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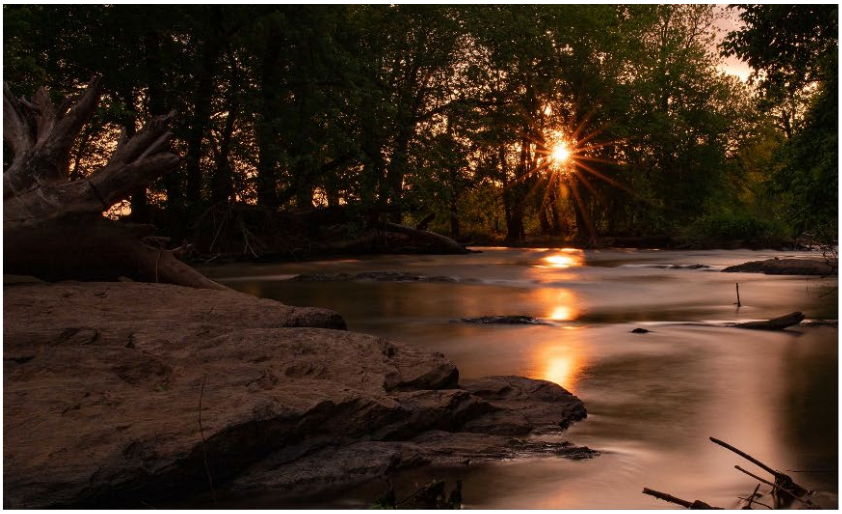
Note: This approval action represents EPA's determination that the document(s) under review comply with applicable requirements of the EPA Region 3 Quality Management Plan [https://www.epa.gov/sites/production/files/2020-06/documents/r3qmp-final-r3-signatures-2020.pdf] and other applicable requirements in EPA quality regulations and policies [https://www.epa.gov/quality]. This approval action does **not** represent EPA's verification of the accuracy or completeness of document(s) under review, and is **not** intended to constitute EPA direction of work by contractors, grantees or subgrantees, or other non-EPA parties.

Revision History

This table shows changes to this controlled document over time. The most recent version is presented in the top row of the table. Previous versions of the document are maintained by Quality Manager.

Document Control Number	History/ Changes	Effective Date
DCN 220078	Updated to the new EPA Heading and Signature page, Dairy Precision Feeding BMP documentation, reattached Appendix A, and included Data Source providers table in the Table of Contents	1.30.23

Maryland's Best Management Practice Verification Protocols





Revised Summer 2023[1]

[1] Photo credits from top left clockwise: "Sunset at Violet's Lock", Tammy Stump | "Baltimore City from Federal Hill", Leon Brown | "Darlene", Carol Ward | "Pride of Baltimore in Annapolis", Kim Kelly | "Maryland Countryside", Erika Forsythe. Source: Maryland Department of Natural Resources Photo Contest on Flickr

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List of Abbreviations

AFAR(s)	Annual Fertilizer Application Report(s)
AIR(s)	Nutrient Management Annual Implementation Report(s)
BAT	Best Available Technology
BMP(s)	Best Management Practice(s)
BRF	Maryland's Bay Restoration Fund
CBP	Chesapeake Bay Program
CBPO	Chesapeake Bay Program Office
CMRs	Construction Monitoring Reports
COMAR	Code of Maryland Regulations
CREP	Conservation Reserve Enhancement Program
CSO	Combined Sewer Overflow
CTIC	Conservation Technology Information Center
DAs	Delegated Authorities
DMRs	Discharge Monitoring Reports
DMS	Data Management System
DNR	Maryland Department of Natural Resources
DNRWIP	DNR Woodlands Incentives Program
E&SC	Erosion and Sediment Control
ENR	Enhanced Nutrient Removal
ESD	Environmental Site Design
FCA	Maryland's Forest Conservation Act
FOTG	Field Office Technical Guides
FSA	Farm Services Agency
GIS	Geographic Information System
HEL	Highly Erodible Lands
HOAs	Homeowner Associations
ICIS	Integrated Compliance Information System
ID	Identification
LSR	Legacy Sediment Removal
MACS	Maryland Agricultural Water Quality Cost-Share
MDA	Maryland Department of Agriculture
MDE	Maryland Department of the Environment
MORs	Monthly Operating Reports
MS4	Municipal Separate Storm Sewer System
NASS	USDA National Agricultural Statistics Service
NCD	Natural Channel Design
NEIEN	National Environmental Information Exchange Network
NGO(s)	Non-governmental Organization(s)
NM	Nutrient Management
NMP(s)	Nutrient Management Plan(s)
NOCC	Notice of Construction Completion

NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	USDS - Natural Resource Conservation Service
O&M	Operations & Maintenance
PIE	Plan Implementation Evaluation
PMAS	Performance Measurement Accountability System
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RDBMS	relational database management system
RI(s)	Resource Improvement(s)
RPC	Responsible Personnel Certification
RSC	Wet Channel Regenerative Stormwater Conveyance
SCD(s)	Soil Conservation District(s)
SCWQP	Soil Conservation and Water Quality Plan
SEC	Soil Erosion Control
SMART	Stormwater Management and Restoration Tracker
SDSFM	Stormwater, Dam Safety, Flood Management Program
SSO	Sanitary Sewer Overflow
ST	Stormwater Treatment
TMDL	Total Maximum Daily Load
UNM	Urban Nutrient Management
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WIP	Watershed Improvement Plan
WRD	WSA's Watershed Restoration Division
WSA	MDE's Water and Science Administration
WSSC	Washington Suburban Sanitation Commission
WWTPs	Wastewater Treatment Plants
XML	extensible markup language

Executive Summary

The best management practice (BMP) verification protocols document the methodologies for ensuring their proper installation and continued effectiveness through long-term inspection and maintenance. Verification methodologies are provided for BMPs in key source sectors: Agriculture, forestry, stream restoration, urban stormwater, wastewater, and wetland restoration. In addition, record keeping and reporting protocols are described.

While it is the goal to verify implementation of all BMPs, resource constraints dictate that priorities be set to focus on those BMPs most critical to achieving Maryland's pollutant load reduction goals for the Chesapeake Bay. Consequently, some BMPs with lower impact on load reductions to the Bay have modest or no verification protocols currently.

Maryland has a long tradition of BMP regulation and oversight in all major source sectors. State laws and regulations have been strengthened over time to ensure that State agencies and local jurisdictions are inspecting and maintaining nutrient removal practices in urban stormwater, wastewater, agriculture, and forestry sectors. Despite some gaps in staffing levels and protocols for some lower priority sectors, overall the State maintains a robust set of protocols, systems and oversight to ensure that BMPs exist and are functioning according to designated criteria.

Agriculture

The Maryland Department of Agriculture has a Memorandum of Understanding (MOU) with the Maryland Soil Conservation Districts (SCDs) and the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) that defines the roles and responsibilities of each agency in the implementation, documentation, and verification of various conservation measures on the landscape. In addition, Maryland's Nutrient Management Program regulates the application of nutrients on agricultural land for which requirements are specified in the Maryland Nutrient Management Manual.

The agricultural BMPs are organized into four logical groupings. *Visual Multi-Year* BMPs are those structural type practices which meet established NRCS Standards and Specifications and have been verified by trained SCD Staff prior to reporting. These practices involve technical designs according to standards. The installation of 100% of these practices is subject to a final construction review by qualified SCD staff. The majority of these BMPs are funded by Maryland Agricultural Cost Share (MACS) grants. During the established contract life of MACS funded BMPs, the projects are subject to annual review. A random sampling of 10% of all active practices under MACS contract is used as a basis for the review. Similar initial and follow-up verification procedures apply for BMPs installed without cost-share funding that meet NRCS design standards.

Resource Improvement Visual Multi-Year BMPs are those structural practices that have been approved by the CBP Partnership as providing environmental benefits while not adhering to NRCS Standards and Specifications. Maryland SCD staff will initially verify 100% of identified RIs

by performing an on-site evaluation of the practice and completing an appropriate Visual Indicator Checklist. RI practices will be re-verified at a more frequent 20% random sampling interval than other BMPs since their design may not be as extensive as similar NRCS practices.

Visual Single Year BMPs are those practices which are agronomic in nature but only remain on the landscape for less than one year. These practices represent some of Maryland's most effective agricultural BMPs. For example, conservation tillage is reported annually through nutrient management program Annual Implementation Reports (AIRs). Maryland reviews at least 10% of the plans each year and is pursuing multiple methods of field verification. Cover crops must be reported within 7 days of planting. SCDs conduct follow-up field checks on at least a random 20% of acres of cover crops that are certified as being planted for 100% of participants who fall certify.

Non-Visual Single Year BMPs are practices which cannot be typically visually assessed due to lack of physical presence on the landscape. This section describes procedures of agricultural nutrient management, manure transport, manure injection/incorporation (an interim practice), cropland irrigation management and Urban Nutrient Management.

MDA proposes to establish a BMP Verification Task Force of five employees whose primary focus would be BMP re-verification. These employees would be an independent review team that reports directly to the Watershed Implementation Program outside the purview of the SCD offices. This would allow for a complete independent review of BMP implementation thereby eliminating any potential conflict of interest associated within an SCD office.

Forestry

BMPs associated with the forest sector are grouped into four categories: forest conservation, upland tree planting, riparian forest buffers, and forest harvest. Priority is based on the relative contribution of the BMP to the overall acreage reported for pollutant reduction credit. Reporting on forestry practices is derived from reporting systems developed and used by the Maryland Department of Natural Resources (DNR) for the Forest Conservation Act, the USDA Forest Service performance reporting, dedicated riparian forest buffer reporting forms, and sediment and erosion control plans required for forest harvesting.

Forest conservation, under the State Forest Conservation Act (FCA), is initially verified through review of 100% of the land development applications. Follow-up checks are done by direct visual and aerial photo assessments for 100% of the sites at 3-year intervals.

Upland tree planting occurs in two settings. Agricultural tree planting is attributable to cost-share or other technical or financial assistance programs. Urban or mixed land use plantings are usually attributed to mitigation of forest cleared during urban development. Initial inspections for both broad categories are conducted for 100% of the projects within 1-year of planting. Follow-up inspections for plantings associated with the FCA are conducted 2-years after

planting at 100% of the sites. Follow-up inspections for plantings associated with agricultural programs are conducted every 3-5 years at 100% of the sites depending on the program.

There are three categories within the riparian forest buffer planting group: federal cost-shared agricultural buffers, non-federal agricultural and urban buffers, and "backyard buffers" in an urban/suburban setting. Initial inspections for the first two categories are conducted for 100% of the projects within 1-year of planting. No formal inspection is required for the backyard buffer category; however, Maryland DNR is conducting survival surveys, which can be used to verify these plantings. Long term follow-up checks for cost-shared buffers are conducted visually for 100% of the plantings at strategic times: 2-3 years after planting and about 2-years before the end of the 15-year contract. Non-cost shared plantings receive site inspections 2-3 years after planting and at a 10% random sampling rate thereafter. Self-reporting is used for long-term verification for the third category of backyard buffers.

The forest harvesting category involves required sediment and erosion control BMPs. On State lands, on-site supervision by a DNR forester is required at 100% of the sites for the entire contract period and implementation is estimated to be 99%. On private lands, local SCD or Forestry Board staff review 100% of forest harvest applications and visual inspection of timber marking. Assessments of private property operations conducted by DNR in 1995 and 2007 found 80% and 82% BMP compliance rates respectively.

Stream Restoration

Stream restoration refers to any natural channel design, baseflow channel design, legacy sediment removal, or other restoration project that meets the qualifying conditions for nutrient or sediment reduction credit. These practices are generally performed in either an agricultural or urban/suburban setting.

In the agricultural setting, on-site initial inspections are performed for 100% of projects by SCD staff throughout the construction phase guided by NRCS's Engineering Folder Completion Checklist to ensure all elements of the design and construction are verified and documented. Follow-up maintenance checks are conducted annually for 10% of the projects selected randomly.

Urban stream restoration projects are evaluated by county or municipal staff during construction. If they wish to seek continued credit, they must inspect and maintain them at a frequency required by the Chesapeake Bay Program. MDE will perform post-construction site visits to a limited number of stream restoration projects.

Urban Stormwater Sector

The State of Maryland has developed comprehensive stormwater management and erosion and sediment control (E&SC) programs to reduce the adverse impacts of development on stormwater runoff. These programs address both the temporary and the permanent impacts

associated with land development activities. During the land development process, on-site inspections for proper E&SC are required an average of once every two weeks. These inspections are conducted directly by the State or by local governments that have been delegated that authority from the State.

Post-development stormwater controls are inspected during their installation by local government programs or by the State in the case of State and federal projects. On-going long-term maintenance is the responsibility of the property owner; however, for private property, inspections are the responsibility of local stormwater programs. State law requires inspections of all BMPs once every three years. State law requires MDE review of local programs once every three years. The reviews include the inspection of a representative sample of projects, comparing initial designs to as-built drawings, and conducting field audits.

Maryland is revamping its stormwater BMP reporting and tracking infrastructure to use on-line reporting. This process has begun with local jurisdictions that are regulated under federal Phase I municipal separate storm sewer system (MS4) permits. This system will track the disposition of long-term maintenance. The reporting system will eventually address Phase II MS4 jurisdictions and facilities, as well as non-MS4 jurisdictions.

Wastewater

This sector includes wastewater treatment facility discharges, septic systems, sanitary sewer overflows, and combined sewer overflows. Wastewater treatment is verified through certified monthly discharge monitoring reports (DMRs) and monthly operating reports (MORs). These reports are independently verified during physical site inspections and through quality assurance procedures to verify the data. Large facilities are inspected once per year. Small facilities are inspected once every 5-year permit cycle.

Septic systems may be upgraded to best available technology (BAT) to reduce nitrogen discharges. Certified installers and service providers are required to report the installation and annual inspection of BAT systems, or no reductions are credited. MDE staff members perform installation and service visit audits at a frequency of no less than 10% of each county's cumulative total BATs selected randomly.

Septic systems may also be connected to advanced wastewater treatment plants that have a lower nitrogen discharge. Local health departments certify the completion of connections that are funded with State grants and loans. Funding source audit protocols govern the validation process.

Sanitary sewer overflows (SSOs) are illegal and indicate a problem with the waste collection system. The Bay TMDL assumes full removal of SSOs and makes no allocation for them. SSO events are reported to MDE, and estimated discharges are documented in the reported sewer overflow database. SSO-related consent decrees are in place for several major sewerage

systems. Verification of this required rehabilitation is ensured through enforcement of the order by MDE.

Combined sewer overflows (CSOs) are the result of joint sewage and stormwater collection systems designed to bypass wastewater plants during large rainfall events to avoid flooding of the plant. CSOs are an obsolete infrastructure technology. CSO are assigned wasteload allocations in the Bay TMDL; however, they are being phased out to the degree that is technically possible through mandatory remediation. Salisbury, Cambridge, and Baltimore City have completed CSO improvements. Westernport, Allegany, Frostburg, LaVale, and Cumberland have each submitted a Long-Term Control Plan (LTCP) for CSO improvements that is compliant with 1995 EPA Guidance. Verification of this required rehabilitation is ensured through enforcement of the LTCPs by MDE.

Wetlands Restoration

This verification protocol addresses wetland restoration and creation in the agricultural and urban/suburban settings that are accounted for in Maryland's WIP. Wetlands projects implemented for compensatory mitigation do not receive Bay load reduction credit and fall outside of this protocol.

Agricultural wetland restoration activities re-establish the natural hydraulic condition in a field that existed prior to the installation of subsurface or surface drainage. Projects may include restoration, creation, and enhancement acreage. Restored wetlands may be any wetland classification including forested, scrub-shrub or emergent marsh. At present, enhancement projects are not assigned an efficiency, but an expert panel is working on recommendations to develop an efficiency so that these projects may formally receive credit.

Of Maryland's total pollutant reductions, agricultural wetland restorations are not a significant strategy in the State's WIP; however, they provide significant habitat value that benefit ecological health. Wetland restoration is largely implemented through a co-cost share agreement between the Maryland Agricultural Water Quality Cost-Share (MACS) program and federal USDA programs. Initial verification of proper construction by qualified SCD staff is performed for 100% of the projects. Follow-up maintenance checks are conducted annually for 10% of the projects selected randomly.

In Maryland, most wetland practices implemented in the urban sector are associated with the treatment of stormwater controls or stream restoration. The urban wetlands credits for these are accounted through the stormwater sector procedures. Therefore, Maryland does not have a current protocol for verification of urban wetlands but may develop one in the future if practices as defined by the Chesapeake Bay Program Wetlands Workgroup become a more significant contributor to Maryland's WIP.

Data Source Providers

The MDE Watershed Protection, Restoration, and Planning Program is the key data aggregator of this information, data providers for this QAPP include the following agencies by data type:

Data Type	Data Provider
All Agricultural BMPs (Including ag forestry and wetland practices)	**Maryland Department of Agriculture**
Non-Agriculture Forestry BMPs	**Maryland Department of Natural Resources**
Urban Stormwater/Stream Restoration/Wetlands	**MDE Stormwater Dam Safety and Flood Management Program**
Non-Agricultural and non-stormwater related wetlands	**MDE Wetlands and Waterways Program**
Septic Data	**MDE Wastewater Pollution Prevention and Reclamation Program**
Wastewater Data	**MDE Compliance Program**

Verification Protocol Gaps

Maryland has not determined an appropriate timeline for the development of these protocols but will base them on when the BMP becomes significant in meeting our WIP goals.

Table A. Verification Protocol Gap Summary

BMPs with protocol gaps	Description of the gap
Urban Shoreline Erosion Control	Currently this BMP falls under urban stormwater practice verification protocols, but if it becomes a significant contributor to nutrient reductions may need its own protocol.
Urban Wetlands	In Maryland, most wetland practices implemented in the urban sector are associated with the treatment of stormwater controls or stream restoration. The wetlands benefit for these practices are accounted through the stormwater and stream restoration procedures. Therefore, Maryland does not have a current protocol for verification of urban wetlands, but may develop one in the future if practices as defined by the Chesapeake Bay Program Wetlands Workgroup identify these a more significant contributor to Maryland's WIP.
Urban Stream Restoration	Currently there is only a requirement by the state to verify the BMP through a visual inspection for NPDES credit. The permits from MDE and US Army Corp of Engineers will require varying degrees of post construction monitoring. The State is in the process of collecting Standard Operating Procedures (SOPs) from the local jurisdictions on how they inspect and maintain these practices. This process is ongoing due to the development of the new "Recommended Methods to Verify Stream Restoration Practices Built for Pollutant Crediting in the Chesapeake Bay Watershed" memo approved by the Chesapeake Bay Program in 2019. Maryland anticipates new verification methods will be used by contractors installing stream restorations that align with this memo.

Urban Forestry BMPs	The Verification for practices other than forest conservation easements and federal co-cost share practices is a current gap in our BMP reporting. The lack of funding for monitoring in many grant programs and staff capacity remains a significant barrier to expanding upon verification efforts in these areas. Of our urban forestry programs, urban RFBs represent an important component of the state WIP, yet we anticipate the reliance of urban RFBs to decrease in the 2017 state WIP. This decrease is due in part to advances in our understanding of other urban BMPs, better estimates of the current forest cover of urban streams in MD, and limitations (i.e., impervious surfaces) to urban RFB expansion. DNR is evaluating its capacity to perform statistical-based sampling along with aerial imagery for verification in the future.

1 Introduction

In October 2014, the Chesapeake Bay Program (CBP) Water Quality Goal Implementation Team's BMP Verification Committee released it guidance for best management practice (BMP) verification: *Strengthening Verification of Best Management Practices Implemented in the Chesapeake Bay Watershed: A Basinwide Framework*. 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, streams restoration, urban stormwater, wastewater, and wetland restoration).

Verification is formally defined by the CBP 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 Maryland Department of the Environment (MDE), in conjunction with the Maryland Department of Agriculture (MDA) and the Maryland Department of Natural Resources (DNR) have assembled a set of BMP verification practices and procedures to comply with the new CBP BMP Verification protocols.

Maryland's policies and practices included in this document reflect the heightened requirements of the various agencies collecting BMP information, and the methods used to ensure that data reported to the CBP for modeling are compliant with the five Chesapeake Bay BMP verification principles adopted in December 2012 (Table 1-1).

Table 1-1. Verification Principles Adopted by the Principles' 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	Asserts that BMP verification should assure effective implementation through scientifically rigorous, defensible, and 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 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 of tracking and reporting 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.

1.1 Selection of BMPs for Verification

While it is the goal to verify implementation of all BMPs implemented within the State, resource constraints dictate that priorities be set to focus on those BMPs included for achieving Maryland's pollutant load reduction goals. The resulting BMPs were grouped appropriately and are listed in Table 1-2. Verification protocols for other BMPs with lower anticipated contributions to the overall load reductions may be developed but at a slower pace, given the reduced reliance on these practices to Maryland's reduction strategy.

Maryland has chosen to list its verification protocols by source sector and by verification procedures used for different BMP types. For example, the verification of agronomic practices like nutrient management differs from structural agricultural practices such as manure storage facilities. Therefore, rather than focusing on individual BMPs, the State has chosen to focus on the methodology of verification instead with groupings of BMPs under those methodologies.

Table 1-2. BMPs for Verification Protocol Development.

Sector	BMP Grouping
Agriculture	Visual Multi-Year BMPs
Agriculture	Visual Single Year BMPs
Agriculture	Non-Visual Single Year Practices
Forestry	Forest Conservation
Forestry	Riparian Forest Buffers
Forestry	Upland Tree Planting
Forestry	Forest Harvest
Stream Restoration	Agricultural Stream Restoration
Stream Restoration	Urban Stream Restoration
Urban Stormwater	Erosion and Sediment Control
Urban Stormwater	Stormwater Treatment
Wastewater	Discharges from Wastewater Treatment Facilities
Wastewater	Septic Systems–Treatment Technology Upgrades
Wastewater	Septic Systems–Connection to WWTP
Wastewater	Sanitary and Combined Sewer Overflows
Wetland Restoration	Agricultural Wetland Restoration

Individual verification protocols for each of the BMP groups in each source sector (agriculture, forestry, streams restoration, urban stormwater, wastewater, and wetland restoration) are provided in sections 2 through 7.

2 Agriculture

The Maryland Department of Agriculture, working in collaboration with Maryland's Conservation Partnership, assists agricultural producers in conservation planning and BMP implementation that balance crop and livestock production with the need to protect natural resources. A key role in this process is the accurate accounting and verification of BMP implementation consistent with United States Environmental Protection Agency (USEPA) guidance to ensure appropriate quantification of nutrient reduction in support of Maryland's Watershed Implementation Plan. Outlined within this document are the proposed protocols to identify and verify the implementation of all reported BMPs across Maryland's agricultural landscape. This information supplements the Maryland Agriculture BMP Implementation Reporting Procedures Quality Assurance Project Plan (QAPP). For details see the 2012 MDA QAPP developed for BMP reporting to the USEPA.

As the lead partner in the delivery of agricultural conservation programs in Maryland, Maryland Soil Conservation Districts (SCDs) have a key role in the implementation, documentation, and verification of various conservation measures on the landscape. A Memorandum of Understanding between MDA, the SCDs and the United States Department of Agriculture (USDA)-Natural Resource Conservation Service (NRCS) is in place that defines the roles and responsibilities of each agency and directs their mutually cooperative efforts to achieve the conservation and protection of soil, water and related resources through the optimum use of state and federal resources.

In addition, Maryland's Nutrient Management Program regulates the application of nutrients on agricultural land. MDA's Phosphorus Management Initiative includes revised Nutrient Management Regulations that modify how a farm nutrient management plan is developed and implemented and changes the way organic nutrient sources and other materials are managed. The requirements are being phased in over the next several years and will help Maryland meet nutrient reduction goals outlined in its WIP for restoring the health of Chesapeake Bay. The Maryland Nutrient Management Manual outlines specific requirements related to Maryland's Nutrient Management Program.

2.1 Best Management Practice Organization

While various BMP options exist for reporting agricultural conservation measures, four logical groupings have been designated for ease in summarizing verification protocols. *Visual Multi-Year* BMPs are those structural type practices which meet established NRCS Standards and Specifications and have been verified by trained Soil Conservation District Staff prior to reporting. *Visual Single Year* BMPs are those practices which are agronomic in nature but only remain on the landscape for less than one year. *Non-Visual Single Year* BMPs are practices which cannot be typically visually assessed due to lack of physical presence on the landscape. *Resource Improvement Visual Multi-Year* BMPs are those structural practices that have been approved by the CBP Partnership as providing environmental benefits while not adhering to NRCS Standards and Specifications.

Tables 2-1 and 2-2 have been developed to organize individual BMPs into the appropriate grouping. While Table 2-3 attempts to summarize each, a full description of the proposed verification protocol is also provided as a narrative. Note that a discussion of the specific verification protocols is provided for each BMP type while a discussion of data validation for agriculture practices is provided in one place (section 2.5) at the end of the agriculture section since the same validation procedures apply to all practices. Each BMP identified has CBP approved definitions and all Resource Improvements are consistent with the approved CBP Resource Improvement Practice Definitions and Verification Visual Indicators Report.

Table 2-1. Agriculture BMP Groupings.

NRCS/MDA Code	Name	CBP Name	BMP Grouping	Data Source
327	Conservation Cover	LandRetireOpen	Visual Multi-Year	Conservation Tracker
342	Critical Area Planting	LandRetireOpen	Visual Multi-Year	Conservation Tracker
318	Dead Bird Composting Facility	MortalityComp	Visual Multi-Year	Conservation Tracker
382	Fencing	GrassBuffExcl ForestBuffExcl	Visual Multi-Year	Conservation Tracker
386	Field Border	GrassBuffers	Visual Multi-Year	Conservation Tracker
393	Filter Strip	GrassBuffers	Visual Multi-Year	Conservation Tracker
412	Grassed Waterway	GrassBuffers	Visual Multi-Year	Conservation Tracker
512	Pasture & Hayland Planting	LandRetirePas	Visual Multi-Year	Conservation Tracker
528	Prescribed Grazing	PrecRotGrazing	Visual Multi-Year	Conservation Tracker
391	Riparian Forest Buffer	ForestBuffers	Visual Multi-Year	Conservation Tracker
390	Riparian Herbaceous Cover	GrassBuffers	Visual Multi-Year	Conservation Tracker
558	Roof Runoff Structure	BarnRunoffCont	Visual Multi-Year	Conservation Tracker
580	Streambank and Shoreline Protection	NonUrbStrmRest	Visual Multi-Year	Conservation Tracker
587	Structure For Water Control	WaterContStruc	Visual Multi-Year	Conservation Tracker
612	Tree/Shrub Establishment	TreePlant	Visual Multi-Year	Conservation Tracker
313	Waste Storage Structure	AWMS	Visual Multi-Year	Conservation Tracker
635	Wastewater Treatment Strip	BarnRunoffCont	Visual Multi-Year	Conservation Tracker
614	Watering Facility	OSWnoFence	Visual Multi-Year	Conservation Tracker
657	Wetland Restoration	WetlandRestort	Visual Multi-Year	Conservation Tracker
380	Windbreak/ Shelterbelt Establishment	TreePlant	Visual Multi-Year	Conservation Tracker
340	Cover Crop	Various	Visual Single Year	MACS Program

NRCS/MDA Code	Name	CBP Name	BMP Grouping	Data Source
590	Nutrient Management	Core, Rate, Placement, & Timing	Non-Visual Single Year	Nutrient Management Program
N/A	Soil Conservation Water Quality Plan	Conservation Plans/SCWQP	Visual Multi-Year	Conservation Tracker
N/A	Dairy Manure Incorporation	LiquidInjection	Non-Visual Single Year	Nutrient Management
N/A	Poultry Manure Incorporation	PoultryInjection	Non-Visual Single Year	Nutrient Management Program
N/A	Conservation Tillage	ConserTillTot Acres	Visual Single Year	Nutrient Management Program
N/A	Irrigation Water Capture and Reuse	CapReuse	Visual Multi-Year	Conservation Tracker
N/A	Poultry Litter Treatment	Alum	Non-Visual Single Year	Nutrient Management Program
N/A	Cropland Irrigation Management	Cropirrmgmt	Non-Visual Single Year	Nutrient Management Program
800	Sorbing Materials in Ag Ditches	DitchFilter	Visual Multi-Year	Conservation Tracker
512	Horse Pasture Management	HorsePasMan	Visual Multi-Year	Conservation Tracker
N/A	High Residue Management	HRTill	Visual Single Year	Nutrient Management
561	Loafing Lot Management	LoafLot	Visual Multi-Year	Conservation Tracker
N/A	Manure Transport	ManureTransport	Non-Visual Single Year	MACS Program
N/A	Poultry Phytase	PoultryPhytase	Non-Visual Single Year	Established by CBP
554	Drainage Management Plan	DrainWaterManagement	Non-Visual Single Year	Conservation Tracker
604	Saturated Buffer	SaturatedBuffer	Visual Multi-Year	Conservation Tracker
605	Denitrifying Bioreactor	DitchBioreactors	Visual Multi-Year	Conservation Tracker
606	Subsurface Drain	BlindInlets	Visual Multi-Year	Conservation Tracker
620	Underground Outlet	BlindInlets	Visual Multi-Year	Conservation Tracker
782	P Removal System	DitchFilter	Visual Multi-Year	Conservation Tracker
658	Wetland Creation	WetlandCreateFloodplain	Visual Multi-Year	Conservation Tracker
592	Feed Management	DairyPrecisionFeeding	Non-Visual Single Year	Conservation Tracker

Table 2-2. Agriculture Resource Improvement Groupings.

RI Code	Name	CBP Name	BMP Grouping	Data Source
RI-1	Dry Waste Storage Structure	AWMS	RI Visual Multi-Year	Conservation Tracker
RI-2	Animal Compost Structure	MortalityComp	RI Visual Multi-Year	Conservation Tracker
RI-3	Alternative Crop/Switchgrass	CarSeqAltCrop	RI Visual Multi-Year	Conservation Tracker
RI-4a	Watercourse Access Control - narrow grass	GrassBuffExclNar	RI Visual Multi-Year	Conservation Tracker
RI-4b	Watercourse Access Control - narrow trees	ForestBuffExclNar	RI Visual Multi-Year	Conservation Tracker
RI-5	Watercourse Access Control - grass	GrassBuffExcl	RI Visual Multi-Year	Conservation Tracker
RI-6	Watercourse Access Control - trees	ForestBuffExcl	RI Visual Multi-Year	Conservation Tracker
RI-7	Grass Nutrient Exclusion Area on Watercourse	LandRetireOpen	RI Visual Multi-Year	Conservation Tracker
RI-8	Grass Buffer on Watercourse	GrassBuffers	RI Visual Multi-Year	Conservation Tracker
RI-9	Forest Nutrient Exclusion Area on Watercourse	TreePlant	RI Visual Multi-Year	Conservation Tracker
RI-10	Forest Buffer on Watercourse	ForestBuffers	RI Visual Multi-Year	Conservation Tracker
RI-11	Vegetative Environmental Buffer for Poultry - grass		RI Visual Multi-Year	Conservation Tracker
RI-12	Vegetative Environmental Buffer for Poultry - trees	TreePlant	RI Visual Multi-Year	Conservation Tracker
RI-13	Conversion to Pasture	LandRetirePas	RI Visual Multi-Year	Conservation Tracker
RI-14	Conversion to Hayland	LandRetireOpen	RI Visual Multi-Year	Conservation Tracker
RI-15	Rotational Grazing	PrecRotGrazing	RI Visual Multi-Year	Conservation Tracker
RI-16	Barnyard Clean Water Diversion	BarnRunoffCont	RI Visual Multi-Year	Conservation Tracker
RI-17	Water Control Structure	WaterContStruc	RI Visual Multi-Year	Conservation Tracker
RI-18	Watering Trough	OSWnoFence	RI Visual Multi-Year	Conservation Tracker

Table 2-3. Agriculture Verfication Protocol Design Table

Verification Element	Description	Description
BMP or Group	Structural BMPs	Structural BMPs
Geographic Scope	Statewide	Statewide
A. WIP Priority	High	Medium
B. Data Grouping	Visual Multi-Year BMPs	Resource Improvement Visual Multi-Year
C. BMP Type	Structural	Structural
D. Initial Inspection		
Method	SCD staff is on-site throughout the construction phase guided by NRCS's Engineering Folder Completion Checklist to ensure all elements of the design and construction are verified and documented.	MDA has developed the "Non-Cost Shared Best Management Practice and Resource Improvement Practice Verification Procedures Manual." This is consistent with *Chesapeake Bay Program Resource Improvement Practice Definitions and Verification Visual Indicators Report* (July 2014) and was rolled out in June 2015.
Frequency	At completion of installation	At the time of discovery via SCD on-site inventories.
Who Inspects?	SCD Staff	SCD staff
Documentation	Engineering Folder Project Completion Checklist	Spatial location, extent, and date of installation recorded into Conservation Tracker.
E. Follow-up Check		
Follow-Up Inspection	Annual MACS Spot-check reviews. Field inspection to determine whether the BMPs were constructed according to plan specifications and whether the BMPs are being maintained in accordance with contract. MDA proposes re-verification of structural BMPs by a BMP Verification Task Force consisting of 5 independent MDA employees.	Re-verification of RIs will be led by the BMP Verification Task Force and will follow the approved Visual Indicator checklist. The MDA proposes re-verification of structural BMPs by a BMP Verification Task Force consisting of 5 independent MDA employees.
Statistical Sub-sample	10% of practices are re-verified annually.	20% of RIs are re-verified annually
Response if Problem	Where the teams find unsatisfactory conditions, a letter of notification is sent to the farmer identifying the issue to be addressed and establishing a time frame to correct the problem. The BMP is re-inspected again, normally within a year, to ensure compliance and performance. The cooperator is ineligible to receive additional cost- share assistance until the BMP is brought back into compliance.	Once assessed, the RI status will be updated in Conservation Tracker to indicate "satisfactory" or "unsatisfactory", where those practices assessed as satisfactory will be eligible for re-verification again over the next credit duration and will be submitted through NEIEN protocols. Practices assessed as unsatisfactory will be removed.
F. Lifespan/Sunset	Established CBP BMP credit duration	Established CBP BMP credit duration

Verification Element	Description	Description
F. Lifespan/Sunset	Established CBP BMP credit duration	Established CBP BMP credit duration
G. Data QA, Recording & Reporting	MDA's implementation is currently tracked in MDA's Conservation Tracker regardless of funding source. All practices are entered into Conservation Tracker, which the Soil Conservation District has provided conservation technical assistance. This database has made it comparatively easy to eliminate double counting and accurately report conservation practice implementation.	See above.
Verification Element	**Description**	**Description**
BMP or Group	Agronomic BMPs	Agronomic BMPs
Geographic Scope	Statewide	Statewide
A. WIP Priority	High	High
B. Data Grouping	Visual Single Year	Visual Single Year
C. BMP Type	Tillage practices	Cover & Commodity Crops
D. Initial Inspection		
Method	Report through NM Program Annual Implementation Reports (AIRs).	Farmers are required to fall certify cover crop acres planted within 7 days of the planting deadline. 100% of contracts are reviewed and verified by staff.
Frequency	Annual via AIRs	Within 7 days of the planting deadline
Who Inspects?	MDA nutrient management staff (AIRs review)	SCD staff
Documentation	Recorded Annual Implementation Report	Status Documented on Fall/Spring Certification Form
E. Follow-up Check		
Follow-Up	Maryland is pursuing multiple methods to verify the extent of these tillage practices: 1) Utilizing	Field checks are performed in both the fall and

Verification Element	Description	Description
Inspection	remote sensing capabilities in partnership with USDA and the United States Geological Survey (USGS);.2) utilizing existing tillage surveys conducted annually by the Maryland NASS office and surveys conducted through the national public-private partnership Conservation Technology Information Center (CTIC, http://www.ctic.purdue.edu/CRM/); 3) Continue using the AIR reported acres of conservation tillage and high residue minimum disturbance as a compliment to the estimated acreages under reduced tillage; and 4) Increase the frequency of Conservation Tracker as a tool for reporting agronomic practices by SCD staff similar to the reporting and tracking of structural practices. Document reduced tillage through SCD staff verification of conservation tillage (NRCS 345) and high residue minimum disturbance (NRCS 329) during on-site farm inventories as part of a comprehensive SCWQP effort.	spring.
Statistical Sub-sample	MDA staff strives to complete about a minimum of 10% plan inspections per year	At least 20% of acres of cover crops that are certified as being planted for 100% of participants who fall certify.
Response if Problem	NA	If after review by the SCD or MACS office, it is determined that an applicant has failed to provide required documentation then any MACS Cover Crop Agreement(s) for the acreage in question will be cancelled by the MACS Administrator. The offending applicant may be placed on probation for one year by the MACS Administrator. The applicant will be ineligible to participate in any MACS Program during their probation.
F. Lifespan/Sunset	Annual Practice	Annual Practice
G. Data QA, Recording & Reporting	MDA's implementation is currently tracked in MDA's Nutrient Management Program Database.	MDA's implementation is currently tracked in MDA's Cover Crop Program Database.
Verification Element	**Description**	**Description**
BMP or Group	Agronomic BMPs	Agronomic BMPs
Geographic Scope	Statewide	Statewide
A. WIP Priority	High	High
B. Data Grouping	Non-Visual Single Year	Non-Visual Single Year
C. BMP Type	Nutrient Management	Manure Transport
D. Initial Inspection		
Method	NMP is reviewed by regional MDA NM staff to assure plans are prepared in accordance with appropriate requirements. This constitutes 100% verification of acres subject to NM regulations.	Compliance procedures for the Manure Transport cover activities at the application stage to verify the eligible distance for transporting manure, compliance with applicable nutrient management

Verification Element	Description	Description
		regulations, and eligible acreage for manure application.
Frequency	Initial NMP is reviewed when it is submitted	At claim for payment stage
Who Inspects?	MDA nutrient management staff	MDA MACS Staff
Documentation	New Plan Reporting form reviewed by MDA and recorded in NM Database	Chain of Custody Form identifies sending/receiving operation, hauler information and actual weigh-ticket information for each load being transported.
E. Follow-up Check		
Follow-Up Inspection	Plan Implementation Evaluation (PIE) reviews. For the operations selected, farmer's records of crops grown, and nutrients applied are compared to the NMP. The farmer is required to maintain records documenting the rate, timing, and method of nutrient applications, as well as crop yields. Farmer requirements are included in the Maryland Nutrient Management Program Plan Implementation Review Process for Operators, which is available to all farmers and prepared by the MDA Office of Resource Conservation.	Subsequent procedures track and verify the chain of custody of the manure transport to ensure compliance with the initial approval and process the claim reimbursement. Manure receiving operations are also subject to onsite farm reviews immediately after implementation and focus on a) receiving operation utilization of manure transported is consistent with the nutrient management plan; b) crops or crop residue in a field are consistent with the nutrient management plan; c) "Delivery Site Guidelines" or "Stockpiling Guidelines" have been followed or are being followed and d) any residual manure will not cause any water quality concerns.
Statistical Sub-sample	MDA staff strives to complete a minimum of 10% plan inspections per year	NA
Response if Problem	Any problems noted during the review requires notation on the PIE form and a follow-up review. The timing of the follow-up review depends on the deficiency noted. Failure to correct the deficiency within the allotted time warrants further enforcement action, including fines. All information gathered during the PIE review and results are subsequently entered into the NM database.	If the applicant fails to comply with program guidelines, follow up action is taken by requiring corrective actions, possible exclusion from future participation, liability for funds paid, and referral to the Nutrient Management Implementation team for compliance enforcement.
F. Lifespan/Sunset	Established CBP BMP credit duration	Annual Practice
G. Data QA, Recording & Reporting	MDA's implementation is currently tracked in MDA's Nutrient Management Program Database.	MDA's implementation is currently tracked in MDA's Manure Transport Program Database.
Verification Element	**Description**	**Description**
BMP or Group	Agronomic BMPs	
Geographic Scope	Statewide	
A. WIP Priority	High	
B. Data Grouping	Non-Visual Single Year	
C. BMP Type	Manure Injection/Incorporation	
D. Initial Inspection		
Method	MDA tracks the acres of cropland practicing manure injection or incorporation through its AIRs	

Verification Element	Description	Description
Frequency	Annual Implementation Report (NM)	
Who Inspects?	MDA nutrient management staff (AIRs review)	
Documentation	Recorded Annual Implementation Report	
E. Follow-up Check		
Follow-Up Inspection	Plan Implementation Evaluation (PIE) reviews conducted for nutrient management are also used to verify manure injection/incorporation.	
Statistical Sub-sample	MDA staff strives to complete a minimum of 10% plan inspections per year	
Response if Problem	Any problems noted during the review requires notation on the PIE form and a follow-up review. The timing of the follow-up review depends on the deficiency noted. Failure to correct the deficiency within the allotted time warrants further enforcement action, including fines.	
F. Lifespan/Sunset	Annual Practice	
G. Data QA, Recording & Reporting	MDA's implementation is currently tracked in MDA's Nutrient Management Program Database.	

2.2 Data Verification

2.2.1 Quality Assurance to Verify and Track Visual Multi-Year BMPs

Visual Multi-Year BMPs are installed on the agricultural landscape through a combination of federal and/or state cost-share assistance or are fully farmer-funded. Regardless of funding source, all BMPs in this grouping are subject to rigorous quality assurance protocols to verify and report implementation.

2.2.1.1 State and/or Federal cost-shared Visual Multi-Year BMPs

Method for Tracking and Verifying BMPs

Maryland Soil Conservation District (SCD) staff work with farmers to develop voluntary, farm-specific Soil Conservation and Water Quality Plans (SCWQP) that assess resource needs of the operation, identify appropriate BMPs to address those resource needs, and suggest potential funding mechanisms to implement the recommended BMPs. Staff then works with cooperators to implement BMPs over a period based on priority needs and available funding.

The State's primary funding mechanism is the Maryland Agricultural Water Quality Cost Share (MACS) program. The MACS Program has established a procedures manual (MACS Manual) utilized by all 24 SCDs which sets forth the policies and procedures of installing eligible BMPs for MACS cost-share assistance. The USDA also cost-shares independently or co-cost shares with MACS on BMP implementation through the NRCS and Farm Service Agency (FSA) cost-share programs. In all circumstances, NRCS provides a series of manuals (Field Office Technical

Guides – FOTG) that describe the standards and specifications for the installation and maintenance of NRCS approved BMPs. The MACS Program relies on the established NRCS technical standards and specifications in the FOTG for the actual placement and installation of these BMPs.

Most of the Visual Multi-Year BMPs installed in Maryland are implemented through MACS cost-share or co-cost-shared between MACS and USDA cost-share programs. For these practices, technical designs and standards are provided through the SCD to the contractor installing the structural practice(s). Upon completion of the BMP a final construction review is performed by qualified SCD staff to ensure that the project meets appropriate NRCS standards and specifications. This process is completed for 100% of structural BMPs and represents initial verification of installed Visual Multi-Year BMPs.

Verification Team

SCDs are the lead partner in delivering cost-share programs in Maryland. Qualified SCD staff with appropriate job approval authority as determined by the NRCS State Engineer is on-site throughout the construction phase guided by NRCS's Engineering Folder Completion Checklist to ensure all elements of the design and construction are verified and documented.

Documentation of Verification

Once any BMP is designed and installed in accordance with established NRCS standards, trained SCD staff enters appropriate BMP information into MDA's Conservation Tracker system. SCD staff are responsible for the timely submission of data into Conservation Tracker including spatial location of the BMP, extent or amount of BMP installed in NRCS established official unit of measure, date of final inspection performed by qualified SCD staff, and any cost-share sources (state, federal, farmer or non-governmental organization (NGO)).

In addition, MDA Headquarters receives an annual report from NRCS at the conclusion of the state fiscal year of federally funded practices. This report is cross-referenced with Conservation Tracker to confirm all installed practices have been accounted for by MDA.

Independent Verification

Per State Regulation, during the established contract life of a MACS funded BMP, the project is subject to annual review, known as Spot-checks. This is to ensure the project is being used and maintained in accordance with contractual obligations. MACS Spot-checks are completed annually by SCD staff from January through March. The MACS Office has established a Guidelines for On-Farm Status Reviews protocol that governs the implementation of the annual status review process. A random, computer-generated sampling of 10% of all active practices under MACS contract is used as a basis for the review. The MACS Office at MDA Headquarters generates this random sample from a report within the MACS Database and sends it to the SCDs for a field review of the practice(s).

Once the SCD receives the list of MACS BMPs to be randomly sampled for re-verification, the SCD schedules a visit with the cooperator. A qualified SCD staff member who was not involved in the initial design of the project performs an in-field evaluation of the BMP to ensure that all

NRCS standards, specifications, and maintenance guidelines are still being met in accordance with the Soil and Water Conservation Plan and MACS agreement on file with the cooperator. Result of the review are recorded on a MACS Status Review Form (Appendix A) and mailed to the MACS Office. Once received by the MACS Office, the evaluation is entered into the MACS database. The electronic record is automatically cross-referenced through a database join to the Conservation Tracker database for reporting and tracking purposes.

Where the inspecting SCD staff finds unsatisfactory conditions, a letter of notification is sent to the farmer identifying the issue to be addressed and establishing a time frame to correct the problem. The BMP is re-inspected by qualified SCD staff again, normally within a year, to ensure compliance and performance. Possible reasons for unsatisfactory conditions could include a lack of maintenance or a change of property ownership. If there has been a change in property ownership, MDA institutes a transfer of maintenance requirements to the new owner through a Property Transfer Worksheet. If the new owner does not agree to maintain the BMP in accordance with the original contract, MDA seeks repayment from the original owner of principle per MACS Regulation. Maintenance issues are required to be addressed using the same NRCS technical standards applied during design and construction. In addition, the cooperator is ineligible to receive additional cost-share assistance until the BMP is brought back into compliance. When a project is reviewed and determined satisfactory, it is removed from the inspection eligible list for two years.

Method for Tracking and Verifying Riparian Forest Buffers

Consistent with most of the Visual Multi-year BMPs, riparian forest buffers in Maryland are largely implemented through a co-cost share agreement between MACS (State) and USDA (federal) programs. Specifically, riparian forest buffers are installed through the USDA Conservation Reserve Enhancement Program (CREP). Site eligibility determination is consistent with USDA protocols, and site design and technical specifications are followed by SCD staff according to the NRCS standards. SCD staff also coordinates with a Maryland DNR Project Forester to develop a site specific "Planting Plan" for species selection, planting density, etc. Additional details regarding the partnership with Maryland DNR are provided in Maryland's Forestry sector narrative.

At the time of planting or upon completion of the BMP, a final site review is performed by qualified SCD staff in coordination with Maryland DNR to ensure that the project meets appropriate NRCS standards and specifications. This process is completed for 100% of buffer plantings and represents initial verification reported through Conservation Tracker. Documentation within Conservation Tracker distinguishes riparian buffers as narrow buffers (less than 10' wide), forest buffers (greater than 35' wide), herbaceous buffers (greater than 35' wide), or as non-streamside buffers.

Documentation of Riparian Forest Buffer Verification

Once any BMP is designed and installed in accordance with established NRCS standards, trained SCD staff enters appropriate BMP information into MDA's Conservation Tracker system. SCD staff are responsible for the timely submission of data into Conservation Tracker including

spatial location of the BMP, extent or amount of BMP installed in NRCS established official unit of measure, date of final inspection performed by qualified SCD staff, and any cost-share sources (state, federal, farmer or NGO).

In addition, MDA Headquarters receives an annual report from NRCS at the conclusion of the state fiscal year of federally funded practices. This report is cross-referenced with Conservation Tracker to confirm all installed practices have been accounted for by MDA.

All riparian forest buffers implemented under Maryland MACS and USDA co-cost share agreements occur adjacent to agricultural lands and will be reported by MDA through its outlined protocols. MDA staff will coordinate annually with Maryland DNR to ensure no double counting of forested acres

Independent Verification of Riparian Forest Buffers

Re-verification of riparian buffers is subject to the MACS annual spot checks as outlined previously. Additionally, landowners installing riparian forest buffers through USDA-CREP are subject to additional reviews according to the USDA contract. The USDA contracts for riparian forest buffers outline required maintenance and operations expectations for the landowner for the duration of the cost-share contract. Such language includes a recommended annual site review occurring between Years 1 to 3 to determine if the forest planting has successfully established. Currently, site reviews are coordinated between the USDA, SCD staff, and Maryland DNR to revisit 100% of sites in Year 1 to document planting survival. Later, a mid-contract site review is required by USDA at 10% of active contracts between Years 6 to 9 (depending on contract length). Reviews are coordinated between the USDA and SCD staff with subsequent follow-up to Maryland DNR if needed. Documentation of these site review findings and any completed MACS annual review will determine if the project status is satisfactory and will serve as 10% re-verification. The BMP status will be updated in the Conservation Tracker system to indicate a "satisfactory" or "unsatisfactory" condition with appropriate notation. A hard-copy report is also filed in the farm's Conservation Plan folder. If the BMP has been determined to be unsatisfactory, trained SCD staff may assist the farmer to bring the practice back into a satisfactory condition within one year. If repairs are not made within the specified time period, the practice will be flagged as unsatisfactory, and credit removed as per the National Environmental Information Exchange Network (NEIEN) reporting protocol.

Methods for Tracking and Verifying Stream Restoration

Stream restoration projects are often implemented with federal cost share. Technical designs and standards are provided through the SCD to the contractor installing the structural or vegetative practice(s). Qualified SCD staff are on-site throughout the construction phase, guided by NRCS's *Engineering Folder Completion Checklist* to ensure all elements of the design and construction are verified and documented. Upon completion of the BMP a final construction review is performed by qualified SCD staff to ensure that the project meets appropriate NRCS standards and specifications. This process is completed for 100% of BMPs and represents initial verification reported through Conservation Tracker.

Documentation of Verification

Once any BMP is designed and installed in accordance with established NRCS standards, trained SCD staff enters appropriate BMP information into MDA's Conservation Tracker system. SCD staff are responsible for the timely submission of data into Conservation Tracker including spatial location of the BMP, extent or amount of BMP installed in NRCS established official unit of measure, date of final inspection performed by qualified SCD staff, and any cost-share sources (state, federal, farmer or NGO).

In addition, MDA Headquarters receives an annual report from NRCS at the conclusion of the state fiscal year of federally funded practices. This report is cross-referenced with Conservation Tracker to confirm all installed practices have been accounted for by MDA.

Independent Verification of Stream Restoration

Re-verification of stream restoration will be tracked in the Conservation Tracker system. A random 10% list will be generated out of the system annually. Trained SCD staff or a member of the proposed BMP Verification Task Force (see Section 2.3) will be responsible for performing an in-field assessment of the BMP to ensure that the practice continues to meet the appropriate NRCS standard and specification. Upon return to the office, the BMP status will be updated in the Conservation Tracker system to indicate a "satisfactory" or "unsatisfactory" condition with appropriate notation. A hard-copy report is also filed in the farm's Conservation Plan folder. If the BMP has been determined to be unsatisfactory, trained SCD staff may assist the farmer to bring the practice back into a satisfactory condition within one year. If repairs are not made within the specified time period, the practice will be flagged as unsatisfactory, and credit removed as per the NEIEN reporting protocol.

Methods for Tracking and Verifying Wetland Restoration

Consistent with most of the Visual Multi-year BMPs, wetland restoration in Maryland is largely implemented through a co-cost share agreement between MACS (State) and USDA (federal) programs. Site eligibility determination is consistent with USDA protocols, and site design and technical specifications are followed by SCD staff according to the NRCS design standards.

Technical designs and standards are provided through the SCD to the contractor installing the structural or vegetative practice(s). SCD staff are guided by two relevant NRCS practice standards, 657 (Wetland Restoration) and 658 (Wetland Creation), Qualified SCD staff are on-site throughout the construction phase guided by NRCS's *Engineering Folder Completion Checklist* to ensure all elements of the design and construction are verified and documented. Upon completion of the BMP a final construction review is performed by qualified SCD staff to ensure that the project meets appropriate NRCS standards and specifications. This process is completed for 100% of wetland restoration projects and represents initial verification reported through Conservation Tracker.

Documentation of Verification

Once any BMP is designed and installed in accordance with established NRCS standards, trained SCD staff enters appropriate BMP information into MDA's Conservation Tracker system. SCD staff are responsible for the timely submission of data into Conservation Tracker including spatial location of the BMP, extent or amount of BMP installed in NRCS established official unit of measure, date of final inspection performed by qualified SCD staff, and any cost-share sources (state, federal, farmer or NGO).

In addition, MDA Headquarters receives an annual report from NRCS at the conclusion of the state fiscal year of federally funded practices. This report is cross-referenced with Conservation Tracker to confirm all installed practices have been accounted for by MDA

All wetland restoration projects implemented under Maryland MACS and USDA co-cost share agreements occur adjacent to agricultural lands and will be reported by MDA through its outlined protocols. MDA staff will coordinate annually with Maryland Department of Environment to ensure no double counting of wetland acres.

Independent Verification of Wetland Restoration

Re-verification of wetland restoration is subject to the MACS annual spot checks as outlined previously. Additionally, USDA contracts for wetland restoration outline required maintenance and operations expectations for the landowner. Such language includes recommended regular site reviews to assess and document the success of the restoration plan. Documentation of these site review findings and any completed MACS annual review will determine if the project status is satisfactory and will serve as re-verification. The BMP status will be updated in the Conservation Tracker system to indicate a "satisfactory" or "unsatisfactory" condition with appropriate notation. A hard-copy report is also filed in the farm's Conservation Plan folder. If the BMP has been determined to be unsatisfactory, trained SCD staff may assist the farmer to bring the practice back into a satisfactory condition within one year. If repairs are not made within the specified time period, the practice will be flagged as unsatisfactory, and credit removed as per the NEIEN reporting protocol.

2.2.1.2 Non cost-shared Multi-Year Visual BMPs

Method for Tracking and Verifying BMPs

In addition to State and/or Federal Cost-share funding to assist in the implementation of NRCS approved BMPs, additional funds may be acquired from other state agencies, NGOs, or the farmer may opt to use their own funds solely. Regardless of the funding source, SCD staff is on-site throughout the construction phase to ensure all elements of the design and construction meet NRCS technical standards and specifications. This process is completed for 100% of structural BMPs at time of implementation and is essentially the same as for those that receive State or Federal Cost-share assistance.

Alternatively, farmers may install BMPs that meet NRCS technical design standards, but the technical assistance was not provided by the SCD staff. Under these circumstances, BMPs may still receive water quality credit according to the CBPO's protocol for reporting and tracking non cost shared BMPs. These practices are generally self-reported to the SCD or documented by SCD staff during farm visits. Regardless of how they are initially implemented, all non-cost shared Multi-Year BMPs are subject to initial verification before being reported through Conservation Tracker.

Consistent with the CBPO protocol, MDA has developed the Non-Cost Shared Best Management Practice and Resource Improvement Practice Verification Procedures Manual (Appendix A) which provides guidance in the initial verification of non-cost shared BMPs that meet NRCS standards and specifications. As described in the manual, trained SCD staff performs an in-field site evaluation of the BMP to ensure that the appropriate NRCS standards and specifications have been satisfied.

Verification Team

As with cost-shared visual multi-year BMPs, the SCD is the lead partner in delivering non cost-share programs in Maryland. Regardless of the funding source, SCD staff is on-site throughout the construction phase to ensure all elements of the design and construction meet NRCS technical standards and specifications. Trained SCD staff performs an in-field site evaluation of the BMP to ensure that the appropriate NRCS standards and specifications have been satisfied. BMPs that were installed by farmers without SCD technical assistance but meet NRCS technical design standards are generally self-reported to the SCD or documented by SCD staff during farm visits.

Documentation of Verification

The SCD staff completes a *Non-Cost Shared Best Management Practice Initial Verification Report* to document the site visit. Upon return to the office, SCD staff is responsible for the timely submission of data into Conservation Tracker including spatial location of the structure, extent of the structure, date of installation, and cost-share sources if any. The BMP is reported in Conservation Tracker and hard-copy report(s) are filed in the Conservation Plan Folder for the farm.

If a BMP is part of the random 10% to be re-verified, a *Non-Cost Shared Best Management Practice Verification Report* will be completed to document the current status of the project. The BMP status will be updated in the Conservation Tracker system to indicate a "satisfactory" or "unsatisfactory" condition with appropriate notation. The hard-copy report is also filed in the farm's Conservation Plan folder.

Independent Verification

Re-verification of Non-Cost shared Multi-Year Visual BMPs will be tracked in the Conservation Tracker system. A random 10% list will be generated out of the system annually for re-verification. Trained SCD staff or a member of the proposed BMP Verification Task Force (see Section 2.3) will be responsible for performing an in-field assessment of the BMP to ensure that

the practice continues to meet the appropriate NRCS standard and specification. If the BMP has been determined to be unsatisfactory, or not meeting the appropriate NRCS standards and specifications, trained SCD staff may assist the farmer to bring the practice back into a satisfactory condition within one year. If repairs are not made within the specified time period, the practice will be flagged as unsatisfactory, and credit removed as per the NEIEN reporting protocol.

2.2.1.3 Resource Improvement (RI) Visual Multi-Year BMPs

Method for Tracking and Verifying RIs

Structural BMPs installed by farmers without cost-share assistance and without SCD assistance that provide similar annual environmental benefits for water quality but do not meet all the design criteria of existing NRCS standards are known as Resource Improvements (RIs). Preliminary surveys of RIs in some Maryland counties (e.g., Howard and Baltimore) revealed an extensive number of RIs on the agricultural landscape in Maryland. While record keeping availability on the timing of RI installation can be challenging, it is agreed by the CBPO that these practices provide water quality benefits and should be credited toward WIP progress. As a result, the CBPO has approved a separate but concurrent process to identify and document RI existence. Identification of RIs would generally occur during on-site farm inventories by SCD staff. Maryland SCD staff will initially verify 100% of identified RIs by performing an on-site evaluation of the practice and completing an appropriate Visual Indicator Checklist.

Verification Team

Maryland SCD staff will be the lead partner in identifying and tracking RIs according to the Non-Cost Shared Best Management Practice and Resource Improvement Practice Verification Procedures Manual. This manual, in addition to training materials and training workshops, was rolled out in June 2015 and includes Visual Indicator checklists that qualified SCD staff can use to assess the functionality of a potential RI.

Documentation of Verification

If an RI meets the defined requirements of the Visual Indicator checklist, SCD staff would record the spatial location of the structure, extent of the structure, and date of installation into the MDA Conservation Tracker system. The RI would be noted as Farmer Installed in Conservation Tracker. In addition to entry into Conservation Tracker, a hard-copy report is filed in the Conservation Plan Folder of the farm.

After re-verification, the RI status will be updated in the Conservation Tracker system to indicate a "satisfactory" or "unsatisfactory" condition with appropriate notation. The hard copy report is also filed in the farm's Conservation Plan folder. As mentioned above, if repairs are not made within the specified time period, the practice will be flagged as unsatisfactory, and credit removed as per the NEIEN reporting protocol.

Independent Verification

RI practices will be re-verified at a more frequent interval than other BMPs since their design may not be as extensive as similar NRCS practices. Re-verification intervals have been established and documented in the Non-Cost Shared Best Management Practice and Resource Improvement Practice Verification Procedures Manual. MDA will generate a random 20% list of RI practices that will be subject to an in-field re-verification by trained SCD staff or BMP Verification Task Force member (see Section 2.3). Re-verification will follow the approved Visual Indicator checklist to assess the continued water quality functionality of the RI. If the RI has been determined to be unsatisfactory, trained SCD staff may assist the farmer to bring the practice back into a satisfactory condition within one year. If repairs are not made within the specified time period, the practice will be flagged as unsatisfactory, and credit removed as per the NEIEN reporting protocol.

2.2.2 Quality Assurance to Verify and Track Visual Single Year BMPs

2.2.2.1 Tillage Practices

Conservation Tillage (> 30% residue cover) and High Residue Minimum Disturbance (> 60% residue cover) are popular agronomic practices in Maryland, implemented without cost share assistance or by regulatory requirement. Maryland currently uses the Nutrient Management Annual Implementation Reports (AIRs) to document these BMP acres. The AIR is a regulatory requirement under Maryland's Nutrient Management Program that is signed under penalty of perjury by the farm operator/owner who details several elements of the farming operation. The AIR is mailed in January of each year with a required response date of March 1. An accompanying instruction form is also provided to assist farmers in accurately completing this report.

While verification at the 100% threshold is infeasible, Maryland is pursuing multiple methods to verify the extent of these tillage practices:

1. Utilizing remote sensing capabilities in partnership with USDA-ARS Hydrology and Remote Sensing Lab and USGS;
2. Utilizing existing tillage surveys conducted annually by the Maryland NASS office and surveys conducted through the national public-private partnership Conservation Technology Information Center (CTIC, http://www.ctic.purdue.edu/CRM/);
3. Continue using the AIR reported acres of conservation tillage and high residue minimum disturbance with at least 10% of operations verified during annual Nutrient Management Program Plan Implementation Evaluations; and
4. Initiate reporting of annual agronomic practices such as tillage in Conservation Tracker by SCD staff, similar to the reporting and tracking of structural practices. Document reduced tillage through SCD staff verification of conservation tillage (NRCS 345) and high residue minimum disturbance (NRCS 329) during on-site farm inventories as part of a comprehensive SCWQP effort.

2.2.2.2 Cover and Commodity Crops

The MDA Cover Crop program provides cost share incentive for farmers to plant winter cover crops immediately following a harvest of corn, sorghum, soybean, vegetables, or tobacco to mitigate leaching of excess nitrogen into the soil profile. The Cover Crop program follows a strict protocol for NRCS planting standards, cost share structure, and verification.

Farmers are required to fall certify cover crop acres planted within 7 days of the planting deadline. Since they may be eligible for planting incentives based on early planting dates, the fall certified fields must be planted in accordance with up to three deadlines. The program is administered at the field level by SCD staff where 100% of contracts are reviewed and verified by staff. Additionally, SCDs conduct follow-up field checks on at least a random 20% of acres of cover crops that are certified as being planted for 100% of participants who fall certify. If participants fall certify for more than one planting date, a random 20% of the acres for each planting tier are checked so the participant may have multiple field checks on any given farm. If any issues arise with the participant's 20% field check, the SCD then expands the field check to include all the participant's certified acres. An additional field check of 20% of the active agreements in each district is done in late February/March using a list that is randomly generated by the MACS office. These checks require that SCD staff check at least 1 field for that applicant that was not checked in the fall. These are also done prior to kill down of the cover crop. MDA also reserves the right to have the SCD's verify kill down if the need arises. All in-field verification of cover crop implementation is recorded on the Fall/Spring Certification form (Appendix A) associated with the contract. Unsatisfactory reviews are entered into the MACS Cover Crop database and the cooperator's account is flagged as being out of compliance with the program. Should the unsatisfactory condition remain unrectified, the cooperator is subject to contract cancellation and forfeiture of any cost-share payment.

2.2.3 Quality Assurance to Track and Verify Non-Visual Single Year Practices

2.2.3.1 Dairy Precision Feed Management

MDA has worked with our local Soil Conservation Districts to survey and capture data related to MUN (Milk Urea Nitrogen) averages, amount of milk shipped, number of cows milking, and the breed of cows on farm in order to report implementation of the dairy precision feed management practice, by animal units addressed. The questions below were asked of Maryland dairy producers, and captured through completion of these forms, to be entered in our Tracking system. Trained staff verified the acceptable MUN range was met, and those operations meeting the acceptable range had AUs reported for nitrogen reductions. No phosphorus data was requested, and no operations not meeting the acceptable MUN range were reported to NEIEN. The acceptable MUN range used in NY was also confirmed with UM Extension to ensure relevance to Maryland. The data collected demonstrates the reduction of the quantity of nitrogen fed to livestock by feeding them formulated diets.

Survey Questions

September 18, 202X

The [XXXX] Soil Conservation District, in partnership with the Maryland Department of Agriculture, is seeking to collect information from farms to document Precision Feed Management occurring on our local farms. This information is for voluntary purposes only but is used to demonstrate Maryland's progress toward our nutrient reduction goals for the Chesapeake Bay. **The information we are collecting are simple numbers that will help us show that farms are not over applying or overusing nutrients in the watershed.** No individual information about your farm or operation will be shared outside the Soil Conservation District or Maryland Department of Agriculture.

Responses to the Soil Conservation District **by October 27** are appreciated.

First the MUN (milk urea nitrogen) number, we need the date and number of your last 4 MUN.

Date_____MUN_____

Date_____MUN_____

Date_____MUN_____

Date_____MUN_____

Second Number of milking cows going into the tank (just cows being milked no dry cows) _____

Third is amount of milk recently shipped? _____ Is milk shipped daily or every other day pick-up?_____

Fourth is type of cows and % (i.e. Holstein 100%, Holstein 80%-jersey 20%)
_____

Farm Operation Name:_____ County _____

Thank you again for your help and if you have any questions feel free to call the [XXXX] Soil Conservation District office.

S
C

FOR DEPARTMENT USE ONLY:
Reviewed by: _____ Date: _____
Operation Meets the Recommended range and ration of N for the herd? Yes No
If Yes, number of animals to be reported _____

aff, please forward completed surveys to MDA, Attention: Alisha Mulkey

2.2.3.2 Agricultural Nutrient Management

The Maryland Water Quality Improvement Act of 1998 requires farmers with gross annual incomes of $2,500 or more, or livestock operations with 8,000 pounds or more of live animal weight to manage their nutrient applications in accordance with farm-specific Nutrient Management Plans (NMPs) that protect waterways from excess crop fertilizers and animal waste according to MDA's Nutrient Management regulations. NMPs are valid for three years and must be prepared by certified professionals. When an operation becomes subject to MDA's Nutrient Management regulations and an initial NMP is submitted along with a New Plan Reporting Form. These documents are reviewed by regional MDA staff to assure plans are prepared in accordance with appropriate requirements. If the review determines the plan is inadequate, the farmer is notified and must work with the NMP consultant to correct all identified deficiencies. This review constitutes 100% verification of acres subject to Maryland's Nutrient Management regulations. Plans can be prepared by the farmer (with technical assistance from a University of Maryland Extension expert) or consultants, but plans can only be prepared by those that have been certified (farmer or consultant). Consultants who do not prepare the plans properly risk losing their licenses.

Subsequent compliance with NMPs is verified by multiple methods and maintained in a separate MDA database for regulatory compliance. Nutrient management implementation in the agricultural sector is tracked to comply with multiple regulatory requirements:

- Farmers submit an initial NMP to MDA written by a certified nutrient management planner.
- Farmers must submit an Annual Implementation Report (AIR) to MDA by March 1 for the previous calendar year. The AIR notes any changes to the operation, crops grown, fertilizer use, acreage managed, animal production, etc.
- Farmers are responsible to keep prescribed records of nutrient inputs and outputs.

Upon receipt at MDA, all submitted AIRs are reviewed for completion and compliance with Nutrient Management regulations. Errors or concerns with the AIRs can result in an on-site review of the operation by MDA regional staff. Additionally, operations can be randomly selected for review to ensure Nutrient Management compliance. In both instances, the process is known as the Plan Implementation Evaluation (PIE) (Appendix A) review. On-site field inspections of NMPs started in 2005 and MDA staff strives to complete a minimum of 10% plan inspections per year. The strategy for identifying farms to inspect is weighted toward those operations considered to have the greatest risk for water quality impacts, i.e. primarily operations managing manure. For the operations selected, farmer's records of crops grown and

nutrients applied are compared to the NMP. The farmer is required to maintain records documenting the rate, timing, and method of nutrient applications, as well as crop yields. Farmer requirements are included in the *Maryland Nutrient Management Program Plan Implementation Review Process for Operators,* which is available to all farmers and prepared by the MDA Office of Resource Conservation. A multi-part Nutrient Management Program PIE report is prepared to document the review and serves as the compliance enforcement notification when certain deficiencies are noted in the review. Any problems noted during the review requires notation on the PIE form and a follow- up review. The timing of the follow-up review depends on the deficiency noted. Failure to correct the deficiency within the allotted time warrants further enforcement action, including fines. All information gathered during the PIE review and results are subsequently entered into the Nutrient Management database.

MDA demonstrates progress towards WIP Nutrient Management goals through operational information provided in the AIRs and NEIEN submitted acreage is reduced by an amount equal to the compliance rate achieved through the PIE reviews (Table 2-4). The rationale is the AIR should reflect the operation's compliance with Nutrient Management regulations, as detailed by the farmer's NMP, whereby PIE reviews provide on-site inspections to verify compliance.

Table 2-4. Annual Nutrient Management Performance and Verification

State Fiscal Year	No. of Site Inspections	Acreage Reviewed on Site Inspection	Percent Inspections In-Compliance
2008	450	--	65%
2009	400	101,500	69%
2010	412	168,117	62%
2011	450	97,533	70%
2012	647	151,740	69%
2013	738	177,030	73%
2014	733	177,030	66%

MDA will continue to utilize the AIRs as the primary source of reported acres re-emphasizing that AIRs are a regulatory requirement, not a voluntary survey, subject to legal enforcement. Concurrently, MDA is initiating efforts to improve the data quality of the AIRs and public understanding of Nutrient Management regulations. These efforts include: 1) a revised 2014 AIR form with clarified questions and sections; 2) MDA presentations at Nutrient Management and University of Maryland Extension events as outreach opportunities to increase awareness of AIR importance; and 3) increased coordination between the MDA WIP staff and the MDA Nutrient Management staff to accomplish program goals

2.2.3.3 Urban Nutrient Management

The Maryland Fertilizer Use Act of 2011 regulates the use of fertilizer on turf for non-agricultural purposes. All persons employed to apply fertilizer on non-agricultural turf must be certified and licensed by MDA. A commercial application for the amount and form of nitrogen fertilizer that may be applied in a single application to lawn is limited. The annual total amount of fertilizer applied may not exceed the most recent University of Maryland Extension

recommendations. Professionals may not apply fertilizer containing nitrogen or phosphorus to lawns between December 1 and March 1. Setbacks of 10-15 feet exist next to waterways, depending on the type of equipment used. Fertilizer containing phosphorus may not be applied to lawns unless a soil test indicates that it is needed or the lawn is being established, patched, or renovated. In addition, if fertilizer lands on an impervious surface, it must be swept back onto the grass or cleaned up. For homeowners, the law encourages the use best management practices such as mowing the grass high to shade out weeds and leaving grass clippings on the lawn to provide free fertilizer. Additionally, beginning in 2014, MDA is requiring Annual Fertilizer Application (AFAR) reports to be submitted by March 1 each year.

Upon receipt at MDA, all submitted AFARs are reviewed for completion and compliance with Nutrient Management regulations. Errors or concerns with the AFARs can result in an on-site review of the operation by MDA staff. Additionally, operations can be randomly selected for an on-site review to ensure Nutrient Management compliance. A report is prepared to document the review and serves as the compliance enforcement notification when certain deficiencies are noted in the review. Any problems noted during the review require a follow-up review. The timing of the follow-up review depends on the deficiency noted. Failure to correct the deficiency within the allotted time warrants further enforcement action, including fines.

MDA demonstrates progress towards WIP Urban Nutrient Management goals through operational information provided in the AFARs and NEIEN submitted acreage is reduced by an amount equal to the compliance rate achieved through the on-site reviews. The rationale is the AFAR should reflect the operation's compliance with Nutrient Management regulations as verified by inspections.

2.2.3.4 Manure Transport

MDA has developed inspection and verification of program compliance procedures for the Manure Transport Program to ensure the generating and receiving operations are eligible for cost-share assistance. Procedures cover activities at the application stage to verify the eligible distance for transporting manure, compliance with applicable nutrient management regulations, and eligible acreage for manure application. Subsequent procedures track and verify the chain of custody of the manure transport to ensure compliance with the initial approval and process the claim reimbursement.

Manure receiving operations are also subject to onsite farm reviews, upon transport, on a) receiving operation utilization of manure transported is consistent with the nutrient management plan; b) crops or crop residue in a field are consistent with the nutrient management plan; c) "Delivery Site Guidelines" or "Stockpiling Guidelines" have been followed or are being followed and d) any residual manure will not cause any water quality concerns. If the applicant fails to comply with program guidelines, follow up action is taken by requiring corrective actions, possible exclusion from future participation, liability for funds paid, and referral to the Nutrient Management Implementation team for compliance enforcement.

2.2.3.5 Manure Injection/Incorporation (interim practice)

Since January 2014, MDA regulations have required, with limited exceptions, the injection or incorporation of all organic nutrient sources within 48 hours of application and have limited the timing of application to minimize nutrient losses. Currently these BMP efforts are not credited by the CBPO towards WIP progress but are under review for inclusion.

MDA tracks the acres of cropland practicing manure injection or incorporation through its AIRs. Subsequently, verification and enforcement of manure injection or incorporation is confirmed through the NM PIE reviews described above. The PIE reviews provide an on-site field inspection focused on reviewing the records and conditions of the operation, consistent with the NMP and Maryland NM regulations. Historically the PIE review process has focused on identifying those operations considered to have the greatest risk for water quality impacts, i.e. primarily operations managing manure. As a result, many of the 2014 reviews noted in Table 2-4 were animal operations subject to the manure incorporation requirements. A multi-part Nutrient Management Program PIE report is prepared to document the review and serves as the compliance enforcement notification when certain deficiencies are noted in the review. Any problems noted during the review requires notation on the PIE form and a follow-up review.
The timing of the follow-up review depends on the deficiency noted. Failure to correct the deficiency within the allotted time warrants further enforcement action, including fines. All information gathered during the PIE review and results are subsequently entered into the NM database.

If and when manure incorporation and injection BMPs are approved for WIP progress, MDA will continue to utilize the AIRs to track annual acres of the practice coupled with the PIE review process to determine any compliance concerns specific to this regulatory requirement. Acres submitted for WIP credit would be adjusted accordingly.

2.2.3.6 Cropland Irrigation Management

MDA traditionally relied upon cropland irrigation estimates as reported through the USDA National Agricultural Statistics Service (NASS) Agriculture Census. Recently, MDA modified the Nutrient Management Annual Implementation Report to include the reporting of irrigation practices annually. It is MDA's intent to continue to utilize the AIR as a primary mechanism for reporting irrigation management as the AIR submission is a regulatory requirement.

MDA staff is also coordinating with the MDE Division of Water Supply concerning cropland irrigation management. Operators subject to irrigation permit issuance from MDE are required to submit annual reports of water withdrawal (gallons per month). Reports are maintained in a central MDE database with limited spatial attributes. Per conversations with the MDE Division of Water Supply Management, reporting records could be shared with MDA to substantiate the extent of crop irrigation, and as a cross-reference to acres of cropland irrigation reported through the MDA AIR process.

2.3 BMP Verification Task Force

In addition to Spot-Checks performed under the MACS Program, MDA proposes to establish a BMP Verification Task Force of five employees whose primary focus would be BMP re-verification. These employees would be an independent review team that reports directly to the Watershed Implementation Program outside the purview of the SCD offices. This would allow for a complete independent review of BMP implementation thereby eliminating any potential conflict of interest associated within an SCD office.

Each BMP Verification Task Force member would be responsible for a specific region of the state, coordinating directly with MDA Headquarters, to develop lists of BMPs eligible for re-verification. As with SCD staff, each member would be trained in the evaluation of BMP implementation to ensure that they are knowledgeable in the appropriate NRCS standards, specifications, and maintenance requirements associated with the BMPs they are tasked with re-verifying.

Re-verification of Visual Multi-Year BMPs will be managed like the MACS spot-check process described above and will complement MACS re-verification efforts. A report will be generated from Conservation Tracker which identifies 10% of each BMP type that are subject for review by the Task Force. The Task Force member will notify the appropriate SCD office to obtain all necessary information regarding the identified BMP, including but not limited to the latest Soil Conservation and Water Quality Plan, Plan Map, and NRCS Implementation Requirements and Certification (Job Sheets) for the associated BMP.

Once appropriate BMP documentation is obtained by the SCD, the Task Force member will review the documentation and schedule a review through the SCD with the cooperator. An in-field evaluation of the BMP is then performed by the Task Force member to ensure that all NRCS standards, specifications, and maintenance guidelines are still being met in accordance with the Soil and Water Conservation Plan. Results of the evaluation are recorded on a Watershed Implementation Program Re-Verification Form (*under development*). Upon return to the office, results are recorded into Conservation Tracker and a copy of the evaluation form is sent to the local SCD office.

The BMP Verification Task Force members will be responsible for data entry and quality assurance. Once assessed, the BMP status will be updated in the Conservation Tracker system to indicate “satisfactory” or “unsatisfactory”, where those practices assessed as satisfactory will be eligible for re-verification again over the next credit duration and will be submitted through NEIEN protocols. Practices assessed as unsatisfactory will be removed for credit through the NEIEN protocol.

To successfully implement an independent BMP Verification Task Force, a dedicated funding source is vital to provided necessary resources. MDA estimates of annual expenditures are attached to this document. As BMP verification is a key component in the accurate accounting of annual implementation, additional financial support provided by USEPA through CBRAP will be required.

2.4 Personnel Qualifications and Training

2.4.1 SCD Staff

As previously indicated, Soil Conservation District (SCD) staff serve as the primary contact point with Maryland's agricultural cooperators to promote and administer BMP implementation via a comprehensive resource assessment included in the SCWQP. SCD staff includes trained conservation planners, technicians, and engineers that have formal education, experience, or a combination of both in the agronomic sciences consistent with our federal partner NRCS's national directive for delivering SCWQP assistance. Once hired, NRCS use a formalized on-job training process known as Essential Knowledge, Skills, and Abilities for achieving Level I and Level II Planner certifications with comparable procedures for technician and engineering staff. Continuing education training is required to maintain Planner certification. Promotion to Level I and Level II Planner certification also requires a formal review and documentation of SCD staff proficiency.

NRCS technical standards are used as a basis for technical adequacy and NRCS provides technical oversight for practice design and implementation to ensure consistency in interpretation and application of conservation practices. Additionally, throughout the conservation planning process multiple levels of review and approval in the planning, design and construction exists. For example, detailed job approval authorities outline the levels of work and expertise that are needed in each phase of the planning, design and installation. Quality assurance is provided by the multiple levels of review and approval within approved job approval levels.

In addition to formal NRCS training and certification, SCD staff are also required to take specific MDA-provided training in the evaluation and certification of Resource Improvement Practices. MDA also conducts annual refresher training in the proper use of Conservation Tracker to ensure consistent data reporting throughout the State.

2.4.2 NM Staff

Nutrient Management staff employed by MDA have prior experience (educational, professional, or both) that qualifies them to implement Maryland's Nutrient Management regulations. All individuals must achieve Nutrient Management certification within one year, if not completed prior to hiring, and are subject to Continuing Education Unit requirements throughout the calendar year to maintain certification. Staff are assigned regional territories,

including being located at central field offices, to provide proximity and flexibility to implement Maryland's Nutrient Management program.

2.4.3 BMP Verification Task Force

Individuals hired for the BMP Verification Task Force will have training and certification consistent with certified verifier's roles under Maryland's Agricultural Certainty Program. A certified verifier is "an individual certified by the Department...to review, inspect, and evaluate conditions, records, and management of an operation." Eligibility requirements include 1) 3 or more years' experience in developing SCWQPs or qualified as an NRCS Level II Planner;2) certification in Maryland to prepare NMPs; and 3) certification in the use of the Maryland Nutrient Trading Tool (including training and passing a competency test).

2.5 Data Validation

MDA utilizes a centralized ORACLE® Relational Database Management System to store program records. Records include ownership, farm information, watershed information, practice information, requested cost share information, and expected costs and design information if needed.

Additional details about MDA's program-specific databases are provided below.

2.5.1 Conservation Tracker

Maryland's Conservation Tracker Program is an integrated database management system designed to track agricultural conservation implementation in Maryland. This system allows for the accurate assessment of all conservation activity, regardless of funding source, in meeting the Chesapeake Bay TMDL as prescribed in Maryland's WIP. MDA provides information on programs and BMP implementation to the Chesapeake Bay Program Office via the National Environmental Information Exchange Network (NEIEN).

Conservation data are collected locally by SCD staff from information maintained in farm-specific Soil Conservation and Water Quality Plans. Once collected, SCD staff are responsible for the timely reporting of this data using a local Conservation Tracker terminal.
Conservation data obtained using Conservation Tracker are reviewed and verified for conformation to program requirements and validated using data quality objectives established by MDA Office of Resource Conservation Operations. Only data that are supported by appropriate quality control criteria and meet the data quality objectives will be considered acceptable for reporting.

Data validation occurs at the time of entry into the Conservation Tracker System through the extensive use of field validations, including table lookups, formulas, and data-type restrictions. Once processed in the database, MDA generates various quality control charts and reports on a quarterly basis to identify potential data quality issues. Evaluation and verification of any data issue is resolved locally by SCD staff.

Data entered into Conservation Tracker are stored centrally at MDA and are maintained and backed-up nightly per MDA Information Technology Department Standard Operating Procedures.

2.5.2 MACS Program

The SCDs promote and administer the MACS programs locally. Trained staff assist potential participants in applying for cost share and act as the liaison to assure that all applicant information required for processing the request is provided. The SCDs forward the information to the MACS office (MDA headquarters) and within 30 days of receipt of a complete application, the SCD is notified if the applicant is eligible for cost share. Applications submitted for MACS cost share are reviewed to ensure that the practices are needed, there is a positive environmental impact, and that the limits and parameters outlined in state law and regulations and per practice criteria as delineated in the MACS Manual are met. Applications are reviewed by trained qualified professionals and if the criteria are met they are approved for submission to the Board of Public Works for funding approval. The Board of Public Works consists of the Governor, the Comptroller, and the Treasurer of the State of Maryland. Upon their approval the applicant is informed they may proceed with the planning, design, and construction of the BMP. Additionally, MDA staff conducts cross compliance checks between nutrient management compliance and applications for MACS cost share programs. Farmers who are out of nutrient management compliance or have not submitted required nutrient management documentation are not eligible to participate in state incentive programs. Farmers who receive financial assistance for agricultural waste management BMPs must have their nutrient management plan reviewed and approved by nutrient management staff prior to receiving payment. Data on submitted MACS applications are recorded in a database maintained by MDA. The data are initially entered by one MACS staff specialist and are reviewed by a second MACS specialist as they move through the review and approval process. Outside sources of information are utilized to assure accurate and correct information. Information sources used for verification include tax maps, watershed maps, and aerial photography.

Data entered into the MACS database are stored centrally at MDA in an ORACLE® relational database management system (RDBMS) and are maintained and backed-up nightly per MDA Information Technology Department Standard Operating Procedures.

2.5.3 Data Submission

As the lead agency for the agricultural sector in Maryland, MDA tracks and reports agricultural BMP implementation annually to the CBPO through NEIEN, the node of which is managed by the Maryland Department of the Environment. The established reporting protocol (Figure 2-1) involves a manual transfer of data to the Maryland Department of Environment utilizing a pre-formatted spreadsheet.

The MDA's implementation tracking data currently includes data from MDA's Conservation Tracker and Nutrient Management Program databases, which together capture agricultural

BMP implementation regardless of funding source.

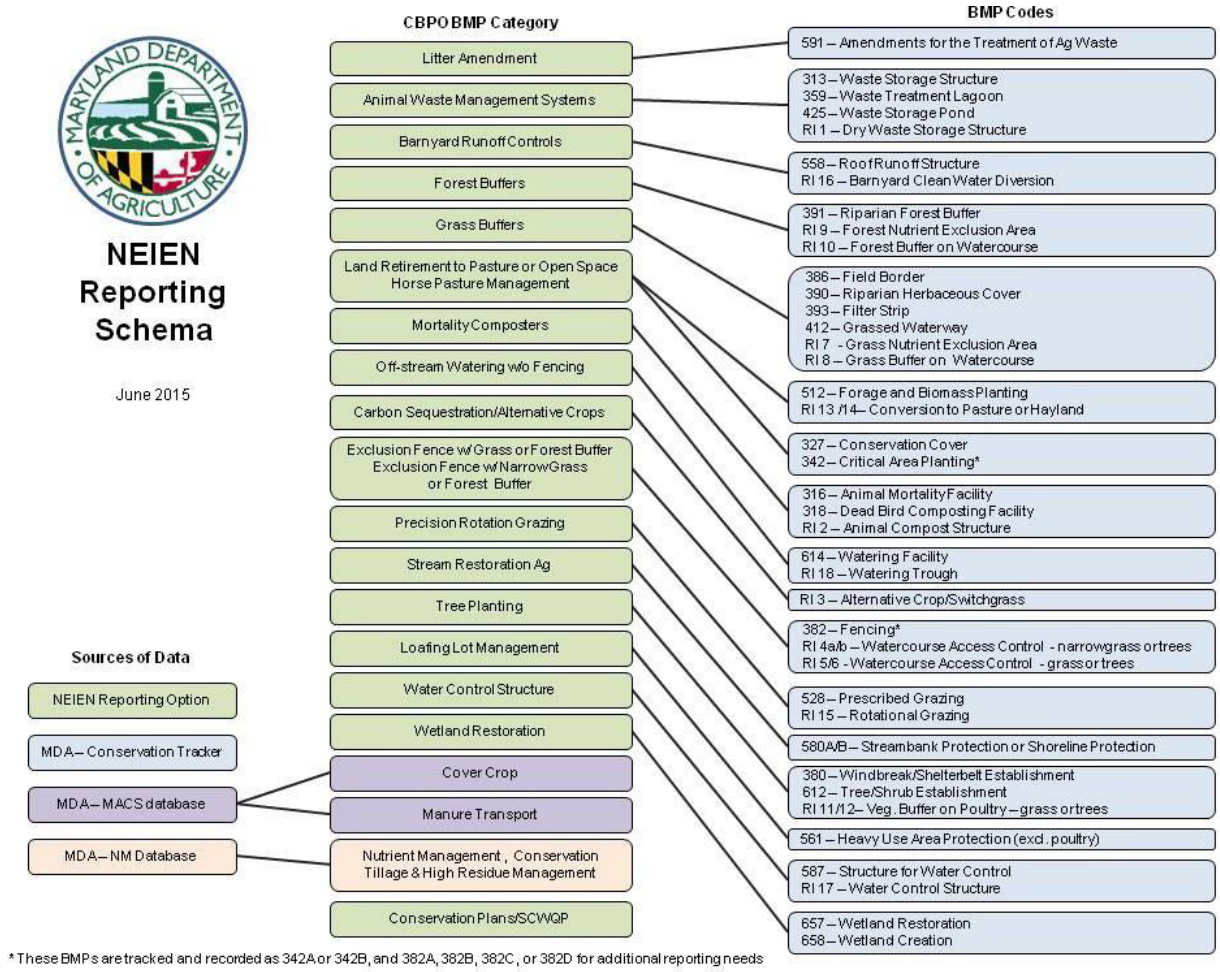

Figure 2-1. Flow Diagram of Data Systems and Reporting Protocols for Agriculture BMP Implementation.

The NEIEN is a partnership between the Bay jurisdictions and the CBPO for the secure, real-time exchange of BMP implementation information. NEIEN uses extensible markup language (XML), web services for geo-location, and common data standards to transmit data from the jurisdictions to the CBPO. Existing data management systems can remain in place and through the Network data are transferred based on strict formatting methods, or a schema.
The schema in use contains fields such as jurisdiction, data source, contact information, name of practice, practice components, unique ID for practices, location, unit of measure, quantity, status, and funding source.

BMP data are submitted on an annual or more frequent basis from MDA to MDE as part of a program to disseminate this data from agriculture-related sectors. The data are sent via electronic mail in MS Excel spreadsheets to MDE's Water and Science Administration (WSA). WSA converts the data into a single database with a consistent format that conforms to the rigors demanded by the NEIEN, which began accepting data in 2010. Once SSA receives the BMP data from MDA, it conducts several formatting tests to make sure the information provided is consistent with previous NEIEN submission formats to assure successful conversion into an XML

document, and acceptance by the CBPO node. MDE-WSA personnel test submissions received by MDA immediately after receipt. If there are non-conforming data, WSA reports results back to MDA for further modification until the deadline for submission is met. The NEIEN submission is verified by CBPO by sending out a summary of acceptance of the individual BMP types when processed by its Scenario Builder tool. MDA then can review and update the submission prior to finalizing the annual submission. The exchange data provided contains projects that were implemented between July 1 and June 30 of each calendar year, corresponding to the State fiscal year.

2.5.4 External Data

Data are collected by farmers, SCDs, and MDA and provided to MDE as described above.

3 Forestry

This section describes the data sources, verification, and validation protocols for forestry-related BMPs reported by the State of Maryland to the Chesapeake Bay Program. Data are grouped by BMP type into four categories including: forest conservation, riparian forest buffers, upland tree planting, and forest harvest. Watershed Implementation Plan priority is based on the relative contribution of the BMP to the overall acreage reported for credit.

Reporting on forestry practices is derived from reporting systems developed and used by the Maryland Department of Natural Resources (DNR) for the Forest Conservation Act, the USDA Forest Service performance reporting, dedicated riparian forest buffer reporting forms, and sediment and erosion control plans required for forest harvesting. Figure 2-1 presents a flow diagram of the path forestry BMP data take to get to the Chesapeake Bay Program. This reporting system is described in greater detail in the following sections.

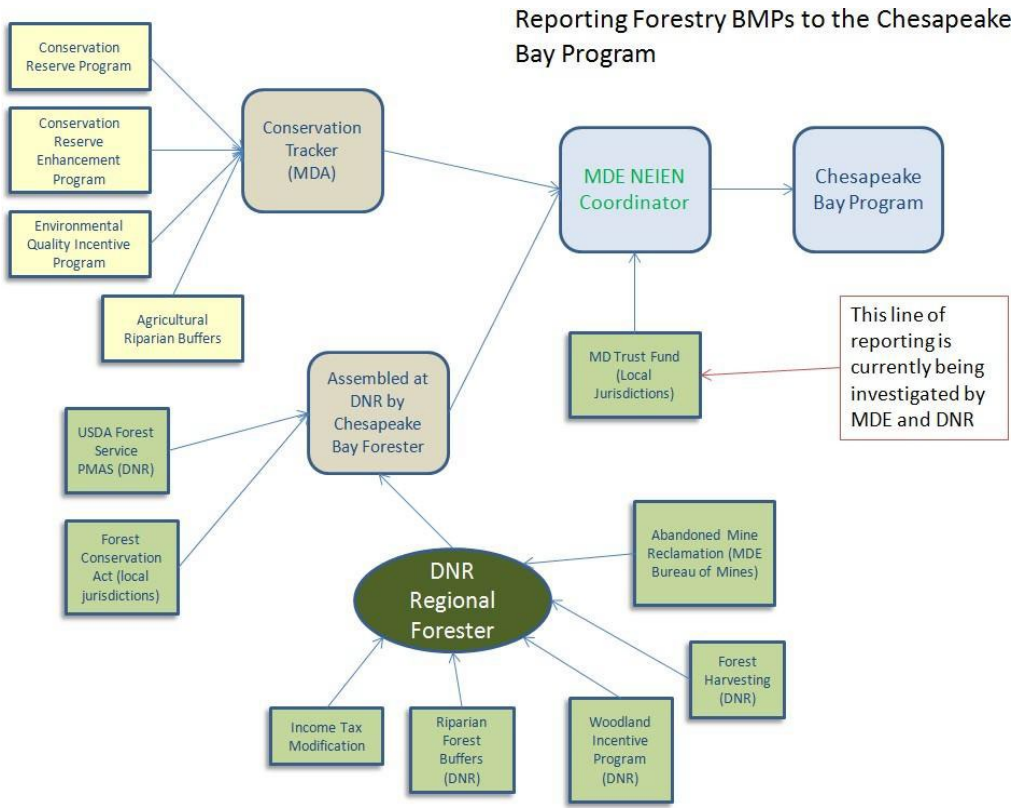

Figure 3-1. Flow Diagram of Data Systems and Reporting Protocols for Forestry BMP Implementation**.**

3.1 Forest Conservation

BMP Definition: Acres of existing forest that are placed under permanent agreement (easement or deed restriction) to remain in forest land use.

Verification and validation procedures for forest conservation practices are summarized in Table 3-1 and outlined in detail in the following section.

Table 3-1. Forest Conservation Verification Protocol Design Table Summary

Verification Element	Description	Description
BMP or Group	Forest Conservation	Forest Conservation
Geographic Scope	Statewide	Statewide
A. WIP Priority	Low	N/A
B. Data Grouping	Forest Conservation	Forest Conservation
C. Sub-grouping	Forest Conservation Act (FCA)	Land Acquisition and Planning
D. BMP Type	Land Use	Land Use
E. Initial Inspection		
Method	Review of land development application	Visual and GIS-based
Frequency	100% where legally required	100%
Who Inspects?	Local FCA Program Coordinator, verified by state Urban Forester	Various; MD DNR or local conservation NGO employees
Documentation	Approved development plan, stand delineation document, summaries in FCA database	Stewardship Assessment Form; Land conservation easement.
F. Follow-up Check		.
Method	Visual and aerial photos	Visual. 100 %; Annual; Various; MD DNR or local conservation NGO employees; Monitoring report.
Completeness; Frequency	Varies by jurisdiction Typical practice is 100%; minimum 3-year intervals	
Who Inspects?	Local planning department	
Documentation	Inspection form, or record in electronic database	
G. Response if Problem	Work with landowner to bring back into compliance	Work with landowner to bring back into compliance; fines or other legal action possible.
H. Lifespan/Sunset	No sunset - permanent protection	No sunset - permanent protection
I. Data QA, Recording & Reporting	FCA Database - summary sent to MDE	FCA Database - summary sent to MDE

3.1.1 Forest Conservation Data Verification

Method

Currently, Forest Conservation Act (FCA) reporting is the sole source of forest conservation data reported by the Maryland Department of Natural Resources Forest Service for BMP credit in the Chesapeake Bay model. Data are generated at the local level (i.e., by counties and some municipalities) by licensed professional planners and foresters from scaled drawings and maps, which are considered to be accurate to the nearest acre. Data are documented in approved development plans held by the local planning department. A small proportion of annual FCA activity occurs at the state level. In this case, data are generated by each of the four regional urban foresters (MD DNR Forest Service) for their respective regions.

Verification Team

Jurisdictions are required, by statute, to submit annual summaries of FCA activities for the previous fiscal year to the Central Region Urban Forester (MD DNR Forest Service). The Central Region Urban Forester verifies all data for completeness and does not accept data if acreage reports are incomplete.

Documentation of Verification

Annual data summaries are maintained in a central electronic FCA database that is backed-up on the Department of Natural Resources server.

Independent Verification

There is currently no independent verification system in place for FCA activities.

3.1.2 Forest Conservation Data Validation

Quality Assurance

In contrast to many BMPs, forest conservation is unique because these lands have fully developed ecological function that supports high water quality. Easement encroachment and/or unapproved forest clearing are the primary concerns for conserved forest. Many local jurisdictions monitor FCA easements at a minimum of 3-year intervals and visits are frequently documented through inspection reports or comments in an electronic database. Only a few jurisdictions do not have the capacity to monitor easements on a regular basis.

Data Entry

The FCA Coordinator sends out requests for data annually to local jurisdiction FCA contacts. Jurisdictions supply the required data in hard copy or electronic form to the Central Region Urban Forester. Typically, data are supplied by the planning department with professional staff and are summed from forms that ask for the required information with each plan submission. The Central Region Urban Forester sums the data, organizes it into a summary table, and supplies the tabular information as a digital spreadsheet to the FCA Coordinator. The Urban Foresters for each of four regions sum the acreages of conserved lands on state land projects within their regions and submit the regional summary to the Coordinator for statewide tables.

Separate tables are prepared for Counties, Municipalities, and State Land Projects. Analysis for reporting consists of simple summation, typically done in spreadsheets, which avoids mathematical error and allows for quick review for data accuracy (no extra digits, double entries, etc.). Data are routinely backed up on the Forest Service central server. Digital data and map shapefiles have been collected since 2010. Methods vary by jurisdiction. These data are assembled at DNR by the Chesapeake Bay Forester and then provided to MDE's NEIEN coordinator for submittal to the Chesapeake Bay Program (see Figure 2-1).

External Data

Data are provided from external government agencies as mentioned above.

Historic Data Verification and Double Counting

Historical data is an important component to FCA reporting as the number of jurisdictions that submit annual reports varies from 50-90%. Reporting is more complete during the 5-year program reviews. 5-year reviews also include updated acreage on all projects. Forestry records were provided back for the draft submission but will be revised to include more historic data in the final submission.

There is no known pathway where FCA activities could be double counted.

3.2 Riparian Forest Buffers

BMP Definitions:

(a) Agricultural riparian forest buffers: acres of trees planted adjacent to streams, shorelines, or other waterways in rural designated areas and up to 300 ft in width.

(b) Urban riparian forest buffers: acres of trees planted adjacent to streams, shorelines, or other waterways in urban designated areas and up to 300 ft in width.

Details regarding verification and validation procedures for riparian forest buffers are contained in Table 3-2 and summarized in the following section.

Table 3-2. Riparian Forest Buffers Verification Protocol Design Table Summary

Verification Element	Description	Description	Description
BMP or Group	Riparian Forest Buffers	Riparian Forest Buffers	Riparian Forest Buffers
Geographic Scope	Statewide	Statewide	Statewide
A. WIP Priority	High	Medium	Low
B. Data Grouping	Federal Cost-Shared Agricultural Forest Buffers (CREP/CP-22)	Non-Federal Cost Shared Agricultural and Urban Forest Buffers	"Backyard Buffers" Urban Forest Buffers
C. BMP Type	Structural	Structural	Structural

Verification Element	Description	Description	Description
D. Initial Inspection			
Method	Visual; typically within 1-year of planting date	Visual; typically within 1-year of planting date	No inspection
Frequency	100%	100%	No inspection
Who Inspects?	MD DNR or SCD district staff	County staff often with support from MD DNR Forest Service staff	No inspection
Documentation	Conservation Plan	Planting plan and riparian forest buffer data sheet	Pre-registration form for program
E. Follow-up Check			
Method	Visual	Visual and GIS-based	Visual tree survival self-reported by landowner (2013 - 2014)
Frequency	100 % ; 1-2 years after planting and 2-years prior to contract expiration by a certified technician	100 % ; 1-2 years after planting	37% response rate; single survey:
Who Inspects?	MD DNR or SCD district staff	County staff often with support from MD DNR Forest Service staff	Landowner
Documentation	Survival and/or compliance report	Survival and/or maintenance report	Survival report
F. Response if Problem	Work with landowner to bring back into program standards	Work with landowner to bring back into program standards	Adjust reported acres by survival rate (65%); no consequence to landowner
G. Lifespan/Sunset	15-years with possibility of re-enrollment	Non-contractual after establishment	Non-contractual
H. Data QA, Recording & Reporting	MD Dept. of Agriculture reconciled with NRCS	Riparian Buffers Database - summary sent to MDE	Riparian Buffers Database - summary sent to MDE

3.2.1 Riparian Forest Buffers Data Verification

Method

All riparian forest buffers reported at the state level, in which a state DNR forester provided technical assistance, are reported through Riparian Forest Buffer Tracking forms. Forms contain information on site physical attributes (e.g., buffer width and length) and planting stock, and data is maintained in a centralized Riparian Forest Buffer database. Funding source and GPS coordinates of riparian forest buffers are the critical factors that determine the level of verification required by contract, and to distinguish agricultural from urban buffers for reporting purposes.

Agricultural riparian forest buffer restoration that are funded through state (MACS) and federal (USDA) co-cost shared programs (i.e., CREP) involve many partners including local Soil Conservation District staff, MD Dept. of Agriculture technical service providers, and often but not always MD DNR foresters. Contract information is maintained through the Maryland

Agricultural Cost-Share Program (MACS) database, which is a more complete data source for cost-shared agricultural buffers compared to the DNR database due to data-sharing privacy restrictions. For this reason, acres of cost-shared agricultural riparian forest buffers are reported directly by MDA and are excluded from DNR reports. 100% of co-cost shared agricultural riparian forest buffers are initially verified through a site inspection the year after planting and documented through a tree survival or equivalent report.

Non-cost shared forest buffers typically have less stringent contract requirements than cost-shared agricultural buffers. Nevertheless, these plantings follow the same initial verification and documentation standards as cost-shared buffers with 100% of forest buffers verified through a site inspection the year after planting. Non-cost shared riparian forest buffers are distinguished as either agricultural or urban using GPS coordinates combined with the U.S. Census (2010) Urban and Rural Classification digital map layer.

A second data source for urban forest buffers is the Backyard Buffers Program. This program was created by the Potomac Watershed Partnership in collaboration with the Maryland DNR Forest Service to assist landowners with riparian buffer restoration on their property by providing them with approximately 25-30 tree seedlings (4-5 species per seedling bundle) for self-planting. Due to the scale and nature of this program, there is no initial verification protocol for seedling planting.

Verification Team

Agricultural riparian forest buffer restoration funded through state (MACS) and federal (USDA) co-cost shared programs (i.e., CREP and CP-22) involve many partners including local Soil Conservation District staff, MD Dept. of Agriculture technical service providers, and often but not always MD DNR foresters.

Documentation of Verification

All riparian forest buffers reported at the state level, in which a state DNR forester provided technical assistance, are reported through Riparian Forest Buffer Tracking forms. Forms contain information on site physical attributes (e.g., buffer width and length) and planting stock, and data are maintained in a centralized Riparian Forest Buffer database.

Best management practices funded through state and federal co-cost shared programs are documented in Conservation Plans prepared by trained SCD staff based on site-specific eligibility criteria and data following NRCS guidelines. Non-cost-shared riparian forest buffers are documented through Riparian Buffer Tracking forms.

The number of saplings distributed through the Backyard Buffers Program is reported each year by county foresters to the Back Yard Buffer Coordinator, who is also responsible for maintaining long-term data records.

Independent Verification

There is currently no independent verification system in place for non-federal cost share riparian buffer or Backyard Buffer Program activities.

3.2.2 Riparian Forest Buffers Data Validation

Quality Assurance

For cost shared agricultural buffers, validation of continued performance is required by contract (15-year duration) and occurs through several mechanisms to ensure data quality. In addition to the verification site visit, natural resource partners complete visual site inspections at a minimum of 3-years after planting (the approximate time until establishment), and 2-3 years prior to contract expiration/renewal (the approximate time required to re-establish failed buffers). Inspections at these strategic intervals are completed on 100% of cost-shared projects and are documented through survival and/or compliance reports. Site visits may occur at more frequent intervals if assistance is requested by the landowner. If a problem is detected, CREP partners work with the landowner to bring the buffer back into compliance, or if the issue is not resolved BMP acres are removed from agency reports.

Non-cost-share riparian forest buffer plantings lack a formal agreement between the grantor and the landowner. Instead, validation of buffer establishment is the responsibility of the grantee, which is often a county, state, or NGO. In Maryland, continued performance is validated through visual sites inspections 2-3 years after planting (the approximate time until establishment) performed by Maryland DNR foresters or with their assistance. Inspections at this strategic interval are completed on 100% of projects, and are documented through survival, compliance, and/or grant progress reports. If a problem is detected, DNR foresters work with the landowner to bring the buffer back into compliance, or if the issue not resolved BMP acres are removed from agency reports. In 2014, the Maryland Forest Service began GIS based assessments for non-cost share buffers at a 10% sampling rate; however, re- establishment of failed buffers may be limited by available funding.

The Backyard Buffer Program does not have an established plan for continuously validating BMP data. Currently, acreage reported for credit is adjusted based on the results of a statewide survey of Backyard Buffer Program participants. In this survey, landowners were requested to self-report survival rate, maintenance activities, causes of tree mortality, and desired tree species. The survey had a response rate of 37%, and a self-reported survival rate of 65%. This rate was confirmed by DNR staff that visually inspecting 10% of the respondents' properties. Therefore, Backyard Buffer acreage is multiplied by 0.65 prior to reporting for BMP credit. High-resolution forest cover imagery could be used in the future to validate Backyard Buffer acreage.

Data Entry

Agricultural riparian buffers are tracked in the Conservation Tracker database by MDA while other riparian buffer data are reported by the DNR regional forester and assembled by the Chesapeake Bay Forester before being provided to MDE's NEIEN coordinator and submitted to the Chesapeake Bay Program (see Figure 2-1).

External Data

Data are provided from external government agencies as mentioned above. Data are sometimes provided by landowners as described above, but typically confirmed by SCD staff or DNR foresters.

Historic Data Verification and Double Counting

Forestry records were provided the draft historic submission but will be revised to include more historic data in the final submission.

To avoid double counting acreage between MS-4 and Chesapeake Bay TMDL reporting, county and state submissions are cross referenced for duplicate entries.

At least two areas of double counting could occur. Projects reported through the state tracking form could also be reported by a planting project partner through the CBP on-line tracking tool, although this has not been seen due to the low volume of information submitted through that venue. This is avoided by having the state riparian forest buffer coordinator check entries from the CBP system against the existing database for duplicate entries, based primarily on location, date, acreage, and length of projects. Another source of double-counting is tracking done through cost-share practices such as the MACS program, which helps fund many but not all the buffers planted in coordination with the Conservation Reserve Enhancement Program. Double-counting is avoided at the state level by counting the MDA acreage for CREP/CP-22 and reporting non-CREP acreage to MDE from the DNR Forest Buffer Database. MACS acres are likely to be entered one year after the riparian forest buffer database acres, since MACS payments are made after a survival check at the end of the growing season. Duplicates within tracking forms submitted to the database (e.g., more than one forester involved in the planting) are avoided by the duplicate-checking routines set up within the database.

3.3 Upland Tree Planting

BMP Definitions:

(a) Agricultural tree planting: acres of newly planted forest, attributable to cost-share or other technical or financial assistance programs.

(b) Tree planting on mixed land uses: acres of newly planted forest, usually to mitigate for forest cleared during urban development.

Details regarding verification and validation procedures for upland tree planting are contained in Table 3-3 and summarized in the following section.

Table 3-3. Upland Tree Planting Verification Protocol Design Table Summary

Verification Element	Description	Description
BMP or Group	Upland Tree Planting	Upland Tree Planting
Geographic Scope	Statewide	Statewide
A. WIP Priority	Medium	Medium
B. Data Grouping	Tree planting on mixed land uses (FCA)	Agricultural tree planting
C. BMP Type	Structural	Structural
D. Initial Inspection		
Method	Review of land development application	Visual and GIS-based
Frequency	100% where legally required	100%
Who Inspects?	Local FCA Program Coordinator, verified by state Urban Forester	MD DNR Forester
Documentation	Approved development plan with annual data summaries in FCA database	Forest Stewardship Plan
E. Follow-up Check		
Method	Visual	Visual
Frequency	100% ; 2-years after planting	100%; every 3-5 years depending on tax incentive program
Who Inspects?	Local planning dept. staff	MD DNR Forester
Documentation	Bond release form	Inspection report
F. Response if Problem	Bond will not be released until planting is successful	Potentially severe financial penalties
G. Lifespan/Sunset	Permanent	15-years
H. Data QA, Recording & Reporting	FCA Database - summary sent to MDE	SMART and PMAS Database - summary sent to MDE

3.3.1 Upland Tree Planting Data Verification

Method

Upland tree planting on agricultural and mixed-use land each have a sole source for BMP data. The USDA Forest Service Performance Measurement Accountability System (PMAS) is the basis for reporting technical assistance on private lands including recommended actions on upland agricultural tree planting. Land management recommendations (i.e., initial verified acreage data) are developed through visual property inspections that are compiled into a Forest Stewardship Plan and are considered to be accurate to the nearest 1/10th acre. Stewardship Plans are written or at a minimum reviewed by a licensed forester and are required to enroll in cost-share and tax incentive programs, such as Conservation Reserve Enhancement Program – Highly Erodible Lands (CREP-HEL) and Woodland Incentives Program (DNRWIP). Data are reported quarterly by the four Regional Foresters to the state Stewardship Coordinator (Maryland DNR Forest Service).

Forest Conservation Act reporting (see Forest Conservation) is also the sole source of upland tree planting data on mixed-use land. Data are generated at the local level by professional planners from scaled drawings and maps, which are considered to be accurate to the nearest

acre. A small proportion of FCA activity occurs at the state level. In this case, data are generated by each of the four regional urban foresters (Maryland DNR Forest Service) for their respective regions. Jurisdictions are required, by statue, to submit annual summaries of FCA activities for the previous fiscal year to the Central Region Urban Forester (Maryland DNR Forest Service). The Central Region Urban Forester verifies all data for completeness and accuracy and does not accept data if acreage reports are incomplete. Acres of tree planting reported to the Chesapeake Bay Program for credit are considered to be conservative because the number of jurisdictions that submit annual reports varies from 50 to 90%.

Verification Team

FCA data are generated at the local level by professional planners from scaled drawings and maps. FCA activities at the state level are generated by the four regional urban foresters (Maryland DNR Forest Service) for their respective regions.

For PMAS, data is collected by county foresters and summarized by the 4 regional foresters.

Documentation of Verification

As stated above, initial verified acreage data collected through the USDA Forest Service PMAS are compiled into a Forest Stewardship Plan. Stewardship Plans are written or at a minimum reviewed by a licensed forester and are required to enroll in cost-share and tax incentive programs, such as Conservation Reserve Enhancement Program – CREP-HEL and DNRWIP.

Forest Conservation Act data are documented in approved development plans held by the local planning department, although mitigation planting may take place offsite. Annual data summaries are maintained in a central electronic FCA database that is backed-up on the DNR server.

Independent Verification

There is currently no independent verification system in place for FCA or PMAS activities.

3.3.2 Upland Tree Planting Data Validation

Quality Assurance

Similar to cost-share agricultural riparian forest buffers, cost-share and tax incentive programs have stringent validation protocols for agricultural tree-planting. MD DNR foresters visually inspect upland agricultural tree plantings on 100% of properties every 3-5 years depending upon the cost-share or tax incentive program in which the landowner participates. If a problem is found, MD DNR foresters work with the landowners to bring the planting back into compliance. However, severe financial penalties may be imposed (e.g., payment of back taxes) if a landowner fails to implement recommended actions, and for this reason historical implementation rates have consistently exceeded 95%.

For the FCA Program, developers must post a bond that is released upon successful establishment of the planted area. Plantings are visually inspected 2 years after the planting by the local planning department prior to bond release.

Data Entry

PMAS reports are prepared quarterly, and sum activity by region and county or project area

(usually a two-county area) for the quarter. Acreages are supplied from each Forest Service employee to the Regional Forester for each of four regions. The Regional Forester reviews data for each county and enters it into a formatted Excel spreadsheet. The spreadsheet is emailed to the Stewardship Program Manager, who combines each region's data into a statewide summary by region and county for each quarter. The PMAS spreadsheets are backed up on the Forest Service central server to allow access to reporting information to authorized users, and the server is routinely backed up by the IT Division. Summary reports are available to the staff that submitted the data, so there is an opportunity to correct information if needed. Typically, performance evaluation criteria for forestry staff include meeting numeric goals associated with one or more items from PMAS reports, which encourages attention to accuracy in reporting.

USDA Forest Service PMAS data and FCA data are compiled by the Chesapeake Bay Forester at Maryland DNR before being provided to MDE's NEIEN coordinator and submitted to the Chesapeake Bay Program (see Figure 2-1).

External Data

Data are provided from external government agencies as mentioned above.

Historic Data Verification and Double Counting

Forestry records were provided for the draft historic submission but will be revised to include more historic data in the final submission.

There is no known pathway where FCA or PMAS activities could be double counted.

3.4 Forest Harvest

BMP Definition: Acres of harvested forest that follow required sediment and erosion control practices.

Details regarding verification and validation procedures for forest harvesting are contained in Table 3-4 and summarized in the following section.

Table 3-4. Forest Harvest Verification Protocol Design Table Summary

Verification Element	Description	Description
BMP or Group	Forest Harvest	Forest Harvest
Geographic Scope	Statewide	Statewide
A. WIP Priority	Low	Low
B. Data Grouping	Forest Harvest on State Lands	Forest Harvest on Private Lands
C. BMP Type	Management	Management
D. Initial Inspection		
Method	On-site supervision	Review of forest harvest application; visual inspection of timber marking
Frequency	100%	100%

Who Inspects?	MD DNR Forester	Local Soil Conservation District Employee and/or Forestry Board
Documentation	State forest harvest contract; Master Logger certification	Sediment and erosion control permit
E. Follow-up Check		
Method	On-site supervision	Visual and GIS-based assessment targeting properties with stream crossings
Frequency	100% ; continuous over the contract period	approx. 10% ; 10-years
Who Inspects?	MD DNR Forester	MD DNR Forest Service employee or contractor
Documentation	Forest Harvest BMP monitoring form	Forest Harvest BMP monitoring form
Response if Problem	BMP implementation rate reduced	BMP implementation rate reduced
F. Lifespan/Sunset	Effect is approx. 3-years in model; rate determined approx. every 10-years	Effect is approx. 3-years in model; rate determined approx. every 10-years
G. Data QA, Recording & Reporting	State Timber Harvest Database - Summary sent to MDE	SMART and PMAS Database - summary sent to MDE

3.4.1 Forest Harvest Data Verification

Method

Forest harvest data are obtained from two sources: harvest contracts on state land and approved sediment and erosion control (SEC) permits on private land. Data for harvested acres on state land are computer generated in Arc-GIS, and timber sale summaries are compiled annually by State Forest Supervisors and the Maryland Forest Service GIS technician. SEC permits are required for forest harvesting on private land in Maryland and are maintained by local Soil Conservation District or County offices depending on the delegation of responsibility from MDE. For private land harvests, when funded, the Maryland Cooperative Extension prepares a quarterly report of timber stumpage prices and includes a summary of SEC plans reported as summed acreage information from the districts or counties that chose to submit information on request. When the Extension report is not available, harvest acreages are taken from the harvest plan reviews reported by DNR foresters on the PMAS forms, which represent voluntary reviews in counties where forms allow landowners to sign off on DNR technical assistance, and Critical Area, where District Forestry Boards have harvest plan oversight. The private acres reported as using BMPs are calculated by multiplying the permitted acreage by the average BMP implementation rate found in the most recent statewide study (MD DNR unpublished data, 2007 from 2004/2005 field work). All forest harvest data are considered to be accurate to the nearest acre; however, there is no consistent means for determining the completion of harvest. For example, saturated soils caused by inclement weather can restrict site access and reduce the number of acres harvested. Harvest permits are valid for 2 years across land ownership sectors.

Verification Team

On-site visits of BMP implementation are routinely made by state forestry staff during harvests, and documentation of the visits is increasing as forest certification requires proof of monitoring. Harvesting on State lands requires that the operator be a certified Master Logger, a program that requires additional training in sediment BMPs and safety measures, coordinated by the Maryland Forest Association. Master Logger also requires ongoing education and site

visits. The Master Logger BMP checklist is one tool used to document BMP compliance on state lands.

Documentation of Verification

Quarterly timber harvest reports are submitted by Regional Foresters to the Stewardship Program Manager, who maintains long-term records in the PMAS database (see upland agricultural tree planting).

Independent Verification

Data is verified by cross checking sediment and erosion control permits for forest harvest held by local soil conservation offices.

3.4.2 Forest Harvest Data Validation

Quality Assurance

Implementation of forest harvest BMPs are validated through visual and GIS-based assessments. Forest Service staff regularly monitors forest harvest operations on all state forest land throughout the contract period, and implementation of BMPs is estimated to be 99% (Koehn and Hairston-Strang 2009). Inspection reports have improved over the past decade as sustainable forestry certification requires proof of monitoring. In addition, to be eligible to bid on state timber contracts operators must be certified through the Master Logger Program, which includes specialized training in sediment management.

In contrast, validating BMP implementation is more difficult on private land where access for monitoring is at the discretion of the landowner. Where site access is granted, implementation of forest harvest BMPs are validated using the same methods as state owned land through visual and GIS-based assessments. Assessments conducted by MD DNR in 1995 and 2007 found very similar BMP implementation rates on private land (81 and 82 %, respectively), and a more recent assessment is expected to be completed later this year. Approximately 230 sediment and erosion control permits are issued annually for forest harvest on private land, and while the number of monitored sites can span several years, it has consistently exceeded the 10% standard for data quality assurance. Moreover, sites that contain stream crossings and forest buffers are given the highest priority for monitoring due to the disproportionate effect harvest operations may have on water quality in these areas.

Data Entry

Forest harvest data are collected by DNR's Forest Stewardship Coordinator and compiled by the Chesapeake Bay Forester at Maryland DNR before being provided to MDE's NEIEN coordinator and submitted to the Chesapeake Bay Program (see Figure 2-1).

External Data

Data are provided from external government agencies as mentioned above.

Historic Data Verification and Double Counting

Forestry records were provided for the draft historic submission but will be revised to include

more historic data in the final submission.

4 Stream Restoration

This Verification Protocol incorporates all stream restoration related BMPs that are implemented and accounted for in Maryland's WIP, including both agricultural and urban stream restoration. Details regarding verification and validation procedures for these practices are contained in Tables 4-1 and 4-2 and summarized in the following sections.

Additional sources of data may exist, but are not currently reported to the CPBO, and stream restoration verification protocols will be updated when these data sources are resolved and included in our annual submission.

4.1 Stream Restoration Projects

Stream restoration refers to any natural channel design, baseflow channel design, or legacy sediment removal, or other restoration project that meets the qualifying conditions for credits as described in Schueler and Stack (2013), including environmental limitations and stream functional improvements. The types of stream restoration projects are defined as:

1. Legacy Sediment Removal (LSR) - A class of aquatic resource restoration that seeks to remove legacy sediments and restore the natural potential of aquatic resources including a combination of streams, floodplains, and palustrine wetlands.

2. Natural Channel Design (NCD) - Application of fluvial geomorphology to create stable channels that maintain a state of dynamic equilibrium among water, sediment, and vegetation such that the channel does not aggrade or degrade over time. This class of stream restoration utilizes data on current channel morphology, including stream cross section, plan form, pattern, profile, and sediment characteristics for a stream classified according to the Rosgen (1996) classification scheme, but which may be modified to meet the unique constraints of urban streams.

3. Wet Channel Regenerative Stormwater Conveyance (RSC) - Also known as baseflow channel design, these practices can be located in intermittent and ephemeral waters as well as further down the perennial stream network and use instream weirs to spread storm flows across the floodplain at minor increases in the stream stage for events much smaller than the 1.5-year storm event, which has traditionally been assumed to govern stream geomorphology and channel capacity. Wet channel RSC may also include sand seepage wetlands or other wetland types in the floodplain that increase floodplain connection or interactions with the stream.

4.2 Agricultural Stream Restoration

Details regarding verification and validation procedures for these practices are contained in Table 4-1 and summarized in the following section.

Table 4-1. Agricultural Stream Restoration Verification Protocol Design Table Summary

Verification Element	Description
BMP or Group	Stream Restoration
Geographic Scope	Statewide
A. WIP Priority	Low
B. Data Grouping	Structural Multi-Year BMPs
C. BMP Type	Stream Restoration
D. Initial Inspection	
Method	SCD staff is on-site throughout the construction phase guided by NRCS's Engineering Folder Completion Checklist to ensure all elements of the design and construction are verified and documented.
Frequency	At completion of project
Who Inspects?	SCD Staff
Documentation	NRCS Engineering Folder Project Completion Checklist
E. Follow-up Check	
Follow-Up Inspection	Annual MACS Spot-check reviews. Field inspection to determine whether the BMPs were constructed according to plan specifications and whether the BMPs are being maintained in accordance with contract. MDA proposes re-verification of structural BMPs by a BMP Verification Task Force consisting of 5 independent MDA employees.
Statistical Sub-sample	10% of practices are re-verified annually
Response if Problem	If the BMP has been determined to be unsatisfactory, trained SCD staff may assist the farmer to bring the practice back into a satisfactory condition within one year. If repairs are not made within the specified period, the practice will be flagged as unsatisfactory and credit removed as per the NEIEN reporting protocol.
F. Lifespan/Sunset	Established CBP BMP credit duration
G. Data QA, Recording & Reporting	MDA's implementation is currently tracked in MDA's Conservation Tracker regardless of funding source. All practices are entered into the Conservation Tracker, which the Service Center Office has provided conservation technical assistance. This database has made it comparatively easy to eliminate double counting and accurately report conservation practice implementation.

Significance of these BMPs

Of Maryland's total pollutant reductions required by the Chesapeake Bay TMDL, agricultural stream restorations are not a significant strategy in the State's WIP reduction goals for the agricultural sector. However, these BMPs are significant to State strategies for habitat, stream health, sediment sequestration and local water quality. Agricultural stream restorations will continue to play a role in overall TN & TP reduction in the state, just at a lower level of significance.

4.2.1 Agricultural Stream Restoration Data Verification

Method

Stream restoration projects are often implemented with federal cost share. Technical designs and standards are provided through the soil conservation district (SCD) to the contractor installing the structural or vegetative practice(s). Qualified SCD staff with appropriate job approval authority, as determined by the NRCS State Engineer, is on-site throughout the construction phase guided by NRCS's *Engineering Folder Completion Checklist* to ensure all elements of the design and construction are verified and documented.

Verification Team

Qualified SCD staff with appropriate job approval authority, as determined by the NRCS State Engineer, are on-site throughout the construction phase. Upon completion of the BMP, a final construction review is performed by qualified SCD staff.

Trained SCD staff or a member of the proposed BMP Verification Task Force will be responsible for performing an in-field assessment of the BMP to ensure that the practice continues to meet the appropriate NRCS standard and specification.

Documentation of Verification

MDA's implementation is currently tracked in MDA's Conservation Tracker. Maryland's Conservation Tracker Program is an integrated database management system designed to track agricultural conservation implementation in Maryland. This system allows for the accurate assessment of all conservation activity, whether publicly and privately funded, in meeting the Chesapeake Bay TMDL as prescribed in Maryland's Watershed Implementation Plan. MDA provides information on programs and BMP implementation to the CPBO via NEIEN.

Upon return to the office from a re-verification inspection, the BMP status will be updated in the Conservation Tracker system to indicate a "satisfactory" or "unsatisfactory" condition with appropriate notation. A hard-copy report is also filed in the farm's Conservation Plan folder.

Independent Verification

Upon completion of the BMP, a final construction review is performed by qualified SCD staff to ensure that the project meets appropriate NRCS standards and specifications. This process is completed for 100% of BMPs and represents initial verification reported through Conservation Tracker.

4.2.2 Agricultural Stream Restoration Data Validation

Quality Assurance

A random 10% list will be generated out of the system annually for re-verification. Trained SCD staff or a member of the proposed BMP Verification Task Force will be responsible for performing an in-field assessment of the BMP to ensure that the practice continues to meet the appropriate NRCS standard and specification. If the BMP has been determined to be unsatisfactory, trained SCD staff may assist the farmer to bring the practice back into a satisfactory condition within one year. If repairs are not made within the specified period, the

practice will be flagged as unsatisfactory, and credit removed as per the NEIEN reporting protocol.

Conservation Tracker has made it comparatively easy to eliminate double counting and accurately report conservation practice implementation.

Conservation data are collected locally by SCD staff from information maintained in farm-specific Soil Conservation and Water Quality Plans. Once collected, SCD staff are responsible for the timely reporting of this data using a local Conservation Tracker terminal.
Conservation data obtained using Conservation Tracker are reviewed and verified for conformation to program requirements and validated using data quality objectives established by MDA Office of Resource Conservation Operations. Only data that are supported by appropriate quality control criteria and meet the data quality objectives will be considered acceptable for reporting.

Data validation occurs at the time of entry into the Conservation Tracker System through the extensive use of field validations, including table lookups, formulas, and data-type restrictions. Once processed in the database, MDA generates various quality control charts and reports on a quarterly basis to identify potential data quality issues. Evaluation and verification of any data issue is resolved locally by SCD staff.

Data entered into Conservation Tracker are stored centrally at MDA in an ORACLE® RDBMS and are maintained and backed-up nightly per MDA Information Technology Department Standard Operating Procedures.

Data Entry

MDA's implementation is currently tracked in MDA's Conservation Tracker regardless of funding source.

As the lead agency for the agricultural sector in Maryland, MDA tracks and reports agricultural BMP implementation annually to CBPO through NEIEN, the node of which is managed by the Maryland Department of the Environment (MDE). The established reporting protocol (Figure 4-1) involves a manual transfer of data to the MDE utilizing a pre-formatted spreadsheet.

The MDA's implementation tracking data currently includes data from MDA's Conservation Tracker and Nutrient Management Program databases, which together capture agricultural BMP implementation regardless of funding source.

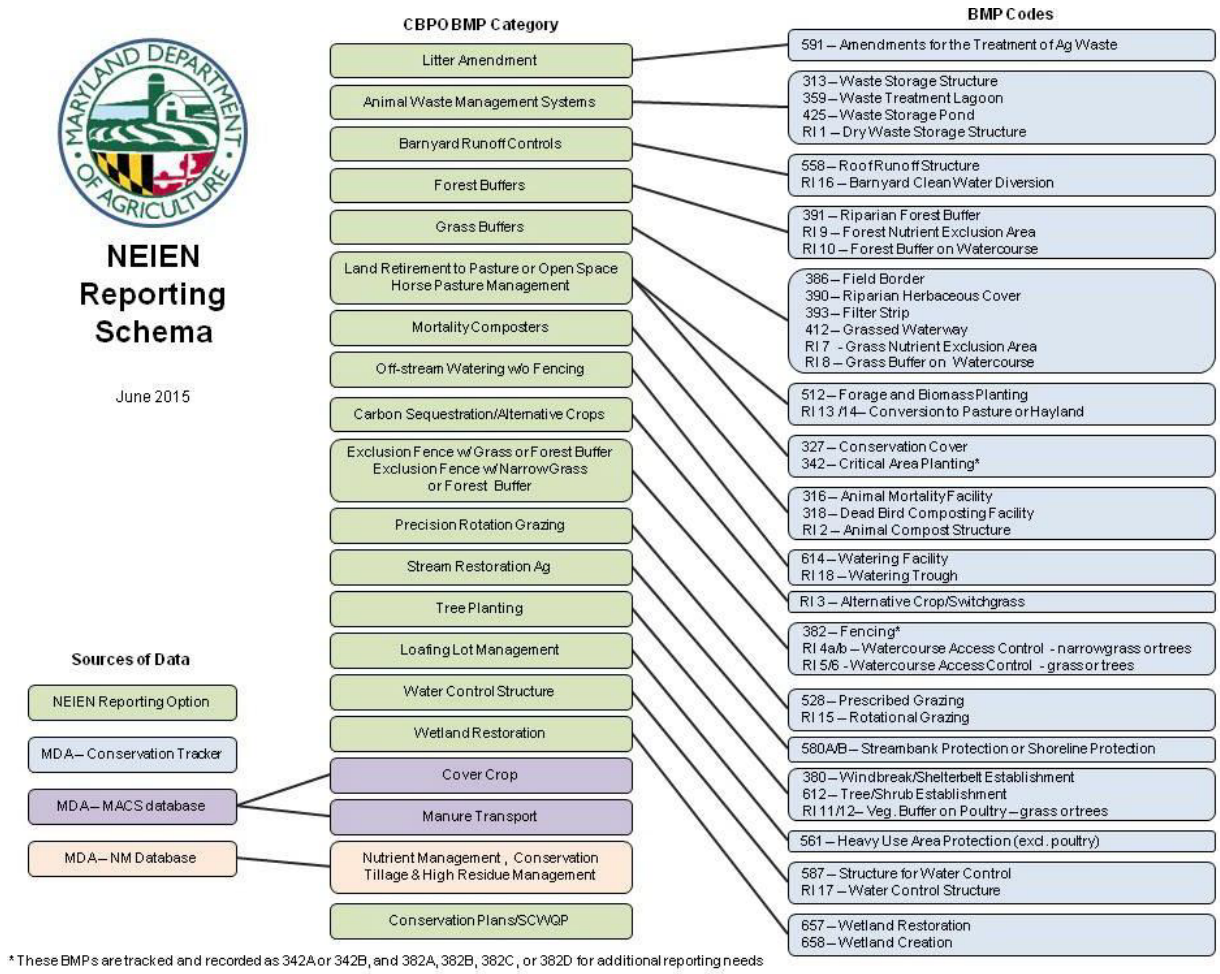

Figure 4-1. Flow Diagram of Data Systems and Reporting Protocols for Agriculture Stream Restoration BMP Implementation.

External Data

Data collected by other organizations are checked and verified as described above.

Historic Data Verification

In Maryland, the historic data cleanup has already begun and a draft submission was conducted on June 30, 2015. Data quality assurance and data entry were conducted the same way as in the past (as discussed in the above sections).

4.3 Urban Stream Restoration

Stream restoration projects are almost exclusively undertaken by, or in close coordination with, local governments.

1. Legacy Sediment Removal (LSR)
2. Natural Channel Design (NCD)
3. *Wet Channel Regenerative Stormwater Conveyance (RSC)*

Most of these projects are designed and constructed to help MS4 jurisdictions meet their impervious surface treatment requirements. As such, these types of projects are required to be verified in the same manner as stormwater BMPs. The requirements for these BMPs are described in Section IV. Of MDE's Accounting Guidance for MS4 permit holders, "Alternative BMP Credits" (MDE 2014). The relevant guidance reads:

> *Regular maintenance shall occur for all BMPs once every 3 years and each jurisdiction shall implement appropriate actions and document that any deficiencies are rectified. Otherwise, the credits will be removed until proper performance is verified. Therefore, proper reporting and ongoing BMP inspection and maintenance are essential for all restoration activities for compliance with NPDES permit requirements.*

Details regarding verification and validation procedures for these practices are contained in Table 4-2 and summarized in the following section.

Table 4-2. Urban Stream Restoration Verification Protocol Design Table Summary

Verification Element	Description
BMP or Group	Stream Restoration
Geographic Scope	Statewide
A. WIP Priority	Low
B. Data Grouping	Urban Stormwater
C. BMP Type	Stream Restoration
D. Initial Inspection	
Method	Visual
Frequency	At project completion.
Who Inspects?	County or municipal staff
Documentation	MS4 Geodatabase
E. Follow-up Check	
Follow-up Inspection	Local jurisdictions shall inspect and maintain BMPs at least once every five years in order to maintain full load reduction credit.
Statistical Sub-sample	
Response if Problem	Regular maintenance shall occur for all BMPs once every 3 years and each jurisdiction shall implement appropriate actions and document that any deficiencies are rectified. Otherwise, the credits will be removed until proper performance is verified.
F. Lifespan/Sunset	This BMP will be included as long as regular maintenance and inspection certify

	that it is functioning in proper condition; if it is not or has failed, it will be removed from MD reporting.
G. Data QA, Recording & Reporting	MS4 Geodatabase

Significance of these BMPs

Of Maryland's total pollutant reductions required by the Chesapeake Bay TMDL, urban stream restorations are not a significant strategy in the State's WIP reduction goals for the urban sector. However, these BMPs are significant to State strategies for habitat, stream health, sediment sequestration and local water quality. Urban stream restoration is also a significant strategy for some local jurisdictions in meeting their nutrient allocations related to the WIP. Therefore urban stream restorations will continue to play a role in overall TN & TP reduction in the state, just at a lower level of significance at the State strategy level.

4.3.1 Urban Stream Restoration Data Verification

Method

Phase I and Phase II communities have NPDES MS4 permit conditions which require them to have programs and staff in place to ensure that maintenance inspections are done according to a prescribed cycle in order to receive credit toward permit goals.

Verification Team

The verification team includes county or municipal staff.

Documentation of Verification

NPDES stormwater permits require that a database be maintained of all urban BMPs implemented for restoration towards credit for impervious surface treatment goals. The database also contains information regarding inspection and maintenance provided by the permittee.

4.3.2 Urban Stream Restoration Data Validation

Quality Assurance

Local jurisdictions with MS4 permits are required to inspect and maintain BMPs at least once every three years, and enter dates of pass/fail; date the last inspection was performed into MDE's database. This information will be used to determine whether timely inspections and necessary maintenance are performed. If not, full load reduction credit will not be provided for the associated BMPs.

Data Entry

Data are received in MDE's new urban BMP geodatabase. This database includes fields for pre- and post- construction dimensions for certain physical stream features (stream width, bank height ratio, and stream length connected to floodplain where bank height ratio is 1.0 or less)

used in calculating individual load reductions from stream restoration projects. MDE's database is as consistent with approved reporting standards found in CBP's stream restoration expert panel report.

After 2015, site-specific data for stream restoration projects must be used to calculate credit according to the protocols outlined in Schueler and Stack (2014). Use of the interim rate in combination with the protocols is not allowed. The interim rate may only be used after 2015 based on exceptional circumstances when compiling the data needed for the protocols may not be practical in order to keep project implementation on schedule. However, the long-term use of the interim rate will be limited. MDE's database has fields for pre- and post-construction calculations for stream restoration protocols 1 (*Credit for Prevented Sediment during Storm Flow*); 2 (*Credit for Instream and Riparian Nutrient Processing during Base Flow*); and 3 (*Credit for Floodplain Reconnection Volume*.)

To prevent double counting of BMPs, in Appendix B of MDE's *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated* guidance, which is being used for non-regulated jurisdictions as well, indicates that all structures and practices be given a unique structure ID. Data validation procedures use conditional formatting in each partner submission to ensure that each BMP_ID provided by a data partner, for individual or aggregated sets of BMPs, does not overlap before data is aggregated for submission via NEIEN.

External Data

Data are not currently collected from external sources, but will need to be checked and verified as described above. The data will be checked ensure that all necessary fields for NEIEN are included.

Historic Data Verification

In Maryland, the historic data cleanup has already begun and a draft submission was conducted on June 30, 2015. Included in this initial submission was information from 17 municipal, State, and federal partners within the urban sector, including all but one Phase I MS4 jurisdiction. Records date back to 1950. Data quality assurance and data entry were conducted the same way as in the past (as discussed in the above sections).

Verification Updates 2021

Maryland is using the new "Recommended Methods to Verify Stream Restoration Practices Built for Pollutant Crediting in the Chesapeake Bay Watershed" memo approved by the Chesapeake Bay Program in 2019 to create verification checklists. The State anticipates new verification methods will be used by contractors installing stream restorations that align with this memo.

5 Urban Sector

The State of Maryland has developed comprehensive stormwater management and erosion and sediment control (E&SC) programs to reduce the adverse impacts of development on stormwater runoff. These programs address both the temporary and the permanent impacts associated with land development activities.

This Verification Protocol addresses urban practices that are implemented and accounted for in Maryland's Chesapeake Bay Watershed Implementation Plan (WIP). This documentation places the greatest emphasis on those best management practices (BMPs) that have the most impact on meeting Chesapeake Bay nutrient and sediment reduction targets.

The following sections describe the BMP verification procedures for E&SC and stormwater management. The E&SC BMPs in this section include sedimentation basins, silt fencing, temporary seeding, and site access management. The post-construction stormwater BMPs include runoff reduction measures, i.e., environmental site design (ESD) practices and stormwater treatment practices, e.g., wet ponds, filtering practices, wet swales. Maryland's stormwater management measures are identified in the State stormwater Code of Maryland Regulations (COMAR) 26.17.01.08.

The primary purpose of this documentation is to describe the verification procedures for proper installation and long-term inspection and maintenance of BMPs. In addition, this document describes the record keeping and data reporting procedures.

5.1 Erosion and Sediment Control

E&SC practices protect water resources from sediment pollution and increases in runoff associated with land development activities. By retaining soil on-site, sediment and attached nutrients are prevented from leaving disturbed areas and polluting streams.

A summary of E&SC BMP verification and validation procedures for is contained in Table 5-1.

Table 5-1. Erosion and Sediment Control Verification Protocol Design Table Summary

Verification Element	Description
BMP or Group	Urban
Geographic Scope	Statewide per COMAR 26.17.01.11
A. WIP Priority	Low
B. Data Grouping	Stormwater
C. BMP Type	Erosion and Sediment Control
D. Initial Inspection	
Method	Physical Inspection: COMAR 26.17.01.09 references 2015 Maryland Standards and Specifications for Soil Erosion and Sediment Control as the official guide for E&SC principles, methods, and practices.

Verification Element	Description
Frequency	The appropriate enforcement authority shall inspect sites with an approved erosion and sediment control plan an average of once every 2 weeks for compliance with the approved plan.
Who Inspects?	MDE-delegated Jurisdictions. Currently 13 counties & 9 municipalities are delegated, or partially delegated, by MDE. MDE is responsible for inspecting the remainder of the state. Training and certification requirements are in COMAR 26.17.01.06. Online Training for inspectors found at: Responsible Personnel Certification (RPC).
Documentation	The inspection authority documents each site visit in a written inspection report. All notices of violation are issued and signed by both the enforcement authority and the construction site operator. MDE's program reviews are documented in formal correspondence with the affected jurisdictions.
E. Follow-up Check	
Follow-Up Inspection	Follow-up inspections follow the same methodology as the initial inspection.
Statistical Sub-sample	NA – All BMPs are inspected per state law at various stages in construction.
Response if Problem	COMAR 26.17.01.09 describes the process for violations found during inspections and complaints. When BMPs are poorly constructed or maintained, violation notices are issued and progressive enforcement is used to bring deficient sites back into compliance with State requirements. These actions may include the issuance of stop work orders, fines, and administrative and criminal penalties. MDE's *Procedures* provide further oversight and assurance that local programs meet State requirements for E&SC.
F. Lifespan/Sunset	BMP is removed upon final inspection, release of ESC performance bond or expiration of the permit.
G. Data QA, Recording & Reporting	Data are submitted to MDE from jurisdictions undergoing delegation review. Data include the number of grading permits, disturbed acres, staff, inspections, and enforcement actions. For non-delegated areas of the State, MDE captures Construction General Permit data through NOIs and enters them into a database. Information in the database includes data on site location, drainage areas, and BMPs. WSA then aggregates data from both processes to capture a complete picture of construction activity and E&SC across the State for submission to NEIEN.

Significance of these BMPs

E&SC BMPs are temporary and address the transient impacts of construction. Because the annual rate of development is generally steady, and E&SC practices are generally implemented consistently, the change Bay pollutants associated with construction is expected to remain relatively unchanged year-to-year. In addition, the annual pollutant loads associated with construction, relative to the Chesapeake Bay scale and other source sectors, is small. Thus, any changed in loads at the Chesapeake Bay scale associated with E&SC practices are very small, making these BMPs of modest significance. The practices are, however, of significance to water quality protection at local scale.

5.1.1 Erosion and Sediment Control Data Verification

Programs Involved in Verification

Maryland Environment Article, Title 4, Subtitle 1, requires the Maryland Department of the Environment (MDE) to implement a statewide E&SC program. The COMAR 26.17.01.05 requires that any construction activity in Maryland that disturbs 5,000 square feet or more of land or results in 100 cubic yards or more of earth movement have an E&SC plan. While the fundamentals of this program were established in the early 1970's, more recently, these laws and regulations have formed the basis for Maryland's general permit for construction activity (Construction General Permit) in compliance with National Pollutant Discharge Elimination System (NPDES) stormwater requirements.

The verification team is composed of:

- E&SC plan review approval authorities and
- Inspection agencies.

Plan Review: The E&SC plans are approved by the local Soil Conservation Districts (SCDs) or, for State and federal projects, MDE, before construction begins (Environment Article 4-105.2). Maryland's Stormwater Management Act of 2007 requires that E&SC plans be developed and reviewed in concert with the ESD planning of post-construction stormwater management practices (Environment Article, 4-201.1 and 4-203). This comprehensive process is expressed in the "2015 Maryland Standards and Specifications for Soil Erosion and Sediment Control" (Standards and Specifications). An approved E&SC plan is also a prerequisite for a Notice of Intent (NOI) to comply with the Construction General Permit.

Inspection and Enforcement: The Maryland E&SC Law authorizes MDE to delegate authority for inspection and enforcement to local jurisdictions (inspection agency). The inspection agencies have enforcement authority over the activities of responsible personnel in charge of on-site sediment control associated with a construction project. Responsible personnel must possess a certificate of completing an MDE approved training program (Environment Article 4-104 and COMAR 26.17.01.06). The State has delegated, or partially delegated, this authority to 12 counties, nine municipalities and the Washington Suburban Sanitary Commission (WSSC) (Figure 1). The MDE Water Management Administration's (WMA) Compliance Program is responsible for inspection and enforcement in the remaining non-delegated counties, for State and federal projects, and ensuring compliance with the Construction General Permit. The Allegany, Caroline, Frederick, and Queen Anne's Soil Conservation Districts perform E&SC inspections on behalf of MDE as part of a Memorandum of Understanding. MDE biennial delegation reviews of local programs are described below.

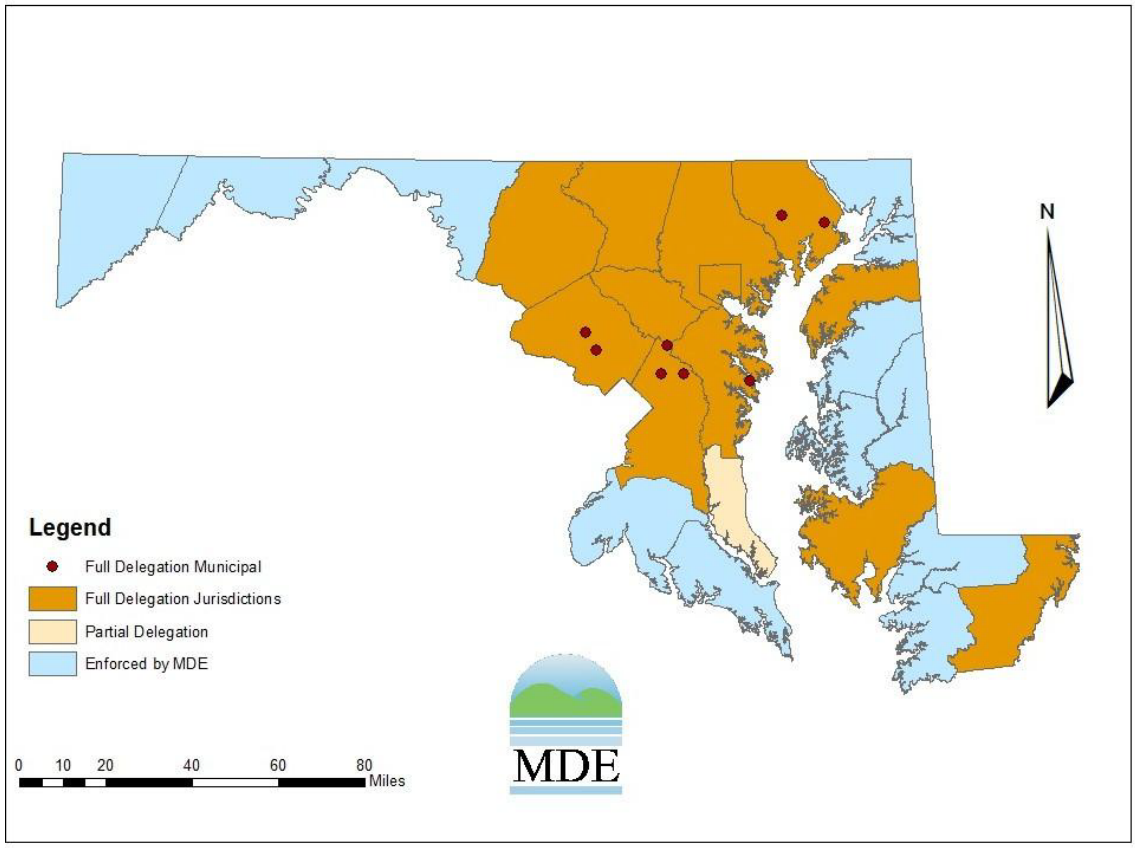

Figure 5-1. Map of E&SC Delegation of Authority.

The Verification Process (Methods)

The verification process applies to both MS4 jurisdictions and non-MS4 jurisdictions. Validation procedures, described below, vary slightly between the two. Of potentially more significance, with regard to the inspection and enforcement process, is the difference between delegated and non-delegated jurisdictions as noted above.

The inspection and enforcement of E&SC during the development process is founded on a coordinated, comprehensive plan development and review process that integrates E&SC planning with ESD for post-construction stormwater management. The planning involves a concept phase, site development phase and a final phase. Approval of the final plan involves a detailed engineering review. The final plan must identify the limit of disturbance, the location of each sediment control practice, design detail regarding sediment basin and trap contours, drainage areas as needed, and project phasing information. The plan must provide the sequence of construction with enough detail to guide inspection and enforcement oversight including maintenance and eventual removal of the erosion and sediment controls after final stabilization of the site.

The owner/developer is responsible for conducting routine inspections and required maintenance. Guidance on maintenance of specific practice types is provided in MDE's 2011 Standards and Specifications document. Additionally, for sites equal to or greater than 1 acre, the Construction General Permit requires the owner/developer to record an inspection log. At a minimum, the site and all controls should be inspected weekly and the day following a rain event. The approval authority may require more frequent inspections for projects adjacent to sensitive areas or for other reasons. A written inspection report is part of every inspection and should include:

- Inspection date
- Inspection type (routine, pre-storm event, post-storm event, during rain event)
- Name and title of inspector
- Weather information (current conditions as well as time and amount of last recorded precipitation)
- Brief description of project's status (e.g., percent complete) and/or current activities
- Evidence of sediment discharges
- Identification of plan deficiencies
- Identification of sediment controls that require maintenance
- Identification of missing or improperly installed sediment controls
- Compliance status regarding the sequence of construction and stabilization requirements
- Photographs
- Monitoring/sampling
- Maintenance and/or corrective action performed
- Other inspection items as required by the General Permit for Stormwater Associated with Construction Activities

The appropriate enforcement authority inspects sites with an approved erosion and sediment control plan an average of once every 2 weeks for compliance with an approved plan. At a bare minimum, the inspection agency must be notified at the following stages of construction:

- Pre-construction meeting;
- After installation of sediment controls for each phase; and
- After permanent stabilization and prior to removal of sediment controls.

For larger and more complex BMPs, additional inspections are required in COMAR during critical stages of construction (e.g., core trench, riser, dam embankment for a wet pond). Any major modification to the approved plan requires approval by the plan approval authority, typically the SCDs. Minor modifications may be made in the field if approved by the inspector and documented in a field inspection report. A final inspection is required prior to release of a required E&SC performance bond.

5.1.2 Erosion and Sediment Control Data Validation

Validation Procedures

For delegated jurisdictions, the State provides a validation function through local program reviews. MDE conducts delegation review at least once every two years, depending on local program status. Delegation involves reviewing inspection records and conducting field verifications of control measures. MDE includes the Soil Conservation District in these reviews, providing the opportunity to discuss any problems with approved E&SC plans. E&SC site logs provide documentation of MDE's site visits and the conditions of the on-site BMPs. A standardized checklist is used to ensure consistency and completeness of each construction site inspection.

Based on the results of MDE's program review, a jurisdiction's enforcement authority for E&SC may be delegated for a full two years, denied altogether, or approved for some intermediate length of time. These procedures ensure that Maryland's E&SC program is implemented consistently across the State, provide incentive for local program improvement, and deny enforcement authority to poorly performing programs.

Another layer of review is applied to delegated jurisdictions with MS4 permits. MDE's evaluation of an MS4 jurisdiction's E&SC program consists of two components. The first component is an annual screening of the jurisdiction's required data and activities submitted in the annual report to assess the jurisdiction's status toward meeting its permit requirements. The second component is an on-site (field) inspection, at least once every five-year permit term, to review ordinances, procedures, and a representative sample of active construction sites to ensure that local programs are effective for E&SC and are in compliance with State and federal regulations. This procedure is laid out in the 2015 MDE *Standard Operating Procedures for Evaluating Compliance with and Enforcement of Maryland's Phase I MS4 Permits* (Procedures). MDE's Procedures clearly detail how follow-up evaluations and progressive enforcement are used to ensure that local program deficiencies are corrected.

Data Reporting

E&SC BMP verification data consists of two broad sets. The first is the extensive set of records kept by the verification team members to ensure proper BMP implementation. The second is the key BMP information used for annual Chesapeake Bay progress evaluations.

The first set of data is essential to the operational BMP verification and validation processes and was described in the previous section. This information is used to determine a compliance rate of proper E&SC BMP implementation. The compliance rate is a key element of the second set of data, which is the focus of this section.

The E&SC data reporting process has varied in recent years and is subject to change in the future. The stormwater BMP database, described in the next section, is designed to collect data from Phase I MS4 jurisdictions that may provide opportunities to improve the current process.

Data Flow: Figure 3 shows two broad data streams for a) BMP information reported by delegated authorities (DAs) and b) BMP information reported by MDE for State, federal and non-delegated jurisdictions. Data from SCDs is provided to DAs and maintained in a DA tracking spreadsheet. Data from DAs are provided to MDE during biennial delegation reviews. Data include the number of grading permits, disturbed acres, staff, inspections, and enforcement actions. From this information a compliance rate is determined which is applied to the annual acres disturbed, which is estimated by the Chesapeake Bay Program.

For BMP information reported by MDE, Construction General Permit data are extracted from NOIs and entered into a database. Information in the database includes data on site location, drainage areas, and BMPs. Compliance rates, estimated on the basis of State enforcement inspection information, are applied to the annual acres disturbed estimated by the Chesapeake Bay Program.

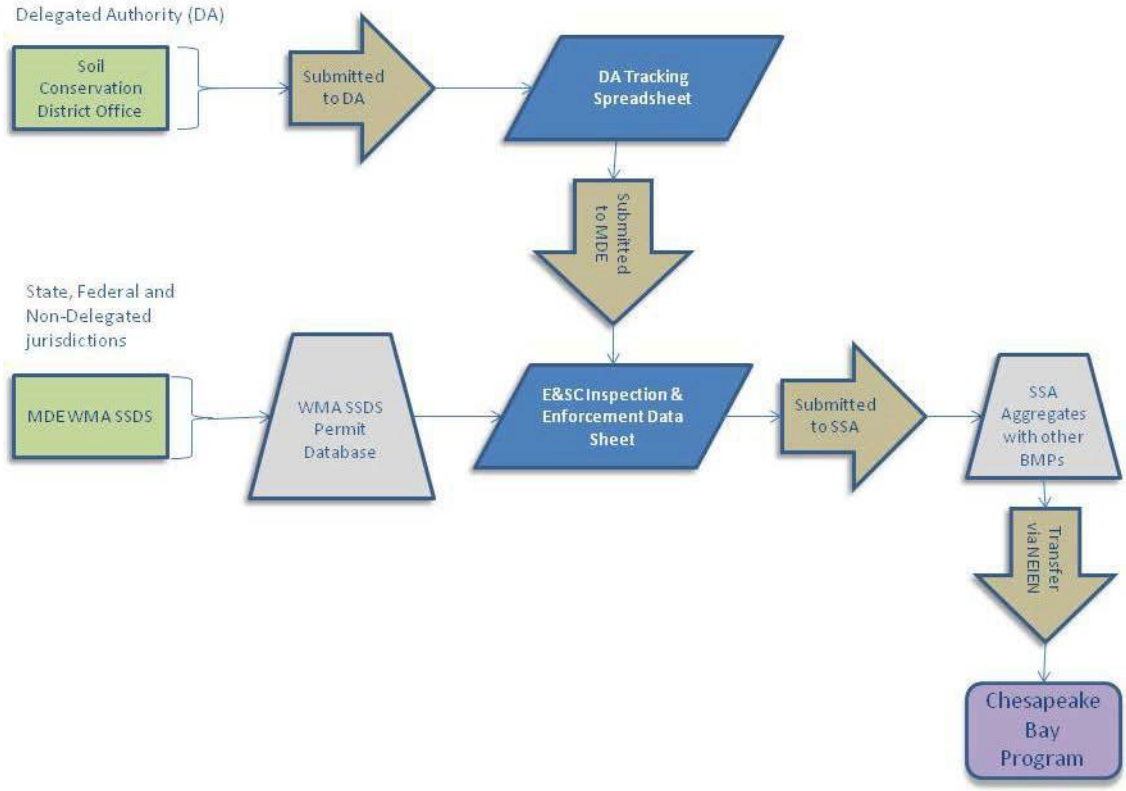

Figure 5-2. Reporting Data Flow of E&SC BMP Information to Chesapeake Bay Program

Data Quality Assurance

MDE WMA's Stormwater, Dam Safety, and Flood Management (SDSFM) Program staff consolidate the information provided by DAs and State compliance programs into a statewide inspection and

enforcement data table. The table includes disturbed acres and compliance information by county for delegated jurisdictions. The table includes disturbed acres and compliance information statewide for non-delegated areas. The table is provided to MDE Water and Science Administration's (SSA) Watershed Restoration Division (WRD) Program for further processing and inclusion in progress scenarios via NEIEN.

To prevent double counting of BMPs, aggregated disturbed acres are reported by delegated jurisdictions and MDE WMA maintains a database with unique ID's for individual permits for all non-delegated jurisdictions. Data validation procedures use conditional formatting in each partner submission to ensure that each BMP_ID provided by a data partner does not overlap before data is aggregated for submission via NEIEN. MDE WSA's WRD Program maintains a Quality Assurance Project Plan (QAPP) on NEIEN data submission.

External Data: No external data are collected. All E&SC data are provided by delegated entities, SCDs, and SDSFM.

Historic Data Verification: Inspection and Enforcement data was reviewed back to 1994 and submitted to EPA as part of the historic data call for the Phase 6 model calibration. Records were checked for duplication. Records were provided back to 2010 for the draft submission, but will be revised to include more historic data in the final submission.

Gaps: As described in the section above on significance of these BMPs, this BMP category is of low significance to Chesapeake Bay progress reporting.

Use of EPA estimates of annual disturbed areas could potentially be improved by using information in MDE's pending online stormwater BMP database, which will include acres disturbed.

Because the delegation review is biennial, this information represents a 2-year average. It's conceivable that this information could be reported annually.

Geographic distribution of E&SC activities in non-delegated areas are reported in aggregate. It is conceivable that this information could be generated by county.

5.2 Stormwater Management

Stormwater management practices control the volume and pollutant content of rainfall runoff from developed land to protect and clean up local and downstream water resources. Stormwater controls are typically implemented as either a) part of the development and redevelopment process, or b) to improve runoff from land developed in the past with obsolete or no stormwater management practices (restoration BMPs).

Stormwater BMP technology has evolved over time. Traditional stormwater BMPs focused on drainage control with limited or no pollutant removal. Typically, these are legacy BMPs reported to EPA Chesapeake Bay Program in the past or discovered BMPs that have previously been excluded from tracking inventories (primarily stormwater treatment (ST) practices as defined by SPSEP, 2012). Newer Runoff Reduction BMPs include Maryland's ESD practices. Maryland's stormwater management measures are identified in the State stormwater regulations (COMAR 26.17.02.08).

Table 5-3. Stormwater BMP Verification Protocol Design Table Summary

Verification Element	Description
BMP or Group	Urban
Geographic Scope	Statewide per COMAR
A. WIP Priority	High
B. Data Grouping	Urban Stormwater
C. BMP Type	All urban stormwater practices excluding Wetlands and Stream Restoration
D. Initial Inspection	
Method	Stormwater BMPs are inspected in the field during and immediately following construction according to methods in Maryland's Stormwater Design Manual pursuant to State regulation COMAR 26.17.02.10
Frequency	Inspections are conducted at determined stages during and immediately following installation. Frequency is determined for each BMP type according to Maryland's Stormwater Design Manual pursuant to State regulation COMAR 26.17.02.10
Who Inspects?	Inspections are conducted by certified local staff of the approval authority or MDE staff for State and federal projects.
Documentation	Inspection reports are maintained by the local approval authority and MDE for State and federal projects. Certified as-built drawings are provided by a professional engineer or land surveyor. Notice of Construction Completion (NOCC) must be reported to the State by local approval authority COMAR 26.17.02.10.G. MDE is adopting an online reporting system to accommodate this requirement.
E. Follow-up Check	
Follow-Up Inspection	The local approval authority is responsible for inspecting new BMPs one-year after installation and once every three years thereafter pursuant to COMAR 26.17.02.11. Inspections follow guidance in Maryland's Stormwater Design Manual. The local approval authority is required to keep detailed inspection reports describing any needed maintenance pursuant to COMAR 26.17.02.11. This regulation also requires the owner to perform routine inspection and maintenance. State and federal facilities must perform regular maintenance and MDE reviews their compliance through Phase II MS4 program oversight.
Statistical Sub-sample	NA – All BMPs are required to be inspected per state law every 3 years

Verification Element	Description
Response if Problem	The local approval authority is required to notify owners of any deficiencies, including a timeframe for repairs; conduct a subsequent inspection to ensure completion of repairs; undertake enforcement procedures if repairs are not undertaken or done properly pursuant to COMAR 26.17.02.11
F. Lifespan/Sunset	MDE is adopting an online reporting system that will require geo-referenced reporting of maintenance information for individual BMPs, or sets of ESD practices, by local approval authorities. MDE's database will include dates and the disposition of BMPs enabling a process of downgrading the BMP pollutant removal if maintenance is not performed according to Chesapeake Bay Program rules. Although this applies to all jurisdictions statewide, the MS4 permits provide the additional incentive of avoiding permit violations.
G. Data QA, Recording & Reporting	MDE WSA staff performs an independent verification of the data that is submitted in the geodatabase. This review includes standardizing site descriptions and addresses, spell- checking, removing non-built BMPs, general location check, verifying valid land use code and other values/codes, and identifying missing or unclear information. MDE performs site visits on select on sub-sample of large projects. Additional data validation checks are being built into the new geodatabase and a tool for non-MS4 jurisdictions is being created as well.

Significance of these BMPs

Of Maryland's total pollutant reductions required by the Chesapeake Bay TMDL, urban stormwater accounts for about 18% of the nitrogen and 30% of the phosphorus. Within the stormwater sector, roughly 80% of the responsibility is borne by MS4[1] jurisdictions/facilities and 20% by non-MS4 jurisdictions. These figures apply to reductions associated with restoration BMPs, including redevelopment projects because both include the implementation of stormwater controls in urban area that were previously uncontrolled. Stormwater controls on new development, while essential to maintaining caps on future loads, are separate from this accounting. Thus, the stormwater sector BMPs are of fairly high significance to Bay restoration, particularly within the MS4 jurisdictions.

5.2.1 Stormwater Management Data Verification

Programs Involved in Verification

Maryland Environment Article, Title 4, Subtitle 2, requires MDE to implement a statewide stormwater management program. Unlike the State E&SC Law that requires MDE to administer the program, and allows MDE delegation of that authority to local jurisdictions, Maryland's stormwater Law requires each county and municipality to adopt ordinances necessary to implement a stormwater management program directly (Environment Article 4-202). All

[1] MS4 stands for municipal separate storm sewer system, in contrast to combined sewer systems (CSSs) that convey sewage and stormwater in shared pipe systems. (See *Programs Involved in Verification*).

federal facilities within Maryland are Phase II NPDES permit holders and are therefore subject to developing and implementing stormwater management programs that comply with COMAR.

MDE's duties include adopting regulations (COMAR 26.17.02), developing a model local ordinance, providing technical assistance typically in the form of guidance documents and training (Environment Article 4-203), and conducting oversight via inspection and review of local programs at least once every 3 years (Environment Article 4-206). MDE is also responsible for conducting plan reviews for State and federal agency projects that require stormwater controls (Environment Article 4-206).

In addition to State law, some local governments, industries, and State and federal facilities are also regulated under the federal Clean Water Act. The Act, administered by MDE via authority delegated by EPA, includes several types of NPDES Permits for stormwater. These are the Phase I MS4 permits for large and medium sized counties and cities, Phase II MS4 permits for small local governmental jurisdictions, Phase II MS4 permits for State and federal facilities, and an industrial general permit (Industrial Permit) for a variety of industries identified in the permit (State No. 12-SW, Federal No. MDR0000).

Specifically, 9 out of 23 counties, the Maryland State Highway Administration, and Baltimore City have a Phase I MS4 permit; two counties and over 50 municipalities and State and federal facilities have been designated as Phase II MS4 permit jurisdictions or facilities. Combined, a majority of the State's geographic area is managed under a federal NPDES stormwater permit (Figure 2). This covers the most developed areas and accounts for the vast majority of stormwater BMPs.

The verification team is composed of:

- E&SC verification team members that also review stormwater plans (see above),
- Stormwater management plan review approval authorities (local and State),
- Inspection agencies (local and State),
- Maryland Registered professionals (engineers, land surveyors, landscape architects),
- Trained third parties, and
- US EPA Region 3 (oversight).

Plan Review and Approval: Aside from State and federal projects reviewed by MDE, stormwater plans are reviewed by local approval authorities (a county or municipal agency). These reviews are coordinated among local planning and zoning, public works, and environmental protection units. The stormwater plans are approved by the local approval authority. In some counties, the county government provides stormwater management services for some or all of its incorporated municipalities. Infrequently, a dam safety approval may be required from MDE. Some stormwater structures may require small pond approval by the local SCD (COMAR 26.17.02.09).

Inspection and Enforcement: Inspection and enforcement of the proper installation of stormwater management practices are the responsibility of the local approving authority. However, inspection of stormwater practice installation for federal and State projects, and restoration projects for NPDES permitted industrial facilities, is the responsibility MDE WMA's Compliance Program.

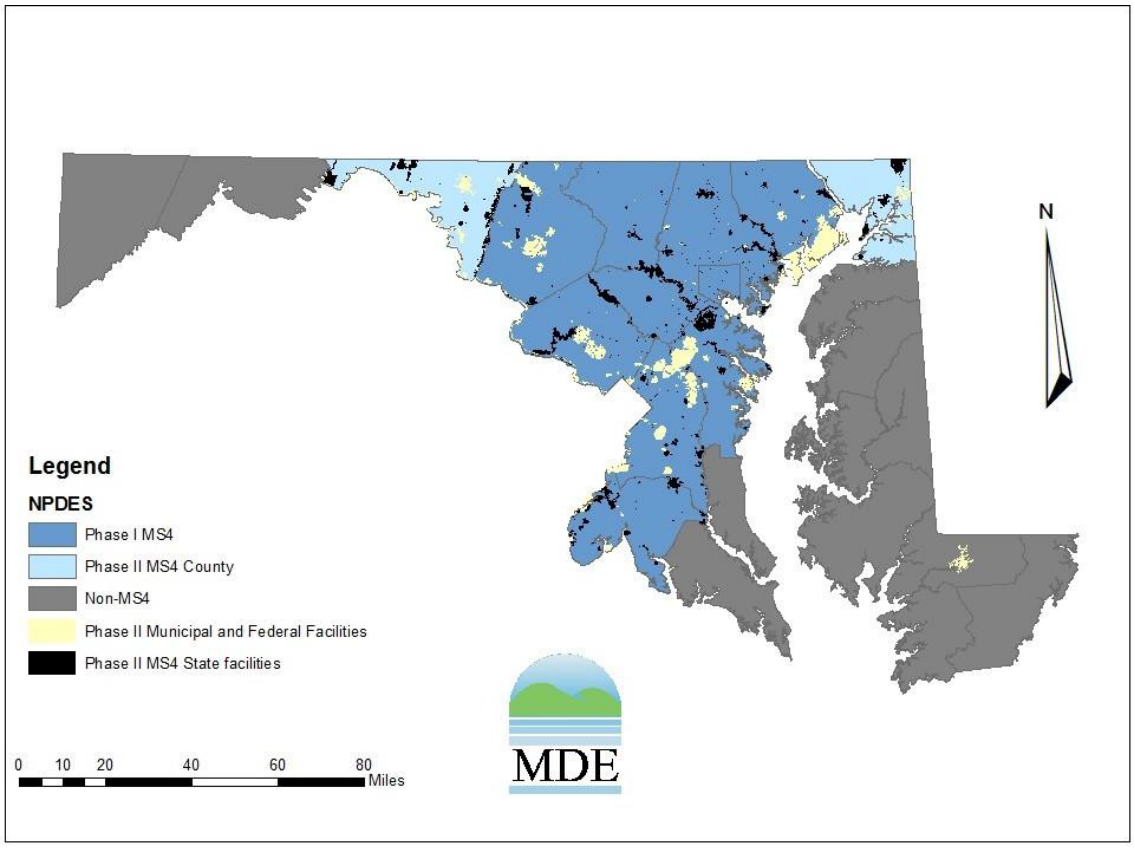

Figure 5-3. Map of MS4 permitted and non-MS4 permitted Stormwater Entities.

Counties and municipalities are responsible for stormwater management maintenance inspection and enforcement for all privately-owned BMPs, including residential, commercial, and industrial properties. Property owners are typically responsible for providing maintenance as directed by the local jurisdiction. Typically, for residential areas, local jurisdictions perform inspections to assess the water quality functioning and structural integrity of BMPs. In some instances, homeowner associations (HOAs) are responsible for both routine and structural maintenance. However, because this arrangement can lead to insufficient structural maintenance, more and more local governments are establishing a maintenance transfer process. This process transfers responsibility for water quality and structural maintenance to the local government.

Routine development and redevelopment of commercial and industrial sites are regulated by the local government review, approval, and enforcement process as stipulated in Maryland

Law. Long-term inspection and maintenance are the responsibility of the property owners with inspection and enforcement oversight provided by local government entities. For industrial properties regulated under the federal NPDES general permit for stormwater, which have additional Chesapeake Bay TMDL restoration requirements, MDE's Compliance Program provides the necessary inspection and oversight of these activities.

For State and federal properties regulated under a federal NPDES Phase II MS4 permit, long-term inspection and maintenance is the responsibility of federal and State owners of the facilities under MDE oversight.

The Verification Process (Method)

This section describes processes to ensure proper installation and long-term maintenance of stormwater BMPs. These processes involve inspection and enforcement methods conducted via programs described in the previous section. This section also addresses restoration/retrofit BMPs, operational or non-structural practices, historical (legacy) BMPs, and homeowner installed BMPs.

Maryland's approach to stormwater BMP verification uses multiple forms of assurance. Assurances are built into each element of the statewide system, which is composed of

- State law;
- State regulations;
- the 2000 Maryland Stormwater Design Manual (Design Manual);
- local ordinances;
- stormwater management plan approvals by local approving authority or MDE;
- security bonding;
- local inspection and enforcement authority to ensure proper construction of the stormwater practices;
- post-construction certification by a registered professional including as-built designs, post-construction inspection and approval of as-built designs by the approving authority;
- 1-year post-construction inspection; and
- 3-year inspections to ensure proper maintenance.

To support these procedures, MDE has developed a draft maintenance inspection manual, which is being updated to include ESD.

In addition to inspections and maintenance enforcement by local approval authorities, State law requires MDE to review local programs every three years, which provides a validation function. Federal NPDES stormwater permit program reviews by EPA Region 3 provide another level of validation.

BMP Installation: The inspection and enforcement methods that ensure proper stormwater BMP installation are founded on the comprehensive, three-phased planning process involving E&SC planning described above. The final plan must identify the location of ESD and stormwater treatment practices, areas that will need rehabilitation from compaction following construction, hydrology analyses, and includes stormwater design details to support a technical engineering review. An overlay plan must identify natural resource areas and drainage patterns, including some of the E&SC elements. Because these features will transition to being part of the post-development stormwater management system, their protection during the development process is an important aspect of proper BMP implementation.

COMAR 26.17.02.10 establishes the requirements for "Construction Inspection and Enforcement," which applies to one hundred percent of the BMPs implemented through new or redevelopment. The Design Manual lays out the specific stages of constructing various types of stormwater BMPs. Some stages require the signature of a county or municipal inspector, or State inspector in the case of federal or State projects. A 48-hour notice must be given to the inspection agency prior to constructing certain stages of a SW practice, because some installation steps require inspection as they are being installed.

Once construction is complete, a final construction inspection is conducted by the approval agency. An as-built plan certification is submitted by either a professional engineer or professional land surveyor licensed in the State. The as-built plan is compared with the original plan to ensure that stormwater management measures and conveyance systems comply with the specifications contained in approved plans. Additional information is submitted as required by the approving agency, depending upon whether or not it is a NPDES regulated entity. Notice of Construction Completion is provided to MDE, and appropriate SCD if applicable, by the municipality or county within 45 days of construction completion COMAR 26.17.02.10.

Restoration/Retrofit Projects: The installation of restoration/retrofit BMPs is not typically associated with the land development process. Nevertheless, plan approvals are required and BMP installation inspection and certification procedures apply whenever there are 5,000 square feet or more of land disturbance. Maryland has required Phase I MS4 jurisdictions to implement restoration projects as a condition of the permit for several permit cycles and will include a similar requirement for Phase II MS4 permits.

For industrial facilities, the NPDES general permit for stormwater calls for BMPs to be installed on existing developed land to address nutrient reduction requirements for Chesapeake Bay Restoration. BMP installation verification procedures require written certification by an authorized professional (Industrial Permit Part III.A.3).

Some non-MS4 jurisdictions implement restoration BMPs on a voluntary basis often using grant funding (non-regulatory BMPs). These are subject to the same BMP installation verification procedures as MS4 jurisdictions pursuant to Maryland's stormwater law that is applicable statewide.

An emerging category of BMP is homeowner-installed practices including rain gardens, rain barrels and downspout disconnection, tree planting, and conversion of turf or hard surfaces to conservation landscaping. These non-regulatory BMPs are typically non-engineered practices and are verified via visual inspection by certified third parties or local jurisdictions (See data reporting below for more information).

BMP Maintenance: COMAR 26.17.02.11 lays out the inspection and maintenance requirements for stormwater practices during the first year of operation and at least once every 3 years thereafter. Because this applies to one hundred percent of the BMPs for MS4 and non- MS4 jurisdictions, sub-sampling is not an element of the urban sector verification protocol.

MDE has a variety of technical guidance documents that support long-term maintenance and cleaning up legacy BMPs. The Design Manual identifies how key components of various BMPs are intended to function (MDE, October 2000, Revised May 2009). Chapter 3 of the Design Manual addresses five groups of structural water quality BMPs. Chapter 5 of the Design Manual addresses ESD BMPs. The detailed guidance on inspections during construction includes what to inspect and functional expectations for long-term maintenance. In addition, these chapters include a specific section on maintenance for each type of BMP including minimum criteria thresholds for key components of the BMPs. The Design Manual provides the fundamental engineering principles necessary to guide visual inspections to assess the hydrologic performance of existing BMPs and determine the need for corrective actions.

MDE has a draft stormwater construction and maintenance inspection manual for practices found in Chapter 3 of the Design Manual. This guidance expands upon the Design Manual and provides the "what to look for" and "how to" inspection details that help to ensure the successful implementation and maintenance of stormwater treatment BMPs. MDE is initiating an update of this manual to include ESD practices.

Section II.3.a of MDE's "Accounting for Stormwater Allocations and Impervious Acres Treated" (MDE, 2014) provides broad guidance on assessing legacy BMPs. It explains which BMPs should receive water quality treatment credit, and if so, how much credit. The guidance is linked to a Chesapeake Bay Program approved expert panel publication that includes methods of estimating pollutant removal efficiencies (Schuler and Lane, 2012). BMPs that currently receive little or no pollutant reduction credits are potential candidates for retrofit procedures to provide pollutant reduction benefits.

State regulation requires local approval authorities to keep inspection reports that include the following (COMAR 26.17.02.11.B):

(1) The date of inspection;

(2) Name of inspector;

(3) The condition of:

(a) Vegetation or filter media;

(b) Fences or other safety devices;

(c) Spillways, valves, or other control structures;

(d) Embankments, slopes, and safety benches;
(e) Reservoir or treatment areas;
(f) Inlet and outlet channels or structures;
(g) Underground drainage;
(h) Sediment and debris accumulation in storage and forebay areas;
(i) Any nonstructural practices to the extent practicable; and
(j) Any other item that could affect the proper function of the stormwater management system.

(4) Description of needed maintenance.

The local approval authority is required to have procedures to ensure that deficiencies identified by inspections are rectified. The procedures must include the following (COMAR 26.17.02.11.C):

(1) Notification to the owner of deficiency including a time frame for repairs;
(2) Subsequent inspection to ensure completion of repairs; and
(3) Effective enforcement procedures if repairs are not undertaken or are not done properly.

MDE's BMP Urban Database fulfills CBP's requirement to tie removal rates to visual inspections, and maintenance to BMP performance. Per MS4 permit requirements, jurisdictions must submit data including BMP types, coordinates, drainage areas, as-built dates (verifying construction), first year inspections, and subsequent triennial inspections. If any of this information is missing, or if the BMP fails to be maintained, pollution reductions will be downgraded or eliminated according to CBP guidelines. For stormwater performance reduction credit, the impervious area and runoff volume treated must also be reported.

Cleanup of Legacy BMPs: MDE requires that the status of all stormwater BMPs be documented in first year MS4 annual reports. This determines each jurisdiction's baseline impervious acres that need treatment, which must be approved by MDE. BMPs that are not inspected, maintained, or do not have water quality features that meet Maryland requirements are not allowable for credit. MDE's MS4 audits of these programs have provided the incentive for local governments to clean up legacy BMPs. This is often done through increasing the number of local inspection staff, and better inspection, maintenance and record keeping for BMPs. Often, BMPs beyond repair, or ones that do not have sufficient water quality features, become prioritized stormwater restoration projects.

These procedures are well established for Maryland's Phase I MS4 community and are transferable to both Phase II MS4s and the non-federally regulated areas of the State. MDE WSA's WRD Program has provided outreach for all local Watershed Implementation Plan (WIP) local contacts and developed reporting databases for legacy BMP cleanup.

COMAR 26.17.02.03 defines MDE's oversight responsibilities of local stormwater programs, which serves to validate BMP implementation and maintenance. This involves a review of local programs once every three years. State inspections and reviews evaluate the local programs' ability to ensure adequate installation and maintenance of stormwater management practices.

The reviews include the inspection of a representative sample of projects, comparing initial designs to as-built drawings, and conducting field audits. Inspection results include the necessary information to assess a jurisdiction's program as a whole and for MDE to recommend improvements when deficiencies have been documented.

County and municipal inspection and maintenance records are crosschecked with the findings of the field inspections for consistency. Local program staffing levels are evaluated to ensure they are consistent with the expected workload associated with inspections and maintenance of the stormwater BMP inventory. If inadequacies are found, they are documented and a follow-up review is conducted.

In addition to statewide triennial program reviews, MDE's evaluation of MS4 permit holders includes an annual screening of the required data and narrative of activities submitted in the jurisdiction's annual report to assess the status toward meeting MS4 permit requirements. The MS4 program review procedure is laid out in MDE's *Standard Operating Procedures for Evaluating Compliance with and Enforcement of Maryland's Phase I MS4 Permits*. (MDE, 2015)

Financial Capacity: Beginning July 1, 2016, and every 2-years thereafter, Phase I MS4s are required to submit a Financial Assurance Plan (Plan) to MDE for determination of sufficiency in meeting estimated costs for the two years following the Plan submission (Environment Article 4-202.1). The determination focuses on financial capacity to comply with the impervious surface restoration plan requirements, which is the activity directly associated with meeting Chesapeake Bay pollutant reduction targets. Because maintaining these targets relies on long-term inspection and maintenance of restoration BMPs, this financial assurance serves an important validation function.

Maryland's NPDES industrial stormwater general permit lays out the long-term inspection and maintenance requirements for relevant industrial facilities (Part V). Quarterly visual inspections of the facility are required each year by a qualified agent of the facility owner, of which one inspection must be conducted during rainfall conditions. These inspections support a required annual Comprehensive Site Compliance Evaluation, relative to the site's Stormwater Pollution Prevention Plan (SWPPP), which includes evaluating the condition of stormwater BMPs. MDE WMA's Compliance Program oversees the permit compliance.

Operational Practices: Some restoration practices are repeated annually, such as street sweeping and urban nutrient management. These are also called "non-structural" practices.

Street sweeping protocols are reflected in MDE's Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated (November 2021). These will be updated as needed to reflect the most current Chesapeake Bay Program expert panel guidance. MDE does not find street sweeping to be an effective means of nutrient reduction. However, street sweeping can be effective for managing trash and other debris. If performed frequently enough and with effective sweeper technology, the local jurisdictions may choose to document and report it as an annual reduction credit. Local jurisdictions seeking credit should keep detailed street

sweeping logs and street sweeper maintenance records to verify their implementation and support MDE program reviews.

Urban nutrient management (UNM) is driven by the Maryland Fertilizer Use Act of 2011, which governs the use of fertilizer on turf for non-agricultural purposes. Verification procedures for UNM BMPs are described in Maryland's Agriculture BMP verification protocols. For more information, see Maryland's UNM webpage.

Elimination of Illicit discharges to storm drain systems are tracked and reported by Phase I MS4 jurisdictions to MDE. MDE has incorporated verification procedures into reporting based on Bay Program expert panel recommendations.

Data Reporting

Stormwater BMP verification data consists of two broad sets. The first is the extensive records kept by the verification team members to ensure proper installation and long term maintenance of the stormwater BMP inventory. The second is the key BMP information used for annual Chesapeake Bay progress evaluations.

The first set of data is essential to the operational BMP verification and validation processes. It includes records of field inspections and maintenance activities, which support enforcement and regulatory oversight functions like MDE's triennial review of local stormwater programs. These data were discussed in the previous section about BMP verification methods.

The second set of data describes the types of stormwater BMPs, their location, and information needed to evaluate pollutant removal rates, which includes the *maintenance condition*. These data are reported annually by local entities to the State. The data are validated, formatted, and reported by the State to the EPA Chesapeake Bay Program.

This section focuses on the second set of data. This section also focuses on BMP reporting by MS4 and non-MS4 local stormwater programs and MS4 State and federal facilities, which constitutes a majority of the urban BMPs in the State. Facilities covered by the MS4 Industrial General Permit report in a separate way described briefly at the end of this section.

Data Flow: Maryland is transitioning to a new data flow process. The old process is summarized in Figure 4 and the new process is summarized in Figure 5.

Figure 4 shows two broad data streams for a) BMPs on new development and b) restoration BMPs, including those associated with redevelopment projects. The stormwater BMPs installed on new development are partitioned into three sources: MS4 Phase I, MS4 Phase II, and non-MS4 jurisdictions. The MS4 Phase I and Phase II reporting is submitted through an appendix to their annual report to MDE WMA's SDSFM Program. Non-MS4 reporting comes directly to MDE WSA's WQRA Program from local sources via a variety of ways including spreadsheet submittal and Notice of Construction Completion (NOCC) forms. Some of these data include

restoration BMPs; however, the vast majority is for new development. MDE WSA consolidates the data, conducts QA/QC, and formats the data for submittal to the EPA CBP via the NEIEN.

The restoration BMPs (retrofits) are reported primarily by MS4 Phase I jurisdictions through the main body of their annual reports. These data are summarized by MDE WMA's SDSFM Program and provided to WSA for formatting and submittal to the EPA CBP via NEIEN.

Figure 5 summarizes the new process, which is expected to be in place by 2018 when Maryland's BMP verification protocols are to be fully operational. The new process will route all of the local information through an online stormwater database managed by MDE WMA's SDSFM Program[2]. The online database will have three separate portals for Phase I, Phase II and Non- MS4 data intake from local sources. The portal for Phase I MS4 data will be linked to a GIS module of the database. The portals for the Phase II MS4 and non-MS4 data will be linked to database modules that do not require GIS information.

WMA's SDSFM Program database will generate stormwater BMP data for annual progress reporting to EPA CBP by MDE WSA's WQRA Program. These data will be stored, along with nonpoint source BMP data from other source sectors, in a BMP data management system (DMS). The BMP DMS will facilitate formatting for NEIEN transmittal. The new BMP data systems will allow MDE to more efficiently and effectively manage and validate the large amounts of information provided by numerous sources.

[2] The data flow process for restoration projects on industrial facilities with an NPDES general permit for stormwater has yet to be determined.

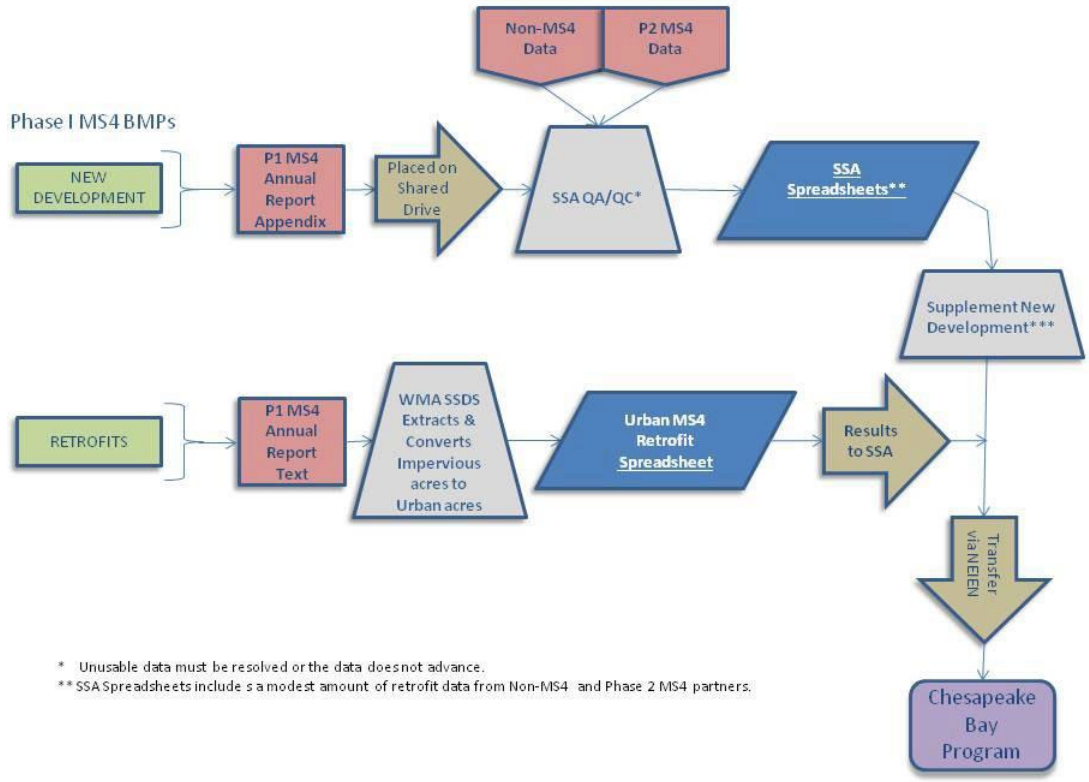

Figure 5-4. Current Reporting Data Flow of Stormwater BMPs to Chesapeake Bay Program

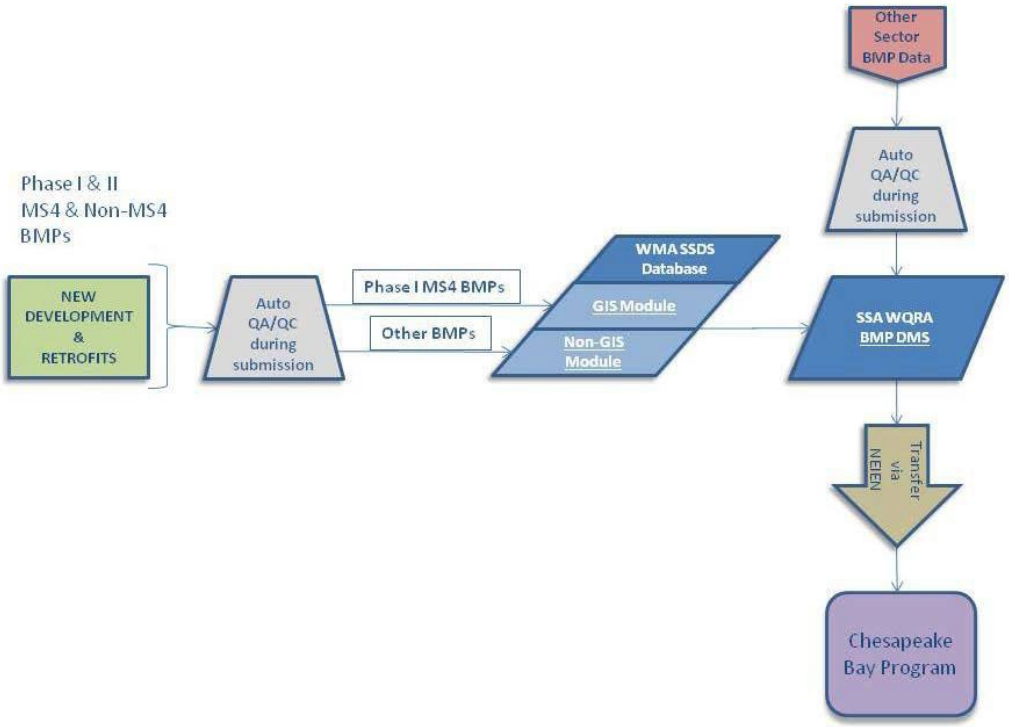

Figure 5-5. Future Reporting Data Flow of Stormwater BMPs to Chesapeake Bay Program

Data Quality Assurance

Maryland's stormwater BMP verification protocols are intended to achieve the same data reporting participation rate and quality for MS4 and non-MS4 jurisdictions. As a foundation, State regulation requires reporting of construction completion to MDE for all jurisdictions (COMAR 26.17.02.10.G). State regulation also requires that all jurisdictions perform inspection and maintenance and keep records (COMAR 26.17.02.11). Although only MS4 jurisdictions are required to report their BMP maintenance status, non-MS4 jurisdictions are evaluated by MDE on a triennial basis, and BMP maintenance is an integral part of any program review. Where MDE finds BMP maintenance lacking, recommendations for local program improvement are formally communicated. Additionally, non-MS4s have an incentive to report this information in order to receive full credit toward meeting Chesapeake Bay nutrient reduction targets. This interest is reflected in increased BMP reporting by local, federal, and State partners since Maryland adopted a Chesapeake Bay WIP.

Beyond having motivation to report, the data that are reported must be complete and accurate. Use of the new stormwater BMP geodatabase for reporting information is a new permit condition of Phase I MS4 jurisdictions (Figure 5). A list of required information is included in Appendix A of their permit. The geodatabase records information on traditional BMPs (e.g., bioretention systems, infiltration systems) and additional restoration activities, such as street sweeping, stream restoration, and tree planting. A data web intake portal is being built into the system to provide quality control as the data are entered into the database. Information on the new geodatabase can be found in the associated user manual and QAPP (MDE, March 2012).

The database is being enhanced to include a module that will support simplified BMP reporting, which does not require GIS information. It is envisioned that this module will be used for Phase II MS4 and non-MS4 BMP reporting (Figure 5).

MDE's adoption of the new online data reporting system for stormwater BMPs will improve data quality in a number of ways. First, the database design process, which involved Phase I MS4 local partners, raised awareness about increased expectations for Chesapeake Bay progress reporting in general and maintenance information in particular. It also promoted data standardization, which streamlines quality assurance processes during data exchanges. Finally, it motivated the development of many new local data management systems. These local systems will improve the quality of local information and will likely promote improved data collection and record keeping by original sources that feed the local databases.

Second, local submissions to the database must pass through validation filters. One obvious data quality benefit is that records not meeting minimum expectations will be rejected. Records with outlier information will be flagged for further review by local data submitters. A less apparent benefit is that, over time, local data submitters will be motivated to improve their

data quality to avoid the burden of addressing negative data validation feedback. Another benefit to overall data quality is that improved local data quality will free up time for State data managers to address more subtle and challenging data quality issues. The new web intake and validation tool will help local data providers report information more easily with a better understanding of data needs and verification.

Third, double counting of BMPs is reduced in several ways. Centralizing the reporting of urban stormwater BMPs through local government programs to MDE WMA's SDSFM Program, rather than allowing some data to be reported directly to MDE WSA, avoids having the same BMP reported by two parties. More accurate geo-locating of BMPs, and the increased attention to data quality in general, also reduces the potential for double counting. In addition, Appendix B of MDE's *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated* (MDE 2014) guidance, calls for all structures and practices to be given a unique structure ID. Data validation procedures use conditional formatting in each partner submission to ensure that each BMP_ID provided by a data partner, for individual or aggregated sets of BMPs, does not overlap before data is submitted via NEIEN. These procedures are being communicated to non-MS4 jurisdictions as well.

In addition to reducing double counting, the policy of having all BMPs report through local governments, including homeowners, non-governmental organizations (NGOs), grant agencies and others, has the additional benefit of promoting long-term maintenance. This policy ensures local stormwater programs with inspection responsibilities are aware of BMPs on private property. This is of particular value in the reporting of tree planting, a popular activity among NGOs and grant-giving organizations. Another example of this is homeowner BMPs. There are a variety of local initiatives promoting the implementation of practices on homeowner property. One example is the process established by the University of Maryland Extension Service's Stormwater Management and Restoration Tracker **(SMART) tool. These initiatives are encouraged to follow the** CBP protocol for crediting homeowner BMPs**, which encourages reporting through local government stormwater programs.**

In addition to the quality assurance benefits of the SDSFM Program's BMP database, the BMP DMS being developed by MDE WSA's WRD Program will promote improved data quality (Figure 5). All stormwater data submitted to MDE WSA is reviewed prior to submittal to EPA CBP to ensure that it conforms to the minimum data requirements established by the Chesapeake Bay Program Partnership and NEIEN data schema[3]. Once data are received by WSA, staff performs an independent validation process. This review includes standardizing addresses, a general location check, data range checks (e.g., drainage area), conformance with CBP BMP names and codes (performing data cross-walks for conforming practices submitted with different names), removing records that do not have minimum required data (BMP type, drainage area, location, built-date and in the future appropriate inspection date, inspection results and maintenance

[3] Information on MDE WSA's procedures for the NEIEN submittal can be found in MDE's 2015 NEIEN Quality Assurance Project Plan (QAPP).

disposition information). As stormwater pollutant removal performance information is provided in the future, data checks will also include impervious areas and the rainfall depth treated for each BMP. These data verification checks and processing steps will be automated and enhanced by the BMP DMS that is under development.

Historic Data Verification: In Maryland, the historic data cleanup has already begun with a draft submission to EPA CBP on June 30, 2015. Included in this initial submission were information from 17 municipal, State, and federal partners within the urban sector including all but one Phase I MS4 jurisdiction. Records date back to 1950. Data quality assurance and data entry were conducted the same way described above.

Industrial Restoration Projects: The process for collecting BMP information for restoration projects implemented pursuant to the NPDES general permit for industrial stormwater discharges is under development. The process will likely involve securing information from MDE WMA's Wastewater Permits Program.

Gaps: Despite the anticipated data quality improvements, MDE is aware that more urban stormwater BMP data exists that are not being reported, particularly in the non-MS4 communities and practices implemented by NGOs or homeowners. As the State moves toward meeting its 2025 TMDL goals, outreach and assistance to these potential data partners will need to be conducted to ensure all practices are accounted for and being maintained.

6 Wastewater Sector

This section of the verification protocol represents the BMP groupings for the Wastewater sector. This sector includes wastewater treatment facility discharges, septic systems, sanitary sewer overflows, and combined sewer overflows. While this section describes many wastewater treatments and technologies used in Maryland to reduce nutrient and sediment loading, sufficient documentation for credit is provided only for permitted discharges, septic system upgrades and septic connection to treatment plants at this time.

6.1 Discharges from Wastewater Treatment Facilities

The Chesapeake Bay TMDL provides individual wasteload allocations for significant wastewater treatment plants (WWTPs). Maryland's significant WWTPs are: a) those that treat domestic wastewater and have design flows greater than or equal to 0.5 million gallons per day (these are also known as "significant"), b) industrial facilities with a nutrient load equivalent to 3,800 pounds of total phosphorus per year or 27,000 pounds of total nitrogen per year, and c) any other municipal and industrial WWTPs identified as significant in Maryland's Watershed Implementation Plan (WIP). Maryland's strategy to reduce the nutrient loading from these facilities involved permitting all facilities and incorporating enforceable discharge limits on the amount of total nitrogen and total phosphorus for all significant facilities. In many instances,

meeting the limits requires installation and operation of additional treatment technologies to reduce nitrogen and phosphorus.

Maryland currently has in place an Enhanced Nutrient Removal (ENR) Cap Strategy that establishes a nutrient loading cap, under which flows may increase to design capacity, with a corresponding decrease in concentration so that the cap is not exceeded. The strategy is a plan to: a) upgrade significant WWTPs to state of the art ENR technology to meet concentrations of 4.0 mg/l or less total nitrogen and 0.3 mg/l or less total phosphorus, and b) maintain the nutrient load caps for all facilities.

Sixty-six out of 67 significant WWTP facilities have had ENR upgrades completed with other facilities upgrade projects underway. Fourteen non-significant WWTP have also completed or are undergoing ENR upgrades. It is anticipated that all upgrades of significant facilities are expected to be completed as planned in Maryland's Phase III WIP. The current status, along with location, of ENR upgrades at significant and non-significant WWTP facilities can be located on MDE's Bay Restoration Fund website.

Details regarding verification and validation procedures for these practices within the State for all WWTP facility owners (e.g. federal, municipal or private) are contained in Table 6-1 and summarized in the following section.

Table 6-1. Wastewater Treatment Facilities Verification Protocol Design Table Summary

Verification Element	Description
BMP or Group	Wastewater
Geographic Scope	Statewide
A. WIP Priority	High
B. Data Grouping	NPDES wastewater
C. BMP Type	Treatment technology
D. Initial Inspection	
Method	DMRs, MORs
Frequency	Monthly DMRs
Who Inspects?	MDE Compliance Program
Documentation	EPA ICIS Reporting Mechanism
E. Follow-up Check	
Follow-Up Inspection	Physical Site Inspections are performed by MDE Water Management Agency Compliance Program.
Statistical Sub-sample	NA – All BMPs are inspected per state law at various stages in ENR construction
Response if Problem	Enforcement action
F. Lifespan/Sunset	NA – Annual BMP
G. Data QA, Recording & Reporting	MDE staff performs regular data assessments. During these reviews staff look for and attempt to rectify any anomalies in the data (e.g., incorrect reporting units, incorrect load calculations), in accordance with an updated quality assurance plan and with the recommended methods described in the CBP Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements guidance document. The State of

Verification Element	Description
	Maryland keeps track of wastewater discharge loadings through the Maryland Point Source database.

Significance of these BMPs

ENR upgrades to Maryland WWTPs are a critical component of the State's WIP strategy with reductions to nitrogen expected to be millions of lbs per year. Thus, the NPDES wastewater sector BMPs are of high significance to Bay restoration and receive a higher level of verification than most other BMPs.

6.1.1 Wastewater Data Verification

Method

The primary mechanisms for verifying compliance are the self-monitoring requirements included in facilities' NPDES permits. Permits require regular and frequent (monthly or quarterly) submission of effluent analytical data for all wastewater facilities (significant and non-significant) to MDE to verify compliance with effluent limitations via monthly discharge monitoring reports (DMRs) and monthly operating reports (MORs). Permits also contain procedures for facilities to calculate monthly loads by averaging nutrient results and coupling those with measured total monthly flow.

Verification Team

The Maryland Department of the Environment's Water Management Administration (WMA) compliance program administers the Federal National Pollutant Discharge Elimination (NPDES) program in Maryland. MDE's surface water discharge permits combine applicable State and NPDES requirements into one permit for facilities that discharge to state surface waters. Through the surface water discharge permitting process, dischargers are inventoried, inspected, and brought into compliance when necessary.

Documentation of Verification

Maryland tracks WWTP NPDES permits for non-significant facilities and annually reports loads for all active facilities using ICIS. Progressively more facilities are using MDE's NetDMR for data population into ICIS versus the manual data entry conducted to populate data in ICIS from Compliance staff. NetDMR is a web-based tool that allows WWTP NPDES permittees to electronically sign and submit their Discharge Monitoring Reports (DMRs) to EPA's Integrated Compliance Information System (ICIS) via the Environmental Information Exchange Network. More information on NetDMR and WWTP discharge permits are on MDE's Municipal Surface Water website.

Independent Verification

The WMA's Compliance Program reviews and tracks DMRs manually during physical site inspections and as part of established quality assurance procedures to verify data and reporting

integrity. Noncompliance reports are generated from ICIS at least quarterly that will include those permittees in significant noncompliance with permit effluent limits or reporting requirements. The number, type, and frequency of inspections performed conform to the guidance provided by the U.S. EPA's Compliance Monitoring Strategy. MDE independently assesses/compels compliance with permits through these inspections and the use of enforcement actions in response to noncompliance. Systematic escalation of enforcement is pursued to resolve noncompliant facilities in the shortest time possible.

On a regular basis, Compliance Program staff inspects facilities to determine compliance with their NPDES permits. Significant facilities are inspected once per year and non-significant facilities are inspected once every permit cycle (5 years). For facilities with compliance concerns, inspection frequency is increased if necessary. These inspections supplement the self-reporting of effluent testing results performed by wastewater dischargers. Inspectors observe unit processes, take on-site samples, and examine testing records. At the conclusion of an inspection, the inspector discusses problems with the certified plant superintendent or operator; when appropriate, MDE notifies the facility of violation and the corrective actions required. As part of their inspections, staff members also may advise site owners and operators about pollution prevention opportunities. Program inspectors also periodically conduct inspections at the contract laboratories for municipal and industrial permittees to verify proper analytical methods are being followed. The Compliance Program reports its activities each fiscal year as part of MDE's Annual Enforcement and Compliance Report.

6.1.2 Wastewater Data Validation

Quality Assurance

In accordance with EPA guidance, MDE staff performs regular assessments of the data received from the facilities. During these reviews, staff look for and attempt to rectify any anomalies in the data (e.g., incorrect reporting units, incorrect load calculations, etc.). This process is completed in accordance with an updated quality assurance plan, consistent with EPA requirements. Double counting is unlikely to occur for these wastewater practices because they are being provided by one agency and are covered and tracked by permit.

Data Entry

Compliance Program staff manually enter effluent analytical data from facilities into ICIS as submitted on paper DMRs. An increasing number of facilities enter effluent analytical data into NetDMR. This information is validated in the ICIS database by the Compliance Program, which oversees compliance and enforcement activities of State/NPDES discharge permits in Maryland. DMRs are entered into ICIS on a daily basis, according to a schedule established in agreement with the EPA.

Upon completion of quality assurance, fiscal year updates for significant facilities are submitted digitally to the Chesapeake Bay Program nutrient database manager by January of each year. In addition, calendar year updates for non-significant facilities are submitted by October. Point source control upgrades are reported on a monthly basis through a spreadsheet with a record for each plant, current status (e.g., planning, design, construction), expected completion, etc. The spreadsheet also provides the expected immediate and long-term load reduction for each upgrade.

External Data
Data are collected by the facilities and provided to WMA and is evaluated as described above.

Historic Data Verification
Historic data was provided by WMA. Data quality assurance and data entry were conducted the same way as in the past (as discussed in the above sections). ENR practices do not expire or need to be re-verified.

6.2 Septic Systems–Treatment Technology Upgrades

Based on 2015 data, there are 395,062 onsite sewage disposal systems, or septic systems, in the Maryland portion of the Bay watershed, with 45,131 in the Chesapeake Bay Critical Area. There are approximately 141,300 systems within 1,000 feet of a perennial stream.

Maryland's strategy for reducing nitrogen loads from septic systems is to either upgrade to nitrogen removal technology or connect to an advanced wastewater treatment plant. In addition, the strategy calls for septic pumping of about 25,325 systems (note that pumping is not currently tracked). The estimated reduction is about 320,000 pounds of nitrogen per year fully implemented.

Details regarding verification and validation procedures for these practices are contained in Table 6-2 and summarized in the following section.

Table 6-2. Septic Systems – Treatment Technology Upgrades Verification Protocol Design Table Summary

Verification Element	Description
BMP or Group	Wastewater
Geographic Scope	Statewide
A. WIP Priority	Low
B. Data Grouping	Septic Systems
C. BMP Type	Treatment technology (BAT)
D. Initial Inspection	
Method	Service providers report all installations
Frequency	After installation, annual operation and maintenance inspections required.
Who Inspects?	Certified service providers
Documentation	Files are created and maintained at MDE for BAT installations.
E. Follow-up Check	
Follow-Up Inspection	Annual operation and maintenance inspections required.
Statistical Sub-sample	All systems inspected annually by certified service provider. In addition,

	MDE BAT staff perform installation and service visit audits at a frequency of no less than ten percent of each county's cumulative total BATs. Systems are selected from a random database query for a particular county.
Response if Problem	COMAR 26.17.01.09: Describes the process for violations found during inspections and complaints. Enforcement actions can include a corrective action plan, stop work order, penalty/fine, or legal action.
F. Lifespan/Sunset	Maryland regulations provide authority to issue fines for failure to inspect and maintain BAT systems. MDE may revoke certification of a service provider for failure to follow procedures or for violating Maryland regulations.
G. Data QA, Recording & Reporting	MDE ensures that O&M reports provided by service providers are valid and tracked for audit purposes. MDE staff verifies that each BAT system installed has a minimum of one O&M visit per year by a qualified O&M service provider. On a quarterly basis, reports are generated from appropriate databases indicating all BAT systems that have not had required O&M performed. MDE maintains a list of certified BAT service providers.

Significance of these BMPs

Of Maryland's total pollutant reductions required by the Chesapeake Bay TMDL, septic upgrades are a small portion of the overall WIP reduction goals. However, these BMPs are significant to State strategies for shellfish production and human health concerns. Septic upgrades will continue to play a part in overall TN reduction in the state, just at a lower level of significance.

6.2.1 Septic Systems–Treatment Technology Upgrades Data Verification

Method

Maryland's Bay Restoration Fund (BRF), established in 2004, provides up to 100 percent funding for the upgrade of septic systems to the best available technology (BAT), about 1,200 systems are upgraded per year. The current BAT has an average cost per septic system of $13,000 and reduces the nitrogen load by 50% minimum. As of October 2014, 7,030 systems have been upgraded with BRF/BAT funding, with 3,517 in the Critical Area.

Maryland requires (COMAR 26.04.02.07) all septic systems serving newly constructed buildings and all replacement septic systems in the Critical Area to include nitrogen removal upgrades using BAT. MDE estimates that this requirement will result in 1200 septic system upgrades per year. Maryland law required MDE to use the BRF for BAT upgrades mitigating failing systems in the Critical Area during as the top priority.

MD law (COMAR 26.04.02.07) requires the installer to report installation of the BAT systems within one month upon completion of the final inspection. In addition, certified service providers are required to report to MDE all inspections and maintenance performed for BAT systems on an annual basis.

Verification Team

Service providers in the State of Maryland must obtain two separate certifications to be eligible to perform service to BAT units in accordance with the Code of Maryland Regulations. Service providers must complete and pass a course of study approved by the MDE on operation and maintenance of BAT systems. The course of study shall include instruction on how BAT systems function as well as elements on operation, maintenance, and repair of BAT systems. The certified service provider shall also have a certificate of qualification from the manufacturer of the BAT system being serviced. MDE maintains a list of certified BAT service providers. MDE may revoke certification of a service provider for failure to follow procedures or for violating Maryland regulations.

Documentation of Verification

Files are created and maintained at MDE for BAT installations. Information is stored in a BAT database, with paper copies of documents stored in BRF file cabinets, after it has been transferred to the BAT database. Reporting requirements for Health Departments and service providers include the name of the applicant, location, the date of the installation and the description of BAT technology installed.

Independent Verification

MDE BAT staff perform installation and service visit audits at a frequency of no less than ten percent of each county's cumulative total BATs. Systems are selected from a random database query for a particular county.

6.2.1 Septic Systems–Treatment Technology Upgrades Data Validation

Quality Assurance

MDE requires all BAT installations to be performed by licensed individuals. In addition, county staff issue permits and conduct inspections/audits of systems to ensure compliance by licensed professionals. Staff also respond to any complaints or concerns by system owners.

MDE staff verifies that each BAT system installed has a minimum of one operations and maintenance (O&M) visit per year by a certified O&M service provider to ensure the system is operating properly. Property owners must comply with annual O&M requirements for the life of all BATs. On a quarterly basis, MDE generates reports from appropriate databases identifying all BAT systems that have not had required O&M performed. MDE ensures that O&M reports provided by service providers are valid and tracked for audit purposes. Installation and service visit audits are mandatory for ensuring the private industry, property owners and governmental organizations comply with MD regulation and law. These audits should occur at a frequency of no less than ten percent of a County's cumulative total BAT upgrades for a given year.

Local governments have the option of participating in the oversight of this process at three levels of increasing involvement. Depending on their level of involvement, either local governments or MDE generate letters to septic system owners that have not performed annual inspections based on information in the online tracking system. Maryland regulations provide authority to issue fines for failure to inspect and maintain BAT systems.

Data Entry

Data are currently collected via the internet using a web portal and an individual log in supplied to authorized data providers. Double counting is unlikely to occur for this practice because information is being provided to one agency via the BRF funding application. BMPs in this database are tied to reimbursement identifications and therefore there is a reasonable assurance that they have unique projects for each allocation of funding.

Training for entering data into the BAT database is provided in the form of a user's manual. There will be no "certification" required to enter data. However, the person entering data will receive detailed instruction on how to use the database and enter data properly.

External Data

Service records are reported from service providers to MDE as an electronic or paper copy record for the properties being serviced. The data are evaluated by MDE as described above.

Historic Data Verification

Historic data were provided by MDE. Data quality assurance and data entry were conducted the same way as in the past (as discussed in the above sections).

6.3 Septic Systems–Connection to WWTP

Maryland's strategy for reducing nitrogen loads from septic systems includes connecting septic system areas to an advanced wastewater treatment plant. MDE provides limited funding such as Supplemental Assistance grants and low interest Water Quality Revolving Loan Fund loans to connect areas with failing septic systems to wastewater treatment plants.

Table 6-3. Septic Systems – Septic Connection to WWTP Protocol Design Table Summary

Verification Element	Description
BMP or Group	Wastewater
Geographic Scope	Statewide
A. WIP Priority	Low
B. Data Grouping	NPDES wastewater
C. BMP Type	Septic Connections to WWTP
D. Initial Inspection	
Method	Visual Inspection
Frequency	Once
Who Inspects?	Jurisdiction Health Department
Documentation	Construction Completion Reports
E. Follow-up Check	
Follow-Up Inspection	N/A

Statistical Sub-sample	N/A
Response if Problem	N/A
F. Lifespan/Sunset	Lifespan is for the life of the home, or WWTP it is connected to.
G. Data QA, Recording & Reporting	Appropriate jurisdiction health department personnel conduct site visits and construction inspections; findings are documented as Construction Monitoring Reports (CMRs). These records are then submitted to MDE for reimbursement, where they are review and approved or disapproved.

Significance of these BMPs

Septic connections are not a strategy in the State's WIP reduction goals. However, these BMPs are significant to State strategies for shellfish production and human health concerns. Septic connections will continue to play a part in overall TN reduction in the state, just at a lower level of significance.

6.3.1 Septic Systems–Connection to WWTP Data Verification

Method

All connections currently reported are paid for with BRF Funds. Planning and construction are coordinated by the county and reimbursed by the BRF.

Appropriate jurisdiction health department personnel conduct site visits and construction inspections; findings are documented as Construction Monitoring Reports (CMRs). Fund recipients must submit requests for fund disbursement; grantees submit "reimbursement payment requests", while loan recipients submit "cash draw request forms". These must be accompanied by certain supporting documentation (including costs incurred, local share/matching funds, recipient payment to vendors, and funds received from other sources), all of which is verified by MDE prior to disbursement. Further, disbursements are reviewed prior to approval.

Verification Team

Septic Connections to Wastewater Treatment Facilities are provided through MDE's Water Quality Financing Administration. An annual report is compiled and the information is provided to MDE's WSA.

Documentation of Verification

The improvements are not paid for until the project is 100% complete. No funds are fronted to the counties for upcoming projects. In the case of a community sewer line, the reimbursement is made as each house connection project is completed.

Independent Verification

Construction completion of these projects requires inspection and certification by the local health department staff. Authorization from the County Health Department is required. The County requests the funds from MDE, but only after their approval and sign-off of the project's completion.

6.3.1 Septic Systems–Connection to WWTP Data Validation

Quality Assurance

Currently this BMP is only reported by BRF project managers. There is very little potential for double counting due to the small number of projects and manner in which they are reimbursed.

Historic Data Verification

No re-verification is needed once a system is removed and a house is connected to the WWTP. The septic system is gone.

6.4 Sanitary and Combined Sewer Overflows

Combined sewer overflows (CSO) are assigned wasteload allocations in the Bay TMDL. Sanitary sewer overflows (SSO) are illegal discharges often indicative of problems with collection systems. The Bay TMDL assumes full removal of SSOs and makes no allocation for them.

Maryland's strategy involves elimination of overflows through consent orders requiring system repair and upgrades. CSO disconnection is not a modeled BMP, but rather a baseline land use change in the Bay model. Therefore Maryland does not provide a protocol for verification of this landuse. When CSOs are disconnected, they undergo an engineering review to certify that construction followed the plans approved by MDE and that the storm system is truly independent of the sewer system. The result is that CSO acres are replaced with urban land use, and there is no verification needed to maintain these acres.

SSOs are reported to MDE, but the maintenance to fix SSO events are not.

6.4.1 Sanitary and Combined Sewer Overflows Data Verification

Salisbury, Cambridge, and Baltimore City have completed CSO improvements. Westernport, Allegany, Frostburg, LaVale, and Cumberland have each submitted a Long Term Control Plan for CSO improvements that is compliant with 1995 EPA Guidance.

Each Long Term Control Plan includes:

1. Characterization, monitoring, and modeling of the combined sewer system
2. Public participation

3. Consideration of sensitive areas
4. Evaluation of alternatives to meet CWA requirements using either the "presumption approach" or the "demonstration approach"
5. Cost/performance considerations
6. Operational plan
7. Maximizing treatment at the existing POTW treatment plant
8. Implementation schedule
9. Post-construction compliance monitoring program

SSO-related consent decrees are in place for several major sewerage systems. The orders require rehabilitation of the sewerage systems to prevent SSOs. In accordance with the terms of each of the consent decrees, stipulated penalties are assessed for sanitary sewer overflows. Maryland regulations require that the owner or operator, or both, of any sanitary sewer system, combined sewer system, or wastewater treatment plant to report to MDE and local health department any overflow that results in the direct or potential discharge of raw, partially treated, or diluted sewage into waters of the State.

Maryland will continue to oversee CSO separation/elimination and SSO elimination through enforcement. In addition, Maryland will ensure continued compliance with overflow reporting regulations.

6.4.1 Sanitary and Combined Sewer Overflows Data Validation

Data Entry

The Maryland Reported Sewer Overflow Database contains CSOs, SSOs and bypasses reported to MDE since January 2005. MDE updates this database regularly. Although MDE requires that all public sewer system owners or operators report overflows, there may be incidents that were not reported. Overflow amounts provided by the person reporting the overflow may be estimated using professional judgment, or they may be actual readings from flow measurement devices.

7 Wetland Restoration

This Verification Protocol incorporates all wetland related BMPs that are implemented and accounted for in Maryland's WIP, including agricultural wetland restorations and creations as well as urban wetland created for stormwater. Details regarding verification and validation procedures for these practices are summarized in the following sections.

Additional sources of data exist, but are not currently reported to the CPBO, and wetland verification protocols will be updated when these data sources are resolved and included in our annual submission.

7.1 Agricultural Wetland Restoration

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

Details regarding verification and validation procedures for agricultural wetland restoration practices are summarized in Table 7-1 and the following sections.

Table 7-1. Agricultural Wetland Restoration Verification Protocol Design Table Summary

Verification Element	Description
BMP or Group	Wetland Restoration
Geographic Scope	Statewide
A. WIP Priority	Low
B. Data Grouping	Structural Multi-Year BMPs
C. BMP Type	Wetlands
D. Initial Inspection	
Method	SCD staff is on-site throughout the construction phase guided by NRCS's Engineering Folder Completion Checklist to ensure all elements of the design and construction are verified and documented.
Frequency	At completion of project
Who Inspects?	SCD Staff
Documentation	NRCS Engineering Folder Project Completion Checklist
E. Follow-up Check	
Follow-Up Inspection	Annual MACS Spot-check reviews. Field inspection to determine whether the BMPs were constructed according to plan specifications and whether the BMPs are being maintained in accordance with contract. MDA proposes re-verification of structural BMPs by a BMP Verification Task Force consisting of 5 independent MDA employees.
Statistical Sub-sample	10% of practices are re-verified annually

Verification Element	Description
Response if Problem	If the BMP has been determined to be unsatisfactory, trained SCD staff may assist the farmer to bring the practice back into a satisfactory condition within one year. If repairs are not made within the specified period, the practice will be flagged as unsatisfactory and credit removed as per the NEIEN reporting protocol.
F. Lifespan/Sunset	Established CBP BMP credit duration
G. Data QA, Recording & Reporting	MDA's implementation is currently tracked in MDA's Conservation Tracker regardless of funding source. All practices are entered into the Conservation Tracker, which the Service Center Office has provided conservation technical assistance. This database has made it comparatively easy to eliminate double counting and accurately report conservation practice implementation

Significance of these BMPs

Of Maryland's total pollutant reductions required by the Chesapeake Bay TMDL, wetland restorations are not a significant strategy in the State's WIP reduction goals for the agricultural sector. However, these BMPs are significant to State strategies for habitat creation, ecological health and water quality. Wetland Restorations will continue to play a role in overall TN & TP reduction in the state, just at a lower level of significance.

7.1.1 Agricultural Wetland Restoration Data Verification

Method

Consistent with the majority of Visual Multi-year BMPs, wetland restoration in Maryland is largely implemented through a co-cost share agreement between the Maryland Agricultural Water Quality Cost-Share (MACS) program (State) and USDA (federal) programs. Site eligibility is determined consistent with USDA protocols, followed by the SCD staff developing site design and technical specifications according to the NRCS design standards.

Technical designs and standards are provided through the SCD to the contractor installing the structural or vegetative practice(s). SCD staff are guided by two relevant NRCS practice standards, 657 (Wetland Restoration) and 658 (Wetland Creation), Qualified SCD staff are on-site throughout the construction phase guided by NRCS's Engineering Folder Completion Checklist to ensure all elements of the design and construction are verified and documented. Upon completion of the BMP a final construction review is performed by qualified SCD staff to ensure that the project meets appropriate NRCS standards and specifications. This process is completed for 100% of wetland restoration projects and represents initial verification reported through Conservation Tracker.

Documentation of Verification

Once any BMP is designed and installed in accordance with established NRCS standards, trained SCD staff enters appropriate BMP information into MDA's Conservation Tracker system. SCD staff are responsible for the timely submission of data into Conservation Tracker including

spatial location of the BMP, extent or amount of BMP installed in NRCS established official unit of measure, date of final inspection performed by qualified SCD staff, and any cost-share sources (state, federal, farmer or NGO).

In addition, MDA Headquarters receives an annual report from NRCS at the conclusion of the state fiscal year of federally funded practices. This report is cross-referenced with Conservation Tracker to confirm all installed practices have been accounted for by MDA

All wetland restoration projects implemented under Maryland MACS and USDA co-cost share agreements occur adjacent to agricultural lands and will be reported by MDA through its outlined protocols. MDA staff will coordinate annually with Maryland Department of Environment to ensure no double counting of wetland acres.

Verification Team

As with cost-shared visual multi-year BMPs, the SCD is the lead partner in delivering noncost-share programs in Maryland. Regardless of the funding source, SCD staff is on-site throughout the construction phase to ensure all elements of the design and construction meet NRCS technical standards and specifications. Trained SCD staff performs an in-field site evaluation of the BMP to ensure that the appropriate NRCS standards and specifications have been satisfied. BMPs that were installed by farmers without SCD technical assistance but meet NRCS technical design standards are generally self-reported to the SCD or documented by SCD staff during farm visits.

Independent Verification

Re-verification of wetland restoration is subject to the MACS annual spot checks as outlined previously. Additionally, USDA contract's for wetland restoration outline required maintenance and operations expectations for the landowner. Such language includes recommended regular site reviews to assess and document the success of the restoration plan. Documentation of these site review findings and any completed MACS annual review will determine if the project status is satisfactory and will serve as re-verification. The BMP status will be updated in the Conservation Tracker system to indicate a "satisfactory" or "unsatisfactory" condition with appropriate notation. A hard-copy report is also filed in the farm's Conservation Plan folder. If the BMP has been determined to be unsatisfactory, trained SCD staff may assist the farmer to bring the practice back into a satisfactory condition within one year. If repairs are not made within the specified time period, the practice will be flagged as unsatisfactory and credit removed as per the NEIEN reporting protocol.

7.1.2 Agricultural Wetland Restoration Data Validation

(See Agriculture Sector for additional detail.)

Quality Assurance

MDA's wetland restoration implementation is currently tracked and QA/QC'd in MDA's Conservation Tracker regardless of funding source. All practices are entered into the Conservation Tracker, which the Service Center Office has provided conservation technical

assistance. This database has made it comparatively easy to eliminate double counting and accurately report conservation practice implementation when used with other records.

Data Entry

As the lead agency for the agricultural sector in Maryland, MDA tracks and reports agricultural BMP implementation annually to the Chesapeake Bay Program Office (CBPO) through the National Environmental Information Exchange Network (NEIEN), the node of which is managed by the Maryland Department of the Environment (Figure 7-1).

The MDA's implementation tracking data currently includes data from MDA's Conservation Tracker and Nutrient Management Program databases, which together capture agricultural BMP implementation regardless of funding source.

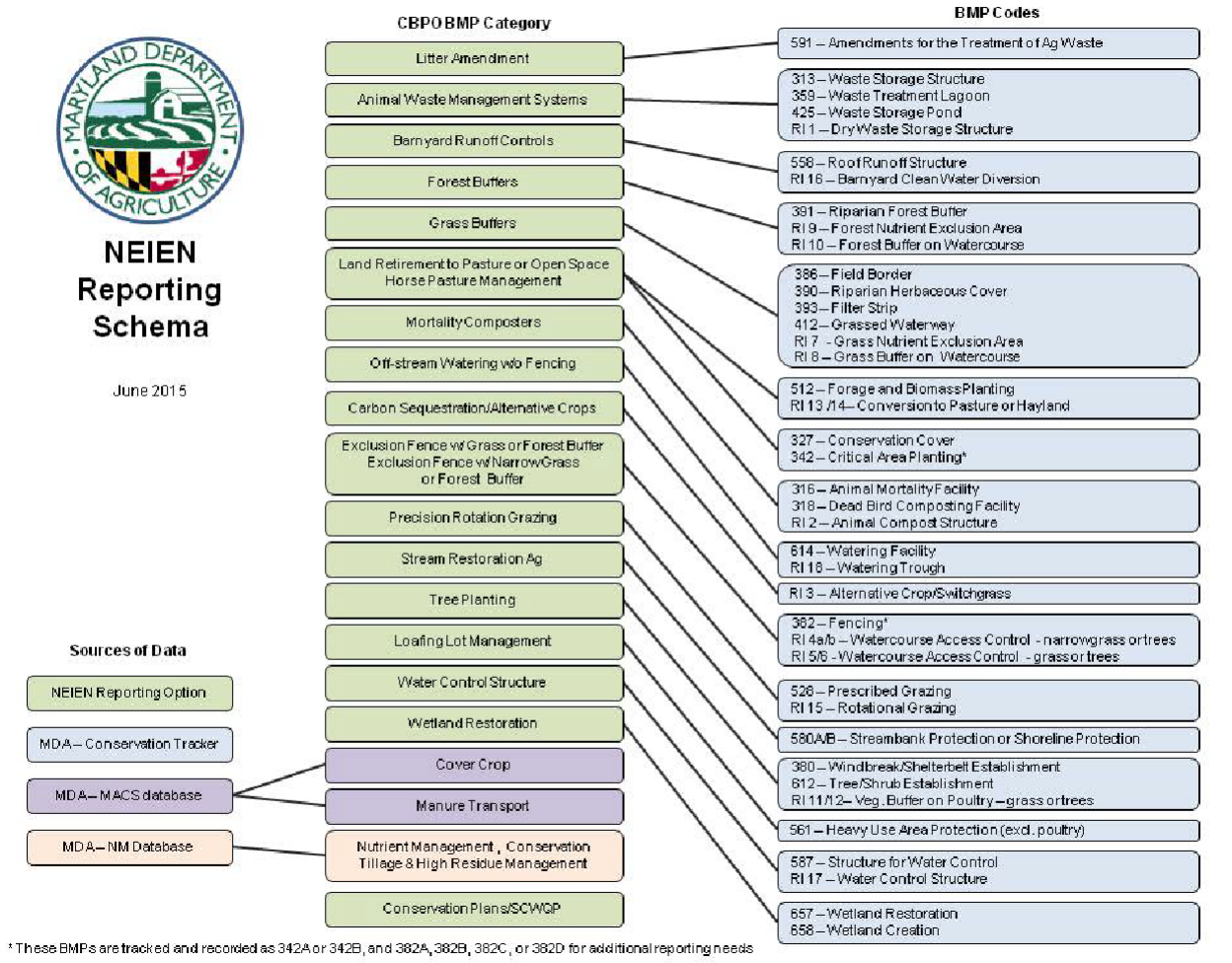

Figure 7-1. Flow Diagram of Data Systems and Reporting Protocols for Agriculture Wetlands BMP Implementation.

External Data

Data are collected by farmers, SCDs, DNR, private conservation organizations, federal agencies, and MDA and provided to MDE as described above.

Historic Data Verification and Double Counting

All wetland restoration projects implemented under Maryland MACS and USDA co-cost share agreements occur adjacent to agricultural lands and will be reported via electronic spreadsheet by MDA through its outlined protocols to MDE. MDA staff will coordinate annually with MDE to ensure no double counting of wetland acres.

7.2 Urban Wetlands

In Maryland, most wetland practices implemented in the urban sector are for the treatment of stormwater, or projects implemented for compensatory mitigation. Wetland restoration or creation projects implemented for compensatory mitigation do not receive BMP credit. Wetlands Workgroup verification guidance also states "Urban wet ponds/wetlands are not equivalent to a wetland project implemented in an agricultural setting. Therefore, jurisdictions should verify any urban wet pond/wetland projects following the Urban Stormwater Workgroup's BMP verification guidance."

Therefore, Maryland does not have a current protocol for verification of urban wetlands, but may develop one in the future if practices as defined by the workgroup become a more significant contributor to WIP reductions.

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Note: All web addresses are current as of November 2021.

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APPENDIX A – Agricultural Verification Forms

MARYLAND AGRICULTURAL WATERSHED IMPLEMENTATION PROGRAM

ON-FARM BMP VERIFICATION MAINTENANCE AND USE

Plan #:
Parcel #:

Cooperator Contact Information

SCD:
Farm/Tract:
MPV Acct ID:

BMP ID	**BMP Practice Code and Name**	**Install Date** / **Verified Date**	**Install Amount** / **Verified Amount**	**Unit**	**MACS #** / **FED CS**	1. Are NRCS Standards & Specs in place at time of construction still being met or does the practice still meet RI visual indicators?	2. Is the BMP being utilized as intended and achieving its original purpose?	3. Are resource concerns being addressed?	4. Were any alterations made to the project that lessened the effectiveness ?	5. Is any maintenance needed to bring the BMP to the minimum NRCS standard or to an RI Level?*	BMP Status
						Y☐ N☐ N/A ☐	Y☐ N☐ N/A ☐	Y☐ N☐ N/A ☐	Y☐ N☐ N/A ☐	Y☐ N☐ N/A ☐	MS MSNA DNMS TYPO DNE SUPB ADMIN NATP
Admin/Notes:						Retire Date:			SUPB ID:		
						Y☐ N☐ N/A ☐	Y☐ N☐ N/A ☐	Y☐ N☐ N/A ☐	Y☐ N☐ N/A ☐	Y☐ N☐ N/A ☐	MS MSNA DNMS TYPO DNE SUPB ADMIN NATP
Admin/Notes:						Retire Date:			SUPB ID:		
						Y☐ N☐ N/A ☐	Y☐ N☐ N/A ☐	Y☐ N☐ N/A ☐	Y☐ N☐ N/A ☐	Y☐ N☐ N/A ☐	MS MSNA DNMS TYPO DNE SUPB ADMIN NATP
Admin/Notes:						Retire Date:			SUPB ID:		

* Forest and Grass Buffers should be evaluated for water quality functionality and not planting density or species mix. Observation of some noxious and/or invasive weeds should be noted but alone will not result in an unsatisfactory review. If checked "Y" briefly describe below 1) the maintenance work required, and 2) the follow-up discussion with SCD staff to address project deficiencies.

For Admin Use Only:
Status entered into Conservation Tracker ________ Initials:______

Reviewer Name, Position and Signature

Date of Review