnetic waters pulled from the lake. The wetland allows for continuous withdrawal of high nutrient-content lake waters, reducing what is available up in the lake to feed bothersome algal blooms. The wetland allows for the treatment of these polluted waters before it reenters Mill Creek.
  2. Lake Luxembourg (Bucks County) has been sampled almost annually since the TMDL was completed in 1999. BMPs in that rapidly developing watershed now focus on wetland enhancements and stormwater retrofits rather than agriculture. Current and new 319 grants address further stormwater BMP implementation.
  3. Harveys Lake (Luzerne County) has been monitored for stormwater mitigation, as that is the main focus of BMP implementation. To date, the Lake's total phosphorus loadings have been reduced by more than 45%.
  4. Lake Wallenpaupack continues to be monitored monthly by the local watershed management district, and a consultant has recently been hired to statistically analyze their data with regard to the TMDL. Significant BMP implementation continues in the watershed. All data will be reviewed in 2013 for possible delisting in 2014.
  5. Other TMDL lakes sampled on an intermittent basis include Pinchot Lake (York County), Lake Nockamixon (Bucks County), and Conneaut Lake (Crawford County). These lakes do not have restoration grants associated with them at this time. Conneaut Lake has implemented several Growing Greener and 319 NPS grants targeting

stormwater controls and stakeholder education. Conneaut Lake is seeking funds for an updated Watershed Implementation Plan in order to readdress their priority needs and organize their stakeholders.

- DEP biologists from all 6 Regions participated in EPA's National Lakes Assessment (NLA) in 2012, with field visits to 16 lakes during the index period May- September. A wide variety of water chemistry, biological, and habitat data was collected on each lake and submitted to EPA. The NLA is one in a series of nation-wide waterbody surveys ([www.epa.gov/aquaticsurveys](http://www.epa.gov/aquaticsurveys)) that assesses the condition of the nation's waters. This assessment evaluated 16 lakes (comprising over 12,825 lake acres) scattered throughout the state. These lake sampling events normally required 3 crews (3 boats and a minimum of 6 people), in order fully sample a given lake. It took more than 145 man-days of effort to just take the samples on these 16 lakes.
- Stream Restoration Inc. (SRI), EPCAMR and WPCAMR partnered to maintain Datashed.org (Datashed 2.0) to maintain and build upon it for OM&R and inventory of PA passive systems. WPCAMR, EPCAMR, PA DEP, SRI and volunteers completed another round of water sampling events of the passive treatment systems in PA.
- EPCAMR has continued AMD sampling handbook updates and dissemination via the web. EPCAMR continues to seek funding for and build a sampling equipment inventory to aide in water sampling throughout the region. EPCAMR conducts AMD Sampling Protocol Certification trainings for conservation district watershed specialists, watershed group members, AmeriCorps VISTAS, volunteers and interns as needed.
- EPCAMR continues to update the Reclaimed Abandoned Mine Lands Inventory (RAMLIS) GIS Tool CDs. Version 12 is now available. This database shows AML Priority 1, 2 and 3 statewide with information on PA DEP BAMR's plans for reclamation. AMD Treatment Systems from Datashed 2.0 are also included in this tool.
- WPCAMR and EPCAMR continue to solicit information about improving streams during meetings, phone calls, and field visits with the watershed community.
- Representatives of the Codorus Creek Watershed Association have continued post Natural Stream Channel Design (NSCD) project construction monitoring, consistent with the monitoring obligations in the permits they received for the projects.
- EPCAMR uses RAMLIS to produce custom mapping of mine waste piles for Anthracite Region Independent Power Producers Association (ARIPPA) member plants.
- DEP is assessing the potential to more actively involve the Nature Abounds group to monitor state supported projects in their localities.

## **Goal 4**

**Encourage development and use of new technologies, tools, and technology transfer practices, to enhance understanding and use of techniques for addressing nonpoint source pollution.**

### **Accomplishments to date:**

Pennsylvania recognizes the significant progress we can make in addressing NPS pollution through the use and encouragement of innovative technologies and practices. We have been facilitating discussions and efforts to move forward on these types of efforts throughout the Commonwealth, addressing the various NPS sources. Funding limitations from the state and private sector in the recent past slowed down the implementation of some very promising projects but several significant projects are still moving forward.

We are encouraged to see the progress of some new and innovative technologies that are being implemented on several of our larger farms in Pa, in an effort to address a number of issues including nutrient imbalance in various regions of the state (see the below bulleted listing). The implementation of these new technologies on farms throughout Pennsylvania show some real promise in sustainably addressing the regional nutrient imbalance issue that can lead to increased NPS loading problems in agricultural watersheds.

- Pa. DEP Nutrient Trading Program web site link ‘Nutrient Trading’ provides current information on Pennsylvania’s active and successful Nutrient Trading Program. See the DEP web site [www.dep.state.pa.us](http://www.dep.state.pa.us). Approved proposals and contracts/trades are included on the site.
- DEP’s Bureau of Point and Non-Point Management administers the DEP Nutrient Credit Trading Program. The program continues to certify requests for Nutrient Credits from a variety of Best Management Practices and Manure Treatment Technologies. Moving forward the program is considering a revision of its current regulations.
- Examples of credits generation include continuous no-till, cover crops and advanced waste water treatment. In addition several proposals have been certified that bring advanced waste water treatment to dairy manure and poultry litter gasification to a large poultry operation. These innovative practices help to increase Pennsylvania’s ability to efficiently utilize agricultural nutrients. Many of these innovative BMP’s are being financed by private dollars. Current demand for credit purchase from waste water treatment plants is modest. However demand is expected to rise in the future.
- Energy Works BioPower LLC in Adams County has received approval for the largest nutrient credit trade of its kind in Pennsylvania. The state has certified that the project will generate at least 1.05 million nitrogen credits and 53,853 phosphorus credits annually, reducing at least this level of nutrients to our local and regional streams and rivers.
- A CAFO dairy farm in Pennsylvania has installed the BION technology to allow the 2,000 head dairy operation to reduce ammonia emissions, nitrogen and phosphorus losses from land application of manure, and to reduce the level of pathogens in the manure applied. The on-farm process uses a bioreactor to process the manure and remove detrimental ammonia emissions as inert nitrogen gas, and then an advanced separation system which

can extract significant levels of nitrogen and phosphorus from the manure effluent coming from the bioreactor. The state has certified that the project will generate at least 600,000 nitrogen credits annually, reducing at least this level of nutrients to our local and regional streams and rivers.

- A manure incinerator installed through an NRCS CIG grant on an 80,000 broiler operation in PA reduces the volume of the manure by 90%, generates a phosphorus rich product that can be marketed for animal feed or as an ingredient for the fertilizer industry.
- EnergyWorks BioPower LLC entered into an agreement with the Hillandale Farms layer operation to install a manure gasifier system adjacent to their farm to treat the poultry manure from their 5 million laying hens. This one system has the potential to remove more than 55,000 tons of poultry manure from the region, without the need for excessive transportation costs or environmental issues associated with transporting of the manure. The gasification facility has completed construction and initial testing and is expected to be in full operation in early 2013. This facility has additional capacity to handle poultry manure from additional operations in the area.
- The state tax credits allowed for through the Pa Resource Enhancement and Protection (REAP) program were doubled in the past year to \$10 million for eligible NPS agricultural practices. In the 6 years that this program has been offered in Pennsylvania, it has installed over 2,609 conservation practices on more than 1,300 farms throughout the Commonwealth, with a total project cost for these practices of over \$68 million. Through 2010, the REAP program has helped reduce more than 11 million pounds of nitrogen, 859,485 pounds of phosphorus and 438 tons sediment. More information on REAP can be found at [www.agriculture.state.pa.us](http://www.agriculture.state.pa.us).
- USDA NRCS administered the Conservation Innovation Grants program in 2012 and distributed more than \$4.18 million to support Pennsylvania farmers' efforts to implement innovative practices addressing environmental issues. Project types funded through the CIG grants include: Refining and Harmonizing Phosphorus (P) Indices in the Chesapeake Bay Region to Improve Critical Source Area Identification and to Address Nutrient Management Priorities; New Three-way Interseeder for Early Establishment of Cover Crops in No-till Corn and Soybean; Next Steps in Pollinator Conservation; Approaches to Capture Nitrogen and Air Pollutant Emissions from Poultry Operations; Energy Savings Through Holistic Planned Grazing and Management.
- The PennDOT Smart Transportation Initiative promotes the use of environmentally-sensitive site design techniques including compost filter blankets, filter berms, and/or compost filled filter socks at selected road and highway projects and at stockpile and garage facilities.
- PennDOT compost projects qualify as surface and ground water protection efforts since they implement erosion and sedimentation controls.
- The PennDOT Strategic Recycling Program promotes the use of recyclable materials (e.g. foundry sand, crushed glass, reclaimed asphalt pavement (RAP) ) in road and highway construction or maintenance projects.

- DEP staff continued participation with the Villanova University Urban Stormwater Partnership initiative. Innovative storm water management BMP research continues with Villanova University through a 319 National Monitoring Program agreement.
- The Keystone Stream Team (KST) continues to be the focal point for NSCD information, education, and outreach. A wealth of information is available and maintained on [www.keystonestreamteam.org](http://www.keystonestreamteam.org). Some commonly applied BMPs relating to NSCD can be found in the Natural Stream Channel Design Guidelines, Chapters 6, “Creating the Final Design”.
- The KST researched and documented a range of costs for assessment, design and construction of Natural Stream Channel Design (NSCD) projects and posted this information as part of its revised NSCD guidelines housed on its web site at [www.keystonestreamteam.org](http://www.keystonestreamteam.org).
- The KST has contracted with software engineers to develop an online database for uploading, storing and retrieving reference reach datasets from Pennsylvania stream restoration projects. An additional spreadsheet is being managed on this website to store general project information from Pennsylvania stream projects that incorporate FGM/NSCD design elements. Currently, data from planned and completed projects, and Growing Greener-funded projects is being entered into this spreadsheet, which is accessible on the KST website.
- Aquatic invasive species control programs have largely been accomplished by the development and adoption of a formal Aquatic Species Management Plan, the efforts of Pennsylvania’s Invasive Species Council (PISC) and the Aquatic Invasive Species Workgroup. DEP has a seat as one of six state agencies represented on the Council in addition to 10 public members. Meetings are held quarterly. The Council has identified priorities and is seeking funds to implement its objectives. The PISC has also completed a management plan for terrestrial invasive species.
  - The Pennsylvania Fish and Boat Commission plays an active role in the PISC, has aquatic nuisance species information on its web site and has published educational materials on aquatic invasive species such as Zebra and Quagga Mussels as well as Viral Hemorrhagic Septicemia (a federally regulated animal disease of freshwater fish). The PFBC also has recently completed the development of the Aquatic Invasive Species Biosecurity Protocols to direct state agencies in their activities in order to minimize the accidental movement of aquatic invasive species through routine staff activities.
  - DCNR mounts extensive efforts to mitigate aquatic invasives in the State’s public parks.
- PALMS and the Lake Wallenpaupack Watershed Management District web sites offer educational materials on innovative lake protection and management practices, offer BMP manuals for free downloading, and offer other contacts and links for further information.
- The Consortium for Scientific Assistance to Watersheds (C-SAW), in partnership with PALMS and Penn State Extension continues to assist lake associations and concerned citizens with watershed and lake management issues providing innovative solutions to



continuing problems, and continues to facilitate popular lake and pond workshops. C-SAW's mission, brochure and program are on the web at (<http://pa.water.usgs.gov/csaw/>).

- Vendors have submitted requests to market their products as alternate on-lot wastewater treatment technologies in Pennsylvania. There are currently ten vendors that have received classification by DEP as an acceptable alternate on-lot sewage treatment system for use in Pa. A listing of these approved alternate technologies can be found on the DEP On-lot Alternate Technology Listings web site at [http://www.portal.state.pa.us/portal/server.pt/community/sewageanddisposal/10583/onlot\\_alternate\\_technology\\_listings/607632](http://www.portal.state.pa.us/portal/server.pt/community/sewageanddisposal/10583/onlot_alternate_technology_listings/607632).
- WPCAMR continues their email subscription service called "Abandoned Mine Posts" & "AML Video Diaries" along with hosting [www.wpcamr.org](http://www.wpcamr.org); EPCAMR continues to host [www.epcamr.org](http://www.epcamr.org) with the "EC Express News Flash"; Both WPCAMR and EPCAMR maintain [www.treatmeinwater.com](http://www.treatmeinwater.com) and [www.AMRclearinghouse.org](http://www.AMRclearinghouse.org).
- The 14th Annual PA Abandoned Mine Reclamation Conference was held in State College in 2012 with 120 attendees for the main conference and 47 participated in the Pre-Conference Tour.
- EPCAMR developed a flow rating curve for the Old Forge Borehole.
- The Ohio River Watershed Celebration in Pittsburgh was held in 2012 with activities for adults and children.
- AMD: an Epic Tale and AMD: It's Everyone's Business Videos distributed via DVD and AMD Treatment video available online via WPCAMR's Video Diaries. WPCAMR also conducted a video making workshop for watershed groups. The workshop was designed to give volunteer groups the tools to begin publicizing their work via video.
- EPCAMR continued its education programs including AMD/AML tours, stream sampling events with hundreds of middle school students, cleanups and workdays with Vo. Tech. students and volunteers, Tie Dye/Chalk and Teacher Training Workshops and participation in various Environmental Themed Festivals; Several Environmental Education grants were awarded to EPCAMR to support education of youth and adults on AMD/AML issues.
- WPCAMR completed a Growing Greener grant with Hedin Environmental to encourage the reuse of iron oxide from AMD sludge.
- The Goal set in 2002 to restore 500 miles of forested riparian buffers by the end of 2010 has been met. To date, a total of 5,106 miles of forested riparian buffers have been added in Pa's Chesapeake Bay Watershed. More than 6,462 miles of forested riparian buffers have been added Statewide. During 2012, 183 miles were added in the Chesapeake Bay Watershed, and an additional 179 miles of buffers were planted in other drainages across the State. Of the 362 new buffer miles, at least 88 miles were protected through new conservation easements and 43 miles were protected through new ordinances.
- Landowner enrollment in the Forest Stewardship Program (FSP) continues to increase. 41 new plans were written between October 2011 and September 2012. Over 562,000 acres of privately owned forest land are covered by stewardship plans.
- The PA Sustainability Forestry Initiative (SFI®) developed a Timber Harvesting Assessment Form and Treatment Unit Sustainability Assessment Form and provides forest

landowners with these forms to assist them with the management of their forest land. The Timber Harvesting Assessment Form provides them with all the necessary items to consider when conducting a silvicultural operation to ensure water quality protection, sustainable forest management practices, and more. The Treatment Unit Sustainability Assessment Form provides forest landowners with a tool to assess their current forest condition, develop a desired forest condition, and evaluate the results of their harvesting operation.

## **Goal 5**

**Assure implementation of appropriate best management practices to protect, improve and restore water quality by using or enhancing the existing financial incentives, technical assistance, education and regulatory programs.**

### **Accomplishments to date:**

Pennsylvania's NPS program is fortunate to have the cooperation of the full range of related agencies and private sector groups as program partners. The partnerships forged over the years with this program are the basis for our ability to leverage and take full advantage of the various funding sources available for NPS work.

Our program partners at NRCS continue to be the main funding and technical assistance source for our work on farms, coupled with the significant effort provided through our 66 county conservation districts. The Chesapeake Bay Foundation has proven to be an excellent partner with our NPS program as well, assisting with getting farmer participation in a number of high priority work areas for the program.

WPCAMR and EPCAMR along with staff from our District Mining Offices and our Bureau of Abandoned Mine Reclamation, along with other various technical partners, help facilitate our efforts to address AMD. The partnership we have been able to foster with the USDI OSM has provided an opportunity for the Commonwealth to complete a number of very important projects that we alone would not have been able to accomplish.

Villanova has proven to be an excellent partner in the NPS program's efforts to better understand the topic of stormwater management and to help develop some excellent direction to groups looking to implement these types of projects.

Some of our long time partners in supporting efforts to restore stream habitat are the Stroud Water Research Center and the Keystone Stream Team. These groups, as well as our various other private sector professionals that assist groups in accomplishing their goals of restoring stream habitats to support aquatic and terrestrial life, are key to allow Pennsylvania to move forward in bringing damaged streams back into full health.

We have developed a significant number of partnerships over the years to support our more generalized efforts to address NPS management. Some of the main players are the Pennsylvania Association of Conservation Districts (PACD) and the League of Women Voters. These groups do excellent work in helping spread the word about the benefits of NPS management and provide excellent educational and outreach efforts throughout the Commonwealth. In particular, the mini-projects supported by the League of Women Voters focuses efforts on informing municipal officials on the importance of stormwater management and efforts they should take to address this issue. Also our Department of Conservation and Natural Resources provides access to their staff to help better manage our public and private lands to address NPS concerns. Local watershed groups are key to helping take a good idea and make it work on the ground. Through our local watershed specialists we are able to partner with all the watershed groups formed throughout Pennsylvania. The Schuylkill Action Network is an excellent example of a regional water protection group that has formed to help encourage the protection and restoration of water resources throughout the Schuylkill River Watershed. Penn State continues to be a key player in

many aspects of our NPS management program. With their technical and education delivery expertise and infrastructure, they have played a critical role in moving our program initiatives forward throughout Pennsylvania, including their concentrated efforts in the Conewago watershed.

Most recently we have been able to form a relationship with our State Revolving Fund agency (PENNVEST) to encourage and facilitate their efforts to provide access to these funds to implement NPS protection practices throughout Pennsylvania. This partnership has opened up a significant funding source for this type of work. Since the NPS program element was opened up in 2009, PENNVEST has entered into agreements with NPS applicants to utilize \$70 million in PENNVEST loan funds, and \$60 million in PENNVEST grant funds, to implement NPS projects in Pennsylvania. We continue to work with PENNVEST to find ways to support access to this funding source to areas that are in real need of work.

Pennsylvania has recently undergone a significant regulatory review and revision process in the past several years updating both our erosion/sedimentation control and our manure management regulations and guidance. These two significant regulatory/guidance revisions set the stage for some of the most significant and long-term nonpoint source reductions seen in Pennsylvania since the inception of our NPS program.

- Our program partners at the USDA, NRCS office continue to provide significant support to the agricultural community in their attempts to address agricultural runoff from their farm sites. The Pennsylvania NRCS office continues to be an excellent program partner, working with DEP and specifically the NPS section, to obtain our input to help them make the most significant impact with their funding resources. Over the past year, NRCS provided over \$18.6 million to farmers through the EQIP program, another \$15.5 million for farm practices specifically within the Chesapeake Bay watershed area in Pennsylvania, and another \$1.9 million for various other smaller NPS related initiatives within the Commonwealth.
- The revised Pa Nutrient Management Act (Act 38 of 2005) requires CAOs, CAFOs and volunteer agricultural operation (VAO) farms to have a current conservation plan before nutrient management plans are authorized for approval. Additional farm conservation plans are being developed as a result.
- As of December 31, 2012, there are a total of 1,140 Concentrated Animal Operations (CAOs) with approved nutrient management plans in Pennsylvania, and another 1,837 non-CAOs with approved nutrient management plans. There is over 701,000 acres of land directly covered under these approved plans. Farms implementing these plans are required to update their approved nutrient management plans according to the schedule established in the regulations. Also all farmers with these approved plans are inspected annually to ensure they are following their approved permits and plans.
- As of December 31, 2012, there are a total of 362 Concentrated Animal Feeding Operations (CAFOs) with NPDES CAFO permits, implementing approved nutrient management plans. These farms are required to update their CAFO permits and approved nutrient management plans according to the schedule established in the regulations. Also all farmers with these approved permits and plans are inspected annually to ensure they are following their approved permits and plans.

- The Penn State University Agriculture & Environment Center website includes current references to water quality-air quality BMPs and research. See the AES website at <http://aec.cas.psu.edu>.
- The Penn State Interagency Nutrient Management Website serves as the clearinghouse for all information relating to on-farm nutrient and manure management efforts in the Commonwealth, including technical guidance and regulatory obligations.
- The NRCS Conservation Planning and Regulatory Compliance Handbook is a significant element of the PA Tech Guide. The handbook is organized into typical planning and land use topic areas to assist users and planners in making sense of regulations affecting conservation decisions. The initial focus addressed recent changes to DEP's Chapter 102 Erosion & Sediment Control regulations for agricultural plowing and tilling activities and animal heavy use areas. As a handbook, it is designed to incorporate guidance for future changes. Current plans include providing guidance as needed to address the new Manure Management Manual changes, Wetland Regulations, and Erosion and Sediment Control for Timbering Activities.
- Pennsylvania enacted final revisions to the Pa DEP Chapter 102 Erosion and Sedimentation Control regulations in November of 2010. Some of the major changes to this regulation, addressing all earth moving in Pennsylvania including agricultural activities, include: incorporating post construction storm water requirements, incorporating buffer permitting options, and anti-degradation requirements. All program staff were trained in 2011 on these new requirements through 4 regional meetings and one statewide meeting. Outreach efforts have been implemented to ensure that the regulated community, including agricultural operations, are made aware of these new requirements. Outreach materials outlining these new requirements, including a Chapter 102 "barn sheet" have been developed and distributed throughout Pennsylvania. Over 20,000 E&S barn sheets, outlining farmers' erosion control requirements, were distributed since 2011.
- Pennsylvania released its revised Manure Management Manual in 2011. The effort to revise this manual represents a significant step in Pennsylvania's actions to ensure farmers are following the water protection obligations provided for in Section 91 of Pennsylvania's Clean Streams Law (CSL) regulations. This revised manual provides definitive direction for the agricultural community to follow in the handling, storage and application of manure on their farms. This revised manual provides guidance relating to: manure application rates addressing both nitrogen and phosphorus, year-round manure application setbacks, winter manure application restrictions, barnyard location and management obligations, manure storage construction and operation/maintenance provisions, and pasture management criteria. Section 91 of Pa's CSL regulations requires farmers are to follow the guidance provided in this manual for the handling, storage and application of their manure, or they are to obtain a permit or approval from DEP if implementing alternative practices. Program staff at the conservation districts, NRCS and DEP were trained on the new obligations outlined in the revised manual through "train-the-trainer" meetings held in six locations throughout the state. These trained trainers are holding local meetings with the farm community to ensure they understand and follow the revised manual. The DEP has finalized delegation agreements with 55 county conservation districts which will obtain their local assistance to ensure that all farmers raising animals are following these new

manure handling guidelines. Over 20,000 manure management barn sheets, outlining farmers' manure management requirements, were distributed since 2011.

- Pennsylvania DEP has initiated an effort within the Chesapeake Bay watershed, to have conservation district, over the next 5 years, visit all animal operations in their counties, to ensure they fully understand their new E&S and Manure Management legal requirements addressing water quality concerns. As of the end of 2012, over 6,240 farmers in 36 Pennsylvania counties have received these on-the-farm compliance visits by the conservation district staff.
- DEP has developed an agricultural compliance brochure, designed to educate farmers on their legal obligations relating to Erosion Control and Manure Management. DEP has mailed out over 82,000 copies of this brochure to individual farmers in order to ensure the agricultural community fully understands its legal obligations relating to state and federal laws addressing NPS pollution control.
- DEP has established a new agriculture compliance specialist position in the Southwest region of the state. This area had been historically underserved relating to compliance oversight staff from DEP. This new position, funded using 319 monies, will help ensure environmental regulations compliance by the agricultural community in that area and will help motivate and support conservation district compliance outreach and technical assistance work. The initiation of this new compliance oversight effort will allow for significant new nutrient and sediment load reductions.
- In 2012, PENNVEST continued to accept non-point source projects in their regular funding rounds of the Clean Water State Revolving Fund. DEP staff assisted in the development, ranking, selection, and continued revisions to policies and procedures. In calendar year 2012, over \$25.6 million was awarded to non-point source projects in the form of either grants or low interest loans. DEP will continue to support PENNVEST in their funding of non-point source projects. In addition DEP will continue to support conservation districts in the development of nonpoint source applications to PENNVEST through the implementation of a Section 319 grant which funds one staff person at the Pennsylvania Association of Conservation Districts (PACD) to assist conservation districts in their efforts to develop eligible nonpoint source applications. DEP continues to work with PENNVEST and the application developer at PACD to find ways to simplify the PENNVEST application process for nonpoint source applicants.
- The DEP Stormwater Management Program staff developed a draft Pennsylvania Model Stormwater Management Ordinance to serve as a model ordinance or template for municipalities developing municipal stormwater management ordinances.
- A total of 57 counties have completed at least one watershed Act 167 Stormwater Management Plan and 24 of those counties have adopted a Stormwater Management Plan that covers the entire county. State funding for the preparation and implementation of local Stormwater Management Plans was discontinued by the Pennsylvania State Legislature effective July 1, 2009 due to state budgetary concerns, which slowed down the rate of further plan development throughout the state.
- The DEP continues to work with EPA to implement a revised National Pollutant Discharge Elimination System general permit for stormwater discharges from regulated small

municipal separate storm sewer systems (MS4s). In order to allow time to undertake municipal outreach on the revised permit and to provide municipalities time to prepare their renewal permit applications and supporting information, the usage of the current PAG-13 has been extended until March 15, 2013.

- The Natural Stream Channel Design Guidelines, found on the KST web site at [www.keystonestreamteam.org](http://www.keystonestreamteam.org), is a comprehensive tool for educating the public about channel maintenance and stream function,
- Ongoing DEP initiatives for outreach on NPS lake issues and programs continue as DEP provides speakers and literature resources for conferences such as the Pennsylvania Lake Management Society (PALMS) the premier lake stakeholder workshop in Pennsylvania. The 2012 conference was held on March 7 & 8, the 2013 conference is scheduled for February 20 and 21. The PALMS web site, [www.palakes.org](http://www.palakes.org), provides information on lake and watershed BMPs, water quality parameters, and other outreach material.
- ARRIPPA, EPCAMR and WPCAMR continue to partner awarding the ARIPPA AMD/AML Reclamation grant where \$10K was given to groups in PA for AML/AMD projects. ARIPPA reports that all their member plants combined are producing 1,500MW of power annually while cleaning up waste coal piles and reclaiming abandoned mine land.
- EPCAMR designed and built 2 Mobile Solar Powered Kilns in 2012 to dry Iron Oxide and offset some of the power costs to produce the pigment on a small scale. On a sunny day the interior of the kiln can exceed 120° dehydrate iron oxide sludge. Solar panels are also employed to run fans on the kilns to draw out moisture. EPCAMR maintains a brochure and web pages promoting use of iron oxide and has been in contact with firms in the US and China that have been showing interest in harvesting iron oxide on a large scale.
- Babb Creek Restoration Association installed Micro Hydropower Turbines on the Antrim Acid Mine Drainage Treatment Plant. These turbines are expected to offset power utilization at the plant by \$10,000 each year.
- Utilization of AMD in Well Development for Natural Gas White Paper and information is now available from DEP. WPCAMR hosted an AMD for Frack Water Workshop at the PA DEP Ebensburg DMO to bring together watershed group and shale gas industry representatives to talk about the possibilities and obstacles.
- EPCAMR continues to work with the Susquehanna River Basin Commission and others to compile, update, and fill in data gaps on the location of Mine Pools in the Anthracite Coal Fields.
- SRBC continues to promote AMD use with financial incentives in water withdrawal permits when AMD is used or treated and used. Also SRBC has invested in 3 projects on the West Branch Susquehanna River (Lancashire #15 – construction complete, Hollywood – construction complete and Cresson- still in design) where mitigation of consumptive use or augmentation of low flow conditions can occur.
- WPCAMR continues to explore ways to address the issue of protecting the region's good Samaritans who clean up AMD by regularly communicating with members of an Ad Hoc committee, meetings developing educational materials and educating state and federal agencies on the issue.

- ARIPPA member plants continue to burn coal waste and reclaim lands with coal ash.
- EPCAMR provided technical support by updating GIS layers, converting GIS datasets to AutoCAD format, and creating maps for partners.
- As of August 2012, there are 736 active Sewage Enforcement Officers certified to perform their work throughout the commonwealth.
- Ten alternative on-lot wastewater treatment systems are currently authorized for use in Pennsylvania. Seven web-based courses are currently being offered that deal with alternative treatment technologies.
- The Pennsylvania State Association of Township Supervisors (PSATS), in cooperation with DEP, maintains a clearinghouse of resources designed to assist Pa municipalities and their SEOs in developing or modifying a SMP.
- With the CHEMSWEEP program, the Pennsylvania Department of Agriculture offers waste pesticide collection and disposal services to farmers and professional pesticide applicators. In 2012, CHEMSWEEP provided a safe disposal outlet for 74,000 pounds of pesticide waste, bringing the program total to over 2 million pounds since 1993. Through a joint effort with PA DEP, CHEMSWEEP is available to homeowners through various local Household Hazardous Waste (HHW) collection events. Nine joint HHW events occurred in 2012, and twelve HHW's are scheduled for 2013. Over 240,000 pounds of homeowner pesticides have been disposed through the PDA/DEP partnership since 2003..
- Pennsylvania has over 270 Act 537 Sewage Management Programs (SMPs) on record, serving at least 390 Pennsylvania municipalities.
- At the end of 2012, there were 942 oil recycling collection stations registered in Pennsylvania. These are promoted on the DEP web site and through communications with citizens and regional and county recycling coordinators.
- All 67 counties in Pennsylvania were represented in the Keep Pennsylvania Beautiful effort in 2012. There were 4,421 events involving 141,264 volunteers. Volunteers collected 338,148 bags, or 6,762,960 pounds of trash. They cleaned 13,589 miles of roads, railroad tracks, trails, waterways, and shorelines, and 14,046 acres of park and/or wetlands. Additionally, volunteers planted 22,511 trees, bulbs, and plants in an effort to keep Pennsylvania beautiful.
- Nearly 8,000 volunteers from 48 counties across Pennsylvania canvassed their communities to remove over 714,000 pounds of trash and debris from Pennsylvania's waterways and coastal regions during the 2012 International Coastal Cleanup event.
- Keep Pennsylvania Beautiful also provides educational resources to help communities raise awareness of the hazards associated with illegal dumping and the availability of affordable disposal and recycling alternatives. With DEP financial support, the organization maintains an Illegal Dump Survey Program, which has identified 6,244 dump sites containing approximately 18,022 tons of trash in 61 counties since its inception in 2005. In 2011 the survey newly identified 485 illegal dumps containing more than 934 tons of trash. For additional results from the Pennsylvania Illegal Dump Survey see the Keep Pennsylvania Beautiful website at <http://www.keppabeautiful.org/IllegalDumpSurveys.aspx>.



- A partnership was established with County Conservation Districts and other conservation groups to encourage riparian buffer plantings, offering \$1 for every tree planted. In 2012 4,040 trees were planted through this partnership.
- In April 2012, TreeVitalize partnered with WITF to plant 200 tree seedlings at the Flight 93 memorial. These trees went towards a combined planting of 13,000 trees. Later in the year TreeVitalize partnered with WDIY and Lehigh County Parks and planted 530 tree seedlings at the Lehigh Gap Nature Center.
- TreeVitalize has partnered with local Central Pennsylvania nurseries to offer homeowners a \$15 off tree coupon. In 2012, the TreeVitalize “Trees Count, Pa!” coupon program planted 799 trees.
- An agreement to expand Urban Tree Canopy (UTC) within the Chesapeake Bay Watershed was signed by the Chesapeake Executive Council (the Governors of Maryland, Pennsylvania, and Virginia) as part of the Expanded Riparian Forest Buffer Goals in 2003. This directive commits each state to partner with at least five communities to set and pursue a specific goal for increased tree canopy in developed areas. PA Urban and Community Forestry Council hired a Chesapeake Bay forester to work with communities through the assessment, planning and implementation processes to reach the UTC goals. To date over 100 communities in PA have the tree canopy data which has been utilized in receiving grants for trees, promoting the benefits of trees, and targeting areas where tree planting and preservation are highest priority.
- In 2011 (which is the most recent data available), approximately 62,000 dry tons of biosolids were applied to approximately 6,000 acres land including both agricultural and mine reclamation lands.
- DEP’s Biosolids Program continued to provide formal training for biosolids generators and land appliers in recommended procedures for producing and applying biosolids during 2011.
- The program continued to register haulers of residential septage in an effort to eliminate illegal disposal practices.
- The program also reviewed and processed permit applications for the beneficial use of biosolids and residential septage, conducted inspections of biosolids processing facilities and application sites and took appropriate enforcement action when violations of Department regulations were discovered.
- Pa DEP has overseen the clean-up of over 374,525 discarded tires in five identified large outdoor tire piles found within 4 counties in the state.

## Pennsylvania Nonpoint Source Management Program Funding

The following table summarizes non-point source funding initiatives implemented by program partners throughout the state during the FFY2012.

(All figures are in federal fiscal year dollars unless otherwise noted)

<b>State Sources</b>	FFY 2010	FFY 2011	FFY 2012
<b>DEP</b>	(\$ millions)	(\$ millions)	(\$ millions)
Conservation District Watershed Specialists	1.963	1.963	1.963
Environment Stewardship and Watershed Protection (Growing Greener):			
Allocation	8.073	9.720	12.458
Surface Mining Conservation and Reclamation Grant	1.784	0.0	0.073
Sub-total	11.820	11.683	14.421
<b>DEP</b>			
Chesapeake Bay Implementation Grant; state fiscal year Funding:			
Technical and Engineering Assistance	2.613	2.635	2.715
Special Projects	1.354	0.810	0.737
Sub-total	3.967	3.445	3.452
<b>DEP</b>			
Conservation District Fund Allocation Program	2.914	2.885	2.856
Dirt and Gravel Roads Pollution Prevention Program FY2010-2011 Allocation	3.528	3.528	3.528
Nutrient Management Fund (11-12) (12-13)	2.035	2.562	2.073
Abandoned Mine Reclamation Program annual Projects	0.380	0.620	0.335
American Recovery and Restoration Act (ARRA)	>20.000	1.300	0.0
PA Infrastructure and Investment Authority (PENNVEST)	17.149	34.029	20.971
Sub-total	46.006	44.924	29.763
<b>PDA</b>			
Nutrient Management Fund	0.706	0.830	0.755
Conservation District Fund Allocation Program	1.039	1.029	1.019
Resource Enhancement and Protection Tax Credits Available (11-12) and (12-13)	4.500	10.000	10.000
Sub-total	6.245	11.859	11.774

<b>Federal Sources</b>	FFY 2010	FFY 2011	FFY 2012
<b>U.S. Environmental Protection Agency</b>			
Section 319 Nonpoint Source Management Program	5.680	5.004	4.609
<b>National Fish and Wildlife Foundation</b>			
Chesapeake Bay Small Watershed Grant-annual Funding	0.554	0.737	0.702
Chesapeake Bay Innovative Nutrient and Sediment Reduction Grant	0.400	2.55	2.026
Technical Assistance Grant	0.0	0.0	0.831
Sub-total	6.634	8.291	8.168
<b>U.S.D.A. Natural Resources Conservation Service</b> Obligated Funding Levels:			
Agricultural Management Assistance	0.855	0.700	0.168
Chesapeake Bay Watershed Initiative	9.776	19.400	15.533
Environmental Quality Incentive Program	12.886	13.500	18.636
Farm and Ranchland Protection Program	6.300	4.000	4.39
<b>U.S.D.A. Natural Resources Conservation Service</b> Obligated Funding Levels:			
Conservation Stewardship Program	3.975	0.880	0.832
Wetlands Reserve Program	4.100	8.600	10.0
Wildlife Habitat Incentive Program	0.822	0.800	0.892
Sub-total	38.714	47.880	50.451
<b>U.S.D.A. Farm Services Agency</b>			
Conservation Reserve Enhancement Program Includes Financial Incentives, Cost-Share and Rental Payments.	25.948	22.181	20.690
Biomass Crop Assistance Program	3.694	0.020	0.339
Grassland Reserve Program	0.049	0.160	0.148
Sub-total	29.691	22.361	21.177
<b>Office of Surface Mining</b>			
AML Reclamation Funding (FY2010) Includes AML, Clean Streams Initiative and Watershed Cooperative Agreement Program.	43.807	47.627	67.152
Sub-total:	43.807	47.627	67.152
<b>TOTAL</b>	186.542	198.070	206.358