
Maryland Animal Agriculture Program Assessment

Final

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Acronyms and Abbreviations

AFO	Animal feeding operation
AIR	Annual Implementation Report
BMP	Best management practice
CAFO	Concentrated animal feeding operation
CBP	Chesapeake Bay Program
CFR	Code of Federal Regulations
CNMP	Comprehensive Nutrient Management Plan
COC	Certification of Conformance
COMAR	Code of Maryland Regulations
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Improvement Program
FTE	Full-time equivalent
FY	Fiscal year
HQ	Headquarters Office (Maryland Department of Agriculture)
ICIS	Integrated Compliance Information System
LILAC	Low Interest Loans for Agricultural Conservation
MACS	Maryland Agricultural Water Quality Cost Share Program
MAFO	Maryland Animal Feeding Operation
MDA	Maryland Department of Agriculture
MDE	Maryland Department of the Environment
NA	Not applicable
ND	Not determined
NMP	Nutrient Management Plan
NOI	Notice of Intent
NOV	Notice of violation
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
RO	Regional Office (Maryland Department of Agriculture)
SCD	Maryland Soil Conservation Districts
SCWQP	Soil Conservation and Water Quality Plan
TMDL	Total maximum daily load
USDA	United States Department of Agriculture
WIP	Watershed Implementation Plan

1.0 Executive Summary

The U.S. Environmental Protection Agency (EPA) conducts periodic reviews of state programs as part of its oversight responsibilities under the Clean Water Act (CWA). Previously, EPA's program reviews have not focused exclusively on animal agriculture regulations and programs. EPA decided to conduct assessments of animal agriculture programs related to water quality in the six Chesapeake Bay jurisdictions as part of its oversight responsibilities under the Chesapeake Bay Total Maximum Daily Load (TMDL) and National Pollutant Discharge Elimination System (NPDES) Permit Program. This review also satisfies certain EPA commitments made in the settlement agreement that resolved the lawsuit [Fowler et al. v. EPA](#), No. 1:09-cv-0005-CKK (D.D.C.). As such, the Maryland review is one of six animal agriculture program reviews that will be completed by 2015.

EPA conducted an assessment of the State of Maryland's (State) animal agriculture programs related to water quality. This assessment (1) identifies successes and challenges within the State's animal agriculture programs related to water quality; (2) evaluates the programs that are available to support Maryland's agricultural pollutant load reduction commitments set forth in Maryland's Watershed Implementation Plans (WIPs) to achieve the allocations set forth in the Chesapeake Bay TMDL; and (3) evaluates Maryland's CAFO/MAFO Program (including its implementation) for concentrated animal feeding operations (CAFOs) with federal NPDES and CAFO requirements. The main goal of the assessment is to determine whether the state programs are consistent with CWA requirements and are implemented effectively to achieve Maryland's animal agriculture WIP commitments to reduce nitrogen, phosphorus and sediment under the Chesapeake Bay TMDL.

This assessment briefly summarizes State environmental regulations applicable to animal agriculture operations as well as those Maryland agencies with regulatory and technical responsibilities for animal agriculture operations. The report also includes EPA's analysis of how the State is implementing its animal agriculture programs related to water quality. The specific programs assessed are the Nutrient Management Program and the CAFO/MAFO Program. These programs were compared to the goals outlined in Maryland's WIP. Maryland was forthcoming with a considerable amount of material and information to support this assessment.

This assessment is based on responses from Maryland to an animal agriculture program questionnaire developed by EPA, information in 34 animal agriculture operations files provided by the Maryland Department of the Environment (MDE), information in 33 files provided by the Maryland Department of Agriculture (MDA), interviews with MDE and MDA staff, and program information available from agency websites. The observations outlined in this report provide a framework for Maryland to strengthen implementation of their animal agriculture programs related to water quality and work toward improved water quality within the State and the Chesapeake Bay watershed.

MDE and MDA have statutory and regulatory authority to manage animal agricultural programs in Maryland. MDA receives technical and implementation assistance from the soil conservation districts (SCDs). As a whole, EPA reviewed two main programs that these agencies implement that emphasize on-farm best management practices (BMPs) to maintain or improve the quality of water runoff from farms into surface waters: 1) Nutrient Management Program; and 2) CAFO/MAFO Permit Program. EPA also analyzed how these programs support Maryland's implementation of its WIP and the BMPs that are

necessary in order to achieve the WIP goals. The purpose of EPA's assessment was to look at all of these programs and evaluate how well they work together collectively to meet CWA requirements and the State's animal agriculture commitments made to meet the Chesapeake Bay TMDL requirements.

Watershed Implementation Plan (WIP) Best Management Practices (BMP) Implementation

Maryland's Phase I and Phase II Watershed Implementation Plans (WIPs) detail how the State plans to meet Chesapeake Bay TMDL loading allocations for nitrogen, phosphorus and sediment. Maryland submitted its Chesapeake Bay TMDL Phase I WIP on December 3, 2010 and the Phase II WIP on March 30, 2012. Maryland anticipates that the agricultural strategies outlined in the Phase I WIP and Phase II WIP, particularly expanded Nutrient Management Program requirements and continued financial support of water quality BMPs through the Maryland Agricultural Water Quality Cost-share (MACS) Program, Low Interest Loans for Agricultural Conservation (LILAC) and other funding programs, will provide significant opportunities toward meeting the load reductions for the agricultural sector.

In evaluating whether the State's CAFO and AFO programs are aligned with meeting the Chesapeake Bay TMDL, EPA focused its assessment on five EPA selected "priority BMPs": (1) nutrient management planning, (2) animal waste management systems, (3) conservation plans (which in Maryland are known as Soil Conservation and Water Quality Plans, or SCWQPs), (4) barnyard runoff control systems, and (5) stream fencing on pastures. EPA chose to focus on these practices because they are related to animal agriculture and they represent the BMPs that Maryland identified in its WIPs (and associated input decks) and is relying on to achieve a significant portion of its animal agricultural nutrient and sediment reductions.

EPA found that NMPs are required for all 5,426 farms with a gross annual income of \$2,500 or more or with eight or more animal units (8,000 pounds of live animal weight) that use chemical fertilizer, biosolids, or animal manure. Animal waste management systems are required for all 573 farms regulated under the CAFO/MAFO Program, and animal waste management systems may or may not be required for other animal agriculture operations within the 4,853 additional farms that are required to implement NMPs, as well as any farms that voluntarily participate in Maryland's Agricultural Certainty Program in the future. Soil Conservation and Water Quality Plans (SCWQPs), are required for all 573 farms regulated under the CAFO/MAFO Program, either as part of a comprehensive nutrient management plan (CNMP) or as a separate SCWQP, as well as for any farms that voluntarily participate in Maryland's Agricultural Certainty Program in the future. Barnyard runoff control are required for all 573 farms regulated under the CAFO/MAFO Program and may or may not be required for other animal operations within the 4,853 additional farms that are required to implement NMPs, as well as any farms that voluntarily participate in Maryland's Agricultural Certainty Program in the future. Stream fencing on pastures may or may not be required by the animal operations within the 5,426 farms regulated under the Nutrient Management Program, including any farms that voluntarily participate in Maryland's Agricultural Certainty Program in the future since they must be in compliance with all Nutrient Management Program requirements. As of January 1, 2014, the Maryland Nutrient Management Manual requires a 10-foot nutrient application setback from surface waters for pastures and 35-foot nutrient application setback from surface waters for sacrifice lots. Livestock must be excluded from the setback to prevent direct deposition of nutrients within the setback, or alternatively, a farmer can work

with the local SCD and develop and implement an SCWQP that includes BMPs such as stream crossings, alternative watering facilities, or pasture management that are equally protective of water quality and stream health. However, a farmer may choose to use stream fencing in order to meet this requirement.

Maryland's Nutrient Management Program, which covers most farms, requires between one and four of the priority BMPs. Maryland's CAFO/MAFO Program, which covers all medium and large AFOs and some small AFOs, requires four of the priority BMPs. Maryland's Agricultural Certainty Program will require between two and five of the priority BMPs for any farms that voluntarily participate in this program in the future. Therefore, Maryland programs are requiring priority BMP implementation.

Maryland's Nutrient Management Program is a broad program, currently regulating 5,426 farms throughout Maryland, including both crop and livestock farmers. In addition to requiring farmers to develop and implement NMPs, the Nutrient Management Program sets minimum requirements for these NMPs. In 2012, MDA's revised nutrient management regulations went into effect that requires farmers to inject/incorporate manure and other organic nutrient sources into the soil, establish 10- to 35-foot setbacks for nutrient and fertilizer applications next to streams depending on application method, and establish 10-foot setbacks and BMPs to exclude livestock from streams. The new regulations also prohibit winter application of organic sources of nutrients beginning in 2016. Maryland has also finalized Maryland Phosphorus Management Tool (PMT) regulations on May 29, 2015 with an effective date of June 8, 2015. The PMT updates the current P Index tool with the latest scientific understanding of phosphorus transport, in order to give farmers the latest scientific advice on how much phosphorus to apply. These programs and tools will help Maryland to increase implementation of various BMPs, including cover crops and conservation tillage.

Maryland has other voluntary programs in place to help encourage farmers to implement voluntary BMPs beyond the scope of Maryland's regulatory programs. Voluntary priority BMP implementation by Maryland's farmers will bridge the gap between priority BMPs implemented for regulatory compliance and the State's 2025 WIP commitments. Financial assistance programs such as the Maryland Manure Transport Program, the MACS Program, and LILAC, help provide financial and technical assistance to farmers to implement agricultural BMPs. These programs provide grants, loans, and cost-share funding to encourage farmers to implement these BMPs voluntarily.

As an additional incentive, Maryland established the voluntary Agricultural Certainty Program in 2013 and the program became effective in January 2015. Agricultural certainty is intended to accelerate implementation of water quality BMP's, including priority BMPs, to meet the State's agricultural nitrogen, phosphorus and sediment reduction goals. A farmer who chooses to participate in Maryland's Agricultural Certainty Program agrees to implement an NMP, an SCWQP, and other BMPs that enable the operation to meet the approved local or Chesapeake Bay TMDL baseline requirements as determined by an analysis using the Maryland Nutrient Tracking Tool (MNNTT). In return, the farmer is provided with a 10-year certainty certificate. During that 10-year certification period, the operation is not subject to new local and State laws, regulations, or requirements that are enacted or adopted after the date of certification regarding the reduction of agricultural sources of nitrogen, phosphorus, or sediment runoff to meet the Chesapeake Bay TMDL. MDA is finalizing administrative policies and

procedures for the Agricultural Certainty Program and anticipates accepting applications and beginning implementation of the program in 2015.

Maryland also has developed a system to track and verify agricultural BMP implementation data reported to the CBP. MDA's Conservation Tracker, an internal database tracking system, accounts for agricultural BMPs implemented with and without public assistance. SCD staff upload local BMP information to Conservation Tracker on a regular basis. Conservation data is documented by staff from SCD activities and from information maintained in farm-specific SCWQPs. MDA reviews and verifies Conservation Tracker data for conformation to program requirements and data is validated with data quality objectives established by MDA. Only data supported by appropriate quality control criteria which meets the data quality objectives is acceptable for reporting. Agricultural information is submitted to the CBP annually through MDE who reports using the National Environmental Information Exchange Network (NEIEN) reporting system.

In summary, Maryland has several regulatory programs that require agricultural BMPs. These programs appear to be well-implemented by MDE and MDA to ensure that farmers are complying with program requirements, including implementing NMPs on 5,426 farms in Maryland. Maryland is supplementing these regulatory programs with voluntary programs to encourage voluntary implementation of additional BMPs. Continued implementation and adequate funding of both the regulatory and voluntary programs will help Maryland move forward towards meeting its WIP agricultural implementation goals.

Nutrient Management Program

Maryland's Nutrient Management Program, which is implemented by MDA, is broad in coverage, requiring all farmers with a gross annual income of \$2,500 or more or with eight or more animal units (8,000 pounds or more of live animal weight) that use chemical fertilizer, biosolids or animal manure to develop and implement an NMP that meets certain minimum requirements. NMPs must be revised and updated at least once every three years. In FY 2014, NMPs were required for 5,426 regulated farms.

In 2012, Maryland's revised nutrient management regulations went into effect. The new regulations provide enhanced protections for Maryland's streams, rivers and the Chesapeake Bay. The new regulations require farmers to inject/incorporate manure and other organic nutrient sources into the soil, establish 10- to 35-foot setbacks for nutrient and fertilizer applications next to streams depending on application method, and establish 10-foot setbacks and BMPs to exclude livestock from streams. The new regulations also prohibit winter application of organic sources of nutrients beginning in 2016.

All NMPs must be developed and written by certified nutrient management consultants or certified farm operators who have been certified through the MDA Nutrient Management Certification Program. As of FY2014, 1,261 individuals had passed the Nutrient Management Certification Examination and become certified nutrient management consultants. As of FY2014, 547 farmers had become certified to develop and write their own NMP as farm operators.

Farmers must submit copies of their initial NMPs to MDA. Initial NMPs do not need to be approved by MDA when they are submitted, but MDA uses the current NMP that is retained at the farm operation site when conducting on-farm audits to verify the NMPs meet regulatory standards and are being followed. By the end of FY2014, 5,351 out of 5,426 regulated farms (approximately 98.6%) had

submitted copies of their initial NMPs to MDA. In FY2014, MDA issued \$3,850 in fines against 11 farmers for failure to file their initial NMPs.

Farmers are required to submit Annual Implementation Reports (AIRs) to MDA by March 1 each year documenting activity for the previous calendar year. By the end of FY2014, 5,384 out of 5,501 farms required to submit AIRs (approximately 97.9%) had submitted AIRs. In FY2014, MDA issued \$23,250 in fines against 93 farmers for late or missing AIRs.

MDA conducts on-farm audits to verify compliance with Nutrient Management Program requirements. In FY2014, MDA conducted on-farm audits at 733 out of 5,426 regulated farms (approximately 13.5%). These audits are focused on ensuring the farmers have an updated NMP and are fully complying with the terms of the NMP. MDA determined that approximately 66% of farms were in compliance. The majority of violations were for expired or out of date NMPs. MDA issued 211 warnings to correct major violations identified during those on-farm audits and documented minor violations to be corrected. In FY 2014, MDA issued \$21,450 in fines against 33 farmers who failed to take corrective actions in a timely manner.

In April 2015, Maryland published proposed Maryland Phosphorus Management Tool (PMT) regulations in the Maryland Register. The PMT is a risk assessment tool that only applies to farms where soil phosphorus has a Fertility Index Value (FIV) of 150 or more. The FIV is a measurement, determined by a soil test, of how much phosphorus is in the soil compared to how much is needed to grow crops. The PMT identifies areas where excess phosphorus is present in the soil and where there is a high potential for phosphorus loss. The PMT, which will replace the Phosphorus Site Index (PSI), reflects the latest research by University of Maryland scientists in collaboration with regional and national experts. Maryland finalized those regulations on May 29, 2015 with an effective date of June 8, 2015.

Maryland's Nutrient Management Program requires between one and four of the five priority BMPs. Maryland's Nutrient Management Program requires nutrient management planning. Maryland's Nutrient Management Program may require animal waste management systems, barnyard runoff control, and stream fencing on pastures. Maryland's Nutrient Management Program does not require SCWQPs.

CAFO/MAFO Program

Maryland's CAFO/MAFO Program, which is implemented by MDE, requires CAFOs and MAFOs to obtain permit coverage under Maryland's General Discharge Permit. CAFOs, which are defined in Maryland as Medium AFOs that discharge or propose to discharge pollutants through a man-made ditch, flushing system, or other similar man-made device and Large AFOs that discharge or propose to discharge, must obtain NPDES CAFO permit coverage under the General Discharge Permit. CAFOs are also defined to include poultry operations (other than laying hens) with dry manure handling and 100,000 square feet or more of poultry house capacity. MAFOs, which are defined as Large CAFOs that do not discharge or propose to discharge to surface water or medium AFOs that have not submitted a Certification of Conformance (COC) prior to beginning operation, must obtain MAFO permit coverage under the General Discharge Permit. MAFOs are also defined to include poultry operations (other than laying hens) with dry manure handling and less than 100,000 square feet of poultry house capacity. A medium poultry AFO with chickens (other than laying hens) with dry manure handling that does not meet the definition of a CAFO or MAFO and has a poultry house capacity between 75,000 square feet and 100,000 square

feet must either submit a Certification of Conformance (COC) to MDE or apply for MAFO permit coverage.

All CAFOs and MAFOs must develop and implement either 1) a comprehensive nutrient management plan (CNMP) or 2) an NMP plus a soil conservation and water quality plan (SCWQP) that is consistent with the nine minimum requirements for nutrient management specified in 40 CFR § 122.42(e)(1) and the General Discharge Permit, Part IV.B.

As of November 30, 2014, 548 CAFOs were registered under the General Discharge Permit, 22 MAFOs were registered under the General Discharge Permit, and three facilities had submitted COCs. An additional nine CAFOs and three MAFOs had submitted NOIs but had not yet been registered under the General Discharge Permit. These 585 operations represent approximately 11% of the 5,143 livestock and poultry operations in Maryland.

MDE conducts compliance inspections of each permitted CAFO at least once during the permit term. In FY2014, MDE conducted compliance inspections at approximately 9% of permitted CAFOs (51 out of 548 total CAFOs registered). In FY2014, MDE also conducted compliance inspections at approximately 42% of CAFOs that were registered under the General Discharge Permit between October 1st and August 1st (51 out of 122 CAFOs), exceeding MDE's commitment in MDE's FY2014 Maryland Clean Water Act Section 106 Performance Partnership Grant Work Plan to inspect 20% of CAFOs registered between October 1, 2013 and August 1, 2014. MDE also conducted inspections at approximately 36% of permitted MAFOs (eight out of 22 total MAFOs registered). Of the 29 CAFO/MAFO/COC files reviewed by EPA, approximately 55% (16 out of 29 files) contained an inspection report between 2009 through 2014. Of those CAFOs, MAFOs and COC facilities that were inspected between 2009 and 2014, five had compliance issues for which documentation of follow-up correspondence was not present in the files reviewed by EPA. This includes one facility that was inspected three months after being permitted and was discovered during that inspection to have 14 deficiencies. In FY2014, MDE issued 21 NOVs with penalties and two Administrative Orders to permitted CAFOs.

Maryland's CAFO/MAFO program requires four of the five priority BMPs. Maryland's CAFO/MAFO Program requires nutrient management planning, animal waste management systems, SCWQPs, and barnyard runoff control. Maryland's CAFO/MAFO Program does not require stream fencing on pastures.

Maryland's Agricultural Certainty Program

Maryland's Agricultural Certainty Program, which is administered by MDA, is a voluntary program. A farmer who chooses to participate in Maryland's Agricultural Certainty Program must be in compliance with a current NMP, and agrees to fully implement an SCWQP and other BMPs that enable the operation to meet the approved local or Chesapeake Bay TMDL baseline requirements as determined by an analysis using the Maryland Nutrient Tracking Tool. During the 10-year certification period, the operation is not subject to new local and State laws, regulations, or requirements that are enacted or adopted after the date of certification regarding the reduction of agricultural sources of nitrogen, phosphorus, or sediment runoff to meet the Chesapeake Bay TMDL. There are 11 programs specifically listed from which the operation is not exempt, including the PMT regulations.

Maryland's Agricultural Certainty Program became effective in January 2015, and MDA anticipates accepting applications beginning early spring 2015. Therefore, no facilities are currently covered under Maryland's Agricultural Certainty Program.

Maryland's Agricultural Certainty Program requires between two and five of the priority BMPs.
Maryland's Agricultural Certainty Program requires nutrient management planning and SCWQPs.
Maryland's Agricultural Certainty Program may require animal waste management system, barnyard runoff control, and stream fencing on pastures.

2.0 Introduction

The U.S. Environmental Protection Agency (EPA) conducted an assessment of the State of Maryland's (State) animal agriculture regulations and programs related to water quality to determine whether they are consistent with Clean Water Act (CWA) requirements and are implemented effectively to achieve Maryland's animal agriculture Watershed Implementation Plan (WIP) commitments to reduce nitrogen, phosphorus and sediment under the Chesapeake Bay Total Maximum Daily Load (TMDL). The assessment process began in summer 2014 when EPA provided Maryland with a detailed Maryland Animal Agriculture Program Review questionnaire (questionnaire). The Maryland Department of the Environment (MDE) coordinated Maryland's completion of the questionnaire with the Maryland Department of Agriculture (MDA). MDE also supported the assessment process by providing EPA with files for 34 animal agriculture operations, and MDA also supported the assessment process by providing EPA access to files for 33 animal agriculture operations. MDA provided responses to EPA's questionnaire in October 2014, and MDE provided responses to EPA's questionnaire in February 2015. EPA provided the draft assessment report to Maryland on May 1, 2015. Maryland provided comments to EPA on June 3-4, 2015. EPA completed the interim final report on June 26, 2015. EPA finalized the report on August 24, 2015.

The report is organized into the following sections: Section 3.0 (Maryland Animal Agriculture Regulatory Program Overview), Section 4.0 (State Agencies involved with Animal Agriculture Programs), Section 5.0 (Maryland and the Chesapeake Bay TMDL) and Section 6.0 (Maryland's Animal Agriculture WIP BMPs) provide background information. Section 7.0 (Nutrient Management Program) and Section 8.0 (CAFO/MAFO Program) discuss and evaluate implementation of Maryland's programs applicable to animal agriculture operations. Each section includes a summary of program requirements and responsible agencies, and includes subsections addressing the following: the universe of animal agriculture operations subject to each program; program staff and financial resources; data systems in place to track program activities; compliance and enforcement; and the role of the program in furthering the State's progress toward meeting the 2025 WIP implementation goals. Each section includes observations based on the staff discussions, file reviews and Maryland's questionnaire responses.

2.1 Purpose of Effort

EPA conducts periodic reviews of state National Pollutant Discharge Elimination System (NPDES) programs as part of its oversight responsibilities under the CWA. EPA discusses program goals and objectives with authorized states, such as Maryland, that are authorized to implement CWA programs (e.g., NPDES permit programs) as part of annual CWA Section 106 grant negotiations.¹ Previously, EPA's program reviews have not focused exclusively on animal agriculture regulations and programs. EPA decided to conduct assessments of animal agriculture programs related to water quality in six Chesapeake Bay jurisdictions² as part of EPA's oversight responsibilities under the NPDES program and the Chesapeake Bay TMDL. These reviews will also be used to fulfill EPA's commitment under the

¹ http://water.epa.gov/grants_funding/cwf/pollutioncontrol.cfm

² Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia. The District of Columbia does not have animal agriculture programs.

settlement agreement with the Chesapeake Bay Foundation (CBF) ([Fowler et al. v. EPA](#)). As such, the Maryland review is one of six animal agriculture state program reviews that EPA will be completing by 2015.

The intent of the assessment is to identify successes and challenges within the State's animal agriculture programs related to water quality, evaluate the programs that are available to support Maryland's pollutant load reduction goals under the Chesapeake Bay TMDL, and compare the Maryland National Pollutant Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) Program with federal CAFO requirements. The goal of this assessment is to determine 1) how well Maryland's programs align with Maryland's Chesapeake Bay TMDL WIP commitments, and 2) how effectively Maryland's programs are being implemented.

2.2 Program Review Approach

In July 2014, EPA sent a questionnaire to Maryland requesting background information on four Maryland programs applicable to animal agriculture as well as Maryland's WIP:

1. NPDES CAFO Program
2. MAFO Program
3. COC Program
4. Nutrient Management Program
5. WIP Best Management Practice (BMP) Implementation

The intent of the assessment was to determine how well these programs were funded, staffed and implemented, as well as how well these programs worked together to collectively meet the requirements under the CWA and Maryland's commitments for reducing animal agriculture nutrient and sediment pollution to meet the Chesapeake Bay TMDL. For each of these programs, EPA requested information on the number of full-time equivalents (FTEs) and fiscal year (FY) 2014 budget (July 1, 2013 through June 30, 2014) supporting the program, the number of animal agriculture operations involved/enrolled in the program, compliance and enforcement activities, communication among agencies involved in each program, communication with farmers, data management, policies and training programs, and program strengths and challenges. MDA provided its completed response to the questionnaire in October 2014, and MDE responded in February 2015.

EPA also conducted file reviews and on-site interviews with MDE and MDA staff. For the file reviews, EPA reviewed MDE and MDA files for animal agriculture operations that are covered by a CAFO permit, a MAFO permit, or certificate of conformance (COC).

Prior to the MDE file reviews, EPA provided MDE with a list of 34 animal agriculture operations to be reviewed by EPA. Below is a brief summary of the number of files based on animal operation type and facility type for 34 files reviewed at MDE.

- 22 poultry operations
- 1 poultry/non-poultry mixed operation
- 11 non-poultry operations

- 21 CAFOs
- 5 Maryland Animal Feeding Operations (MAFOs)

- 3 Certification of Conformance (COC) facilities
- 5 unpermitted operations

Prior to the MDA file reviews, EPA provided MDA with a list of 44 animal agriculture operations to be reviewed by EPA, of which MDA was able to provide 33 files for EPA to review. Farm and farmer specific information in the MDA files were redacted, so the number of files based on animal operation type and facility type were known for the 33 files reviewed at MDA.

Each facility file included information such as: inspection reports; current and expired nutrient management plans (NMPs) and comprehensive nutrient management plans (CNMPs); Nutrient Management annual implementation reports (AIRs); correspondence; Notices of Intent (NOIs); and other facility-specific information. During the MDA file reviews, EPA reviewed Nutrient Management Annual Implementation Reports (AIRs) that had been redacted of personally identifiable information to protect farmer confidentiality.

EPA performed a detailed review of each file. EPA logged the type and date of each document in each operation's file and recorded observations related to program implementation, including potentially missing documents (e.g., correspondence about an inspection without a corresponding inspection report in the file), NMP and CNMP approval issues, typical inspection findings, and challenges with permit issuance or reissuance. The observations help to identify opportunities for Maryland to strengthen implementation of the State's animal agriculture programs related to water quality and work towards improved water quality within Maryland and the Chesapeake Bay watershed.

EPA used information from the on-site meetings with MDA and MDE, MDA and MDE file reviews, State questionnaire responses, and agency and entity websites to develop and substantiate observations about Maryland's animal agriculture programs related to water quality. EPA reviewed all of the material provided but generally limits the content of this report to information necessary to support the observations. For this report, the files reviewed are considered representative.

3.0 Maryland Animal Agriculture Regulatory Program Overview

According to the 2012 United States Department of Agriculture, National Agricultural Statistics Service Census of Agriculture (Ag Census), Maryland had 12,256 farms in 2012, down slightly from 12,834 farms in 2007 (USDA, 2014). According to the 2012 USDA Ag Census, Maryland had 5,143 livestock and poultry operations (animal agriculture operations) in 2012, down slightly from the 5,970 animal agriculture operations from the 2007 Ag Census (USDA, 2014). Below in Table 1 are animal inventories for Maryland from the Ag Census.

Table 1. 2007 and 2012 USDA Ag Census Animal Inventories

Census	Beef	Dairy	Poultry				Swine
			Broilers	Turkeys	Pullets	Layers	
2007	44,015	57,172	65,503,541	223,233	250,395	2,682,723	(D)
2012	39,188	50,923	64,192,426	77,375	707,617	2,364,942	19,869
Change	-4,827 (-11.0%)	-6,249 (-10.9%)	-1,311,115 (-2.0%)	-145,858 (-65.3%)	+457,222 (+182.6%)	-317,781 (-11.8%)	Unknown

(D) = data suppressed by USDA

Another measure of the livestock industry besides inventory is the number of animals sold. Table 2 shows the numbers of animals sold in Maryland from the Ag Census.

Table 2. 2007 and 2012 USDA Ag Census Animal Numbers Sold

Census	Beef	Dairy	Poultry				Swine
			Broilers	Turkeys	Pullets	Layers	
2007	32,629	41,097	296,373,113	739,398	576,010	1,777,658	123,734
2012	30,663	34,864	304,729,435	154,404	391,042	1,086,075	(D)
Change	-1,966 (-6.0%)	-16,233 (-39.5%)	+8,356,322 (+2.8%)	-584,994 (-79.1%)	-184,968 (-32.1%)	-691,583 (-38.9%)	Unknown

(D) = data suppressed by USDA

Table 3 presents poultry data from the Delmarva Poultry Industry about Maryland's poultry industry.

Table 3. Maryland Poultry Industry, 2009-2013.

Year	Meat Chickens	
	Numbers Produced	Pounds Produced
2009	291,400,000	1,398,700,000
2010	300,500,000	1,433,400,000
2011	Not available	Not available
2012	304,000,000	1,611,200,000
2013	305,200,000	1,617,600,000
Change	+13,800,000 (+4.7%)	+218,900,000 (+15.7%)

Source: <http://www.dpichicken.org>

Table 4 presents poultry data from the USDA NASS about Maryland's poultry industry.

Table 4. Maryland Poultry Industry, 2007-2013

Year	Number of Broilers Placed
2007	307,931,000
2008	305,740,000
2009	307,644,000
2010	324,081,000
2011	318,607,000
2012	316,718,000
2013	312,553,000
Change	+4,622,000 (+1.5%)

Source: <http://quickstats.nass.usda.gov/>

Table 5 presents the primary statutes and regulations under which Maryland administers Maryland's animal agriculture programs related to water quality.

Table 5. Maryland Animal Agriculture Programs, Statutes, Laws, and Regulations Related to Water Quality

Maryland Animal Agriculture Program	Law/Statute and Regulations
Nutrient Management Program	§8-801 (Maryland Nutrient Management Law) ; COMAR 15.20.07 ; COMAR 15.20.08
CAFO/MAFO Program	Md. ENVIRONMENT Code Ann. § 9-301 et seq.; COMAR 26.08.01 through 26.08.04 (Water Pollution)
Maryland's Agricultural Certainty Program	COMAR 15.20.11

4.0 State Agencies involved with Animal Agriculture Programs

MDE and MDA are the primary agencies with regulatory responsibilities for Maryland’s animal agriculture programs related to water quality. The Soil Conservation Districts (SCDs) and the University of Maryland, Extension are also integral partners with the State’s animal agriculture technical and educational programs. The scope of this assessment report does not directly address the roles played by the University of Maryland, Extension, EPA, USDA, the Natural Resources Conservation Service (NRCS) and other non-State agencies.

4.1 Agency Funding

Table 6 summarizes the resources allocated (budget and FTE), number of operations, and the target type of facility for each animal agriculture program related to water quality.

Table 6. Resources Allocated, Number of Operation and Targeted Facility Type

Program (Lead Agency)	Budget (FY 2014)	FTEs	Operations	Target Facilities
Nutrient Management Program (MDA)	\$7,187,280 (MDA HQ, MDA RO, & SCDs)	10.5 (MDA HQ)	5,426 regulated farms	Agricultural operations with 8 or more animal units; Agricultural operations grossing \$2,500 a year or more
CAFO/MAFO Program (MDE)	\$502,239	7	548 CAFOs (plus 9 pending); 22 MAFOs (plus 3 pending); 3 COC Facilities	CAFOs that discharge or propose to discharge; MAFOs; COC Facilities
Maryland’s Agricultural Certainty Program	\$15,000	1	0 farms*	Any agricultural operation except CAFOs

*Program became effective in January 2015

Table 6 presents Maryland’s estimated breakdown of the State’s animal agriculture budget by funding source.

Table 6. Funding Sources for Maryland’s Animal Agriculture Programs, Sorted by Funding Source

Source Description	Percent Contribution to Total Budget	FY 2014 Amount
Nutrient Management Program (MDA, SCDs)		
General Funds (MDA, Nutrient Management Program [NM])	14.4%	\$1,035,400
Chesapeake Bay Trust Grant (MDA, NM)	0.3%	\$22,680
MDE/EPA Grant (MDA, NM)	12.2%	\$879,200
General Funds (MDA, RO)	47.9%	\$3,445,400
General Funds (SCDs)	7.0%	\$504,600
State 2010 Chesapeake Bay Trust Fund (MDA, RO & SCDs)	18.1%	\$1,300,000
Subtotal	100%	\$7,187,280
CAFO/MAFO Program (MDE)		
CBRAP CAFO Federal Funds (6176T)	27.2%	\$136,505
CAFO Federal Funds (6135F)	8.0%	\$40,000
Solid Waste CAFO Special Fund (615F3)	5.9%	\$29,811
CAFO Water Special Fund (6153D)	58.9%	\$295,923
Subtotal	100%	\$502,539

There are many different grants and other funding mechanisms that Maryland uses to support animal agriculture operations, some of which are identified in Table 7. For example, MDA administers the Maryland Agricultural Water Quality Cost-Share (MACS) Program and the Low Interest Loans for Agricultural Conservation (LILAC) Program. These programs provide farmers with grants or low-interest loans in order to install BMPs on their farms to prevent soil erosion, manage nutrients and safeguard water quality. MDA also administers the Manure Transport Program, which pays farmers to transport manure away from farms with high soil phosphorus levels to other farms and alternative use facilities.

Table 7. MDE, MDA, and DNR Grants and Other Funding Mechanisms to Support Animal Agriculture Operations

Program	Resp. Agency	Description	Program Capacity (FY2015)		Disbursements (FY2014)	
			Per farm (\$)	Total (\$)	Farms (#)	Total (\$)
Cover Crop Program	MDA	Provide farmers with grants to plant traditional cover crops or commodity cover crops	Up to \$100/acre for traditional cover crops Up to \$35/acre for commodity cover crops	\$21,250,000	1,571 projects covering 423,212 acres statewide, including 410,530 acres within Chesapeake Bay watershed	\$21,226,104
Conservation Reserve Enhancement Program	MDA	Pays farmers to take environmentally sensitive cropland out of production for 10 to 15 years and install conservation practices that protect water quality and provide wildlife habitats		Not applicable; BMPs are cost-shared through MACS, not a stand-alone CREP budget allocation	84 projects, including 356 acres of forested buffers and 1,038 acres of grassed buffers in the Chesapeake Bay watershed	\$427,009

Table 7. MDE, MDA, and DNR Grants and Other Funding Mechanisms to Support Animal Agriculture Operations

Program	Resp. Agency	Description	Program Capacity (FY2015)		Disbursements (FY2014)	
			Per farm (\$)	Total (\$)	Farms (#)	Total (\$)
Manure Transport	MDA	Pays farmers to transport manure away from farms with high soil phosphorus levels to other farms and alternative use facilities	Up to \$20 per ton	\$907,500	118,995 tons transported	\$608,259 from MDA, \$419,929 from poultry companies
Manure Injection and Incorporation Program	MDA	Help farmers incorporate or inject manure or other organic nutrients within 48 hours as required by Maryland's nutrient management regulations		\$2,000,000 for manure injection and incorporation as well as other nutrient management BMPs	131 farmers	\$674,640
Maryland Agricultural Water Quality Cost-Share (MACS) Program ³	MDA	Provides farmers with grants to install BMPs on their farms to prevent soil erosion, manage nutrients and safeguard water quality, including funding Cover Crop Program, Manure Transport, and Manure Injection and Incorporation Program.	Up to 87.5% of the cost to install BMPs Up to \$200,000 for each animal waste management system project, with a maximum of \$300,000 per farm Up to \$50,000 for all other BMP projects, with a maximum of \$150,000 per farm ⁴	\$6,200,000 bond; balances from previous years bonds are also available	460 projects	\$4,811,103
Low Interest Loans for Agricultural Conservation (LILAC) ⁵	MDA	Low interest loans to help farmers install BMPs on their farms, purchase conservation equipment and adopt new technologies that help protect natural resources and safeguard water quality		\$500,000	6 farmers	\$300,395
Manure Matching Service	MDA	Connects farmers who have excess animal manure with nearby farmers or alternative use projects that can use the manure as a valuable resource	Not applicable	Not applicable	Not applicable	Not applicable

³ http://mda.maryland.gov/resource_conservation/Pages/macs.aspx

⁴ http://mda.maryland.gov/resource_conservation/Documents/RevisedMACSbochure.pdf

⁵ http://mda.maryland.gov/resource_conservation/counties/LILAC.pdf

Following are brief descriptions of the roles and responsibilities of MDE, MDA and the SCDs with respect to animal agriculture in Maryland.

4.2 Maryland Department of the Environment

MDE's mission is "to protect and restore the quality of Maryland's air, water and land resources, while fostering smart growth, a thriving and sustainable economy and healthy communities."⁶ MDE administers many Maryland and federal laws and regulations for air quality, water quality, and land protection.

Specific to animal agriculture, MDE is responsible for oversight and implementation of the AFO Program, which regulates medium and large AFOs through CAFO permits, MAFO permits, and Certificates of Conformance (COCs). MDE maintains the AFO Program website⁷ that includes CAFO, MAFO and COC information, permit applications and instructions as well as forms, guidance and agriculture-related links. The AFO Program website also includes a searchable database of all active CAFOs, MAFOs, and COCs.⁸

4.3 Maryland Department of Agriculture

MDA's mission is "to provide leadership and support to agriculture and the citizens of Maryland by conducting regulatory, service, and educational activities that assure consumer confidence, protect the environment, and promote agriculture."⁹

Specific to animal agriculture, MDA is responsible for oversight and implementation of Maryland's Nutrient Management Program and Maryland's Agricultural Certainty Program. MDA is also responsible for other programs that provide educational, financial, and technical assistance to farmers, such as providing technical staff support to SCDs, the Cover Crop Program, Manure Transport Program, Maryland Agricultural Water Quality Cost-Share (MACS) Program, and Low Interest Loans for Agricultural Conservation (LILAC) Program.

4.4 Maryland Soil Conservation Districts

The mission of the soil conservation districts (SCDs) is to "promote practical and effective soil, water, and related natural resources programs to all citizens in a timely fashion on a voluntary basis leadership, education, and cooperation."¹⁰ The SCDs "provide technical assistance and guidance on Federal, state, local and private programs available to farmers and landowners for the implementation of best management practices and coordinate planning, engineering design, and implementation activities and funding between state, district, local and federal programs" (State of Maryland, 2010). Maryland's 24 SCDs are all members the [Maryland Association of Soil Conservation Districts \(MASCD\)](#), which was organized to provide coordination, cooperation, and information exchange among the SCDs.

⁶ <http://www.mde.state.md.us/aboutmde/Pages/aboutmde/home/index.aspx>

⁷ <http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/AFO/Pages/index.aspx>

⁸ <http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/AFO/Pages/CAFO.aspx>

⁹ http://mda.maryland.gov/about_mda/Pages/about_mda.aspx

¹⁰ <http://www.mascd.net/districts/default.html>

Specific to animal agriculture, the SCDs deliver financial and technical assistance to farmers to encourage the adoption of agricultural BMPs through many programs, including implementation of MDA's Cover Crop Program and the Maryland Agricultural Water Quality Cost-Share (MACS) Program (State of Maryland, 2010). The SCDs also jointly implement the Environmental Quality Incentive Program (EQIP) with NRCS (State of Maryland, 2010). The SCDs also implement the Farm Stewardship Certification and Assessment Program (FSCAP) "to acknowledge those farmers who are good stewards of their natural resources and to encourage and reward farmers to put more conservation best management practices (BMPs) on the land."¹¹ The SCDs, while a non-regulatory agency, receive financial, technical and staffing support from MDA (State of Maryland, 2010) as well as other funding mechanisms.

¹¹ <http://www.mascd.net/FSCAP/default.html>

5.0 Maryland and the Chesapeake Bay TMDL

On December 29, 2010, the U.S. Environmental Protection Agency established the Chesapeake Bay Total Maximum Daily Load (TMDL), a historic and comprehensive “pollution diet” to restore clean water in the Chesapeake Bay and the region’s streams, creeks and rivers. The Chesapeake Bay TMDL is the largest and most complex TMDL ever developed, involving six states and the District of Columbia and the impacts of pollution sources throughout a 64,000-square-mile watershed. The Chesapeake Bay TMDL – actually a combination of 92 smaller TMDLs for individual Chesapeake Bay tidal segments – includes individual and aggregate allocations for nitrogen, phosphorus and sediment sufficient to achieve state clean water standards for dissolved oxygen, water clarity, underwater Bay grasses and chlorophyll-a, an indicator of algae levels.¹² Maryland contributes drainage to 58 of the 92 tidal segments within the Chesapeake Bay watershed (State of Maryland, 2010).

The Chesapeake Bay TMDL is designed to ensure that all pollution control measures needed to fully restore the Bay and its tidal rivers are in place by 2025, with practices in place to achieve at least 60 percent of the reductions necessary to obtain water quality standards in the Chesapeake Bay by 2017. The TMDL is supported by rigorous accountability measures to ensure cleanup commitments are met, including short- and long-term benchmarks, a tracking and accountability system for jurisdiction activities, and federal contingency actions that can be employed if necessary to spur progress (EPA, 2010).

Maryland and the other Chesapeake Bay jurisdictions¹³ developed Watershed Implementation Plans (WIPs) that detail each jurisdiction’s plan to meet the TMDL allocations for nitrogen, phosphorus and sediment. To date, WIPs have been developed in two phases. The Phase I WIPs, submitted in late 2010, proposed Chesapeake Bay TMDL pollutant allocations and laid out the plan for how each jurisdiction would meet its allocations. The EPA’s TMDL allocations were based almost entirely on the proposed allocations in the state’s Phase I WIPs. Phase II WIPs, finalized in March 2012, provided additional detail on implementation actions, including actions by local partners to support achievement of the TMDL allocations. Phase III WIPs, when submitted in 2018, will provide the opportunity for the jurisdictions to make mid-course adjustments to pollutant reduction strategies, provide additional detail on implementation strategies and propose refinements to the TMDL allocations. Each WIP includes detailed plans for reducing nutrient and sediment loads from agricultural runoff, including runoff from animal feeding operations (AFOs) and CAFOs.

As of 2009, the Chesapeake Bay Program (a regional partnership that includes EPA and Maryland) estimated that Maryland was the source of 20% of the nitrogen, 20% of the phosphorus and 17% of the sediment load delivered to the tidal Chesapeake Bay waters.¹⁴ To meet its overall TMDL allocations, Maryland has committed to achieving approximately 60% of its necessary nitrogen reductions, approximately 70% of its necessary phosphorus reductions and approximately 57% of its necessary sediment reductions from the agricultural sector (State of Maryland, 2010). Controlling the agricultural load is not only essential to achieving Maryland’s portion of the Chesapeake Bay TMDL, but it is essential

¹² <http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/FrequentlyAskedQuestions.html>

¹³ Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia

¹⁴ http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/FinalBayTMDL/CBayFinalTMDLSection4_final.pdf

for the overall Chesapeake Bay restoration. Table 8 identifies the progress and target loads for the agricultural sector, including animal agriculture operations, by milestone period.

Table 8. Agricultural Sector Target Loads by Milestone Period (pounds per year).

Ending Year	2009 Progress	2013 Progress	2014 Interim Progress	2015 Milestone	2017 60% Target	2025 TMDL	% Reduction (2009-2025)
Nitrogen	19,764,000	17,151,000	18,844,000	16,367,000	17,018,000	15,188,000	23%
Phosphorus	1,613,000	1,561,000	1,460,000	1,624,000	1,511,000	1,444,000	10%
Sediment	744,409,000	622,579,000	632,974,000	608,449,000	767,121,000	782,262,000	0%

Maryland submitted its Chesapeake Bay TMDL Phase I WIP on December 3, 2010 (State of Maryland, 2010) and Phase II WIP on March 30, 2012. Maryland updated its Phase II WIP in October 2012 to incorporate new and refined local strategies (State of Maryland, 2012). Specific to agriculture and therefore animal agriculture, agricultural pollutant reduction targets were set at levels achievable through significantly expanded implementation of BMPs such as: nutrient management plans addressing the application of nutrients; livestock waste management systems; soil conservation and water quality plans; barnyard runoff control; and stream fencing on pastures for livestock exclusion.

Maryland anticipates that the strategies outlined in the Phase I WIP and the Phase II WIP, particularly expanded Nutrient Management Program requirements and continued financial support of water quality BMPs through MACS, LILAC and other funding programs, will contribute to meeting the TMDL. Maryland plans to meet its animal agriculture nutrient and sediment reduction goals through a combination of regulatory and voluntary programs.

Maryland uses the following regulatory programs to facilitate pollutant load reductions through required implementation of specific BMPs or general classes of BMPs (i.e., barnyard runoff control):

- Nutrient Management Program
- CAFO/MAFO program

Maryland uses the following financial assistance programs to support voluntary BMP implementation and to help further reduce nutrient and sediment loads to the Chesapeake Bay.

- Maryland Agricultural Certainty Program
- Maryland Manure Transport Program
- Maryland Agricultural Water Quality Cost-share (MACS) Program
- Maryland Cover Crop Program
- Low Interest Loans for Agricultural Conservation (LILAC)

Maryland, in its Phase I WIP, identified contingency plans to address shortfalls in the meeting agricultural load reduction targets (State of Maryland, 2010). Maryland stated that “If reporting shows that individual jurisdictions or sectors are not meeting their milestones, the State will work closely with the parties involved to help them overcome obstacles and get back on schedule. MDE would begin with discussions and negotiations, and would be compelled to impose escalating consequences only if progress remained stalled. Specific consequences will not be identified unless they are required, and will be appropriate to the nature and level of the insufficiency. Consequences could include the following:

- Establishing enforceable compliance schedules.
- Reviewing environmental regulatory authority delegated to the jurisdiction.
- Redirecting grants and loans.
- Reviewing Maryland’s voluntary agricultural programs to determine their effectiveness in meeting the WIP commitments and to assess whether such programs should begin to include mandatory components...
- Tightening permit requirements where appropriate.”

Along with the WIPs, each of the jurisdictions established two-year programmatic milestones to further outline the detailed steps to achieve 60% of necessary reductions by 2017 and full TMDL implementation by 2025 (see below for discussion of dates). The two-year milestones provide measureable interim implementation goals used to monitor process toward full TMDL implementation.

The [Chesapeake Bay Program](#) (CBP), a regional partnership comprised of EPA and Bay jurisdictions including Maryland, leads and directs Chesapeake Bay restoration and protection activities, collects data from the Chesapeake Bay jurisdictions to track and model progress toward the two-year milestones and Bay-wide TMDL implementation. The CBP collectively has adopted 2025 as the date by which 100% of the controls necessary to achieve the Bay TMDL allocations are expected to be in place. CBP has also adopted 2017 as an interim goal and the date by which practices should be in place to achieve 60% of the necessary reductions, as compared with the level of reduction achieved in 2009. Best management practice (BMP) data are compiled by each jurisdiction and forwarded to the CBP as an electronic “input deck.” Each input deck is entered into computer models maintained by the CBP to simulate nitrogen, phosphorus and sediment loads from all sectors and sources and the units (e.g., acres) of each BMP for any area in the Chesapeake Bay watershed.¹⁵ Model output is used to track progress toward each jurisdiction’s 2017 and 2025 WIP implementation goals.¹⁶

Under the accountability framework adopted by the CBP and discussed in the TMDL, EPA has committed to evaluating the two-year milestone commitments and the progress in meeting these commitments. Based on EPA’s recent evaluation of the State’s 2012-2013 WIP milestones and input deck, Maryland achieved its 2013 overall milestone targets for nitrogen, phosphorus and sediment reductions.¹⁷

The CBP collects data from the Chesapeake Bay jurisdictions, including Maryland, on BMP implementation and land use. BMP data are compiled by each jurisdiction and forwarded to the CBP as an electronic “input deck.” Each input deck is entered into computer models maintained by the CBP to simulate nitrogen, phosphorus and sediment loads from all sectors and sources and the acres of each BMP for any area in the Chesapeake Bay watershed. Model output is used to track progress toward each jurisdiction’s 2017 and 2025 WIP implementation goals ([Chesapeake Bay Program, 2012](#)).

In evaluating whether the State’s CAFO and AFO programs are aligned with meeting the Chesapeake Bay TMDL, EPA focused its assessment on five EPA-selected “priority BMPs”: 1) nutrient management

¹⁵ The Chesapeake Assessment Scenario Tool (CAST) estimates load reductions for point and nonpoint sources including: agriculture, urban, waste water, forest, and septic loading to the land (edge-of-stream) and loads delivered to the Chesapeake Bay. CAST stores data associated with each BMP as well as the load for each sector and land use (<http://casttool.org/About.aspx>).

¹⁶ <http://www.chesapeakebay.net/about/programs/modeling>

¹⁷ <http://www.epa.gov/reg3wapd/tmdl/2014Evaluations/MD.pdf>

planning, 2) animal waste management systems, 3) conservation plans (which in Maryland are known as Soil Conservation and Water Quality Plans, or SCWQPs), 4) barnyard runoff control systems, and 5) stream fencing on pastures. EPA chose to focus on these practices because they are related to animal agriculture and represent the BMPs that Maryland identified in its WIPs (and associated input decks) and is relying on to achieve a significant portion of its animal agricultural nutrient and sediment reductions. Maryland is relying on these five practices for reducing its nitrogen loads from all sectors by approximately 14.8%, reducing its phosphorus loads from all sectors by approximately 30.3%, and reducing its sediment loads from all sectors by approximately 9.4% (Table 9). Maryland is relying on these five practices for reducing its agricultural nitrogen loads by approximately 24.6%, reducing its agricultural phosphorus loads by approximately 43.3%, and reducing its agricultural sediment loads by approximately 16.5%. These practices are also the focus of many of Maryland’s plans for ramping up animal agricultural programs. This assessment report evaluates how Maryland’s regulatory and non-regulatory programs require or facilitate implementation of these five priority BMPs.

Table 9. Maryland Total Load Reductions Resulting from Priority BMP

Priority BMP	Nitrogen	Phosphorus	Sediment
Nutrient Management Planning	5.0%	8.1%	0%
Animal Waste Management System	6.2%	15.0%	0%
Soil Conservation and Water Quality Plans	3.1%	6.4%	9.0%
Barnyard Runoff Control	0.2%	0.5%	0.1%
Stream Fencing on Pastures	0.1%	0.4%	0.2%
Total	14.8%	30.3%	9.4%

6.0 Maryland's Animal Agriculture WIP BMPs

Maryland is relying on both regulatory and voluntary programs to meet the 2017 and 2025 WIP goals pertaining to animal agriculture operations. Table 10 summarizes EPA's findings on the priority BMPs incorporated into each of Maryland's programs along with an estimated number of animal operations subject to each program.

Table 10. Implementation of Priority BMPs

Priority BMP	Nutrient Management Program	CAFO/MAFO Program			Agricultural Certainty Program
		CAFO	MAFO	COC	
Lead Agency	MDA	MDE	MDE	MDE	MDA
Estimated Facility Universe	5,426 farms	548 (plus 9 pending)	22 (plus 3 pending)	3	0
Nutrient Management Planning	Required	Required	Required	Required	Required
Animal Waste Management System	May be required	Required	Required	Required	May be required
Soil Conservation and Water Quality Plans		Required	Required	Required	Required
Barnyard Runoff Control	May be required	Required	Required	Required	May be required
Stream Fencing on Pastures	Exclusion required; Fencing may be required				Exclusion required; Fencing may be required

NMPs are required for all farms with a gross annual income of \$2,500 or more or with eight or more animal units (8,000 pounds of live animal weight) that use chemical fertilizer, biosolids, or animal manure to develop and implement NMPs. In FY2014, NMPs were required for 5,426 regulated farms.

Animal waste management systems are required for all 573 farms regulated under the CAFO/MAFO Program. Animal waste management systems may or may not be required for other animal agriculture operations within the 4,853 additional farms that are required to implement NMPs, as well as any farms that voluntarily participate in Maryland's Agricultural Certainty Program in the future.

SCWQPs are required for all 573 farms regulated under the CAFO/MAFO Program, either as part of a comprehensive nutrient management plan (CNMP) or as a separate Soil Conservation and Water Quality Plan (SCWQP). SCWQPs are also required for any farms that voluntarily participate in Maryland's Agricultural Certainty Program in the future.

Barnyard runoff control are required for all 573 farms regulated under the CAFO/MAFO Program. Barnyard runoff control may or may not be required for other animal operations within the 4,853 additional farms that are required to implement NMPs, as well as any farms that voluntarily participate in Maryland's Agricultural Certainty Program in the future.

Stream fencing on pastures may or may not be required by animal operations within the 5,426 farms regulated under the Nutrient Management Program. As of January 1, 2014, the Maryland Nutrient Management Manual requires a 10-foot nutrient application setback from surface waters for pastures and 35-foot nutrient application setback from surface waters for sacrifice lots. Livestock must be

excluded from the setback to prevent direct deposition of nutrients within the setback. Exclusion must be achieved with stream fencing, or alternatively, a farmer can work with the local SCD and develop and implement an SCWQP that includes BMPs such as stream crossings, alternative watering facilities, or pasture management that are equally protective of water quality and stream health. MDA has emphasized that “Fencing is not necessarily a requirement.”¹⁸ However, a farmer may need to use stream fencing in order to meet this requirement. Stream fencing may or may not be required for any farms that voluntarily participate in Maryland’s Agricultural Certainty Program in the future, depending on the BMPs that the certified verifier determines must be implemented to enable the operation to meet the approved local or Chesapeake Bay TMDL baseline requirements as determined by an analysis using the MNTT.

Table 11 summarizes Maryland’s progress toward meeting the 2025 implementation goals, as reported by Maryland to the CBP, for the five priority BMPs selected by EPA as specifically relevant to animal agriculture programs related to water quality. Note that the data are not necessarily limited to animal agriculture operations.

Table 11. Maryland’s Progress Toward 2025 Priority BMP Implementation Goals¹⁹

WIP Priority Practice	Units	2009 Progress		2014 Progress		2025 Goal
		(% of 2025 Goal)		(% of 2025 Goal)		
Nutrient Management Planning	Acres	1,225,002	94%	802,282	61%	1,309,106
Animal Waste Management Systems	AUs	200,921	53%	240,057	63%	379,346
Soil Conservation and Water Quality Plans	Acres	734,810	64%	998,915	87%	1,142,939
Barnyard Runoff Control	Acres	948	56%	1,274	81%	1,570
Stream Fencing on Pastures	Acres	429	53%	717	89%	803

Maryland’s Nutrient Management Program, which covers most farms, requires between one and four of the priority BMPs. Maryland’s CAFO/MAFO Program, which covers all medium and large AFOs and some small AFOs, requires four of the priority BMPs. Maryland’s Agricultural Certainty Program will require between two and five of the priority BMPs for any farms that voluntarily participate in this program in the future. Therefore, Maryland programs are requiring priority BMP implementation.

Maryland’s Nutrient Management Program is a broad program, regulating 5,426 farms throughout Maryland, including both crop and livestock farmers. In addition to requiring farmers to develop and implement NMPs, the Nutrient Management Program sets minimum requirements for these NMPs. In 2012, MDA’s revised nutrient management regulations went into effect that requires farmers to inject/incorporate manure and other organic nutrient sources into the soil, establish 10- to 35-foot setbacks for nutrient and fertilizer applications next to streams depending on application method, and establish 10-foot setbacks and BMPs to exclude livestock from streams. The new regulations also prohibit winter application of organic sources of nutrients beginning in 2016. Maryland has also proposed Maryland Phosphorus Management Tool (PMT) regulations. The PMT updates the current P Index tool with the latest scientific understanding of phosphorus transport, in order to give farmers the

¹⁸ https://extension.umd.edu/sites/default/files/docs/NMtimelineregfinal_2.pdf

¹⁹ Numbers are for the Chesapeake Bay watershed, not for the entire state of Maryland.

latest scientific advice on how much phosphorus to apply. These programs and tools will help Maryland to increase implementation of various BMPs, including cover crops and conservation tillage.

Maryland has other voluntary programs in place to help encourage farmers to implement BMPs beyond the scope of Maryland's regulatory programs. Voluntary priority BMP implementation by Maryland's farmers will bridge the gap between priority BMPs implemented for regulatory compliance and the State's 2025 WIP commitments. Financial assistance programs such as the Maryland Manure Transport Program, Maryland Agricultural Water Quality Cost-share (MACS) Program, Low Interest Loans for Agricultural Conservation (LILAC), help provide financial and technical assistance to farmers to implement agricultural BMPs. These programs provide grants, loans, and cost-share funding to encourage farmers to implement these BMPs voluntarily.

As an additional incentive, Maryland established the voluntary Agricultural Certainty Program in 2013 and the program became effective in January 2015. Agricultural certainty is intended to accelerate implementation of water quality BMP's, including priority BMPs, to meet the State's agricultural nitrogen, phosphorus and sediment reduction goals. A farmer who chooses to participate in Maryland's Agricultural Certainty Program must be in compliance with the farmer's NMP, and agree to implement an SCWQP and other BMPs that enable the operation to meet the approved local or Chesapeake Bay TMDL baseline requirements as determined by an analysis using the Maryland Nutrient Tracking Tool (MNTT). In return, the farmer is provided with a 10-year certainty certificate. During that 10-year certification period, the operation is not subject to new local and State laws, regulations, or requirements that are enacted or adopted after the date of certification regarding the reduction of agricultural sources of nitrogen, phosphorus, or sediment runoff to meet the Chesapeake Bay TMDL. MDA is finalizing administrative policies and procedures for the Agricultural Certainty Program and anticipates accepting applications in 2015.

Maryland also has developed a system to track and verify agricultural BMP implementation data reported to the CBP. MDA's Conservation Tracker, an internal database tracking system, accounts for agricultural BMPs implemented with and without public assistance. SCD staff upload local BMP Information to Conservation Tracker on a regular basis. Conservation data is documented by staff from SCD activities and from information maintained in farm-specific SCWQPs. MDA reviews and verifies Conservation Tracker data for conformation to program requirements and data is validated with data quality objectives established by MDA. Only data supported by appropriate quality control criteria and meet the data quality objectives are acceptable for reporting. Agricultural information is submitted to the CBP annually through MDE which uses the National Environmental Information Exchange Network (NEIEN) reporting system.

In summary, Maryland has several regulatory programs that require agricultural BMPs. These programs appear to be well-implemented by MDE and MDA to ensure that farmers are complying with program requirements, including implementing NMPs on 5,426 farms in Maryland. Maryland is supplementing these regulatory programs with voluntary programs to encourage voluntary implementation of additional BMPs. Continued implementation and adequate funding of both the regulatory and voluntary programs will help Maryland move forward towards meeting its WIP agricultural implementation goals.

6.1 Maryland's Animal Agriculture WIP BMPs – Observations

- Maryland's regulatory programs require between four and five of the priority BMPs. NMPs are required for 5,426 farms, and 573 of these farms are regulated under the CAFO/MAFO Program and required to implement animal waste management systems, soil conservation and water quality plans, and barnyard runoff control.
- Maryland's Nutrient Management Program regulates 5,426 farms in Maryland and require agricultural BMPs such as NMPs. Maryland's CAFO/MAFO Program also requires soil conservation and water quality plans, animal waste management systems, and barnyard runoff control for 573 farms.
- Maryland's financial assistance programs, such as the Maryland Manure Transport Program, Maryland Agricultural Water Quality Cost-share (MACS) Program, Low Interest Loans for Agricultural Conservation (LILAC), help provide financial and technical assistance to farmers to implement agricultural BMPs. These programs provide grants, loans, and cost-share funding to encourage farmers to implement these BMPs voluntarily.
- Continued implementation and adequate funding of both the regulatory and voluntary programs will help Maryland move forward towards meeting its WIP agricultural implementation goals.

7.0 Nutrient Management Program

Maryland's Water Quality Improvement Act of 1998, also known as [Maryland's Nutrient Management Law](#) (Md. Code Ann., Agric. §§8-801 through 8-807), established Maryland's Nutrient Management Program to be implemented by MDA. Maryland's Nutrient Management Law is broad in coverage, requiring all farms with a gross annual income of \$2,500 or more or with eight or more animal units (8,000 pounds of live animal weight) that use chemical fertilizer, biosolids or animal manure to develop and implement an NMP that meets certain minimum requirements. Maryland's Nutrient Management Law requires that all NMPs be developed by certified nutrient management planners and established the Nutrient Management Certification Program. Maryland's Nutrient Management Law also authorizes funding such as state cost-share funding to assist with the transport of excess manure under the Manure Transportation Project, and to implement BMPS under the MACS Program. Maryland's Nutrient Management Law also established Maryland's Turfgrass Nutrient Management Program as well as a Nutrient Management Advisory Committee that reports to the Governor annually on implementation of Maryland's Nutrient Management Law. MDA implements Maryland's Nutrient Management Law through regulations found in the Code of Maryland Regulations (COMAR), ([COMAR 15.20.04-15.20.08](#)):

- 15.20.04 – Nutrient Management Certification and Licensing
- 15.20.05 – Manure Transportation Project
- 15.20.06 – Nutrient and Commercial Fertilizer Application Requirements for Agricultural Land
- 15.20.07 – Agricultural Operation Nutrient Management Plan Requirements
- 15.20.08 – Content and Criteria for a Nutrient Management Plan Developed for an Agricultural Operation

Nutrient Management Certification and Licensing Program

The Nutrient Management Certification and Licensing Program was established by Maryland's Nutrient Management Law and is administered by MDA. All NMPs must be written by a certified nutrient management consultant or certified farm operator (COMAR 15.20.07.05A), and the Nutrient Management Certification and Licensing Program establishes the criteria for becoming a certified nutrient management consultant or certified farm operator.

A certified nutrient management consultant is an individual who is certified by MDA to prepare an NMP (COMAR 15.20.04.02B-2). In order to become a certified nutrient management planner, an individual must submit an application to MDA, pay an application fee, and pass a written examination (COMAR 15.20.04.04). The application must include proof of meeting the educational requirements of either 1) a college degree in an agriculturally related area and 1 year of practical experience in nutrient management planning or 2) a combination of education and practical experience related to nutrient management planning that is acceptable to MDA (COMAR 15.20.04.04A-2). After meeting the requirements and passing the examination, a certificate is issued for a term of one year. The certificate may be renewed for a three-year term by submitting a renewal application, paying a renewal fee, and providing proof of meeting continuing education requirements (COMAR 15.20.04.08). Certified nutrient management consultants must complete six hours of continuing education within the first year and 12 hours thereafter within the three year renewal term (COMAR 15.20.04.08A-3.a). In FY2014, MDA issued certificates to 23 new certified nutrient management consultants (MDA, 2015). As of FY2014, 1,261

individuals had passed the Nutrient Management Certification Examination and become certified nutrient management consultants (MDA, 2015). Approximately 25% of the 1,261 certified nutrient management consultants were actively writing NMPs in Maryland (MDA, 2015).

A certified farm operator is an individual who is certified by MDA to prepare an NMP only for the agricultural land that the individual owns, operates, or has a legal interest in (COMAR 15.20.04.02B-1). In order to become a certified farm operator, an individual must submit an application to MDA, pay an application fee, and pass a written examination (COMAR 15.20.04.04). After meeting the requirements and passing the examination, a certificate is issued for one year. The certificate may be renewed for a three-year term by submitting a renewal application, paying a renewal fee, and providing proof of meeting continuing education requirements (COMAR 15.20.04.08). Certified farm operators must complete two hours of continuing education within the first year and six hours thereafter for the three-year term (COMAR 15.20.04.08A-3.b). In FY2014, MDA issued certificates to 46 farmers to be certified farm operators and develop their own NMPs (MDA, 2015). As of FY2014, 547 farmers had become certified farm operators (MDA, 2015).

The Nutrient Management Certification and Licensing Program establishes the criteria for obtaining a license to engage in the business of providing NMPs for others. Certified nutrient management consultants and certified farm operators may develop an NMP for land they own or operate. However, a certified nutrient management consultant must also obtain a license in order to go into business writing NMPs for others. In order to obtain a license, an individual must submit an application to MDA, pay an application fee, and have at least one individual working under the license be certified as a nutrient management consultant (COMAR 15.20.04.09). After meeting these requirements, a license is issued for one year. The license may be renewed for a three-year term by submitting a renewal application, paying a renewal fee, and maintaining a certified nutrient management consultant (COMAR 15.20.04.10). All license holders must maintain records of all NMPs prepared for at least five years and make them available to MDA upon request. All license holders must also submit annual activity reports to MDA that identify the number of NMPs completed, the acreage covered by the NMPs written, and the location (both county and watershed) of this acreage (COMAR 15.20.04.11).

In FY2014, 2,288 NMPs (54.0%) were developed by private consultants, 1,434 NMPs (34.0%) were developed by University of Maryland Extension Specialists, 316 NMPs (7.5%) were developed by certified farmers, and 193 NMPs (4.3%) were developed by government personnel, including personnel from state agencies, USDA-NRCS, SCDs, counties and municipalities (MDA, 2015).

Nutrient Management Program

The Nutrient Management Program was established by Maryland's Nutrient Management Law and is administered by MDA. Maryland's Nutrient Management Program is broad in coverage, requiring all farms with a gross annual income of \$2,500 or more or with eight or more animal units (8,000 pounds of live animal weight) that use chemical fertilizer, biosolids or animal manure to develop and implement an NMP (COMAR 15.20.07.05). All NMPs must address:

- 1) All aspects of the agricultural operation, including tillage, cropping, pasture, or production of any agricultural product, such as plants, trees, sod, food, animals, and fiber; and

- 2) Identification, management and disposition of all primary nutrients produced on, or imported to, the agricultural operation
- 3) Manure management conditions that protect water quality and improve manure utilization. (COMAR 15.20.07.05A)

NMPs must contain recommendations for an agricultural operation for the management of fertilizer inputs and other nutrient sources, and the operator may not exceed the recommended nutrient application rates when implementing the NMP (COMAR 15.20.07.05B). NMPs must also contain the required information specified at COMAR 15.20.08.04 through 15.20.08.07, such as nutrient rates, expected crop yield, method/timing of nutrient application, and manure management. NMPs must also be consistent with the [Maryland Nutrient Management Manual](#), which contains additional technical standards and criteria for nutrient management planning (COMAR 15.20.08.05A).

Farmers must submit copies of their initial NMPs to MDA, including a [New Plan Reporting Form](#) (COMAR 15.20.07.06A-1). Initial NMPs do not need to be approved by MDA when they are submitted; MDA uses the updated plan onsite, maintained for the farm operation, when conducting on-farm audits to verify the NMPs meet regulatory standards and are being followed. NMPs must be revised and updated at least once every three years (COMAR 15.20.07.05D-1). Updated NMPs do not need to be submitted to MDA. Updated NMPs must be made available to MDA to review on-site, as well as records that document NMP implementation such as soil and manure analysis results, crop yields, and documentation of the timing, rate, quantity, type, and analysis of nutrients used in each field (COMAR 15.20.07.06B-4).

Farmers are required to submit an [Annual Implementation Report \(AIR\)](#) by March 1 of each year summarizing their nutrient applications for the previous year, including total acreage managed under a NMP and total nutrients applied to each crop (COMAR 15.20.07.06A-3).

On October 15, 2012, MDA's revised nutrient management regulations went into effect (State of Maryland, 2015). The new regulations provide enhanced protections for Maryland's streams, rivers and the Chesapeake Bay (State of Maryland, 2015). The new regulations require farmers to inject/incorporate manure and other organic nutrient sources into the soil, establish 10- to 35-foot setbacks for nutrient and fertilizer applications next to streams depending on application method, and establish 10-foot setbacks and BMPs to exclude livestock from streams (MDA, 2013b). The new regulations also prohibit winter application of organic sources of nutrients beginning in 2016 (MDA, 2013b).

On April 3, 2015, Maryland published proposed Maryland Phosphorus Management Tool (PMT) regulations in the Maryland Register. Maryland finalized the PMT regulations by Notice in the Maryland Register on May 29, 2015 with an effective date of June 8, 2015. The PMT is a risk assessment tool that only applies to farms where soil phosphorus has a Fertility Index Value (FIV) of 150 or more. The FIV is a measurement, determined by a soil test, of how much phosphorus is in the soil compared to how much is needed to grow crops. The PMT identifies areas where excess phosphorus is present in the soil and where there is a high potential for phosphorus loss. The PMT, which will replace the Phosphorus Site

Index (PSI), reflects the latest research by University of Maryland scientists in collaboration with regional and national experts.²⁰

The PMT updates the current P Index tool with the latest scientific understanding of phosphorus transport, in order to give farmers the latest scientific advice on how much phosphorus to apply. The regulations call for full implementation of the PMT by 2022, with two possible 1-year delays if capacity is insufficient for handling the excess manure resulting from implementation of the PMT. The PMT allows for a phased-in approach to allow farmers time to plan for making changes to their manure management and to allow the state time to ensure it has the capacity to address the excess manure nutrients resulting from PMT implementation.

Promulgating the PMT is one part of Maryland's "Phosphorus Initiative" which also includes conducting an on-farm economic analysis of PMT implementation and expanding investments in new technologies that provide alternative uses for manure and/or improve manure management.

Maryland NMPs must be developed according to the Maryland Nutrient Management Manual,²¹ which is incorporated by reference into COMAR 15.20.07, as well as technical guides, academic research, and other resources ("Technical Standards"). EPA periodically compares state technical standards against agency expectations. The 2012 EPA review determined that most aspects of Maryland's Technical Standards are consistent with EPA's effluent limitation guidelines but that some portions are inconsistent.²²

7.1 Facility Universe

In FY2014, NMPs were required for 5,426 regulated farms (i.e., farms that have a gross income of at least \$2,500 or eight or more animal units) (MDA, 2015). By the end of FY2014, approximately 98.6% of regulated farms (5,351 out of 5,426 farms) had submitted copies of their initial NMP to MDA (MDA, 2015).

7.2 Resources Allocated

In FY2014, MDA HQ had a budget of \$1,937,280 and approximately 10.5 FTEs dedicated to the Nutrient Management Program (State of Maryland, 2015). In FY2014, MDA HQ had approximately 3 FTEs dedicated to the Nutrient Management Program, while MDA ROs had approximately 7 FTEs (State of Maryland, 2015). Of these, 2 FTEs at MDA HQ and all 7 FTEs at MDA ROs are certified nutrient management consultants (State of Maryland, 2015). MDA expects to expand to 5 FTEs at MDA HQ and 11 FTEs at MDA ROs in the future (State of Maryland, 2015).

In FY2014, MDA ROs and SCDs had a budget of \$5,260,000 dedicated to all animal agriculture programs, including the Nutrient Management Program (State of Maryland, 2015).

7.3 Data Systems

MDE tracks NMP information from CAFOs/MAFOs in three separate systems: MDE's Tools for Environmental Management and Protection Organizations (TEMPO) permit tracking database, Access

²⁰ <http://mda.maryland.gov/Documents/PMT-Handout-WEB.pdf>

²¹ http://mda.maryland.gov/resource_conservation/counties/Read%20the%20Revised%20Regs.pdf

²² Additional information available upon request.

database, and Excel database (State of Maryland, 2015). Permitting, compliance, enforcement, project assignment and completion, and annual report data are entered into these data systems on a daily basis (State of Maryland, 2015). MDE generates reports to summarize the registration process, enforcement process, categorization, mail merges, project assignments, and technical data on AFOs (State of Maryland, 2015).

MDA uses an Oracle database, as well as the Plan Implementation Enforcement (PIE) system, to track and manage oversight of NMPs and associated information. MDA enters data from the AIRs into the Oracle database.²³ Data entry typically occurs once or twice a month, and MDA generates monthly reports that are used by supervisors and quarterly and annual reports for various other purposes (State of Maryland, 2015).

MDA ROs and the SCDs use Maryland's Conservation Tracker Program to track agricultural BMP implementation in Maryland (State of Maryland, 2015). Maryland's Conservation Tracker Program captures BMPs implemented under State and Federal programs, including SCD data, MACS data, NRCS data, and Farm Service Agency (FSA) data.²⁴ Data are entered following the completion of a project, or on a monthly basis, by planners, technicians, or other designated staff familiar with the projects (State of Maryland, 2015). SCD managers run reports to track individual performance for employee evaluation or for reporting information to the SCD Board of Supervisors (State of Maryland, 2015).

7.4 Compliance and Enforcement

MDA is responsible for enforcement of the Nutrient Management Program requirements. MDA is authorized to issue fines and penalties, take administrative actions, and pursue civil proceedings against farmers who fail to comply with nutrient management requirements (MDA, 2015). MDA monitors and ensures compliance with the Nutrient Management Program requirements, including the following requirements:

- All regulated farmers must submit copies of their original NMPs to MDA.
- Farmers must submit Annual Implementation Reports (AIRs) to MDA that summarize the previous calendar year's nutrient applications by crop.
- Farmers must maintain current NMPs, operate in accordance with their NMPs, and maintain nutrient records to demonstrate compliance with their NMPs.

Nutrient Management Plan Submission

By the end of FY2014, approximately 98.6% of regulated farms (5,351 out of 5,426 farms) had submitted copies of their initial NMPs to MDA (MDA, 2015). MDA is pursuing enforcement actions against the 75 farm operators who have not yet submitted copies of their initial NMPs to MDA as required (MDA, 2015). In FY2014, MDA issued \$3,850 in fines against 11 farmers for failure to file their initial NMPs (MDA, 2015). MDA's FY2014 data is compared to previous years in Table 12 below.

²³ http://www.chesapeakebay.net/channel_files/18593/maryland_qapp_agriculture_bmp_072612.pdf

²⁴ http://www.chesapeakebay.net/channel_files/18593/maryland_qapp_agriculture_bmp_072612.pdf

Table 12. NMP Submittals, FY2009-FY2014.

	FY2009 (MDA, 2010)	FY2010 (MDA, 2011)	FY2011 (MDA, 2012)	FY2012 (MDA, 2013a)	FY2013 (MDA, 2014b)	FY2014 (MDA, 2015)
# of regulated farms	5,727 farms	5,727 farms	5,516 farms	5,433 farms	5,382 farms	5,426 farms
# of plans submitted	5,715 (99.8%)	5,722 (99.9%)	5,514 (99.9%)	5,411 (99.6%)	5,355 (99.5%)	5,351 (98.6%)
# of farms remaining	12 (0.2%)	5 (0.1%)	2 (0.1%)	22 (0.4%)	27 (0.5%)	75 (1.4%)
Fines issued for failing to submit NMP	\$3,150 in fines issued to 5 farmers	\$2,800 in fines issued	\$0 in fines issued to 2 farmers	\$350 in fines issued to 1 farmer	\$1,700 in fines issued to 27 farmers	\$3,850 in fines issued to 11 farmers

Annual Implementation Reports (AIRs)

Farmers are required to submit Annual Implementation Reports (AIRs) to MDA by March 1 each year. In April 2014, MDA issued warning notices to 974 farmers who failed to file their AIRs by March 1, 2014 (MDA, 2015). Some farmers submitted their AIRs in response to MDA's warning notices. In May 2014, MDA then issued 299 notices of pending fines (MDA, 2015). Again, some farmers submitted their AIRs in response to MDA's warning notices. Finally, in August 2014, MDA issued 117 default notices seeking fines (MDA, 2015). In FY2014, MDA issued \$23,250 in fines against 93 farmers for late or missing AIRs (MDA, 2015). By the end of FY2014, approximately 97.9% of farms (5,384 out of 5,501 farms required to submit AIRs) had submitted AIRs, with 2.1% of farms (117 farms out of 5,501 farms eligible for AIRs) remaining to submit their AIRs (MDA, 2015). MDA's FY2014 data is compared to previous years in Table 13 below.

Table 13. AIR Submittals, FY2012-FY2014.

	FY2009 (MDA, 2010)	FY2010 (MDA, 2011)	FY2011 (MDA, 2012)	FY2012 (MDA, 2013a)	FY2013 (MDA, 2014b)	FY2014 (MDA, 2015)
# of farms eligible for AIRs	5,514 farms	5,517 farms	5,597 farms	5,315 farms	5,271 farms	5,501 farms
# of AIRs submitted	5,457 (99.0%)	5,390 (97.7%)	5,448 (97.3%)	5,198 (97.8%)	5,158 (97.9%)	5,384 (97.9%)
# of AIRs remaining	57 (1.0%)	127 (2.3%)	149 (2.7%)	117 (2.2%)	113 (2.1%)	117 (2.1%)
Fines issued for failing to submit AIRs	\$31,250 in fines issued to 57 farmers	\$9,000 in fines issued to 36 farmers	\$13,250 in fines issued to 53 farmers	\$10,700 in fines issued to 43 farmers	\$6,750 in fines issued to 27 farmers	\$23,250 in fines issued to 93 farmers

On-Farm Audits

MDA conducts on-farm audits to verify compliance with Nutrient Management Program requirements (MDA, 2015). MDA conducts on-farm audits of all farms whose operators submitted late, incomplete or inconsistent AIRs, as well as all farms that are the subject of complaints received by MDA. MDA also randomly selects other farms for on-farm audits. During an on-farm audit, MDA staff verify that the information in the AIR matches the on-site records and that both the AIR and the NMP records reflect

the practices that are currently being implemented on the farm. These audits are focused on ensuring the farmers have an updated NMP and are fully complying with the terms of the NMP. MDA reviews documentation to support yield goals, soil and manure analysis results, land application records, and the current NMP. MDA staff also evaluate manure storage facilities and land application setbacks, and select 2 or 3 fields for detailed review. MDA has 9 staff members who conduct 800 to 900 on-farm audits and follow-up visits each year. On-farm audits and follow-up visits are performed year-round, and farmers are notified 48 hours before the visit as required by the Maryland Nutrient Management Law (§8-803.1.k.4.i).

If problems are identified during an on-farm audit, MDA will give the farmer a prescribed amount of time to make a correction to address the problem (MDA, 2010). If the problem is severe, the farmer may be issued a warning along with the time frame for correction (MDA, 2010). If the problem is not corrected within the established time frame, MDA will advance enforcement through the following steps (MDA, 2010):

Step 1: A formal Notice of Agency Action is sent by first-class mail and certified mail. Farmers have 15 days to respond to this letter.

Step 2: If 15 days pass with no resolution, a Notice of Default is sent by first-class mail and certified mail advising farmers that they have 15 days to correct the violation.

Step 3: If 15 days pass with no resolution, a Default Decision and Order is sent by first-class mail and certified mail. The farmer is charged a \$350 penalty and required to correct the violation within 30 days.

Step 4: If 30 days elapse without resolution, a Fine Letter is sent by first-class mail advising the farmer that he/she has 10 days to pay the penalty before it is sent to the Department of Budget and Management's Central Collections Unit (CCU). Once the debt is sent to the CCU, the farmer will be assessed the \$350 penalty, plus an additional 17% collection fee, bringing the total charge to \$410.

If the original violation remains uncorrected, farmers may be fined an additional \$100 per day, up to \$2,000 per year (MDA, 2010). Farmers involved in enforcement actions are ineligible to participate in state programs, including the Maryland Agricultural Water Quality Cost-Share (MACS) Program (MDA, 2010).

In FY2014, MDA conducted 733 on-farm audits, representing approximately 13.5% of regulated farms (733 out of 5,426 farms). MDA determined that approximately 66% of farms were in compliance (MDA, 2014). MDA determined that approximately 15% of farms had expired plans, approximately 2% of farms had incomplete plans, and approximately 8% of farms had no plans (MDA, 2014). MDA also determined that 6% of farms were out of compliance with record keeping requirements and approximately 3% of farms were out of compliance due to over-application of nutrients (MDA, 2014). MDA issued 211 warnings to correct major violations identified during those on-farm audits and documented minor violations to be corrected (MDA, 2014). MDA confirmed during follow-up visits that 66% of the operators had come into compliance, and enforcement actions are underway with the remaining operations (MDA, 2014). In FY 2014, MDA issued \$21,450 in fines against 33 farmers who failed to take

corrective actions in a timely manner (MDA, 2014). MDA’s FY2014 data is compared to previous years in Table 14 below.

Table 14. Nutrient Management Program On-Farm Audits, FY2012-FY2014.

	FY2009 (MDA, 2010)	FY2010 (MDA, 2011)	FY2011 (MDA, 2012)	FY2012 (MDA, 2013a)	FY2013 (MDA, 2014b)	FY2014 (MDA, 2015)
# of on-farm audits	400 audits (7.0% of regulated farms)	412 audits (7.1% of regulated farms)	450 audits (8.1% of regulated farms)	542 audits (10.0% of regulated farms)	738 audits (13.7% of regulated farms)	733 audits (13.5% of regulated farms)
% in compliance	69%	62.1%	70%	69%	73%	66%
% expired plans	25%	29.2%	20%	18%	16%	15%
% incomplete plans		4.4%**	5%***	5%	2%	2%
% no plans					3%	8%
% record keeping	6%*	4.4%**	5%***			6%
% over-application		4.3%	5%	8%	6%	3%
Fines issued for failing to take corrective actions in a timely manner	\$3,500 in fines issued to 36 farmers	\$15,050 in fines issued to 43 farmers	\$10,500 in fines issued to 34 farmers	\$10,200 in fines issued to 32 farmers	\$9,050 in fines issued to 28 farmers	\$21,450 in fines issued to 33 farmers

*6% identified as “Non-Compliant (Inadequate records/failure to allow MDA staff to conduct inspections)”

**4.4% identified as “Non-Compliant (improper nutrient timing, incomplete plans, poor records)”

***5% identified as “Poor records, improper nutrient timing, incomplete plans”

7.5 WIP Implementation Goals

Maryland’s Nutrient Management Program requires NMPs for all farms with a gross annual income of \$2,500 or more or with eight or more animal units (8,000 pounds of live animal weight).

Maryland’s Nutrient Management Program may or may not require a facility to have an animal waste management system. Many operations will have waste storage facilities, but the nutrient management regulations and technical standards do not explicitly require waste storage facilities. All NMPs must be developed to address current manure management practices, and “manure management includes structural or management components necessary to manage animal manure for optimal benefit while minimizing water quality impacts” [Maryland Nutrient Management Manual Section III(C)]. Therefore, an animal waste management system may or may not be required.

Maryland’s Nutrient Management Program may or may not require barnyard runoff control. NMPs must be developed to address current manure management practices, and “manure management includes structural or management components necessary to manage animal manure for optimal

benefit while minimizing water quality impacts. Manure management consists of a single component such as a diversion to exclude clean water from concentrated manure areas (emphasis added) or several BMPs that function together (sic) to address site conditions, animal and manure management, manure storage and nutrient application requirements” [Maryland Nutrient Management Manual Section III(C)].

Maryland’s Nutrient Management Program does not require SCWQPs.

Maryland’s Nutrient Management Program may or may not require stream fencing on pastures. As of January 1, 2014, the Maryland Nutrient Management Manual requires a 10-foot nutrient application setback from surface waters for pastures and 35-foot nutrient application setback from surface waters for sacrifice lots [Maryland Nutrient Management Manual Section 1(D)(II)(B)]. Livestock must be excluded from the setback to prevent direct deposition of nutrients within the setback, or alternatively, a farmer can work with the local SCD and develop and implement an SCWQP that includes BMPs such as stream crossings, alternative watering facilities, or pasture management that are equally protective of water quality and stream health [Maryland Nutrient Management Manual Section 1(D)(II)(B)]. MDA has emphasized that “Fencing is not necessarily a requirement.”²⁵ However, if the alternative practices are not effective MDA can require fencing. Therefore, Maryland’s Nutrient Management Program may or may not require stream fencing on pastures.

Table 15. Priority BMPs, Nutrient Management Program

Priority BMP	Required Component?	Notes
Nutrient Management Planning	Required	COMAR 15.20.07.05A
Animal Waste Management System	May be required	
Soil Conservation and Water Quality Plans		
Barnyard Runoff Control	May be required	
Stream Fencing on Pastures	Exclusion required; Fencing may be required	

7.6 Nutrient Management Program – Observations

- In FY2014, MDA HQ had a budget of \$1,937,280 and approximately 10.5 FTEs dedicated to the Nutrient Management Program, and the MDA ROs and SCDs had a budget of \$5,260,000 dedicated to all animal agriculture programs including the Nutrient Management Program.
- Maryland’s Nutrient Management Law is broad in coverage, requiring all farms with a gross income of at least \$2,500 or eight or more animal units that use chemical fertilizer, sludge or animal manure to develop and implement an NMP. In FY 2014, NMPs were required for 5,426 regulated farms.
- All NMPs must be written by a certified nutrient management consultant or certified farm operator. As of FY2014, 1,261 individuals had passed the Nutrient Management Certification Examination and become certified nutrient management consultants. As of FY2014, 547 farmers had become certified farm operators.
- Farmers must submit copies of their initial NMPs to MDA. MDA does not approve NMPs when submitted but uses submitted NMPs and on-site updates when conducting on-farm audits to verify the NMPs meet regulatory standards and are being followed. By the end of FY2014, 5,351

²⁵ https://extension.umd.edu/sites/default/files/docs/NMtimelineregfinal_2.pdf

out of 5,426 regulated farms (approximately 98.6%) had submitted copies of their initial NMPs to MDA. In FY2014, MDA issued \$3,850 in fines against 11 farmers for failure to file their initial NMPs

- Farmers are required to submit Annual Implementation Reports (AIRs) to MDA by March 1 each year. By the end of FY2014, 5,384 out of 5,501 farms required to submit AIRs (approximately 97.9%) had submitted AIRs. In FY2014, MDA issued \$23,250 in fines against 93 farmers for late or missing AIRs.
- MDA conducts on-farm audits to verify compliance with Nutrient Management Program requirements. These audits are focused on ensuring the farmers have an updated NMP and are fully complying with the terms of the NMP. In FY2014, MDA conducted on-farm audits at 733 out of 5,426 regulated farms (approximately 13.5%). MDA determined that approximately 66% of farms were in compliance. The majority of violations were for expired or out of date NMPs. MDA issued 211 warnings to correct major violations identified during those on-farm audits and documented minor violations to be corrected. In FY 2014, MDA issued \$21,450 in fines against 33 farmers who failed to take corrective actions in a timely manner.
- Maryland's Nutrient Management Program requires between one and four of the five priority BMPs. Maryland's Nutrient Management Program requires nutrient management planning. Maryland's Nutrient Management Program may require animal waste management systems, barnyard runoff control, and stream fencing on pastures. Maryland's Nutrient Management Program does not require SCWQPs.

8.0 CAFO/MAFO Program

The National Pollutant Discharge Elimination System (NPDES) program was established by Section 402 of the CWA to regulate the discharge of pollutants from point sources to waters of the United States. Section 502(14) of the CWA defined CAFOs as point sources that are regulated under the NPDES program, and 40 CFR § 122.23 identifies which animal agriculture operations are defined as CAFOs that need to obtain NPDES permit coverage.

EPA can delegate the authority to administer the NPDES program to states, and each state that seeks to be authorized to administer the NPDES program must submit a request to the EPA. Maryland has been authorized to administer the CWA's NPDES program (33 U.S.C. § 1251 et seq.) since September 5, 1974.²⁶ In Maryland, MDE is responsible for administering the NPDES program.

Maryland's NPDES CAFO regulations became effective January 12, 2009.²⁷ Maryland issued an NPDES CAFO general permit (NPDES Permit No. MDG01) on December 1, 2009 as Maryland's [General Discharge Permit for Animal Feeding Operations](#) (General Discharge Permit). The General Discharge Permit expired on November 30, 2014, and Maryland re-issued the [General Discharge Permit](#) on December 1, 2014. The current GDP expires on November 30, 2019. The General Discharge Permit regulates three types of facilities: CAFOs, Maryland Animal Feeding Operations (MAFOs), and Certification of Conformance (COC) facilities.

Maryland defines CAFOs in the General Discharge Permit using most of the same CAFO size thresholds that are identified in 40 CFR § 122.23. Maryland's regulatory requirements for facilities to apply for NPDES permits are more stringent than the federal CAFO regulations, requiring NPDES CAFO permits for 1) CAFOs that "propose to discharge," 2) CAFOs that discharge to "underground waters", which are considered waters of the State, and 3) CAFOs that are located outside of Maryland if animal waste storage or any other part of its production or land application area is located in Maryland. Maryland also has a broader definition for CAFOs with chickens (other than laying hens) with dry manure handling. Maryland defines Large CAFOs as having 125,000 or more animals or 100,000 square feet or more of poultry house capacity (General Discharge Permit, Part I.A.6).

In addition to permitting CAFOs, Maryland's General Discharge Permit also identifies requirements for Maryland Animal Feeding Operations (MAFOs). Maryland defines a MAFO as a Large CAFO that does not discharge or propose to discharge to surface waters (General Discharge Permit, Part I.A.4). MAFOs must obtain permit coverage under the General Discharge Permit, which serves as the State's groundwater discharge permit (Maryland Permit No. 14AF) for MAFOs. Maryland defines Large CAFOs for chickens (other than laying hens) with dry manure handling as having 125,000 or more animals or 100,000 square feet or more of poultry house capacity (General Discharge Permit, Part I.A.6).

In addition to permitting CAFOs and MAFOs, Maryland's General Discharge Permit also identifies requirements for Certification of Conformance (COC) facilities. A medium poultry AFO with chickens (other than laying hens) with dry manure handling that does not meet the definition of a CAFO or MAFO and has a poultry house capacity between 75,000 square feet and 100,000 square feet must submit a Certification of

²⁶ <http://water.epa.gov/polwaste/npdes/basics/State-Program-Status.cfm>

²⁷ <http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/AFO/Pages/index.aspx>

Conformance (COC) to MDE (General Discharge Permit, Part I.A.5.a.i). If the facility does not submit a Certification of Conformance (COC) to MDE, MDE will designate the operation as a MAFO and the facility will be subject to enforcement and penalty for operating without a Maryland discharge permit (General Discharge Permit, Part I.A.5.a.iv).

MDE may require an operation to apply for an individual permit coverage if the General Discharge Permit will not adequately protect waters of the state. However, to date, MDE has not issued any individual CAFO or MAFO permits (State of Maryland, 2015).

In order to obtain CAFO or MAFO permit coverage under the General Discharge Permit, a CAFO or MAFO must submit a Notice of Intent (NOI) and the required plans (either a CNMP, or an NMP plus an SCWQP) (General Discharge Permit, Part III.A). After receiving an NOI, MDE is required to public notice the receipt of all NOIs by posting relevant information on its [Status of Animal Feeding Operations \(AFO\) Applications](#) website (COMAR 26.08.04.09N-3).

MDE reviews the NOI and required plans and determines whether they satisfy the requirements of the General Discharge Permit (COMAR 26.08.04.09N-3.g). MDE may visit the facility to observe the operation and collect additional information. Prior to approving the required plans (either a CNMP, or an NMP plus a SCWQP), MDE makes a copy of each CAFO or MAFO's NOI and required plans available for public comment in the main branch of the public library in the county in which the AFO is located (COMAR 26.08.04.09N-3.e; General Discharge Permit Part III.B.3). MDE public notice the status of all NOIs, including when and where the NOI and required plans are available for review, on its [Status of Animal Feeding Operations \(AFO\) Applications](#) website.

Following the public notice period, if MDE determines that the required plans satisfy the requirements of the General Discharge Permit, MDE shall prepare a preliminary approval identifying the terms of the plans that satisfy the General Discharge Permit requirements (COMAR 26.08.04.09N-3.i). MDE shall then publish public notice of a preliminary approval of the required plans that provides a 30-day period for the public to review the preliminary approval, NOI, and the required plans (COMAR 26.08.04.09N-3.j). During the public notice period, the public can request a public hearing regarding the preliminary approval of the terms of the required plans (COMAR 26.08.04.09N-3.j). For CAFOs, "a public hearing will be held upon request to review MDE's preliminary approval of the required CNMP if a written request is received on or before twenty (20) calendar days of the publication of notice of MDE's preliminary approval on the MDE website."²⁸ For MAFOs, "public hearings regarding MAFOs may be held at MDE's discretion. However, interested parties may submit written comments. Any written comments concerning the preliminary approval must be received by the close of business, thirty (30) calendar days after the publication of the notice on the MDE website."²⁹

After completing the public notice and any required public hearing, MDE may grant final approval of the required plans, which become enforceable under the permit (COMAR 26.08.04.09N-3.l; General Discharge Permit Part III.B.5).

²⁸ <http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/AFO/Pages/CAFO.aspx>

²⁹ <http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/AFO/Pages/CAFO.aspx>

The significant differences between a CAFO and MAFO are 1) CAFOs may discharge from the production area in a storm event greater than the 25-year, 24-hour storm while MAFOs are not (General Discharge Permit, Parts I.B.2 and I.B.3), 2) MAFOs do not have a fee associated with the permit General Discharge Permit, Part III.F), 3) additional record keeping requirements for CAFOs (General Discharge Permit, Part IV.A.6), and 4) longer time allowed for temporary field stockpiling of litter or manure for MAFOs than CAFOs (30 calendar days versus 14 calendar days) (General Discharge Permit, Part IV.B.6).

CAFO/MAFO Nutrient Management Requirements

All CAFOs and MAFOs must develop and implement either 1) a comprehensive nutrient management plan (CNMP) or 2) an NMP plus a SCWQP (General Discharge Permit, Part IV.A.1). As discussed in the Nutrient Management Program section, all NMPs must be written by a certified nutrient management consultant. All CAFO and MAFO NMPs need to be consistent with the nine minimum requirements for nutrient management specified in 40 CFR § 122.42(e)(1) (General Discharge Permit, Part IV.B).

By signing and submitting a COC, all COC facilities commit to having and implementing an NMP and SCWQP that are consistent with the MAFO requirements and incorporate all buffers, setbacks and storage requirements otherwise applicable to MAFOs (General Discharge Permit, Part II.D). A COC facility also agrees to allow MDE access to the operation in order to confirm conformance with these requirement (General Discharge Permit, Part II.D).

8.1 Facility Universe

CAFOs

As of November 30, 2014 when the previous General Discharge Permit expired, 548 CAFOs were registered under the General Discharge Permit with nine registrations pending (State of Maryland, 2015). Of the 548 registered CAFOs, 519 were located within the Chesapeake Bay watershed.

A CAFO or AFO located outside of Maryland may be designated a CAFO by MDE and required to obtain coverage under the General Discharge Permit if animal waste storage or any other part of the production or land application area is located in Maryland. Under the previous General Discharge Permit, Maryland had designated one CAFO outside of Maryland as requiring CAFO permit coverage (State of Maryland, 2015).

Under the new General Discharge Permit effective December 1, 2014, 445 CAFOs have submitted NOIs for CAFO permit coverage as of May 18, 2015. MDE is still processing these NOIs and have not registered any CAFOs under the General Discharge Permit to date.

MAFOs

As of November 30, 2014 when the previous General Discharge Permit expired, 22 MAFOs were registered under the General Discharge Permit with three registrations pending (state of Maryland, 2015). All were located within the Chesapeake Bay watershed.

Under the new General Discharge Permit effective December 1, 2014, 19 MAFOs have submitted NOIs for MAFO permit coverage as of May 18, 2015. MDE is still processing these NOIs and have not registered any MAFOs under the General Discharge Permit to date.

COC Facilities

As of November 30, 2014 when the previous General Discharge Permit expired, MDE had three COC facilities (State of Maryland, 2015). All three COC facilities were located within the Chesapeake Bay watershed.

Under the new General Discharge Permit effective December 1, 2014, three AFOs have submitted COCs.

8.2 Resources Allocated

In FY2014, MDE had appropriations of \$181,936 and had actual expenditures of \$502,239 and approximately 7 FTEs for CAFO/MAFO Program activities (State of Maryland, 2015).

8.3 Data Systems

MDE tracks CAFO/MAFO information using three separate systems: MDE's Tools for Environmental Management and Protection Organizations (TEMPO) permit tracking database, Access database, and Excel database (State of Maryland, 2015). Permitting, compliance, enforcement, project assignment and completion, and annual report data are entered into these data systems on a daily basis (State of Maryland, 2015). MDE generates reports to summarize the registration process, enforcement process, categorization, mail merges, project assignment and technical data on AFOs (State of Maryland, 2015).

Maryland's data systems do not currently integrate with EPA's Integrated Compliance Information System (ICIS), however MDE is currently developing a Node to sync with ICIS (State of Maryland, 2015).

8.4 Compliance and Enforcement

MDE is primarily responsible for compliance and enforcement related to the General Discharge Permit at CAFOs, MAFOs and COC facilities. MDE addresses NMP compliance issues related to the General Discharge Permit at CAFOs, while MDA addresses NMP compliance issues at CAFOs, MAFOs, and COC facilities regarding the Nutrient Management Program.

MDE conducts compliance inspections of each permitted CAFO at least once during the permit term. In FY2014, MDE conducted compliance inspections at approximately 9% of permitted CAFOs (51 out of 548 total CAFOs registered). In FY2014, MDE also conducted compliance inspections at approximately 42% of CAFOs that were registered under the General Discharge Permit between October 1st and August 1st (51 out of 122 CAFOs), exceeding MDE's commitment in MDE's FY2014 Maryland Clean Water Act Section 106 Performance Partnership Grant Work Plan to inspect 20% of CAFOs registered between October 1, 2013 and August 1, 2014. In FY2014, MDE also conducted inspections at approximately 36% of permitted MAFOs (eight out of 22 total MAFOs registered) (State of Maryland, 2015).

Of the 29 CAFO/MAFO files reviewed by EPA, 21 were CAFOs, five were MAFOs, and three were COC facilities. EPA observed that 9 of 21 CAFO files (43%), two of five MAFO files (40%), and two of three COC facility files (67%) contained an inspection report dated between 2009 and 2014 (13 out of 29 files, or approximately 45%).

MDE addresses noncompliance with NMP and General Discharge Permit requirements at CAFOs and MAFOs according to MDE's Standard Operating Procedure (SOP) for AFO Compliance and Enforcement document. MDE's SOP provides guidance on enforcement actions and penalties. MDE's SOP identifies

the types of issues that result in MDE issuing a site complaint, notice of non-compliance (NON), notice of violation (NOV), administrative order (AO), or settlement agreement and order (SAO). MDE's SOP provides timeframes for each level of enforcement to allow a farmer to come back into compliance before elevating to the next level of enforcement.

MDE also addresses noncompliance with annual reporting requirements at CAFOs and MAFOs. When MDA receives an AIR from a permitted CAFO or MAFO, MDA sends a consolidated AIR form to MDE (State of Maryland, 2015). MDE determines which AFOs have not submitted an AIR and which have returned an incomplete AIR (State of Maryland, 2015). For all CAFOs and MAFOs that failed to submit an AIR or submitted an incomplete AIR, MDE sends a notice of non-compliance (NON) and provides a time period to complete and send in the AIR (State of Maryland, 2015). For CAFOs and MAFOs that did not comply with the NONs, MDE sends notices of violations (NOVs) with a penalty and a requirement to send in the AIR (State of Maryland, 2015). If a CAFO or MAFO does not fulfill the NOV, MDE refers the CAFO or MAFO to the Maryland Attorney General's Office for further enforcement action (State of Maryland, 2015). NOVs are issued within 30 days following documentation of the incident (State of Maryland, 2015).

In FY2014, MDE issued 21 NOVs with a penalty to permitted CAFOs (State of Maryland, 2015). In FY2014, MDE issued two Administrative Orders to permitted CAFOs (State of Maryland, 2015). The main reasons for these enforcement actions were failure to submit NOIs, failure to submit annual reports, and failure to keep proper records (State of Maryland, 2015). Only one of the 29 CAFO/MAFO files reviewed contained a formal enforcement action, which was a \$30,000 settlement agreement for previous discharges. Two additional CAFO/MAFO files contained a reminder letter in regards to a missing CNMP status form.

The 13 CAFO/MAFO files reviewed by EPA with an inspection report contained a total of 17 inspection reports dated between 2009 and 2014. Nine of the 13 CAFO/MAFO files (approximately 69%) contained inspection reports that documented noncompliance or that corrections were needed. Areas of noncompliance included lack of weekly inspections of waste storage areas, over-application of manure, and discharges of silage leachate. One facility was found to have 14 deficiencies. Three of the nine files (approximately 33%) contained a follow-up inspection report that documented that the facility took corrective actions and was now in compliance, while six of the nine files (approximately 67%) did not contain documentation that the deficiencies and noncompliance had been addressed. Follow-up enforcement documents are located in MDE's Centreville field office and transported to the Baltimore office periodically.

In FY2014, MDE responded to four complaints at permitted CAFO (State of Maryland, 2015).

8.5 WIP Implementation Goals

Maryland's CAFO/MAFO program requires all CAFOs, MAFOs, and COC facilities to develop and implement an NMP.

Maryland's CAFO/MAFO program requires an animal waste management system. An animal waste management system is defined as "practices designed for proper handling, storage, and utilization of

wastes generated from confined animal operations.”³⁰ This definition does not require a waste management structure. Maryland’s General Discharge Permit requires that “all CAFO and MAFO animal waste storage and distribution systems, including land application, shall be operated and maintained in accordance with either a CNMP or 1) a NMP and 2) a Conservation Plan” (General Discharge Permit, Part IV.A.1). Maryland’s General Discharge Permit also requires that “the plans shall ensure that appropriate manure management measures are used to store, stockpile, and handle animal manure and waste nutrients associated with animal production” (General Discharge Permit, Part IV.A.1.a). Therefore, Maryland’s CAFO/MAFO program requires an animal waste management system that may or may not include a waste management structure.

Maryland’s CAFO/MAFO program requires all CAFOs, MAFOs, and COC facilities to develop and implement a SCWQP, either as part of a CNMP or separately.

Maryland’s CAFO/MAFO program requires barnyard runoff control structures to be implemented. The General Discharge Permit requires that the operation “divert clean water, as appropriate, from the production area to keep it separate from process wastewater (General Discharge Permit, Part IV.B.3).

Maryland’s CAFO/MAFO Program does not require stream fencing on pastures.

Table 16. Priority BMPs, CAFO/MAFO Program

Priority BMP	Required Component?			Notes
	CAFOs	MAFOs	COC facilities	
Nutrient Management Planning	Required	Required	Required	General Discharge Permit, Part IV.A.1
Animal Waste Management System	Required	Required	Required	General Discharge Permit, Part IV.A.1
Soil Conservation and Water Quality Plans	Required	Required	Required	General Discharge Permit, Part IV.A.1
Barnyard Runoff Control	Required	Required	Required	General Discharge Permit, Part IV.B.3
Stream Fencing on Pastures				

8.6 CAFO/MAFO Program – Observations

- In FY2014, MDE had appropriations of \$181,936 and had actual expenditures of \$502,239 and approximately 7 FTEs for CAFO/MAFO Program activities.
- CAFOs, which are defined in Maryland as Medium and Large AFOs that discharge or propose to discharge, must obtain NPDES CAFO permit coverage under the General Discharge Permit. CAFOs also include poultry operations (other than laying hens) with dry manure handling and 100,000 square feet or more of poultry house capacity.
- MAFOs, which are defined as Large CAFOs that do not discharge or propose to discharge, must obtain MAFO permit coverage under the General Discharge Permit. MAFOs also include poultry operations (other than laying hens) with dry manure handling and less than 100,000 square feet of poultry house capacity.

³⁰ <http://www.casttool.org/Documentation.aspx>

- A medium poultry AFO with chickens (other than laying hens) with dry manure handling that does not meet the definition of a CAFO or MAFO and has a poultry house capacity between 75,000 square feet and 100,000 square feet must either submit a Certification of Conformance (COC) to MDE or, if a COC is not submitted, apply for coverage under the General Discharge Permit as a MAFO.
- As of November 30, 2014, 548 CAFOs were registered under the General Discharge Permit, 22 MAFOs were registered under the General Discharge Permit, and three facilities had submitted COCs. An additional nine CAFOs and three MAFOs had submitted NOIs but had not yet been registered under the General Discharge Permit. These 585 operations represent approximately 11% of the 5,143 livestock and poultry operations in Maryland.
- All CAFOs and MAFOs must develop and implement either 1) a comprehensive nutrient management plan (CNMP) or 2) an NMP plus a SCWQP that is consistent with the nine minimum requirements for nutrient management specified in 40 CFR § 122.42(e)(1) and the General Discharge Permit, Part IV.B.
- MDE conducts compliance inspections of each permitted CAFO at least once during the permit term. In FY2014, MDE conducted compliance inspections at approximately 9% of permitted CAFOs (51 out of 548 total CAFOs registered). In FY2014, MDE also conducted compliance inspections at approximately 42% of CAFOs that were registered under the General Discharge Permit between October 1st and August 1st (51 out of 122 CAFOs), exceeding MDE's commitment in MDE's FY2014 Maryland Clean Water Act Section 106 Performance Partnership Grant Work Plan to inspect 20% of CAFOs registered between October 1, 2013 and August 1, 2014. MDE also conducted inspections at approximately 36% of permitted MAFOs (eight out of 22 total MAFOs registered).
- Of the 29 CAFO/MAFO/COC files reviewed by EPA, approximately 55% (16 out of 29 files) contained an inspection report dated between 2009 through 2014.
- Of the 16 CAFO/MAFO files reviewed by EPA with an inspection report, between 2009 and 2014, five had compliance issues for which documentation of follow-up correspondence was not present in the files reviewed by EPA. This includes one facility that was inspected three months after being permitted and discovered during that inspection to have 14 deficiencies.
- In FY2014, MDE issued 21 NOVs with penalties and two Administrative Orders to permitted CAFOs.
- Maryland's CAFO/MAFO program requires four of the five priority BMPs. Maryland's CAFO/MAFO Program requires nutrient management planning, animal waste management systems, SCWQPs, and barnyard runoff control. Maryland's CAFO/MAFO Program does not require stream fencing on pastures.

9.0 Maryland's Agricultural Certainty Program

In 2013, the Maryland General Assembly passed legislation to establish a voluntary Maryland Agricultural Certainty Program ([COMAR 15.20.11](#)).³¹ The program, which is administered by MDA, provides Maryland farmers "a 10-year exemption from new environmental laws and regulations in return for installing best management practices in order to meet local or Chesapeake Bay Total Daily Maximum Load (TMDL) goals ahead of schedule" (MDA, 2014c).

Any farmer who operates an agricultural operation, except for CAFOs, can voluntarily participate in Maryland's Agricultural Certainty Program (COMAR 15.20.11.03). Agricultural operations are defined as "a business or activity where a person tills, crops, keeps, pastures, or produces an agricultural product, including livestock, poultry, plants, trees, sod, food, feed, or fiber by in-ground, out-of-ground, or other culture" (COMAR 15.20.11.02B(2)). An application must include a farm parcel in its entirety for enrollment in the program, but farmers do not need to include all farms or farm parcels under their ownership or control (COMAR 15.20.11.03B).

MDA will certify qualified verifiers who meet experience and knowledge criteria in conservation and nutrient management planning. In order to be a certified verifier, an individual must 1) have three or more years of experience developing Soil Conservation and Water Quality Plans (SCWQPs) or qualify as a USDA NRCS Conservation Planner level II; 2) be certified in Maryland to prepare NMPs; and 3) be certified in the use of the Maryland Nutrient Tracking Tool (MNTT) (COMAR 15.20.11.07B). In order to maintain certification, certified verifiers must complete at least six hours of MDA-approved training within the first year, and 12 hours thereafter for each three-year certification period, including training on any modified version of the MNTT (COMAR 15.20.11.07C).

Farm operations that are seeking agricultural certainty must undergo an inspection, field evaluation and records review conducted by a certified verifier to determine compliance with local, state and federal environmental requirements (COMAR 15.20.11.04B-1 and COMAR 15.20.11.04B-2). The certified verifier will confirm that the agricultural management and BMPs implemented on the farm enable the operation to meet the approved local or Chesapeake Bay TMDL baseline requirements as determined by an analysis using the Maryland Nutrient Tracking Tool (MNTT), which uses the same online platform developed by MDA for the Nutrient Trading Program (COMAR 15.20.11.04B(3)(c)).

After being inspected by a certified verifier, a farmer must submit to MDA an application of all farm parcels to be certified, documentation from the local SCD that the farm has a current Soil Conservation and Water Quality Plan (SCWQP) that is fully implemented, a current NMP that is fully implemented, and a map identifying the location of existing agricultural BMPs (COMAR 15.20.11.04A). The farmer must also provide a report from the certified verifier that confirms that 1) the SCWQP is being fully implemented and addresses all nitrogen, phosphorus, and sediment runoff issues on the operation, 2) the NMP is being implemented, 3) the BMPs implemented enable the operation to meet the approved local or Chesapeake Bay TMDL baseline requirements as determined by an analysis using the MNTT, and 4) no deficiencies exist and no corrective measures are needed on the operation (COMAR 15.20.11.04B-3).

³¹ http://mda.maryland.gov/resource_conservation/Pages/agricultural_certainty_program.aspx

After receiving an application, MDA will review the application for completeness and accuracy and may inspect the operation and request records in order to verify the application (COMAR 15.20.11.04D). MDA will also provide a copy of the application to MDE. MDE will determine whether the operation possesses or has applied for any MDE permits. If so, MDE may either approve the operation for participation in the program or notify MDA of any conditions that must be satisfied before MDE would approve the operation (COMAR 15.20.11.04D-2). MDE's approval of an operation is required only if the operation possesses or has applied for an MDE permit. MDE may also advise MDA that it will participate in an inspection of the operation. After the operation receives approval from MDE (if required), MDA will grant certification to an operation that MDA determines meets all program requirements and meets the local and Chesapeake Bay TMDLs at the time of certification as determined by the MNTT (COMAR 15.20.11.04E).

Once MDA determines that a farmer is eligible for certification, the last step is to develop a Certainty agreement between the farmer and MDA (COMAR 15.20.11.04E-8). In the certainty agreement, the farmer agrees to maintain and fully implement a current NMP, maintain existing BMPs, meet record-keeping and annual reporting requirements, and notify MDA if management or site conditions change that result in or increase nitrogen, phosphorus, or sediment runoff (COMAR 15.20.11.04F).

Once an operation is certified, the certification remains in effect for a 10-year certification period (COMAR 15.20.11.05A). During that 10-year certification period, the operation is not subject to local and State laws, regulations, or requirements that are enacted or adopted after the date of certification regarding the reduction of agricultural sources of nitrogen, phosphorus, or sediment runoff to meet the Chesapeake Bay TMDL (COMAR 15.20.11.05I-1). There are 11 programs specifically listed from which the operation is not exempt, including the phosphorus management tool regulations (COMAR 15.20.11.05I(3)).

During the 10-year certification period, the owner or operator must maintain records of 1) all NMPs and records used to manage soil fertility (such as land-application records) and 2) all SCWQPs and any updates, information, or documentation that addresses SCWQP implementation or installation of additional BMPs during the certification period (COMAR 15.20.11.08B). The owner or operator must also submit annual reports to MDA certifying that the operation has been managed in accordance with the Certainty agreement and will continue to be so managed during the upcoming calendar year, as well as a copy of the current NMP records including soil analysis, fertility recommendations for crops produced, nutrients applied by source and crop type, and a map showing the location of BMPs (COMAR 15.20.11.08A).

During the 10-year certification period, if the owner or operator of the farm changes or the average annual number of animal units increases by 10 percent or greater, the operator must notify MDA and reapply for certification (COMAR 15.20.11.05A and COMAR 15.20.11.05B).

During the 10-year certification period, MDA will assign certified verifiers to conduct site reviews and inspection of records at least once every three years for each certified operation (COMAR 15.20.11.06D). If the operation fails to comply with any of the requirements of the program or certainty agreement signed with MDA, MDA shall either provide a time frame for the operator to come into compliance to retain their existing certainty agreement or require the operator to apply for a new certainty certification when changes to the operation have occurred (COMAR 15.20.11.06F). If the operator fails to comply with MDA, the Agricultural Certainty Program requirements, or the Certainty agreement, MDA may revoke or suspend the certification after the opportunity for a hearing (COMAR 15.20.11.09).

Following the site inspection that takes place nearest to year 9 during the 10-year certification period, the operator shall take steps to address compliance issues with any new local, State, or federal requirements that took effect during the Certainty agreement period (COMAR 15.20.11.05E). At the end of the 10-year certification period, the operation must be in compliance with all current requirements (COMAR 15.20.11.05G).

The enabling legislation authorizes MDA to charge fees to cover Agricultural Certainty Program costs.³²

9.1 Facility Universe

Maryland's Agricultural Certainty Program became effective in January 2015, and MDA anticipates accepting applications beginning early spring 2015. Therefore, no facilities are currently covered under Maryland's Agricultural Certainty Program.

9.2 Resources Allocated

In FY2015, MDA had a budget of \$400,000 and approximately 1 FTE to staff and operate Maryland's Agricultural Certainty Program.

9.3 Data Systems

Maryland has not yet established how data will be tracked for Maryland's Agricultural Certainty Program since the program just became effective in January 2015. MDA is required to submit an annual report including the acres of agricultural land certified under the program (presented by county and watershed scales) (COMAR 15.20.11.08D), and Maryland will have to track sufficient data elements in order to provide this information.

9.4 Compliance and Enforcement

MDA is responsible for enforcement of the Agricultural Certainty Program requirements. During the 10-year certification period, MDA will assign certified verifiers to conduct site reviews and inspection of records at least once every three years for each certified operation (COMAR 15.20.11.06D). If the operation fails to comply with any of the requirements of the program or certainty agreement signed with MDA, MDA shall either provide a time frame for the operator to come into compliance to retain their existing certainty agreement or require the operator to apply for a new certainty certification when changes to the operation have occurred (COMAR 15.20.11.06F). If the operator fails to comply with MDA, the Agricultural Certainty Program requirements, or the Certainty agreement, MDA may revoke or suspend the certification after the opportunity for a hearing (COMAR 15.20.11.09).

MDA has not conducted any compliance inspections for Maryland's Agricultural Certainty Program since the program just became effective in January 2015.

9.5 WIP Implementation Goals

Maryland's Agricultural Certainty Program requires facilities to develop and implement an NMP and a Soil Conservation and Water Quality Plan (SCWQP).

³² http://mda.maryland.gov/resource_conservation/Pages/agricultural_certainty_program.aspx

Maryland’s Agricultural Certainty Program may or may not require animal waste management systems, barnyard runoff control structures, and stream fencing on pastures depending on the BMPs that the certified verifier determines must be implemented to enable the operation to meet the approved local or Chesapeake Bay TMDL baseline requirements as determined by an analysis using the MNTT.

Table 17. Priority BMPs, Maryland’s Agricultural Certainty Program

Priority BMP	Required Component?	Notes
Nutrient Management Planning	Required	COMAR 15.20.11.04A(4)
Animal Waste Management System	May be required	
Soil Conservation and Water Quality Plans	Required	COMAR 15.20.11.04A(2)
Barnyard Runoff Control	May be required	
Stream Fencing on Pastures	May be required	

9.6 Maryland’s Agricultural Certainty Program – Observations

- In FY2015, MDA had a budget of \$400,000 and approximately 1 FTE to staff and operate Maryland’s Agricultural Certainty Program.
- A farmer who chooses to participate in Maryland’s Agricultural Certainty Program agrees to implement an NMP, an SCWQP, and other BMPs that enable the operation to meet the approved local or Chesapeake Bay TMDL baseline requirements as determined by an analysis using the MNTT.
- During that 10-year certification period, the operation is not subject to local and State laws, regulations, or requirements that are enacted or adopted after the date of certification regarding the reduction of agricultural sources of nitrogen, phosphorus, or sediment runoff to meet the Chesapeake Bay TMDL.
- There are 11 programs specifically listed from which the operation is not exempt, including the phosphorus management tool regulations.
- Maryland’s Agricultural Certainty Program requires between two and five of the priority BMPs. Maryland’s Agricultural Certainty Program requires nutrient management planning and SCWQPs. Maryland’s Agricultural Certainty Program may require animal waste management system, barnyard runoff control, and stream fencing on pastures.

10.0 Summary

This section summarizes the observations that EPA highlighted in each of the program sections above.

Maryland's Animal Agriculture WIP BMPs

1. Maryland's regulatory programs require between four and five of the priority BMPs. NMPs are required for 5,426 farms, and 573 of these farms are regulated under the CAFO/MAFO Program and required to implement animal waste management systems, SCWQPs, and barnyard runoff control.
2. Maryland's Nutrient Management Program regulates 5,426 farms in Maryland and require agricultural BMPs such as NMPs. Maryland's CAFO/MAFO Program also requires SCWQPs, animal waste management systems, and barnyard runoff control for 573 farms.
3. Maryland's financial assistance programs, such as the Maryland Manure Transport Program, Maryland Agricultural Water Quality Cost-share (MACS) Program, Low Interest Loans for Agricultural Conservation (LILAC), help provide financial and technical assistance to farmers to implement agricultural BMPs. These programs provide grants, loans, and cost-share funding to encourage farmers to implement these BMPs voluntarily.
4. Continued implementation and adequate funding of both the regulatory and voluntary programs will help Maryland move forward towards meeting its WIP agricultural implementation goals.

Nutrient Management Program

1. In FY2014, MDA had a budget of \$1,937,280 and approximately 10.5 FTEs dedicated to the Nutrient Management Program, and the MDA ROs and SCDs had a budget of \$5,260,000 dedicated to all animal agriculture programs, including the Nutrient Management Program.
2. Maryland's Nutrient Management Law is broad in coverage, requiring all farms with a gross income of at least \$2,500 or eight or more animal units that use chemical fertilizer, sludge or animal manure to develop and implement an NMP. In FY 2014, NMPs were required for 5,426 regulated farms.
3. All NMPs must be written by a certified nutrient management consultant or certified farm operator. As of FY2014, 1,261 individuals had passed the Nutrient Management Certification Examination and become certified nutrient management consultants. As of FY2014, 547 farmers had become certified farm operators.
4. Farmers must submit copies of their initial NMPs to MDA. MDA does not approve NMPs when submitted but uses submitted NMPs and on-site updates when conducting on-farm audits to verify the NMPs meet regulatory standards and are being followed. By the end of FY2014, 5,351 out of 5,426 regulated farms (approximately 98.6%) had submitted copies of their initial NMPs to MDA. In FY2014, MDA issued \$3,850 in fines against 11 farmers for failure to file their initial NMPs
5. Farmers are required to submit Annual Implementation Reports (AIRs) to MDA by March 1 each year. By the end of FY2014, 5,384 out of 5,501 farms required to submit AIRs (approximately 97.9%) had submitted AIRs. In FY2014, MDA issued \$23,250 in fines against 93 farmers for late or missing AIRs.
6. MDA conducts on-farm audits to verify compliance with Nutrient Management Program requirements. These audits are focused on ensuring the farmers have an updated NMP and are

fully complying with the terms of the NMP. In FY2014, MDA conducted on-farm audits at 733 out of 5,426 regulated farms (approximately 13.5%). MDA determined that approximately 66% of farms were in compliance. The majority of violations were for expired or out of date NMPs. MDA issued 211 warnings to correct major violations identified during those on-farm audits and documented minor violations to be corrected. In FY 2014, MDA issued \$21,450 in fines against 33 farmers who failed to take corrective actions in a timely manner.

7. Maryland's Nutrient Management Program requires between one and four of the five priority BMPs.

CAFO/MAFO Program

8. In FY2014, MDE had appropriations of \$181,936 and had actual expenditures of \$502,239 and approximately 7 FTEs for CAFO/MAFO Program activities.
9. CAFOs, which are defined in Maryland as Medium AFOs that discharge or propose to discharge pollutants through a man-made ditch, flushing system, or other similar man-made device and Large AFOs that discharge or propose to discharge, must obtain NPDES CAFO permit coverage under the General Discharge Permit. CAFOs also include poultry operations (other than laying hens) with dry manure handling and 100,000 square feet or more of poultry house capacity.
10. MAFOs, which are defined as Large CAFOs that do not discharge or propose to discharge to surface water or medium AFOs that have not submitted a Certification of Conformance prior to beginning operation, must obtain MAFO permit coverage under the General Discharge Permit. MAFOs also include poultry operations (other than laying hens) with dry manure handling and less than 100,000 square feet of poultry house capacity.
11. A medium poultry AFO with chickens (other than laying hens) with dry manure handling that does not meet the definition of a CAFO or MAFO and has a poultry house capacity between 75,000 square feet and 100,000 square feet must either submit a Certification of Conformance (COC) to MDE or apply for MAFO permit coverage.
12. As of November 30, 2014, 548 CAFOs were registered under the General Discharge Permit, 22 MAFOs were registered under the General Discharge Permit, and three facilities had submitted COCs. An additional nine CAFOs and three MAFOs had submitted NOIs but had not yet been registered under the General Discharge Permit. These 585 operations represent approximately 11% of the 5,143 livestock and poultry operations in Maryland.
13. All CAFOs and MAFOs must develop and implement either 1) a comprehensive nutrient management plan (CNMP) or 2) an NMP plus a SCWQP that is consistent with the nine minimum requirements for nutrient management specified in 40 CFR § 122.42(e)(1) and the General Discharge Permit, Part IV.B.
14. MDE conducts compliance inspections of each permitted CAFO at least once during the permit term. In FY2014, MDE conducted compliance inspections at approximately 9% of permitted CAFOs (51 out of 548 total CAFOs registered). In FY2014, MDE also conducted compliance inspections at approximately 42% of CAFOs that were registered under the General Discharge Permit between October 1st and August 1st (51 out of 122 CAFOs), exceeding MDE's commitment in MDE's FY2014 Maryland Clean Water Act Section 106 Performance Partnership Grant Work Plan to inspect 20% of CAFOs registered between October 1, 2013 and August 1, 2014. MDE also conducted inspections at approximately 36% of permitted MAFOs (eight out of 22 total MAFOs registered).

15. Of the 29 CAFO/MAFO/COC files reviewed by EPA, approximately 55% (16 out of 29 files) contained an inspection report between 2009 through 2014.
16. Of those CAFOs, MAFOs and COC facilities that were inspected between 2009 and 2014, five had compliance issues for which documentation of follow-up correspondence was not present in the files reviewed by EPA. This includes one facility that was inspected three months after being permitted and discovered during that inspection to have 14 deficiencies.
17. In FY2014, MDE issued 21 NOVs with penalties and two Administrative Orders to permitted CAFOs.
18. In FY2014, MDE responded to four complaints at permitted CAFOs.
19. Maryland's CAFO/MAFO program requires four of the five priority BMPs.

Maryland's Agricultural Certainty Program

20. In FY2015, MDA had a budget of \$400,000 and approximately 1 FTE to staff and operate Maryland's Agricultural Certainty Program.
21. A farmer who chooses to participate in Maryland's Agricultural Certainty Program agrees to implement an NMP, an SCWQP, and other BMPs that enable the operation to meet the approved local or Chesapeake Bay TMDL baseline requirements as determined by an analysis using the MNTT.
22. During that 10-year certification period, the operation is not subject to local and State laws, regulations, or requirements that are enacted or adopted after the date of certification regarding the reduction of agricultural sources of nitrogen, phosphorus, or sediment runoff to meet the Chesapeake Bay TMDL.
23. There are 11 programs specifically listed from which the operation is not exempt, including the phosphorus management tool regulations
24. Maryland's Agricultural Certainty Program requires between two and five of the priority BMPs.

11.0 References

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