

**Phase 3 Watershed Implementation Plan (WIP) Planning and Progress Template – NORTHUMBERLAND COUNTY**

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Action #	Description	Performance Target(s)	Partners	Geographic Location	Expected Timeline	Potential Implementation Challenges or Recommendations	Resources Available				Resources Needed			
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<b>Priority Initiative 1: County Programmatic Initiatives</b>														
<b>1.1A</b>	Implement County Comprehensive Plan policies and actions	Ensure that growth activities address existing water quality impairments through stormwater BMP implementation already required by local ordinances  Preservation of environmentally sensitive, economically important and culturally important lands – <b>Conserve 1,800 acres of forest</b> - <b>Conserve 70 acres of wetland</b>  Utilize conservation easements to protect land	NCPC, municipal engineers, NCCD, Municipalities, SEDA-COG, Keystone COG, ACT 167 Plan, Hazard Mitigation Plan, Greenway Plan	Multi-Municipality	Ongoing	Educating municipalities, Updating local plans and ordinances, Growth areas not consistent with Census Urbanized Areas  Local governments willing to propose to ordinances to protect economically and environmentally friendly landscapes	Education, outreach	1 NCPC staff person			1 – FTE Clean Water Coordinator for Planning Commission	Planning Commission	\$130,000 per year  \$2,000 per acre of forest conserved through easement → Total \$3.6M  \$2,000 per acre of wetland conserved through easement → Total \$140K	DEP  TBD  TBD  Funding Options: PA DCNR Community Conservation Partnerships Program  CFA Greenways, Trails, and Recreation Program

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1.1B*	Evaluate areas to establish riparian buffers to stabilize stream banks and limit encroachment	Identify landowners willing to participate and work with the partners to identify (5) buffer opportunities  Leverage municipal parks along creeks for education, BMP work, habitat value, etc.  Protect riparian greenways, promote establishment and maintenance of riparian forest buffers	CBF, Sunbury Chapter of TU, Chesapeake Conservancy, NRCS, NCCD, PAFBC, DCNR, North Central PA Conservancy, Merrill Linn Conservancy, Middle Susquehanna River Keepers, Northumberland AOAA, Watershed groups LSCWA and SCRA, SEDA-COG, PennDOT, AG Land Preservation, Brush Valley Preservation Association, ACT 167 Plan, Greenway Plan	Countywide	5-10 years	Adopting ordinances, may require a pilot project in a willing municipality to demonstrate success.  Lack of technical assistance to support implementation goals for forest buffers.  Buffer funding programs must include 5- to 10-year minimum maintenance plan, incentive money for landowners, along with volunteers to establish the buffer.	landowner outreach; on the ground riparian project execution	1 County GIS staff person, 2 Conservation District staff people			1 – FTE Clean Water Coordinator for Planning Commission  1 – Additional Watershed Specialist for Conservation District	Planning Commission  Conservation District	\$130,000 per year  \$130,000 per year  Expand Buffer Bonus Program to provide \$5,000 per acre of buffer installed → \$1,010,000 total  Maintenance equipment/contract \$50,000 per year for upkeep	DEP  DEP  Funding Options: CFA Watershed Restoration and Protection Program PA Fish and Boat Commission CBF, Alliance for the Bay DCNR, Growing Greener, NFWF

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1.2	Northumberland County Hazard Mitigation Plan	<p>Improve flood prone areas with BMPs that also enhance water quality</p> <p>Develop a stream corridor restoration plan to protect the Susquehanna River Banks and Creek</p> <p>Enforce flood plain development regulations</p> <p>Promote open space preservation and purchase flood prone easements</p>	NCPC, municipal engineers, NCCD, Municipalities, SEDA-COG, Keystone COG, County Comprehensive Plan, ACT 167 Plan	<p>Countywide</p> <p>West Milton and Kelly Township</p>	2022-2025	<p>Funding, land for BMPs, willing landowners to implement projects</p> <p>Enforcement and compliance with local zoning ordinances</p>					1 – FTE Clean Water Coordinator for Planning Commission	Planning Commission	<p>\$130,000 per year</p> <p>\$2,000 per acre of flood prone easement → total easement TBD</p> <p>\$100,000 Stream Restoration Corridor Plan</p>	<p>DEP</p> <p>PEMA/FEMA</p> <p>PEMA/FEMA</p>

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1.3*	Continue to Implement ACT 167 requirements, look to update requirements where opportunities exist to improve water quality benefits	Revise existing model stormwater ordinance where needed. Look to incentivize additional protections for streams  Enforce urban forest and landscape management policies for stormwater management  Encourage the development of a wellhead protection plan where appropriate	NCPC, municipal engineers, NCCD, Municipalities, SEDA-COG, Keystone COG, Hazard Mitigation Plan, Comprehensive Plan	Countywide	2022-2025	Should local involvement exist, funding to support coordination of ACT 167 requirements	Institutional knowledge	Municipal engineers – assume 6 for well-rounded local background			1 – FTE Clean Water Coordinator for Planning Commission	Planning Commission	\$130,000 per year	DEP

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1.4A*	Continue to address and support existing Acid Mine Drainage (AMD) treatment systems and streams impaired by Acid Mine Drainage	Continue to provide funding to both active and passive treatment systems that are reducing the impacts of AMD impairments. If funding recedes water quality could degrade.	PA DEP Bureau of Mining, Conservation District, watershed groups, NRCS, Stream Restoration INC. Office of Surface Mining, AOAA	Countywide  Shamokin Creek  Mahantango Creek	Ongoing	Need to support legislation regarding the RECLAIM Act to support funding of new treatment systems.  Lack of technical assistance to support restoration efforts	Monitoring	Conservation District			Support for monitoring	USGS	\$25,000 per year for water quality monitoring  \$75,000 per year for maintenance of restored AMD sites	DEP Bureau of Mining, Abandoned Mine Reclamation Program, USGS
										1 – FTE Clean Water Coordinator for Conservation District	Conservation District	\$130,000 per year	DEP	

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1.4B*	Identify new funding to support the implementation of Acid Mine Drainage treatment systems	Opportunities still exist to address AMD runoff into local streams. New passive and active treatment systems are needed to support water quality improvements . Work with DEP and other identified partners to find funding to support the implementation of new treatment systems	PA DEP Bureau of Mining, Conservation District, watershed groups, NRCS, Stream Restoration INC. Office of Surface Mining, AOAA	Countywide  Shamokin Creek  Mahantango Creek	2022-2025	Need to support legislation regarding the RECLAIM Act to support funding of new treatment systems.  Lack of technical assistance to support restoration efforts  Work with USGS to monitor Shamokin Creek prior to restoration efforts to display the nutrient benefits of AMD treatment. CAST acceptance of results to depict nutrient reductions associated with in stream AMD repair					Coordination of restoration  Monitoring Shamokin Creek  1 – FTE Clean Water Coordinator for Conservation District	PL 566 Program with NRCS  USGS  Conservation District	\$10,000,000  \$150,000  \$130,000 per year	DEP Bureau of Mining, Abandoned Mine Reclamation Program, USGS  DEP

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1.5	Anthracite Outdoor Adventure Area (AOAA) Authority conservation measures	6,500 acres to conserve, implement BMPs, implement AMD and recreational activities – specific BMP targets to be identified at a later date	AAOA, NCCD, Keep PA Beautiful, PennDOT, Shingara Enterprises, SEDA-COG, COG Rail Authority, American Chestnut Foundation, Carbon Run Initiative, Shamokin Creek Restoration Alliances	AOAA	2022-2025	Funding and technical assistance to support restoration work  Additional AMD needs funding to improve water quality					1 – FTE Clean Water Coordinator for Conservation District	Conservation District	\$130,000 per year	DEP, DCNR, NFWF, PAFBC,

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1.6*	Implement County Farmland Preservation Program with farmland preservation program incentives enhancement	<p><b>Total farmland preservation 9,104 acres currently in preservation</b></p> <p><b>54 farms waiting to enter Ag Land Preservation – goal is to enroll as many as funding allows</b></p> <p>Utilize conservation easements to protect and preserve agriculture land</p>	4R Alliance, NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation, Greenway Plan	Ag land use area that fits farmland preservation criteria	2022-2023 – explore incentive opportunities	Operator acceptance, additional resources for plan development to incentivize BMP installation as a farmland preservation goal, need funding to support farmers wanting to enter farmland preservation Preserved farms are required to have an NRCS Conservation Plan, work with farmers to ensure Conservation Plan is reported in PracticeKeeper. Recommend making this a program requirement statewide. Sharing NRCS data must comply with 1619 form.					Technical assistance for program management	PDA	Assume \$150,000 per farm → \$8,100,000	NFWF, GG. Increased Conservation District budget, PDA, SCC
											1 – FTE Clean Water Coordinator for Conservation District	Conservation District	\$130,000 per year	DEP



1.7**	<p>Establish funding/staff support to assist the Agricultural community (day to day support)</p> <p>728 farms exist in Northumberland County</p> <p>Approximately 100 farms have their plans in Northumberland County</p>	<p><b>The goal is to Complete 200 total farms by 2025</b></p> <p>Work with private consultants to document plans.</p> <p>In order to communicate effectively with the farming community one on one farmer outreach must be conducted. The most effective way to capture and report BMPs is through one-on-one farm visits. Farmers do not participate in surveys or other methods.</p> <p>Work with agricultural community to implement BMPs consistent with E&amp;S regulations</p>	<p>4R Alliance, NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation, Northumberland County Greenways Plan</p>	<p>Countywide AG Land</p>	<p>2022-2025</p>	<p>Limited compliance activities by DEP. Lack of Technical assistance to support the farming community. Private sector Ag plans are not required to be shared with District staff. Work with ACT 38, Preserved farms and organic farms to report AG E&amp;S and NRCS Conservation Plans. These operations are required to have them, but no requirement to report the plans. It is recommended state agencies make changes to ACT 38 and Persevered Farm programs to require PracticeKeeper reporting.</p>	<p>Field verification, troubleshooting</p>	<p>NCCD, USDA NRCS, Private Consultants</p>	<p>N/A</p>	<p>N/A</p>	<p>6 – additional Ag Planners to provide technical assistance and ag planning</p> <p>3 – FTE Design, Permit construction Services</p> <p>3 – FTE Design, Permit construction Services</p> <p>1 – FTE Clean Water Coordinator for Conservation District</p>	<p>District/NRCS/Private Sector Farm Visits</p> <p>Private Sector/NCCD</p> <p>Private Sector/NCCD</p> <p>Conservation District</p>	<p>\$780,000 per year</p> <p>\$420,000 per year</p> <p>\$315,000 per year</p> <p>\$130,000 per year</p>	<p>DEP/NRCS/SCC/PDA</p> <p>DEP/NRCS/SCC/PDA</p> <p>DEP/NRCS/SCC/PDA</p> <p>DEP</p>
1.8	<p>Bloomsburg, Susquehanna, and Bucknell University Partnership - Implementation</p>	<p>Develop undergraduate and graduate students so that they can effectively engage in landowner</p>	<p>Bloomsburg University, Susquehanna University, Bucknell University</p>	<p>319 Priority Watershed</p> <p>Riparian properties</p> <p>Preserved farms</p>	<p>2022-2025</p>	<p>Continued undergraduate/graduate engagement as students graduate through program, implementation funding</p>	<p>Outreach boots on the ground</p>	<p>Bloomsburg, Susquehanna, Bucknell University students</p>	<p>N/A</p>	<p>N/A</p>	<p>5 – Student Internships to Support CAP Implementation</p>	<p>Bloomsburg, Susquehanna and Bucknell University or Other Students who live locally and attend other colleges</p>	<p>\$50,000</p>	<p>TBD</p>

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		outreach during implementation years.		Priority Corridor Watersheds – Warrior Run, Mahantango, Shamokin		<p>Lack of technical assistance professionals to mentor students and develop workforce development.</p> <p>Lack of competitive paying job opportunities that ensure long term sustainable for recently graduated students</p>							See 3.3 for funding needs on plan development and reporting	

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1.9A	Water quality communication plan, leveraging existing documents and covering topics including Comprehensive Plan, Greenway, Plan, ACT 167 Plan, Hazard Mitigation Plan, Watershed Implementation Plans	Develop messages and audience; execute plan and distribute messaging through staff and partners	CBF, Sunbury Chapter of TU, Chesapeake Conservancy, NRCS, NCCD, NCCP PAFBC, DCNR, North Central PA Conservancy, Merrill Linn Conservancy, Middle Susquehanna River Keepers, Northumberland AOAA, Watershed groups LSCWA and SCRA, Universities, Other Recreational groups, Universities, etc.	Countywide	2022 – develop local content, timing, identify responsible staff	Simplifying the resources that are available	Website Development	NCCD	N/A	N/A	Website development and continued maintenance	Consultant	\$30,000 per year	Administrative budget tag-along to project-related grant award
											1 – FTE Marketing and Outreach Coordinator	Planning Commission	\$130,000 per year	NFWF
											1 – FTE Clean Water Coordinator for Planning Commission	Planning Commission	\$130,000 per year	DEP

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1.9B	Agricultural Communication Strategy	<p>One-on-one farm outreach is the best way to communicate with farmers in addition to reporting practices. Work to develop a plan to complete one on one farm visits.</p> <p>Work to develop a communication plan to engage integrators.</p> <p>Partner with external ag partners to present CAP goals at meeting.</p> <p>Utilize Farm Bureau Newsletters for announcements</p>	CD, County Farm Bureau, Integrators, Ag Land Preservation, PSU Extension, NRCS	Countywide	2022-2025	<p>Funding to support the technical assistance required to complete one on one farm outreach</p> <p>Outreach to integrators is a challenge due to the number of integrators and multiple country boundaries they serve. It is recommended DEP/PDA/SCC communicate with integrators on a frequent basis to reduce mixed messages.</p>					<p>6 – additional Ag Planners to provide technical assistance and ag planning</p> <p>1 – FTE Marketing and Outreach Coordinator</p> <p>1 – FTE Clean Water Coordinator for Conservation District</p>	<p>District/NRCS/Private Sector Farm Visits</p> <p>Planning Commission</p> <p>Conservation District</p>	<p>\$780,000 per year</p> <p>\$130,000 per year</p> <p>\$130,000 per year</p> <p>See 1.9A for website costs.</p> <p>Costs for meeting attendance and administration is covered through other funding requests.</p>	<p>DEP/NRCS/SCC/PDA</p> <p>NFWF</p> <p>DEP</p>



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2.2*	Identify future ag/urban project opportunities using automated means	BMP opportunity analysis – ag conservation, land retirement, alternative crop, forest conservation, stream restoration  Back check with staff field views  Batch upload to FieldDoc to calculate credit opportunity	Lead - Chesapeake Conservancy  Stakeholder peer review – Bloomsburg University, USGS, Farm Bureau, PDA	Countywide	2022 – cataloguing  2023 – batch upload processing and field views  2024 – 2025 – implementation focus	Different data set scales/ precision	Precision Conservation Tools  Batch upload processing  BMP field backcheck	Chesapeake Conservancy  DEP/SRBC  Varies by BMP	N/A   	N/A   	Further GIS and data processing/method refinement  5 – Student Internships to Support CAP Implementation	Chesapeake Conservancy  Local University Student or local student attending nearby university etc.	\$44,000 (2022 only)  \$50,000 per year	EPA/DEP  TBD
2.3*	Develop a local system to capture data collection on urban structural and non-structural practices	Add urban BMPs to CAST/FieldDoc so that as land use data sets are updated, there are accompanying BMPs  Use Chapter 102 Permit Close Milestone to report BMPs	Municipal engineers, Chesapeake Conservancy, Keystone Council of Governments	Urban/suburban landscape	2022	Currently municipalities are not collecting BMP data because it is not required in Non-MS4 communities. Must incentivize communities to report, no existing system in place	Reporting platform	FieldDoc	N/A	N/A	Training  5 – Student Internships to Support CAP Implementation  1 – municipal planner	DEP  Local University Student or local student attending nearby university etc.  Planning Commission, COG, Municipality, etc.	N/A  \$50,000 per year  \$130,000 per year	DEP  TBD  DEP

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2.4*	Implement a documentation program for commercial and homeowner nutrient applications in developed lands  Support current legislation for a fertilizer bill.	Support fertilizer legislation – where legislation requires reporting  Legislation will support the implementation of <b>Urban Nutrient Management – 2,000 acres.</b>	PSU Extension	Countywide	2022	Education of responsible parties, receiving timely information, training on reporting system, will need direction from State on what’s expected and any reporting system that’s developed, Counties aren’t equipped with technology or field experience to manage this initiative Fertilizer Legislation has failed to pass congress in the last two years.	TBD based on fertilizer legislation, if passed	TBD based on fertilizer legislation, if passed	TBD based on fertilizer legislation if passed	TBD based on fertilizer legislation, if passed	1 – FTE Clean Water Coordinator for Planning Commission	Planning Commission	\$130,000 per year  Urban Nutrient Management \$10 per acre → \$20,000	DEP  DEP/PDA

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2.5*	Improve Agricultural BMP reporting utilizing PracticeKeeper, Capital RC&D Transect Survey, PSU Survey, Manure Transport Reporting and Remote Sensing	<p><b>Increase reporting of agriculture plans (30 per year) into PracticeKeeper</b></p> <p>Work with Capital RC&amp;D to improve current transect survey routes to be more inclusive</p> <p>Work with PSU to produce better response rate to the PSU survey for Northumberland County</p> <p>Work with PDA/DEP to improve manure transport reporting</p>	DEP, NCCD, NRCS, PDA, NRCS, Northumberland County Farm Bureau, Capital RC&D, Chesapeake Conservancy, PSU Survey, Manure Brokers	Countywide	2022-2025	<p>Private sector ag planners do not have access to PracticeKeeper. Ag planners do not have time to report into PK.</p> <p>Current Capital RC&amp;D routes are not all inclusive and could be improved.</p> <p>Current response rates are low and miss a large demographic of Northumberland County farmers.</p> <p>Manure brokers are not required to report data annually. Data is not inclusive.</p>					<p>1 – FTE Clean Water Coordinator for Conservation District</p> <p>5 – Summer interns for reporting and verification</p>	<p>Conservation District</p> <p>Local University Student or local student attending nearby university etc.</p>	<p>\$130,000 per year</p> <p>\$50,000 – paid internships</p> <p>See 3.5 for funding needs to improve cover crop reporting for capital RC&amp;D</p>	<p>DEP</p> <p>DEP/PDA/SCC</p>



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2.6*	Standardized Reporting for Dairy Precision Feeding	County would like to utilize the dairy precision feeding BMP. However, current reporting guidelines do not allow for clear reporting standards on feed reduction amounts, how to report, and who is qualified to report. <b>-1,000 animal units per year for dairy precision feeding</b>	Chesapeake Bay Program, Penn State Extension, Dairy co-ops	Countywide	2022	It is recommended that MUN be an acceptable standard for reporting dairy precision feeding. Guidelines need to be posted on acceptable MUN rates and work with dairy integrators to receive MUN data to report to DEP.	N/A	N/A	N/A	N/A	Reporting protocol	Chesapeake Bay Program, Penn State Extension, Dairy co-ops	N/A	N/A
<b>Priority Initiative 3: Achieve New Pollutant Reductions</b>														
3.1	Implementation of the Warrior Run Watershed 319 Plan	Conduct farm visits, windshield surveys, GIS Studies	Bloomsburg University, NCCD, other partners to be identified	Warrior Run Watershed	2021-2025	Funding, landowner interest in BMPs, implementation partner coordination  Reverification of existing farm BMPs					1 – New Environmental Specialist	Conservation District	\$68,000.00  \$1,000,000 to support implementation of Warriors Run 319	Applied for EPA 319 Grant, waiting on approval  319 Program, GG, PDA, SCC, NRCS

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3.2	Accelerated Implementation of Rapid Delisting Catchment Strategy through the Precision Conservation Partnership	Would like to partner in the future with Chesapeake Conservancy to explore rapid delisting approach	Chesapeake Conservancy, NCCD and Precision Conservation Partnership Stakeholders	TBD with input from Chesapeake Conservancy	2022-2025	Gaining landowner interest, design/permit/construction schedules, dedicated funding to support BMP implementation, Lack of technical assistance and engineering staff to support implementation	Program management and GIS  Landowner outreach	Chesapeake Conservancy  Partnership stakeholders			3 – additional FTE environmental technician	Chesapeake Conservancy, CBF, Clearwater Conservancy, etc.	\$390,000 per year  \$100,000 dollars to complete rapid delisting program management per year → total cost \$500,000	DEP/NRCS/SCC/PDA/DCNR/NFWF/Growing Greener/ EPA  EPA/DEP

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3.3*	Help farmers and operators to be in compliance with state and federal Conservation and Nutrient Management Plans	<p><b>Soil and Water Quality Conservation Plans (AG E&amp;S) 25,000 new acres</b></p> <p><b>Nutrient Management (Manure Management) 31,000 new acres Core N, 17,500 new acres Core P</b></p> <p>Work with ACT 38 operators, Preserved Farms, and certified organics to document plans already required. State agencies must work with integrators to ensure they are requiring compliance by farmers. Some integrators require compliance, but not all, great way to communicate</p>	4R Alliance, NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation	Countywide Ag Land	2022-2025	Lack of DEP inspections. Reporting and verification of AG Plans, NRCS plans expire and do not get reverified, private plans are never entered. Lack of Technical assistance to support agriculture planning and implementation, one on one farm outreach is best way to capture existing plans. Act 38 and Preserved Farm programs are not required to enter plans in PK, Recommendations to require all programs to enter plans into PK with farmers as well.	Educational support	CBF/4R Alliance	CBF grant	NFWF	<p>Cost share support for equipment/maintenance/staff</p> <p>6 – additional Ag Planners to work with farmers</p>	<p>Private Consultant/District/ NRCS</p> <p>District/NRCS/Private Sector Farm Visits</p> <p>Conservation Plans</p> <p>Core N and Core P</p>	<p>\$150,000 cost share budget per year</p> <p>\$780,000 per year</p> <p>\$15 per acre for a total cost of \$375,000</p> <p>\$15 per acre for a total cost of \$465,000</p>	<p>DEP</p> <p>DEP/NRCS/SCC/PDA</p> <p>DEP/SCC/PDA/NRCS</p> <p>DEP/SCC/PDA/NRCS</p>

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Action #	Description	Performance Target(s)	Partners	Geographic Location	Expected Timeline	Potential Implementation Challenges or Recommendations	Resources Available				Resources Needed			
							Technical	Source	Financial	Source	Technical	Suggested Source	Financial	Suggested Source
3.4	Advanced Nutrient Management (4R) Practice Education and Implementation	<p>Transition manure management plans to nutrient management plans and incentivize implementation</p> <p><b>Increase existing 4R practice (N/P Rate by 2,300 acres, N/P Timing by 2,300 acres and N/P Placement by 2,300 acres)</b></p> <p>Explore the idea of increasing PSNT or Chlorophyll testing to district program participants</p>	4R Alliance, NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation	Countywide AG Land	2022-2025	<p>Landowner interest, BMP verification (annual). Lack of Technical assistance to support agriculture planning and implementation. Additional funding to support soil testing. Soil testing is key to meeting the recommendations of supplemental BMPs.</p> <p>Machine dependent for most farming operations</p> <p>Cost of fertilizer is self-regulating farmers to use less fertilizer; therefore, lower rates result when PSNTs are done at the beginning of the growing season.</p>	Educational support	CBF/4R Alliance	CBF grant	NFWF	6 – additional Ag Planners to work with farmers to meet 4R standards	District/NRCS/Private Sector Farm Visits	\$780,000 per year	DEP/NRCS/SCC/PDA
												See 3.3 for cost share budget for equipment rentals.		
												\$10 per acre of advanced nutrient management planning per type → total cost for all is \$138,000	DEP/PDA/SCC/NRCS	

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3.5*	Implement Practice to improve soil health and sustainability (Tillage Management and Cover Crops)	Determine feasibility of having a county/state cost share program to enhance adoption of the annual practice  <b>Implement tillage management and cover crops on an annual rate of 58,000 acres High Residue, 7,000 acres Conservation Tillage, 4,000 acres Low Residue, 18,000 acres of cover crops and 10,000 acres of cover crops with fall nutrients</b>	NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation	Countywide Ag Land	2022 – investigation  2023 – next steps	Capacity to manage the program, landowner interest  Lack of technical assistance and farm planners to work with farmers to transition to High Residue Tillage  Current verification methods do not accurately capture implemented amounts – Capital RC&D survey needs revised  Farmers are harvesting cover crops for forage, need accurate efficiency crediting for commodity cover crops	Transect survey  Landowner education  Existing No-Till farm equipment for Rent – no longer rents  Cover Crop Incentive Program	Capital RC&D  1 NCCD staff person  Conservation District  NCCD	    \$73,749 in 2019	    Growing Greener	6 – additional Ag Planners to transition farmers to high residue    County Conservation District – staff to administer the program    No-till drill rental program	District/NRCS/Private Sector Farm Visits    Cover Crop Incentive Program    NCCD	\$780,000 per year    \$90 per acre traditional per year → \$1.62M for a 5 year total of \$8.1M (incentive payment, administration , capital RC&D reporting) \$50 per acre fall nutrients per year → \$500,000 for 5-year total of \$2.5M   \$150,000 for drill and maintenance, storage, admin	DEP/NRCS/SCC/PDA    PDA, SCC, Growing Greener, PACD,    DEP

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3.6*	Implement more pasture management BMPs	<p><b>Prescribed grazing – 800 acres</b></p> <p><b>Pasture Alternative Watering – 150 acres</b></p> <p><b>Grass buffers on fenced pasture corridor – 220 acres</b></p> <p><b>Forest buffers on fenced pasture corridor – 10 acres</b></p> <p><b>Land Retirement to Ag Open Space – 205 acres</b></p>	NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation Chesapeake Bay Foundation, Chesapeake Conservancy	Countywide ag lands – landowners who raise horses, dairy, beef and other pasture grazing animals	2022-2025	<p>Landowner education, BMP funding for non-buffer work, plan updates, data gathering</p> <p>Lack of Technical assistance to support agriculture planning and implementation</p> <p>Old NRCS plans need to be updated to comply with prescribed grazing definition – difficult to get landowner buy-in – fund alternative watering and fencing; most pastures are streamside</p> <p>Increasing construction costs are resulting in canceled NRCS contracts by landowners.</p>	Landowner education	NRCS	CBF grant		<p>6 – additional Ag Planners to provide technical assistance and ag planning</p> <p>3 – additional FTE environmental technician</p>	<p>District/NRCS/Private Sector Farm Visits</p> <p>Chesapeake Conservancy, CBF, Clearwater Conservancy, etc.</p>	<p>\$780,000 per year</p> <p>\$390,000 per year</p> <p>Prescribed grazing \$540 per acre → \$432,000 total</p> <p>Off stream watering \$500 per acre → \$75,000 total</p> <p>Land Retirement \$500 per acre → \$102,500 total</p> <p>FB Buffer W/ Exclusion \$10,500 per acre → \$105K total</p> <p>GB Buffer W/ Exclusion \$2,750 per acre → \$605K total</p>	<p>DEP/NRCS/SCC/PDA</p> <p>DEP/NRCS/SCC/PDA/DCNR/NFWF/Growing Greener/ EPA</p> <p>""</p> <p>""</p> <p>""</p> <p>""</p> <p>""</p>

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3.7*	Riparian buffer and re-forestation BMPs	<p><b>410 riparian forest buffer acres;</b> Need to recredit additional acres lost since 2010</p> <p><b>62 riparian grass buffer acres;</b> Need to recredit additional acres lost since 2010</p> <p><b>40 acres – Agriculture Tree Planting</b></p> <p><b>80 acres – urban forest buffer</b></p> <p><b>2 acres – urban tree canopy</b></p> <p><b>120 acres – urban forest planting</b></p> <p><b>500 acres – forest harvesting practices</b></p>	<p>CBF, Sunbury Chapter of TU, Chesapeake Conservancy, NRCS, NCCD, PAFBC, DCNR, North Central PA Conservancy, Merrill Linn Conservancy, Middle Susquehanna River Keepers, Northumberland AOAA, Watershed groups LSCWA and SCRA, Universities, Other Recreational groups, DCNR, DEP BAMR</p>	Countywide	<p>2022 – line up landowners</p> <p>2023-2025 – implementation</p>	<p>Landowner partnerships, landowner education, volunteer acceptance of buffer plantings, buffer maintenance guide for farmers, routine site visits to confirm buffers are thriving, invasive species removal during establishment</p> <p>Flash grazing must be allowed with buffer installation</p> <p>Funding program must include a 5-10-year maintenance program to establish buffers along with incentive program \$4K minimum per acre payment</p>	<p>Materials</p> <p>Mapping</p>	<p>NCCD (in-kind, annual tree sale efforts), CBF</p> <p>Chesapeake Conservancy</p>	<p>Budget available to be determined</p>	<p>CBF, NFWF, NFWS, NRCS - CREP</p>	<p>6 – additional Ag Planners to provide technical assistance and ag planning</p> <p>3 – additional FTE environmental technician</p>	<p>District/NRCS/Private Sector Farm Visits</p> <p>Chesapeake Conservancy, CBF, Clearwater Conservancy, etc.</p>	<p>\$780,000 per year</p> <p>\$390,000 per year</p> <p>Forest Buffer \$5,000 per acre → \$250K</p> <p>Maintenance equipment/contract \$490K</p> <p>Grass Buffer \$2,500 per acre → \$100K</p> <p>Tree/Forest Planting \$10,000 per acre → \$1.2M</p> <p>Forest Harvesting \$60 per acre → \$30K total</p>	<p>DEP/NRCS/SCC/PDA</p> <p>DEP/NRCS/SCC/PDA/DCNR</p> <p>DCNR, NFWF, PACD, TreeVitalize, DEP, Coldwater Heritage Partnership Implementation Grants, Landscape Scale Restoration (LSR) Grant Program – US Forest Service, Pennsylvania Habitat Stewardship Program, Alliance for the Bay, CBF, Chesapeake Conservancy</p>

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3.8	Wetland restoration implementation on marginal production agricultural land	<b>82 acres of Wetland Restoration</b>  Identify 1 large property owner from University of Vermont restorable wetland layer to install a wetland	CBF, Sunbury Chapter of TU, Chesapeake Conservancy, NRCS, NCCD, PAFBC, DCNR, North Central PA Conservancy, Merrill Linn Conservancy, Middle Susquehanna River Keepers, Northumberland AOAA, Watershed groups LSCWA and SCRA,	Countywide	2022 –2025	Willing landowner; appropriate siting, design, and construction for successful restoration result  Lack of technical assistance for landowner outreach and agriculture planning to identify potential site locations  Lead time it takes to secure projects can take years	Landowner outreach	1 NCCD staff person			3 – additional FTE environmental technician  2 – stream biologist	Chesapeake Conservancy, CBF, Clearwater Conservancy, etc.  NCCD/ Environmental Group	\$390,000 per year  \$280,000  Wetland Restoration \$30,000 per acre → \$2.46M	DEP/DCNR  DEP/DCNR/PA FBC/USGS  DEP/DCNR/ USDA Conservation Reserve Program (CRP) or NRCS Wetlands Reserve Program (WRP)



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3.9	Stream Restoration (Urban and Agriculture)	<p><b>10,000 Linear feet (~2 miles) Urban Stream Restoration</b></p> <p><b>8,000 Linear feet (~1.5 mile) Agriculture Stream Restoration</b></p>	CBF, Sunbury Chapter of TU, Chesapeake Conservancy, NRCS, NCCD, PAFBC, DCNR, North Central PA Conservancy, Merrill Linn Conservancy, Middle Susquehanna River Keepers, Northumberland AOAA, Watershed groups LSCWA and SCRA,	Rapid delisting areas top priority & Countywide	2022 – 2025	Design/permit/construction cycle seems to work in two-year increments, there is an assumption that eroded/degraded streams exist based upon 403(d) listing – should that not be the case in the field, adjust quantitative goal down and ensure buffers are in place Lack of funding to cover engineering design	Design/GP-1 permit	Trout Unlimited, Municipalities			Design, permit, construction services	Private sector, USFWS, TU	Assume \$900/LF - \$9.0M – Urban  Assume \$400/LF - \$3.2M Agriculture	Growing Greener, NFWF, DEP, DCNR, PAFBC, USGS  DEP/NRCS/SCC/PDA
											2 – Municipal Engineers	Municipalities, Planning Commission, COG	\$280,000 per year	DEP/DCNR
											3 – FTE Design, Permit construction Services	Private Sector/ NCCD	\$420,000	DEP/DCNR/PAFBC/USGS
											2 – stream biologist	NCCD/ Environmental Group	\$280,000	

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3.10	Implement more barnyard runoff control/loafing lot management	<p><b>49 acres of barnyard runoff controls</b></p> <p><b>72 acres of agriculture drainage management</b></p>	NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation	Countywide Farms	2022-2025	<p>Landowner buy-in and project development/funding</p> <p>Lack of Technical assistance to support agriculture planning and implementation</p> <p>Increasing construction costs are cancelling NRCS contracts</p> <p>Lack of funding to cover engineering design</p>					<p>6 – additional Ag Planners to provide technical assistance and ag planning</p> <p>3 – FTE Design, Permit construction Services</p> <p>3 – FTE Design, Permit construction Services</p>	<p>District/NRCS/Private Sector Farm Visits</p> <p>Private Sector/NCCD</p> <p>Private Sector/NCCD</p>	<p>\$780,000 per year</p> <p>\$420,000 per year</p> <p>\$315,000 per year</p> <p>Barnyard Runoff Control \$175,000 per project, assume 1 acre per project \$5.6M in total</p> <p>Agriculture Stormwater Management \$10,000 per project, assume 1 acre per project \$720K in total</p>	<p>DEP/NRCS/SCC/PDA</p> <p>DEP/NRCS/SCC/PDA</p> <p>DEP/NRCS/SCC/PDA</p> <p>DEP/NRCS/SCC/PDA/PennVEST</p> <p>DEP/NRCS/SCC/PDA/PennVEST</p>

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3.11	Animal Waste Storage Systems	<p><b>5,000 new AUs of livestock waste management systems</b></p> <p><b>10,000 new AUs of poultry waste management systems</b></p>	NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation	Livestock & Poultry farms	2022-2025	<p>Current capacity through NRCS and NCCD implements about 5 farms projects per year; Time to get through planning, design, and construction; outreach to smaller farms that likely need the assistance; match cash value for small farms; readiness to plan/implement projects when outreach efforts yield willing landowners</p> <p>Lack of funding to cover planning, I&amp;Es, and engineering design</p>	Project implementation – 5 farms a year	NRCS, NCCD, Private Ag Sector			<p>6 – additional Ag Planners to provide technical assistance and ag planning</p> <p>3 – FTE Design, Permit construction Services</p> <p>3 – FTE Design, Permit construction Services</p>	<p>District/NRCS/Private Sector Farm Visits</p> <p>Private Sector/NCCD</p> <p>Private Sector/NCCD</p>	<p>\$780,000 per year</p> <p>\$420,000 per year</p> <p>\$315,000 per year</p> <p>Animal waste management system \$175,000 per project, assume 100 AUs per project \$26.25M in total</p>	<p>DEP/NRCS/SCC/PDA</p> <p>DEP/NRCS/SCC/PDA</p> <p>DEP/NRCS/SCC/PDA</p> <p>DEP/NRCS/SCC/PDA/PennVEST</p>

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3.12*	Urban Stormwater Management Non-Regulated Communities	Implement existing ordinances at local municipal level  <b>Stormwater Treatment Performance Standard – 16 acres treated</b>  <b>Stormwater Treatment Performance Standard – 273 acres treated</b>  <b>Advanced Grey Infrastructure – 190 acres treated</b>  <b>Dry Detention Ponds – 65 acres treated</b>  <b>Infiltration Practices – 58 acres treated</b>  <b>Impervious Surface reduction – 1 acre</b>	NCPC, NCCD, developing municipalities, Keystone Council of Governments, Sunbury Municipal Authority, SEDA-COG, DCED	County-wide	Ongoing  2022-2025	Coordination/training for municipal staff, FieldDoc batch opportunity, non-MS4 engagement (what’s in it for them?), very little reporting in the non-ms4 sector, must encourage more reporting  Catalogue existing BMPs that fit into this category and newly built ones	Reporting platform	FieldDoc			5 – Summer interns for reporting and verification  2 – Municipal Engineers  1 – municipal planner	Local University Student or local student attending nearby university etc.  Municipalities, Planning Commission, COG  Planning Commission, COG, Municipality, etc.	\$50,000 – paid internships  \$280,000 per year  \$130,000 per year  Stormwater Treatment \$1,815/acre → \$29,040 Runoff Reduction \$4,162/acre → \$1.136M Advanced Grey Infrastructure \$132/acre → \$25,080 Dry Detention Ponds \$7,917/acre → \$511,000 Infiltration Practices \$7,917/acre → \$460,000 Impervious Surface reduction \$57,460/acre → \$57,460	NRCS/PDA/DEP  TBD  DEP

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3.13	Conservation Landscaping/Turf to Meadow Conversion	Promote new program and enable one large tract landowners' participation  <b>120 new acres of Conservation Landscaping</b>	NCPC, NCCD, developing municipalities, Keystone Council of Governments, Sunbury Municipal Authority, SEDA-COG, Watershed organizations	Developed areas in County municipalities	2022 - 2025	Landowner education and acceptance  Existing mowing ordinances and weed ordinances can be a challenge to implementation	Planting plan assistance	Alliance for the Bay (in-kind)			1 – FTE Municipal Planner  3 – additional FTE environmental technician	Planning Commission  Chesapeake Conservancy, CBF, etc.	\$130,000 per year  \$130,000 per year  \$2,500 per acre meadow → \$300,000 budget for all	DEP/DCNR  DEP/DCNR/SCC/PDA/NRCS  DCNR
3.14*	Continue dirt and gravel road program	<b>34 miles overall restored through past projects and future projects</b>  <b>5,000 new linear feet of D&amp;G Road improvements</b>	NCCD	Countywide	2025	Continue D&G Road program funding  Expand Dirt and Gravel Road Program to include farm lanes	Education, technical assistance, project oversight	NCCD, Center for Dirt & Gravel Road Studies, SCC	\$2.4 million since 1998	State Conservation Commission	1 – FTE Clean Water Coordinator for Conservation District	Conservation District	\$130,000 per year  Dirt and Gravel Roads \$40 per foot → \$200,000	DEP/PDA/ SCC  SCC
3.15*	Work with PennDOT and local municipalities to reduce frequency of mowing road ditches and along roadways	Educate local municipal leaders and PennDOT on the importance of keeping higher vegetation along roadways to prevent erosion and increase nutrient uptake.	Local Municipalities, DEP and PennDOT	Countywide	2023	PennDOT's and Municipal willingness to cut back on mowing programs. DEP Chesapeake Bay Program will need to assist in the education of PennDOT.					1 – FTE Clean Water Coordinator for Planning Commission  1 – FTE Clean Water Coordinator for Conservation District	Planning Commission  Conservation District	\$130,000 per year  \$130,000 per year	DEP  DEP/PDA/ SCC

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3.16	Private Funding & Grant Administration	Identify some private funding sources that may be able to supplement public funding sources/existing sources utilized for stakeholders, continue to work with partners to facilitate additional funding	Existing project implementer networks	Countywide	2022-2023	Need to expand network, educational aspect of less common funders, logistics of utilizing unproven funding sources (or lesser known)  Grant administration is a challenge due to limited staff and time-consuming nature of grant reporting and administration	Financial services	HRG (CAP coordinator)			1 – FTE Conservation District Grant Manager	Conservation District	\$130,000	TBD
											1 – FTE Planning Commission Grant Manager	Planning Commission	\$130,000	TBD
											2 – staff accountants	Planning Commission & Conservation District	\$140,000 per year	TBD

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<b>Priority Initiative 4: Research, Education, and Training</b>														
4.1*	Develop new water quality monitoring data into Chesapeake Data Explorer/ Chesapeake Monitoring Cooperative database	Location identification, financial and volunteer budget analysis, and initial landowner communication by end of 2021  CAST-21 acknowledgment of our data  Map existing monitoring locations  Expand monitoring based on Corridors of Opportunity area monitoring gaps	ALLARM, Bloomsburg University, Watershed Associations	To be determined	2022	Land access, expanded volunteer need, equipment/materials budget, Consistent data collection, QAQC continuation  Data precision, QAQC, opportunity to educate landowners about local stream health and what they can do about it  Consideration to expand the Keystone Water Resources Center			N/A	N/A	Volunteers for Water quality monitoring  New monitoring equipment  3 – additional FTE environmental technician  2 – stream biologist	Local environmental groups  Conservation District  Chesapeake Conservancy, CBF, etc.  NCCD/ Environmental Group	N/A  \$10,000  \$130,000 per year  \$280,000 per year	TBD  ALLARM  DEP/NRCS/ DCNR/PDA  DEP/DCNR/PAFBC/USGS

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4.2	Enhance the capacity of local watershed associations for short-term success and long-term sustainability	Develop new or reestablish existing watershed associations to support with CAP implementation. Watershed organizations can support with outreach, engagement, new project identification and implementation  Encourage project implementation on the watershed level so that these partners enhance their relationships with non-peers with a co-benefit of diversifying their membership	Watershed Associations, Trout Unlimited, National Trout Unlimited, Rivers Keeper, Shamokin Creek Restoration Alliance, Little Shamokin Creek Watershed Association, AOAA	Countywide	Ongoing	Willing volunteers and leaders to establish and run watershed organizations to be successful and support with implementation	Social media shares  Project development support	County – department to be determined  CAP Coordinator (HRG)			1 – FTE Clean Water Coordinator for Planning Commission  1 – FTE Clean Water Coordinator for Conservation District	Planning Commission  Conservation District	\$130,000 per year  \$130,000 per year  \$5000 per organization to produce promotional materials (hats, shirts, stickers) for members → \$15,000 total	DEP  DEP/PDA/ SCC  Enhance the capacity of local watershed associations for short-term success and long-term sustainability



## Phase 3 Watershed Implementation Plan (WIP) Planning and Progress Template

**Each county-based local area will use this template to identify:**

1. Inputs – These are both existing and needed resources, public and private, to implement the identified priority initiative. These include both technical and financial resources, such as personnel, supplies, equipment and funding.
2. Process – what is each partner able to do where and by when. These are the action items listed under each priority initiative.
3. Outputs and outcomes – both short and long-term. These are the priority initiatives identified by each county. The performance targets are the intermediate indicators that will measure progress.
4. Implementation challenges – any potential issues or roadblocks to implementation that could impede outputs and outcomes.

**Asterisk:** Place an asterisk next to the action number(s) for action items that appear in both the County Planning and Progress Template and the Programmatic Recommendations Template.

**For each Priority Initiative or Program Element:** Use the fields, as defined below, to identify the inputs and the process that will be followed to achieve each priority initiative. This is the “who, what, where, when and how” of the plan:

**Description** = What. This may include programs that address prevention, education, or as specific as planned BMP installations that will address the Priority Initiative. A programmatic or policy effort will require some ability to quantify the anticipated benefits which will allow calculation of the associated nutrient reductions.

**Performance Target** = How. This is an extension of the Description above. The Performance Target details the unique BMPs that will result from implementation of the Priority Initiative and serves as a benchmark to track progress in addressing the Priority Initiative. Performance Targets may be spread across multiple Responsible Parties, Geographies, and Timelines based on the specifics of the Initiative.

**Responsible Party(ies)** = Who. This is/are the key partner(s) who will implement the action items through outreach, assistance or funding, and who will be responsible for delivering the identified programs or practices.

**Geographic Location** = Where. This field identifies the geographic range of the planned implementation. This could extend to the entire county or down to a small watershed, based on the scale of the Priority Initiative, range of the Responsible Party, or planned funding/resources. *NOTE: Resource limitations alone should not limit potential implementation as additional funding may become available in the future.*

**Expected Timeline** = When. Provide the expected completion date for the planned activity. This should be a reasonable expectation, based on knowledge and experience, that will aid in tracking progress toward addressing the Priority Initiative.

**Resources Available: Technical & Funding** = This field will note technical and financial resources secured/available to implement the program (Description). This is the total of the resources identified in the County Resources Inventory Template below allocated to the priority initiative as a whole; or, if available, to each action.

**Resources Needed: Technical & Funding** = This field will note technical and financial resources needed/outstanding to implement the program (Description). This is the total of the additional resources projected and identified as needed in the County Resources Inventory Template below allocated to the priority initiative as a whole; or, if possible, to each action.

**Potential Implementation Challenges/Issues** = This field will note challenges and issues that may delay program implementation (Description).

## GLOSSARY

**ACT 167 Plan.** The Pennsylvania Stormwater Management Act of 1978, or Act 167, required that each county must prepare and adopt a watershed stormwater management plan for each watershed located in the county as designated by DEP, in consultation with the municipalities located within each watershed.

**Ag E & S – Agricultural Erosion and Sedimentation Plan.** Agricultural Erosion and Sedimentation plans document best management practices on crop and pasture fields to mitigate erosion and protect soil health. Any landowner that disturbs the soil (including no tillage) more than 5,000 square feet ( $\sim 1/10$  acre) must have a written Agricultural Erosion & Sediment Control Plan according to Pennsylvania State law, Chapter 102.

**ALLARM – Alliance for Aquatic Resource Monitoring.** ALLARM is a program of Dickinson College that enhances local action for the protection and restoration of waterways by empowering communities with scientific knowledge and tools.

**AMD – Acid Mine Drainage.** Outflow of acidic water from metal mines or coal mines.

**BMP – Best Management Practice.** Best management practices describe a type of water pollution control. Using agricultural BMPs can help to prevent or minimize the effects of nonpoint source pollution.

**CAST - Chesapeake Assessment Scenario Tool.** CAST is a web-based nitrogen, phosphorus and sediment load estimator tool that streamlines environmental planning.

**CBF – Chesapeake Bay Foundation.** The Chesapeake Bay Foundation is a non-profit organization devoted to the restoration and protection of the Chesapeake Bay in the United States.

**NCCD – Northumberland County Conservation District.** The Northumberland County Conservation District serves as the primary local source of assistance to all individuals and organizations who benefit from the county’s natural resources that we collectively strive to sustain and improve.

**NCPC – Northumberland County Planning Commission.** The Northumberland County Planning Commission makes recommendations and decisions to maintain and enhance the high quality of life for all residents, in accordance with the Pennsylvania Municipalities Planning Code, and other laws and regulations of the Commonwealth of Pennsylvania and the County of Northumberland.

**DCNR – Department of Conservation and Natural Resources.** DCNR is responsible for maintaining and preserving state parks and forests; providing information on the state's natural resources; and working with communities to benefit local recreation and natural areas.

**DEP – Department of Environmental Protection.** The Department of Environmental Protection's mission is to protect Pennsylvania's air, land and water from pollution and to provide for the health and safety of its citizens through a cleaner environment.

**EPA – Environmental Protection Agency.** The Environmental Protection Agency is a United States federal government agency whose mission is to protect human and environmental health.

**FEMA – Federal Emergency Management Agency.** FEMA supports citizens and emergency personnel to build, sustain, and improve the nation's capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.

**FieldDoc – FieldDoc** is a protected, online database that uses geographic information to generate baseline nutrient and sediment loading information and calculate load reductions for planned BMPs.

**GIS – Geographic Information System.** GIS is a computer system that analyzes and displays geographically referenced information.

**HUC12 – Watershed.** A local sub-watershed level delineation that captures tributary systems draining into the larger Chesapeake Bay watershed.

**MMP – Manure Management Plan.** Manure management plans document how a landowner plans to capture, store, treat, and utilize animal manures in an environmentally sustainable manner. Every landowner that has livestock or spreads manure on their property must have a written Manure Management Plan according to Pennsylvania State law, Chapter 91.

**MS4 – Municipal Separate Storm Sewer System.** A separate storm sewer system is a collection of structures, including retention basins, ditches, roadside inlets and underground pipes, designed to gather stormwater from built-up areas and discharge it, without treatment, into local streams and rivers.

**NFWF – National Fish and Wildlife Foundation.** NFWF works towards sustaining, restoring, and enhancing the nation's fish, wildlife, plants and habitats for current and future generations through innovative public and private partnerships, and by investing financial resources and intellectual capital into science-based programs designed to address conservation priorities and achieve measurable outcomes.

**NMP – Act 38 Nutrient Management Plan.** Nutrient management plans are required under Pennsylvania State law Act 38 which applies to operations with more than 2,000 pounds live animal weight per acre of pasture and crop fields.

**NRCS – Natural Resource Conservation Service.** NRCS's programs help farmers reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damages caused by floods and other natural disasters.

**PACD – Pennsylvania Association of Conservation Districts.** Provides support for Pennsylvania's conservation districts.

**PEMA – Pennsylvania Emergency Management Agency.** PEMA is tasked with the response to, preparedness for, recovery from, and the mitigation or prevention of disasters and other emergencies.

**PracticeKeeper.** PracticeKeeper is a protected, online database Used for reporting conservation plans, BMPs, E&S plans, nutrient management plans, watershed plans, complaints, DEP inspection reports and data exports to DEP.

**QAPP – Quality Assurance Project Plan.** A QA Project Plan documents the technical and quality aspects of a project, including project management, implementation and assessment. It specifies responsibilities, monitoring objectives, sampling design, sample collection methods, analytical methods, quality control, data management and data validation activities. It is required by EPA prior to any monitoring or data collection.

**QAQC – Quality Assurance Quality Control.** QA/QC is the combination of quality assurance, the process or set of processes used to measure and assure the quality of a product, and quality control, the process of ensuring products and services meet consumer expectations.

**4R Nutrient Stewardship – Precision Conservation.** Right fertilizer source at the Right rate, at the Right time and in the Right place for optimal crop management.

**SRBC – Susquehanna River Basin Commission.** SRBC's mission is to enhance public welfare through comprehensive planning, water supply allocation, and management of the water resources of the Susquehanna River Basin.

**SWM – Stormwater Management.** Stormwater management is the effort to reduce runoff of rainwater or melted snow into streets, lawns and other sites and the improvement of water quality.

**SWP – Source Water Protection.** Source Water Protection is a planning process conducted by local water utilities, as well as regional or national government agencies, to protect drinking water sources from overuse and contamination.

**USGS – United States Geological Survey.** USGS provides science about the natural hazards that threaten lives and livelihoods; the water, energy, minerals, and other natural resources we rely on; the health of our ecosystems and environment; and the impacts of climate and land-use change.

**WIP – Watershed Implementation Plan.** Watershed Implementation Plans (WIPs) are the roadmap for how the Bay jurisdictions (including Pennsylvania), in partnership with federal and local governments, will achieve the Chesapeake Bay TMDL allocations.

**WWTP – Wastewater Treatment Plant.** Wastewater treatment plants process contaminants from wastewater or sewage and convert it into an effluent that can be returned to the water cycle with acceptable impact on the environment or reused for various purposes.