UPPER SUSQUEHANNA COALITION QUALITY ASSURANCE PROJECT PLAN PROCEDURES FOR COLLECTING, REPORTING, AND VERIFYING AGRICULTURAL, STREAM, AND WETLAND DATA IN THE CHESAPEAKE BAY WATERSHED

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Upper Susquehanna Coalition

TIOGA SOIL AND WATER CONSERVATION DISTRICT

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Upper Susquehanna Coalition
Quality Assurance Project Plan
Procedures for Collecting, Reporting, and Verifying Agricultural, Stream, and Wetland Data in the Chesapeake Bay Watershed

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VERSION TRACKING

This quality assurance project plan (QAPP) for nonpoint source (NPS) data replaces the March 4, 2016 version and complements the New York Department of Environmental Conservation (NYSDEC) QAPP for wastewater and developed sector data (*Quality Assurance Project Plan Procedures for Collecting, Reporting and Verifying Wastewater and Developed Sector Data in the Chesapeake Bay Watershed* November 2019).

QUALITY ASSURANCE PROJECT PLAN REQUIREMENT

New York State (NYS) is a recipient of Chesapeake Bay Regulatory and Accountability Program (CBRAP) and Chesapeake Bay Implementation Grant (CBIG) funds from the U.S. Environmental Protection Agency (EPA). CBRAP grants aid the six Chesapeake Bay watershed states and the District of Columbia in implementing and expanding their jurisdictions' regulatory, accountability, assessment, compliance, and enforcement capabilities in support of reducing nitrogen, phosphorus, and sediment loads delivered to the Bay to meet the Water Quality Goal of the *2014 Chesapeake Bay Watershed Agreement* and the Bay TMDL. CBIG funds are awarded for the purpose of implementing the management mechanisms established under the Chesapeake Bay Agreement, with particular emphasis on state programs for control and abatement of nonpoint source nutrient and sediment pollution (including atmospheric deposition as a NPS). Specifically, CBIG awards support the jurisdictions' implementation of the management strategies developed for each of the applicable outcomes identified in the *2014 Chesapeake Bay Watershed Agreement*.

All organizations conducting environmental programs funded by EPA are required to establish and implement a quality system. EPA also requires that all environmental data used in decision making be supported by an approved Quality Assurance Project Plan (QAPP). Activities supported by New York's CBRAP and CBIG funding that require quality assurance include the compilation, management, and reporting of information on wastewater treatment plants, best management practices (BMPs) for construction sites, stream corridor rehabilitation, wetland restoration, and agricultural BMPs.

QAPP OVERVIEW

The QAPP integrates all technical and quality aspects of a project, including planning, implementation, and assessment (USEPA 2006). The purpose of the QAPP is to document planning results for environmental data operations and to provide a project-specific "blueprint" for obtaining the type and quality of environmental data needed for a specific decision or use. The QAPP documents how quality assurance (QA) and quality control (QC) are applied to an environmental data operation to assure that the results obtained are of the type and quality needed and expected. The QAPP must be composed of standardized, recognizable elements covering the entire project from planning, through implementation, to assessment. These elements are presented in that order and have been arranged for convenience into four general groups. The four groups of elements and their intent are summarized as follows:

A. Project Management - The elements in this group address the basic area of project management, including the project history and objectives, roles and responsibilities of the participants, etc. These elements ensure that the project has a defined goal, that the participants understand the goal and the approach to be used, and that the planning outputs have been documented.
B. Data Generation and Acquisition - The elements in this group address all aspects of project design and implementation. Implementation of these elements ensures that appropriate methods for sampling, measurement and analysis, data collection or generation, data handling, and QC activities are employed and are properly documented.
C. Assessment and Oversight - The elements in this group address the activities for assessing the effectiveness of the implementation of the project and associated QA and QC activities. The purpose of assessment is to ensure that the QA Project Plan is implemented as prescribed.
D. Data Validation and Usability - The elements in this group address the QA activities that occur after the data collection or generation phase of the project is completed. Implementation of these elements ensures that the data conform to the specified criteria, thus achieving the project objectives.

Quality assurance procedures for collection, reporting, and verification of NPS BMP implementation are described in this QAPP. The Upper Susquehanna Coalition (USC) will carry out BMP data collection and reporting in accordance with this QAPP to ensure that data reported are of acceptable quality to meet the needs of the Chesapeake Bay Program (CBP) as specified by the EPA's Chesapeake Bay Program Office (CBPO).

GROUP A – PROJECT MANAGEMENT

The elements in this group address the basic area of project management, including the project history and objectives, roles and responsibilities of the participants, etc. These elements ensure that the project has a defined goal, that the participants understand the goal and the approach to be used, and that the planning outputs have been documented.

A1 – TITLE AND APPROVAL SHEET

Plan Coverage: This *Quality Assurance Project Plan for New York Work Plan for the Chesapeake Bay Program* reflects the overall Quality Assurance Program framework and management systems necessary to assure that data reported by the USC are of acceptable quality to meet the needs of CBP.

Approved:

By: _____ Date: _____

Wendy Walsh, USC Watershed Coordinator / Tioga Co. SWCD District Manager

By: _____ Date: _____

Lauren Townley, Chesapeake Bay Watershed Program Coordinator / New York State Department of Environmental Conservation

By: _____ Date: _____

Carin Bisland, QA Officer / U.S. Environmental Protection Agency, Chesapeake Bay Program

By: _____ Date: _____

Holly Waldman, CBIG Grant Project Officer / U.S. Environmental Protection Agency, Chesapeake Bay Program Office

A2 – TABLE OF CONTENTS

1. Appendix 1-NY Draft Ag Sampling Approach
2. Appendix 2-AEM Tier 2 Worksheet for Manure and Fertilizer Management
3. Appendix 3-USC BMP Data Entry & Verification Guide

4. Appendix 4-BMP Mapping USC-SB-NEIEN
5. Appendix 5-AEM Tier 1 Worksheet
6. Appendix 6-USC – AEM Data Collection Sheet
7. Appendix 7-Work Flow Figure B10.1
8. Appendix 8-AEM 11 Tier 5B BMP Checklist
9. Appendix 9-AEM 11 Tier 5B Plan Checklist
10. Appendix 10-WRP Monitoring Worksheet
11. Appendix 11-USC Stream Project Report
12. Appendix 12- USC Non-Ag BMP Definitions
13. Appendix 13. – Riparian Buffer Assessment Sheet 2017
14. Appendix 14 – USC Forest Buffer Monitoring Protocol
15. Appendix 15 – A Guide to USC Stream Reporting

LIST OF FIGURES

LIST OF TABLES

A3: DISTRIBUTION LIST

- USC Watershed Coordinator – Wendy Walsh, walshw@co.tioga.ny.us
- USC Chairperson-Jeff Parker, jgparker@stny.rr.com
- USC Agricultural Team Leader – Amanda Barber, amanda.barber@cortlandswcd.org
- USC Agricultural Coordinator – Emily Dekar, dekare@co.tioga.ny.us
- USC Wetland Coordinator – Melissa Yearick, melissa@u-s-c.org
- USC Stream Team Leader – Mike Lovegreen, mike.lovegreen@u-s-c.org
- SWCD Technicians – All USC-member SWCD personnel

A4: PROJECT/TASK ORGANIZATION

A4.1: PROJECT SUMMARY

The USC currently collects data on agricultural, stream, and wetland best management practice (BMP) implementation in the New York portion of the Upper Susquehanna River watershed that drains into the Chesapeake Bay (Figure 1). The specific BMPs reported to EPA and addressed in this QAPP are shown in Table 1. Stream rehabilitation data are tracked and reported as of 2018 Progress (see A5.3). In addition, stream rehabilitation practices currently account for less than 5 percent of pollutant load reductions. The continued improvement of tracking, reporting and verification of stream rehabilitation will be a focus in the next 2 years. Wetland restoration is also tracked and reported. NYSDEC is taking the lead on reporting of wastewater and developed sector data and the verification process is outlined in a separate QAPP developed by NYSDEC. The relationship, or mapping, between these reported BMPs and BMPs implemented under New York's programs is described in section A.6 and shown in Table 4 of Appendix 1. Note that the list of BMPs in Table 4 of Appendix 1 will be updated to address all BMPs tracked and reported as we move forward. Data are aggregated at the county level and provided to the CBPO through the National Environmental Information Exchange Network (NEIEN) node.

We will continue update to our QAPP documents on an as needed basis to provide information regarding any changes that are made to our verification protocols.

Figure 1. Upper Susquehanna River watershed

Table 1. Nonpoint source BMPs reported to EPA.

BMP	Assessment Type
Animal Waste Management Systems	Visual Multi-Year
Barnyard Runoff Control & Loafing Lot Management System	Visual Multi-Year
Soil and Water Conservation Plans	Non-Visual Single-Year
Conservation Tillage - Tillage Practices (Conservation Tillage, High-Residue Tillage, Low-Residue Tillage)	Visual Single-Year
Dairy Precision Feeding	Non-Visual Single-Year
Nutrient Management Plans Nutrient Application Management (Core N, Core P, N Rate, N Placement, N Timing, P Rate, P Placement and P Timing	Non-Visual Single-Year
Cropland Forest Buffers	Visual Multi-Year
Cropland Grass Buffer	Visual Multi-Year
Exclusion Fence with Grass Buffer	Visual Multi-Year
Exclusion Fence with Grass Buffer Narrow	Visual Multi-Year
Exclusion Fence with Forest Buffer	Visual Multi-Year
Exclusion Fence with Forest Buffer Narrow	Visual Multi-Year
Land Retirement (Land Retirement to Ag Open Space, Land Retirement to Pasture, and Alternative Crops)	Visual Multi-Year
Prescribed Grazing	Visual Multi-Year
Horse Pasture Management	Visual Multi-Year
Cover Crops (Cover Crops, Cover Crops with Fall Nutrients, & Commodity Cover Crops)	Visual Single-Year

Manure Incorporation	Non-Visual Single Year
Ag Tree Planting	Visual Multi-Year
Pasture Alternative Watering	Visual Multi-Year
Stream Rehabilitation - Non-Urban Stream Restoration	Visual Multi-Year
Wetland Restoration	Visual Multi-Year
Wetland Enhancement	Visual Multi-Year
Urban Forest Buffer	Visual Multi-Year
Urban Forest Buffer Narrow	Visual Multi-Year

A4.2: Data Collection Program and Key Project Staff

To date all agricultural, non-urban stream restoration, urban buffers and wetland restoration BMP implementation are reported to the CBPO through the USC. The USC is a network of 22 Soil and Water Conservation Districts (SWCDs) (18 in NY and 4 in PA) that encompass the headwaters of the Chesapeake Bay and work together under a Memorandum of Understanding. The USC is the sole data collector of agricultural, wetland, and stream BMPs implemented in the New York portion of the watershed.

The USC relies on the New York State funded Agricultural Environmental Management (AEM) program (http://www.nys-soilandwater.org) as its framework for data collection, reporting, and verification of agricultural BMPs. AEM is the statewide "umbrella program" that provides a consistent format to efficiently identify and address environmental concerns through a comprehensive on-farm assessment. AEM utilizes a five-tiered process that includes inventory, assessment, plan development, implementation, and evaluation (http://www.nys-soilandwater.org/aem/index.html). The inventory and documentation of existing BMPs occurs during any one of the five tiers, depending on where each particular farm is in the process.

The USC also handles data collection and reporting for stream and wetland BMPs, but this may be accomplished outside of the AEM framework if the participant is not an agricultural producer. Often times these practices can be implemented by various entities in the watershed, including municipalities, state agencies, and rural landowners, many of which fall outside of the AEM program framework.

The USC has developed its own structure for data collection and reporting of agricultural, wetland, and stream BMPs to the Chesapeake Bay Program. To understand the approach used by USC, it is also important to understand the approach the USC takes toward implementation in the watershed. The USC has developed a "Multiple Barrier Approach" (MBA) for planning and implementing restoration projects on a watershed basis. The MBA addresses the issue at the **source** (e.g., headwaters), **across the landscape**, and in the **stream corridor**, as well as **programmatically** (e.g., regulations, training, and protection).

By developing multiple projects to address problems, progress can continue, and tangible results achieved even with smaller funding levels. The MBA approach can increase the probability of success and help capture stakeholder interest by demonstrating progress through implementation.

A successful MBA relies on a firm understanding of how each watershed functions in relation to its hydrological characteristics, drainage patterns, topography, land cover, land uses and misuses, precipitation events, and other parameters. Flooding, streambank erosion**,** gravel deposition, and nutrient loading are both common problems in the Upper Susquehanna River watershed and priority USC issues.

Based on this approach the USC has developed three key focus areas: environmentally and economically sustainable agriculture, stream corridor rehabilitation, and wetland restoration. The USC has supported the use of the MBA by the creation of "teams" for each of these focus areas (Table 2). Each team has a team leader and in some cases a program coordinator. Below is a listing of the key project staff identified for these teams.

Key Project Staff

- USC Watershed Coordinator – Wendy Walsh, walshw@co.tioga.ny.us
- USC Chairperson-Jeff Parker, jgparker@stny.rr.com
- USC Agricultural Team Leader – Amanda Barber, amanda.barber@cortlandswcd.org
- USC Agricultural Coordinator – Emily Dekar, dekare@co.tioga.ny.us
- USC Wetland Coordinator – Melissa Yearick, melissa@u-s-c.org
- USC Stream Team Leader – Mike Lovegreen, mike.lovegreen@u-s-c.org
- USC Buffer Coordinator – Lydia Brinkley, lbrinkley@u-s-c.org
- SWCD Technicians – All USC-member SWCD personnel

Table 2. Focus area team membership

Team Information	Focus Area		
	Environmentally and Economically Sustainable Agriculture	Stream Corridor Rehabilitation	Wetland Restoration
Team Name	Agricultural Team	Stream Team	Wetland Team
Point of Contact	Amanda Barber, Emily Dekar	Mike Lovegreen	Melissa Yearick

USC Team personnel and USC Member SWCD technicians are collectively responsible for QA/QC of data management, practice tracking, verification, record reviews, and reporting. AEM BMP data collection is administered by the USC Member SWCD technicians and is overseen by the USC Agricultural Team Leader and Agricultural Coordinator. Stream BMP data is coordinated and overseen by the USC Stream Team Leader, and Urban Buffer BMP data is coordinated and overseen by the USC Buffer Coordinator. Wetland BMP data is handled solely by the USC Wetland Coordinator as she is involved in all USC wetland implementation projects, has developed a relationship with the U.S. Department of Agriculture (USDA) Natural Resource Conservation Serve

(NRCS), and documents all practices implemented in the watershed regardless of the funding mechanism.

Once all BMP data has been collected by the respective team leader, coordinator, or USC Member SWCD technician, it is then reviewed by the USC Agricultural Coordinator providing another opportunity for QA/QC prior to submission.

A5: Problem Definition/Background

A5.1: USC History and BMP Involvement

EPA's Chesapeake Bay Total Maximum Daily Load (TMDL) requires New York to reduce nutrient and sediment pollutant loads to the Chesapeake Bay. As illustrated by Figure 1, the Susquehanna and Chemung rivers flow south from New York to the Chesapeake Bay. The USC has been New York State Department of Environmental Conservation's (NYSDEC's) primary local partner since New York formally joined the effort to restore the Chesapeake Bay in 2000. New York's efforts to meet its Chesapeake Bay restoration goals rely heavily on the work of the USC to implement BMPs to reduce pollutant loads and to collect data about BMPs that are implemented. Without the USC, New York cannot meet its Chesapeake Bay restoration goals and would be subject to regulatory penalties from EPA.

Established in 1992, the USC is a coalition of 18 SWCDs in New York and 4 SWCDs in Pennsylvania whose mission is to protect and improve water quality and natural resources in the Upper Susquehanna River watershed. Through a Memorandum of Understanding, the Tioga County SWCD is designated as the administrator and fiscal agent of the USC.

A5.2: Importance of Data Reporting

Even before it was formalized in 2000 when the AEM program was enacted into the New York State Agriculture and Markets Law, the USC's SWCDs from New York had begun efforts to collect BMP data. SWCDs have a long history of implementing agricultural NPS BMPs and retain extensive hard copies of their projects in cooperator files. Data were solicited from NRCS, USDA Farm Services Agency (FSA), and SWCD files since the period 1985 to 2005. This timeframe represents the baseline BMP data for New York State. All baseline data collection was completed by December 2005. Data collection has continued since 2006. In 2013, a new online AEM Data Management Application was developed to manage historic and future BMP data collection for reporting to the CBPO. The USC is the sole provider of county-level agricultural, stream, and wetland data reported to the NYSDEC. The NYSDEC manages reporting of data to the CBPO through the NEIEN node. However, with the permission of NYSDEC, the USC also has access to upload XML files directly to the NEIEN node for efficiency in testing XML's.

A5.3: General BMP Reporting Principles

The goal of BMP data collection is to provide information to the CBPO that will assist in a more accurate estimate of baseline practices and future conservation needs on agricultural lands in the New York portion of the Chesapeake Bay watershed. The data are reported in standardized formats and codes via the NEIEN node. The CBPO creates annual progress scenarios using the WSM to describe, assess, and report the status of the restoration efforts, including estimated reductions in

nitrogen, phosphorus and sediment loadings to Chesapeake Bay and its tidal tributaries. The CBPO uses these assessments to track progress toward meeting New York State's current Watershed Implementation Plan (WIP) target loads.

To facilitate accurate reporting of agricultural BMP data, the USC has developed an online AEM Data Management System tool for use by the SWCDs in reporting agricultural data directly from their offices to a server. The tool uses GIS (Geographic Information System) and mapping capabilities to identify and geographically reference BMPs to a specific farm. Annual reporting consists only of new BMPs implemented that particular year and BMPs that were identified that year but not previously captured. Annual or single-year BMPs are reported once they are verified for that year. Previously reported multi-year structural BMPs are only reported once. This is treated as historical data and the data on these multi-year structural BMPs are not re-entered even if the BMP name is changed by the CBPO. BMP units are field verified and reported directly in the units established by the CBPO.

Data collection efforts are handled differently for the stream, urban buffers and wetland practices. For all stream data, the USC Stream Team Leader provides a form (Appendix 11) for each District to log completed practices that were implemented within their county that year. The form is completed by SWCD staff and then sent back to the USC Stream Team Leader who acts as the repository for these practices. Stream data was reported to the CBPO for the first time during the 2018 Progress Submission.

Urban Buffer implementation is tracked by the USC Buffer Coordinator and USC Buffer Stewards. The USC Buffer Coordinator provides a form (Appendix 13) for each Buffer Steward to use for evaluation of implemented practices within their area. Evaluations of urban buffers will happen on an annual basis for the first 3 years following implementation; thereafter the verification protocols outlined in D2.10 – D2.12 will be followed. These data are provided the USC Ag Coordinator on a county by county basis for tracking purposes in the online tool. These data are then included with NYSDEC's submittal of the USC data through the NEIEN node.

Wetland implementation is tracked by the USC Wetland Coordinator, including USC, NRCS, and U.S. Fish and Wildlife Service (USFWS) implementation projects. These data are then provided to the USC Ag Coordinator on a county by county basis. The USC Ag Coordinator manually enters the data it into the online tool. These data are then included with NYSDEC's submittal of USC data through the NEIEN node.

It is important to mention that both cost-shared and non-cost shared practices are being implemented within the watershed. The USC tracks and reports these practices regardless of the implementation mechanism. Cost-shared practices meet CBP or NRCS conservation practice standards. Practices that are implemented without cost share often meet the CBP or NRCS conservation practice standards, but there are cases where such standards are not met despite providing similar environmental benefits. Practices that do not meet the conservation practice standard associated with our state and or federal cost-share programs but still provide a similar annual environmental benefit for water quality are called Resource Improvement (RI) BMPs. The USC will track and report RI practices in accordance with EPA's guidance on reporting and verifying

RI practice implementation (*Chesapeake Bay Program Resource Improvement Practice Definitions and Verification Visual Indicators Report* 2014). SWCD technicians will review and utilize Tier 2 AEM worksheets (see Appendix 2 for an example; others can be found at http://www.nys-soilandwater.org/aem/techtools.html) and complete a visual assessment of these practices in order to document and capture these RI practices in the online tool.

A6: Project Description – BMP Names, Definitions, and Reporting to NEIEN

Agricultural BMP definitions are found in the *USC BMP Data Entry & Verification Guide* which is attached as Appendix 3. Non-Agricultural BMP definitions are found in the Word Document "USC Non-Ag BMP Def.docx" which is attached as Appendix 12. USC BMP to Scenario Builder BMP Mapping is available in the Excel File "BMP Mapping USC-SB-NEIEN.xlsx." which is included as Appendix 4. The information in this worksheet represents the current BMP information, including units and all relationships between CBP BMP names and USC BMP names.

Farms in each county are mapped in GIS. The data are then transferred (digitized) to GIS. USC and SWCD technicians then collect BMP data for each farm, tagging them with the latitude/longitude coordinates of the farm where the BMPs are applied. BMP data are tagged with a Chesapeake Bay identifier to indicate that the BMPs are geographically part of the Chesapeake Bay Watershed. Data are then aggregated by county and processed into the required XML data exchange files for the NEIEN. The NYS Agriculture and Markets Law requires that data be aggregated by county to protect farmer confidentially.

The wetland data is tracked by site using information from the various implementation representatives and compiled by the USC Wetland Coordinator into the Chesapeake Bay Wetland Workgroup tracking spreadsheet. Each site record is assigned a unique identifier and contains acreage, completion date, prior land use, and location information. Wetland data is provided to the USC Ag Coordinator on a county-by-county basis.

The non-urban stream data is tracked by site using information from the various implementation representatives and compiled by the USC Stream Coordinator into a tracking spreadsheet. Each site record is assigned a unique identifier and contains the number of feet of project area, completion date, and location information. Stream data is provided to the USC Ag Coordinator on a county-by-county basis.

The urban buffer data is tracked by site using information from the various implementation representatives and compiles by the USC Buffer Coordinator into a tracking spreadsheet. Each site record is assigned a unique identifier and contains the length, width, total acres, implementation date, prior land use and location information. Urban buffer data is provided to the USC Ag Coordinator on a county by county basis.

A7: Quality Objectives and Criteria

A7.1: Accuracy Objectives

BMP projections are made annually based on the WSM reduction requirements and projects scheduled for that year. These projections are compared to the actual BMPs reported at the end of the year. The USC generates county-level reports from the AEM Data Management System that allows for an end-of-year BMP report for the current year and a total of the historical data for comparison to previous years.

A7.2: Completeness Objectives

There is low potential for double counting BMPs, the inclusion of expired and non-functional BMPs, or failure to implement annual BMPs because the data are site specific. These issues are addressed in greater detail in section B.10.

Each USC-member SWCD collects BMP data throughout the year and data are submitted to the USC by July 31st. A single BMP data transfer XML file is created for each county, accounting for all years, 1985 through current. XML files are named identically as previous years files to overwrite the old data, when uploaded into the NEIEN to better track previously implemented practices that were found in the current year. All new BMPs reported are field verified by technicians. The verification of historic, expired, or annual practices is described in section D2.2.

A8: Training and Certification of Key Staff

The mission of the USC is to protect and improve water quality and natural resources in the Upper Susquehanna River Basin with the involvement of citizens and agencies through planning and implementation of conservation projects, education, and advocacy for water resources. Each of the 18 NY SWCDs that are USC members are designated as the "lead" for water quality issues in their county and each has over 60 years of experience working on water quality issues with local landowners, natural resource partners, municipalities, industries, and regulators.

The USC currently communicates to its 18 NY member Districts using existing infrastructure and well-established relationships and traditions. Furthermore, our strategies are shared through a basin-wide array of professional partnerships that are focused on the Chesapeake Bay watershed effort. Other communication tools include USC bi-monthly meetings and partnerships with crop consultants, nutrient management and CAFO (concentrated animal feeding operation) planners, New York Farm Bureau, and the Northeast Dairy Producers Association. Moreover, the USC has strong partnerships with NRCS, FSA, NYSDEC, NYS Department of Agriculture & Markets, and the Soil and Water Conservation Committee (SWCC) in New York. As a result, the USC is in a strong position to communicate our approach accurately and efficiently.

As described in section A4.2, the USC uses a "multiple barrier approach" for planning and implementation that addresses issues at the source, across the landscape, and in the stream corridor. At the basin-wide scale, the USC uses its success in soil and water conservation to be an active partner in the multi-state effort to restore the Chesapeake Bay. The USC is also the lead in

New York for developing the agricultural NPS implementation portion of the Phase I and Phase II WIPs.

While individual SWCDs implement BMPs across a wide variety of land uses, the USC focuses our efforts on three key focus areas: Environmentally and Economically Sustainable Agriculture, Stream Corridor Rehabilitation, and Wetland Restoration. Each focus area has a team leader and/or coordinator to facilitate effective and efficient implementation within each SWCD and across the basin to meet local and regional water quality goals. Central to the success of the USC is its 'vertical and horizontal' integration: the USC plans, designs, and implements using its own professional staff, technicians and equipment. The USC represents a basin-wide distribution of natural resources professionals that has established relationships and partnerships with stakeholders at every level (local, state, multi-state, and federal). The result has been a productive, decades-long history of strengthening and promoting environmental stewardship and protecting water quality at all scales.

Because the USC and SWCD members recognize the importance of training our resource professionals, each USC focus area has specific training and education opportunities as described below.

A8.1: Agricultural Team Training and Education

Training of resource professionals from the public and private sectors is a vital component of AEM. Training is regularly provided to SWCDs and their partners with NRCS, Cornell Cooperative Extension, Private AEM Certified Planners, Certified Crop Advisors (CCA), NRCS Technical Service Providers (TSP), and agri-businesses. Training is overseen by the AEM State-wide Interagency Committee that reports to the SWCC. It is guided by a Technical Development Curriculum developed by the Conservation Partnership and endorsed by the SWCC and the NYS Conservation Districts Employee's Association (CDEA). The curriculum has two tracks, one for planners who generally identify environmental concerns and opportunities and work with the farmer to plan solutions, and another for technicians who generally develop detailed designs of BMPs and oversee the installation. Training on the curriculum and related topics is provided annually at three venues:

- NYS Water Quality Symposium (WQS) – 3 days of concurrent training held annually in March. Over 300 participants attend including Conservation District staffs and conservation partners from NRCS, Cooperative Extension, AEM Certified Planners, DEC staff, some farmers, and agribusiness representatives. The WQS annually hosts the classroom component of the AEM Planner Certification requirements. The WQS has occurred annually since 1979 and is funded through state funds and participant registrations.
- NYS Conservation Skills Workshop (CSW) – 4.5 days of concurrent field training in support of the curriculum is held annually in October. Training at the CSW is often the field component of classroom training initiated at the WQS. The audience is similar to the WQS and averages 130 participants annually. The CSW has occurred annually since 1997 and is supported through participant registrations and contributions from CDEA, SWCC, and NRCS.
- Northeast Region Certified Crop Advisor Annual Training Session (NRCCA) – 3 days of concurrent training held annually in December for Certified Crop Advisors and all

conservation partners. Sessions are awareness oriented related to conservation programs, regulatory issues, current events, and new technology. Offerings at the NRCCA are coordinated with the Interagency Training Committee. The audience is predominantly CCAs from the public sector (Cooperative Extension, NRCS, and SWCD) and agri-businesses averaging around 150 participants annually. A training component for professional engineers (PEs) associated with AEM Certified Planners is often held in conjunction with the NRCCA or the WQS. The training is supported through participant registrations and has been held since 1992.

In addition to the three annual training events described above, numerous other statewide and regional sessions are offered through the AEM Interagency Training Committee as needed to support the curriculum, programs, and regulations, as well as address emerging needs, issues, and technology. Examples of training opportunities held annually that are available to the conservation partnership, CCAs, TSPs, and agribusiness include:

- AEM: Overview of Procedures and Tools for Inventory and Assessment
- AEM: Overview of Procedures and Tools for Conservation Planning
- AEM Communications Training Phase 1, 2, and 3
- Cropland Conservation Planning Field Session
- Farmstead Resource Concern Identification
- Nutrient Management and Groundwater
- Cover Crops Field Day
- Soil Health Training Course
- Conservation Planning on Pasture
- Cornell Cropware Nutrient Management Planning and RUSLE2 Training
- NRCS Phase 3 Conservation Planning Training

The USC takes a team approach to all of the agricultural issues within the Chesapeake Bay watershed, including BMP data collection. Key USC project staff identified in section A4.2 who are responsible for the BMP data collection efforts include a Watershed Coordinator, Agricultural Team Leader, Agricultural Coordinator and SWCD technicians. USC Staff and the USC-member SWCDs staff maintain a variety of professional certifications that include CCA, Certified Agricultural Environmental Management Planner (AEM Planner), Certified Professional in Erosion and Sediment Control (CPESC), and TSP. These resources are available to all USC-member counties.

A8.2: Stream Team Training and Education

The USC has developed a core group of individuals throughout the membership that enable the USC to address issues related to stream resources. The USC believes that it is critical to both expand that group to include others from member SWCDs as well as expand and continue the professional competency of those involved. Members of the USC Stream Team and SWCD continue to improve skills and knowledge through annual trainings including the WQS and the CSW which both have stream management tracks that our technicians attend. In addition, the USC also seeks out specific training for staff based on program initiatives and priorities, including HEC RAS modeling, Culvert Assessment, etc. The USC recently won the 2015 NYSDEC Environmental Excellence Award for stream training sessions we offer throughout the watershed. Our team is recognized by the state as

being the leader in stream corridor management and as such, offers opportunities for sharing that expertise with partners, agencies, and others as needed.

A8.3: Wetland Team Training and Education

The USC Wetland Team is also comprised of highly trained individuals who are leaders in their field. This is evidenced by the fact that the USC has been designated by the DEC as the official NY wetland data manager for the Chesapeake Bay Program and is responsible for New York's wetland goals in its Chesapeake Bay Tributary Strategy. In addition to that, the USC is the Chesapeake Bay Program's "Wetland Champion" nominated to promote accelerated wetland restoration in the Basin. Our staff attend training similar to the above but also attend NYS Wetlands Forum and other training opportunities throughout the year. The USC Wetlands Team has also been awarded for being leaders of our field, winning the NYSDEC Environmental Excellence Award in 2014 and winning the EPA Environmental Champion Award in 2015.

A9: Documentation and Records

A9.1: Data Collection Process and Data Management Systems

As mentioned in section A4.2, the USC teams and or SWCD members track and collect data for streams, urban buffers, wetlands, and agricultural BMPs implemented in the watershed. The USC Stream Team leader works with SWCD technicians to capture implemented stream rehabilitation projects that meet the CBP definitions. The form currently used to report stream projects is provided in Appendix 11, the information is then summarized by county for submission into the USC tracking database by our USC Ag Coordinator and then reported through the NEIEN node. The form currently used to report urban buffer projects is provided in Appendix 13, the information is then summarized by county for submission into the USC tracking database by our USC Ag Coordinator and then reported through the NEIEN node. Wetland implementation tracked by the USC Wetlands Coordinator includes projects constructed by the Wetlands Team, the USFWS and the NRCS. This information is tracked by project and summarized by county for submission into the USC tracking database by our USC Ag Coordinator, and then reported through the NEIEN node. The respective USC Team Leaders and/or Coordinators maintain hard copies of all implementation data.

The USC Agricultural team and USC member SWCDs are the agricultural data providers. As described in section A4.2, they use the NYS AEM Program as its framework. Each county uses the highly interactive AEM on-farm framework and has resource professionals and peers working with the farmer throughout the process. This framework and associated process are designed to increase farmer awareness of the impact that farm activities have on the environment. Further, it encourages farmer participation and seeks behavioral change, both of which are important overall goals. AEM utilizes the NRCS Planning Process as enhanced by its five-tiered framework. Initial BMP data collection starts with the AEM Tier 1 worksheet which is included as Appendix 5.

USC staff or a SWCD Technician uses the AEM Tier 1 to collect farm contact information; inventories farm infrastructure, land use, and livestock; determines the farm's future plans; informs the farmer of their watershed(s) and watershed concerns; and identifies potential environmental concerns and

opportunities (see http://www.agriculture.ny.gov/SoilWater/aem/techtools.html for details). This information is kept confidential and coded with an individual farm AEM ID.

BMP data collection can be conducted throughout any of the five AEM Tiers by using the USC CBP *Agricultural Environmental Management Ag BMP Data Entry Sheet* which is included as Appendix 6. All relevant agricultural BMP data that will be reported to the CBPO can be captured on this sheet in a form ready for data entry to the online AEM Data Management System. Each SWCD keeps track of BMPs installed under different contracts associated with NYS Agriculture and Markets grants or other non-federal cost share funding. Each District will meet with NRCS and FSA staff at the local level to document and review the list of USDA cost-shared projects. All of this data is then compiled and entered into the AEM Data Management System.

A9.2: Data Retention Time and Loss Prevention

Each SWCD keeps a back-up copy of its own data in a hard copy, Excel spreadsheet, or Access database. These copies are stored in Cooperator Files and/or stored on the SWCD servers. Backup procedures are determined by the District. Once the BMP data is entered into the online AEM data management application, the USC Ag Coordinator can provide data feedback reports about the data to the individual SWCDs and other entities.

AEM plans, on-farm surveys, and assessments filed with the Department of Agriculture and Markets or filed with or prepared by county SWCDs are considered confidential and not subject to public disclosure, except such documents will not be considered confidential as deemed necessary by the Agricultural Commissioner or the SWCDs to implement the purposes of confidentiality. AEM and SWCDs cooperator files are retained permanently.

The AEM Database Management system is housed on virtual servers located at Tioga County. The SQL databases are backed up internally daily. The server is attached to a SAN (storage area network) for hard drive capacity. The virtual server management software along with the SAN tools are creating backups of the server and database daily, weekly, and monthly. Copies of these backups are also stored off site.

A9.3: BMP Inspection Forms

Inspection forms were created utilizing the AEM program template for practice and plan evaluation. The USC Agricultural Team completed this work with the USC Agricultural Committee, which includes additional partners and experts. These forms along with the BMP Data Entry Guide and Verification Guide are reviewed annually by the USC Ag Coordinator and distributed to the USC Ag Team Members. The *USC BMP Data Entry and Verification Guide* can be found in Appendix 3. The BMP information is captured using the AEM Tier 2 (available at http://www.nys-soilandwater.org/aem/techtools.html) and USC CBP Ag BMP Data Entry Sheet (Appendix 6) under the current process.

GROUP B: DATA GENERATION AND ACQUISITION

The elements in this group address all aspects of project design and implementation. Implementation of these elements ensures that appropriate methods for sampling, measurement and analysis, data collection or generation, data handling, and QC activities are employed and are properly documented.

Sections B1 through B8 of an EPA-required QAPP (USEPA 2006) are not directly applicable to NPS BMP data tracking and reporting. Situations where implementing organizations generate data through sampling to answer research questions do occur. For example, soil samples are taken during the development of a nutrient management plan to determine appropriate fertilizer and manure application rates. Likewise, manure is sampled to determine nutrient content. Details regarding any sampling protocols related to evaluation of NPS BMPs will be incorporated in future versions of this QAPP.

B9: NON-DIRECT MEASUREMENTS

All data used to record and report on agricultural, stream, and wetland BMP implementation in New York's portion of the Upper Susquehanna River watershed is collected directly. There is no reliance on non-measurement sources such as computer data bases, programs, literature files or historic data bases.

B10: Data Management (TRACKING AND REPORTING PROCEDURES)

B10.1: ROLES AND RESPONSIBILITIES

AEM BMP data collection is administered by the USC Agricultural Team. The Agricultural Coordinator is responsible for QA/QC of data management, tracking, verification, record reviews, and reporting. Technicians at the local level through USC-member SWCDs are the lead data collectors responsible for on-site inspections, data collection, and data entry.

1) **Stream Data**: As described previously, stream data are requested via the USC Stream Team Leader and are provided by each SWCD with project implementation data. These data are tracked by county in a spreadsheet format. This information is aggregated at the county level for reporting to the USC Ag Coordinator. The USC Ag Coordinator then enters the data into the database and the stream practices are reported via the NEIEN node along with the agricultural practices.
2) **Wetland Data:** The Wetland Coordinator is responsible for collecting, verifying, and reporting all wetland implementation in the watershed. This information is aggregated at the county level for reporting to the USC Ag Coordinator. The USC Ag Coordinator then enters the data into the database and the wetland practices are reported via the NEIEN node with the agricultural practices.
3) **Agricultural Data**: Each SWCD is responsible for collecting, verifying, and entering agricultural BMP data in their county. Each SWCD keeps track of BMPs installed under different contracts associated with NYS Agriculture and Markets grants or other non-federal

cost-share funding. Each District meets with NRCS and FSA staff at the local level and reviews the list of USDA cost-shared projects. The SWCD staff also participates in DEC CAFO visits and reviews previous year CAFO reporting as another means of ensuring that all BMPs are reported. All of these data are compiled and entered into the AEM Data Management System using a standardized USC CBP Agricultural BMP Data Entry Sheet. Additional details of how BMP data are obtained are provided in section A9.1.

4) **Urban Buffer Data:** The USC Buffer coordinator is responsible for collecting, verifying and reporting of all urban buffer implementation that the USC is involved with the installation of such projects. This data is aggregated at the county level for reporting to the USC Ag Coordinator, who then enters the data into the database and is reported via the NEIEN node with the agricultural practices.

B10.2: Data Management System and Work-Flow Diagram

The AEM Data Management System is an online tool developed using ESRI's ArcServer Software and Microsoft Silverlight. The tool allows for a common database standard that is directly formatted to match the Chesapeake Bay Program's WSM schema. The database is created using SQL Server software and is designed as a multi-tiered relational database.

Figure 2 (also Appendix 7) is a simplified work-flow diagram showing the data flow for BMPs.

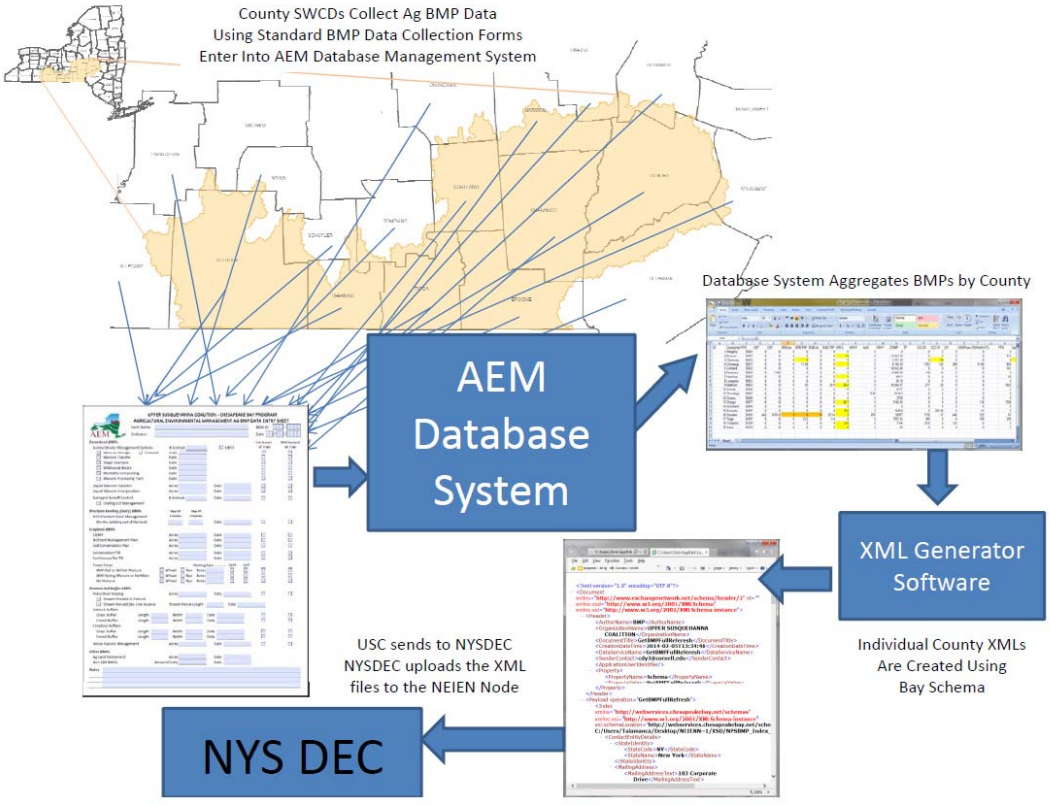


Figure 2. AEM Database System work-flow diagram

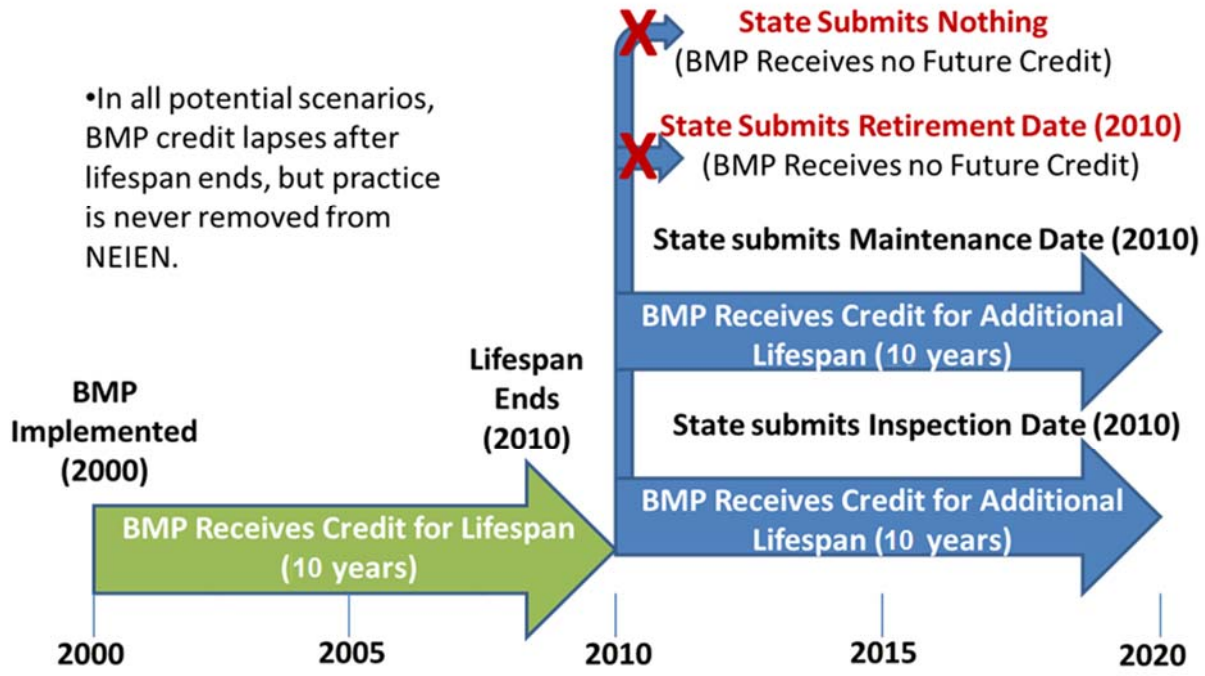
B10.3: Basic File Structure and Data Aggregation

All BMP data are tagged to the latitude and longitude coordinates of the farm where the BMPs are applied. BMP data are also tagged with a Chesapeake Bay identifier to indicate that the BMPs are geographically part of the Chesapeake Bay Watershed. Each farm is referenced by a unique AEM ID number for SWCD tracking, however this AEM ID is not included as part of the information reported through the NEIEN.

All BMP and farm point data collected under the AEM program is protected under NYS Department of Agriculture and Markets Law and confidentiality law. Data are aggregated by county in accordance with this law and processed into the required XML data exchange files for the NEIEN.

B10.4: BMP Lifespans and Tracking

BMP lifespans will be tracked using the implementation date or an updated verification date as illustrated in Figure 3. Lifespans used for BMPs are those set by the CBP. The USC Ag Coordinator has the ability to query data and build customized reports at the counties request. Annual reports identifying practices that are set to expire are produced for the counties each year to allow for practice verification to occur prior to a practice's expiration date.



USC BMP Name	*Credit Duration*
Waste Management Systems	15
Barnyard & Runoff Management	10
Soil Conservation Plants	10
Tillage Practices (Conservation Tillage, High-Residue Tillage, Low-Residue Tillage)	1
Dairy Precision Feeding	1
Nutrient Management (Core N, Core P, NRate, N Placement, N Timing, P Rate, P Placement and P Timing	1
Cropland Forest Buffers (Regular & Narrow)	10
Cropland Grass Buffer (Regular & Narrow)	10
Exclusion Fence with Grass Buffer	10
Exclusion Fence with Grass Buffer Narrow	10
Exclusion Fence with Forest Buffer	10
Exclusion Fence with Forest Buffer Narrow	10
Ag Land Retirement (Land Retirement to Ag Open Space, Land Retirement to Pasture, and Alternative Crops)	10
Prescribed Grazing	10
Horse Pasture Management	10
Cover Crops (Cover Crops, Cover Crops with Fall Nutrients, & Commodity Cover Crops)	1
Manure Incorporation	1
Ag Tree Planting	10
Pasture Alternative Watering	10
Non-Urban Stream Restoration	10
Wetland Restoration	15
Urban Forest Buffer	10
Urban Forest Buffer Narrow	10

Figure 3. BMP lifespan tracking approach

B10.5: Quality Assurance and Quality Control

The USC database is a comprehensive source of agricultural BMP implementation in New York, including BMPs funded by both state and federal programs. The online application of the AEM Data Management System has numerous security measures in place. Staff from USC-member SWCDs are the only people who enter data into the USC database, and all users are issued a unique password and credentials for their assigned geographic extent.

Each year, SWCD staff review BMP implementation data with NRCS and FSA staff at the local level in each county to verify that all federally-funded BMPs are included and that none are double-counted or missed. Once these data entry and quality control processes are complete each year, the USC database becomes the sole source of agricultural BMP information used for New York's annual Progress Reporting.

B10.6: Reporting to the NEIEN

Because USC is not a state entity, the XML files generated are sent to NYSDEC to be uploaded into the NEIEN through the NYSDEC NEIEN network node located in Albany. However, with the

permission of NYSDEC, the USC also has access to upload XML files directly to the NEIEN node for efficiency in testing XML's.

GROUP C: ASSESSMENT AND OVERSIGHT

The elements in this group address the activities for assessing the effectiveness of the implementation of the project and associated QA and QC activities. The purpose of assessment is to ensure that the QA Project Plan is implemented as prescribed.

C1: ASSESSMENT AND RESPONSE ACTION

C1.1: STRUCTURE OF ASSESSMENT PROTOCOL

The USC assesses data acquisition and verifications annually, led by the USC Program and Team Leaders and the Watershed Coordinator. The USC member SWCDs are informed of new information concerning BMP data, definitions, collection procedures, entry procedures, and projected timelines for their BMP data management goals. There is an established infrastructure for communication which includes bi-monthly USC meetings, monthly Team conference calls, and a Team e-mail list. Each of these elements offers a mechanism to provide new information, assess progress, answer questions, and have general discussions about all aspects of the BMP data management system. In addition, there are multiple trainings available as described in section A8 and a mandatory annual training for the BMP data management system.

As described in section B10.1, the data providers are SWCD technicians, and all collected data must meet the specifications outlined in sections A9 and B10. The AEM Data Management System also helps to control data quality by limiting data entry to only those data that are suitable for reporting. The data will be verified according to the procedures in Section D.

C1.2: BMP VERIFICATION

The BMPs and definitions that the USC has historically used are identified in section A6 and the appendices referred to therein. The USC continues to assess the current BMPs, definitions, and detailed coding practices to ensure that the highest priority practices are reported, and nutrient and sediment pollutant load reductions are fully accounted for by the Phase 6 WSM. The USC completed a major historical data cleanup in 2015 and continues to review historic data on an annual basis. All newly implemented BMPs are field verified and entered based on the actual year of implementation. The USC has identified the BMPs defined in Appendix 3 and Appendix 12, based on the ability to collect and input associated implementation data into the WSM. The USC Wetland, Stream, and Agricultural Teams continue to work with our partners and experts to achieve these goals while the BMP verification program outlined in Section D is further developed and piloted.

C2: COMMUNICATION AND REPORTS TO MANAGEMENT

Key project staff of the USC (see section A4.2) will be kept informed of project oversight, assessment activities, and findings by the communication infrastructure, which includes bi-monthly USC meetings, monthly and quarterly Team conference calls, and a Team e-mail distribution list.

USC Program Coordinators and Team Leaders complete monthly activity reports that are provided to the USC Watershed Coordinator and sent out to the USC Executive Board for review. USC key project staff will develop other reports as required.

GROUP D: DATA VALIDATION AND USABILITY

The elements in this group address the QA activities that occur after the data collection or generation phase of the project is completed. Implementation of these elements ensures that the data conform to the specified criteria, thus achieving the project objectives.

D1: DATA REVIEW, VERIFICATION, AND VALIDATION

D1.1: CBPO VERIFICATION PRINCIPLES

The Chesapeake Bay Program has called for increased transparency and scientific rigor in the verification of the BMPs that are implemented as part of the states' WIPs and the Chesapeake Bay TMDL. To respond to this request, *Strengthening Verification of Best Management Practices Implemented in the Chesapeake Bay Watershed: A Basinwide Framework - Report and Documentation from the Chesapeake Bay Program Water Quality Goal Implementation Team's BMP Verification Committee* (Verification Framework) (Chesapeake Bay Program 2014), was developed. The Verification Framework is intended to serve as a guide for the states to document the methodology for verification of BMP installation, function, and continued effectiveness of practices over time. This Verification Framework provides the requirements for reporting and documentation of practice verification for the states to follow. Specific guidance is provided for each of the source sectors (agriculture, forestry, urban stormwater, wastewater, wetlands, and streams).

Verification is formally defined by the Chesapeake Bay Program partners as "the process through which agency partners ensure practices, treatments, and technologies resulting in reductions of nitrogen, phosphorus, and/or sediment pollutant loads are implemented and operating correctly." The Chesapeake Bay Program partnership's Principals' Staff Committee formally adopted five verification principles in December 2012; these are described in Table 3. The USC is committed to adhering to these verification principles in the collection and reporting of BMP implementation data.

Table 3. Verification principles adopted by the Principals' Staff Committee

Principle	Description
Practice Reporting	Affirms that verification is required for practices, treatments, and technologies reported for nitrogen, phosphorus and/or sediment pollutant load reduction credit through the Bay Program. This principle also outlines general expectations for BMP verification protocols.
Scientific Rigor	Scientific Rigor Asserts that BMP verification should assure effective implementation through scientifically rigorous and defensible, professionally established and accepted sampling, inspection and certification protocols. Recognizes that BMP verification shall allow for varying methods of data collection that balance scientific rigor with cost effectiveness and the significance of or priority placed upon the practice in achieving pollution reduction.
Public Confidence	Calls for BMP verification protocols to incorporate transparency in both the processes of verification and tracking and reporting of the underlying data. Recognizes that levels of transparency will vary depending upon source sector, acknowledging existing legal limitations and the need to respect individual confidentiality to ensure access to non-cost shared practice data.
Adaptive Management	Recognizes that advancements in practice reporting and scientific rigor, as described above, are integral to assuring desired long-term outcomes while reducing the uncertainty found in natural systems and human behaviors. Calls for BMP verification protocols to recognize existing funding and allow for reasonable levels of flexibility in the allocation or targeting of funds.
Sector Equity	Calls for each jurisdiction's BMP verification program to strive to achieve equity in the measurement of functionality and effectiveness of implemented BMPs among and across the source sectors.

D1.2: Initial and Follow-Up Verification Requirements

While it is the goal to verify implementation of all BMPs implemented within the Chesapeake Bay watershed, resource constraints dictate that priorities be set to focus on those BMPs of greatest contribution to achieving each jurisdiction's pollutant load reduction goals. This reality is reflected in Table 4 which summarizes the expected coverage of BMPs for agricultural verification protocols described in the agricultural verification guidance (Appendix B of the Verification Framework). Note that all practices are to be verified at installation or startup. Follow-up verification requirements vary based on program type and practice type, with a range of 5 to 20 percent annually.

Table 4. Summary of verification coverage requirements

Program Type	Practice Type	Initial Verification	Follow-Up or Re-Verification
Non-Cost-Shared BMPs (including Resource Improvement Practices)	Annual	100% BUT sub-sampling allowed for single year BMPs (e.g., tillage practices) that are visually assessed.	Annual survey (using performance criteria and performed by qualified personnel) will determine the total number of annual BMPs. Based on the totals, the number of whole farm verification visits will be determined to achieve follow-up verification of at least 10% of those annual BMPs that account for >5% of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario (and 5% of those BMPs contributing ≤5% of the load reduction).
	Multi-Year	100%	10% of those multi-year BMPs which account for >5% of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario (and 5% of those BMPs contributing ≤5% of the load reduction).
Cost-Shared BMPs	Annual	100% BUT sub-sampling allowed for single year BMPs (e.g., tillage practices) that are visually assessed.	Annual survey (using performance criteria and performed by qualified personnel) will determine the total number of annual BMPs. Based on the totals, the number of whole farm verification visits will be determined to achieve follow-up verification of at least 10% of those annual BMPs that account for >5% of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario (and 5% of those BMPs contributing ≤5% of the load reduction).
	Multi-Year	100%	10% of those multi-year BMPs which account for >5% of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario (and 5% of those BMPs contributing ≤5% of the load reduction).
Permit-Based BMPs	Annual	100% BUT sub-sampling allowed for single year BMPs (e.g., tillage practices) that are visually assessed.	At least 20% during annual CAFO inspections.
	Multi-Year	100%	At least 20% during annual CAFO inspections.

D2: Verification and Validation Methods

This section summarizes the approach the USC will use to perform both initial and follow-up verification for both agricultural BMPs and wetlands. Initial verification for stream rehabilitation BMPs is described in sections D2.7-D2.9. Follow up verification will follow the same protocol as other BMP's similar to Wetlands. Over time as practices are changed and reported to the CBPO, additional verification and usability protocols will be developed as needed or as funds become available.

D2.1: Selection of Farms and Practices

New York will meet or exceed the verification frequency requirements in Table 4 for both initial and follow-up verification. New York State performs initial verification of all agricultural BMPs on farms participating in its AEM program, farms with contracts, and CAFO permitted facilities. Follow-up verification frequencies will be based on both the requirements in Table 4 and the relative contribution of BMPs to N, P, and sediment load reductions as supported by Attachment A in Appendix B (*Relative Influence of BMPs in Agriculture Sector*) of the Verification Framework.

Recent efforts of the USC and its partners have focused on the development of the sampling approach for follow-up verification of BMPs. Appendix 1 (*Statistical Sampling Approach to Agricultural BMP Verification in New York State*) describes New York's adaptive management approach for prioritizing BMPs and selecting inspection sites for verification that implemented BMPs are performing as expected based on performance criteria, NRCS practice standards and specifications, engineering specifications, or other applicable criteria.

Our approach is to first evaluate the latest model load reductions from WSM progress runs as a basis for selection of BMPs and determining the required level of verification. BMPs considered the highest priority for developing verification procedures are those that are generally projected to contribute at least 5 percent of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario. In Appendix B of the agricultural verification guidance document, load reductions were compared between a 2018 progress scenario and a *No-Action* scenario. The results for New York are summarized in Table 5. Differences in the BMPs found in Table 5 and those in Table 1 of section A4.1 are due largely to the updated list of BMPs reported for the 2019 progress year. These differences will be resolved as we move forward.

Table 5. BMP-specific load reductions for 2013 vs. no-action scenarios for New York

BMP	Share of Total Agricultural Load Reductions for 2018 vs. No-Action		
	N (%)	P (%)	Sediment (%)
Animal Waste Management System	42.9%	15.6%	0.0%
Barnyard Runoff Control	1.8%	0.6%	0.1%
Cover Crops (Cover Crops, Commodity Cover Crops, Cover Crops w/Fall Nutrients)	4.1%	0.1%	0.4%
Dairy Precision Feeding and/or Forage Management	1.3%	0.5%	0.1%
Forest Buffer	2.6%	0.6%	1.6%
Urban Forest Buffer	0.0%	0.0%	0.1%
Forest Buffer-Streamside with Exclusion Fencing	18.0%	47.2%	43.3%
Grass Buffer	0.8%	0.0%	0.7%
Grass Buffer-Streamside with Exclusion Fencing	8.8%	23.8%	22.2%
Horse Pasture Management	0.0%	0.0%	0.0%
Land Retirement to Ag Open Space	0.6%	-0.2%	0.7%
Non-Urban Stream Restoration	0.0%	0.4%	1.5%
Nutrient Management Core N	3.7%	0.1%	0.0%
Nutrient Management Core P	0.0%	1.8%	0.0%
Nutrient Management N Placement	1.3%	0.0%	0.0%
Nutrient Management N Rate	2.0%	0.0%	0.0%
Nutrient Management N Timing	2.5%	0.0%	0.0%
Nutrient Management P Placement	0.0%	1.3%	0.0%
Nutrient Management P Rate	0.0%	0.5%	0.0%
Nutrient Management P Timing	0.0%	0.3%	0.0%
Precision Intensive Rotational/Prescribed Grazing	1.6%	1.8%	0.0%
Soil Conservation and Water Quality Plans	5.3%	4.0%	16.9%
Tillage Practices (Conservation Tillage, High Residue Tillage, Low Residue Tillage)	1.8%	1.3%	11.9%
Wetland Restoration - Floodplain	0.9%	0.3%	0.7%

In accordance with the Verification Framework, the five (5) BMPs highlighted in Table 5 would require re-verification at a 10 percent rate and the remaining BMPs with ≤5 percent load reduction contribution could be sampled at a 5 percent rate. Per an adaptive verification approach, these sampling rates may be adjusted to address factors such as the risk of BMPs not being maintained and the relative importance of BMPs in the future.

Conservation partners working to advance AEM in NYS have long held planning, implementation of high impact BMPs, and on-going operation and maintenance (O&M) as high priorities. Therefore, the partnership also sought to develop follow-up verification methods that would primarily be of value to the farmer and for conservation and secondarily serve to collect data for progress

reporting as required by the Verification Framework. For this reason, a whole-farm approach was preferred over a BMP-based approach to achieve the required sampling rates for all reported BMPs. This method is designed to avoid artificial and confusing aspects of visiting farms to capture data on a single BMP when other BMPs are likely present (as well as repeat visits to verify independent BMPs) and should better match how farmers see their farms: as whole systems. It is anticipated that a whole-farm approach to verification will lead to more meaningful interactions with farmers about performance of current BMPs and potential for further BMP implementation, as has been the case during AEM Tier 5B evaluations and annual CAFO updates in NYS.

Follow-up verification of the permit-based (CAFO) BMPs has been on-going since 2004. The whole-farm approach has been successful, but full implementation of the planned additional procedures will be even more labor intensive.

The specific method for selecting farms to achieve these sampling frequencies is described in detail in Appendix 1. This method incorporates random sampling of farms to achieve target sampling frequencies within a framework designed to both minimize overall cost and balance workload across NY USC member counties. As found on page 4 of Appendix 1, follow-up inspections of BMPs at CAFOs will be 2.5 times (50 vs. 20 percent) that required by the Verification Framework. Approximately 50 percent of CAFO-permitted farms are inspected by NYSDEC or EPA annually (or 100 percent every two years; essentially verification by census). In addition, preliminary results show that the method achieves the minimum selection targets for BMPs using a farm-based approach (see Table 5 and Figure 3 of Appendix 1).

D2.2: Agricultural BMP Verification Methods

New York will use on-site visual assessments and on-site record reviews for all verification during a BMP's lifespan. On-site assessments for Visual–Multi-Year BMPs are employed to determine if the BMP meets the NRCS practice standards and specifications or the WSM practice definition and is performing as intended. These visual inspections are supported by AEM Tier 2 Worksheets (available at http://www.nys-soilandwater.org/aem/techtools.html), AEM Tier 5B Checklists (Appendix 8 and 9), NRCS practice standards, and any management records. A similar approach is used for Visual–Single-Year BMPs, except that the inspection is timed to occur when the BMP can be visually observed (e.g., late fall through spring for cover crops). On-site assessments for Non-Visual–Single-Year BMPs are also used to determine if the BMP meets the NRCS practice standards and specifications or the WSM practice definition and is performing as intended. These assessments consist of a review of farm management records and further assessment with AEM Tier 2 Worksheets (available at http://www.nys-soilandwater.org/aem/techtools.html), AEM Tier 5B Checklists (Appendix 8 and 9), and NRCS practice standards.

The on-site, non-visual assessment for nutrient management is similar to the verification of other non-visual, single-year BMPs and determines if the BMP(s) was implemented according to the farm's plan (i.e., a current plan based on NRCS definitions for that management area) or BMP definitions from Scenario Builder documentation. For nutrient management in NYS, the plan is based on the NRCS 590 Nutrient Management Standard (either stand-alone or as a part of a broader-based CNMP) and the plan criteria are linked to the different categories reportable for

Nutrient Application Management BMPs. The assessment of whether nutrient applications and other management practices were performed in accordance with the farm's 590 nutrient management plan is based on discussion with the farmer and a review of the 590 plan, nutrient application records, soil and manure analyses, manure application setbacks, and crop rotation records. SWCD technicians use the *USC BMP Data Entry & Verification Guide* (see Appendix 3) as their reference for what to look for within the plan and record keeping documents. Since Nutrient Management is primarily a management practice, if the practice is found to be satisfactory and pass our verification process then the implementation date for that practice will be continued through the verification year. (Example: Original implementation date of 1/1/2017, verification occurred on 5/5/2018 recorded as field verified on this date and passed, implementation date for current progress year would be recorded as 1/1/2018.)

Additional agricultural BMP's submitted with 2019 progress will include Manure Incorporation, Ag Tree Planting, Alternative Crops, Pasture Alternative Watering and Livestock Stream Exclusion. These practices will be 100% verified for 2019 progress and will be incorporated into the Site/Farm Verification Selection Protocol as outlined in section D2.1 for future verification.

All verification is performed by County Conservation Districts, NRCS Staff, Certified AEM Planners, and NYSDEC inspectors (CAFOs). The USC will document verification of non-cost-shared BMPs through confirmation via PE signoff or SWCD evaluation that they meet appropriate government or CBP practice standards. Cost-shared BMPs and those implemented under permit issuing programs are documented by BMP certification or PE sign off.

Re-verification of non-cost-shared and cost-shared BMPs will be performed by SWCD personnel or AEM planners. A farm inventory will be conducted if a practice sunsets within 2 years of the most recent on-site visual inspection. For BMPs implemented under permit issuing programs, re-verification will be performed by SWCD personnel or NYSDEC staff during inspections. Additional information regarding how the USC will address lifespans can be found in section B10.4.

The overall approach for meeting the agricultural BMP verification targets in Table 4 is summarized in Table 6.

Table 6. Summary of proposed agricultural BMP verification approach

Verification Element	BMP Implementation Mechanism[1]		
	Non-Cost-Shared BMPs	***Cost-Shared BMPs***	***Permit Issuing Programs***
Initial Inspection			
Method	Farm Inventory: On Site Visual[2] or Non-Visual[3] Assessment	Farm Inventory: On Site Visual[2] or Non-Visual[3] Assessment	Farm Inventory: On Site Visual[2] or Non-Visual[3] Assessment
Frequency	100% of farms participating in AEM	100% of All farms under contract	100% of all CAFO permitted facilities
Who Inspects	County Conservation Districts, NRCS Staff and Certified AEM Planners	County Conservation Districts, NRCS Staff and Certified AEM Planners	County Conservation Districts, NRCS Staff and Certified AEM Planners, NYSDEC inspectors
Documentation	BMPs meet appropriate government and/or CBP practice standard (PE sign off and/or SWCD evaluation)	BMP certification and/or PE sign off	BMP certification and/or PE Sign off
Follow-Up Check			
Follow-Up Inspection	Annual and Multi-year BMPs: Farm Inventory: On-site Visual[2] or Non-Visual[3] Assessment	Annual and Multi-year BMPs: Farm Inventory: On-site Visual[2] or Non-Visual[3] Assessment	Annual and Multi-year BMPs: On-site Visual[2] or Non-Visual[3] Assessment
Statistical Sub-Sample	Random selection of ≥10% of all farms participating in AEM in order to verify at least 10% of those BMPs that account for >5% of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario (and 5% of those BMPs contributing ≤5% of the load reduction).	Random selection of ≥10% of farms with active contracts in order to verify at least 10% of those BMPs that account for >5% of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario (and 5% of those BMPs contributing ≤5% of the load reduction).	50% of all farms w/ active permits.
Response if Problem	Bring into compliance within one year or remove from reported BMPs	Cost Share Program Contract Compliance Policy	NYSDEC CAFO Permit Compliance Policy
Lifespan/Sunset[4]	Re-verification by SWCD personnel and/or AEM planners. If practice sunsets within 2 years of on-site visual inspection a farm inventory will be conducted.		Re-verification by SWCD personnel and/or NYSDEC staff during inspections.

[1]New York State does not employ a Regulatory Program for BMP implementation as defined in the Chesapeake Bay Program Basinwide Framework. All farms under regulation operate within Permit Issuing Programs.

[2]For animal waste management systems, barnyard runoff control, conservation tillage, forest buffers, grass buffers, grass buffers TRP, land retirement, precision rotation grazing, and wetlands (for Initial Inspection only).

[3]For conservation plans, dairy precision feeding, and enhanced nutrient management.

[4]Lifespan to be addressed in accordance with CBP lifespan criteria, including those for Resource Improvement practices.

D2.3: Agricultural BMP Data Validation

In 2015 the USC endeavored to document and further develop the USC data validation and usability protocols. The USC sector teams along with SWCD technicians, additional partners, experts, and outside consultants have been working to document existing and modify new data management practices and procedures to meet the Verification Framework requirements.

Initial validation and verification occur now through our existing data collection and management process. SWCD technicians and partners field verify initial implementation of all BMPs, both those funded through state and federal sources and those funded by landowners independently. Because only SWCD technicians with personal knowledge of practices report data to the data management system, no double counting of BMPs can occur. Initial verification of all BMP's is 100 percent field checked. No data are accepted from other sources or entered into the system without initial verification. The USC Agricultural Coordinator is responsible for QA/QC. Additionally, the on-line data entry tool provides limitations and prompts for reporting that would prevent double counting. See section A9.1 and Group B for more details.

Data collection procedures are described further in sections A5.3, A6, A9, and B10.1 Data management procedures are described further in sections B10.2 through B10.6.

During 2016 and 2017 upgrades were made to the data management system to incorporate the BMP verification framework. These upgrades allow SWCD staff to record inspection dates, and a practice status for each BMP. The retirement/expired function was also updated in our system to incorporate individual BMP lifespans. The USC and SWCD staff completed and will continue to complete on farm BMP verification visits throughout the watershed on an annual basis. Farms are selected annually for BMP Verification using the protocols in Section D2.1. Implementation of the BMP verification process continues to be a substantial time commitment for SWCD staff and the USC Ag Coordinator.

D2.4: Selection of Wetland BMP Verification Sites

New York will meet or exceed the verification frequency requirements in Table 4 for both initial and follow-up verification of wetland BMPs. New York State and implementation partners at NRCS and USFWS perform initial verification of all wetland BMPs reported to the Chesapeake Bay Program. Follow-up verification frequencies for wetland BMPs will be at least 5 percent. The sampling approach described in Appendix 1 will be applied to all wetlands, resulting in at least 5 percent verification of wetlands installed under all programs. A number of these wetlands selected via the approach in Appendix 1 will be verified by NRCS based on its monitoring protocols which are described in Section D2.5. The remaining selected wetlands not implemented by NRCS will be verified by USC or USFWS as described in Section D2.5. Because NRCS annually verifies 20 percent or more of wetlands it installs under the Wetland Reserve Easement (WRE), the coupling of the 5 percent sampling by USC per Appendix 1 with additional NRCS verification will always result in annual verification of at least 5 percent of wetland BMPs.

D2.5: WETLAND BMP VERIFICATION METHODS

The New York Wetland BMP Verification Methods incorporate all wetland related BMPs that are implemented and accounted for within New York's WIP, including wetland restorations and creations. This information is also available in the Excel File "BMP Mapping USC-SB-NEIEN.xlsx." which is included as Appendix 4. Details regarding verification and validation procedures for these practices are contained in Table 7 and summarized herein.

Programs involved in verification include:

- Wetland restoration is funded and implemented primarily by **NRCS** and **FSA** under the Agricultural Conservation Easement Program (ACEP) - Wetland Reserve Easement (WRE) component, formerly known as Wetlands Reserve Protection (WRP). Through the easement program, all wetland practices are initially inspected upon completion, and follow a rigorous monitoring schedule for the duration of the easement. Because these lands are now considered federal "stewardship lands," they must meet certain criteria as described below.
- The **USFWS** partners with NRCS in many of their projects to provide technical assistance. For the projects for which they are partners, NRCS takes the lead on the initial and follow-up verification. However, USFWS also implements wetland restoration on their own; FWS will follow their most current verification protocol as we proceed with this verification process, and where FWS projects are selected by the New York Statistical Sampling approach, USC Wetland Team monitors will assist as needed in performing wetland verification using the NRCS WRP Monitoring worksheet (Appendix 10) to ensure consistency in monitoring data.
- The **USC** often partners with NRCS, USFWS or both to implement wetland restoration projects. For those projects with which USC partners with NRCS, NRCS takes the lead on the initial and follow-up verification. However, USC also implements wetland restoration on its own. In these cases, USC will follow the wetland BMP verification approach outlined in Table 7, including 100 percent initial verification and 5 percent annual field verification of randomly selected sites. Field visits will be completed using the NRCS WRP Monitoring worksheet (Appendix 10) to ensure consistency in monitoring data.
- **Other Groups** including Ducks Unlimited (DU) and various local conservation partners may also implement wetland restoration projects throughout the watershed. For those projects that are reported to the Wetland Coordinator, USC will follow the wetland BMP verification approach outlined in Table 7 including 100 percent initial verification, and 5 percent annual field verification of randomly selected sites. Field visits will be completed using the NRCS WRP Monitoring worksheet (Appendix 10) to ensure consistency in monitoring data.

<u>NRCS WRE Monitoring Methodology</u>

Wetland restoration projects implemented by NRCS are monitored using methodology outlined in the WRP manual which can be found here: http://directives.sc.egov.usda.gov/RollupViewer.aspx?hid=17111. This methodology has been approved by the CBP wetland workgroup (Chesapeake Bay Program 2014).

Inspection and maintenance are routinely performed as part of federal agricultural financial assistance programs. With the exception of post-construction monitoring frequency (which still meets the verification requirement of 5 percent annually), New York monitoring of all wetland projects will conform to the following guidelines set forth by NRCS:

- WRE projects are monitored annually for three years, followed by an ownership review in the fourth year, then three years of remote sensing review. Onsite monitoring should occur every five years after that. Monitoring may be more frequent if there are violations or if compatible uses of the wetland have been approved. Note that rehabilitation projects in existing wetlands do not receive nutrient or sediment reduction credit at this time.
- CRP/CREP projects are verified for correct installation. Annual monitoring is required for 10 percent of all active contracts. All of these projects are implemented on private lands where landowners typically inspect the sites a few times throughout the year. Landowners contact NRCS regarding any problems noted during these inspections.

During the monitoring process, the evaluator will record observations based on the questions found on the *NRCS Wetlands Reserve Program (WRP) Monitoring Worksheet* (Appendix 10). The WRP Monitoring Worksheet aims to ensure restoration requirements are being met, evaluate progress, determine what restoration repairs or enhancements may be needed, and maintain contact with the landowner. Photographs are also taken and stored with site visit information. Each implementing agency uses the following checklist for field verification:

- Is the landowner present during the review?
- Has the landowner changed?
- Is the restoration boundary clearly marked and identifiable?
- Are the contract and agreement conditions being met?
- Are restoration practices being properly operated and maintained? (If not, what maintenance is needed? Fill in maintenance practice and cost worksheet.)
- Is the planned hydrology (i.e. saturation or inundation) present? (If no, what actions are needed?)
- Are maximum wildlife habitat objectives being achieved? (e.g. adequate hydrology, nesting cover, etc.)
- Are planned vegetation restoration goals being achieved (e.g. is desired vegetation being established, are invasive or noxious species a problem)? (If no, what modifications are necessary?)
- Are restoration practices being properly operated and maintained? (If no, what maintenance is needed?)
- Are there opportunities to enhance wildlife habitat components?
- Does the landowner have any concerns or suggestions for improvement of the project site?
- Identify concerns or suggestions from partners involved with the restoration and management of the restoration project.
- Additional observations or comments.

Table 7. Summary of proposed wetland BMP verification approach

Verification Element	Wetland BMP Implementation Mechanism Description
Initial Inspection	
Method	**NRCS Easements:** On-site inspection and follow-up off-site/landowner contact **All Other Projects:** On-site inspection through completion of construction
Frequency	**NRCS Easements:** 100% on-site inspection and annually thereafter (on-site, off-site, landowner contact) **All Other Projects:** 100% on-site inspection at installation
Who Inspects	**NRCS Easements:** Technical Specialist, County Conservation Districts or TSP **US FWS Projects:** USFWS Trained Biologist or USC Trained Biologists **USC and Other Voluntary Projects:** USC Trained Biologists or County Conservation District Staff
Documentation	**NRCS Easements:** Reports to District Conservationist and inclusion of a summary of completed spot checks to State NRCS Easement Programs Coordinator who provides documentation to the USC Wetlands Coordinator **US FWS Projects:** USFWS or USC Biologists provides Wetland Coordinator inspection information alongside construction data for the annual data call **USC and Other Voluntary Projects:** USC Wetland Team provides Wetland Coordinator inspection information alongside construction data for the annual data call
Follow-up Check	
Follow-up Inspection	**NRCS Easements:** On-site, off-site, and landowner contact as per the Monitoring Schedule (exceeds 5%) **All Other Projects:** On-site inspection at 5% of all projects including NRCS
Statistical Sub-sample	**NRCS WRP/WRE Easements:** Monitored annually for three years, followed by an ownership review in the fourth year, then three years of remote sensing review. Onsite monitoring occurs every five years after that. Monitoring may be more frequent if there are violations or if compatible uses of the wetland have been approved **NRCS CRP/CREP Easements:** 10% of sites monitored annually for the duration of the easement **All Other Projects:** Field-based site visits selected based on randomized site selection protocol for 5% of reported sites annually
Response if Problem	**NRCS Easements:** Cost-share program Contract compliance policy implemented **All other Projects:** All sites should be brought into compliance within one year or removed from reported BMPs
Lifespan/ Sunset	Re-verification by NRCS, SWCD, or USC personnel throughout the 15-year lifespan determined for the Chesapeake Bay. If practice no longer exists or is no longer functional, the data are to be removed from NEIEN

D2.6: WETLAND DATA VALIDATION

Initial validation and verification occur through USC's existing data collection and management process. Implementation partners and district technicians from throughout the watershed verify initial implementation of all wetlands, both those funded through state and federal sources and those funded by landowners independently. Because only SWCD technicians and federal agency staff with personal knowledge of practices report data to the data management system, no double counting of BMPs can occur. No data are accepted from other sources or entered into the system without initial verification, and the moderate number of sites reported annually allows the Wetland Coordinator to crosscheck each site and ensure that no project is reported twice. The Wetland Coordinator and USC Ag Coordinator are responsible for QA/QC.

Data collection procedures are described further in sections A5.3, A6, A9, and B10.1 Data management procedures are described further in sections B10.2 through B10.6.

During 2016 and 2017 upgrades were made to the data management system to incorporate the BMP verification framework. These upgrades allow for the ability to record inspection dates, and a practice status for each BMP. The retirement/expired function was also updated in our system to incorporate individual BMP lifespans. Wetland Practice BMP verification visits will continue throughout the watershed on an annual basis. Wetland Sites are selected annually for BMP Verification using the protocols in Section D2.1. Implementation of the BMP verification process continues to be a substantial time commitment for SWCD staff, the USC Wetland Coordinator, USC Buffer Coordinator, USC Stream Team Leader and the USC Ag Coordinator.

D2.7: SELECTION OF STREAM RESTORATION BMP VERIFICATION SITES

New York will meet or exceed the verification frequency requirements in Table 4 for both initial and follow-up verification of urban and non-urban stream restoration BMPs. New York State and implementation partners at NRCS perform initial verification of all stream rehabilitation and restoration BMPs reported to the Chesapeake Bay Program. The sampling approach described in Appendix 1 will be applied to provide for a follow-up verification frequency of 5 percent.

D2.8: STREAM RESTORATION BMP VERIFICATION METHODS

The New York stream project verification methods will address all stream restoration BMPs that are implemented and accounted for within New York's WIP. Non-urban stream restoration is a visual assessment-multi-year BMP that can be verified and inventoried by trained/certified personnel (Chesapeake Bay Program 2014). Details regarding verification and validation procedures for these practices are provided here and summarized later in Table 9. SWCD Technicians can also utilize *A Guide to USC Stream Reporting* (see Appendix 15) as an easy to use field document, when verifying stream projects.

The USC's design and implementation of stream restoration BMPs in the watershed will be performed in accordance with the following guiding principles:

1. Stream issues will be approached in a systemic manner considering whole watershed condition and impact

2. When possible, stream issues will be monitored to determine rate and status of observed or perceived impairments
3. Stream issues will be approached wherever possible with clearly identified restoration objectives as opposed to a stabilization approach
4. Restoration includes consideration of geomorphic, hydrologic, habitat, water quality, riparian, social, and economic values
5. Stream issues will be approached in a pragmatic manner with the realization that funding, materials, and other resources are limited
6. The education and involvement of landowners, municipal officials, maintenance personnel, land use planners, etc. is of primary importance in order to effect cultural change in how we manage our streams and watersheds and addressing the assurance of both the success and long-term maintenance of BMPs identified
7. Creative, cost effective approaches to stream restoration are encouraged in management, regulation, and actual in-channel work
8. Lessons learned in our region regarding stream restoration (what works and what doesn't work) will be shared and networked
9. Local empowerment through education, training, actual experience, etc. is a primary objective (use of local designers, contractors, material suppliers)
10. Further research of regional stream system elements is needed to better understand the complexity of local streams
11. All practitioners of stream rehabilitation and restoration will be adequately trained and supervised under the appropriate qualified authority
12. All stream BMPs designed and installed will have plans that clearly identify responsible parties for the inspection, functional verification, and operation and maintenance procedures.

The Urban Stream Restoration BMP Expert Panel (USRBMPEP 2014) recommends a watershed-based approach for screening and prioritizing stream restoration projects. The USRBMPEP also specified the following basic qualifying conditions for allowing stream restoration project credit (USRBMPEP 2014):

1. Stream restoration projects that are primarily designed to protect public infrastructure by bank armoring or rip rap **do not qualify for a credit**.
2. The stream reach must be greater than 100 feet in length and be still actively enlarging or degrading in response to upstream development or adjustment to previous disturbances in the watershed (e.g., a road crossing and failing dams). Most projects will be located on first- to third-order streams, but if larger fourth and fifth order streams are found to contribute significant and uncontrolled amounts of sediment and nutrients to downstream waters, consideration for this BMP would be appropriate, recognizing that multiple and/or larger scale projects may be needed or warranted to achieve desired watershed treatment goals.
3. The project must utilize a comprehensive approach to stream restoration design, addressing long-term stability of the channel, banks, and floodplain.

4. Special consideration is given to projects that are explicitly designed to reconnect the stream with its floodplain or create wetlands and instream habitat features known to promote nutrient uptake or denitrification.
5. In addition, there may be certain project design conditions that must be satisfied in order to be eligible for credit under one or more of the specific protocols described in Section 5.

USC satisfies these requirements through its reliance on available USDA NRCS practice standards and specifications as well as private professional engineers to plan and implement stream channel and corridor rehabilitation and restoration projects in the watershed. Practices for stream restoration are implemented in accordance with engineering principles and processes specified in the National Engineering Handbook Part 654, Stream Restoration Design. This includes establishment of goals and objectives, site assessment and investigation, a stream restoration design process, sediment impact assessments, project implementation, and maintenance and monitoring.

Quality assurance measures for designed and constructed practices will be based on application of NRCS practice standards and specifications and/or engineered designs for stream restoration and riparian land best management practices. Based on the standard applicable to the practice installed, the appropriate units and measurements will be tracked for each practice at each site.

The USC, its member Soil and Water Conservation Districts, and all partners engaged in any and all projects associated with stream channel and corridor BMP identification, design and implementation, recognize the need for quality, engineering based approach. As such, any BMP will adhere to both the standards and specifications for such practices as identified by the Engineering Field Manual developed and adopted by the NRCS. In the absence of practice specific standards and specifications for a specific BMP needed to address a stream corridor/channel need, acceptable engineering practices and standards will be used and certified by a licensed engineer

The Stream Team is most comfortable using the BEHI (Bank Erosion Hazard Index) to determine potential sediment loading from the site but may explore additional methods. The BEHI estimates sediment loading, and nitrogen and phosphorus loads are usually calculated using standard soil nutrient content values from NRCS. The USC started reporting non-urban stream restoration in "length of restoration", using measurement units of feet for 2018 Progress. The USC expects the implementation numbers to increase in future years as verification of stream practices that were previously implemented but were not yet reported into the database system are entered into the system for tracking and reporting.

Table 8. Summary of proposed stream restoration BMP verification approach

Verification Element	Stream Restoration BMP Implementation Mechanism
	Description
Initial Inspection	
Method	**NRCS Projects:** Operation and maintenance and inspection protocols **All Other Projects:** On-site inspection through completion of construction
Frequency	100% on-site inspection
Who Inspects	NRCS and USC
Documentation	USC Stream Team Leader provides a form (Appendix 11) for each District to log completed practices that were implemented within their county that year. The form is completed by SWCD staff and then sent back to the USC Stream Team Leader who acts as the repository for these practices.
Follow-up Check	
Follow-up Inspection	Annual on-site inspection of a randomly selected 5% subset of all projects
Response if Problem	**NRCS:** Cost-share program Contract compliance policy implemented **All other Projects:** All sites should be brought into compliance within one year or removed from reported BMPs
Lifespan/ Sunset	Re-verification by NRCS, SWCD, or USC personnel throughout the project lifespan as determined for the Chesapeake Bay. If practice no longer exists or is no longer functional, the data are to be removed from NEIEN

D2.9: Stream Restoration BMP Data Validation

Initial validation and verification occur through USC's existing data collection and management process. Implementation partners and district technicians from throughout the watershed verify initial implementation of all stream restoration projects, both those funded through state and federal sources and those funded by landowners independently. Because only SWCD technicians and federal agency staff with personal knowledge of practices report data to the data management system, no double counting of BMPs can occur. No data are accepted from other sources or entered into the system without initial verification, and the moderate number of sites reported annually allows the Stream Team Leader to crosscheck each site and ensure that no project is reported twice. The USC Stream Team Leader and Stream Team are responsible for initial QA/QC. Final QA/QC is performed by the USC Agricultural Coordinator prior to submission.

Data collection procedures are described further in sections A5.3, A6, A9, and B10.1 Data management procedures are described further in sections B10.2 through B10.6.

D2.10: Selection of Urban Buffer BMP Verification Sites

New York will meet or exceed the verification frequency requirements in Table 4 for both initial and follow-up verification of Urban Buffer BMPs. The USC Buffer Coordinator and staff perform

initial verification of all urban buffer BMPs reported to the Chesapeake Bay Program. The sampling approach described in Appendix 1 will be applied to provide for a follow-up verification frequency of 5 percent.

D2.11: Urban Buffer BMP Verification Methods

The New York urban buffer verification methods will address all urban buffer BMPs that are implemented and accounted for within New York's WIP. Urban buffer is a visual assessment-multi-year BMP that can be verified by trained and certified personnel (Chesapeake Bay Program 2014). Details regarding verification and validation procedures for these practices are provided in Appendix 14 (USC Forest Buffer Monitoring Protocol) and summarized later in Table 10.

Urban Buffers are typically small in size and located in public areas, therefore the USC Buffer Coordinator and staff monitor and evaluate these urban buffer practices on an annual basis for 3 years following implementation. The USC has developed a monitoring worksheet attached in Appendix 13 (Riparian Buffer Assessment Sheet 2017). After the initial 3 years of monitoring and evaluation, all urban buffers will be verified at a minimum frequency of 5 percent.

Table 9. Summary of proposed Urban Buffer BMP verification approach

Verification Element	Urban Buffer BMP Implementation Mechanism Description
Initial Inspection	
Method	**NRCS Projects:** Operation and maintenance and inspection protocols **All Other Projects:** On-site inspection through completion of establishment
Frequency	100% on-site inspection for first 3 years
Who Inspects	USC Buffer Coordinator and USC Buffer Stewards
Documentation	USC Buffer Coordinator provides a form (Appendix 13) for all Buffer Stewards to log completed practices that were implemented within their county that year. The form is completed by Buffer Stewards and then sent back to the USC Buffer Coordinator who acts as the repository for these practices.
Follow-up Check	
Follow-up Inspection	Annual on-site inspection of a randomly selected 5% subset of all projects
Response if Problem	All sites should be brought into compliance within one year or removed from reported BMPs
Lifespan/ Sunset	Re-verification by USC personnel throughout the project lifespan as determined for the Chesapeake Bay. If practice no longer exists or is no longer functional, the data are to be removed from NEIEN

D2.12: URBAN BUFFER BMP DATA VALIDATION

Initial validation and verification occur through USC's existing data collection and management process. USC Buffer Coordinator and additional buffer stewards throughout the watershed verify initial implementation of all urban buffer projects, both those funded through state and federal sources and those funded by landowners independently. Because only USC or SWCD technicians with personal knowledge of practices report data to the data management system, no double counting of BMPs can occur. No data are accepted from other sources or entered into the system without initial verification, and the moderate number of sites reported annually allows the USC Buffer Coordinator to crosscheck each site and ensure that no project is reported twice. The USC Buffer Coordinator and USC Ag Coordinator are responsible for QA/QC.

Data collection procedures are described further in sections A5.3, A6, A9, and B10.1 Data management procedures are described further in sections B10.2 through B10.6.

ACRONYMS

AEM – Agricultural Environmental Management program of NYS

BMP – Best Management Practices

CAFO – Concentrated Animal Feeding Operation

CBIG – Chesapeake Bay Implementation Grant

CBP – Chesapeake Bay Program

CBPO – Chesapeake Bay Program Office

CBRAP – Chesapeake Bay Regulatory and Accountability Program

CCA – Certified Crop Advisor

CDEA – New York's Conservation Districts Employee's Association

CPESC – Certified Professional in Erosion and Sediment Control

CSW – Conservation Skills Workshop

DEC – New York State Department of Environmental Conservation

EPA – U.S. Environmental Protection Agency

ESRI – Environmental Systems Research Institute

FSA – USDA Farm Services Agency

GIS – Geographic Information System

MBA – Multiple Barrier Approach

N - Nitrogen

NEIEN – National Environmental Information Exchange Network

NPS – Nonpoint Source

NRCCA – Northeast Region Certified Crop Advisor

NRCS – USDA's Natural Resources Conservation Service

NY – New York

NYS – New York State

O&M – Operation and Maintenance

P - Phosphorus

PE – Professional Engineer

QA – Quality Assurance

QAPP – Quality Assurance Project Plan

QC – Quality Control

RAID 5 – Redundant Array of Independent (or Inexpensive) Disks. RAID 5 is the most common RAID configuration for business servers and enterprise NAS (network-attached storage) devices. A RAID-enabled system uses two or more hard disks to improve the performance or provide some level of fault tolerance for a machine—typically a NAS or server. Fault tolerance simply

means providing a safety net for failed hardware by ensuring that the machine with the failed component, usually a hard drive, can still operate. Fault tolerance lessens interruptions in productivity, and it also decreases the chance of data loss.

RI – Resource Improvement

RUSLE2 – Revised Universal Soil Loss Equation Version 2

SQL – Structured Query Language. This is a special-purpose programming language designed for managing data held in a relational database management system, or for stream processing in a relational data stream management system.

SWCD – Soil and Water Conservation District

TMDL – Total Maximum Daily Load

TSP – Technical Service Provider for NRCS

USC – Upper Susquehanna Coalition

USDA – U.S. Department of Agriculture

WIP – Watershed Implementation Plan

WQS – Water Quality Symposium

WSM – Chesapeake Bay Program Watershed Model

XML – EXtensible Markup Language. XML was designed to store and transport data.

REFERENCES

Chesapeake Bay Program. 2014. *Strengthening Verification of Best Management Practices Implemented in the Chesapeake Bay Watershed: A Basinwide Framework - Report and Documentation from the Chesapeake Bay Program Water Quality Goal Implementation Team's BMP Verification Committee.* Accessed March 2, 2016. http://www.chesapeakebay.net/publications/title/strengthening_verification_of_best_management_practices_implemented_in_the

USEPA (U.S. Environmental Protection Agency). 2006. *Requirements for Quality Assurance Project Plans.* (EPA QA/R-5, EPA/240/B-01/003. U.S. Environmental Protection Agency, Office of Environmental Information, Washington DC, March 2001 [Reissued May 2006]). Accessed March 2, 2016. http://www.epa.gov/sites/production/files/2015-07/documents/r5-final.pdf

USRBMPEP (Urban Stream Restoration BMP Expert Panel). 2014. *Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects*. Test-Drive Revisions Approved by the WQGIT: September 8, 2014. Prepared for Urban Stormwater Work Group, Watershed Technical Work Group, and Water Quality Goal Implementation Team, by Tom Schueler, Chesapeake Stormwater Network and Bill Stack, Center for Watershed Protection. Accessed March 27, 2017. http://www.chesapeakebay.net/documents/Stream_Panel_Report_Final_08282014_Appendices_A_G.pdf

Principles for Verifying Stream Restoration Projects: http://www.chesapeakebay.net/channel_files/20794/attachment4b._principles_for_verifying_stream_restoration_project_june_6-2013_ver_final_draft-track_changes.docx

U4. Urban Stream Restoration Fact Sheet:
http://www.chesapeakebay.net/documents/U4._Urban_Stream_Restoration_Fact_Sheet_in_Chesapeake_Bay_Watershed.pdf

APPENDICES

Appendix 1.
Statistical Sampling Approach to Agricultural BMP Verification in New York State

Purpose

This document outlines an adaptive management approach for selecting sites to inspect for verification that agricultural BMPs are on the ground (or otherwise continue to be implemented) and performing as expected based on performance criteria, NRCS standards, engineering specifications or other applicable criteria. Techniques used to inspect BMPs at selected sites and record and track findings are described in *Upper Susquehanna Coalition (USC) Quality Assurance Project Plan for New York Work Plan for the Chesapeake Bay Program* (2015)**.**

Overview

The expected coverage of BMPs for agricultural verification protocols described in the agricultural verification guidance (Appendix B of *Strengthening Verification of Best Management Practices Implemented in the Chesapeake Bay Watershed: A Basinwide Framework*, October 2014) is summarized in Table 1.

Table 1. Summary of verification coverage requirements.

Program Type	Practice Type	Initial Verification	Follow-Up or Re-Verification
Non-Cost-Shared BMPs (including Resource Improvement Practices)	Annual	100% BUT sub-sampling allowed for single year BMPs (e.g., tillage practices) that are visually assessed.	Annual survey (using performance criteria and performed by qualified personnel) will determine the total number of annual BMPs. Based on the totals, the number of whole farm verification visits will be determined to achieve follow-up verification of at least 10% of those annual BMPs that account for >5% of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario (and 5% of those BMPs contributing ≤5% of the load reduction).
	Multi-Year	100%	10% of those multi-year BMPs which account for >5% of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario (and 5% of those BMPs contributing ≤5% of the load reduction).
Cost-Shared BMPs	Annual	100% BUT sub-sampling allowed for single year BMPs (e.g., tillage practices) that are visually assessed.	Annual survey (using performance criteria and performed by qualified personnel) will determine the total number of annual BMPs. Based on the totals, the number of whole farm verification visits will be determined to achieve follow-up verification of at least 10% of those annual BMPs that account for >5% of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario (and 5% of those BMPs contributing ≤5% of the load reduction).
	Multi-Year	100%	10% of those multi-year BMPs which account for >5% of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario (and 5% of those BMPs contributing ≤5% of the load reduction).
Permit-Based BMPs	Annual	100% BUT sub-sampling allowed for single year BMPs (e.g., tillage	At least 20% during annual CAFO inspections.

		practices) that are visually assessed.	
	Multi-Year	100%	At least 20% during annual CAFO inspections.

The overall approach for meeting the targets in Table 1 is summarized in Table 2. New York State performs initial verification of all agricultural BMPs on farms participating in its Agricultural Environmental Management program (AEM), farms with contracts, and CAFO permitted facilities. This document focuses on how the follow-up checks described in Table 2 will be used to meet the re-verification targets in Table 1.

Table 2. Summary of proposed verification approach.

Verification Element	BMP Implementation Mechanism			
	Non Cost Shared BMPs	***Cost Shared BMPs***	***Regulatory Programs[1]***	***Permit Issuing Programs***
Initial Inspection				
Method	Farm Inventory: On Site Visual Assessment	Farm Inventory: On Site Visual Assessment		Farm Inventory: On Site Visual Assessment
Frequency	100% of farms participating in AEM	100% of All farms under contract		100% of all CAFO permitted facilities
Who Inspects	County Conservation Districts, NRCS Staff and Certified AEM Planners	County Conservation Districts, NRCS Staff and Certified AEM Planners		County Conservation Districts, NRCS Staff and Certified AEM Planners, NYSDEC inspectors
Documentation	BMPs meet appropriate government and/or CBP practice standard (PE sign off and/or SWCD evaluation)	BMP certification and/or PE sign off		BMP certification and/or PE Sign off
Follow-Up Check				
Follow-Up Inspection	Annual and Multi-year BMPs: Farm Inventory: On-site Visual Assessment	Annual and Multi-year BMPs: Farm Inventory: On-site Visual Assessment		Annual and Multi-year BMPs: On-site Visual Assessment
Statistical Sub-Sample	Random selection of ≥10% of all farms participating in AEM in order to verify at least 10% of those BMPs that account for >5% of agricultural	Random selection of ≥10% of farms with active contracts in order to verify at least 10% of those BMPs that		50% of all farms w/ active permits.

	sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario (and 5% of those BMPs contributing ≤5% of the load reduction).	account for >5% of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario (and 5% of those BMPs contributing ≤5% of the load reduction).		
Response if Problem	Bring into compliance within one year or remove from reported BMPs	Cost Share Program Contract Compliance Policy		NYSDEC CAFO Permit Compliance Policy
Lifespan/Sunset[2]	Re-verification by SWCD personnel and/or AEM planners. If practice sunsets within 2 years of on-site visual inspection a farm inventory will be conducted.			Re-verification by SWCD personnel and/or DEC staff during inspections.

[1]New York State does not employ a Regulatory Program for BMP implementation as defined in the Chesapeake Bay Program Basinwide Framework. All farms under regulation operate within Permit Issuing Programs.

[2]Lifespan to be addressed in accordance with CBP lifespan criteria, including those for Resource Improvement practices.

Selecting Sites to Inspect for Follow-Up Verification

The AEM program is the umbrella agricultural program in New York supporting farmers in their efforts to protect water quality and conserve natural resources, while enhancing farm viability. State and Federal programs are coordinated through AEM to work together to efficiently provide technical and financial assistance to priority farms and priority environmental issues.

New York's Concentrated Animal Feeding Operation (CAFO) and AEM programs cover 95 percent of the dairies in the New York portion of the Chesapeake Bay watershed. This includes permitting of 65 CAFOs (11 large, 54 medium) with over 45 percent of the total dairy animals. New York does not have significant numbers of poultry or swine. There are currently 2,832 farms included in Tier 1 of the AEM database. Tier 1 consists of basic information such as farm contact information, farm inventories, and potential environmental concerns and opportunities. A subset of these farms has BMPs.

A comparison of Tables 1 and 2 shows that follow-up inspections of BMPs at CAFOs will be 2.5 times (50% vs. 20%) that required by the Chesapeake Bay Program. Approximately 50 percent of CAFO-permitted farms are inspected by NYS DEC and/or US EPA annually (or 100 percent every two years; essentially verification by census). During those inspections, follow-up BMP inspections are performed to verify all BMPs submitted for annual progress reporting. Any BMPs not meeting performance criteria will be improved according to permit compliance policy or removed from reported BMPs.

Cost-shared and non-cost-shared BMPs all have 100 percent initial verification before annual progress reporting. Conservation partners working to advance AEM in NYS have long held planning, implementation of high impact BMPs, and on-going operation and maintenance as high priority. Therefore the partnership sought to develop follow-up verification methods that would first be of value to the farmer and for conservation and second collect data for progress reporting according to the new Basinwide Verification Framework. The resulting method proposes a whole farm approach, rather than a per-BMP approach to achieve the required sampling rates for all BMPs reported for annual progress. The method is designed to avoid artificial and confusing aspects of visiting farms to capture data on a single BMP when other BMPs are likely present (as well as repeat visits to verify independent BMPs) and should better match how farmers see their farms: as whole systems. It is anticipated that a whole-farm approach to verification will lead to more meaningful interactions with farmers about performance of current BMPs and potential for further BMP implementation, as has been the case during AEM Tier 5B evaluations and annual CAFO updates in NYS. An adaptive management approach described below will allow adjustments to the sampling method over time to ensure that the expectations summarized in Table 1 are met as the blend of BMPs, on-farm conditions, and conservation goals change.

Steps for Selecting Sites to Inspect for Follow Up Verification

Step 1 – Summarize percent load reduction per BMP from the latest progress scenario

The first step in the site selection process is to identify the BMPs that account for >5 percent of agricultural sector nutrient and/or sediment load reductions as estimated in the most recent progress scenario, as well as those BMPs associated with ≤5 percent of the load reductions. The agricultural verification guidance illustrates this with Attachment A in Appendix B (*Relative Influence of BMPs in Agriculture Sector*). In Appendix B of the agricultural verification guidance document, load reductions were compared between a 2013 progress scenario and a *No-Action* scenario. The results for New York are summarized in Table 3. The data presented in the following steps will be updated for future sampling goals as new progress scenarios and BMP information is generated over time.

Table 3. BMP-specific load reductions for 2013 vs. no-action scenarios for New York.

BMP	Share of Total Agricultural Load Reduction for 2013 vs. No-Action		
	N (%)	P (%)	Sediment (%)
Animal Waste Management Systems	28.6	30.8	-
Land Retirement	15.9	4.9	13.0
Enhanced Nutrient Management	14.1	8.1	-
Trampled Riparian Pasture	14.0	26.1	29.3
Forest Buffers	8.0	2.5	7.9
Conservation Plans	3.6	5.5	14.5
Pasture Fencing	3.1	5.4	8.2
Grass Buffers	2.8	-	2.3
Conservation Tillage	2.6	2.8	12.4
Wetland Restoration	2.4	-	4.1
Precision Rotation Grazing	-	4.4	5.6
Barnyard Runoff Control	-	2.8	-
Dairy Precision Feeding	-	2.1	-

Tree Planting	-	-	1.9

The nine (9) BMPs highlighted in Table 3 would require re-verification at a 10 percent rate and the remaining BMPs with ≤5 percent load reduction contribution could be sampled at a 5 percent rate. Per an adaptive verification approach, these sampling rates may be adjusted to address factors such as the risk of BMPs not being maintained and the relative importance of BMPs in the future.

Step 2 – Determine approaches for re-verification on CAFO and on non-CAFO farms

The next step is to determine how to inspect the BMPs. New York State will perform re-verification on a whole farm basis rather than on a BMP-by-BMP basis, so the protocol is designed to ensure that site selection on a farm basis will yield satisfactory re-verification rates on a BMP basis. This will result in coverage of additional BMPs beyond the minimum requirements in Table 1.

New York inspects 50 percent of CAFO-permitted farms each year. The 50 percent not sampled during a year will be sampled the next year to ensure that 100 percent of CAFO-permitted farms are inspected every two years. This approach to CAFO re-verification will result in easily meeting the target of 20 percent for permit-based BMPs (Table 1).

For re-verification of BMPs on non-CAFO-permitted farms, a random 10 percent sample of these farms would be suitable if each farm implemented these BMPs, but this scenario is unlikely for the complete set of BMPs that need to be re-verified. For this reason, more than 10 percent of the farms would likely be targeted.

The sampling approach described in *Statistical Sampling Approach for Initial and Follow-Up BMP Verification* in the Basinwide Verification Framework provides an equation for determining sample size based on the following variables:

- An initial estimate of both the percent of BMPs still in place and the percent of BMPs still performing as expected. This can be based on previous studies or assumed to be 50% (p=0.5) for a conservative (high) estimate of sample size.
- An allowable error (e.g. ±10% or 0.10). This error (d) can be different for different BMPs based on considerations of BMP importance, risk of BMP abandonment, failure, cost, or other factors.
- A confidence level (e.g., 90% or α=0.10). This is used to determine the 2-sided Z score from the standard normal distribution ($Z_{1-\alpha/2}$), e.g., $Z_{1-\alpha/2}$ is equal to 1.645 for $\alpha = 0.10$. For example, an α=0.10 indicates that the actual proportion of BMPs still in place has a 10 percent chance of being outside the allowable error or calculated confidence interval.
- An estimate of the total population (N) from which the sample is taken (e.g., how many BMPs were installed). This can be based on records of BMP implementation.

Using available data and reasonable assumptions, the sampling size equation for binary distributions (pass/fail) was used to determine the best sampling approach for New York farms within the Chesapeake Bay Watershed. The best approach will satisfy the requirements summarized in Table 1 and address the following additional important factors:

- allow for conservation professionals to perform productive whole farm BMP evaluations with farmers while also collecting verification data for progress reporting;
- work load balance across all counties involved;
- re-verification of sun-setting BMPs;
- time period over which sampling approach is evaluated (e.g., 2 yr, 5 yr, 10 yr);
- BMP lifespans;
- independent verification requirements;
- inspection methods (e.g., visual); and
- other logistics constraints.

Step 3 – Determine the whole-farm follow-up sampling strategy for non-CAFO farms

The data set from the USC AEM Data Management System was analyzed for this the current sampling protocol and included a non-CAFO farm table and a BMP implementation table. The non-CAFO farm table has 2,200 observations. The BMP table contains 3,192 observations. There are more observations in the BMP table because each farm can have multiple occurrences of BMP implementation, including multiple occurrences of the same BMP.

Step 3A – Summarize number of practices, number of non-CAFO farms, and link practices from database to names used for progress reporting through NEIEN

Table 4 presents the distribution of database BMPs implemented by non-CAFOs. For example, the database reported 26 instances of Agricultural Land Retirement. After aggregating by operation, it is found that 22 non-CAFOs have implemented Agricultural Land Retirement. The rightmost column in Table 4 presents the cross walk to the reported BMPs.

Table 4. Distribution of database practices implemented by non-CAFOs and cross walk to reported practice.

Database Practice	Number of Practices Implemented by Non-CAFOs	Number of Non-CAFOs Implementing Practice	Reported Practice
Agricultural Land Retirement	26	22	Land Retirement
Barn Yard Runoff Control	160	146	Barnyard Runoff Control
CNMP	376	250	Enhanced Nutrient
Conservation Till	58	33	Conservation Tillage
Continuous No Till	27	19	NA
Cover Crops No Manure	27	15	NA
Cover Crops With Fall or Winter Manure	100	63	NA
Cover Crops With Spring Manure or	8	8	NA
Crop Land Forest Buffer	34	24	Forest Buffers
Crop Land Grass Buffer	16	14	Grass Buffer
Horse Pasture Management	11	11	Precision Rotation Grazing
Liquid Manure Incorporation	1	1	NA
Liquid Manure Injection	3	2	NA
Manure Processing Technology	1	1	Animal Waste Management
Manure Storage	93	86	Animal Waste Management
Manure Transfer	44	41	Animal Waste Management
Milk House Waste	86	82	Animal Waste Management
Mortality Composting	13	13	Animal Waste Management
Nutrient Management	71	41	Enhanced Nutrient
NYS Precision Feed Management	6	6	Dairy Precision Feeding
Off Stream Water	96	84	NA
Precision Feeding Dairy	80	42	Dairy Precision Feeding
Prescribed Grazing Implementation	762	444	Precision Rotation Grazing
Silage Leachate	31	31	Animal Waste Management
Soil Conservation	634	353	Conservation Plans
Stream Fence	161	148	NA
Stream Forest Buffer	126	106	Forest Buffers
Stream Grass Buffer	141	114	Grass Buffers TRP
TOTAL	**3,192**	**2,200**	

Step 3B – Summarize reported practices for non-CAFO farms and minimum selection targets

Table 5 summarizes the number of non-CAFO farms implementing each of the reported BMPs. For example 146 non-CAFO farms implemented barnyard runoff controls. The total number of non-CAFO farms implementing practices in Table 5 (i.e., 1,711) is the total of unique combinations of practices and operations. In other words, non-CAFO farms can be counted multiple times because they can implement more than one practice. The last two columns on the right present the target percentage of operations to select for each BMP (from Table 3) and the actual minimum number of operations to select for verification. Continuing the barnyard runoff example, 146 x 0.05 = 7.3, rounded up to 8.

Table 5. Distribution of reported practices implemented by non-CAFOs and minimum selection target.

Reported Practice	Number of non-CAFOs Implementing Practice	Minimum Selection Target (%)	Minimum Selection Target
Animal Waste Management Systems	146	10%	15
Barnyard Runoff Control	146	5%	8
Conservation Plans	353	10%	36
Conservation Tillage	33	10%	4
Dairy Precision Feeding	42	5%	3
Enhanced Nutrient Management	267	10%	27
Forest Buffers	123	10%	13
Grass Buffer	14	5%	1
Grass Buffers TRP	114	10%	12
Land Retirement	22	10%	3
Precision Rotation Grazing	451	5%	23
	1,711		**145**

Step 3C – Distribute minimum BMP targets per county

An important refinement to the chosen approach was to address workload balance across counties. Table 6 presents the distribution of reported practices by non-CAFOs. The 1,711 practices from Table 5 are shown in Table 6 to be implemented by 813 non-CAFO operations. In other words, there is an average of about 2 practices per non-CAFO operation (1,711/813 ≈ 2). Steuben, Madison, and Tioga have the largest percentage of non-CAFO operations implementing practices. The rightmost column in Table 6 presents the maximum number of operations per county that may be evaluated to balance workload. For example, in Delaware County, 63 x 0.10 = 6.3, rounded up to 7.

The selection process is constrained to randomly selecting non-CAFO operations by meeting the minimum selection targets identified in Table 5 and not exceeding the maximum number of operations per county identified in Table 6. The selection process is initiated by randomly selecting one operation from each county (excluding Ontario and Schoharie counties which had no practices implemented by non-CAFOs). This "one-county, one operation" approach was employed, because preliminary selection results had shown that multiple counties would not have any operations selected if this step was not taken.

Table 6. County distribution of implemented practices by non-CAFOs and upper thresholds considered to balance workload.

County	Number of Reported Practices Implemented by Non-CAFOs (after aggregation)	Number of Non-CAFOs Implementing Reported Practices	Percentage of Non-CAFOs Implementing Reported Practices	Maximum Number of Non-CAFOs to Verify
Allegany	4	3	0.37	1
Broome	162	57	7.01	6
Chemung	113	45	5.54	5
Chenango	158	75	9.23	8
Cortland	95	56	6.89	6
Delaware	164	63	7.75	7
Herkimer	34	29	3.57	3
Madison	327	124	15.25	13
Oneida	26	7	0.86	1
Onondaga	65	26	3.2	3
Ontario	NA	NA	NA	0
Otsego	26	22	2.71	3
Schoharie	NA	NA	NA	0
Schuyler	12	9	1.11	1
Steuben	272	199	24.48	20
Tioga	243	94	11.56	10
Tompkins	10	4	0.49	1
TOTAL	**1,711**	**813**	**100**	**88**

Step 3D – Iterative sampling rounds to achieve BMP selection targets

After the one-county, one-operation selection is completed, tallies (including all practices at the selected operations) are updated to indicate progress toward achieving the minimum selection targets in Table 5 while not exceeding the maximum number of operations per county in Table 6. After the tallies are updated, the practice that provides the least flexibility (or number of options) is identified. We define flexibility as the difference between the number of non-CAFOs implementing a particular practice (that had not already been selected) and the remaining number of operations that still need to be selected for a given practice. A smaller difference denotes less flexibility. Once the practice with the least flexibility is identified, all non-CAFOs that implement that practice (minus those already selected) are identified. From this list, one operation is chosen at random. The process of updating the tallies, identifying the least flexible practice, and randomly selecting an operation is repeated until all minimum selection targets in Table 5 are met.

Results from of this protocol run based on current data from the USC AEM Data Management System are appended at the end of this document.

This procedure for selecting farms for follow-up verification would ensure that 10 percent or more of each BMP implemented on non-CAFO operations is verified annually (or at least 5% of those BMPs contributing ≤5% of the load reduction from the latest progress scenario). This procedure includes an approach to balance the work load across counties. CAFOs were excluded from the procedure because they are all inspected over a two-year period.

Adaptive Management Approach

Regardless of the initial sampling method used, an adaptive management approach to re-verification will be applied to ensure that sampling rates remain on or within reasonable range of the targets in Table 1. As implementation of BMPs in the watershed progresses, BMP goals may be exceeded in some cases and not achieved in others. This would result in different contributions of individual BMPs to load reductions based on the most recent progress scenario. Therefore, NYS will use the whole-farm follow-up verification steps outlined, above, to update the sampling targets for non-CAFO farms on an annual basis in line with Table 1 and the BMP load reduction data from the most recent progress scenario. Such updates may shift the focus of re-verification to a slightly different set of BMPs. Similarly, an improvement or decline in compliance rates may result in a need to change the sample size. The AEM Data Management System provides opportunities for tracking important information such as the geographic distribution and age of re-verified BMPs. This and other information will be used to help assess the need to alter the sampling approach. Adjustments will be made as necessary to ensure that re-verification goals are met.

Results Appendix

Figure 1 presents the total number operations selected by running the above simulation 500 times. The yearly total workload for all counties ranges from 50-71 operations.

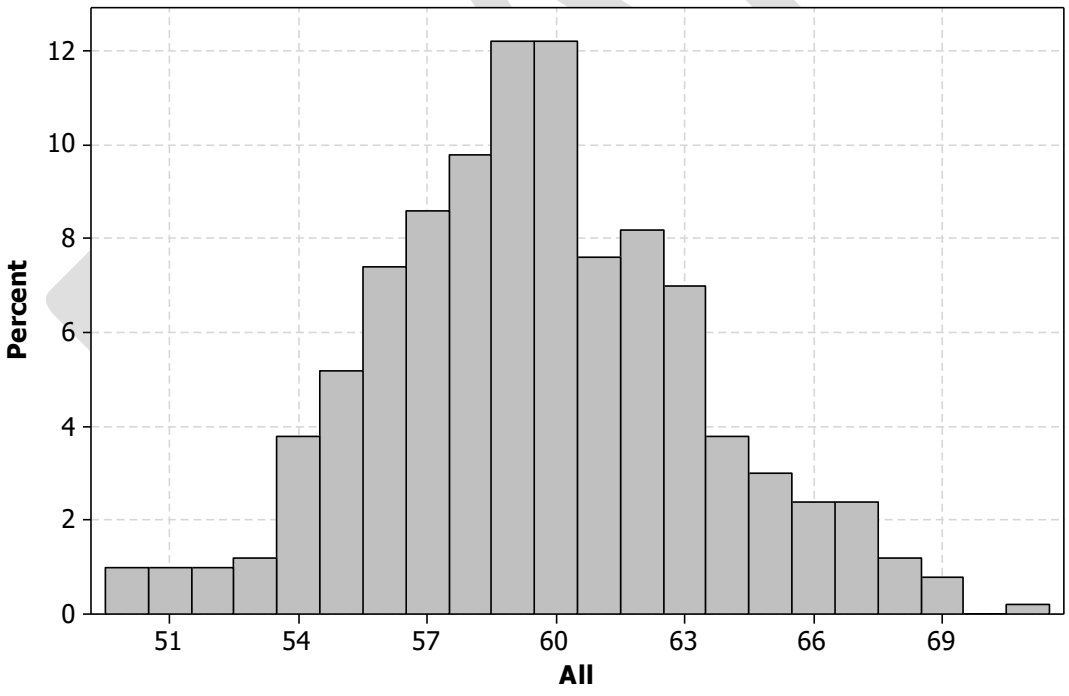


Figure 1. Distribution of overall workload.

Figure 2 presents the number of operations by county selected by running the above simulation 500 times. While the range varies among the simulations, no results exceed the maximum number of operations per county in Table 6.

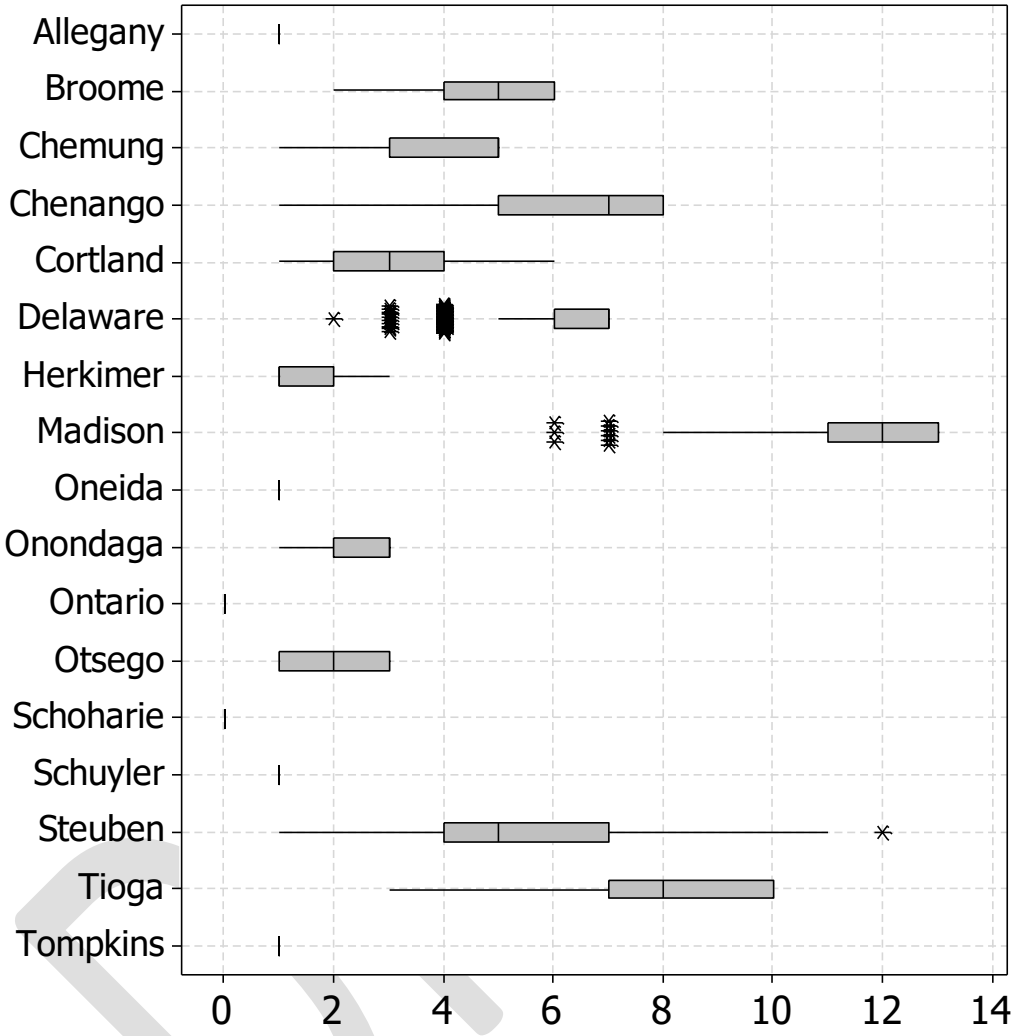


Figure 2. Number of operations selected by county during 500 simulations.

Figure 3 presents the number of operations by practice selected by running the above simulation 500 times. While the range varies among the simulations, no result is less than minimum selection targets in Table 5.

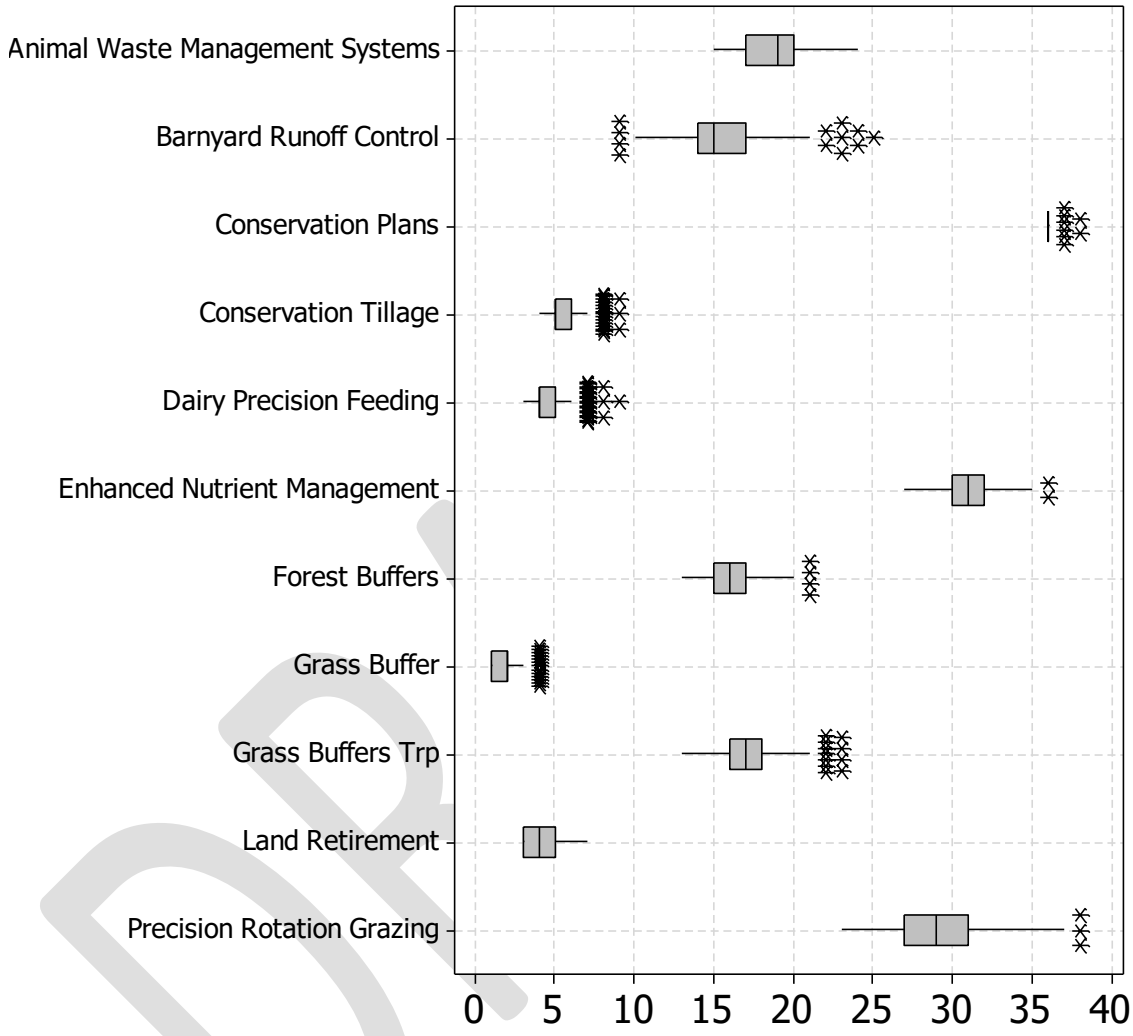


Figure 2. Number of operations selected by practice during 500 simulations.

AEM Tier 2 Worksheet
Nutrient Management: Manure and Fertilizer

Glossary

Animal Unit: One animal unit equals 1,000 lbs. of live animal body weight, and correlates to the amount of manure produced.

Concentrated Flow: Flow of water, greater than ½ inch that carries potential pollutants across a vegetative buffer.

Field Runoff Potential: Measurement of risk derived from soil characteristics and topography that estimates the potential for surface loss of nutrients.

Eutrophication: The process of nutrient enrichment and excess algae or plant growth in a waterbody.

Nitrogen Management Tests: Soil and plant tests such as the Pre-Sidedress Nitrate Test (PSNT), Corn Stalk Nitrate Test (CSNT), Illinois Soil Nitrogen Test (ISNT), etc.

Vegetative Buffer: A permanent strip of dense, vigorous perennial vegetation of at least 35 feet in width established and maintained along a watercourse or stream. See NRCS Standards NY 393 (Filter Strip), NY 390 (Riparian Herbaceous Buffer), and NY 391 (Riparian Forest Buffer).

Watercourse: Water flowing over a non-vegetated channel to a waterbody.

Background

Nutrient management using soil tests, crop needs based on realistic yields, and effective application of manure and fertilizer can enhance crop productivity and farm profitability while decreasing farm operating costs. Proper application method, rate, and timing optimize the uptake of nutrients by the crop and minimize nutrient loss to the environment.

If used properly, manure is an excellent crop nutrient source and soil conditioner. Bacterial and protozoan pathogens in manure can pose a human health risk when found in drinking and recreational waters. Nitrate can leach to groundwater, creating potential human and animal health risks. Nitrate, ammonia and phosphorus can also reach surface waters, stimulating undesirable algae and plant growth, and consequently damaging recreational and drinking water uses. Phosphorus is usually the limiting nutrient for plant growth in fresh water and regardless of source can accelerate eutrophication.

Nutrients in fertilizers can also leach to groundwater or be carried by runoff into surface water, degrading water quality. Excessive nitrate concentrations in drinking water can negatively affect human and animal health. In addition to the concerns associated with phosphorus, excess potassium in feed or water can cause animal health problems.

A sound and comprehensive nutrient management plan should account for nutrients from all sources, including prior nutrient applications, soil and crops; incorporate conservation practices that control erosion and manage runoff; and deliver recommendations to minimize losses to the environment through efficient nutrient use by crops.

AEM Principle

Nutrients for crop production used by farms should be applied to land in a manner that optimizes the nutrient value and soil conditioning benefits while protecting surface and ground water resources.

AEM Tier 2 Worksheet: **Manure and Fertilizer Management** **Table 1: General**		**Potential Concern**		
Factors Needing Assessment	**Lower** **1**	**2**	**3**	**Higher** **4**
Do you follow an up to date nutrient management plan based on soil tests, crop needs and nutrient sources?				
How many acres typically receive manure application?				
How many animal units do you have? (Complete calculation on page 4)				
If manure is exported off the farm, what percentage is exported?				
Based on the above information, how many animal units do you have per acre of land to which manure is applied?				
How often do you soil test?	All fields are soil tested at least every 1 or 2 years.	All fields are soil tested at least every 3 years.	Fields are soil tested regularly, but less often than every 3 years.	Soil testing is not done regularly on fields.
Does your farm manage soils for optimum pH levels?	Soils are tested for pH and amended with lime to maintain optimum pH.		Lime is applied, but not based on soil test results.	Soils are not amended with consideration of pH levels.
How often do you test manure for nutrient content?	There is a history of manure testing that characterizes variability throughout the year. **AND** Manure is tested every year.		Manure is tested at least every other year.	

AEM Tier 2 Worksheet: **Manure and Fertilizer Management** **Table 1: General**		**Potential Concern**		
Factors Needing Assessment	**Lower** **1**	**2**	**3**	**Higher** **4**
Does your farm regularly use nitrogen management tests (e.g. PSNT, CSNT, ISNT) to adjust nitrogen rates?				
Do you keep records of nutrient applications to fields?	Records are kept indicating the amount applied, source, yields, rotations, and fertilizer applications for each field.		Records are kept indicating the amount applied, only.	No records of amount applied, yields, and rotations for each field.
Do you calibrate manure and fertilizer application equipment?	All nutrient application equipment is calibrated yearly to determine the amount applied per acre.		Nutrient application equipment is calibrated occasionally to determine the amount applied per acre.	Nutrient application equipment is not calibrated.
How is the rate of manure and fertilizer application determined?	Nutrients are applied based on land grant guidelines. **AND** Commercial fertilizer applications are adjusted in order to meet crop needs.	Manure is applied based on crop needs, with nitrogen as the priority nutrient. **AND** Commercial fertilizer applications are adjusted in order to meet crop needs.	Manure is occasionally applied in rates that exceed the nitrogen needs of the crop. **OR** Commercial fertilizer applications only partially take into account nutrients in manure.	Manure is often applied at rates that exceed the nitrogen needs of the crop. **OR** Commercial fertilizer applications do not take into account nutrients in manure.
How is nitrogen application determined?	Account for past and current manure application rates, soil nitrogen supply potential, and crop history. **AND** Routinely conduct field by field nitrogen management tests.		Some consideration of previous manure application rates, soil nitrogen supply potential, or crop history.	No accounting of previous manure application rates, soil nitrogen supply potential, or crop history.

AEM ID: _____ Date: _____

Formula for Calculating Animal Units

Animal Type	Number (from Tier 1)	×	Average Weight (lbs; from Tier 1)	=	Total Weight (lbs)	÷	1000 lbs/Animal Unit	=	Number of Animal Units
		×		=		÷	1000 lbs/AU	=	
		×		=		÷	1000 lbs/AU	=	
		×		=		÷	1000 lbs/AU	=	
		×		=		÷	1000 lbs/AU	=	
		×		=		÷	1000 lbs/AU	=	
								+	
								Total Animal Units for the Farm	

AEM Tier 2 Worksheet: Manure and Fertilizer Management Table 2: Manure Application		**Potential Concern**		
Factors Needing Assessment	**Lower 1**	**2**	**3**	**Higher 4**
Have there been any concerns about manure contamination of wells on or near the farm?				
Are field runoff potentials considered in scheduling manure applications?	Manure is never spread when fields: -- are saturated or frozen -- are prone to flood; or -- when runoff risk is high **AND** Manure is applied just prior to planting or to a growing crop.	Manure is never spread when fields: -- are saturated or frozen -- are prone to flood; or -- when runoff risk is high **AND** Manure is applied during the growing season to fields with the highest runoff potential and outside the growing season to fields with the lowest runoff potential.	Manure is sometimes spread on fields that: -- are saturated or frozen -- are prone to flood; or -- when runoff risk is high **AND** Manure is applied outside the growing season to fields with the lowest runoff potential.	Manure is sometimes spread on fields that: -- are saturated or frozen -- are prone to flood; or -- when runoff risk is high **AND** Fields are not prioritized based on runoff potential.
How close is manure spread to wellheads or springs?	Manure is not spread within 200 ft. from any wellhead or spring.	Manure is not spread within 100 ft. from any wellhead or spring.	Manure is not spread within 50 ft. from any wellhead or spring.	Manure is spread less than 50 ft. from any wellhead or spring.
Are vegetative buffers maintained along watercourses in fields receiving manure?	A vegetative buffer that meets NRCS Standards is maintained along water courses in fields receiving manure.	A naturally occurring buffer of at least 35ft. exists along watercourses adjacent to fields.	A naturally occurring buffer of at least 10ft. exists along watercourses adjacent to fields.	Little or no vegetation exists along watercourses in fields receiving manure.
How close is manure spread to surface waters?	Manure is not spread within 100ft. of surface water. **OR** Manure is not spread within 35ft. of surface water where a vegetative buffer meeting NRCS Standards exists.	Manure is not spread within 35ft. of surface water where a vegetative buffer meeting NRCS Standards exists.	Manure is spread less than 100ft. from surface water where no vegetative buffer exists.	No manure spreading setbacks are used.

AEM Tier 2 Worksheet: **Manure and Fertilizer Management** **Table 2: Manure Application**		**Potential Concern**		
Factors Needing Assessment	**Lower** **1**	**2**	**3**	**Higher** **4**
How is manure incorporated after spreading?				
If the farm has soils shallow to bedrock or with a high leaching potential, how is manure spread?	Manure is never spread when fields: - are saturated or frozen or, - when runoff risk is high **AND** Manure is applied just prior to planting or to a growing crop.	Manure is never spread when fields: - are saturated or frozen or, - when runoff risk is high **AND** Manure is applied during the growing season to fields with the highest leaching risk and outside the growing season to fields with the lowest leaching risk.	Manure is never spread when fields: - are saturated or frozen or, - when runoff risk is high **AND** Manure is applied outside the growing season to fields with the lowest leaching risk.	Manure is never spread when fields: - are saturated or frozen or, - when runoff risk is high **AND** Fields are not prioritized based on leaching risks.

AEM Tier 2 Worksheet: **Manure and Fertilizer Management** **Table 3: Fertilizer Application**		**Potential Concern**		
Factors Needing Assessment	**Lower** **1**	**2**	**3**	**Higher** **4**
How is the rate of fertilizer application determined?	Fertilizer rate is based on land grant university guidance and, for P and K, by an appropriate soil test lab. **AND** Soil tests are within the past 3 years. All other nutrient sources are accounted for (e.g. crop residues and manure). **AND** Proper soil pH is maintained.			Fertilizer rate is not based on soil tests. **OR** Other nutrient sources are unaccounted for. **OR** Proper pH is not maintained.
What is the timing of application?	Nutrients are applied as close to the period of maximum nutrient uptake as possible.			Fertilizer is applied outside the growing season.
Is fertilizer spread on soils shallow to bedrock or with a high leaching potential?				
Does your farm import other sources of nutrients (e.g. manure, poultry litter, whey, or other food waste, bio solids) and are they accounted for in your applications to fields?				
Benefits to other resources can also be possible while working toward improved water quality. Taking stock of how existing and future management affect **soil, water, air, plants, animals, energy, greenhouse gases, people, and economics** can result in more effective plans and additional benefits to farms and communities both now and into the future. **Additional Comments:**				

Upper Susquehanna Coalition

BMP Data Entry & Verification Guide

May 2019

TABLE OF CONTENTS

The Importance of BMP Data Collection
Chesapeake Bay TMDL Update

Why do we need to collect BMP data from farms for the Chesapeake Bay Program?
New York (NY) is required to develop and maintain a Watershed Implementation Plan (WIP) outlining practices and procedures that will be in place by 2025 to restore the Chesapeake Bay. By submitting data, we document the implementation progress of Best Management Practices (BMP) made by NY for soil and water conservation and we provide the Environmental Protection Agency (EPA) with the reasonable assurance that NY continues to do the work year after year to meet water quality goals.

What is data used for?
Water quality targets are set by the EPA utilizing a complex computer model. These targets aim to achieve reductions in nitrogen, phosphorus, and sediment loads through continued implementation of farmstead and field conservation practices. NY's progress toward their planning targets is evaluated annually by using the model to estimate the nutrient and sediment load reduction based on the type and number of conservation practices implemented and reported to the EPA. Practices are credited by the Chesapeake Bay model toward reduction goals. The annual evaluation is called a "Progress Run". In addition, NY is required to provide 2-year milestone planning targets. The milestones provide short-term objectives and are key check-in points on the way to having all practices in place by 2025 to restore the Bay. If states fall behind on goals in the future, the EPA has suggested they will take actions to ensure progress.

What farmstead and field conservation practices can be reported?
The Upper Susquehanna Coalition (USC) is the designated data manager for agriculture in the NY portion of the Chesapeake Bay Watershed and is responsible for submitting BMP data to the Department of Environmental Conservation (DEC) for both the annual progress and 2-year milestones. Farm BMP data is collected under the NYS Agricultural Environmental Management (AEM) umbrella and is thereby held confidentially by SWCD's. The data submitted to the DEC and eventually the EPA for the Chesapeake Bay Model is aggregated to the county level; so individual farms are not identified. Practices such as stream restoration, cover crops, conservation tillage, nutrient management, manure storages, precision feed management, prescribed grazing, stream exclusion fence, forest and grass buffers, runoff controls from barnyards and heavy use area protection that are implemented by farms can all be credited by the Chesapeake Bay toward the nitrogen, phosphorus, and sediment reduction goals for NY.

USC Ag BMP Data Collection Form and USC AEM Online Tool
The USC has developed a form with a complete list of NY/CBP BMPs and the reportable units. This form can be used during an AEM visit to record all Ag BMPs that the farm has implemented. It is recommended to use the form to record annual data of individual farms that have had implementation since last year's reporting. Please include NRCS and FSA data! Once completed, the form will help to seamlessly transfer BMP data into the USC AEM Online Tool (**http://aem.co.tioga.ny.us/aem/web**). **Annual progress data must be entered into the USC AEM Online Tool by June 30th each and every year.**

For question, please contact the USC Agricultural Coordinator.

Chesapeake Bay TMDL
Progress and AEM Confidentiality

How is Progress data collected and reported to the EPA?
The Upper Susquehanna Coalition (USC) is the designated data manager for agricultural Best Management Practices (BMP's) in the New York State (NYS) portion of the Chesapeake Bay Watershed, and is responsible for submitting the BMP implementation data to the Department of Environmental Conservation (DEC) for both the annual progress and 2 year milestones. The data is entered by each counties Soil and Water Conservation District (SWCD) into the USC Online Tool. Data is then aggregated by county, submitted to the DEC, and eventually transferred to the Environmental Protection Agency (EPA) for the Chesapeake Bay Model. Individual farms are not identified. All farm BMP data is collected, recorded and reported under the NYS Agricultural Environmental Management (AEM) umbrella and is thereby held confidentially by the SWCD.

How can I assure my clients that their data is confidential?
The AEM Law has a subpart addressing confidentiality, which exempts AEM on-farm surveys, assessments, and plans from the Freedom of Information Law (FOIL) disclosure. The subpart serves as a useful tool for encouraging farmers to voluntarily participate in conservation work with SWCD's. As a note, information directly linked to NYS Agricultural Nonpoint Source Abatement & Control Program (AgNPS) contracts are technically a part of District's own programs.

So, if AEM Law maintains confidentiality of inventories, assessments, plans, and evaluations (that includes that data captured in the AEM Online Tool) in New York State, what about when its sent to the EPA? For starters, data that is entered into the USC AEM Online Tool is being stored on a server in an office located in the NY portion of the Chesapeake Bay Watershed and overseen by a USC staff member. USC staff has exclusive access to this data. Once the Tier 1 and BMP implementation data is in the system, it is only used by the USC for the annual progress runs and individual SWCD planning. In most cases, only the most recent year's implementation data will be pulled from the server. Data from the USC AEM Online Tool is cleansed of farm specific details (name, location, contact info, AEM ID number, etc.) and aggregated to the county level, so the report communicates all the collective work in a county and not per individual farm. Then, those anonymous county-aggregated data are sent to DEC for packaging into a standard nationwide database format required by EPA (the NEIEN node), and transmission to EPA for TMDL progress. Any FOIL request to DEC or FOIA request to EPA for the Chesapeake Bay data would result in a county-wide, aggregated dataset being released (not farm specific). The USC data is demonstrating good stewardship by farmers and only provides specified number of acres, or animal units that were treated by a specified number of practices in a given year by a county. It does not point out what still needs to be done within the NY portion of the watershed.

What about CAFO farms? Is their data confidential too?
The BMP data collected on Concentrated Animal Feeding Operations (CAFO) permitted farms for Chesapeake Bay TMDL progress runs and 2 year milestones is handled as described above. Beyond these efforts to collect BMP data for the TMDL, though confidentiality of data is different for CAFO-permitted farms; All information sent to DEC for CAFO permit purposes (NOIs, Annual Compliance Reports, Spill Reports, etc.) as well as inspection reports and documents associated with enforcement actions can be obtained via FOIL requests to DEC. DEC is also obligated to send Clean Water Act (CWA) permit info to EPA per their delegated authority to run the CAFO CWA permit on EPA's behalf in NYS.

In short, the work that the USC SWCD's are doing to collect, record, and report Agricultural BMP data is protected under AEM Law. Data is aggregated at the county level so that no individual farm is identified when reporting to DEC and EPA. CAFO farm data may fall into a different category because inspection reports and documents associated with enforcement actions can be obtained via FOIL requests. However, these requests would go through the DEC and not the SWCD's.

USC AEM Online Tool Users Guide
http://aem.co.tioga.ny.us/aem/web

Login:
Enter username and password, and then click Login. If you do not have a username or password, please contact the USC Ag Coordinator.

To Select Farm Record:
Select an existing records using complete or partial farm information details, such as: farm name, owner name, etc. then click Search Farms. You can also search by using the select tool  , located on the top left side of the map. The farm information will show under your search criteria. Clicking on the zoom button  will zoom in on the selected farm within the map. Clicking on the continue button  will open the Farm Details page for that farm location.

To Add Farm Record:
Add a new farm record by clicking the "Add Farm" tab at the top right of the screen. Enter the farm address in the search bar located on the top right of the map screen. Click on the pin drop button  , then click the location on the map where you want the farm location pin set. Enter ALL farm information on the right side of the screen and click Save and Continue.

NOTE – The information entered here, is the information that will be used for the search criteria on the "Select Farm" page.

Farm Details:
Enter the Farm Details then click Save. Clicking the Delete button at the bottom of the page will delete the entire farm record.

NOTE – If the farm is a CAFO, you must designate on the Farm Details page under Farm Information.

Tier 1:
To enter Tier 1 information click on the Tier 1 tab on the left of the screen. Answer all questions appropriately. When finished with entire page click SAVE.

NOTE: Checked = YES / Unchecked = NO

Additional Tier 1 Instructions:
To add animal counts and weights, click on the "Add New Farm Animal" button.
NOTE: Animal Units are auto calculated using Chesapeake Bay Program calculations.

1. Choose animal type from the "Name" dropdown list.
2. Enter animal weight (per animal).
3. Enter number of animals in that group.
4. Click Save.
5. Repeat steps 1-4 for additional animal groups.

BMP:
To enter BMP data click on the BMP tab on the left side of the screen. To open an individual BMP data entry screen, click on the View/Edit button. For instructions on entering BMP data, please see "General Instructions for BMP Data Entry (p. 8-9), and the individual BMP Definitions/Instructions pages.

General Instructions for BMP Data Entry

Instructions for entering <u>NEW multi-year practice</u> data:

1. Choose the practice you would like to work with, by clicking on the "View/Edit" button for that BMP.
2. Click the "Add New" button at the bottom right of the screen.
3. Enter an implementation date – this is the original date that the BMP was installed or implemented.
4. Enter an inspection date – this is either the same as the implementation date, or it is the date the practice was inspected or verified.
5. Click "PASS", "FAIL" or "Re-Inspect"
    - PASS = The practice is functioning as intended
    - FAIL = The practice is not functioning as intended, and has already used it's 1 year maintenance period.
    - Re-Inspect = The practice is not functioning as intended and will be placed into a 1 year maintenance period. If needed maintenance does not occur within 1 year from the original inspection date, the BMP will be automatically retired. If maintenance has occurred and the BMP was re-inspected and found to be functioning as intended, then enter a new inspection date and click "PASS".
6. Enter specific BMP location on the operation by clicking the "Edit Location" button. (see BMP Location Instructions)
7. If the BMP is located within the Chesapeake Bay Watershed leave the checkbox checked, if it is not in the Chesapeake Bay Watershed, un-select the checkbox.
8. Choose "YES" or "NO" for the following questions:
    - Is Cost Shared
    - Is NRCS Standard
9. Continue by following BMP specific entry instructions located on the individual BMP Definition/Instruction pages.
10. Press "SAVE"

Instructions for <u>UPDATING</u> data:

If acres, animal numbers, or other BMP specific information changes for a BMP (ex: Soil Conservation Plan that was originally for 200 acres, and now the farms Conservation Plan covers 500 acres) follow the instructions below.

1. Click the "Start Editing" button located on the bottom of the BMP page.
2. Retire the existing practice, by entering a Retirement Date.
3. Click "Save".
4. Then add a new practice using the "Add New" button. For the updated (new) practice, use an implementation date immediately following the retirement date (ex: retired on December 14th, new implementation date would be December 15th)
5. Follow the instructions for entering NEW data above.

NOTE – Clicking the "Delete" button will delete the entire practice.

General Instructions for BMP Data Entry

Instructions for entering annual practice data:

You MUST add a NEW record EVERY year

1. Choose the practice you would like to work with, by clicking on the "View/Edit" button for that BMP.
2. Click "Add New".
3. Enter an implementation date – this is the date that the BMP was implemented.
4. If there was in-field verification completed on this farm, check the field verified button and enter the date that the practice was verified. If the practice was not field verified, leave blank.
5. If the BMP is located within the Chesapeake Bay Watershed leave the checkbox checked, if it is not in the Chesapeake Bay Watershed, un-select the checkbox.
6. Choose "YES" or "NO" for the following questions:
    - Is Cost Shared
    - Is NRCS Standard
7. Continue by following BMP specific entry instructions located on the individual BMP Definition/Instruction pages.
8. Press "SAVE".

BMP Location Instructions

By default, the BMP location will be set the same as the farm location point. To change the actual BMP location, follow the instructions below.

1. Click the "Edit Location" button located on the data entry screen (this will be under to the Lat/Long and in RED text)
2. Zoom in or out as needed.
3. You can move the map around as needed to locate the practice on the map, by clicking and dragging.
4. Drop a pin for the BMP location, by clicking on the map. (You can click on the map as many times as needed to pinpoint the correct location.
5. Click "SAVE"

Accessing Online Reports

1. Click on the "Report" button located on the top right of the screen.
2. Search using one or a combination of search criteria, then click "Search BMP's"
3. To clear search criteria, click on the refresh/clear button.
4. You can sort a column alphabetically or numerically by clicking on the column heading.
5. Each report can be exported to Microsoft Excel by click the "Export to CSV" .
6. In the "FARMS" report, clicking on an AEM-ID will take you directly to the "Farm Details" page.

NOTE: The "Farms Summary" and "# of BMP Records" tables, show everything that is in your county, active and inactive. (For annual practices, it counts every record ever reported.)

If you would like any additional reports, please contact the USC Ag. Coordinator.

Multi-Year BMP Definitions & Individual Data Entry Instructions

Table of Contents

Ag Land Retirement

Definitions: Agricultural land retirement takes marginal and highly erosive cropland out of production by planting permanent vegetative cover such as shrubs, grasses, and/or trees. There are 3 categories of Agricultural Land Retirement.

1. ***Acres converted to hay with nutrient applied*** – Accounts for those crops that are planted and managed as permanent, such as warm season grasses, to sequester carbon in the soil. Cropland converted to permanent hay with nutrients applied.
2. ***Acres converted to hay without nutrients applied*** – Converts land area to hay without nutrients applied.
3. ***Acres converted to pasture*** – Converts land area to permanent pasture.

Common Practice Names: Critical Area Planting (NRCS 342); Conservation Cover (NRCS 327); Permanent Vegetative Cover; Retirement of Highly Erodible Land; Carbon Sequester Alternative Crop

Lifespan: 10 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter acres of retired agricultural land for each category.
2. Enter any additional comments (ex: funding sources, etc.)
3. Click "SAVE".

NOTE:

- If cropland is converted to pasture under Ag Land Retirement, the same acres could receive credit under Prescribed Grazing as well as Ag Land Retirement.

Ag Tree Planting

Definition: Includes any trees planted on agricultural land, except those used to establish riparian forest buffers, targeting lands that are highly erodible or identified as critical resource areas.

Common Practice Names: Reforestation: Forest Planting; Tree Planting; Windbreak/Shelter Establishment (NRCS 380); Tree/Shrub Establishment (NRCS 612); Tree Planting (FSA CP3); Hardwood Tree Planting (FSA CP3A)

Lifespan: 10 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter the acres of trees planted.
2. Enter any additional comments (ex: funding source)
3. Click "SAVE".

NOTE:

- This practice applies to areas with trees planted as permanent. Does not apply to "Christmas Tree" farms.

Barnyard & Runoff Management

Definition: Included in this system is the installation of practices to control runoff from barnyard areas, with practices such as roof runoff control, diversion of clean water from entering the barnyard areas and control of contaminated runoff from barnyard areas. This practice also includes the stabilization of areas frequently and intensively used by people, animals or vehicles by establishing vegetative cover, surfacing with suitable materials, and/or installing needed structures. (see additional notes below)

Common Practice Names: (*Practice system may include multiple BMPs)* Heavy Use Area Protection (NRCS 561); Roof Runoff Structure (NRCS 558); Structure for Water Control (NRCS 587); Diversion (NRCS 362); Roofs and Covers (NRCS 367); Subsurface Drain (NRCS 606); Underground Outlet (NRCS 620); Vegetated Treatment Area (NRCS 635); Trails and Walkways (NRCS 575)

Lifespan: 10 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter the number of animals treated by the system.
2. Check any/all boxes that apply for practices present on the farm that control runoff from the barnyard and/or type(s) of barnyard surface.
3. Enter any additional comments (ex: funding source)
4. Click "SAVE".

NOTE:

- The operation is **not** required to have a constructed "Heavy Use Area" to receive credit for Barnyard & Runoff Management.
- If the operation has confined animals (after 2005) in free stall barns or moves them directly to a pasture or otherwise, then the operation can receive credit for total confinement.

Cropland Forest Buffer

Definition: Linear strips of wooded areas maintained on agricultural land between the edge of fields and streams, or rivers that help filter nutrients, sediment and other pollutants from runoff. (see note below regarding widths)

Common Practice Names: Riparian Forest Buffer (NRCS 391); Riparian Buffer (FSA CP22)

Lifespan: 10 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter the length of the buffer in feet
2. Enter the average width of the buffer in feet
3. Enter any additional comments (ex: funding source)
4. Click "SAVE".

NOTE:

- Acres of buffer are auto-calculated based on length and width.
- Recommended width for buffer implementation (per the Chesapeake Bay Program) is 100 feet with a 35 ft minimum to receive full credit.
- Buffers less than 35ft in width will be credited as a narrow buffer.

Cropland Grass Buffer

Definition: Linear strips of grass or other non-woody vegetation maintained to help filter nutrients, sediment and other pollutants from runoff. (see note below regarding widths)

Common Practice Names: Riparian Herbaceous Cover (NRCS 390); Filter Strip (NRCS 393 or FSA CP21); Field Border (NRCS 386); Grass Waterway (NRCS 412); Grass Water Non-Easement (FSA CP8A)

Lifespan: 10 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter the length of the buffer in feet
2. Enter the average width of the buffer in feet
3. Enter any additional comments (ex: funding source)
4. Click "SAVE".

NOTE:

- Acres of buffer are auto-calculated based on length and width.
- Recommended width for buffer implementation (per the Chesapeake Bay Program) is 100 feet with a 35 ft minimum to receive full credit.
- Buffers less than 35ft in width will be credited as a narrow buffer.

Exclusion Fence with Forest Buffer

Definition: Linear strips of wooded areas maintained on agricultural land between the edge of fields and streams, or rivers that help filter nutrients, sediment and other pollutants from runoff. This practice also includes exclusion fence be installed to prevent livestock from entering the stream and/or grazing or trampling the buffer area. (see note below regarding widths)

Common Practice Names: Riparian Forest Buffer (NRCS 391); Riparian Buffer (FSA CP22)

Lifespan: 10 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter the number of animals excluded.
2. Enter the length of the buffer in feet
3. Enter the average width of the buffer in feet
4. Enter any additional comments (ex: funding source)
5. Click "SAVE".

NOTE:

- Acres of buffer are auto-calculated based on length and width.
- Recommended width for buffer implementation (per the Chesapeake Bay Program) is 100 feet with a 35 ft minimum to receive full credit.
- Buffers less than 35ft in width will be credited as a narrow buffer.

Exclusion Fence with Grass Buffer

Definition: Linear strips of grass or other non-woody vegetation maintained to help filter nutrients, sediment and other pollutants from runoff from pasture areas. This practice also includes exclusion fence be installed to prevent livestock from entering the stream and/or grazing or trampling the buffer area. (see note below regarding widths)

Common Practice Names: Riparian Herbaceous Cover (NRCS 390); Filter Strip (NRCS 393 or FSA CP21); Field Border (NRCS 386); Grass Waterway (NRCS 412); Grass Water Non-Easement (FSA CP8A)

Lifespan: 10 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter the number of animals excluded.
2. Enter the length of the buffer in feet
3. Enter the <u>average</u> width of the buffer in feet
4. Enter any additional comments (ex: funding source)
5. Click "SAVE".

NOTE:

- Acres of buffer are auto-calculated based on length and width.
- Recommended width for buffer implementation (per the Chesapeake Bay Program) is 100 feet with a 35 ft minimum to receive full credit.
- Buffers less than 35ft in width will be credited as a narrow buffer.

Horse Pasture Management

Definition: Horse pasture management is defined as maintaining a 50% pasture cover with managed species (desirable, inherent) and managing high traffic areas.

Common Practice Names: Prescribed Grazing (NRCS 528 or 528A)

Lifespan: 10 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter number of horses associated with practice.
2. Enter acres associated with the horse pasture management practice, including additional acres improved to stabilize overused small pasture containment areas (animal concentration areas) adjacent to animal shelters or farmsteads.
3. Enter any additional comments (ex: funding source, etc.)
4. Click "SAVE".

NOTE:

- This practice applies to all horse pastures having 50% or greater vegetative cover.

Manure Storage Facility

Includes Manure Stacking

Definition: Any structure designed for collection, transfer and storage of manures and associated wastes generated from the confined portion of animal operations. Manure conserved through reduced storage and handling losses associated with Manure Storage Facility implementation are available for land application or export from the farm.

Common Practice Names: Waste Storage Facility (NRCS 313); Waste Treatment Lagoon (NRCS 359); Waste Storage Structure; Dry Waste Storage Structure; Waste Storage Pond

Lifespan: 15 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. If a farm has a manure storage that is covered with floating or rigid cover, check the corresponding box. (This does NOT include a natural crust)
2. Enter the number of animals treated with the manure storage facility.
3. Enter any additional comments (ex: funding source, sizing or storage duration, etc.)
4. Click "SAVE".

NOTE: If the operation has multiple storages for different animal groups, enter each practice individually identifying the location of the each storage with the BMP Location Tool.

Milk House Waste System

Definition: Practices designed for proper handling, storage and utilization of milk house waste and wash water. This practice applies to mainly dairy operations but can also apply to poultry facilities with egg wash water, vegetable facilities with wash water, or other operations that may have a wash down procedure that would collect nutrients.

Common Practice Names: Waste Transfer (NRCS 634); Pumping Plants (NRCS 533); Vegetated Treatment Area (NRCS 635)

Lifespan: 15 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter the number of animals treated by the milk house waste system.
2. Enter any additional comments (ex: funding source)
3. Click "SAVE".

Pasture Alternative Watering

Definition: This BMP required the use of alternative drinking water sources, such as permanent or portable livestock troughs places away from the stream corridor while livestock still have access to the stream. Implementing off-stream shade for livestock is encouraged where applicable. The water supplied to the facilities can be from any source including pipelines, spring developments, water wells and ponds. In-stream watering facilities such as stream crossings or access points are not eligible for Pasture Alternative Watering.

Common Practice Names: Watering Facility (NRCS 614)

Lifespan: 10 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter the acres of pasture served by the alternative watering facility.
2. Enter any additional comments (ex: funding source)
3. Click "SAVE".

NOTE:

- This practice cannot be combined with Exclusion Fence with Forest Buffer, Exclusion Fence with Grass Buffer, or Stream Exclusion practices.

Prescribed Grazing

Definition: This practice utilizes a range of pasture management and grazing techniques to improve the quality and quantity of the forages grown on pastures and reduce the impact of animal travel lanes, animal concentration areas or other degraded areas. Prescribed Grazing can be applied to pastures intersected by stream or upland pastures outside of the degraded stream corridor. Pastures under the prescribed grazing system need to have vegetative cover of 60% or greater.

Common Practice Names: Prescribed Grazing (NRCS 528 or 528A); Managed Intensive Grazing; Rotational Grazing;

Lifespan: 10 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter animals numbers associated with the grazing system.
2. Enter any additional comments (ex: average paddock sizing, days in rotation, funding source, etc.).
3. Click "SAVE".

Silage Leachate System

Definition: Practices designed for proper handling, storage and utilization of silage leachate from any type of silage storage system, including: upright silos, ag bags, and feed bunkers. This practice applies to Dairy, Beef, Poultry, Swine, Horses, Goats, Sheep, and Other Livestock operations that rate a 1 or 2 on the AEM Tier 2 assessment for Silage Storage.

Common Practice Names: Waste Transfer (NRCS 634); Pumping Plants (NRCS 533); Vegetated Treatment Area (NRCS 635)

Lifespan: 15 years

Instructions for entering data:
Follow “General Entry Instructions for Multi-Year Practices” then proceed to the instructions below.

1. Enter the number of animals treated by the silage leachate system.
2. Enter any additional comments (ex: funding source)
3. Click “SAVE”.

Soil Conservation Plans

Definition: Soil conservation plans are a combination of agronomic, management and engineered practices that protect and improve soil productivity and water quality, and to prevent deterioration of natural resources on all of part of the farm. Plans may be prepared by staff working in conservation districts, natural resource conservation field offices or a certified private consultant. In all cases, the plan must meet technical standards. These types of plans would include: AEM Tier 3A Cropland Conservation plans, Highly Erodible Land (HEL) plans, and/or plans that meet the requirements of 1985 Food Security Act. This practice applies to all agricultural land and operation types.

Common Practice Names: Soil Conservation Plan; Water Quality Plan; Conservation Planning; Field and Pasture Erosion Control Plan; Agricultural Erosion & Sediment Control Plan

Lifespan: 10 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter total acres associated with the Soil Conservation Plan.
2. Enter any additional comments (ex: funding source)
3. Click "SAVE".

NOTE:

- If the operation has a CNMP, you must enter Nutrient Management and Soil Conservation Plans as separate practices. Soil Conservation Plans has a 10 year lifespan, and Nutrient Management has a 1 year lifespan and must be re-entered annually.
- An operation should only have one active Soil Conservation Plan that accounts for all of the operations acres.

Stream Exclusion

Definition: This practice includes stream exclusion fence that is installed on existing forested land and/or stream exclusion fence installed at top of bank.

Common Practice Names: Fence (NRCS 382); Exclusion Fence; Stream Exclusion Fence

Lifespan: 10 years

Instructions for entering data:
Follow "General Entry Instructions for Multi-Year Practices" then proceed to the instructions below.

1. Enter the length of stream exclusion in feet.
2. Enter any additional comments (ex: funding source)
3. Click "SAVE".

NOTE:

- This practice cannot be combined with Exclusion Fence with Forested Buffer, or Exclusion Fence with Grass Buffer for the same section of fencing.
- If there are areas of fencing installed, excluding animals from a stream and existing forest land, this practice would apply.
- If there are areas of fencing installed with no buffer area, and stream is at or near the top of stream bank, this practice would apply.

Annual BMP Definitions & Individual Data Entry Instructions

Table of Contents

Cover Crops

Definition: Cover crops are short-term crops grown after the main cropping season to reduce nutrient and sediment losses from the farm field. The selected crop species and management of cover crops vary based on the farmer's needs and preferences. Cover Crops is broken up into three categories:

1. Traditional Cover Crops: A short-term crop grown after the main cropping season to reduce nutrient losses to ground and surface water by sequestering nutrients. This type of cover crop may not receive nutrients in the fall and may not be harvested in the spring.

2. Traditional Cover Crop with Fall Nutrient Applications: A short-term crop grown after the main cropping season to reduce nutrient losses to ground and the surface water by sequestering nutrients. This type of cover crop is planted upon cropland where manure is applied following the harvest of a summer crop and prior to cover crop planting. The crop may not be harvested in the spring.

3. Commodity Cover Crop: A winter cereal crop planted for harvest in the spring which does not receive nutrient applications in the fall. Any winter cereal crop which did receive nutrient applications in the fall is not eligible for nutrient reductions.

Common Practice Names: Cover Crops (NRCS 340)

Lifespan: Annual Practice

Instructions for entering data:
Follow "General Entry Instructions for Annual Practices" then proceed to instructions below.

1. Enter the acres of each crop type – Wheat, Rye, Barley or Triticale/Other Small Grain
2. Choose Planting Method – Drilled or Other
3. Choose when Manure was Applied – Fall/Winter, Spring or No Manure
4. Choose the Outcome – Harvested or Plowed Under (report as "plowed under" if the cover crop is killed and residue is left)
5. Enter any additional comments
6. Click "SAVE".

NOTE:

- Our model year starts July 1st of the previous year and runs through June 30th of the current year. Therefore, cover crops are implemented in the fall, verified in the spring and applied to the correct and current year.

Manure Incorporation

Definition: Manure incorporation is defined as the mixing of dry, semi-dry, or liquid organic nutrient sources into the soil profile within a specified time period from application by a range of field operations. Manure MUST be incorporated into the soil within 3 days to be eligible for Incorporation. below. There are three categories of Manure Incorporation:

1. ***High Disturbance Incorporation*** – provides the highest degree of mixing of organic nutrient sources into the root zone, but effectively eliminates the erosion control benefits of conservation tillage. Incorporation plus additional field operations retain <30% of residue cover at planting.

2. ***Low Disturbance Incorporation*** – leaves greater quantities of organic nutrient sources on the soil surface, but maintains most of the benefits of conservation tillage. Incorporation plus additional field operations retains at least 30% of residue cover at planting. (will also meet Conservation Tillage Practice definition)

3. ***Liquid Manure Injection*** – is a specialized category of placement in which organic nutrient sources are mechanically applied into the root zone with surface soil closure at the time of application. Injection is expected to provide the greatest level of nutrient loss reduction to both atmospheric and surface runoff pathways, as well as odor reduction, due to limited quantities of material left of the soil surface, limited soil disruption, and immediate soil closure. Total soil surface disturbance for injection plus planting and any other field operations should be less than 40%.

Common Practice Names: N/A

Lifespan: Annual Practice

Instructions for entering data:
Follow “General Entry Instructions for Annual Practices” then proceed to the instructions below.

1. Enter the number of acres that meets the High Disturbance Incorporation definition.
2. Enter the number of acres that meets the Low Disturbance Incorporation definition.
3. Enter the number of acres that meets the Liquid Manure Injection definition.
4. Enter any additional comments (ex: funding source)
5. Click “SAVE”.

Nutrient Management

Definition: The implementation of a site-specific combination of nutrient source, rate, timing and placement into a strategy that seeks to optimize agronomic and environmentally efficient utilization of nitrogen and phosphorus. Improvement in nutrient-use efficiency necessitates documentation of nutrient management implementation strategies that are suitable for independent verification. Nutrient Management is categorized into Core Nutrient Management, and Supplemental Nutrients Management both for Nitrogen and Phosphorus. Supplemental NM is further divided by Rate, Placement and Timing. *(See charts on next page)*

Common Practice Names: Nutrient Management (NRCS 590**);** AEM Certified Nutrient Management Plan

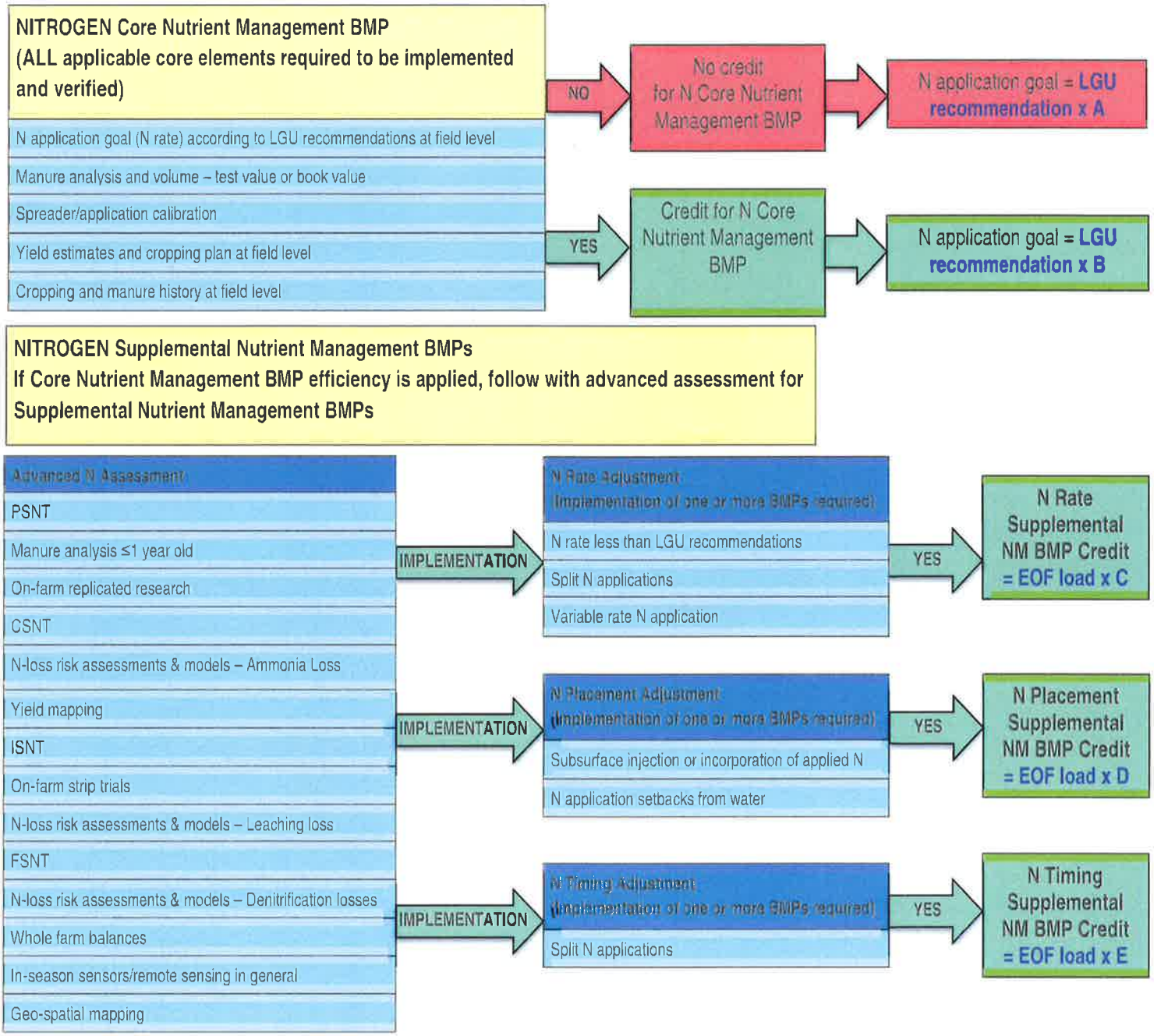
Lifespan: Annual Practice

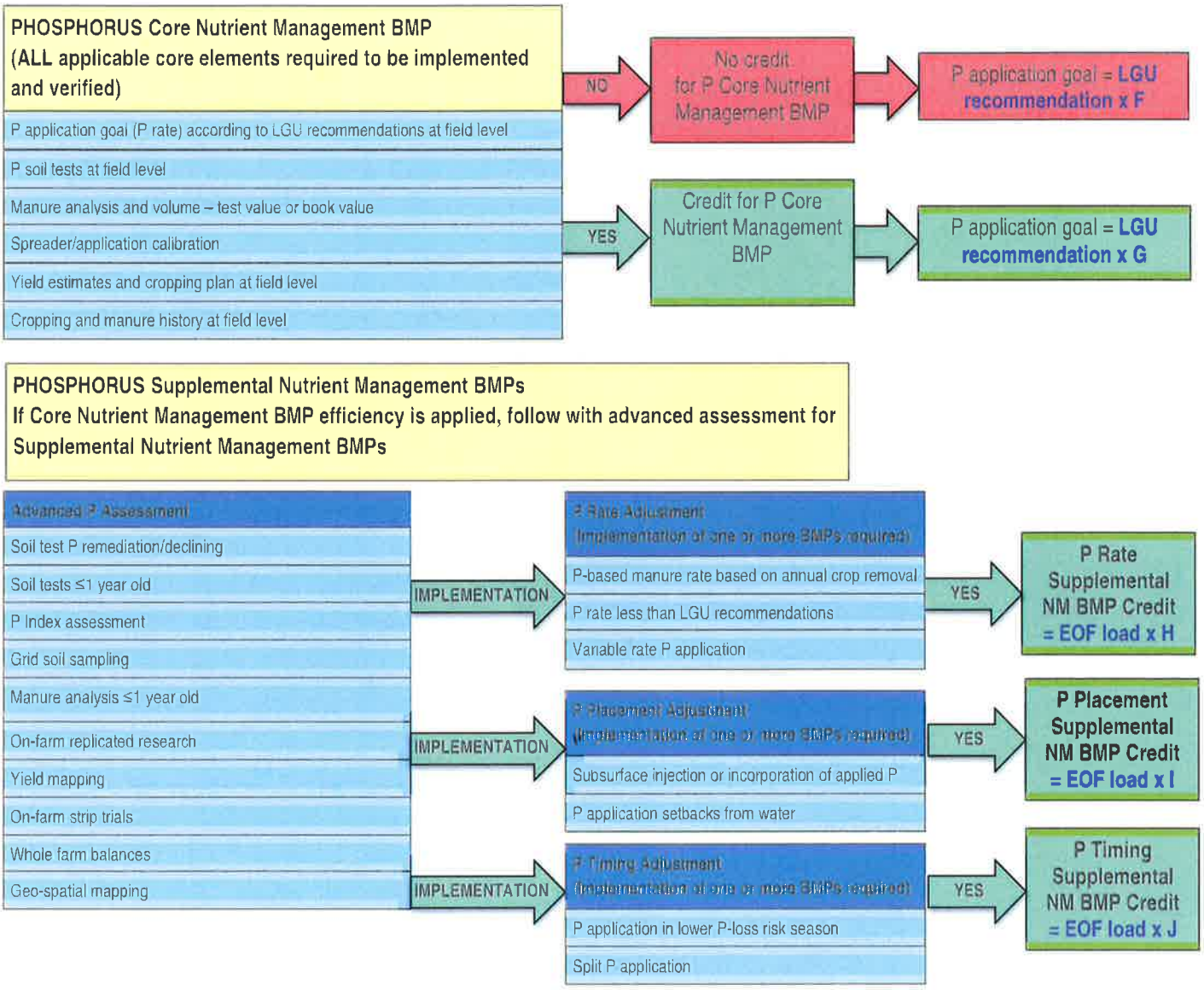
Instructions for entering data:
Follow "General Entry Instructions for Annual Practices" then proceed to instructions below.

1. Enter Row Crop acres
2. Enter Alfalfa/Grass acres
3. Enter Permanent Hay acres
4. Enter Pasture acres
5. Enter a check for each category that the practice meets (Core N, N Rate, N Placement, N Timing, Core P, P Rate, P Placement, and P Timing)
6. Enter any additional comments
7. Click "SAVE".

NOTE:

- If the operation has a CNMP, you must enter the Nutrient Management and Soil Conservation Plan as separate practices. Soil Conservation Plans has a 10 year lifespan, and Nutrient Management has a 1 year lifespan and must be entered annually.
- Nutrient Management is based on IMPLEMENTATION and RECORD KEEPING more than the "Plan" itself.
- All elements of the Core Nutrient Management BMP must be met to be eligible for one or more of the Supplemental BMPS for Nitrogen and/or Phosphorus.


NITROGEN Core Nutrient Management BMP
(ALL applicable core elements required to be implemented and verified)
N application goal (N rate) according to LGU recommendations at field level
Manure analysis and volume – test value or book value
Spreader/application calibration
Yield estimates and cropping plan at field level
Cropping and manure history at field level
NO
No credit for N Core Nutrient Management BMP
N application goal = LGU recommendation x A
YES
Credit for N Core Nutrient Management BMP
N application goal = LGU recommendation x B
NITROGEN Supplemental Nutrient Management BMPs
If Core Nutrient Management BMP efficiency is applied, follow with advanced assessment for Supplemental Nutrient Management BMPs
Advanced N Assessment
PSNT
Manure analysis ≤1 year old
On-farm replicated research
CSNT
N-loss risk assessments & models – Ammonia Loss
Yield mapping
ISNT
On-farm strip trials
N-loss risk assessments & models – Leaching loss
FSNT
N-loss risk assessments & models – Denitrification losses
Whole farm balances
In-season sensors/remote sensing in general
Geo-spatial mapping
IMPLEMENTATION
N Rate Adjustment
(Implementation of one or more BMPs required)
N rate less than LGU recommendations
Split N applications
Variable rate N application
YES
N Rate Supplemental NM BMP Credit = EOF load x C
IMPLEMENTATION
N Placement Adjustment
(Implementation of one or more BMPs required)
Subsurface injection or incorporation of applied N
N application setbacks from water
YES
N Placement Supplemental NM BMP Credit = EOF load x D
IMPLEMENTATION
N Timing Adjustment
(Implementation of one or more BMPs required)
Split N applications
YES
N Timing Supplemental NM BMP Credit = EOF load x E


PHOSPHORUS Core Nutrient Management BMP
(ALL applicable core elements required to be implemented and verified)
P application goal (P rate) according to LGU recommendations at field level
P soil tests at field level
Manure analysis and volume – test value or book value
Spreader/application calibration
Yield estimates and cropping plan at field level
Cropping and manure history at field level
NO
No credit for P Core Nutrient Management BMP
P application goal = LGU recommendation x F
YES
Credit for P Core Nutrient Management BMP
P application goal = LGU recommendation x G
PHOSPHORUS Supplemental Nutrient Management BMPs
If Core Nutrient Management BMP efficiency is applied, follow with advanced assessment for Supplemental Nutrient Management BMPs
Advanced P Assessment
Soil test P remediation/declining
Soil tests ≤1 year old
P Index assessment
Grid soil sampling
Manure analysis ≤1 year old
On-farm replicated research
Yield mapping
On-farm strip trials
Whole farm balances
Geo-spatial mapping
IMPLEMENTATION
P Rate Adjustment
(Implementation of one or more BMPs required)
P-based manure rate based on annual crop removal
P rate less than LGU recommendations
Variable rate P application
YES
P Rate Supplemental NM BMP Credit = EOF load x H
IMPLEMENTATION
P Placement Adjustment
(Implementation of one or more BMPs required)
Subsurface injection or incorporation of applied P
P application setbacks from water
YES
P Placement Supplemental NM BMP Credit = EOF load x I
IMPLEMENTATION
P Timing Adjustment
(Implementation of one or more BMPs required)
P application in lower P-loss risk season
Split P application
YES
P Timing Supplemental NM BMP Credit = EOF load x J

Precision Feed Management Dairy

Definition: Dairy precision feeding and/or forage management reduces the quantity of phosphorus and nitrogen fed to the lactating portion of the dairy herd by formulating diets within 110% of Nutritional Research Council recommended level in order to minimize the excretion of nutrients without negatively affecting milk production. This practice applies to dairy animals only.

Common Practice Names: Feed Management (NRCS 592)

Lifespan: Annual Practice

Instructions for entering data:
Follow "General Entry Instructions for Annual Practices" then proceed to the instructions below.

1. Check "Meets N" if the farm meets the Nitrogen Requirement, then enter the number of animals in the lactating herd that meet these requirements.
2. Check "Meets P" if the farm meets the Phosphorus Requirement, then enter the number of animals in the lactating herd that meet these requirements.
3. Enter any additional comments (ex: funding source)
4. Click "SAVE".

NOTE:

- If only a portion of the lactating herd meets the PFM requirements from the "PFM Tool" than you enter only the animal numbers meeting those requirements. The whole lactating herd does not need to be included to receive credit – credit is based only on animal numbers meeting the requirements.

Tillage Practices

Definition: Conservation tillage involves the planting, growing and harvesting of crops with minimal disturbance to the soil. Tillage is broken up into three categories:

1. Low Residue Tillage – A conservation tillage routine that involves the planting, growing, harvesting of crops with minimal disturbance to the soil in an effort to maintain 15-29% crop residue coverage immediately after planting each crop.
2. Conservation Tillage – A conservation tillage routine that involves the planting, growing, and harvesting of crops with minimal disturbance to the soil in an effort to maintain 30-59% crop residue coverage immediately after planting each crop.
3. High Residue, Minimum Soil Disturbance Tillage – A conservation tillage routine that involves the planting, growing and harvesting of crops with minimal disturbance to the soil in an effort to maintain at least 60% crop residue coverage immediately after planting each crop.

Other Practice Names: Residue and Tillage Management – No Till (NRCS 329); Residue and Tillage Management – Reduced Till (NRCS 345)

Lifespan: Annual Practice

Instructions for entering data:
Follow "General Entry Instructions for Annual Practices" then proceed to instructions below.

1. Enter acres associated with each type of tillage practice.
2. Enter any additional comments
3. Click "SAVE".

NOTE:

- Any tillage routine that achieves less than 15% crop residue coverage immediately after planting each crop is considered conventional tillage, and does NOT qualify for any conservation tillage practices.

BMP Verification Overview

Each year the USC will provide each county with a list of farms and associated BMPs in their county. This list will be generated by a “random sampling” program developed by Tetra Tech. These farms will need on farm verification completed for submission into the database. On farm verification will be completed using a “whole farm approach” to collect information on all BMPs that are located on each farm selected.

Table of Contents

BMP Data Entry & Verification Timeline

January –

Random sampling reports distributed to counties

January through June –

BMP Verification, Data Collections, and Data Entry

June 30th –

Data entry deadline for all data including BMP verifications and annual practices for the dates falling between July 1st of the previous year through June 30th of the current year

July –

QA/QC and finalizing ALL data for progress year submission

July 31st –

Data Submission Deadline for all necessary changes

Instructions for In-Field Verification of BMP's

Useful tools for verification –

- Tier 1 worksheet – if time allows, Tier 1 farm information could be updated during the on-site verification visit.
- Tier 2 worksheet(s) – to assist with the evaluation of each practice.
- Tier 5B Conservation Plan Evaluation Worksheet – to assist with the evaluation of a Conservation Plan
- Tier 5B BMP Evaluation Worksheet – to assist with the evaluation of BMP's
- USC Annual BMP Questionnaire
- USC Ag. BMP Data Collection Sheet – to assist in collecting information to be included in data entry.
- USC Data Entry Information & BMP Definitions document

Before going to the farm –

1. If available, obtain the NRCS Conservation Practices Standard(s) and locate the design(s) for the system or practice(s) to be evaluated.
2. Review the design and any related notes from the practice installation.

During the on-site verification –

1. Verify that the system/practice is stable with no signs of erosion, deposition, sloughing, leaks, cracks, dead or lacking vegetation, etc. – This will require an in depth evaluation of each practice.
2. If available, utilize the Operation & Maintenance section of the design or practice standard to verify that the practice is being properly operated & maintained.
3. Verify that each system/practice is properly functioning.
    a. Determine if there is evidence of overtopping, concentrated flows, or contaminated water where it does not belong.
    b. Verify that the capacity (depth, width & grade) has been maintained.

What to do after returning to the office –

1. If Tier 2 and/or Tier 5B worksheets were not completed during the on-site verification, complete those worksheet in the office using your knowledge of the farm and any notes taken during the field visit.
2. Enter all data collected into the AEM database. (See Data Entry Information & BMP Definitions document)
3. If during the on-site verification, a practice was found to be in need of maintenance – Enter the inspection date and click the re-inspect button. Be sure to follow-up with this operation regarding the required maintenance for the practice. (Practices will have a 1 year maintenance period when the re-inspect button is clicked. If the inspection status is not changed to PASS within 1 year, it will automatically be retired, and will no longer receive credit.)
4. File all hard copy documentation.

Useful Tools and Forms

Table of Contents

AGRICULTURAL ENVIRONMENTAL MANAGEMENT

Tier 1 *AEM Identification Number:*

_____ County SWCD Date: ____/____/____

Evaluator Name:	Evaluating Agency:
Watershed Identification:	
Farm Name:	
Owner's Name:	Operator's Name:
Address:	Address:
Phone: Fax:	Phone: Fax:
Email:	Email:

Preferred Contact Point? (please check only one)

☐ Owner ☐ Operator

1) **Future Status of the Farm**

A) Do you anticipate any major modifications on your farm within the next 5 years? ☐ **Yes** ☐ **No**

If yes, please check the condition(s) that best describes the modification(s):

☐ Business Structure ☐ Expansion ☐ Retirement

☐ Operation Type ☐ Diversification of Farm Business ☐ Sale of Farm

B) Do you plan to subdivide any portion of your farm in the next 5 years? ☐ **Yes** ☐ **No**

2) **Basic Farm Information**

A) What **Primary** Farm Enterprise best describes your operation?

☐ Dairy ☐ Beef ☐ Horses ☐ Fruit/Vegetables

☐ Poultry ☐ Swine ☐ Vineyard ☐ Greenhouse

☐ Cash Crop: (**Please Define**) _____ ☐ Sheep/Goats

☐ Other: (**Please Define**) _____

B) Please indicate the following number of acres:

	Owned	**Rented**
Cropland Acres	_____	_____
Grazed Land Acres	_____	_____
Permanent Hay Land Acres	_____	_____
Woodland Acres	_____	_____
Total Acres	_____	_____

C) Does your operation qualify for Ag Value Assessment? ☐ **Yes** ☐ **No**

3) **Animal Numbers for your <u>Primary</u> Farm Type**

Average Weight: _____ Number: _____ Average Weight: _____ Number: _____

Average Weight: _____ Number: _____ Average Weight: _____ Number: _____

4) **Management Questions** (Please check Yes or No)

	Yes	No
Do you spread manure?	☐	☐
Do you have a manure storage facility?	☐	☐
Do you generate process washwater from the cleaning of product or facilities? (i.e. milkcenter, egg wash, washing of produce)	☐	☐
Is there a barnyard or outdoor feedlot on your farm?	☐	☐
Do you store silage or other high moisture feeds on the farm?	☐	☐
Do you utilize pastureland on your farm?	☐	☐
Do you use commercial fertilizer?	☐	☐
Do you use pesticides (herbicides, insecticides, fungicides) on your farm?	☐	☐
Do you store and/or mix pesticides (herbicides, insecticides, fungicides) on your farm?	☐	☐
Does your operation utilize cropland for row crop production?	☐	☐
Is the water supply on your farm from a well or a spring?	☐	☐
Is there a waterbody within or adjacent to your farm?	☐	☐
Do you presently or do you plan to harvest timber on your farm?	☐	☐
Do you store fuel or other bulk petroleum products on your farm?	☐	☐
Have you received odor complaints or do you believe your farm has an odor concern?	☐	☐

NYS Agricultural Interest Assessment – check all that are of interest

- ☐ Agricultural Tax Relief
- ☐ Agri-Tourism
- ☐ Air Quality
- ☐ Biofuels
- ☐ Biosecurity
- ☐ Conservation Easements
- ☐ Energy Conservation/Generation
- ☐ Environmental Management Systems
- ☐ Farmland Protection
- ☐ Feed Management
- ☐ Fisheries Habitat Management
- ☐ Forest Management/Timber Harvest
- ☐ Grasslands Farming
- ☐ Integrated Pest Management
- ☐ Irrigation Management
- ☐ Manure Treatment Options
- ☐ Neighbor-Farm Relations
- ☐ Nuisance Wildlife Control
- ☐ Organic Farming
- ☐ Pollution Credit Trading
- ☐ Right To Farm
- ☐ Stream Management
- ☐ Water Conservation/Management
- ☐ Wellhead Protection
- ☐ Wetland Conservation
- ☐ Wildlife Habitat Improvement

Would you like to receive a copy of the AEM Guide to Conservation Funding? ☐ Yes ☐ No
This document is also online at www.nys-soilandwater.org/aem/aemoutreach.html

(***OPTIONAL***)

Producer Questions & Comments:

_____

Agricultural
Environmental
Management

Tier 5B Conservation Plan Evaluation Requirements Checklist for AEM Base Program

Check only ONE box per form.

3A Plan ☐ Completed Year ☐

3B CNMP ☐ Completed Year ☐

3C Whole Farm ☐ Completed year ☐

This checklist will help determine if all required tasks and documentation have been completed for the Tier 5B Evaluation of an AEM Tier 3 Plan. Also consult "*Participating in AEM Tier 5B*" when completing this checklist.

Please complete the following information on the farm planned.

County: **Date:** **AEM YEAR:**

AEM Farm Identification Number:

12-digit HUC of the predominant watershed in which the farm is located:

Primary type of farm evaluated: **Acres:**

Animal Units on the farm:

Date of the original plan:

Existing planned component(s): ☐Farmstead ☐Cropland ☐Nutrient Mgmt. ☐Pasture ☐Pest

Additional components planned: ☐Farmstead ☐Cropland ☐Nutrient Mgmt. ☐Pasture ☐Pest ☐NA

Additional acres planned: ☐

Please check each item addressed and documented in the plan and/or the farm's case file.

- **If an item does not apply please explain why in the notes section of this form.**

1. ☐ Identify the land units planned and review the natural resource issues & opportunities, decisions, and recommendations in the plan.

2. ☐ Meet with the farmer to review and discuss their plan noting any progress made in implementing decisions from the plan by documenting on the *Record of Decisions and Progress* form. Also, note any changes made to the farming operation that necessitate a plan update/revision. Note that AEM Tier 1 and 2 can be used to help identify changes and assess the need for additional planning.

3. ☐ Check that the existing plan covers all natural resource issues & opportunities and identify any missing high priority issues that should be progressively planned in the updated plan.

4. ☐ Discuss with the farmer the decisions/recommendations not implemented from the existing plan then update the plan to reflect any new high priority issues & opportunities, or adjustments to the timetable to implement already planned practices in the *Record of Decisions and Progress* form.

5. ☐ Plan any additional high priority issues or components the farmer is now willing to address (progressively plan). Utilize the *Participating in AEM Tier 3* document and the *Tier 3 Plan Requirements Checklist* to help guide the planning.

6. ☐ Tier 3B or C plans must be evaluated by or under the supervision of a Certified Planner.

7. ☐ Complete the update, review with the farmer and gain their approval. Note the process in the *Assistance Notes* in the farmer's case file and in any data management system maintained by the District.

8. ☐ Provide a copy of the revised plan to the farmer.

9. Comments:

Agricultural Environmental Management

Tier 5B BMP Evaluation Requirements Checklist for AEM Base Program

This checklist will help determine if all required tasks and documentation have been completed for the Tier 5B Evaluation of an existing BMP system or conservation practice. Also consult "Participating in AEM Tier 5B" when completing this checklist.

Please complete the following information on the farm & BMP evaluated.

County: **Date:** **AEM YEAR**:

AEM Farm Identification Number:

12-digit HUC of the predominant watershed in which the farm is located:

Type of BMP System/conservation practice(s) evaluated:

Date of BMP installation:

ID the source of cost share for original installation (if applicable)**:** ☐**Ag NPS** ☐**Farm Bill** ☐ **Both**

Type or Farm: **Acres:**

Animal Units on the farm:

Please check each item addressed and documented in the plan and/or the farm's case file.

- **If an item does not apply please explain why in the notes section of this form.**

1. ☐ The NRCS Conservation Practice Standard(s), the design, and "as-built" of the conservation practice(s) to be evaluated have been found and reviewed. The design and "as-built" was signed by an individual(s) with the appropriate Job Approval Authority.

2. ☐ An on-site evaluation of the practice(s) was conducted noting the condition of the practice, the status of operation & maintenance, and if the practice is properly functioning including a check of the capacity if appropriate. You have utilized the assistance, if needed, of an individual with Job Approval Authority or a Professional Engineer.

3. ☐ Determination was made on whether or not the practice is addressing the concern for which it was installed. The "Criteria" and "Considerations" sections of the appropriate NRCS Conservation Practice Standard were utilized to help make this determination.

4. ☐ You have met with the farmer to discuss if the practice is meeting expectations, and to review operation and maintenance activities.

5. ☐ The farmer has been provided a written report on the condition of the practice that identifies any changes and/or improvements needed, and provides any additional information required to properly operate and maintain the practice. Recommendations on new or additional BMPs have been made if needed. The report was reviewed on-site.

6. ☐ The evaluation of the practice and review with the farmer has been documented in the conservation plan or case file. A copy of the report has also been filed. Accomplishments were documented in any data management system maintained by the District.

7. Comments:

UPPER SUSQUEHANNA COALITION - CHESAPEAKE BAY PROGRAM
AGRICULTURAL ENVIRONMENTAL MANAGEMENT AG BMP DATA ENTRY SHEET

Farm Name _____ AEM ID _____ - _____

Evaluator _____ Inspection Date ___ / ___ / _____

Multi-Year Practices ☐ CAFO	Inspection Result (✔ PASS or FAIL)	Cost Shared? (✔ if yes)	NRCS Standard? (✔ if yes)
Agricultural Land Retirement Implementation Date ___ / ___ / _____ Acres converted to hay without nutrients _____ Acres converted to hay or open space WITHOUT nutrients _____ Acres converted to pasture _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Agricultural Tree Planting Implementation Date ___ / ___ / _____ Acres Planted _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Barnyard & Runoff Management * If multiple systems - see attached * Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ ☐ Heavy Use Area ☐ Concrete ☐ Aggregate ☐ Managed Vegetation ☐ Mulch ☐ Roof Runoff Structure ☐ Diversion ☐ Stormwater Runoff Control ☐ Vegatated Treatment Area/Strip ☐ Total Confinement (after 2005) ☐ Animal Trails & Walkways	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Cropland Forest Buffer * If multiple buffers - see attached * Implementation Date ___ / ___ / _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Cropland Grass Buffer * If multiple buffers - see attached * Implementation Date ___ / ___ / _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Exclusion Fence with Forest Buffer * If multiple buffers - see attached * Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Exclusion Fence with Grass Buffer * If multiple buffers - see attached * Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Horse Pasture Management Implementation Date ___ / ___ / _____ Animal Numbers _____ Acres _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Manure Storage Facility * If multiple systems - see attached * Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ ☐ Covered	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Milkhouse Waste Implementation Date ___ / ___ / _____ Number of Dairy Cows _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Pasture Alternative Watering Implementation Date ___ / ___ / _____ Acres served by watering facility _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐

Prescribed Grazing Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ Acres _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Silage Leachate Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Soil Conservation Plan Implementation Date ___ / ___ / _____ Acres _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Stream Exclusion Fencing Implementation Date ___ / ___ / _____ Length Fenced (Feet) _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐

Notes _____

Annual Practices

	Field Verifield (✔ if yes)	Cost Shared? (✔ if yes)	NRCS Standard? (✔ if yes)

Cover Crops ☐ Field Verified

Planting Date	Cover Crop Type	Planting Method	Manure Applied	Outcome	Acres		
___ / ___ / _____	_____	_____	_____	_____	_____	☐	☐
___ / ___ / _____	_____	_____	_____	_____	_____	☐	☐
___ / ___ / _____	_____	_____	_____	_____	_____	☐	☐
___ / ___ / _____	_____	_____	_____	_____	_____	☐	☐
___ / ___ / _____	_____	_____	_____	_____	_____	☐	☐
	Wheat, Rye, Barley, Tritcale or other small grain	Drilled or Other	No Manure, Fall/Winter, or Spring (after March 1)	Harvested or Plowed Under	Acres Planted		

Manure Incorporation ☐ Field Verified ☐ ☐

Implementation Date ___ / ___ / _____

Length Fenced (Feet)

Acres of high disturbance incorporation (<30% residue at planting) _____

Acres of low disturbance incorporation (30% or more residue at planting) _____

Acre of liquid manure injections (<40% soil surface disturbance) _____

Nutrient Management Plans ☐ Field Verified ☐ ☐

Implementation Date ___ / ___ / _____

Landuse Type Acres	NM Level N	NM Level P
_____ Row Crops	☐ Core N	☐ Core P
_____ Alfalfa/Grass Hay	☐ N Rate	☐ P Rate
_____ Permanent Hay	☐ N Placement	☐ P Placement
_____ Pasture	☐ N Timing	☐ P Timing

Precision Feed Management (For the lactating part of the herd) ☐ Field Verified ☐ ☐

Implementation Date ___ / ___ / _____

Number of Animals Meeting N _____ Number of Animals Meeting P _____

Tillage Practices ☐ Field Verified ☐ ☐

Implementation Date ___ / ___ / _____

	Acres
Low Residue, Strip-Till/No-Till (15-29% cover & <40% soil disturbance)	_____
Conservation Tillage (30-59% cover)	_____
High Residue, min. disturbance (>60% cover)	_____

Notes _____

Multi-Year Practices (Additional)	Inspection Result (✔ PASS or FAIL)	Cost Shared? (✔ if yes)	NRCS Standard? (✔ if yes)
Agricultural Tree Planting #2 Implementation Date ___ / ___ / _____ Acres Planted _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Barnyard & Runoff Management #2 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Barnyard & Runoff Management #3 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Cropland Forest Buffer #2 Implementation Date ___ / ___ / _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Cropland Grass Buffer #2 Implementation Date ___ / ___ / _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Exclusion Fence with Forest Buffer #2 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Exclusion Fence with Grass Buffer #3 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Exclusion Fence with Grass Buffer #2 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Exclusion Fence with Grass Buffer #3 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Manure Storage Facility #2 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ ☐ Covered	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Manure Storage Facility #3 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ ☐ Covered	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Pasture Alternative Watering #2 Implementation Date ___ / ___ / _____ Acres served by watering facility _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Stream Exclusion Fencing #2 Implementation Date ___ / ___ / _____ Length Fenced (Feet) _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐

Notes

Annual BMP Questionnaire

Farm Name _____ **AEM ID** _____

Technician Name _____ **Date Completed** _____

Cover Crops

1. Does the operation plant cover crops? **Yes** ☐ **No** ☐
2. What type of cover crop was planted? _____
3. What was the planting method used? _____
4. Was manure applied to the cover crops? **Yes** ☐ **No** ☐
   (check for timing of manure application) Spring ☐ Fall/Winter ☐
5. Were the cover crops plowed under or killed? If so, which one? **Yes** ☐ **No** ☐ _____
6. How many acres of cover crops were planted? _____
7. What was the planting date? _____

Manure Incorporation

1. Does the operation apply manure? **Yes** ☐ **No** ☐
2. Does the operation incorporate their manure? **Yes** ☐ **No** ☐
3. How soon after application, does the operation incorporate? _____
4. What type of application method is used? _____
5. After incorporation, what % crop residue is left on the ground at the time of planting? _____
6. Does the operation inject liquid manure? _____
7. After injection, what % crop residue is left on the ground at the time of planting? _____

Nutrient Management

Total Acres: Row Crops_____ Alfalfa/Grass Hay_____ Permanent Hay_____ Pasture_____

Nitrogen Core

1. Is nitrogen applied according to Cornell recommendations? **Yes** ☐ **No** ☐
2. Is manure analysis used (book or test value)? **Yes** ☐ **No** ☐
3. Is the manure spreader calibrated to apply at the correct rates? **Yes** ☐ **No** ☐
4. Does the operation have yield estimates and a cropping plan? **Yes** ☐ **No** ☐
5. Does the operation have cropping and manure history records? **Yes** ☐ **No** ☐

Phosphorus Core

1. Is phosphorus applied according to Cornell recommendations? **Yes** ☐ **No** ☐
2. Does the operation have P soil tests? **Yes** ☐ **No** ☐
3. Is manure analysis used (book or test value)? **Yes** ☐ **No** ☐
4. Is the manure spreader calibrated to apply at the correct rates? **Yes** ☐ **No** ☐
5. Does the operation have yield estimates and a cropping plan? **Yes** ☐ **No** ☐
6. Does the operation have cropping and manure history records? **Yes** ☐ **No** ☐

Annual BMP Questionnaire

Nitrogen Supplemental BMPs

PSNT	Manure Analysis < 1 yr. old	On-farm replicated research	CSNT
Yield Mapping	ISNT	On-farm strip trials	N-loss risk assessments & models – Denitrification losses
In-season sensors/remote sensing in general	Geo-spatial mapping	N-loss risk assessment & models – Ammonia Loss	Whole farm balances

Have any of the below practices been used/implemented due to using one of the above tools.

N Rate Adjustment

1. Is the operation applying nutrients at a rate less than Cornell University recommendations? **Yes** ☐ **No** ☐
2. Is the operation applying nutrients using split N application? **Yes** ☐ **No** ☐
3. Is the operation applying nutrients at a variable N application rate? **Yes** ☐ **No** ☐

N Placement Adjustment

1. Is the operation using subsurface injection or incorporation of applied N? **Yes** ☐ **No** ☐
2. Is the operation implementing N application setbacks from water? **Yes** ☐ **No** ☐

N Timing Adjustment

1. Is the operation applying nutrients using split N applications? **Yes** ☐ **No** ☐

Phosphorus Supplemental BMPs

Soil test P remediation/declining	Soil Tests < 1 yr old	P Index assessment	Grid soil sampling
Manure analysis < 1 yr. old	On-farm replicated research	Yield Mapping	On-farm strip trials
Whole farm balances	Geo-spatial mapping		

Have any of the below practices been used/implemented due to using one of the above tools.

P Rate Adjustment

1. Is the operation applying nutrients at a rate less than Cornell recommendations? **Yes** ☐ **No** ☐
2. Is the operation applying P manure rates based on annual crop removal **Yes** ☐ **No** ☐
3. Is the operation applying nutrients at a variable P application rate? **Yes** ☐ **No** ☐

P Placement Adjustment

1. Is the operation using subsurface injection or incorporation of applied N? **Yes** ☐ **No** ☐
2. Is the operation implementing P application setbacks from water? **Yes** ☐ **No** ☐

P Timing Adjustment

1. Is the operation applying nutrients using split P applications? **Yes** ☐ **No** ☐
2. Is the operation applying P during lower P-loss risk season? **Yes** ☐ **No** ☐

Annual BMP Questionnaire

Dairy Precision Feed Management

1. Is the herd engaged in NYS Precision Feed Management? (If yes, answer 2-8) **Yes**☐ **No**☐
2. MUN - Milk Urea Nitrogen number (date and results of last 4 MUN)
   Date_____ Date_____ Date_____ Date_____
   MUN_____ MUN_____ MUN_____ MUN_____
3. Phosphorus % in feed Ration _____
   Name of Nutritionist_____Phone number_____
4. Number of milking cows going into the tank (just cow being milked no dry cows) _____
5. Amount of milk recently shipped? _____(once-a-day or every-other-day pick-up)
6. Breed of cow and %(i.e. Holstein 100% OR Holstein 80%, Jersey 20%, etc.)_____
7. Does the operation meet the recommended range and ration of nitrogen for any given portion of the herd?
   Yes☐ **No**☐
   If yes, how many animals?
   _____
8. Does the operation meet the recommended range and ration of phosphorus for any given portion of the herd?
   Yes☐ **No**☐
   If yes, how many animals?
   _____

Tillage Practices

Indicate which type of tillage was used:

Yes☐ **No**☐ 1. Conventional/High Till (less than 15% cover OR 15-29% cover with full width tillage)
Yes☐ **No**☐ 2. Low residue, strip till/no till (15-29% cover, strip-till or no-till, and less than 40% soil disturbance)
Yes☐ **No**☐ 3. Conservation Tillage (30-59% cover)
Yes☐ **No**☐ 4. High residue, minimum soil disturbance tillage (more than 60% cover, minimum disturbance)

How many acres? _____

Multi-Year BMP's

Check all that exist on the operation

Yes☐ **No**☐ Ag. Land Retirement
Yes☐ **No**☐ Ag. Tree Planting
Yes☐ **No**☐ Barnyard & Runoff Management
Yes☐ **No**☐ Cropland Forest Buffer
Yes☐ **No**☐ Cropland Grass Buffer
Yes☐ **No**☐ Exclusion Fence w/ Forest Buffer
Yes☐ **No**☐ Exclusion Fence w/ Grass Buffer
Yes☐ **No**☐ Horse Pasture Management
Yes☐ **No**☐ Manure Storage Facility
Yes☐ **No**☐ Milk House Waste System
Yes☐ **No**☐ Pasture Alternative Watering
Yes☐ **No**☐ Prescribed Grazing
Yes☐ **No**☐ Silage Leachate System
Yes☐ **No**☐ Soil Conservation Plan
Yes☐ **No**☐ Stream Exclusion Fence

Annual BMP Questionnaire

Do any of the multi-year practices currently have a need for maintenance? **Yes** ☐ **No** ☐

Are there any changes to any of the multi-year practices from previous years? **Yes** ☐ **No** ☐

Notes

For questions regarding BMP Data Entry and/or Verification, contact:

Emily Dekar – USC Ag. Coordinator

dekare@co.tioga.ny.us

(607)972-2346

BMP Name	USC Database Table	NEIEN BMP Name	USC Database Column Name	Scenario Builder BMP	Default Scenario Builder Land Use	Land Use Class Code	Land Use Code	Measurement Name	Unit Name	Unit Code	Prior or Existing Land Use	New Land Use	Width Condition Minimum	Width Condition Maximum
Nutrient Management P Timing - Grass Hay	BMP_NutrientManagementPlans	Nutrient Management P Timing	CombinedAPPTiming	nmtimep	HayAl	NEIENSB	HayAl	Acres	ACRE	ACRE	HayAl			
Conservation Tillage	BMP_TillagePractices	Conservation Tillage	AcresConservationTillage	ConserveTill	ROW			Total Acres	ACRE	ACRE				
Exclusion Fence with Grass Buffer	BMP_ExclusionFenceGrassBuffer	Exclusion Fence with Grass Buffer	Acres	GrassBuffExcl	Pasture			Acres	ACRE	ACRE			35	2147483647
Exclusion Fence with Forest Buffer	BMP_ExclusionFenceForestBuffer	Exclusion Fence with Forest Buffer	Acres	ForestBuffExcl	Pasture			Acres	ACRE	ACRE			35	2147483647
Exclusion Fence with Narrow Grass Buffer	BMP_ExclusionFenceGrassBuffer	Exclusion Fence with Narrow Grass Buffer	Acres	GrassBuffExclNar	Pasture			Acres	ACRE	ACRE			0	35
Exclusion Fence with Narrow Forest Buffer	BMP_ExclusionFenceForestBuffer	Exclusion Fence with Narrow Forest Buffer	Acres	ForestBuffExclNar	Pasture			Acres	ACRE	ACRE			0	35
Cropland Grass Buffer	BMP_CropLandGrassBuffer	Grass Buffers	Acres	GrassBuffers	CropHay			Acres	ACRE	ACRE			35	2147483647
Cropland Narrow Grass Buffer	BMP_CropLandGrassBuffer	Narrow Grass Buffers	Acres	grassbuffnarrow	CropHay			Acres	ACRE	ACRE			0	35
Cropland Forest Buffer	BMP_CropLandForestBuffer	Riparian Forest Buffer	Acres	ForestBuffers	CropHay			Acres	ACRE	ACRE			35	2147483647
Cropland Narrow Forest Buffer	BMP_CropLandForestBuffer	Narrow Forest Buffers	Acres	forestbuffnarrow	CropHay			Acres	ACRE	ACRE			0	35
Wetland Enhancement (Crop)	BMP_Wetlands	Wetland Functional Gains - Enhanced	WE-C	WetlandEnhance	Wetland			Non-Tidal Emergent Area	ACRE	ACRE				
Wetland Enhancement (Hay)	BMP_Wetlands	Wetland Functional Gains - Enhanced	WE-H	WetlandEnhance	Wetland			Non-Tidal Emergent Area	ACRE	ACRE				
Wetland Enhancement (Pasture)	BMP_Wetlands	Wetland Functional Gains - Enhanced	WE-P	WetlandEnhance	Wetland			Non-Tidal Emergent Area	ACRE	ACRE				
Wetland Enhancement (Forest)	BMP_Wetlands	Wetland Functional Gains - Enhanced	WE-F	WetlandEnhance	Wetland			Non-Tidal Emergent Area	ACRE	ACRE				
Wetland Restoration (Crop)	BMP_Wetlands	Wetland Gains - Reestablished	WR-C	WetlandRestoreFloodplain	AG	NLCD01	82	Non-Tidal Emergent Area	ACRE	ACRE	82			
Wetland Restoration (Hay)	BMP_Wetlands	Wetland Gains - Reestablished	WR-H	WetlandRestoreFloodplain	AG	NEIENSB	HayAl	Non-Tidal Emergent Area	ACRE	ACRE	HayAl			
Wetland Restoration (Pasture)	BMP_Wetlands	Wetland Gains - Reestablished	WR-P	WetlandRestoreFloodplain	AG	NEIENSB	Past	Non-Tidal Emergent Area	ACRE	ACRE	Past			
Wetland Restoration (Forest)	BMP_Wetlands	Wetland Restoration	WE-F	WetlandRestoreFloodplain	AG	NLCD01	41	Acre	ACRE	ACRE	41			
Nutrient Management Core N - Row Crops	BMP_NutrientManagementPlans	Nutrient Management Core N	RowCropsCoreN	nmcoren	ROW	NLCD01	82	Acres	ACRE	ACRE	ROW			
Nutrient Management P Placement - Row Crops	BMP_NutrientManagementPlans	Nutrient Management P Placement	RowCropsPPlacement	nmplacep	ROW	NLCD01	82	Acres	ACRE	ACRE	ROW			
Nutrient Management N Rate - Row Crops	BMP_NutrientManagementPlans	Nutrient Management N Rate	RowCropsNRate	nmraten	ROW	NLCD01	82	Acres	ACRE	ACRE	ROW			
Nutrient Management P Rate - Row Crops	BMP_NutrientManagementPlans	Nutrient Management P Rate	RowCropsPRate	nmratep	ROW	NLCD01	82	Acres	ACRE	ACRE	ROW			
Nutrient Management N Timing - Row Crops	BMP_NutrientManagementPlans	Nutrient Management N Timing	RowCropsNTiming	nmtimen	ROW	NLCD01	82	Acres	ACRE	ACRE	ROW			
Nutrient Management P Timing - Row Crops	BMP_NutrientManagementPlans	Nutrient Management P Timing	RowCropsPTiming	nmtimep	ROW	NLCD01	82	Acres	ACRE	ACRE	ROW			
Nutrient Management Core N - Pasture	BMP_NutrientManagementPlans	Nutrient Management Core N	PastureCoreN	nmcoren	Pasture	NEIENSB	Past	Acres	ACRE	ACRE	Pasture			
Nutrient Management Core P - Pasture	BMP_NutrientManagementPlans	Nutrient Management Core P	PastureCoreP	nmcorep	Pasture	NEIENSB	Past	Acres	ACRE	ACRE	Pasture			
Nutrient Management N Placement - Pasture	BMP_NutrientManagementPlans	Nutrient Management N Placement	PastureNPlacement	nmplacen	Pasture	NEIENSB	Past	Acres	ACRE	ACRE	Pasture			
Nutrient Management P Placement - Pasture	BMP_NutrientManagementPlans	Nutrient Management P Placement	PasturePPlacement	nmplacep	Pasture	NEIENSB	Past	Acres	ACRE	ACRE	Pasture			
Nutrient Management N Rate - Pasture	BMP_NutrientManagementPlans	Nutrient Management N Rate	PastureNRate	nmraten	Pasture	NEIENSB	Past	Acres	ACRE	ACRE	Pasture			
Nutrient Management N Placement - Row Crops	BMP_NutrientManagementPlans	Nutrient Management N Placement	RowCropsNPlacement	nmplacen	ROW	NLCD01	82	Acres	ACRE	ACRE	ROW			
Nutrient Management Core P - Row Crops	BMP_NutrientManagementPlans	Nutrient Management Core P	RowCropsCoreP	nmcorep	ROW	NLCD01	82	Acres	ACRE	ACRE	ROW			
Nutrient Management P Rate - Pasture	BMP_NutrientManagementPlans	Nutrient Management P Rate	PasturePRate	nmratep	Pasture	NEIENSB	Past	Acres	ACRE	ACRE	Pasture			
Nutrient Management N Timing - Pasture	BMP_NutrientManagementPlans	Nutrient Management N Timing	PastureNTiming	nmtimen	Pasture	NEIENSB	Past	Acres	ACRE	ACRE	Pasture			
Nutrient Management P Timing - Pasture	BMP_NutrientManagementPlans	Nutrient Management P Timing	PasturePTiming	nmtimep	Pasture	NEIENSB	Past	Acres	ACRE	ACRE	Pasture			
Soil Conservation Plans	BMP_SoilConservationPlans	Conservation Plans	Acres	ConPlan	AG			Acres	ACRE	ACRE				
Prescribed Grazing	BMP_PrescribedGrazing	Prescribed Grazing	Acres	PrecRotGrazing	PASTURE			Acres	ACRE	ACRE				
Precision Feed Management	BMP_PrecisionFeedManagementDairy	Feed Management	AnimalUnitN	DairyPrecFeed	dairy			AU	COUNT	AU				
Horse Pasture Management	BMP_HorsePastureManagement	Horse Pasture Management	Acres	HorsePasMan	PASTURE			Acres	ACRE	ACRE				
Manure Storage System	BMP_ManureStorageFacility	Waste Storage Facility	AnimalUnitDairyCows	AWMS	dairy			DAIRY_AU	COUNT	AU				
Manure Storage System	BMP_ManureStorageFacility	Waste Storage Facility	AnimalUnitBeefCows	AWMS	beef			BEEF_AU	COUNT	AU				
Manure Storage System	BMP_ManureStorageFacility	Waste Storage Facility	AnimalUnitOtherCattle	AWMS	Livestock			OTHER_AU	COUNT	AU				
Manure Storage System	BMP_ManureStorageFacility	Waste Storage Facility	AnimalUnitHorses	AWMS	horses			HORSE_AU	COUNT	AU				
Manure Storage System	BMP_ManureStorageFacility	Waste Storage Facility	AnimalUnitSheepsAndGoats	AWMS	sheep and lambs			SHEEP_AU	COUNT	AU				
Manure Storage System	BMP_ManureStorageFacility	Waste Storage Facility	AnimalUnitPigs	AWMS	Swine			SWINE_AU	COUNT	AU				
Manure Storage System	BMP_ManureStorageFacility	Waste Storage Facility	AnimalUnitChickens	AWMS	Poultry			POULTRY_AU	COUNT	AU				
Manure Storage System	BMP_ManureStorageFacility	Waste Storage Facility	AnimalUnitTurkeys	AWMS	pullets			TURKEY_AU	COUNT	AU				
Silage Leachate System	BMP_SilageLeachateSystem	Waste Treatment - Dairy	AWMS_SystemCount	AWMS	dairy			Systems	COUNT	COUNT				
Milkhouse Waste System	BMP_MilkHouseWasteSystem	Waste Treatment - Dairy	AWMS_SystemCount	AWMS	dairy			Systems	COUNT	COUNT				
Barnyard Runoff Control System	BMP_BarnyardAndRunoffManagement	Barnyard Runoff Controls	AnimalNoDairyCows	BarnRunoffCont	Feed			Dairy Animals	COUNT	COUNT				
Barnyard Runoff Control System	BMP_BarnyardAndRunoffManagement	Barnyard Runoff Controls	AnimalNoBeefCows	BarnRunoffCont	Feed			beef	COUNT	COUNT				
Barnyard Runoff Control System	BMP_BarnyardAndRunoffManagement	Barnyard Runoff Controls	AnimalNoOtherCattle	BarnRunoffCont	Feed			other cattle	COUNT	COUNT				
Barnyard Runoff Control System	BMP_BarnyardAndRunoffManagement	Barnyard Runoff Controls	AnimalNoHorses	BarnRunoffCont	Feed			horses	COUNT	COUNT				
Barnyard Runoff Control System	BMP_BarnyardAndRunoffManagement	Barnyard Runoff Controls	AnimalNoSheepsAndGoats	BarnRunoffCont	Feed			sheep and lambs	COUNT	COUNT				
Barnyard Runoff Control System	BMP_BarnyardAndRunoffManagement	Barnyard Runoff Controls	AnimalNoPigs	BarnRunoffCont	Feed			Swine	COUNT	COUNT				
Barnyard Runoff Control System	BMP_BarnyardAndRunoffManagement	Barnyard Runoff Controls	AnimalNoChickens	BarnRunoffCont	Feed			Poultry	COUNT	COUNT				
Barnyard Runoff Control System	BMP_BarnyardAndRunoffManagement	Barnyard Runoff Controls	AnimalNoTurkeys	BarnRunoffCont	Feed			turkeys	COUNT	COUNT				
Urban Narrow Stream Buffers	BMP_UrbanBuffer	Narrow Urban Forest Buffer	Acres	UrbanTreePlant	Turfgrass			Acres	ACRE	ACRE			0	35
Urban Stream Buffers	BMP_UrbanBuffer	Urban Forest Buffer	Acres	ForestBufUrban	Turfgrass			Acres	ACRE	ACRE			35	2147483647
Stream Restoration	BMP_StreamRestoration	Stream Channel Stabilization	Length	NonUrbStrmRest	StreamBedAndBank			Length	FEET	FEET				
Nutrient Management Core N - Grass Hay	BMP_NutrientManagementPlans	Nutrient Management Core N	CombinedAPCoreN	nmcoren	HayAl	NEIENSB	HayAl	Acres	ACRE	ACRE	HayAl			
Nutrient Management Core P - Grass Hay	BMP_NutrientManagementPlans	Nutrient Management Core P	CombinedAPCoreP	nmcorep	HayAl	NEIENSB	HayAl	Acres	ACRE	ACRE	HayAl			
Nutrient Management N Placement - Grass Hay	BMP_NutrientManagementPlans	Nutrient Management N Placement	CombinedAPNPlacement	nmplacen	HayAl	NEIENSB	HayAl	Acres	ACRE	ACRE	HayAl			
Nutrient Management P Placement - Grass Hay	BMP_NutrientManagementPlans	Nutrient Management P Placement	CombinedAPPPlacement	nmplacep	HayAl	NEIENSB	HayAl	Acres	ACRE	ACRE	HayAl			
Nutrient Management N Rate - Grass Hay	BMP_NutrientManagementPlans	Nutrient Management N Rate	CombinedAPNRate	nmraten	HayAl	NEIENSB	HayAl	Acres	ACRE	ACRE	HayAl			
Nutrient Management P Rate - Grass Hay	BMP_NutrientManagementPlans	Nutrient Management P Rate	CombinedAPPRate	nmratep	HayAl	NEIENSB	HayAl	Acres	ACRE	ACRE	HayAl			
Nutrient Management N Timing - Grass Hay	BMP_NutrientManagementPlans	Nutrient Management N Timing	CombinedAPNTiming	nmtimen	HayAl	NEIENSB	HayAl	Acres	ACRE	ACRE	HayAl			
Conservation Tillage	BMP_TillagePractices	Reduced Tillage	AcresLowResidue	ConserveTill	ROW			Acres	ACRE	ACRE				
Conservation Tillage	BMP_TillagePractices	High Residue Tillage Management	AcresHighResidue	ConserveTill	ROW			Acres	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CCC-DB	CoverCropComNormal	SmallGrainsAndDoubleCrops	SmallGrainsAndDoubleCrops	8	Commodity Cover Crop Standard Drilled Barley	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CCC-DR	CoverCropComNormal	SmallGrainsAndDoubleCrops	SmallGrainsAndDoubleCrops	8	Commodity Cover Crop Standard Drilled Rye	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CCC-DW	CoverCropComNormal	SmallGrainsAndDoubleCrops	SmallGrainsAndDoubleCrops	8	Commodity Cover Crop Standard Drilled Wheat	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CCC-OB	CoverCropComNormal	SmallGrainsAndDoubleCrops	SmallGrainsAndDoubleCrops	8	Commodity Cover Crop Standard Other Barley	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CCC-OR	CoverCropComNormal	SmallGrainsAndDoubleCrops	SmallGrainsAndDoubleCrops	8	Commodity Cover Crop Standard Other Rye	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CCC-OW	CoverCropComNormal	SmallGrainsAndDoubleCrops	SmallGrainsAndDoubleCrops	8	Commodity Cover Crop Standard Other Wheat	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-DB	CoverCropTradBND	ROW	82	7	Cover Crop Standard Drilled Barley	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-DR	CoverCropTradRND	ROW	82	7	Cover Crop Standard Drilled Rye	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-DW	CoverCropTradWND	ROW	82	7	Cover Crop Standard Drilled Wheat	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-OB	CoverCropTradBNO	ROW	82	7	Cover Crop Standard Other Barley	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-OR	CoverCropTradRNO	ROW	82	7	Cover Crop Standard Other Rye	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-OW	CoverCropTradWNO	ROW	82	7	Cover Crop Standard Other Wheat	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-DBM	CoverCropTradNutBND	ROW	82	7	Traditional with Fall Nutrients Barley Normal Drilled	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-OBM	CoverCropTradNutBNO	ROW	82	7	Traditional with Fall Nutrients Barley Normal Other	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-DRM	CoverCropTradNutRND	ROW	82	7	Traditional with Fall Nutrients Rye Normal Drilled	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-ORM	CoverCropTradNutRNO	ROW	82	7	Traditional with Fall Nutrients Rye Normal Other	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-DTM	CoverCropTradNutTND	ROW	82	7	Traditional with Fall Nutrients Triticale Normal Drilled	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-OTM	CoverCropTradNutTNO	ROW	82	7	Traditional with Fall Nutrients Triticale Normal Other	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-DWM	CoverCropTradNutWND	ROW	82	7	Traditional with Fall Nutrients Wheat Normal Drilled	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-OWM	CoverCropTradNutWNO	ROW	82	7	Traditional with Fall Nutrients Wheat Normal Other	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CCC-OT	CoverCropComNormal	ROW	82	7	TRITICALE Normal BROADCAST Commodity	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CCC-DT	CoverCropComNormal	ROW	82	7	TRITICALE Normal CONVENTIONAL Commodity	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-DT	CoverCropTradTND	ROW	82	7	Triticale Standard Drilled	ACRE	ACRE				
Cover Crops	BMP_CoverCrops	Cover Crops	CC-OT	CoverCropTradTNO	ROW	82	7	Triticale Standard Other	ACRE	ACRE				
Land Retirement	BMP_AgLandRetirement	Land Retirement	AcresConvertedToHayOrOpenSpaceAcresWithoutNutrients	LandRetireOpen	ROW	7	82	Area Retired to hay without nutrients	ACRE	ACRE				
Land Retirement	BMP_AgLandRetirement	Alternative Crops	AcresConvertedToHayWithNutrients	CarSeqAltCrop	ROW	7	82	AC	ACRE	ACRE				
Land Retirement	BMP_AgLandRetirement	Land Retirement	AcresConvertedToPasture	LandRetirePas	ROW	7	82	Area Retired to pasture	ACRE	ACRE				
Livestock Stream Exclusion	BMP_StreamExclusion	Exclusion Fence with Narrow Grass Buffer	Length	GrassBuffExclNar	Pasture	8	Past	Length Fenced	FEET					
Pasture Alternative Watering	BMP_PastureAlternativeWatering	Watering Facility	Acres	OSWnoFence	Pasture	8	Past	Area served by Facility	ACRE					
Manure Incorporation	BMP_ManureIncorporation	Manure Incorporation High Disturbance	AcresHighDisturbanceIncorporation	incorphighlate	RowWithManure	8	ROWMAN	Acres	ACRE					
Manure Incorporation	BMP_ManureIncorporation	Manure Incorporation Low Disturbance	AcresLowDisturbanceIncorporation	incorphighlate	RowWithManure	8	ROWMAN	Acres	ACRE					
Manure Incorporation	BMP_ManureIncorporation	Manure Injection	AcresLiquidManureInjection	injection	RowWithManure	8	ROWMAN	Acres	ACRE					
Ag Tree Planting	BMP_AgTreePlanting	Tree Planting	Acres	TreePlant	AG	8	Agric	ac	ACRE	ACRE				

AGRICULTURAL ENVIRONMENTAL MANAGEMENT

Tier 1 *AEM Identification Number:*

_____ County SWCD Date: ____/____/____

Evaluator Name:	Evaluating Agency:
Watershed Identification:	
Farm Name:	
Owner's Name:	Operator's Name:
Address:	Address:
Phone: Fax:	Phone: Fax:
Email:	Email:

Preferred Contact Point? (please check only one)
☐ Owner ☐ Operator

1) **Future Status of the Farm**

A) Do you anticipate any major modifications on your farm within the next 5 years? ☐ **Yes** ☐ **No**

If yes, please check the condition(s) that best describes the modification(s):

☐ Business Structure ☐ Expansion ☐ Retirement
☐ Operation Type ☐ Diversification of Farm Business ☐ Sale of Farm

B) Do you plan to subdivide any portion of your farm in the next 5 years? ☐ **Yes** ☐ **No**

2) **Basic Farm Information**

A) What **Primary** Farm Enterprise best describes your operation?

☐ Dairy ☐ Beef ☐ Horses ☐ Fruit/Vegetables
☐ Poultry ☐ Swine ☐ Vineyard ☐ Greenhouse
☐ Cash Crop: (**Please Define**) _____ ☐ Sheep/Goats
☐ Other: (**Please Define**) _____

B) Please indicate the following number of acres:

	Owned	**Rented**
Cropland Acres		
Grazed Land Acres		
Permanent Hay Land Acres		
Woodland Acres		
Total Acres	_____	_____

C) Does your operation qualify for Ag Value Assessment? ☐ **Yes** ☐ **No**

3) **Animal Numbers for your <u>Primary</u> Farm Type**

Average Weight: _____ Number: _____ Average Weight: _____ Number: _____

Average Weight: _____ Number: _____ Average Weight: _____ Number: _____

4) **Management Questions** (Please check Yes or No)

	Yes	No
Do you spread manure?	☐	☐
Do you have a manure storage facility?	☐	☐
Do you generate process washwater from the cleaning of product or facilities? (i.e. milkcenter, egg wash, washing of produce)	☐	☐
Is there a barnyard or outdoor feedlot on your farm?	☐	☐
Do you store silage or other high moisture feeds on the farm?	☐	☐
Do you utilize pastureland on your farm?	☐	☐
Do you use commercial fertilizer?	☐	☐
Do you use pesticides (herbicides, insecticides, fungicides) on your farm?	☐	☐
Do you store and/or mix pesticides (herbicides, insecticides, fungicides) on your farm?	☐	☐
Does your operation utilize cropland for row crop production?	☐	☐
Is the water supply on your farm from a well or a spring?	☐	☐
Is there a waterbody within or adjacent to your farm?	☐	☐
Do you presently or do you plan to harvest timber on your farm?	☐	☐
Do you store fuel or other bulk petroleum products on your farm?	☐	☐
Have you received odor complaints or do you believe your farm has an odor concern?	☐	☐

NYS Agricultural Interest Assessment – check all that are of interest

- ☐ Agricultural Tax Relief
- ☐ Agri-Tourism
- ☐ Air Quality
- ☐ Biofuels
- ☐ Biosecurity
- ☐ Conservation Easements
- ☐ Energy Conservation/Generation
- ☐ Environmental Management Systems
- ☐ Farmland Protection
- ☐ Feed Management
- ☐ Fisheries Habitat Management
- ☐ Forest Management/Timber Harvest
- ☐ Grasslands Farming
- ☐ Integrated Pest Management
- ☐ Irrigation Management
- ☐ Manure Treatment Options
- ☐ Neighbor-Farm Relations
- ☐ Nuisance Wildlife Control
- ☐ Organic Farming
- ☐ Pollution Credit Trading
- ☐ Right To Farm
- ☐ Stream Management
- ☐ Water Conservation/Management
- ☐ Wellhead Protection
- ☐ Wetland Conservation
- ☐ Wildlife Habitat Improvement

Would you like to receive a copy of the AEM Guide to Conservation Funding? ☐ Yes ☐ No
This document is also online at www.nys-soilandwater.org/aem/aemoutreach.html

(***OPTIONAL***)

Producer Questions & Comments:

_____

UPPER SUSQUEHANNA COALITION - CHESAPEAKE BAY PROGRAM
AGRICULTURAL ENVIRONMENTAL MANAGEMENT AG BMP DATA ENTRY SHEET

Farm Name _____ AEM ID ____ - ____

Evaluator _____ Inspection Date ___ / ___ / ____

☐ CAFO

Multi-Year Practices	Inspection Result (✔ PASS or FAIL)	Cost Shared? (✔ if yes)	NRCS Standard? (✔ if yes)
Manure Storage Facility * If multiple systems - see attached * Implementation Date ___ / ___ / ____ Animal Type _____ Animal Numbers _____ ☐ Covered	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Silage Leachate Implementation Date ___ / ___ / ____ Animal Type _____ Animal Numbers _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Milkhouse Waste Implementation Date ___ / ___ / ____ Number of Dairy Cows _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Barnyard & Runoff Management * If multiple systems - see attached * Implementation Date ___ / ___ / ____ Animal Type _____ Animal Numbers _____ ☐ Heavy Use Area ☐ Concrete ☐ Aggregate ☐ Managed Vegetation ☐ Mulch ☐ Roof Runoff Structure ☐ Diversion ☐ Stormwater Runoff Control ☐ Vegatated Treatment Area/Strip ☐ Total Confinement (after 2005) ☐ Animal Trails & Walkways	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Soil Conservation Plan Implementation Date ___ / ___ / ____ Acres _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Prescribed Grazing Implementation Date ___ / ___ / ____ Animal Type _____ Animal Numbers _____ Acres _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Exclusion Fence with Grass Buffer * If multiple buffers - see attached * Implementation Date ___ / ___ / ____ Animal Type _____ Animal Numbers _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Exclusion Fence with Forest Buffer Implementation Date ___ / ___ / ____ Animal Type _____ Animal Numbers _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Cropland Grass Buffer * If multiple buffers - see attached * Implementation Date ___ / ___ / ____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Cropland Forest Buffer * If multiple buffers - see attached * Implementation Date ___ / ___ / ____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Horse Pasture Management Implementation Date ___ / ___ / ____ Animal Numbers _____ Acres _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Agricultural Land Retirement Implementation Date ___ / ___ / ____ Acres Retired _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐

Annual Practices

	Field Verifield (✔ if yes)	Cost Shared? (✔ if yes)	NRCS Standard? (✔ if yes)

Precision Feed Management (For the lactating part of the herd)

Implementation Date ___ / ___ / _____ ☐ Field Verified

Number of Animals Meeting N _____ Number of Animals Meeting P _____

Nutrient Management Plans

Implementation Date ___ / ___ / _____ ☐ Field Verified

Landuse Type Acres	NM Level N	NM Level P
_____ Row Crops	☐ Core N	☐ Core P
_____ Alfalfa/Grass Hay	☐ N Rate	☐ P Rate
_____ Permanent Hay	☐ N Placement	☐ P Placement
_____ Pasture	☐ N Timing	☐ P Timing

Conservation Tillage

Implementation Date ___ / ___ / _____ ☐ Field Verified

	Acres
Low Residue, Strip-Till/No-Till (15-29% cover & <40% soil disturbance)	_____
Conservation Tillage (30-59% cover)	_____
High Residue, min. disturbance (>60% cover)	_____

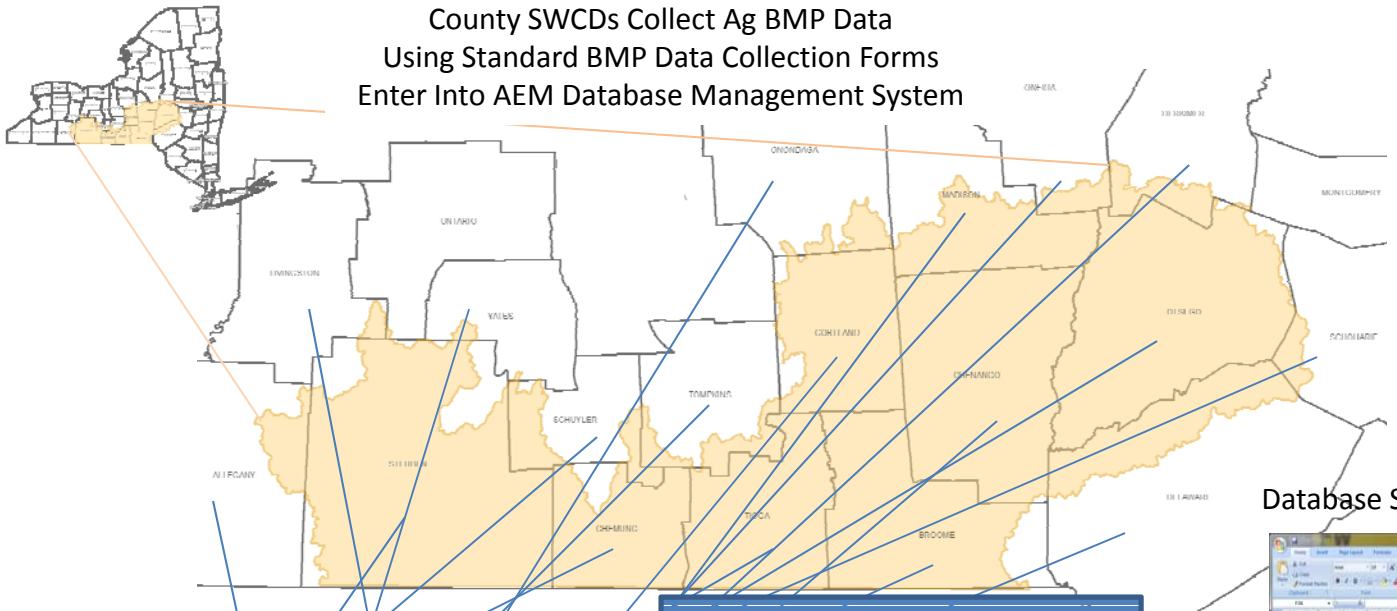
Cover Crops ☐ Field Verified

Planting Date	Cover Crop Type	Planting Method	Manure Applied	Outcome	Acres
___ / ___ / _____					
___ / ___ / _____					
___ / ___ / _____					
___ / ___ / _____					
___ / ___ / _____					
	Wheat, Rye, Barley, Tritcale or other small grain	Drilled or Other	No Manure, Fall/Winter, or Spring (after March 1)	Harvested or Plowed Under	Acres Planted

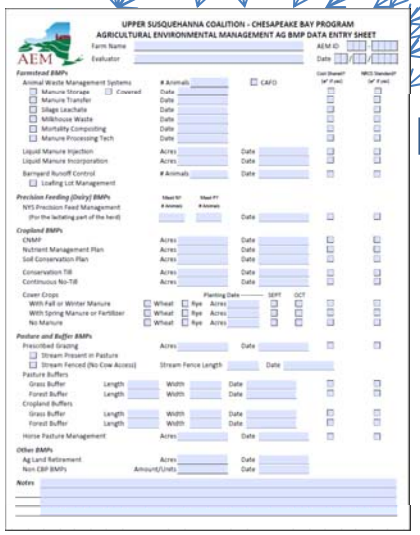
Notes _____

Multi-Year Practices (Additional)	Inspection Result (✔ PASS or FAIL)	Cost Shared? (✔ if yes)	NRCS Standard? (✔ if yes)
Manure Storage Facility #2 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ ☐ Covered	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Manure Storage Facility #3 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ ☐ Covered	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Manure Storage Facility #4 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ ☐ Covered	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Barnyard & Runoff Management #2 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Barnyard & Runoff Management #3 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Exclusion Fence with Grass Buffer #2 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Exclusion Fence with Grass Buffer #3 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Exclusion Fence with Forest Buffer #2 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Exclusion Fence with Forest Buffer #3 Implementation Date ___ / ___ / _____ Animal Type _____ Animal Numbers _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Cropland Grass Buffer #2 Implementation Date ___ / ___ / _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐
Cropland Forest Buffer #2 Implementation Date ___ / ___ / _____ Length _____ feet Width _____ feet	☐ PASS ☐ FAIL ☐ Re-Inspect	☐	☐

Notes _____

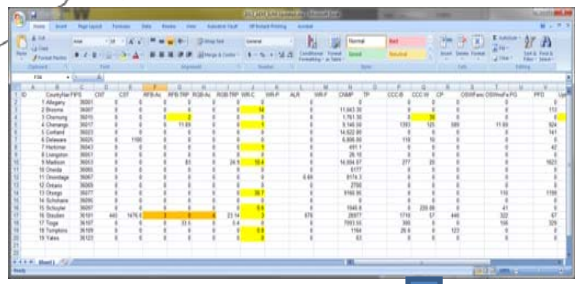


County SWCDs Collect Ag BMP Data
Using Standard BMP Data Collection Forms
Enter Into AEM Database Management System

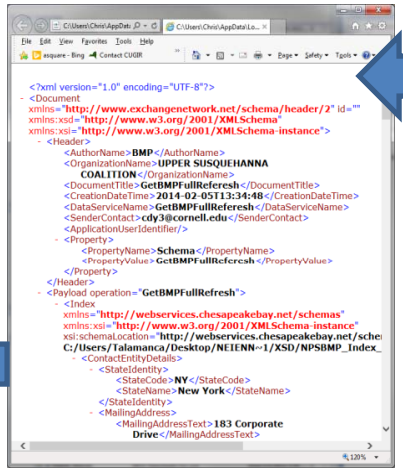


AEM Database System

Database System Aggregates BMPs by County



XML Generator Software



Individual County XMLs
Are Created Using
Bay Schema

USC sends to NYSDEC
NYSDEC uploads the XML
files to the NEIEN Node

NYS DEC

Agricultural
Environmental
Management

Tier 5B BMP Evaluation Requirements Checklist for AEM Base Program

This checklist will help determine if all required tasks and documentation have been completed for the Tier 5B Evaluation of an existing BMP system or conservation practice. Also consult "Participating in AEM Tier 5B" when completing this checklist.

Please complete the following information on the farm & BMP evaluated.

County: **Date:** **AEM YEAR:**

AEM Farm Identification Number:

12-digit HUC of the predominant watershed in which the farm is located:

Type of BMP System/conservation practice(s) evaluated:

Date of BMP installation:

ID the source of cost share for original installation (if applicable)**:** ☐ **Ag NPS** ☐ **Farm Bill** ☐ **Both**

Type or Farm: **Acres:**

Animal Units on the farm:

Please check each item addressed and documented in the plan and/or the farm's case file.

- **If an item does not apply please explain why in the notes section of this form.**

1. ☐ The NRCS Conservation Practice Standard(s), the design, and "as-built" of the conservation practice(s) to be evaluated have been found and reviewed. The design and "as-built" was signed by an individual(s) with the appropriate Job Approval Authority.

2. ☐ An on-site evaluation of the practice(s) was conducted noting the condition of the practice, the status of operation & maintenance, and if the practice is properly functioning including a check of the capacity if appropriate. You have utilized the assistance, if needed, of an individual with Job Approval Authority or a Professional Engineer.

3. ☐ Determination was made on whether or not the practice is addressing the concern for which it was installed. The "Criteria" and "Considerations" sections of the appropriate NRCS Conservation Practice Standard were utilized to help make this determination.

4. ☐ You have met with the farmer to discuss if the practice is meeting expectations, and to review operation and maintenance activities.

5. ☐ The farmer has been provided a written report on the condition of the practice that identifies any changes and/or improvements needed, and provides any additional information required to properly operate and maintain the practice. Recommendations on new or additional BMPs have been made if needed. The report was reviewed on-site.

6. ☐ The evaluation of the practice and review with the farmer has been documented in the conservation plan or case file. A copy of the report has also been filed. Accomplishments were documented in any data management system maintained by the District.

7. Comments:

Agricultural
Environmental
Management

Tier 5B Conservation Plan Evaluation Requirements Checklist for AEM Base Program

Check only ONE box per form.

3A Plan ☐ Completed Year ____

3B CNMP ☐ Completed Year ____

3C Whole Farm ☐ Completed year ____

This checklist will help determine if all required tasks and documentation have been completed for the Tier 5B Evaluation of an AEM Tier 3 Plan. Also consult "*Participating in AEM Tier 5B*" when completing this checklist.

Please complete the following information on the farm planned.

County: ____ **Date:** ____ **AEM YEAR:** ____

AEM Farm Identification Number: ____

12-digit HUC of the predominant watershed in which the farm is located: ____

Primary type of farm evaluated: ____ **Acres:** ____

Animal Units on the farm: ____

Date of the original plan: ____

Existing planned component(s): ☐Farmstead ☐Cropland ☐Nutrient Mgmt. ☐Pasture ☐Pest

Additional components planned: ☐Farmstead ☐Cropland ☐Nutrient Mgmt. ☐Pasture ☐Pest ☐NA

Additional acres planned: ____

Please check each item addressed and documented in the plan and/or the farm's case file.

- **If an item does not apply please explain why in the notes section of this form.**

1. ☐ Identify the land units planned and review the natural resource issues & opportunities, decisions, and recommendations in the plan.

2. ☐ Meet with the farmer to review and discuss their plan noting any progress made in implementing decisions from the plan by documenting on the *Record of Decisions and Progress* form. Also, note any changes made to the farming operation that necessitate a plan update/revision. Note that AEM Tier 1 and 2 can be used to help identify changes and assess the need for additional planning.

3. ☐ Check that the existing plan covers all natural resource issues & opportunities and identify any missing high priority issues that should be progressively planned in the updated plan.

4. ☐ Discuss with the farmer the decisions/recommendations not implemented from the existing plan then update the plan to reflect any new high priority issues & opportunities, or adjustments to the timetable to implement already planned practices in the *Record of Decisions and Progress* form.

5. ☐ Plan any additional high priority issues or components the farmer is now willing to address (progressively plan). Utilize the *Participating in AEM Tier 3* document and the *Tier 3 Plan Requirements Checklist* to help guide the planning.

6. ☐ Tier 3B or C plans must be evaluated by or under the supervision of a Certified Planner.

7. ☐ Complete the update, review with the farmer and gain their approval. Note the process in the *Assistance Notes* in the farmer's case file and in any data management system maintained by the District.

8. ☐ Provide a copy of the revised plan to the farmer.

9. Comments:

Appendix 10. Wetlands Reserve Program (WRP) Monitoring Worksheet

Landowner _____ Review Date _____

Contract Number _____ Reviewer(s) _____

The purpose of easement monitoring is to ensure compliance with easement requirements, evaluate restoration progress, determine what restoration repairs or enhancements are needed to ensure maximum wetland/wildlife benefits, and to maintain contact with landowner or partner. Staff familiar with wetland restoration, management and wildlife needs should collect the information. Partner technical expertise should be provided an opportunity to participate in monitoring activities and may be authorized to conduct the monitoring reviews.

Take photograph from designated photo point when doing on-site monitoring.

Was landowner present during review? YES NO

Has landowner changed? YES NO
(If yes, review easement, contract, agreement requirements with new owner.)

Is easement boundary clearly marked and identifiable? YES NO
(If no, what actions are needed? Note - the boundary must be traversed at least once every three years.)

Are easement, contract, agreement conditions being met (e.g., no encroachment, dumping, cropping, etc.)? YES NO
(If no, describe and document with photograph.)

Is the WRPO and any Compatible Use Authorizations being followed? YES NO
(If no, describe and document with photograph.)

Are restoration practices being properly operated and maintained? YES NO
(If not, what maintenance is needed? Complete Practice & Cost Worksheet.)

Is planned hydrology present? YES NO
(If no, what actions are needed?)

Are migratory bird program objectives being achieved (e.g., adequate hydrology, nesting cover, etc.)? YES NO
(If no, what modifications are necessary? Complete Practice & Cost Worksheet.)

If Threatened or Endangered species were part of selection criteria, were habitat needs restored? YES NO
(If no, what modifications are necessary? Complete Practice & Cost Worksheet.)

WRP Monitoring Worksheet

Are planned vegetation restoration goals being achieved (e.g., is desired vegetation being established, are invasive or noxious species a problem)? YES NO
(If no, what modifications are necessary? Complete Practice & Cost Worksheet.)

Are restoration practices being properly operated and maintained? YES NO
(If no, what maintenance is needed? Complete Practice & Cost Worksheet.)

Are there opportunities to enhance wildlife habitat components? YES NO
(If yes, identify and complete Practice & Cost Worksheet.)

Does the landowner have any concerns or suggestions for improvement of the easement?

Identify concerns or suggestions from partners involved with the restoration and management of the easement, contract or agreement area.

Additional Observations or Comments:

Practice and Cost Worksheet

Practice	Practice Code	Specific Need	Number	Acres	Cost

APPENDIX 11. USC STREAM PROJECT REPORT

UPPER SUSQUEHANNA COALITION
Stream Project Report

Project Funding Source /Type: Choose an item.

County: Click here to enter text.

Project Contact Person: Click here to enter text.

Phone Contact: Click here to enter text.

Email: Click here to enter text.

Address: Click here to enter text.

Project Information:

Project Name (Landowner): Click here to enter text.

Watershed Name & 12 digit HUC: Click here to enter text.

Project Summary Description: Click here to enter text.

Project Location (Lat & Long): Click here to enter text.

Any Watershed Plans Project is Part of: Click here to enter text.

Type of Project Practices (check all that apply):

I – Stream Channel Projects:

☐ **Stream Bank Stabilization (feet & type):** Click here to enter text.

Bank Height (feet): Click here to enter text.

Annual Erosion Rate (lateral – if known – feet): Click here to enter text.

☐ **Channel Rehabilitation (feet & type & number of structures):** Click here to enter text.

☐ **Habitat Improvement (describe practices, number & type of structures & feet improved):** Click here to enter text.

☐ **Riparian Buffer Planting (type and acres, 1 or 2 sides):** Click here to enter text.

☐ **Exclusionary fencing (feet):** Click here to enter text.

☐ **Stream Crossing (number & type):** Click here to enter text.

☐ **Other Practices/BMPs:** Click here to enter text.

II – Grazing Projects:

☐ **Acres of Planned Grazing:** Click here to enter text.

☐ **Feet of Fencing Installed:** Click here to enter text.

☐ **Number & Type of Watering Systems:** Click here to enter text.

☐ **Number & Description of Stream Crossings:** Click here to enter text.

III - Project Design and Quality Assurance:

Project Designer (name & affiliation): Click here to enter text.

Certifying Project Design Engineer (name & affiliation): Click here to enter text.

Project Inspector (name & affiliation): Click here to enter text.

Project Completion Certifier (name & affiliation): Click here to enter text.

Date Completed: Click here to enter a date.

IV - Funding Source and amount:

Primary: Click here to enter text.

Secondary: Click here to enter text.

Other: Click here to enter text.

Landowner Contributions: Click here to enter text.

Total Amount: $Click here to enter text.

V - Operations & Maintenance (O&M):

Identified Party Responsible for O & M: Click here to enter text.

O & M Phone Contact: Click here to enter text.

O & M Email: Click here to enter text.

O & M Address: Click here to enter text.

O & M Timespan (start to finish): Click here to enter text.

Please attach electronic copies of a minimum of 2 before and 2 after photographs and send to:

USC BMP Definitions – Non-Agricultural Best Management Practices

Wetland Restoration

Agricultural wetland restoration activities re-establish the natural hydraulic condition in a field that existed prior to the installation of subsurface or surface drainage or in a place where no wetland exists currently. Projects may include restoration, creation and enhancement acreage. Restored wetlands may be any wetland classification including forested, scrub-shrub or emergent marsh.

Wetland work can be accomplished on most existing landuses, but is predominantly targeted to Agricultural – Cropland, Hay/Alfalfa, Pastureland and Non-production Cropland, Forest, Old Field and Other landuse categories. Because many partners are involved in wetland work, broad categories are needed to encompass all ongoing efforts. The duration of BMP effectiveness is another source of variability, but most programs have a minimum easement length of 15 years, with 30 years or permanently eased also common options. We do not track wetland work by accomplished cover type (i.e. emergent, forested, scrub shrub or other), as the different cover types do not appear to produce different model results, and simplifying data categories makes sense where possible. The two categories of wetland work we will divide projects into are:

Wetland Functional Gains – Enhancement ("enhance")

Manipulation of the physical, chemical, or biological characteristics of an existing wetland (undisturbed or degraded) site to heighten, intensify, or improve specific function(s) or for a purpose such as water quality improvement, flood water retention, or wildlife habitat. Results in gain in functional wetland acres.

Recorded in acres on various SB landuse type (CROP, PASTUREHAY, PASTURE, Grasslands/Herbaceous, FOREST)

Wetland Gains – Re-establishment and Establishment ("restore")

Manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland, and/or developing a wetland that did not previously exist on an upland or deepwater site.

Recorded in acres on various SB landuse type (CROP, PASTUREHAY, PASTURE, Grasslands/Herbaceous, FOREST)

Urban Forest Buffers

Forest buffers are linear wooded areas that help filter nutrients, sediments and other pollutants from runoff as well as remove nutrients from groundwater. The recommended buffer width is 100 feet, with a 35 feet minimum width required.

Recorded in length and width; reported in acres.

Stream Restoration (DRAFT) – The USC plans to report streams in 2018

Stream restoration is a change to the stream corridor that improves the stream ecosystem by restoring the natural hydrology and landscape of a stream, and helps improve habitat and water quality conditions in degraded streams

Recorded and reported in feet

Upper Susquehanna Coalition
Buffer Program 2017

Riparian Forest Buffer Assessment Sheet

INFORMATION FROM FILE

Site Name:
Landowner name and address:

Phone:
Email:
Location: Latitude: Longitude:
Farm Number/Tract: /
Buffer Acres:
Planting Date:
Planting Contractor/ Volunteers:
Implementing Program:
Length of Contract: NA 10 yr. 15 yr.
Year Contract Expires:
Herbicide Application's (PPA) after Planting Year? Yes No
How Many PPA's?

Attach copy of Plan Map, Soil Map, and Species List of Planting

SITE ASSESSMENT
Date: Reviewer (s):

Survival percentage of planted trees:
Survival percentage of shrubs:
Noxious or Invasive Plants present:
Planted Species that are thriving:
Planted Species that are missing:

Upland areas survival percentage:
Low/wetland areas survival percentage:

Natural Regeneration of woody growth
Percent of overall growth:
Species Present:

Herbaceous community - (golden rod, reed canary or other grasses, etc.):

Does it appear as though LO maintenance is being performed? Yes No
Shelter maintenance needed? Yes No
Shelter removal needed? Yes No

Upper Susquehanna Coalition
Buffer Program 2017

Note any pests/diseases:
General site conditions, weed competition, invasive notes, streambank concerns:

Attach photos of site

Need for additional supplies?

	Trees		How Many?
	Shrubs		How Many?
	Shelters		How Many?
	Stakes		How Many?
	Zipties		How Many?

Buffer maintenance summary, cost estimate, and map (if necessary):

INFORMATION FROM LANDOWNER INTERVIEW

Benefits of your Buffer:
Challenges you've had with your Buffer:
Limitations/Barriers:

Likely to reenroll, if CREP? Yes No
If "no", why not?

Addtitional Follow up Needed:

SUPPLEMENTAL PRACTICE MAINTENANCE NEEDS
List of BMPs installed to support buffer implementation (if any)

BMP name/#	Date Installed	Program(s) utilized for installation	Description of maintenance needs

USC Riparian Forest Buffer Monitoring Protocol
For use on riparian forest planting projects any year after planting.
Developed April, 2017

1) Upon completion of a planting project, delineate the accurate boundaries of the actual planted project area using GPS points. Create an ArcMap shapefile polygon of the planted area. Final modification of your planting plan should accurately reflect what species of plants were installed in each location. You may also want to establish an inflection point within the buffer to ease monitoring. GPS that point if possible.

In Office:

2) Calculate the total area of the planted polygon in acres.
3) Determine the appropriate sampling intensity for your site.

Buffer Area	Target area to be monitored
Less than 1 acre	100%
1-5 acres	10%
> 5 acres	5-10%

4) Determine the length and location of transect(s) to be cruised. From the planted buffer area and transect length, determine the width of transect(s) to be assessed to achieve targeted monitoring area.

5) Determine locations of inflection points to be used.

6) Record all of this information on a map to be brought to the field.

In Field:

Bring along an accurate planting plan, transect map, tape measure, compass, data recording sheet, and camera.

7) Use GPS, maps, and/or compass to located transect inflection points in the field.

8) When possible, create a long-term monument at your plot center points. This will be critical for re-locating transect inflection points in the future, if that is what is desired.

9) Record data on data collection sheet ("Riparian Forest Buffer Assessment Sheet"):

10) Take pictures as needed.

A guide to

Non-Urban Stream Restoration

Eligibility & Data Tracking

Stream restoration is a carefully designed intervention to improve the hydrologic, hydraulic, geomorphic, water quality and biological condition of degraded streams, and must not be implemented for the sole purpose of nutrient and sediment reduction.

Natural Channel Design applies the principles of stream geomorphology to maintain a state of dynamic equilibrium among water, sediment and vegetation that creates a stable channel.

Regenerative Stream Channel (RSC or Regenerative Stormwater Conveyance) uses in-stream weirs in perennial streams to increase the interaction with the floodplain during smaller storm events. These projects may also include sand seepage, wetlands and other habitats to increase the stream's connection with its floodplain. Only wet channel RSC practices are eligible as stream restoration projects. Dry channel RSC projects are considered a runoff reduction retrofit practice which is not applicable to agricultural load sources.

Legacy Sediment Removal seeks to remove legacy sediments from the stream and its floodplain and thereby restore the natural potential of aquatic resources including a combination of streams, floodplains and wetlands.

Specifications or Key Qualifying Conditions:

1. Reach restored must be greater than 100ft in length.
2. Reach restored must be actively enlarging or degrading.
3. Reach restored MAY NOT be tidally influenced.
4. The project MAY NOT be primarily designed to protect public infrastructure. Bank armoring and rip rap are not eligible for stream restoration credit.
5. Restoration plan must utilize a comprehensive approach to stream restoration design, addressing long-term sustainability of the channel, banks, and floodplain.
6. Must comply with all state and federal permitting requirements, including 404 and 401 permits.