

# Adams County Phase 3 WIP - Recommendations



Phase 3 WIP - State Work Group Meeting Presentation  
Wednesday, February 20, 2019



**ADAMS COUNTY  
CONSERVATION DISTRICT**



## ADAMS COUNTY PHASE 3 WATERSHED IMPLEMENTATION PLAN OVERVIEW

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### Plan Highlights

Adams County benefits from abundant natural resources, a conservation-minded agricultural community, a thriving tourism industry, and an active stakeholder base with a demonstrated commitment to land and water resource stewardship. This plan includes recommendations for activities that help to achieve local goals like environmental health and economic development as well as Chesapeake Bay water quality goals. The plan's recommendations were developed with input from diverse county stakeholders. County staff would like to thank all of the stakeholders who volunteered their time and expertise as part of this planning process and for their continued participation to maintain a successful pollutant reduction strategy in the future.

The Adams County plan focuses on four key areas; specifically, 1) programmatic recommendations that are needed for any of the goals of this planning effort to be achieved; 2) reporting and tracking improvements; 3) achieving pollutant reductions; and 4) research, education, and training initiatives; Each of these are introduced here in turn. First, programmatic changes are a priority that recommend statewide activities that are needed to facilitate the implementation of this plan's recommendations. Reporting and tracking are essential to understanding what is already on the ground (establishing an accurate baseline) and tracking BMP implementation and water quality conditions during implementation to ensure accuracy. The pollutant reduction section includes recommendations for a series of



*Cover crops are essential to Adams County soil and water quality and are strongly supported by the ag community.*

agricultural and urban Best Management Practices (BMPs). Finally, research, education, and training are essential to understanding the effectiveness and practicality of various BMPs, communicating with and educating stakeholders, and developing needed technology and skills.

### Key Findings

There are many opportunities for expanding existing efforts and developing new programs and practices in the county, as described in detail in the planning template. These opportunities can be associated with numerous benefits and challenges (see sections on these topics below). Some of these opportunities and/or challenges are unique to Adams County. Full implementation of the recommendations described in the plan will not be possible without considerable additional resources or the state's assistance in better utilizing existing resources. Identifying and securing the needed resources will be no small task.

# ADAMS COUNTY

## PHASE 3 WATERSHED IMPLEMENTATION PLAN OVERVIEW

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### Opportunities for Success

Implementation of the county's plan can help achieve multiple local, state, and bay-wide objectives. It may also have numerous positive outcomes like encouraging and enhancing communication with stakeholders, promoting a think-outside-the-box mindset, implementing pilot studies that promote ingenuity and enhance understanding of the practicality of various practices, streamlining requirements across multiple programs, and removing barriers to on-the-ground implementation.



*The annual Adams County Soil Quality Meeting is always well attended by the conservation-minded ag community.*

Overcoming the challenges will enable the plan's implementation and facilitate the associated improvements in water and land conditions throughout the county.

### Challenges to Implementation

While Adams County is committed to a sustainable land and water resources future, there are very real challenges to implementation of the plan's recommendations. Existing regulations, programs, and funding need to be streamlined so existing resources can be better utilized. Recommendations should be implemented in a voluntary approach that supports and encourages stakeholders to make environmentally conscious decisions. Funding to achieve these goals should be flexible and uncomplicated particularly for projects correcting existing resource concerns. Technical and staffing resources will be crucial to implement the programs and practices necessary to achieve the desired goals. Additional baseline information should be obtained, that maintains confidentiality as needed, for both BMPs and water quality to evaluate progress over time. Improved data collection and tracking methods are vital to ensure accuracy and will require tremendous staffing and financial resources to achieve. Finally, and possibly most important, soils and weather patterns can severely limit the ability to implement management practices like no-till, cover crops, and crop rotation. The development of gully erosion in fields is common and preparing plans will not locate or treat these issues.

### Issues Unique to Adams County

There are additional issues and challenges that are unique to Adams County. Adams County has a diverse fruit crop industry. Long known for being the number one producer of apples in the state; Adams County also produces peaches, grapes, berries and other fruits. According to Penn State Extension surveys, there are over 31,000 acres of tree fruit in the Commonwealth with more than 22,000 of those acres found in the Historic South Mountain Fruit Belt of Adams County. The fruit growing industry has many distinctive challenges and unique practices that should be evaluated to allow for use in the bay model. The fact that Penn State University has a research and education facility located in the county to assist with this particular industry does provide some necessary technical resources for the evaluation but additional technical and

## ADAMS COUNTY

### PHASE 3 WATERSHED IMPLEMENTATION PLAN OVERVIEW

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financial resources may be necessary to adequately provide for this. Additionally, there is currently technology that is unique to Adams County. A sizeable energy and nutrient recovery facility is located in the county that has the ability to process large quantities of poultry manure to provide for substantial nitrogen reductions. This facility and other emerging technologies should continue to be considered, evaluated for approval by the Pennsylvania Department of Environmental Protection; and supported with the technical, legislative, regulatory, and financial resources necessary to activate and maintain operations.



*Adams County is home to the Historic South Mountain Fruit Belt produces more apples than any county in the Commonwealth.*

#### **Plan Summary**

The Adams County plan focuses on essential programmatic recommendations necessary for the achievement of any of the pollutant reduction goals in this plan as well as planning and progress activities that focus on three priority initiatives 1) reporting and tracking; 2) pollutant reductions; and 3) research, education, and training. Each of these is associated with a number of recommended actions, listed below. More details on each of these actions are provided in the attached templates and technical appendix.

#### **Programmatic Recommendations**

Programmatic changes are recommended for statewide activities necessary for achieving the plan objectives.

- Action 1 Improve statewide tracking;
- Action 2: Enhance local water quality monitoring;
- Action 3: Improve funding program requirements and enhance funding resources;
- Action 4: Allow for work outside of current MS4 designated jurisdiction to increase nitrogen reductions;
- Action 5: Improve permitting processes at the state level;
- Action 6: Evaluate current system of incentives/implementation for agricultural practices and define enhanced incentive program for BMPs with greatest impact on nutrient loads to obtain landowner cooperation;
- Action 7: Evaluate current practices in the fruit growing industry for inclusion in the CAST model;
- Action 8: Expand staffing resources to conduct additional activities described in this plan; and
- Action 9: Expand state agricultural workgroup representation.

# ADAMS COUNTY

## PHASE 3 WATERSHED IMPLEMENTATION PLAN OVERVIEW

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### Planning and Progress Activities

#### 1) Reporting and Tracking

Reporting and tracking are important to establishing an accurate baseline and evaluating implementation progress for both BMP installments and water quality conditions.

- Action 1: Initiate additional water quality monitoring sites that promote long-term trend evaluation at key locations in Adams County Establish baseline of current practices for comparison with future implementation;
- Action 2: Improve data collection on urban non-structural practices;
- Action 3: Implement a documentation program for commercial and homeowner nutrient applications in developed lands; and
- Action 4: Establish baseline of current practices for comparison with future implementation.

#### 2) Achieve Pollutant Reductions

Agricultural and urban BMPs are described in the eighteen action items in this initiative. A list of specific BMP types and amounts are provided in the technical appendix.

#### *General*

- Action 1: Establish a set of BMPs that will achieve desired pollutant reductions in an efficient and cost effective manner;
- Action 2: Identify key areas for installation of BMPs with greatest net effect on nutrients;
- Action 3: Evaluate technologies to enhance nutrient reductions;
- Action 4: Conduct pilot studies to identify and/or confirm efficiency of practices; and
- Action 5: Provide support for necessary legislation and regulatory changes.

#### *Agricultural Sector*

- Action 6: Reduce challenges with BMP implementation;
- Action 7: Improve Soil Health;
- Action 8: Enhance nutrient management;
- Action 9: Install riparian buffers; and
- Action 10: Provide for other Ag BMP's;



*Local volunteers planting riparian buffers.*

## ADAMS COUNTY

### PHASE 3 WATERSHED IMPLEMENTATION PLAN OVERVIEW

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#### *Urban Sector*

- Action 11: Seek creative solutions to focus on the problem (pollution), not the geography (MS4 and urban areas) ;
- Action 12: Create a documentation program for urban nutrient management;
- Action 13: Install riparian buffers on public lands;
- Action 14: Create additional natural areas
- Action 15: Establish more Shade Tree Commissions;
- Action 16: Implement other urban initiatives, i.e. stream restorations, etc.
- Action 17: Promote creation of additional sewage management districts at the municipal level; and
- Action 18: Evaluate the formation of a Countywide Stormwater Management Authority.

#### 3) Research, Education, and Training

Research, education, and training are essential to understanding the effectiveness and practicality of BMPs, communicating with and educating stakeholders, and developing needed technical skills.

- Action 1: Develop a strategy to communicate parallel goals of the WIP3 and local goals such as public and environmental health, economic development, and provide necessary education and training;
- Action 2: Conduct 20-acre pilot studies of agricultural BMPs to assess impacts to profitability; and
- Conduct education of commercial landscape industry/golf courses/homeowners regarding urban nutrient management.

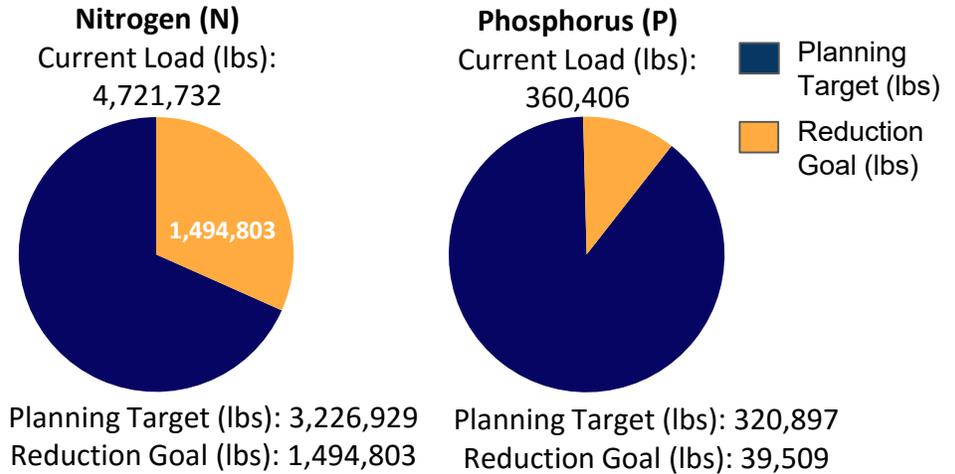


*Ultimately, while planning is vital for progress; it is the community, whether it be agricultural or urban, that recognizes and addresses resource concerns as they arise that is essential for this or any project to succeed.*

# Adams County, Pennsylvania

## Current Conditions

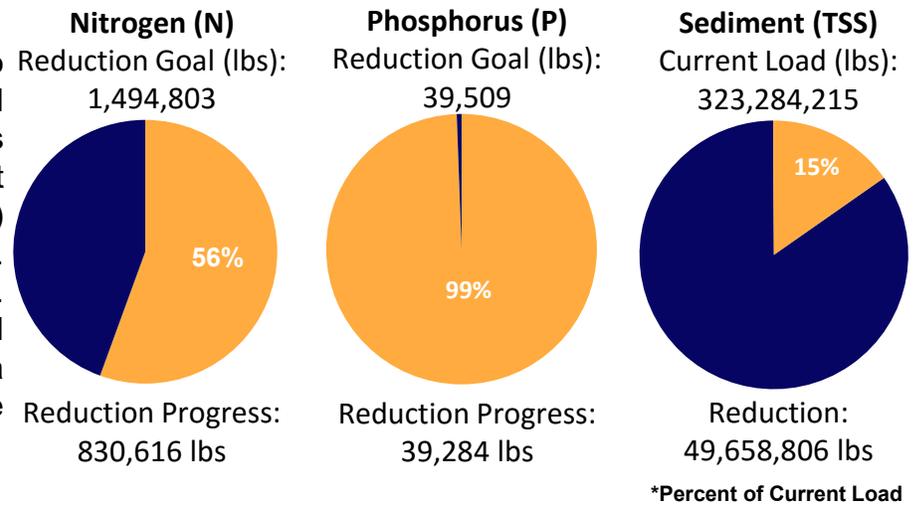
Adams County is one of the higher loading counties in Pennsylvania's Chesapeake Bay Watershed. Current loading rates are 4.72M lbs of nitrogen and 360.41K lbs of phosphorous annually. Adams County's goal is to reduce 1.49M lbs of nitrogen and 39.5K lbs of phosphorous by 2025.



## Pollutant Reduction Progress

By 2025, Adams County's goal is to reduce 1.49M lbs of nitrogen and 39.5K lbs of phosphorous. Adams County has developed a plan that intends to reduce 830.62K lbs. (56%) of the nitrogen goal and 39.28K lbs. (99%) of the phosphorous goal. Sediment reductions are not required but this planning effort provides for a reduction of 49.66M lbs (15%) of the current load.

■ Nutrient Reduction Progress  
■ Remaining Reduction



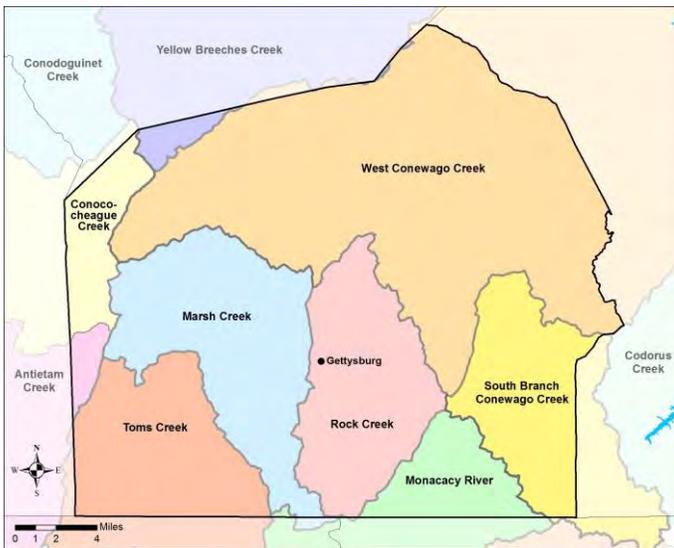
## Priority Initiative Progress

Adams County has identified three (3) priority planning/progress initiatives: 1) Enhanced reporting and tracking; 2) Achieving pollutant reductions; and 3) Research, education and training. Ag Sector initiatives for pollutant reductions account for a reduction of 827.79K lbs. of nitrogen. The stormwater initiatives, including non-MS4 municipalities reduce an additional 970 lbs of nitrogen.

| Initiative              | Nitrogen (lbs.) | Phosphorous (lbs.) |
|-------------------------|-----------------|--------------------|
| Agriculture             | 827,789         | 38,802             |
| Stormwater              | 970             | 97                 |
| PRPs                    | 1,858           | 385                |
| <b>Total Reductions</b> | <b>830,616</b>  | <b>39,284</b>      |

Adams County's PRPs and other municipal initiatives have identified practices that reduce 1.86K lbs. of nitrogen. These priority initiatives result in a total reduction of 830.62K lbs. of nitrogen. In addition to the 3 planning initiatives, there are significant programmatic recommendations that will be necessary to meet these targets including; improving funding program requirements and enhanced funding resources, streamlining the state permitting processes and allowing for projects to be conducted where they are most impactful to the environment even if they are completed by MS4 municipalities outside of their jurisdiction.

# Adams County Watershed Map



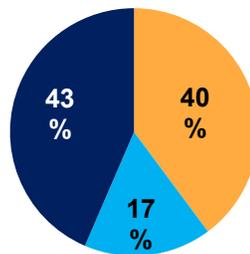
## Information About the Watersheds

Adams County contains seven major watersheds: Conococheague Creek, West Conewago Creek, South Branch Conewago Creek, Marsh Creek, Rock Creek, Monacacy River, and Toms Creek. While these watersheds have been some of the highest loading watersheds in Pennsylvania's Chesapeake Bay Watershed, monitoring shows that conditions for nitrogen have been improving which means nitrogen levels are decreasing. Conditions for phosphorous are remaining steady, which means no change in phosphorous levels. Of the 1,270 total stream miles in Adams County, approximately 30% are nutrient impaired.

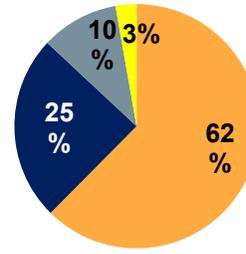
## County Land Use

Adams County has a total acreage of 333,943 acres. Agricultural land represents 40% of the total land with 133,008 total acres. Developed land represents 17% of the total land with 55,614 total acres. Natural land, which is made up of forests, streams and wetlands, represents the remaining 43% or 145,321 total acres. Cropland makes up a majority of the Agriculture sector with 83,037 acres. The developed sector is mostly Non - Municipal Separate Storm Sewer Systems (MS4s) (86%) 47,811 acres and a small portion of MS4 (14%) 7,803 acres.

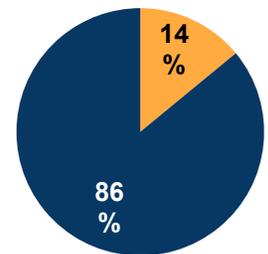
**Adams County:** Total Acres: 333,943  
**Agriculture:** Total Acres: 133,008  
**Developed:** Total Acres: 55,614



- Agriculture
- Developed
- Natural



- Cropland
- Hay
- Pasture
- Other Ag



- MS4

## Local Benefits

Adams County promotes voluntary conservation and good stewardship of natural resource to maintain a balance and harmony between a profitable agricultural economy and other land uses to enhance our quality of life. The efforts of this planning project are indicative of this local mindset and are intended to protect our resources and those of our neighbors downstream.



Flooding affects safety, property, infrastructure, and economics.



Adams County relies on local water sources to supply drinking water to its residents.



Just like humans, Adams County's livestock depend on clean water.

## Learn more and Get Involved

To get involved with the Watershed Implementation Plan (WIP) please visit:

<https://bit.ly/2RE7Dzb> or

<http://www.adamscounty.us/Dept/Conservation/Pages/default.aspx>



## Phase 3 Watershed Implementation Plan (WIP) Programmatic Recommendations

| Action #                             | Description   | Performance Target(s)  | Expected Timeline | Potential Implementation Challenges   | Potential Recommendations on Improvement   | Resources Needed<br><i>*Needs further evaluation</i> |                      |                       |                                |
|--------------------------------------|---|--|-------------------|---|--|--|----------------------|-----------------------|--------------------------------|
|                                      |   |  |                   |   |  | Technical  | Suggested Source     | Financial             | Suggested Source               |
| <b>Programmatic Recommendations:</b> |   |  |                   |   |  |  |                      |                       |                                |
| P.1                                  | Improve permitting processes at state level                                     | Streamline permitting processes to allow for increased implementation efforts specifically chapter 105                   | 2019/Ongoing      | Evaluation of current permitting process required. Staff resources would be needed to accomplish.   | Reduce time necessary to produce permit packages from partners and process permits by state.                   | State staff required. (? FTE)                        |                      |                       |                                |
| P.2                                  | Improve funding program requirements  | Simplify funding to allow for more flexible use of funds, i.e., block grant model  | 2019/Ongoing      | Evaluation of existing programs needed for improvement and efficiency. State staff resources would be needed to accomplish. Limited financial resources to preserve backlog of conservation easement applications. (Important as conservation plans are required as part of this process.)  | Coordination among all funding sources to reduce administration and enhance implementation.                    | DEP Staff (#? FTE)                                   |                      | *                     | DEP<br>State/federal funding   |
| P.3                                  | Allowance for work outside of MS4 jurisdictions to increase nitrogen reductions | Provide for credit for BMP's implemented by MS4 municipalities outside their jurisdiction to enhance nitrogen reduction. | 2020/Ongoing      | Change in regulations required. Limited BMP funding.  |  | Ag Technicians (2 FTE)                               | New County Employees | \$150,000/yr          | State/Federal grant assistance |
| P.4                                  | Expand staffing resources to conduct additional work described in this plan     | Provide appropriate staffing levels as needed to achieve goals   | Ongoing           | Implementation of the county recommendations cannot be accomplished with existing staff and expertise.<br><br>Additional staffing may also be needed in other agencies to support county implementation. E.g. NRCS staff typically write the conservation plans in Adams County. If additional plans are needed, either NRCS staffing needs to be expanded, the Conservation District needs to hire a dedicated plan writer, or a private sector plan writer needs to be hired. | Any changes in regulation must be accompanied by the resources necessary to achieve the desired objective.     | Evaluate as necessary                                |                      | Evaluate as necessary |                                |
| P.5                                  | Enhance local water quality monitoring  | Improved tracking of Adams County specific pollution levels  | Ongoing           | Upgrades to the East Berlin monitoring station.<br>Recognition of local data collection efforts.  | Rely more on water quality data rather than the model and allow local data collection efforts to be recognized | USGS   |                      |                       |                                |
| P.6                                  | Improve statewide tracking  | Improved tracking is needed by DEP related to existing data and BMPs/infrastructure across the                           | Ongoing           | Local cooperation with the state is needed in addition to possible funding for staffing resources.  | Clarification on information being documented.<br>More inclusive allowances for urban                          |  |                      |                       | DEP                            |

|            |   |   |      |   |   |  |                       |              |   |
|------------|---|---|------|---|---|--|-----------------------|--------------|---|
|            |   | spectrum including ag and urban sectors.  |      |   | BMP's   |  |                       |              |   |
| <b>P.7</b> | Evaluate current system of incentives/implementation for agricultural practices and define enhanced incentive program for BMPs with greatest impact on nutrient loads to get landowner buy-in | Ensure programs are more efficient, flexible and user friendly with incentives where possible to encourage land-owner buy-in. | 2025 | Landowner buy in is a challenge, existing incentive programs don't pay for certain parts of implementation (e.g. maintenance).<br><br>Cover crop practices involve costs for equipment, pest management, etc. Incentive programs should account for more than planting alone. | CREP program has not been a sought after program in Adams County because of the lack of flexibility. Additional flexibility needed to make the program successful | Additional staff: Ag Technicians (2 FTE) | New County Employees  | \$150,000/yr | State/Federal grant assistance and possible technical provider circuit rider assistance |
| <b>P.8</b> | Evaluate current and innovative practices in the fruit growing industry   | Allow specific practices to be considered BMPs in the model.  | 2020 | Nitrogen and phosphorus numbers for orchards (and associated assumptions) need to be revisited for accuracy and completeness. Additional monitoring necessary. DEP/NRCS/Penn State Extension staff required.  | Allow practices unique to the fruit growing industry to be validated for use in the model.  | 3 (FTE)                                  | State and Local Staff | \$150,000    | State/Federal grant assistance  |
| <b>P.9</b> | Expand state agricultural workgroup representation  | Seek orchard representation on the state agricultural workgroup   | 2019 | Orchards are unique and the industry should have representation on the state workgroup.   | Identify potential representative(s) through standard selection procedures  |  |                       |              |   |

**Template 1. Phase 3 Watershed Implementation Plan (WIP) Planning and Progress Template**

| Action #   | Description   | Performance Target(s)   | Responsible Party(ies) and Partnerships                       | Geographic Location | Expected Timeline | Potential Implementation Challenges or Recommendations                  | Resources Available<br>*Further evaluation required. |        |  |        | Resources Needed<br>*Further evaluation required.   |                         |   |                                   |
|--|---|---|---|---------------------|-------------------|---|--|--------|--|--------|---|-------------------------|---|-----------------------------------|
|  |   |   |   |                     |                   |   | Technical  | Source | Financial  | Source | Technical   | Suggested Source        | Financial   | Suggested Source                  |
| <b>Priority Initiative 1: Reporting and Tracking</b> |   |   |   |                     |                   |   |  |        |  |        |   |                         |   |                                   |
| 1.1  | Initiate additional water quality monitoring sites that promote long-term trend evaluation at key locations in Adams County | <p>Additional sites as needed to evaluate Adams County progress as well as progress for specific land uses or projects in the county</p> <p>Additional monitoring capabilities needed at monitoring station at East Berlin and Bridgeport Stations to analyze nitrogen and phosphorus</p> <p>Increase technical capacity to be able to evaluate loading trends</p> <p>Work w/ state so citizen stream monitoring data can be utilized</p> <p>It is important to monitor implementation progress in terms of water quality, not just using the model</p> | WAAC, USGS, DEP, USGS, Conservation District                  | Adams County        | 2025              | Additional funding and coordination with USGS                           | *  |        | Cost savings may be realized if existing stations can be upgraded where possible |        | <p>Year 1 equipment cost/setting up East Berlin &amp; Bridgeport to collect N &amp; P</p> <p>Annual costs maintaining equipment, developing regression models, calibration, displaying on the web</p> | <p>USGS</p> <p>USGS</p> | <p>\$190,000</p> <p>\$75,000/yr per site East Berlin &amp; Bridgeport</p> | <p>USGS, DEP</p> <p>USGS, DEP</p> |
| 1.2  | Improve data collection on urban non-structural practices   | Chapter 102 provide more credit for non-structural practices.   | ACOPD, Conservation District, DEP, developers, municipalities | Adams County        | Ongoing           | <p>Long-term compliance.</p> <p>Maintaining accurate BMP inventory.</p> | *  |        | *  |        | *   |                         | *   |                                   |

|     |   |  |                              |                            |         |   |   |  |   |  |           |               |   |                       |
|-----|---|--|------------------------------|----------------------------|---------|---|---|--|---|--|-----------|---------------|---|-----------------------|
| 1.3 | Implement a documentation program for commercial and homeowner nutrient applications in developed lands | Required Urban Nutrient management plans   | DEP, SCC, Landscape Industry | Statewide                  | 2020    | Commercial and home use of nutrients should be evaluated in the CAST model, more data are needed on current application levels.   | * |  | * |  | *         |               | * |                       |
| 1.4 | Establish baseline of current practices for comparison with future implementation                       | Develop/implement a process for capturing current agricultural best management practices that are unreported<br><br>Create a systematic process and database for inventorying stormwater management practices and facilities in MS4 and non-MS4 municipalities | DEP                          | Adams County and Statewide | Ongoing | Verification of BMP's is time intensive.<br><br>Identify the types of unreported, currently installed BMPs that would provide significant credit if verified. Focus on verifying those BMPs.<br><br>Privacy concern | * |  | * |  | *Staffing | DEP and Local | * | State/federal funding |

### Priority Initiative 2: Achieve Pollutant Reductions

|     |  |  |  |              |      |  |   |                               |   |  |  |                           |  |                                |
|-----|--|--|--|--------------|------|--|---|-------------------------------|---|--|--|---------------------------|--|--------------------------------|
| 2.1 | Establish a set of BMPs that will achieve desired pollutant reductions in an efficient and cost effective manner | BMP Implementation   | ACOPD, Conservation District, NRCS, Municipalities, DEP, EPA, Stakeholders | Adams County | 2025 | There are considerable resource limitations to implement BMPs as described throughout this template. | Resources available for implementation of existing programs |                               | Resources available for implementation of existing programs |  | Substantial staffing and technical resources will be needed to fully implement the proposed BMPs | State and federal sources | Substantial staffing and technical resources will be needed to fully implement the proposed BMPs | State and federal sources      |
| 2.2 | Identify key areas for installation of BMPs with greatest net effect on nutrients                                | Complete GIS analysis to identify priority areas.<br><br>Support legislation as necessary to achieve reductions that make the most economic sense. | ACOPD, Conservation District, DEP, WAAC, ICPRB, SRBC                       | Adams County | 2025 | This information is needed to prioritize key areas.<br><br>Landowner buy-in.                         | GIS expertise   | County, ICPRB, and SRBC staff | Resources available for ongoing GIS analyses                |  | Technical resources needed to complete GIS analysis  | State and federal sources | Funding needed for staff time and/or funding for external organization to conduct analysis       | State/ federal funding sources |

|     |   |   |  |                         |              |   |   |  |   |  |   |  |   |                           |
|-----|---|---|--|-------------------------|--------------|---|---|--|---|--|---|--|---|---------------------------|
| 2.3 | Evaluate technologies to enhance BMP's                                    | Identify additional technology or improvements to practices to enhance nutrient reductions  | DEP, Penn State, NRCS, Conservation District | Adams County, Statewide | 2020/Ongoing | Utilize technology to process livestock manure for improved management and greater storage capacity, i.e., small capacity digesters.<br><br>Farm operator buy-in as well as funding remains a challenge.  | * |  | * |  | * |  | * | State and Federal Funding |
| 2.4 | Conduct pilot studies to identify and/or confirm efficiency of practices. | Investigate opportunities to improve efficiency of BMP's  | DEP, Penn State, NRCS, Conservation District | Adams Count, Statewide  | 2020/Ongoing | Financial and technical resources will be needed but will not be able to be specified until pilots are introduced<br><br>Landowner participation will be crucial  | * |  | * |  | * |  | * |                           |
| 2.5 | Provide support for necessary legislation and regulatory changes.         | Support legislation and regulatory and policy changes that will allow the utilization of proven technology and ensure financial support to maintain operations that address specific pollutants, i.e. poultry manure, etc.<br><br>Provide a framework for urban nutrient management that will establish requirements for the application of fertilizer for commercial operations (including golf courses) and homeowners. | DEP and PA legislature                       | Statewide, Adams County | 2019/Ongoing | Support legislation and regulatory and policy changes that will provide the ability to utilize proven technology to reduce pollutant levels.<br><br>Specifically, support Senate Bill 799 establishing the PA Clean Water Procurement Program committing funding to the purchase of long-term nutrient reduction credits.<br><br>Support SB 792 establishing requirements for urban nutrient management including planning for commercial operations (including golf courses) | * |  | * |  | * |  | * |                           |

|  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  | and homeowners regarding the application of fertilizer. |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|

**Agricultural Sector**

|     |  |  |   |           |      |   |  |  |  |  |  |                |              |                                     |
|-----|--|--|---|-----------|------|---|--|--|--|--|--|----------------|--------------|-------------------------------------|
| 2.6 | General Challenges with BMP implementation |  | Conservation District, NRCS, DEP, Army Corps, PDA, SCC, PAFB, FWS, PGC, NPS, landowners, Municipalities | Statewide | 2019 | <p>Reduce administrative burdens of permits and current funding to better utilize our current resources: Simplify Chapter 105 permitting and create block grants for BMPs fixing existing resource concerns.</p> <p>Allow for MS4's to install BMPs outside of their MS4 area (municipal cost savings but more load reduced). (1.5x rate?)</p> <p>Additional funding for technicians and BMPs needed to additionally increase current outputs</p> <p>Allow flexible funding options to meet landowner's needs</p> <p>Confidentiality of agricultural operators/producers</p> <p>Verification of BMPs: annual/periodic bmps and verification beyond installation would be difficult, time consuming, and require additional support.</p> |  |  |  |  |  | 2 FTE Ag Techs | \$150,000/yr | State/federal grant funding sources |
|-----|--|--|---|-----------|------|---|--|--|--|--|--|----------------|--------------|-------------------------------------|

|            |                     |  |  |              |      |  |  |  |  |  |   |   |   |   |   |
|------------|---------------------|--|--|--------------|------|--|--|--|--|--|---|---|---|---|---|
|            |                     |  |  |              |      | Identify mechanism and party to verify BMPs.   |  |  |  |  |   |   |   |   |   |
|            |                     |  |  |              |      | Getting proper credit for current BMPs if there is value.  |  |  |  |  |   |   |   |   |   |
|            |                     |  |  |              |      | Include Orchard representation on State Ag Workgroup.  |  |  |  |  |   |   |   |   |   |
|            |                     |  |  |              |      | Need ability to implement BMPs on Nation Park Service property.  |  |  |  |  |   |   |   |   |   |
| <b>2.7</b> | Soil Health         | <p><i>High Residual Till - 55,000 acres annually</i></p> <p><i>Conservation Till - 13,000 acres annually</i></p> <p><i>Cover Crop - 30,000 acres annually</i></p> <p><i>Cover Crop w/Fall Nutrients – 10,000 acres annually</i></p> <p><i>Prescribed Grazing – 3,500 total acres</i></p> <p><i>Soil Conservation/Water Quality Plans – 101,000 acres annually</i></p> <p><i>Manure Incorporation – 10,000 acres annually</i></p> | Conservation District, NRCS, RC&D, DEP, PDA, SCC, Plan Writers, landowners and operators | Adams County | 2025 | <p>Need dedicated source of funding for Cover Crops.</p> <p>Mechanism/staff to verifying plans and annual practices.</p> <p>Weather and soils severely impact feasibility of implementation.</p> <p>Determine where and how vertical tillage can be used in a farmer’s conservation plan and for incorporating manure.</p> |  |  |  |  | <p>verification of practices</p> <p>Verification of plans</p> | <p>DEP, PDA, SCC</p> <p>DEP, PDA, SCC</p>     | <p>\$1,600,000/yr for cover crops (\$40/acre) (verification cost not included)</p> <p>\$1,010,000 Ag E&amp;S plans (\$500 plan/50 acres) (verification of plans not included)</p> | <p>DEP, PDA, SCC</p> <p>DEP, PDA, SCC</p>   |   |
| <b>2.8</b> | Nutrient Management | <p><i>Nutrient Management Core N&amp;P - 104,000 N&amp;P acres annually</i></p> <p><i>Nutrient Management Rate N&amp;P – 10,000 N&amp;P acres annually</i></p> <p><i>Nutrient Management Time N&amp;P -10,000 N&amp;P acres annually</i></p>   | Conservation District, NRCS, SCC, private agricultural contractors, local farmers        | Adams County | 2025 | <p>Mechanism/staff to verifying annual and current practices.</p> <p>Weather and soils severely impact feasibility of implementation.</p>  | Conservation District staff can educate about these recommended actions during routine conversations |  |  |  |   | <p>verification of practices</p> <p>1 FTE</p> | <p>PDA, DEP, SCC</p> <p>PDA, DEP, SCC</p>   | <p>\$1,040,000 Ag Manure &amp; Fertilizer plans (\$500 plan/50 acres)</p> <p>\$100,000/yr</p> | <p>PDA, DEP, SCC</p> <p>PDA, DEP, SCC</p> |

|            |          |   |   |              |      |  |                         |  |  |  |                                    |               |   |  |
|------------|----------|---|---|--------------|------|--|-------------------------|--|--|--|------------------------------------|---------------|---|--|
|            |          |   |   |              |      | <p>Three applications over the growing season rather than one impacted by weather</p> <p>Equipment to reduce overlap of fertilizer on fields \$30K/per spreader (not practical)</p> <p>Currently no template plans for inorganic fertilizer plans.</p> <p>Yields vary based on soils and weather.</p> <p>Establishing soil specific, realistic yield goals requires considerable one-on-one interaction</p> <p>Several years of results are needed for review and development of a variable rate technology program.</p> | with farmers/landowners |  |  |  | Adams Co Agronomist                | PDA, DEP, SCC |   |  |
| <b>2.9</b> | Riparian | <p><i>Stream Restoration – 10,000 new linear feet</i></p> <p><i>Grass Buffers w/Exclusion Fencing – 200 new acres</i></p> <p><i>Forest Buffer w/Exclusion Fencing – 100 new acres</i></p> <p><i>Grass Buffers – 1,000 new acres</i></p> <p><i>Forest Buffers – 500 new acres</i></p> <p><i>Wetland Restoration – 25 new acres</i></p> | Conservation District, USDA, DEP, Army Corps, DCNR, contractors, local farmers, nonprofits, PFBC, CBF, PACD, nonprofits | Adams County | 2025 | <p>Chapter 105 permitting a major hurdle for drainage and stream restoration projects.</p> <p>Prioritize grass waterways on areas of active field erosion to capture soil and nutrients and not based GIS database.</p> <p>Prioritize forest buffers on 3rd order streams on agricultural lands and 1<sup>st</sup>/2nd order in abandoned ag land.</p>   |                         |  |  |  | Third party maintenance of buffers | DCNR          | <p>\$2,400,000 Forest buffer planting (\$4,000/acre)</p> <p>\$7,150,000 Grassed buffers in eroding fields</p> | <p>DEP, DCNR</p> <p>USDA, DEP, PDA, DCNR, nonprofits</p> <p>USDA, DEP, PDA, nonprofits</p> |

|             |               |  |   |              |      |  |  |  |  |  |  |  |   |
|-------------|---------------|--|---|--------------|------|--|--|--|--|--|--|--|---|
|             |               |  |   |              |      | <p>Buffers are a labor intensive management practice.</p> <p>Incentive program needed to compensate for long-term loss of crops.</p> <p>Remove buffered lands from tax parcels<br/>The ability to fix failing buffers is needed (e.g. stream movement over time undermines buffers and they cannot be fixed without permits and expense).</p> <p>Need more research on value of saturated buffers.</p> |  |  |  |  |  | <p>(\$6,500/acre)</p> <p>\$937,500 fencing associated w/ buffers (\$3,125/acre)</p> <p>\$880,000 stream restoration (\$88/ linear ft)</p> <p>\$156,250 wetland restoration (\$6,250/acre)</p> <p>\$4,000/0.5 acre of saturated buffers</p> | <p>USDA, DEP, PDA, nonprofits</p> <p>USDA, DEP, PDA, nonprofits</p> <p>USDA, DEP, PDA, nonprofits</p> <p>USDA, DEP, PDA, nonprofits</p> |
| <b>2.10</b> | Other Ag BMPs | <p><i>Land Retirement – 1,500 new acres</i></p> <p><i>Forest Harvesting Practices – 100%</i></p> <p><i>Waste Storage Facilities – 4,000 new Animal Units</i></p> <p><i>Barnyard Runoff Controls – 15 new acres</i></p> | Conservation District, NRCS, contractors, industry, local farmers, DCNR | Adams County | 2025 | <p>Focus on small to mid-sized animal operations needing: well-placed fencing, dedicated sacrifice areas, and/or manure storage.</p> <p>Expand manure storage capacity for dairy operations to six months of storage: expand infrastructure, covering and/or digesters.</p> <p>Evaluate exporting or the reintroduction of existing technology</p>   |  |  |  |  |  | <p>\$5,000,000 new waste storage (\$1,250/AU)</p> <p>\$1,875,000 Barnyard runoff controls (\$125,000/acre)</p> <p>Proposed cost for reduction of</p>   | <p>USDA, PDA, DEP</p> <p>USDA, PDA, DEP</p> <p>State/federal funding</p>  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  | (utilize local energy and nutrient reduction facility) to address local poultry manure management<br><br>Land retirement would be implemented when converted to solar farm<br><br>Options for extending manure storages may be outside normal funding priorities<br>Satellite storage facilities for manure may not be used for multiple purposes. |  |  |  |  |  |  | N - \$8-10/lb (1.1 M lb annual reduction = appx \$10M) |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

**Urban Sector**

|             |  |  |  |              |         |  |   |  |   |  |   |  |           |                       |
|-------------|--|--|--|--------------|---------|--|---|--|---|--|---|--|-----------|-----------------------|
| <b>2.11</b> | Seek creative solutions to focus on the problem (pollution), not the geography (MS4 and urban areas) | Redefine MS4 area to allow mitigating efforts to occur outside of the urbanized areas  | DEP, ACO PD, municipalities                          | Adams County | Ongoing | Policy or legislative change required.   | * |  | * |  | * |  | *         |                       |
| <b>2.12</b> | Create a documentation program for urban nutrient management   | Support current proposed fertilizer legislation for nutrient applications in urban environments.   | DEP, Landscaping Industry                            | Statewide    | 2020    | Legislation required.  | * |  | * |  | * |  | *         |                       |
| <b>2.13</b> | Install riparian buffers on public lands   | Implement riparian buffers on public lands.<br>Try to coordinate<br><br><i>-100' buffers on public parcels greater than 10 acres (96 acres of riparian buffer)</i><br><i>-50' buffers on public parcels less than 10 acres (14 acres of riparian buffer)</i> | ACOPD, Conservation District, WAAC, NRCS, landowners | Adams County | 2025    | Landowner cooperation and funding required for successful implementation.<br>Security issues may be a constraint of planting trees on private properties.<br><br>Forest buffer credit challenges – 20 years until tree maturity.<br><br>Financial resources. |   |  |   |  |   |  | \$500,000 | State/federal funding |

|   |  |   |  |                              |         |   |                                  |                      |   |  |   |  |   |                             |
|---|--|---|--|------------------------------|---------|---|----------------------------------|----------------------|---|--|---|--|---|-----------------------------|
| 2.14  | Create additional natural areas  | Create forest buffers, meadowlands, and other natural areas that are not considered a nuisance  | ACOPD, Conservation District, NRCS, municipalities | Adams County                 | 2025    | Coordination with municipalities will be needed to comply with ordinances and other planning tools.   | *                                |                      | * |  | * |  | * |                             |
| 2.15  | Establish more Shade Tree Commissions  | Establish additional Commissions<br><br><i>50 acres tree planting.</i>  | ACOPD, Municipalities, community members           | Adams County                 | 2025    | Funding is required to develop and implement these programs.  | *                                |                      | * |  | * |  | * |                             |
| 2.16  | Implement other urban initiatives  | <i>Full implementation of the municipal PRP plans: Retrofit runoff reductions for 145 treated acres. 3,750 linear feet of urban stream restoration. 16 acres forest buffer. Install 2.5 acres of permeable pavement. Street sweep 109.43 miles.</i><br><br><i>Dry detention ponds to treat 100 acres. 50 acres treated by rain gardens and 25 acres treated by bioswales.</i> | ACOPD, Municipalities, community members           | Adams County, municipalities | 2025    |   | Current resources being utilized | Local municipalities |   |  |   |  |   |                             |
| 2.17  | Promote creations of additional sewage management districts at the municipal level   | Proper on-site septic system management   | ACOPD, COG, Local municipalities                   | Adams County, municipalities | Ongoing |   | Current Staffing                 |                      |   |  |   |  |   |                             |
| 2.18  | Evaluate formation of a Countywide Stormwater Authority                              | This effort could potentially establish an implementation and funding mechanism   | Adams County                                       | Adams County                 | Ongoing | Educating and garnering support of municipalities may be challenging. Additional financial resources would be required to initiate this effort. | *                                |                      | * |  | * |  | * |                             |
| <b>Priority Initiative 3: Research, Education, and Training</b> |  |   |  |                              |         |   |                                  |                      |   |  |   |  |   |                             |
| 3.1   | Develop a strategy to communicate parallel goals of the WIP3 and local goals such as | Nutrient Management Workshop or similar forum   | Conservation District, ACOPD, Penn State           | Adams County                 | Ongoing | Financial resources, participant interest.  | Annual No-till forum             |                      |   |  |   |  |   | State/Federal grant funding |

|            |  |  |  |              |         |                                       |   |            |  |  |                             |                           |                             |
|------------|--|--|--|--------------|---------|---------------------------------------|---|------------|--|--|-----------------------------|---------------------------|-----------------------------|
|            | water quality, public and environmental health, economic development, and others                               | Annual No-till Forum<br>Adams County State of the Waters forum | Extension, WAAC, Municipalities, School Districts, Local farmers |              |         |                                       | Adams County State of the Waters forum<br><br>Penn State Extension Training |            |  |  |                             |                           |                             |
| <b>3.2</b> | 20-acre pilot studies of agricultural BMPs to assess impacts to profitability                                  | Analysis of the effects of BMP installation                    | Conservation District, landowners, NRCS                          | Adams County | 2025    | Landowner willingness to participate. | Current staff expertise   | Penn State |  |  | Laboratory Analysis, etc.   | DEP, Penn State Extension | State/Federal grant funding |
| <b>3.3</b> | Conduct education of commercial landscape industry/golf course owners/homeowners regarding nutrient management | Nutrient reduction outside of agriculture                      | ACOPD including Conservation District, WAAC, Penn State, DEP     | Adams County | Ongoing | Legislation/regulation required.      |   |            |  |  | Nutrient Technician (1 FTE) | Penn State, DEP           | State/Federal Funding       |

**ADAMS COUNTY - AGRICULTURAL TARGET GOALS FOR NUTRIENT REDUCTION**

| <b>Soil Health</b>                       | <b>Final</b> | <b>Description</b>                           |
|--|--------------|--|
| High Residue Till                        | 55,500       | Acres Annually                               |
| Conservation Till                        | 13,000       | Acres Annually                               |
| Cover Crops                              | 30,000       | Acres Annually                               |
| Cover Crop with Fall Nutrients           | 10,000       | Acres Annually                               |
| Prescribed Grazing                       | 3,500        | Total Acres                                  |
| Soil Conservation/Water Quality Plans    | 101,000      | Acres Annually                               |
| Manure Incorporation                     | 10,000       | Acres Annually                               |
| <b>Nutrient Management</b>               | <b>Final</b> |  |
| Nutrient Management Core N               | 104,000      | Acres Annually                               |
| Nutrient Management Rate N               | 10,000       | Acres Annually                               |
| Nutrient Management Time N               | 10,000       | Acres Annually                               |
| Nutrient Management Core P               | 104,000      | Acres Annually                               |
| Nutrient Management Rate P               | 10,000       | Acres Annually                               |
| Nutrient Management Time P               | 10,000       | Acres Annually                               |
| <b>Riparian</b>                          | <b>Final</b> |  |
| Stream Restoration Ag (feet)*            | 10,000       | New Linear Feet                              |
| Grass Buffer with Exclusion Fencing*     | 200          | New Acres                                    |
| Forrest Buffer with Exclusion Fencing*   | 100          | New Acres                                    |
| Grass Buffers*                           | 1,000        | New Acres                                    |
| Forest Buffers*                          | 500          | New Acres                                    |
| Saturated Buffers                        | ??           |  |
| Wetland Restoration*                     | 25           | Acres  |
| <b>Other</b>                             | <b>Final</b> |  |
| Land Retirement to Open Space            | 1,500        | New Acres                                    |
| Forest Harvesting Practices              | 100%         |  |
| Waste Storage Facilities (Animal Units)* | <b>4,000</b> | New Animal Units                             |
| Barnyard Runoff Controls*                | 15           | New Acres                                    |
| Dairy Precision Feeding (Aus)            | 8,000        | Total Dairy Cows Receiving Precision Feeding |

**ADAMS COUNTY - URBAN TARGET GOALS FOR NUTRIENT REDUCTION**

| <b>Stormwater Management</b>    | <b>Units</b>  | <b>Adams County</b> |
|---------------------------------|---------------|---------------------|
| Dry Detention Ponds             | Acres treated | 100                 |
| Retrofit Runoff Reduction       | Acres treated | 145                 |
| Bioswale                        | Acres treated | 25                  |
| Rain gardens and bioretention   | Acres treated | 50                  |
| <b>Riparian Buffers</b>         | <b>Final</b>  |                     |
| Stream Restoration Urban        | Linear Feet   | 3,750               |
| Forest Buffer                   | Acres         | 16                  |
| <b>Other</b>                    | <b>Final</b>  |                     |
| Permeable pavement              | Acres         | 3                   |
| Tree planting                   | Acres         | 50                  |
| Street sweeping                 | Miles         | 109                 |
| Urban Nutrient Management Plans | Acres         | ?                   |

*Includes PRP data collected from Gettysburg Borough and Cumberland and Conewago Townships as well as additional activity in various municipalities other than MS4 designations.*

Questions?

