
Delaware Animal Agriculture Program Assessment

Final

Prepared by:
U.S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

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Contents

1.0	Executive Summary.....	1
2.0	Introduction	6
2.1	Purpose of Effort.....	6
2.2	Program Review Approach	7
3.0	Delaware Animal Agriculture Regulatory Program Overview	9
4.0	State Agencies involved with Animal Agriculture Programs.....	11
4.1	Agency Funding.....	11
4.2	Delaware Department of Natural Resources and Environmental Control	13
4.3	Delaware Department of Agriculture	13
4.4	Delaware Nutrient Management Commission	14
5.0	Delaware and the Chesapeake Bay TMDL	15
6.0	Delaware’s Animal Agriculture WIP BMPs.....	19
6.1	Delaware’s Animal Agriculture WIP BMPs – Observations.....	22
7.0	Nutrient Management Program	24
7.1	Facility Universe	27
7.2	Resources Allocated.....	28
7.3	Data Systems.....	28
7.4	Compliance and Enforcement.....	29
7.5	WIP Implementation Goals.....	34
7.6	Nutrient Management Program – Observations	35
8.0	NPDES CAFO Program	37
8.1	Facility Universe	40
8.2	Resources Allocated.....	40
8.3	Data Systems.....	41
8.4	Compliance and Enforcement.....	41
8.5	WIP Implementation Goals.....	42
8.6	NPDES CAFO Program – Observations	44
9.0	Summary	45
10.0	References	48

Acronyms and Abbreviations

AFO	Animal feeding operation
AU	Animal unit
AWMP	Animal waste management plan
BMP	Best management practice
CAFO	Concentrated animal feeding operation
CBP	Chesapeake Bay Program
CFR	Code of Federal Regulations
CNMP	Comprehensive nutrient management plan
CWA	Clean Water Act
DDA	Delaware Department of Agriculture
DNMC	Delaware Nutrient Management Commission
DNREC	Delaware Department of Natural Resources and Environmental Control
EPA	U.S. Environmental Protection Agency
FTE	Full-time equivalent
FY	Fiscal year
MOA	Memorandum of agreement
NMP	Nutrient management plan
NOI	Notice of intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
SRF	State Revolving Fund
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 Delaware review is one of six animal agriculture program reviews that will be completed by 2015.

EPA conducted an assessment of the State of Delaware'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 Delaware's agricultural pollutant load reduction commitments set forth in Delaware's Watershed Implementation Plans (WIPs) to achieve the allocations set forth in the Chesapeake Bay TMDL; and (3) evaluates Delaware's NPDES permit 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 Delaware'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 Delaware 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 NPDES CAFO Program. These programs were compared to the goals outlined in Delaware's WIP. Delaware was forthcoming with a considerable amount of material and information to support this assessment.

This assessment is based on responses from Delaware to an animal agriculture program questionnaire developed by EPA; information in 30 NPDES CAFO files provided by the Delaware Department of Agriculture (DDA) and Delaware Department of Natural Resources and Environmental Control (DNREC); discussions with agency staff; and program information available from agency websites. The observations outlined in this report provide a framework for Delaware 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.

According to the United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS) Census of Agriculture (Ag Census), Delaware had 1,372 farms with livestock and poultry in 2007 (USDA, 2009) and 1,304 farms with livestock and poultry in 2012 (USDA, 2014).

DNREC, DDA, and the Delaware Nutrient Management Commission (DNMC) have statutory and regulatory authority to manage animal agricultural programs in Delaware. As a whole, EPA reviewed

two main regulatory 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) NPDES CAFO Program. EPA also analyzed how these programs support Delaware'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 both of these programs and evaluate how well they work together collectively to meet the 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

Delaware'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. Delaware submitted its Chesapeake Bay TMDL Phase I WIP on November 29, 2010 and its Phase II WIP on March 30, 2012. Delaware anticipates that the agricultural strategies outlined in the Phase I WIP and Phase II WIP, particularly increased funding of cost-share programs combined with a continued commitment to the State's Nutrient Management Program and NPDES CAFO 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, (2) animal waste management systems, (3) conservation plans, (4) barnyard runoff control systems, and (5) mortality composting. EPA chose to focus on these practices because they are related to animal agriculture and they represent BMPs that Delaware 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 Delaware's animal agriculture programs related to water quality require the implementation of some but not all of these priority BMPs. Nutrient management plans (NMPs) are required for all AFOs with at least eight animal units (AUs), including all NPDES-permitted CAFOs, as well as for any person who manages more than 10 acres of land on which nutrients are applied. Animal waste management systems are required for all AFOs, including NPDES-permitted CAFOs, although waste management structures are not required. Conservation plans are not required by any Delaware regulatory program. Barnyard runoff control is required at all NPDES-permitted CAFOs. Mortality composting may or may not be required at NPDES-permitted CAFOs.

Delaware is relying heavily on programs with voluntary participation, such as cost-share programs, and better data collection efforts in order to increase BMP implementation and account for conservation practices that are currently on the ground to meet Delaware's WIP goals. For example, Delaware has increased its cost-share rates for manure transport from \$0.16/ton-mile to \$0.18/ton-mile in order to incentivize participation in the program. Delaware has also increased cost-share funding for cover crops.

Delaware's voluntary programs are important in achieving Delaware's animal agriculture pollution reduction goals set forth in the WIP, but there is currently uncertainty if and how the voluntary programs will ensure these reductions are met. For example, the County Conservation Districts have

large gaps between needed cost-share funding and available cost-share funding. Delaware prioritizes cost-share funding for annual cover crops, which results in other practices being placed on a waiting list. While the demand for BMPs seems to be there, it is unclear whether Delaware will be able to help fund these practices.

Tracking priority BMP implementation is an additional challenge for Delaware. In Delaware's 2014-2015 WIP Programmatic Milestones, Delaware committed to "develop and implement a tracking and reporting system for agricultural non-cost shared BMPs" in 2015. In Delaware's 2014-2015 WIP Programmatic Milestones, Delaware also committed to develop a method to track and report both conservation tillage and cover crop implementation. Delaware developed and implemented a crop residue transect survey in 2014 to assess and document conservation tillage practices implemented on farms within the state. Delaware also developed and implemented a cover crop pilot transect survey to assess and document implementation of cover crops within the state. Delaware will use these BMP tracking tools to document and report agricultural non-cost shared BMPs that farmers are implementing voluntarily.

In the event that Delaware is unable to keep up with or make progress toward meeting its agricultural implementation goals, Delaware may need to act on its commitment outlined in the WIP to enact new policy measures and explore mandatory BMP compliance options, as well as examining the possibility and implications of prohibiting manure-source phosphorus application on high phosphorus soils.

Nutrient Management Program

The Nutrient Management Program is directed by the Delaware Nutrient Management Commission (DNMC) and administered by DDA. Delaware's Nutrient Management Program is broad in coverage, requiring NMPs for all AFOs with greater than eight animal units (AUs) and for any farmer who applies nutrients to more than 10 acres under their control. All NMPs must be developed by a certified nutrient consultant. In FY2013, the Nutrient Management Program had a total budget of \$103,335 and approximately 1.625 FTEs dedicated to the Nutrient Management Program.

Currently, there are approximately 1,072 AFOs and crop land farm operations in Delaware regulated by the Delaware Nutrient Management Law, representing approximately 57% to 68% of the farms that meet the USDA definition of a farm in Delaware over 10 acres or with more than \$10,000 in sales, respectively. The DNMC reports that 100% of cropland and nutrient-applied acres were managed under a current NMP developed by a certified consultant.

NMPs do not need to be submitted to the DNMC for approval but must be kept on-farm and made available to DDA to review. Only one of the 30 files reviewed is for an NPDES-permitted CAFO; the remaining 29 files are for operations that have applied for NPDES CAFO permits but are still in the pre-permitting process. These unpermitted CAFOs are being regulated currently under the Delaware Nutrient Management Law. Of the 30 files reviewed, three facilities were inactive. Of the 27 files for active facilities, eight facilities had land application areas for manure (including four poultry operations) and 19 facilities did not have land application areas for manure (including 17 poultry operations).

DDA currently commits to inspecting, at a minimum, 82 AFOs (including CAFOs) and crop land farm operations per year for compliance with the Delaware Nutrient Management Law and regulations. At a

minimum, 46 of these inspections must be non-CAFO operations. In 2013, DDA conducted DDA conducted nutrient management compliance visits at 85 out of the 1,072 regulated AFOs (including CAFOs) and crop land farm operations in Delaware (approximately 8%). During the nutrient management compliance visits, DDA determines whether or not the farmer's NMP contains the information required under Delaware's Nutrient Management Program and whether the farmer has current nutrient management certification, has an up-to-date manure analysis, and has the required records of land application and manure export. According to DDA, DDA also determines whether or not the farmer is complying with the requirements in the NMP by inspecting the farmer's records of implementation, although this information is not currently being documented by DDA in the nutrient management compliance visit reports. Upon inspecting those documents, and all other above mentioned requirements, DDA determines whether or not the farmer complied with the requirements of the NMP.

For the 30 CAFO files reviewed by EPA, 22 files (approximately 73%) contained a nutrient management compliance visit and eight files (approximately 27%) did not contain a nutrient management compliance visit. All 22 files with a nutrient management compliance visit had a nutrient management compliance visit conducted in 2011, and seven of the 22 files contained a second nutrient management compliance visit conducted after 2011. For the 30 files reviewed by EPA, DDA determined that "Utilization of Nutrient Management Plan," (i.e. compliance with the NMP) was adequate at eight out of the 30 nutrient management compliance visits (approximately 27%), while DDA did not make a determination at the remaining 22 out of the 30 nutrient management compliance visits (approximately 73%).

The 30 CAFO files reviewed by EPA contained 18 nutrient management annual reports for 2011, 22 annual reports for 2012, 17 annual reports for 2013, and 15 annual reports for 2015. The annual report response rate for these 30 farms from 2011 to 2014 ranged from 50% to 73%.

DDA does not use annual reports to determine NMP compliance because the reports do not contain the detailed information that the NMP's and records of implementation contain which DDA reviews during compliance inspections. DDA is uncertain of annual report response rate due to database design, functionality, and glitches. DDA's Nutrient Management Program is currently having a new database built to replace the existing database that will resolve the current issues related to annual reporting. The new database will also track compliance inspections.

Delaware's Nutrient Management Program requires two of the five priority BMPs. Delaware's Nutrient Management Program requires nutrient management and animal waste management systems for AFOs.

NPDES CAFO Program

Delaware's NPDES CAFO Program is implemented jointly by DNREC and DDA through an MOA. DDA manages the day-to-day operations, including inspections, while DNREC administers the program, including issuing permits. In FY2013, the NPDES CAFO Program had a total budget of \$70,326 and approximately 1.375 FTEs dedicated to the NPDES CAFO Program.

Previously, Delaware had 24 NPDES-permitted CAFOs before Delaware's NPDES CAFO general permit expired in September 2010. Delaware issued one NPDES CAFO individual permit in 2013. Delaware currently has 439 pending applications for NPDES CAFO permits statewide, including 318 in the

Chesapeake Bay watershed. Delaware is currently working to develop three NPDES CAFO general permits: poultry operations with no land application areas, poultry operations with land application areas, and non-poultry operations. EPA closed out its review of Delaware's NPDES CAFO general permit and Fact Sheet for poultry operations with no land application areas on April 29, 2015. Delaware will be making the general permit and fact sheet available for public review and comment prior to finalizing the general permit and registering CAFOs under it. Delaware intends to issue the general permit for poultry operations with no land application areas by the end of 2015 to meet its 2014-2015 WIP Programmatic Milestones. Afterwards, Delaware intends to develop the CAFO general permit for poultry operations with land application areas, followed by the CAFO general permit for non-poultry operations.

The MOA between DDA and DNREC will need to be updated since currently it only provides responsibilities for issuing individual CAFO permits and does not include provisions for issuing a CAFO general permit.

DDA conducts Permit Audits for CAFOs that submitted NPDES CAFO permit applications in order to determine whether DDA had the necessary paperwork and information in order to process the permit application. DDA's primary inspection focus has been on poultry operations that do not land apply manure. Of the 30 files reviewed by EPA, 20 had received a Permit Audit. DDA states that the permit audit is the equivalent of a routine nutrient management compliance inspection conducted by the DDA except conducted on operations that are seeking NPDES CAFO permits. Of the 20 files with Permit Audits, 19 were poultry operations and one was a poultry/non-poultry mixed livestock operation. All 17 non-land applying poultry CAFO operations had received a permit audit. The Permit Audits were fairly detailed, with DDA noting both areas where the facilities were excelling as well as areas of concern that needed to be addressed, either immediately or prior to permit issuance. Of the 20 files with Permit Audits, six files (30%) had all of the documentation necessary to proceed with issuing NPDES CAFO permit coverage, while 14 files (70%) were missing documentation (current NMPs/AWMPs, etc.) that will need to be submitted by the farmer to DDA before DDA can issue the operation an NPDES CAFO permit. DDA stated that DDA is not required to receive and maintain these documents in DDA's files until the facility receives NPDES CAFO permit coverage.

Delaware's NPDES CAFO Program requires three or four of the five priority BMPs. Delaware's NPDES CAFO Program requires nutrient management, animal waste management systems, and barnyard runoff control. Delaware's NPDES CAFO Program may require mortality composting.

2.0 Introduction

The U.S. Environmental Protection Agency (EPA) conducted an assessment of the State of Delaware'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 Delaware'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 Delaware with a detailed Delaware Animal Agriculture Program Review questionnaire (questionnaire). The Delaware Department of Natural Resources and Environmental Conservation (DNREC) coordinated Delaware's completion of the questionnaire with the Delaware Department of Agriculture (DDA). DDA and DNREC also supported the assessment process by providing EPA with NPDES CAFO files for 30 animal agriculture operations that have applied for NPDES CAFO permits. Delaware provided responses to EPA's questionnaire in October 2014. EPA provided the draft assessment report to Delaware on April 24, 2015. Delaware provided comments to EPA on June 3, 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 (Delaware Animal Agriculture Regulatory Overview), Section 4.0 (State Agencies Involved with Animal Agriculture Programs), Section 5.0 (Delaware and the Chesapeake Bay TMDL), and Section 6.0 (Delaware's Animal Agriculture WIP BMPs) provide background information. Section 7.0 (Nutrient Management Program) and Section 8.0 (NPDES CAFO Program) discuss and evaluate implementation of Delaware's various 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 Delaware's questionnaire responses.

2.1 Purpose of Effort

EPA conducts periodic reviews of state NPDES programs as part of its oversight responsibilities under the CWA. EPA discusses program goals and objectives with authorized states, such as Delaware, 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 the 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 settlement agreement with the Chesapeake Bay Foundation

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

² Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia

(CBF) ([Fowler et al. v. EPA](#)). As such, the Delaware 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 Delaware's pollutant load reduction goals under the Chesapeake Bay TMDL, and compare the Delaware National Pollutant Discharge Elimination System (NPDES) program with federal concentrated animal feeding operations (CAFO) requirements. The goal of this assessment is to determine 1) how well Delaware's programs align with Delaware's Chesapeake Bay TMDL WIP commitments and 2) how effectively Delaware's programs are being implemented.

2.2 Program Review Approach

In June 2014, EPA sent a questionnaire to Delaware requesting background information on two Delaware programs applicable to animal agriculture as well as Delaware's WIP:

1. Nutrient Management Program
2. NPDES CAFO Program
3. WIP BMP Implementation

The intent of the questionnaire 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 Delaware'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 FY2013 budget (July 1, 2012 through June 30, 2013) 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. Delaware provided its completed response to the questionnaire in October 2014.

EPA also conducted file reviews and had discussions with agency staff. For the file reviews, EPA reviewed DNREC and DDA files for AFOs that have applied for NPDES CAFO permits. Prior to the file reviews, EPA provided DNREC and DDA with a list of animal agriculture operation files to be reviewed by EPA. DDA and DNREC provided NPDES CAFO files for all 30 operations selected by EPA. Below is a brief summary of the number and animal operation type of the 30 files reviewed.

- 24 poultry operations
- 2 poultry/dairy mixed operations
- 1 pullet/dairy mixed operation
- 1 beef operation
- 1 swine operation
- 1 horse operation

Only one of the 30 files reviewed is for an NPDES-permitted CAFO; the remaining 29 files are for operations that have applied for NPDES CAFO permits but are still in the pre-permitting process. These unpermitted CAFOs are being regulated currently under the Delaware Nutrient Management Law. Of

the 30 files reviewed, three facilities were inactive. Of the 27 files for active facilities, eight facilities had land application areas for manure (including four poultry operations) and 19 facilities did not have land application areas for manure (including 17 poultry operations).

Each facility file from DDA included information such as: inspection reports; compliance and enforcement communications; current and expired nutrient management plans (NMPs) or comprehensive nutrient management plans (CNMPs); correspondence; self-monitoring reports; Notices of Intent (NOIs); and other facility-specific information maintained by DDA. The facility files from DNREC generally only contained each facility's NPDES CAFO permit NOI. DDA stated that certain permit supporting documentation, such as NMPs/AWMPs and manure sample analyses, are not required to be maintained by DDA in their files until the operation is covered under a CAFO NPDES permit.

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), NMPs/CNMP approval issues, typical inspection findings, and challenges with permit issuance or reissuance. The observations help to identify opportunities for Delaware to strengthen implementation of the State's animal agriculture programs related to water quality and work towards improved water quality within Delaware and the Chesapeake Bay watershed.

EPA used information from the on-site agency meetings, DNREC and DDA file reviews, State questionnaire responses, and agency and entity websites to develop and substantiate observations about Delaware'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 Delaware Animal Agriculture Regulatory Program Overview

According to the 2012 United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS) Census of Agriculture (Ag Census), Delaware had 2,451 farms in 2012, down slightly from 2,546 farms in 2007 (USDA, 2014).³ According to the 2012 USDA Ag Census, Delaware had 1,304 livestock and poultry operations (animal agriculture operations) in 2012, down slightly from the 1,372 animal agriculture operations in 2007 (USDA, 2014). Below in Table 1 are animal inventories for Delaware from the Ag Census.

Table 1. 2007 and 2012 Ag Census Animal Inventories.

Census	Beef	Dairy	Poultry				Swine
			Broilers	Turkeys	Pullets	Layers	
2007	3,668	6,526	51,092,495	701	(D)	(D)	8,955
2012	3,833	4,512	43,206,514	778	(D)	(D)	5,891
Change	+165 (+4.5%)	-2,014 (-30.9%)	-7,885,981 (-15.4%)	+77 (+11.0%)	Unknown	Unknown	-3,064 (-34.2%)

(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 Delaware 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	2,625	4,227	246,098,878	(D)	(D)	(D)	49,898
2012	3,219	3,898	211,576,121	(D)	(D)	(D)	23,422
Change	+594 (+22.6%)	-329 (-7.8%)	-34,522,757 (-14.0%)	Unknown	Unknown	Unknown	-26,476 (-53.1%)

(D) = data suppressed by USDA

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

Table 3. Delaware Poultry Industry, 2009-2013.

Year	Meat Chickens	
	Numbers Produced	Pounds Produced
2009	231,500,000	1,597,400,000
2010	235,000,000	1,630,900,000
2011	218,000,000	1,530,000,000
2012	212,000,000	1,505,000,000
2013	215,000,000	1,530,800,000
Change	-16,500,000 (-7.13%)	-66,600,000 (-4.17%)

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

³ The USDA definition of a farm is "any place that produced and sold, or normally would have sold, \$1,000 or more of agricultural products during the Census year." (http://www.agcensus.usda.gov/Help/FAQs/General_FAQs/)

Table 4 presents poultry data from the USDA NASS about Delaware’s poultry industry.

Table 4. Delaware Poultry Industry, 2007-2013.

Year	Number of Broilers Placed
2007	257,973,000
2008	245,505,000
2009	243,572,000
2010	243,035,000
2011	223,582,000
2012	216,645,000
2013	238,248,000
Change	-19,725,000 (-7.65%)

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

According to DDA’s communications with poultry industry representatives, the poultry industry in Delaware is expected to grow over the next five years. A five-year projection for the Delmarva Peninsula (Delaware, Maryland Eastern Shore, and Virginia Eastern Shore) indicates the need for 245 new poultry houses, with the most growth in the first and second years (70 houses per year) and with more moderate growth in the remaining three years (35 houses per year). DDA estimates that 40 percent of this growth will occur in Delaware, or 98 new poultry houses. Eighty percent of the new capacity is dedicated to cover new demand, while 20 percent covers attrition as growers retire or close aged or obsolete houses. As a result, DDA expects that about 80 new houses to be built in Delaware from 2015 to 2020.

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

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

Delaware Animal Agriculture Program	Law/Statute and Regulations
Nutrient Management Program	3 Del. C. § 2240-2249
NPDES CAFO Program	3 Del. C. § 2200 et. Al. And 7 Del. C. § 6000 40 CFR § 122 and 40 CFR § 412 7 Del. Admin. C. § 7201, Section 9.5

4.0 State Agencies Involved with Animal Agriculture Programs

DNREC, DDA, and DNMC are the primary agencies with regulatory responsibilities for Delaware’s animal agriculture programs related to water quality. The three conservation districts and the Delaware Cooperative 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 conservation districts, Delaware Cooperative Extension, EPA, USDA-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 (State of Delaware, 2014).

Program (Lead Agency)	Budget (FY 2013)	FTEs	No. of Operations	Target Facilities
NPDES CAFO Program (DNREC and DDA)	\$75,000 (DNREC)	1 (DNREC)	1	CAFOs
	\$70,326 (DDA)	1.375 (DDA)		
Nutrient Management Program (DDA)	\$103,335	1.625	1,072 AFOs & crop land farm operations	AFOs with more than 8 animal units (AUs) Anyone who manages more than 10 acres of land on which nutrients are applied.

NR – not reported

There are many different grants and other funding mechanisms that Delaware uses to support animal agriculture operations, some of which are identified in Table 7. For example, DDA administers the Nutrient Relocation Program to assist poultry farmers who do not have cropland or have high soil phosphorus levels and must find alternative uses for poultry manure (DNMC, 2015). The Nutrient Relocation Program provides financial reimbursement to farmers, brokers, and trucking businesses for the transportation costs of relocating litter from Delaware farms to alternative use projects or other farms for land application (DNMC, 2015). In addition, low-cost loans are offered to poultry and dairy farms to implement BMPs through the State Revolving Fund. Additional information on the allocation of Section 319 nonpoint source program funding, including cost-share funding for agricultural BMPs, is available in DNREC’s 2013 Nonpoint Source Program Annual Report.⁴

Table 7. DNREC and DDA Grants and Other Funding Mechanisms to Support Animal Agriculture Operations.

Program	Resp. Agency	Description	Program Capacity (Year)		Disbursements (Year)	
			Per farm (\$)	Total (\$)	Farms (#)	Total (\$)
Nutrient Planning Program ⁵	DDA	Financial reimbursement to farmers for the writing of NMPs	\$1.90-\$5.70 per acre plus base rate of \$0-\$9,000	\$411,000 (FY2015)	145 farms representing 79,869 acres (2014)**	\$411,800 (2014)**

⁴ http://www.epa.gov/reg3wapd/pdf/pdf_nps/nps_annualreports/2013/DE2013AnnualReport.pdf

⁵ http://dda.delaware.gov/nutrients/nm_cs.shtml

Program	Resp. Agency	Description	Program Capacity (Year)		Disbursements (Year)	
			Per farm (\$)	Total (\$)	Farms (#)	Total (\$)
Nutrient Relocation Program ⁶	DDA	Provides financial reimbursement to farmers, brokers and trucking businesses for the transportation cost of relocating manure from Delaware farms to alternative use projects or other farms for land application	\$0.16/ton-mile with a cap of \$18.00/ton for farm-to-farm or farm-to-alternative-use in Delaware \$0.08/ton-mile with a cap of \$10.00/ton for farm-to-alternative use outside Delaware	\$246,000 in state funds (FY2015), plus additional Federal funds portion available over 4 years	Approximately 150 Farms (FY2013) 61,782 tons relocated (FY2013)*	\$454,651 (FY2013)
State Revolving Fund (SRF) Agricultural Nonpoint Source Loan Program (AgNPSLP)	DNREC and conservation districts	Poultry Loan Program – help poultry farmers implement BMPs on their farms to reduce potential for pollution from the operation ⁷	\$1,000-\$60,000	\$0 for 0 loans (2014)	5 loans (2013)	\$96,696.45 (2013)
		Dairy Loan Program – help dairy farmers implement BMPs on their farms to reduce potential for pollution from the operation ⁸	\$5,000-\$100,000	\$0 for 0 loans (2014)	0 loans (2013)	\$0 (2013)
New Castle Conservation District Cost-Share Program	New Castle Conservation District	Assist farmers with design and installation of BMPs	30-75% cost-share depending on practice*	\$420,000 for agricultural and urban-suburban BMPs (FY2015)	65 applications, including 48 applications for 6,343 (FY2014) ⁹	Approx. \$507,000 (FY2014) ⁹
Kent Conservation District Cost-Share Program	Kent Conservation District	Assist farmers with design and installation of BMPs	25-75% cost-share depending on practice*	\$450,000 (2015)	22,321 acres of cover crops, 3,050 feet of open ditching, 1,682 feet of field drainage tiling, 18	\$450,000 (2014)

⁶ http://dda.delaware.gov/nutrients/nm_reloc.shtml

⁷ <http://www.dnrec.delaware.gov/fab/Pages/Poultry-Loan-Program.aspx>

⁸ <http://www.dnrec.delaware.gov/fab/Pages/Dairy-Loan-Program.aspx>

⁹ <http://www.newcastleconservationdistrict.org/News/2014%20Annual%20Report.pdf>

Program	Resp. Agency	Description	Program Capacity (Year)		Disbursements (Year)	
			Per farm (\$)	Total (\$)	Farms (#)	Total (\$)
					poultry heavy use area protection, and \$61,050 for large animal mortality disposal (2014)	
Sussex Conservation District Cost-Share Program	Sussex Conservation District	Assist farmers with design and installation of BMPs	50-75% cost-share depending on practice*	\$1,182,268 for cover crops (FY2015)	30,095 acres of cover crops, 201 large animal mortality disposals, 4 vegetative shoreline stabilization project	\$1,090,379 including \$1,032,483 for cover crops (2014)

*DCIW, 2012

**DNMC, 2015

Following are brief descriptions of the roles and responsibilities of DNREC and DDA with respect to animal agriculture in Delaware.

4.2 Delaware Department of Natural Resources and Environmental Control

DNREC’s mission is “to ensure the wise management, conservation, and enhancement of the State’s natural resources, protect public health and the environment, provide quality outdoor recreation, improve the quality of life and educate the public on historic, cultural, and natural resource use, requirements and issues.”¹⁰

Specific to animal agriculture, DNREC administers the NPDES CAFO Program jointly with DDA. EPA delegated the authority to DNREC to administer the federal NPDES program. In 2010, DNREC and DDA signed a Memorandum of Agreement (MOA) setting forth provisions by which DDA is to manage many components of the NPDES CAFO Program under the supervision of DNREC (DCIW, 2012). DNREC retains supervision and enforcement authority, jointly promulgates CAFO regulations with DDA, issues NPDES permits, and is EPA’s primary point of contact regarding the State’s NPDES permit program (DCIW, 2012). In FY2013, DNREC had a budget of \$75,000 and approximately 1 FTE for the NPDES CAFO Program activities (State of Delaware, 2014).

4.3 Delaware Department of Agriculture

DDA’s mission is “to sustain and promote the viability of food, fiber, and agricultural industries in Delaware through quality services that protect and enhance the environment, health, and welfare of the general public.”¹¹

¹⁰ <http://www.dnrec.delaware.gov/Info/Documents/Department%20Vision%20Mission%20Values%2010-09.pdf>

¹¹ <http://dda.delaware.gov/mission.shtml>

Specific to animal agriculture, DDA administers the NPDES CAFO Program jointly with DNREC. In 2010, DNREC and DDA signed an MOA under which DDA is to manage many components of the NPDES CAFO Program under the supervision of DNREC (DCIW, 2012). In accordance with the MOA, DDA is the initial point of contact for the regulated community, reviews and makes the initial determinations about the need for NPDES permit coverage, performs most inspections and enforcement actions, and reviews and makes determinations as to whether the NMP is adequate/in compliance with requirements (DCIW, 2012). In FY2013, DDA had a budget of \$70,326 and approximately 1.375 FTE for the NPDES CAFO Program activities (State of Delaware, 2014).

Specific to animal agriculture, DDA also administers and oversees the Nutrient Management Program. In FY2013, DDA had a budget of \$103,335 and approximately 1.625 for the Nutrient Management Program activities (State of Delaware, 2014).

In FY2013, DDA also had a budget of \$354,249 to administer the Nutrient Relocation Program.

4.4 Delaware Nutrient Management Commission

The Delaware Nutrient Management Commission (DNMC) was established in 1999 as a result of the Delaware Nutrient Management Law, which also established the Nutrient Management Program. The DNMC is organized within DDA. The DNMC consists of 15 voting members and 4 ex officio members. The 15 voting members include 1 DNREC representative, 7 full-time farmers, 1 commercial/agricultural applicator, 1 nutrient consultant, 1 member of the commercial nursery industry, 1 golf/lawn care industry representative, 2 members from community-based environmental advocacy groups, and 1 public citizen (3 *Del. C.* §2222.a and 3 *Del. C.* §2222.b). The 4 ex officio members include the Secretary of DDA, the Secretary of DNREC, and the Secretary of the Department of Health and Social Services (DHSS), or their respective designees, and the Nutrient Management Program Administrator (3 *Del. C.* §2222.l). The DNMC was established with the power “to develop, review, approve and enforce regulations governing the certification of individuals engaged in the business of land application of nutrients and the development of NMPs” (3 *Del. C.* §2220).

Specific to animal agriculture, the DNMC directs the Nutrient Management Program and develops regulations pertaining to nutrient management, waste management for animal feeding operations (AFOs), and NPDES permits for CAFOs.¹² The DNMC can issue fines and penalties for noncompliance with the Nutrient Management Law (DCIW, 2010). The DNMC administers the nutrient management training, education and certification program (DCIW, 2012). The DNMC also serves an advisory role for the NPDES CAFO Program (DCIW, 2010).

¹² http://dda.delaware.gov/nutrients/nutrient_management.shtml

5.0 Delaware and the Chesapeake Bay TMDL

On December 29, 2010, the EPA established the [Chesapeake Bay 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 (EPA, 2010). Delaware contributes drainage to 11 of the 92 tidal segments within the Chesapeake Bay watershed, including numerous impaired streams that do not meet Delaware’s Water Quality Standards for dissolved oxygen or do not meet target concentrations for nitrogen or phosphorus (DCIW, 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).

Delaware and the other Chesapeake Bay jurisdictions¹³ developed 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](#) (CBP) (a regional partnership that includes EPA and Delaware) estimated that Delaware was the source of 2% of the nitrogen, 2% of the phosphorus and 1% of the sediment load delivered to the tidal Chesapeake Bay waters (EPA, 2010). To meet its overall TMDL allocations, Delaware has committed to achieving approximately 94% of its necessary nutrient and sediment reductions from the agricultural sector. Controlling the agricultural load is not only essential to achieving Delaware’s portion of the Chesapeake Bay TMDL, but it is essential for the overall

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

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	3,449,000	3,518,000	3,084,000	3,241,000	2,810,000	2,384,000	31%
Phosphorus	311,000	316,000	232,000	261,000	268,000	239,000	23%
Sediment	63,945,000	57,551,000	51,478,000	49,987,000	64,744,000	65,276,000	0%

Delaware submitted its Chesapeake Bay TMDL Phase I WIP on November 29, 2010 (DCIW, 2010) and Phase II WIP on March 30, 2012 (DCIW, 2012). Specific to agriculture (including animal agriculture), agricultural pollutant reduction targets were set at levels achievable through significantly expanded implementation of BMPs such as: animal waste management systems; barnyard runoff control; and vegetated buffers. In particular, Delaware plans to achieve these levels of BMP implementation through effective funding and implementation of its regulatory programs, increased voluntary BMP implementation through increased funding of cost-share programs, and improved tracking of both mandated and voluntary BMPs.

Delaware anticipates that the strategies outlined in the Phase I WIP and the Phase II WIP, particularly increased funding of cost-share programs combined with a continued commitment to the State’s Nutrient Management Program and NPDES CAFO Program, will contribute to meeting the TMDL. Delaware plans to meet its animal agriculture nutrient and sediment reduction goals through a combination of regulatory and voluntary programs.

Delaware 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
- NPDES CAFO Program

Delaware uses the following voluntary programs to encourage voluntary BMP implementation and to help further reduce nutrient and sediment loads to the Chesapeake Bay.

- Nutrient Management Planning Program
- Nutrient Relocation Program
- State Revolving Fund (SRF) Agricultural Nonpoint Source Loan Program (AgNPSLP)
- New Castle Conservation District Cost-Share Program
- Kent Conservation District Cost-Share Program
- Sussex Conservation District Cost-Share Program
- Manure Matching Program

Delaware, in its Phase II WIP, has identified the following contingency actions that may need to be taken in the agricultural sector in the event that WIP reduction goals are not achieved:

- Review and evaluate the pace and progress of BMP implementation by the agriculture sector and enact new policy measures and explore mandatory BMP compliance options in a timely manner to ensure that water quality commitments will be met.

- Consult with the University of Delaware, other academic institutions, DDA, USDA and DNREC to examine the possibility and implications of prohibiting manure-source phosphorus application on high phosphorus soils.
- Review Delaware’s CAFO program for gaps.
- Increase its educational efforts for voluntary programs.

Along with the WIPs, each of the jurisdictions established two-year programmatic milestones to further outline the detailed steps to achieve 60 percent 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 CBP, a regional partnership that includes EPA and Delaware, leads and directs Chesapeake Bay restoration and protection activities, and 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.¹⁴ Model output is used to track progress toward each jurisdiction’s 2017 and 2025 WIP implementation goals.¹⁵

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, Delaware nearly achieved its 2013 milestone target for nitrogen. Delaware did not achieve its 2013 milestone targets for phosphorus and sediment, although Delaware has already met its 2025 WIP sediment target.¹⁶

The CBP collects data from the Chesapeake Bay jurisdictions, including Delaware, 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.¹⁷

¹⁴ 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>).

¹⁵ <http://www.chesapeakebay.net/about/programs/modeling>

¹⁶ <http://www.epa.gov/reg3wapd/tmdl/2014Evaluations/DE.pdf>

¹⁷ <http://www.chesapeakebay.net/about/programs/modeling>

In evaluating whether the State’s animal agriculture programs are aligned with meeting the Chesapeake Bay TMDL, EPA focused its assessment on five EPA-selected “priority BMPs”: nutrient management, animal waste management systems, conservation plans, barnyard runoff control systems, and mortality composting.¹⁸ EPA chose to focus on these practices because they are related to animal agriculture and represent the BMPs that Delaware 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. Delaware is relying on these five practices for reducing its nitrogen loads from all sectors by approximately 21.2%, reducing its phosphorus loads from all sectors by approximately 38.4%, and reducing its sediment loads from all sectors by approximately 14.4% (Table 9). Delaware is relying on these five practices for reducing its agricultural nitrogen loads by approximately 22.5%, reducing its agricultural phosphorus loads by approximately 39.0%, and reducing its agricultural sediment loads by approximately 16.2%. These practices are also the focus of many of Delaware’s plans for ramping up animal agricultural programs. This assessment report evaluates how Delaware’s regulatory and non-regulatory programs require or facilitate implementation of these five priority BMPs.

Table 9. Delaware Total Load Reductions Resulting from Priority BMPs.

Priority BMP	Nitrogen	Phosphorus	Sediment
Nutrient management	5.0%	6.8%	7.6%
Animal waste management systems	10.2%	23.7%	0.0%
Conservation plans	3.9%	4.0%	6.8%
Barnyard runoff control systems	1.4%	2.2%	0.0%
Mortality composting	0.7%	1.7%	0.0%
Total	21.2%	38.4%	14.4%

¹⁸ <http://www.casttool.org/Documentation.aspx>

6.0 Delaware’s Animal Agriculture WIP BMPs

Delaware 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 Delaware’s programs along with an estimated number of animal operations subject to each program.

Table 10. Delaware Programs Contributing to Implementation of Priority BMPs.

Priority BMP	NMP Program	NPDES CAFO Program
Lead Agency	DDA	DNREC and DDA
Estimated Facility Universe	1,072 AFOs & crop land farm operations	1
Nutrient Management	Required	Required
Animal Waste Management Systems	Required for AFOs; Not applicable for crop land farm operations	Required
Conservation Plans		
Barnyard Runoff Control		Required
Mortality Composting		May be required

NMPs are required for all facilities that are and will be covered by an NPDES CAFO permit, for all AFOs with greater than eight animal units (AUs), and for any person who manages more than 10 acres of land on which nutrients are applied.

Animal waste management systems are required for all facilities that are and will be covered by an NPDES CAFO permit and for all non-permitted AFOs. These animal waste management systems may or may not include a waste management structure. Delaware’s SRF Agricultural Nonpoint Source Loan Program (AgNPSLP) Poultry Loan Program provides low-interest loans to help poultry farmers implement BMPs to manage poultry manure, mortalities, and other sources of poultry-related pollution at their operations, including construction of poultry manure storage structures.¹⁹ Delaware’s SRF Agricultural Nonpoint Source Loan Program (AgNPSLP) Dairy Loan Program provides to help dairy farmers implement BMPs to manage dairy and milking parlor waste and manure at their operations, including construction of waste management systems, manure storage and transfer equipment, and irrigation equipment for spray irrigating dairy wastes.²⁰

Conservation plans are not required by any Delaware regulatory programs. Farmers that voluntarily participate in USDA’s Environmental Quality Incentives Program (EQIP) and Conservation Reserve Enhancement Program (CREP) must have an NRCS-approved conservation plan. Other farmers may voluntarily implement conservation plans.

Barnyard runoff control is required at all facilities that are and will be covered by an NPDES CAFO permit. The type of barnyard runoff control that is required depends on the site-specific characteristics of the facility. Other farmers may voluntarily implement barnyard runoff control practices.

Mortality composting may or may not be required at facilities that will be covered by an NPDES CAFO permit. NPDES CAFO permits require the implementation of an NMP that identifies how the operation

¹⁹ <http://www.dnrec.delaware.gov/fab/Pages/Poultry-Loan-Program.aspx>

²⁰ <http://www.dnrec.delaware.gov/fab/Pages/Dairy-Loan-Program.aspx>

is handling mortalities, but the operation can choose whether to handle mortalities using mortality composting or another method, such as incineration or off-site rendering. Other farmers may voluntarily implement mortality composting. The Agricultural Nonpoint Source Loan Program (AgNPSLP) Poultry Loan Program provides low-interest loans to help poultry farmers implement BMPs to manage poultry manure, mortalities, and other sources of poultry-related pollution at their operations.²¹ Loans can be used for several BMPs, including construction of mortality composters and purchase of front-end loader or bucket attachment for use in mortality composting.²²

Table 11 summarizes Delaware’s progress toward meeting the 2025 implementation goals, as reported by Delaware 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. Delaware’s Progress Toward 2025 Priority BMP Implementation Goals

Priority BMP	Units	2009 Progress (% of 2025 Goal)		2014 Progress (% of 2025 Goal)		2025 Goal
		Units	%	Units	%	
Nutrient Management	acres	198,625	114%	163,004	93%	174,907
Animal Waste Management Systems	AUs	12,414	17%	30,105	41%	72,656
Conservation Plans	Acres	0	0%	198,328	102%	193,999
Barnyard Runoff Control	Acres	0	0%	190	105%	181
Mortality Composting	AUs	2,184	57%	3,325	87%	3,815

Increased implementation of agricultural BMPs is necessary to achieve the nutrient and sediment reductions in the WIP. For example, Delaware has placed particular emphasis on nutrient management planning by requiring NMPs for all AFOs with more than 8 animal units (AUs) and all farmers who apply nutrients to 10 acres or more. As a result, Delaware reports that approximately 93% (163,004 acres implemented out of goal of 174,907 acres) of the 2025 target for nutrient management was met in 2013. Delaware has also supported animal waste management systems and mortality composting through Delaware’s SRF Agricultural Nonpoint Source Loan Program (AgNPSLP). Delaware has also increased cost-share funding for cover crops, with the county conservation districts prioritizing funding of cover crops over all other practices. Among all agricultural BMPs, Delaware is relying on cover crops to reduce approximately 20.8% of the agricultural nitrogen loads.

Delaware’s NPDES CAFO and Nutrient Management programs help manage pollution from CAFOs as well as from all AFOs with more than eight animal units (AUs). Delaware’s Nutrient Management Program regulates approximately 1,072 AFOs and crop land farm operations in Delaware and requires two of the five priority BMPs (NMPs and animal waste management systems for AFOs). Delaware’s NPDES CAFO Program covers a subset of these 1,072 AFOs and crop land farm operations and requires an additional one or two priority BMPs (barnyard runoff control and possibly mortality composting) on top of the Nutrient Management Program requirements. One of these 1,072 AFOs and crop land farm operations is currently covered by an NPDES CAFO permit, and 439 of these 1,072 AFOs and crop land

²¹ <http://www.dnrec.delaware.gov/fab/Pages/Poultry-Loan-Program.aspx>

²² <http://www.dnrec.delaware.gov/fab/Pages/Poultry-Loan-Program.aspx>

farm operations have submitted NPDES CAFO permit applications and are awaiting permit coverage. While Delaware's Nutrient Management Program covers approximately 1,072 AFOs and crop land farm operations in Delaware (representing approximately 57% to 68% of the farms that meet the USDA definition of a farm in Delaware over 10 acres or with more than \$10,000 in sales, respectively), Delaware's Nutrient Management Program only requires two of the five priority BMPs.

It is also critical to ensure that farmers are complying with their NMPs, including the nutrient application recommendations and additional BMPs. Farmers do not need to submit NMPs to DDA for review but are required to maintain their NMPs on site and make them available to DDA during nutrient management compliance visits. In 2013, DDA conducted nutrient management compliance visits at 85 out of the 1,072 regulated AFOs (including CAFOs) and crop land farm operations in Delaware (approximately 8%). During the nutrient management compliance visit, DDA determines whether the farmer's NMP contains the information required under Delaware's Nutrient Management Program. DDA also determines whether the farmer has current nutrient management certification, has an up-to-date manure analysis, and has the required records of land application and manure export. According to DDA, DDA also determines whether or not the farmer is complying with the requirements in the NMP by inspecting the farmer's records of implementation.

Delaware is relying on BMPs outside of those required under regulatory programs in order to meet the 2017 and 2025 WIP implementation goals. Delaware's voluntary programs are important in achieving Delaware's animal agriculture pollution reduction goals set forth in the WIP. For example, Delaware increased its cost-share rates for manure transport from \$0.16/ton-mile to \$0.18/ton-mile in order to incentivize participation in the program. Delaware has also increased cost-share funding for cover crops.

While Delaware's voluntary programs are important in achieving Delaware's animal agriculture pollution reduction goals set forth in the WIP, there is currently uncertainty if and how the voluntary programs will ensure these reductions are met. Kent Conservation District had a waiting list for its cost-share program for at least the past 7 years. Sussex Conservation District had a gap of nearly \$2.5 million between cost-share demand and availability (DCIW, 2012), and Sussex Conservation District is currently seeking cost-share funding from alternative sources to try to close a gap of \$1.5 million between needed cost-share funding and available cost-share funding (State of Delaware, 2015). While the farmer demand for BMPs seems to be high it is unclear whether Delaware will be able to adequately fund these practices.

Tracking priority BMP implementation is an additional challenge for Delaware. In Delaware's 2014-2015 WIP Programmatic Milestones, Delaware committed to "develop and implement a tracking and reporting system for agricultural non-cost shared BMPs" in 2015 (State of Delaware, 2015). In Delaware's 2014-2015 WIP Programmatic Milestones, Delaware also committed to develop a method to track and report both conservation tillage and cover crop implementation. Delaware developed and implemented a crop residue transect survey in 2014 to assess and document conservation tillage practices implemented on farms within the state. Delaware also developed and implemented a cover crop pilot transect survey to assess and document implementation of cover crops within the state.

Delaware will use these BMP tracking tools to document and report agricultural non-cost shared BMPs that farmers are implementing voluntarily.

In summary, Delaware's Nutrient Management Program regulates a large number of animal agriculture operations and requires nutrient management (and animal waste management systems for AFOs) at those operations. In addition to the requirements from the Nutrient Management Program, facilities regulated by Delaware's NPDES CAFO Program will also be required to implement additional BMPs such as barnyard runoff control and possibly mortality composting. Delaware has currently issued one individual NPDES CAFO permit (to an operation located outside of the Chesapeake Bay watershed) out of approximately 440 facilities state-wide that have applied for NPDES CAFO permits. Strong compliance assurance programs for the Delaware's Nutrient Management Program and NPDES CAFO Program are critical to ensure that appropriate BMPs are being implemented, including nutrient management planning. Because implementation of these two programs alone will not achieve Delaware's reduction goals, Delaware is also relying on voluntary programs to achieve other necessary reductions, such as the manure transport program and providing cost-share funding for BMPs such as cover crops.

In the event that Delaware is unable to keep up with or make progress toward meeting its agricultural implementation goals, Delaware may need to act on its commitment outlined in the WIP to enact new policy measures and explore mandatory BMP compliance options, as well as considering prohibiting manure-source phosphorus application on high phosphorus soils (DCIW, 2012).

6.1 Delaware's Animal Agriculture WIP BMPs – Observations

1. Delaware's regulatory programs require some but not all of the priority WIP BMPs. The NMP Program and the NPDES CAFO Program both require nutrient management and animal waste management systems for AFOs. The NPDES CAFO Program also requires barnyard runoff control and in some cases mortality composting.
2. Delaware is relying on both regulatory and voluntary programs in order to increase BMP implementation to meet Delaware's WIP goals.
3. Delaware's regulatory programs currently cover one CAFO under the NPDES CAFO Program and 1,072 AFOs (including CAFOs) and crop only farm operations under the Nutrient Management Program. All of the AFOs covered by these regulatory programs are required to implement two priority BMPs: nutrient management plans and animal waste management systems. The on permitted CAFO is also required to implement barnyard runoff control.
4. There is currently uncertainty if and how Delaware will achieve the projected reductions through the voluntary programs, particularly given the funding gaps that Delaware has identified between cost-share demand and availability.
5. Delaware is relying heavily on programs with voluntary participation, such as cost-share programs, and better data collection efforts in order to increase BMP implementation and account for conservation practices that are currently on the ground to meet Delaware's WIP goals. Tracking BMP implementation is an additional challenge for Delaware.
6. In the event that Delaware is unable to keep up with or make progress toward meeting its agricultural implementation goals, Delaware may need to act on its commitment outlined in the

WIP to enact new policy measures and explore mandatory BMP compliance options, as well as considering prohibiting manure-source phosphorus application on high phosphorus soils.

7.0 Nutrient Management Program

The goal of the Delaware Nutrient Management Program is to “manage those activities involving the generation and application of nutrients in order to help maintain and improve the quality of Delaware’s ground and surface waters and to help meet or exceed federally mandated water quality standards, in the interest of the overall public welfare.”²³ The Delaware Nutrient Management Program was established in June 1999 following enactment of the [Delaware Nutrient Management Law](#) (3 *Del. C.* §§ 2200-2290). The Delaware Nutrient Management Law establishes both a Nutrient Management Certification Program and a Nutrient Management Planning Program. In addition, the Delaware Nutrient Management Law established the Delaware Nutrient Management Commission (DNMC) to direct the Nutrient Management Program and develop regulations pertaining to nutrient management, waste management for AFOs and NPDES permits for CAFOs.²⁴

Nutrient Management Certification Program

The Nutrient Management Certification Program was established by the Delaware Nutrient Management Law (3 *Del. C.* §2241.b), and the DNMC administers the nutrient management certification program. Anyone who operates an AFO in excess of 8 AUs or applies nutrients to lands in excess of 10 acres, and anyone who advises or consults those individuals, must receive nutrient generator or nutrient handler certification from the DNMC. There are four levels of certification available: nutrient generator, private nutrient handler, commercial nutrient handler, and nutrient consultant (3 *Del. C.* §2241.b; 3 DE Admin. Code 1201). All NMPs in Delaware must be developed by a certified nutrient consultant (3 *Del. C.* §2202).

A nutrient generator is a person in Delaware who operates a facility within Delaware that produces organic or inorganic nutrients. A nutrient generator who owns or operates any AFO in excess of 8 AUs must have a nutrient generator certificate. To obtain a nutrient generator certificate, the applicant must complete at least six credit hours of educational course work as approved by the DNMC. To obtain a nutrient generator certificate, the applicant must complete at least six credits of DNMC-approved course work. Nutrient generator certificates are valid for three years. To maintain a nutrient generator certificate, the certificate holder must complete six credits of continuing education every three years (3 DE Admin. Code 1201).

A private nutrient handler is a person in Delaware who applies organic or inorganic nutrients to lands or waters he/she owns, leases, or otherwise controls. A private nutrient handler who, on an annual basis, applies nutrients to 10 acres or greater of land or waters owned, leased, or otherwise controlled by such handler must have a private nutrient handler certificate. To obtain a private nutrient handler certificate, the applicant must complete at least nine credits of DNMC-approved course work. Private nutrient handler certificates are valid for three years. To maintain a private nutrient handler certificate, the certificate holder must complete six credits of continuing education every three years (3 DE Admin. Code 1201).

²³ http://dda.delaware.gov/nutrients/nutrient_management.shtml

²⁴ http://dda.delaware.gov/nutrients/nutrient_management.shtml

A commercial nutrient handler is a person who applies organic or inorganic nutrients to lands or waters in Delaware as a component of a commercial or agricultural business in exchange for a fee or service charge. A commercial nutrient handler who, on an annual basis, applies nutrients to 10 acres or greater of land or waters of the state must have a commercial nutrient handler certificate. To obtain a commercial nutrient handler certificate, the applicant must complete at least 12 credits of DNMC-approved course work, pass a DNMC-approved written exam, and pay a \$150 certificate fee. Commercial nutrient handler certificates are valid for three years. To maintain a commercial nutrient handler certificate, the certificate holder must complete six credits of continuing education and pay a \$150 certificate fee every three years (3 DE Admin. Code 1201).

A nutrient consultant is a person who is engaged in the activities of advising or consulting with another person who is required to have a certificate regarding the formulation, application or scheduling of organic or inorganic nutrients within Delaware. A nutrient consultant who is engaged in the provision of nutrient management advice or the formulation of an NMP or in nutrient management planning as it relates to the application or disposal of nutrients at or from a specific site in Delaware must have a nutrient consultant certificate. To obtain a nutrient consultant certificate, the applicant must complete at least 12 credits of DNMC-approved course work, pass a DNMC-approved written exam, and pay an annual \$100 certificate fee. Nutrient consultant certificates are valid for one year. To maintain a nutrient consultant certificate, the certificate holder must complete five credits of continuing education and pay a \$100 certificate fee every year (3 DE Admin. Code 1201). All NMPs in Delaware must be developed by a certified nutrient consultant (3 *Del. C.* §2202).

As of 2013, Delaware had approximately 519 certified nutrient generators, 1,136 certified private nutrient handlers, 74 certified commercial nutrient handlers, and 113 certified nutrient consultants (DNMC, 2014).

Nutrient Management Planning Program

Delaware's Nutrient Management Law requires all AFOs with greater than eight animal units (AUs) or any person who applies nutrients to more than 10 acres under their control to develop and implement an NMP (3 *Del. C.* §2247.a). All NMPs must be developed by a certified nutrient consultant, and all NMPs must include the minimum components listed below:

1. Field maps showing reference points (such as buildings, stream, irrigation equipment, etc.), number of acres and soil types
2. Soil and organic waste analyses;
3. Current and planned crop rotations;
4. Expected yields based on the best 4 out of 7 years of data or, in the absence thereof, soil productivity charts; and
5. Recommended rates, timing and methods of nutrient applications.²⁵

All NMPs must specify the level of nutrient applications that are needed to attain expected crop yields (3 *Del. C.* § 2247.b). Applications of phosphorus to high phosphorous soils cannot exceed a 3-year crop

²⁵ [3 *Del. C.* §2247.a](#)

removal rate, and nitrogen applications cannot exceed the recommended application rate for expected yield (3 *Del. C.* § 2247.b).

An animal waste management plan (AWMP) can be substituted for an NMP for AFOs where no other nutrients are used for farming and the animal waste is not land applied (3 *Del. C.* § 2247.i). For example, an AWMP can be substituted for a poultry farm that exports all of its litter to another farmer. The AWMP must include, at minimum, information concerning how the waste is stored prior to transport; records of where and to whom the animal waste was transported and the amount of waste transported; and the mortality disposal method (3 *Del. C.* § 2247.i).

The Nutrient Management Law requires Delaware to make nutrient consultants available through the conservation districts to provide free NMPs to anyone requesting assistance, or to reimburse at a determined rate anyone who chooses to hire a private nutrient consultant to develop an NMP (3 *Del. C.* §2247.j).

Once an NMP is completed and implemented, the facility owner/operator or nutrient management planner must notify the DNMC within 60 days of completing the NMP (3 *Del. C.* §2247.g). However, NMPs do not need to be submitted to the DNMC for approval. NMPs must be maintained on-site and must be made available for inspection by DDA and DNMC (3 *Del. C.* §2247.c). Records of NMP implementation must also be maintained on site and include:

1. Soil test results and recommended nutrient application rates;
2. Quantities, analyses and sources of nutrients applied;
3. Dates and methods of nutrient applications;
4. Crops planted, yields and crop residues removed; and
5. Certification statement signed by the operator to document the intention of NMP and/or AWMP implementation.²⁶

Each person who is required to implement an NMP (or AWMP) must submit an annual report to the DNMC by March 1 of every calendar year, on a form developed and supplied by the DNMC.²⁷ The report details nutrient handling activities that occurred during the previous calendar year, including at a minimum:

1. The amount of animal waste applied to the land and the area of land to which it was applied;
2. The amount of animal waste transferred for alternative uses (if applicable); and
3. The amount of inorganic fertilizer applied to the land.

All NMPs must be updated at least every three years, or after significant changes to the facility operations or a 25% or greater increase in facility operations (3 *Del. C.* §2247.d). Updated NMPs must be reported to the DNMC no later than December 15 of the year in which it must be updated (3 *Del. C.* §2247.d). NMPs can be written as either one-year plans or three-year plans. Approximately 74% of NMPs in Delaware are one-year plans, and approximately 26% of NMPs are three-year plans (DNMC, 2014). The 30 files reviewed by EPA contained three one-year plans, 20 three-year plans, and ten five-year plans. DDA stated that five-year AWMPs were developed to match the five-year CAFO NPDES

²⁶ [3 *Del. C.* §2247.c](#)

²⁷ [3 *Del. C.* §2290.b.1](#)

permit cycle. AFOs with AWMPs regulated under Delaware Nutrient Management Law do not have an expiration date, which is satisfactory under the Nutrient Management Program as long as they are following the provisions found in 3 *Del. C.* §2247.i. However, an NPDES-permitted CAFO must have their AWMP written by a Delaware certified nutrient consultant. DDA decided that since a non-land applying permitted CAFO must have their AWMP written by a Delaware certified nutrient consultant, the lifecycle of the AWMP should match the five-year lifecycle of the CAFO NPDES permit.

EPA periodically compares state technical standards against agency expectations. The 2012 EPA review determined that most aspects of Delaware's Technical Standards are consistent with EPA's effluent limitation guidelines but that some portions are inconsistent.²⁸

Through the Nutrient Management Program, DDA provides financial reimbursement to farmers for the writing of NMPs. In 2013, DDA paid reimbursements to 153 farms representing 102,915 acres (DNMC, 2014). During 2013, the total acreage covered by nutrient management planning reimbursements (including 3-year NMPs that were approved during 2011 and 2012) was 291,851 acres (DNMC, 2014).

7.1 Facility Universe

Delaware's Nutrient Management Program is broad in coverage, requiring NMPs for all AFOs with greater than eight animal units (AUs) and for any farmer who applies nutrients to more than 10 acres under their control.

Currently, there are approximately 1,072 AFOs and crop land farm operations in Delaware regulated by the Delaware Nutrient Management Law. In 2014, DDA mailed out 1,341 annual reports, of which 1,072 were sent to AFOs and crop land farm operations and 269 were sent to non-AFOs and non-crop land farm operations [44 golf courses, 137 nutrient management consultants, 88 commercial nutrient handlers (turf & ornamental)]. In 2013, a total of 291,851 acres were covered by NMP reimbursement in 2013 (DNMC, 2014).

Currently, there are approximately 1,072 AFOs and crop land farm operations in Delaware regulated by the Delaware Nutrient Management Law, which represents approximately 44% of total farms in Delaware (1,072 out of 2,451 total farms) based on the 2012 USDA Ag Census. However, the USDA Ag Census definition of a farm²⁹ is different than what the Delaware Nutrient Management Law regulates as a farm, and not all farms in Delaware are regulated by the Delaware Nutrient Management Law, only those AFOs with greater than 8 AUs and those farms that apply nutrients to more than 10 acres. Delaware estimates that the Delaware Nutrient Management Law currently regulates approximately 57 to 68% of farms in Delaware. According to the [2013-2014 Delaware Agricultural Statistics Bulletin](#), Delaware has 2,546 total farms, including 651 farms that are less than 10 acres in size. These 651 farms would not be regulated by the Delaware Nutrient Management Law for applying nutrients to more than 10 acres under their control (although some may be regulated for being an AFO with greater than eight AUs). Assuming these 651 farms are not AFOs with greater than 8 AUs and therefore are not regulated, the Delaware Nutrient Management Law regulates approximately 57% of

²⁸ Additional information available upon request.

²⁹ The USDA definition of a farm is "any place that produced and sold, or normally would have sold, \$1,000 or more of agricultural products during the Census year." (http://www.agcensus.usda.gov/Help/FAQs/General_FAQs/)

farms in Delaware (1,072 out of 1,895 farms greater than 10 acres in size). Alternatively, according to the [2013-2014 Delaware Agricultural Statistics Bulletin](#), Delaware has 867 farms that generate less than \$10,000 of agricultural sales annually. DDA estimates that these farms are more than likely less than 10 acres in size and not required to be regulated by the Delaware Nutrient Management Law. Assuming these 867 farms are not regulated, the Delaware Nutrient Management Law regulates approximately 68% of farms in Delaware (1,072 out of 1,584 farms that generate more than \$10,000 of agricultural sales annually). Therefore, the Delaware Nutrient Management Law regulates approximately 1,072 AFOs and crop land farm operations in Delaware, representing approximately 57% to 68% of the farms that meet the USDA definition of a farm in Delaware over 10 acres or with more than \$10,000 in sales, respectively.

In 2013, the Delaware Nutrient Management Commission reported that 100% of cropland and nutrient-applied acres were managed under a current NMP developed by a certified consultant (DNMC, 2014). In 2013-2014, DDA conducted nutrient management compliance visits in an entire watershed in Sussex County. DDA conducted nutrient management compliance visits at the 16 farm operations that till ground within the watershed (DNMC, 2014). According to DDA, 100% of the farmers tilling ground within the boundaries of the watershed had a current NMP implemented.

Delaware states that all farms requiring an NMP have one (DCIW, 2010). DDA contacted all eligible farms between 2003 and 2007 to verify the presence of an NMP (State of Delaware, 2014). As a result, DDA states that all farms required to have an NMP or AWMP do have one (State of Delaware, 2014). At that time, DDA did not review the NMPs to determine whether or not the NMPs met Delaware's nutrient management standards or whether the farmers were complying with their NMPs. DDA conducts nutrient management compliance visits in order to determine whether the farmer's NMP contains the information required under Delaware's Nutrient Management Program.

For the files for the three mixed livestock operations (two poultry/dairy operations and one pullet/dairy operation), one of the three files contained an NMP covering both livestock types while the other two files contained NMPs that only covered one livestock type. According to Delaware's CAFO regulations, once an AFO is defined as a CAFO for one type of animal, the NPDES requirements for CAFOs apply to all confined animals at the operation and all manure, litter and process wastewater generated by those animals (7 *Del. Admin. C.* §7201, Section 9.5.1.3). Therefore, the NMP for these three mixed livestock operations will need to cover all confined livestock types for the facility as part of the facility's CAFO permit requirements.

7.2 Resources Allocated

In FY2013, DDA had a budget of \$103,335 and approximately 1.625 FTE for the Nutrient Management Program activities (State of Delaware, 2014).

7.3 Data Systems

DDA uses a Microsoft Access database that is Excel-linked to track and manage facility information. The Delaware Department of Agriculture's Nutrient Management Program maintains a Nutrient Management Plan cost share database that includes but is not limited to the following information: farmer name, address, consultant name, acres submitted for cost share application, acres approved for

cost share payment, and the total amount of the claim paid by the department. The information is entered as needed, and reports are generated to provide cost share information for NMPs (State of Delaware, 2014).

7.4 Compliance and Enforcement

DDA is responsible for performing all Nutrient Management Program compliance activities, including inspections of AFOs and CAFOs to ensure that farms are operating in compliance with their NMPs.

The Delaware Nutrient Management Law establishes the enforcement authority for the Nutrient Management Program. Anyone can file a complaint with the DNMC regarding an alleged violation of the Nutrient Management Law (3 DE Admin. Code 1202). The Nutrient Management Program Administrator will conduct an investigation to determine if the complaint has merit and whether there is a possible means of resolving it. If the Nutrient Management Program Administrator determines that the complaint may be founded, the alleged violator shall be informed of the complaint and provided an opportunity to respond. The Nutrient Management Program Administrator prepares a report and presents it to the DNMC with the findings and recommendations. If a resolution has been tentatively agreed to by the alleged violator, the DNMC can authorize approval of the resolution, pursue an alternate resolution, or hold a hearing on the complaint. A hearing will be held on any complaint if requested by an interested party or determined by the DNMC. At the hearing, the DNMC will make a decision regarding whether a violation occurred, what actions the violator has taken or must take, any fine the violator must pay, and any revocation, suspension or modification to the violator's nutrient management certificate. (3 *Del. C.* §2261; 3 DE Admin. Code 1202).

DDA is authorized to seek civil penalties of not less than \$25 and not more than \$1,000 for each violation, with each day of continued violation considered a separate violation up to a limit of \$10,000 (3 *Del. C.* §2280.a.1). The DNMC can also recommend that DDA impose an administrative penalty of not more than \$1,000 for each violation (3 *Del. C.* §2280.a.2). Prior to assessing an administrative penalty, DDA must provide written notice of the proposed penalty to the violator, providing the violator 30 days to request a public hearing on the matter (3 *Del. C.* §2280.a.2).

DDA is responsible for several types of compliance activities at animal agriculture operations: complaint-based compliance audits and nutrient management compliance visits.

Complaint-based compliance audits

DDA conducts complaint-based compliance audits as needed when complaints are received (State of Delaware, 2014). In 2013, DDA received and resolved 20 public complaints relating to manure management, fertilizer management, mortality management, and odor (DNMC, 2014). DDA reported that 90% (18 out of 20) of the complaints were at livestock operations: 16 poultry operations, one swine operation, and one equine operation. None of the complaints resulted in a corrective order or civil penalty (State of Delaware, 2014). The annual report did not provide additional information on whether the complaints were founded or what management practices were implemented to resolve the issues (DNMC, 2014). DDA stated that complaint resolutions are resolved by outreach and education efforts to the affected parties which are implemented by Nutrient Management Program staff.

Only one of the files reviewed by EPA included a complaint-based compliance audit. DDA received several complaints regarding this facility, including one complaint in May 2008 regarding odors and two complaints in December 2008 regarding improper land application of manure. DDA investigated these complaints and determined that the farm only had five to seven weeks of storage and did not have adequate storage, which NRCS defines as three to four months of storage. DDA determined that the farm was “spreading manure at 2-3 week intervals as a waste rather than at agronomic rates” and was not complying with the farm’s NMP, which had been paid for by DDA cost-share. In January 2009, DDA recommended to the DNMC that “the complaint be dismissed and a resolution be discussed, which addresses adequate storage for liquid manure handling systems and a winter application best management practice.” In February 2009, the farmer refused to obtain an NPDES CAFO permit or to increase manure storage capacity. In March 2009, the farmer finally applied for and received coverage under Delaware’s NPDES CAFO General Permit, which requires adequate manure storage. However, in April 2009, the farmer again refused to increase the farm’s manure storage capacity. In June 2009, DDA conducted a follow-up visit to discuss farm options. In September 2009, DDA approved the farm’s proposal to reduce the number of livestock on the farm in order to achieve adequate storage by May 2010. As of February 2010, the farm still lacked adequate capacity. The only document in the files after February 2010 is a DDA Nutrient Management Evaluation Report dated April 2011 that found the farm’s NMP (which had been effective since February 2009) was inadequate. DDA’s file did not contain any documentation showing that the farm ever came back into compliance and achieved adequate capacity. Despite the farm’s noncompliance with its NMP, noncompliance with its NPDES CAFO permit for adequate capacity, and at least three complaints, DDA never took a formal enforcement action.

Nutrient Management Compliance Visits

DDA reports 100 percent compliance with Delaware’s Nutrient Management Law (State of Delaware, 2014), meaning that 100% of acres that are required to develop and implement an NMP are doing so. While NMPs do not need to be submitted to DDA for approval, they do need to be maintained on-site and made available for inspection by DDA and DNMC (3 *Del. C.* §2247.c).

Since NMPs are not submitted to DDA for review, DDA determines NMP compliance by conducting nutrient management farm visits. DDA currently commits to inspecting, at a minimum, 82 AFOs (including CAFOs) and crop land farm operations per year for compliance with the Delaware Nutrient Management Law and regulations. At a minimum, 46 of these inspections must be non-CAFO operations. These minimum number of inspections are established by the Nutrient Management Program Administrator based on a minimum number of inspections per staff member per fiscal year. In 2013, the DDA conducted nutrient management compliance visits at 85 out of the 1,072 regulated AFOs (including CAFOs) and crop land farm operations in Delaware (approximately 8%).

For the 30 CAFO files reviewed by EPA, 22 files (approximately 73%) contained a nutrient management compliance visit and eight files (approximately 27%) did not contain a nutrient management compliance visit. All 22 files with a nutrient management compliance visit had a nutrient management compliance visit conducted in 2011, including 18 nutrient management compliance visits from a single month (April 2011) and six nutrient management compliance visits from a single day (April 19, 2011). Seven of the 22

files contained multiple nutrient management compliance visits after 2011, including two in 2012 and five in 2014.

In the nutrient management compliance visit, DDA determines whether the farmer's NMP contains the information required under Delaware's Nutrient Management Program. DDA also determines whether the farmer has current nutrient management certification, has an up-to-date manure analysis, and has the required records of land application and manure export. According to DDA, DDA also determines whether or not the farmer is complying with the requirements in the NMP by inspecting the farmer's records of implementation. For example, a spot check of farmer nutrient application rates and amounts applied is conducted for crop land farms to determine compliance with the recommendations outlined in the NMP. Upon inspecting those documents, DDA determines whether the farmer complied with the requirements of the NMP or not. For the 30 files reviewed by EPA, DDA determined that "Utilization of Nutrient Management Plan," (i.e. compliance with the NMP) was adequate at eight out of the 30 nutrient management compliance visits (approximately 27%), while DDA did not make a determination at the remaining 22 out of the 30 nutrient management compliance visits (approximately 73%).

Based on EPA's file review, only one facility was issued a formal enforcement action, which was a single Notice of Conciliation and Secretary's Order. In FY2013, DDA did not issue any enforcement actions related to NMP noncompliance.

Annual Reports

The Delaware Nutrient Management Law, which was enacted in June 1999, requires everyone with an NMP or an AWMP to submit an annual report by March 1 detailing the amount of animal wastes applied to the land and the quantity of the land it was applied to, the amount of animal wastes transferred for alternative uses if applicable, and the amount of inorganic fertilizers applied to the land (3 *Del. C.* §2290.b.1). In 2013, DDA mailed out approximately 1,451 annual report forms to agricultural, golf course and lawn care operations throughout Delaware (DNMC, 2014), including 1,072 AFOs and crop land farm operations, and DDA received annual reports back from 696 AFOs and crop land farm operations (approximately 65%). Of the reported plans, 237 plans were crop production only, 301 were animal production only, and 133 were combined animal and crop production operations.

DDA stated that these numbers do not reflect the total number of NMPs and AWMPs in the state. Delaware has a database that manages mailings and submissions of annual reports, among other items. This database was developed at the inception of the Nutrient Management Program in 1999. Delaware has recognized many glitches in its current database which does not allow them to track and report accurately. For example, the database currently tracks certified users instead of farm operations. In many cases, more than one person is certified for one particular farming operation that is required to only report on one form. For instance, the database will mail out two annual reports to a husband and a wife who are both certified for the same farming operation, but only one report will be turned into the Nutrient Management Program and therefore skew the statistics. For that reason, DDA believes its annual reporting compliance rate is higher than the 65% compliance rate represented in this data.

The 30 CAFO files reviewed by EPA contained a total of 46 nutrient management annual reports. The 2013 annual reports submitted by March 1, 2014 were still being entered into the DDA database and

were not filed into the CAFO NPDES files until after EPA's file reviews occurred in June 2014. DDA reviewed the files after this time and reported that DDA received a total of 72 nutrient management annual reports from these 30 CAFOs (Table 12).

Table 12. Nutrient Management Annual Reports in 30 CAFO files and database from DDA, 2011-2014.

File #	Animal Type	Acres in NMP	2011	2012	2013	2014	NMP Expiration Date	Nutrient Management Compliance Visit Date
File 1	Poultry	190	8/9/2012	5/17/2013	3/5/2014	3/9/2015	6/28/2017	8/7/2012
File 2	Poultry	0	6/20/2012		6/26/2014	3/31/2015	11/15/2018	6/30/2014
File 3	Poultry	0	3/22/2012	5/21/2013	2/17/2014	3/31/2015	12/28/2016	11/3/2014
File 4	Poultry	0	2/6/2012	5/17/2013				
File 5	Poultry	0		5/2/2013	4/3/2014		9/6/2014	6/21/2012
File 6	Poultry	86	1/24/2012	5/17/2013	2/27/2014		4/16/2015	
File 7	Poultry	0	5/16/2012	5/26/2013	2/26/2014	3/24/2015	6/1/2014	3/10/2015
File 8	Poultry	0	3/6/2012	7/23/2013		3/10/2015	9/23/2016	7/3/2014
File 9	Poultry	0	5/15/2012	6/10/2013	9/11/2014		10/31/2013	9/5/2014
File 10	Poultry	0	7/9/2012	4/23/2013			6/10/2014	6/23/2014
File 11	Pullets/Dairy	2000		5/7/2013	2/27/2014	3/4/2015		2/23/2012
File 12	Poultry/Dairy	0	5/16/2012	6/30/2013	6/5/2014	4/20/2015	8/26/2013	
File 13	Poultry	0		5/17/2013			1/9/2017	2/8/2013
File 14	Poultry	0		4/30/2013	3/13/2014	3/9/2015	10/31/2016	4/12/2012
File 15	Poultry	0	8/30/2012	7/3/2013	2/25/2014		7/1/2017	8/14/2012
File 16	Poultry	0		5/15/2013			1/31/2017	10/16/2012
File 17	Poultry	0					8/31/2013	9/9/2014
File 18	Poultry	0	5/16/2012	5/30/2013	3/4/2014	3/9/2015	12/16/2013	9/24/2014
File 19	Poultry	0		4/23/2013	2/12/2014		1/3/2018	12/19/2012
File 20	Poultry	0	5/16/2012	6/12/2013		3/31/2015	10/31/2016	3/31/2015
File 21	Poultry	0						
File 22	Poultry	450						1/23/2012
File 23	Poultry	0	5/15/2012				6/2/2013	1/21/2012
File 24	Dairy/Poultry	710	5/16/2012	5/20/2013	2/25/2014	3/31/2015		
File 25	Poultry	0	1/19/2012	4/30/2013	2/27/2014	2/12/2015	2/15/2016	10/15/2014
File 26	Beef	2600				3/1/2015	2010	
File 27	Swine	700	5/16/2012					
File 28	Poultry	1850			2/5/2014		2/16/2012	2/20/2012
File 29	Poultry	0		5/20/2013		3/31/2015	4/8/2012	7/18/2012
File 30	Horse	0	3/29/2012	4/18/2013	3/12/2014	3/9/2015	7/3/2017	5/9/2012
All Farms (#/%)			18/30 (60%)	22/30 (73%)	17/30 (57%)	15/30 (50%)	24/30 (80%)	23/30 (77%)
Active Farms (#/%)			17/27 (63%)	21/27 (78%)	17/27 (63%)	15/27 (56%)	23/27 (85%)	22/27 (81%)
No-land-poultry Farms (#/%)			11/17 (65%)	15/17 (88%)	10/17 (59%)	9/17 (53%)	17/17 (100%)	17/17 (100%)
Permitted Farms (#/%)			1/1 (100%)	1/1 (100%)	1/1 (100%)	1/1 (100%)	1/1 (100%)	1/1 (100%)

*Rows highlighted in grey are the files representing the farms that were inactive at time of file review.

*Columns highlighted in light blue are dates annual reports were entered into Delaware's database.

DDA tracks annual reports in a web-based database developed in 1999 at the inception of Delaware's Nutrient Management Program. As per the database, a total of 18 nutrient management annual reports were submitted in 2011, 22 annual reports were submitted in 2012, 17 annual reports were submitted in 2013, and 15 annual reports were submitted in 2014. The annual report response rate for these 30 farms from 2011 to 2014 ranged from 50% to 73%. DDA stated that annual report response rates are important to Delaware because annual reporting is a requirement of the Nutrient Management Law, and the data provided in the reports informs Delaware of the nutrient handling activities occurring within the State and serves to direct the Nutrient Management Program. However, the annual report response rates do not reflect Delaware's goal of 100% compliance. DDA reported that, due to glitches and constraints within the current database, Delaware has not been able to track accurately the annual report response rate. For example, the current database tracks by certified users and not by farm. Farm names, farm owners and farm operators may change from year to year for the same physical farm. While the physical farm location does not change from year to year, Delaware currently does not track this aspect of each operation. Furthermore, DDA stated that if an annual report is not received by DDA, the database system automatically removes that user from the mailing list for the following year. Therefore, a farmer who fails to comply one year will no longer be monitored, tracked or reached out to by DDA. DDA stated that there are many other faults in the system which has affected Delaware's ability to accurately represent this data at this time, and Delaware is currently in the process of working with the state's Department of Technology and Information (DTI) on building a new database which will serve DDA's tracking and reporting needs more efficiently in the future. The new database will resolve the current issues related to annual reporting. The new database will also track compliance inspections.

It is unclear from the files what actions DDA takes for farmers that fail to submit an annual report to comply with the Nutrient Management Law. There were no documents in the files demonstrating that DDA had requested or required farmers to submit the missing annual reports. DDA stated that DDA mails a letter to all farms that did not submit an annual report approximately 30 days after the March 1st submission deadline. Of the annual reports in the 30 files reviewed by EPA, approximately 44% (32 out of 72 annual reports) were submitted after May 1st, approximately 60 days after the March 1st submission date.

DDA does not use annual reports to determine NMP compliance because the reports do not contain the detailed information that the NMP's and records of implementation contain which DDA reviews during compliance inspections. DDA is uncertain of annual report response rate due to database design, functionality, and glitches. DDA's Nutrient Management Program is currently having a new database built to replace the existing database that will resolve the current issues related to annual reporting. The new database will also track compliance inspections.

7.5 WIP Implementation Goals

Delaware's Nutrient Management Program requires NMPs for all AFOs with greater than eight animal units (AUs) and for any farmer who applies nutrients to more than 10 acres under their control.

Delaware’s Nutrient Management Program requires an animal waste management system for all AFOs. 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. DDA requires all NMPs for AFOs to include “annual waste generation estimation and handling methods” and “description of any outside storage/stockpiling of manure.”³¹ Delaware’s Nutrient Management Program also requires anyone who intends to store manure outside of an approved manure storage structure to include the outdoor storage site in the NMP (3 Del. C. §2247.e). Delaware’s Nutrient Management Program allows AFOs that export manure to substitute an AWMP for an NMP, provided the AWMP includes “information concerning how the waste is stored prior to transport” (3 Del. C. §2247.i.1). Delaware’s Nutrient Management Program does not explicitly require an animal waste management system that includes a waste management structure. Many AFOs will have waste management structures due to their larger size, but an AFO could comply with the Nutrient Management Program requirements through a waste management system that does not include a waste management structure. For example, a poultry operation may move poultry litter directly from the poultry houses to fields for land application, may store poultry waste in a stockpile that is covered to protect it from precipitation and wind, or may sell the poultry litter to another farmer or broker who collects the poultry litter from inside the poultry houses and takes the litter off-site. Therefore, Delaware’s Nutrient Management Program requires an animal waste management system for all AFOs that may or may not include a waste management structure.

Delaware’s Nutrient Management Program does not require conservation plans, barnyard runoff control, or mortality composting.

Table 15. Priority BMPs, Nutrient Management Program.

Priority BMP	Required Component?	Notes
Nutrient Management	Required	3 Del. C. §2247.a
Animal Waste Management Systems	Required for AFOs; Not applicable for crop land farm operations	3 Del. C. §2247.e
Conservation Plans		
Barnyard Runoff Control		
Mortality Composting		

7.6 Nutrient Management Program – Observations

1. In FY2013, DDA had a total budget of \$103,355 and approximately 1.625 FTEs dedicated to the Nutrient Management Program.
2. Delaware’s Nutrient Management Program is broad in coverage, requiring NMPs for all AFOs with greater than eight animal units (AUs) and for any farmer who applies nutrients to more than 10 acres under their control. All NMPs must be developed by a certified nutrient consultant.
3. Currently, there are approximately 1,072 AFOs and crop land farm operations in Delaware regulated by the Delaware Nutrient Management Law, representing approximately 57% to 68%

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

³¹ <http://dda.delaware.gov/nutrients/forms/checklist.pdf>

of the farms that meet the USDA definition of a farm in Delaware over 10 acres or with more than \$10,000 in sales, respectively.

4. The DNMC reports that 100% of cropland and nutrient-applied acres were managed under a current NMP developed by a certified consultant.
5. NMPs do not need to be submitted to the DNMC for approval but must be kept on-farm and made available to DDA to review.
6. In 2013, DDA conducted nutrient management compliance visits at 85 out of the 1,072 regulated AFOs (including CAFOs) and crop land farm operations in Delaware (approximately 8%).
7. During the nutrient management compliance visits, DDA is determining whether or not the farmer's NMP contains the information required under Delaware's Nutrient Management Program and whether the farmer has current nutrient management certification, has an up-to-date manure analysis, and has the required records of land application and manure export. According to DDA, DDA also determines whether or not the farmer is complying with the requirements in the NMP by inspecting the farmer's records of implementation. Upon inspecting those documents, DDA determines whether or not the farmer complied with the requirements of the NMP.
8. For the 30 CAFO files reviewed by EPA, 22 files (approximately 73%) contained a nutrient management compliance visit and eight files (approximately 27%) did not contain a nutrient management compliance visit. All 22 files with a nutrient management compliance visit had a nutrient management compliance visit conducted in 2011, and seven of the 22 files contained a second nutrient management compliance visit conducted after 2011.
9. For the 30 files reviewed by EPA, DDA determined that "Utilization of Nutrient Management Plan," (i.e. compliance with the NMP) was adequate at eight out of the 30 nutrient management compliance visits (approximately 27%), while DDA did not make a determination at the remaining 22 out of the 30 nutrient management compliance visits (approximately 73%).
10. The 30 CAFO files reviewed by EPA contained 18 nutrient management annual reports for 2011, 22 annual reports for 2012, 17 annual reports for 2013, and 15 annual reports for 2015. The annual report response rate for these 30 farms from 2011 to 2014 ranged from 50% to 73%.
11. Delaware's Nutrient Management Program requires two of the five priority BMPs. Delaware's Nutrient Management Program requires nutrient management and animal waste management systems for AFOs.

8.0 NPDES CAFO Program

The 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 identified 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. Delaware has been authorized by EPA to administer the NPDES program since 1974. Through a joint MOA between DDA and DNREC, DNREC and DDA jointly implement the NPDES CAFO Program (DDA and DNREC, 2010).

Under the terms of the MOA, the NPDES CAFO Program is administered by DNREC and managed by DDA, with the DNMC serving an advisory role (CBIW, 2010). DDA is the primary administrator of the NPDES CAFO Program and handles the day-to-day activities of the CAFO Program, while DNREC is responsible for promulgating, supervising and enforcing the regulations and issuing CAFO permits.³² Both DDA and DNREC have authority to jointly promulgate and amend regulations for the CAFO NPDES Program (3 *Del. C.* §2248.b).

Delaware's CAFO regulations were last updated in November 2011 (DCIW, 2012), and were approved by EPA in January 2012. Delaware's CAFO regulations (7 *Del. Admin. C.* §7201, Section 9.5.3.1) define CAFOs in Delaware using the federal CAFO size categories at 40 CFR § 122.23. In addition, DNREC can designate any AFO as a CAFO upon determination that it is a significant contributor of pollutants to waters of the State (7 *Del. Admin. C.* §7201, Section 9.5.3.2). Delaware's CAFO regulations (7 *Del. Admin. C.* §7201, Section 9.5.4.1) state that any owner of a Large, Medium, or designated CAFO who does not have an effective NPDES CAFO permit has a duty to apply for an NPDES CAFO permit when:

- Pollutants originating from the CAFO are discharged or proposed to discharge directly or indirectly into Waters of the State; or
- Pollutants originating from a CAFO are discharged into Waters of the State caused by handling of animal mortalities or manure; or
- Pollutants originating from a CAFO are proposed for discharge as a result of the design, construction, operation or maintenance of a CAFO such that a discharge will occur; or
- Pollutants from a large CAFO are discharged into Waters of the State from the land application area as agricultural storm water, except for discharges falling within the agricultural storm water exemption.

Delaware'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" and 2) CAFOs that discharge to ground water, which is considered waters of the State.

As of February 2010, Delaware had 24 NPDES-permitted CAFOs (DCIW, 2012). Delaware's NPDES CAFO general permit expired in September 2010. When the general permit expired, Delaware decided to issue individual permits instead of a general permit. Delaware submitted its first draft individual permits for EPA's review, and after addressing EPA's comments, Delaware issued its first CAFO individual permit

³² <http://www.dnrec.delaware.gov/News/Pages/Delaware%E2%80%99s-Concentrated-Animal-Feeding-Operation-%28CAFO%29-Regulations-.aspx>

on March 21, 2013. EPA also provided comments on two additional draft CAFO individual permits. Delaware currently has received approximately 440 NPDES CAFO permit applications, with all but one still waiting to receive permit coverage.

As of the fall of 2014, Delaware is pursuing a CAFO general permit, rather than the individual permits. EPA has been working with Delaware to develop a CAFO general permit and to update the MOA between DDA and DNREC since currently it only provides responsibilities for issuing individual CAFO permits and does not include provisions for issuing a CAFO general permit.

To implement Delaware's CAFO Program, Delaware has chosen to divide and group the CAFO universe by animal sector and common agricultural practices. Delaware plans to develop three separate CAFO general permits to cover:

1. Poultry operations with no land application areas (no-land-application poultry);
2. Poultry operations with land application areas (land-application poultry); and
3. Non-poultry operations (non-poultry).

Delaware's initial focus was on the poultry industry, since it is the largest animal agriculture sector in Delaware, and Delaware first developed a CAFO general permit for no-land-application poultry operations. Delaware submitted this draft general permit on December 8, 2014, and after making numerous improvements to the draft permit, EPA closed out its review of Delaware's NPDES CAFO general permit and Fact Sheet for no-land-application poultry operations on April 29, 2015. Delaware will be making the general permit and fact sheet available for public review and comment prior to finalizing the general permit and registering CAFOs under it. After the CAFO general permit for no-land-application poultry operations, Delaware estimates that approximately 260 operations will be registered under the general permit. Delaware intends to issue this general permit by the end of 2015.³³

After developing a CAFO general permit for poultry operations with no land application areas, Delaware has stated that it will then develop the CAFO general permit for poultry operations with land application areas, which will cover approximately 100 operations. Finally, Delaware has stated that it will develop the CAFO general permit for non-poultry operations, such as dairies and swine farms, which will cover approximately 11 operations.

The 2010 MOA between DDA and DNREC describes responsibilities under an individual CAFO permitting approach. Facilities seeking to obtain an NPDES CAFO permit must complete a notice of intent ("NOI") and submit it to DDA along with the facility's current NMP. DDA will provide a list of all NOIs to DNREC and make all NOIs and accompanying documents available to DNREC for review. Newly constructed CAFOs must submit an NOI at least 180 days prior to beginning operation, and expanded CAFOs that become a CAFO as a result of the expansion must submit an NOI within 90 days of becoming a CAFO (7 *Del. Admin. C.* §7201, Section 9.5.4.1.2). DDA will review the NOI and its accompanying documentation to determine whether the NOI application package is complete, including whether the submitted NMP meets applicable state requirements (DDA and DNREC, 2010). The NMP must meet the criteria required

33

http://www.dnrec.delaware.gov/swc/wa/Documents/ChesapeakePhaseIIWIP/Milestones/DE_Programmatic_Milestones_2015_Updates.pdf

under Delaware’s CAFO Regulations (3 *Del. C.* §§2200-2290) and the State Technical Standards (DDA and DNREC, 2010).

If the application package is incomplete, DDA will notify the applicant of the deficiencies (DDA and DNREC, 2010). If the application package is complete, DDA will determine “whether it will recommend that CAFO Permit coverage should be issued, and what the terms of the permit should be for each applicant, and will notify the DNREC of its recommendation for the DNREC’s concurrence” (DDA and DNREC, 2010). If CAFO permit coverage is recommended, DNREC and DDA will develop a draft CAFO permit for public notice.

DDA conducts the public notice and public participation process (DDA and DNREC, 2010). DDA will issue a public notice that includes a description of the CAFO and the location where members of the public can review the CAFOs’ NOI, NMP/AWMP, and draft CAFO permit (7 *Del. Admin. C.* §7201, Section 9.5.8.2). DDA will provide a minimum 30-day public comment period (7 *Del. Admin. C.* §7201, Section 9.5.8.2.1.5). Afterwards, DDA will draft a response to all public comments received, and DNREC will be provided an opportunity to consult and concur in DDA’s proposed response to public comments (DDA and DNREC, 2010). Finally, DNREC will render a final NPDES CAFO permit decision about whether to issue, deny, or modify an NPDES CAFO permit for the facility (7 *Del. Admin. C.* §7201, Section 9.5.8.5.1). A public hearing may be held if DDA determines that a public hearing is in the public interest or if a written meritorious request for a hearing is submitted during the public comment period (7 *Del. Admin. C.* §7201, Section 9.5.8.4.1).

DDA will develop a notice of permit coverage, including a concise statement of the terms of the CAFO Permit and provide the opportunity for final approval by DNREC (DDA and DNREC, 2010). Following DNREC’s approval, DDA will notify the applicant and the public of the granting of permit coverage and the terms of the CAFO Permit (DDA and DNREC, 2010). Issuance of an NPDES CAFO permit constitutes DDA’s acceptance and approval of the CAFO’s NMP (State of Delaware, 2014). NPDES CAFO permits may be issued for a term of up to five years.

NPDES CAFO Nutrient Management Plans

All NPDES-permitted CAFOs must develop and submit an NMP that is developed in accordance with the Delaware Nutrient Management Planning Program requirements described in Section 7 previously (3 *Del. C.* §2248.c). In addition, DNREC and DDA may prescribe additional or different requirements for an NMP submitted under the NPDES CAFO Program (3 *Del. C.* §2248.c): “As necessary, the NMP shall also include but not be limited to, the following additional site specific handling and storage considerations:

- 1) Diverting clean water from contacting animal waste or litter;
- 2) Preventing storage, collection and conveyance systems from leaking organic matter, nutrients and pathogens to ground or surface water;
- 3) Providing adequate storage to prevent polluted runoff;
- 4) Handling manure and litter to reduce nutrient losses;
- 5) Managing dead animals to protect ground and surface waters;
- 6) Proper chemical handling; and
- 7) Tillage and crop residue management practices.”

An NPDES-permitted CAFO's NMP is also required to include the nine minimum elements of an NMP identified at 40 CFR part 122.42(e)(1) (7 *Del. Admin. C. §7201*).

All NMPs in Delaware must be updated at least every 3 years, or after significant changes to the facility operations or a 25% or greater increase in facility operations (3 *Del. C. §2247.d*). An NPDES-permitted CAFO must also update its NMP "whenever there is any significant change in the design, construction or operation which has a significant effect on the potential for the discharge of pollutants to state waters" (3 *Del. C. §2248.c*).

For the 30 CAFO files reviewed by EPA, six of the files (20%) did not contain any NMP, 12 files (40%) contained an NMP that was not current at the time of the file review, and 12 of the 30 files (40%) had a current NMP in the file. DDA stated that DDA is not required to receive and maintain these documents in DDA's files until the facility receives NPDES CAFO permit coverage. Also, according to DDA, NMPs that are past their expiration date are still viewed as current and accurate if the farming practices represented in the NMPs have not changed.

8.1 Facility Universe

Currently, DNREC has issued individual NPDES CAFO permits to cover one facility in Delaware, with 439 pending applications for NPDES CAFO permits. Within the Chesapeake Bay watershed, no facilities have been issued NPDES CAFO permits, with 318 pending applications for NPDES CAFO permits. Delaware is currently planning to develop three NPDES CAFO general permits (no-land-application poultry, land-application poultry, and non-poultry) to cover the remaining applications unless DNREC determines that an individual permit is warranted. DNREC has not provided an estimated date for issuing the three proposed NPDES CAFO general permits. In Delaware's 2014-2015 WIP Programmatic Milestones, Delaware committed to issuing either 100 CAFO individual permits or registering 150 operations under a CAFO general permit by the end of 2015 (State of Delaware, 2015).

Since May 2011, DDA has been updating the inventory of poultry operations in the state. The last such inventory was conducted by DNREC and was completed in 2000. During the inventory, DDA staff conducted 473 site visits and provided information on the NPDES CAFO program. On December 20, 2013, this inventory was completed with a final count of 618 poultry operations. Further outreach to all identified farms will be made to provide educational information regarding the NPDES CAFO Program (DNMC, 2014).

8.2 Resources Allocated

DNREC's role in the NPDES CAFO Program is to serve as the Delaware point of contact with EPA, to oversee DDA's management of the NPDES CAFO Program while retaining supervision and enforcement authority, to jointly promulgate CAFO regulations with DDA, and to issue and approve final NPDES CAFO permits (DCIW, 2012; State of Delaware, 2014). In FY2013, DNREC had a budget of \$75,000 and approximately 1 FTE for the NPDES CAFO Program activities (State of Delaware, 2014).

DDA's role in the NPDES CAFO Program is to serve as the Delaware primary point of contact with the regulated community, to manage the NPDES CAFO Program under the supervision of DNREC, to review and make initial permit determinations, to perform most inspections and enforcement actions, and to

review NMPs for permitted operations (DCIW, 2012; State of Delaware, 2014). In FY2013, DDA had a budget of \$70,326 and approximately 1.375 FTE for the NPDES CAFO Program activities (State of Delaware, 2014).

8.3 Data Systems

DNREC uses a Microsoft Access database to track facility information, information from submitted NOIs, information from the NMP or AWMP, permit processing information, notes, and correspondence. The information is entered as needed and is used for tracking permits and reporting to EPA. This data system does not currently integrate with EPA's ICIS system, although there are future plans to integrate with EPA's system (State of Delaware, 2014).

DDA uses a Microsoft Access database, an annual report database, and an internet system to track NPDES CAFO permit information. Information is entered as received and is used for the DNMC Administrative Report, other reports and Freedom of Information Act (FOIA) requests. This data system does not currently integrate with EPA's ICIS system, and there are no future plans to integrate with EPA's system (State of Delaware, 2014).

Delaware reported that its Microsoft Access CAFO database is insufficient for tracking and reporting (State of Delaware, 2014). Delaware's database currently does not meet the minimum federal NPDES data entry requirements for the Integrated Compliance Information System (ICIS) national database system. DNREC is currently working with EPA to address this issue.

8.4 Compliance and Enforcement

DDA is primarily responsible for compliance and enforcement at NPDES-permitted CAFOs. DDA will perform inspections and monitoring as necessary to ensure compliance with NPDES permits (DDA and DNREC, 2010). DDA will share the inspection reports and monitoring results with DNREC, which retains its inspection authority (DDA and DNREC, 2010).

DDA will take the initial lead in trying to resolve compliance issues, while DNREC will take enforcement actions relating to CAFOs should DDA be unable to resolve an enforcement issue (DDA and DNREC, 2010). According to the MOA, DDA will take the lead in developing and implementing "voluntary compliance strategies" to bring AFOs/CAFOs into compliance with the NPDES CAFO Program requirements and other applicable laws (DDA and DNREC, 2010). DDA will issue notifications to facilities that they must seek CAFO permit coverage (DDA and DNREC, 2010). DDA will also work with AFOs and CAFOs to utilize BMPs to improve facility practices (DDA and DNREC, 2010). In contrast, according to the MOA, DNREC will take the lead in developing and implementing "compulsory compliance strategies" to bring AFOs/CAFOs into compliance with the NPDES CAFO Program requirements and other applicable laws (DDA and DNREC, 2010). DDA will assist DNREC with DNREC's enforcement activities and "may act as DNREC's agent to, among other things, collect information, evaluate best management practices, evaluate land application rates, and evaluate NMPs and NMP implementation" (DDA and DNREC, 2010).

DDA staff is responsible for performing a compliance inspection for each facility at least once during its NPDES CAFO permit term (State of Delaware, 2014). According to DDA, DDA attempts to inspect CAFOs once every three to five years depending upon staffing levels, budget, and as needed for complaint

investigations. Follow up inspections will be performed if deficiencies are identified. DDA did not conduct any NPDES CAFO compliance inspections in FY2013 for Delaware's one NPDES-permitted CAFO. DDA also responds to complaints regarding CAFOs (State of Delaware, 2014). Where DDA observes noncompliance during a compliance inspection, DDA will provide verbal instruction during the inspection. If needed, DDA will issue a follow-up letter within a week of the inspection. DDA will conduct a follow-up visits within two weeks of the initial inspection to confirm whether or not the deficiencies were addressed. Finally, either DDA or DNREC can take administrative actions as needed (State of Delaware, 2014).

DDA conducts Permit Audits for CAFOs that submitted NPDES CAFO permit applications in order to determine whether DDA had the necessary paperwork and information in order to process the permit application. DDA explained that the permit audit is the equivalent of a routine nutrient management compliance visit conducted by the DDA except conducted on operations that are seeking NPDES CAFO permits. The Permit Audits were a one page document that included information such as: description of the farm; whether the farm had met the reporting requirements and provided an annual report and NMP; whether the farm had submitted a current manure analysis; a description of nearby surface waters and ditches that should be considered in the permit; and production site notes describing the observations from DDA's on-site visit. The Permit Audits were fairly detailed, with DDA noting both areas where the facilities were excelling as well as areas of concern that needed to be addressed, either immediately or prior to permit issuance.

Of the 30 CAFO files reviewed by EPA, 20 files had received a Permit Audit, including one facility that received two Permit Audits (2011 and 2014). The remaining ten CAFO files did not have a Permit Audit in their file. Of the 20 files with Permit Audits, 19 were poultry operations and one was a poultry/non-poultry mixed livestock operation. Of the 20 files with Permit Audits, six files (30%) had all of the documentation necessary to proceed with issuing NPDES CAFO permit coverage, while 14 files (70%) were missing documentation (current NMPs/AWMPs, etc.) that will need to be submitted by the farmer to DDA before DDA can issue the operation NPDES CAFO permit. DDA stated that DDA is not required to receive and maintain these documents in DDA's files until the facility receives NPDES CAFO permit coverage. DDA's assessments of the facilities in the Permit Audits appeared to be fairly thorough, with DDA providing compliance assistance and documenting whether or not farmers had submitted all required documentation and had current NMPs prior to issuing an NPDES CAFO permit.

8.5 WIP Implementation Goals

Delaware's one NPDES CAFO permit requires an NMP, and all future NPDES CAFO permits will require NMPs.

Delaware's one NPDES CAFO permit requires an animal waste management system, and all future NPDES CAFO permits will require 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."³⁴ This definition does not require a waste management structure. An NPDES-permitted CAFO is required to include manure storage capacity and manure

³⁴ <http://www.casttool.org/Documentation.aspx>

storage system in its NOI (7 *Del. Admin. C.* §7201, Section 9.5.4.4.2). An NPDES-permitted CAFO is required to include its manure storage methods in its NMP (7 *Del. Admin. C.* §7201, Section 9.5.5.1.3.1) and to “Describe adequate storage methods for manure, litter and process wastewater, and proper operation and maintenance of the storage facilities in accordance with State Technical Standards” (7 *Del. Admin. C.* §7201, Section 9.5.5.1.4.3), where “adequate Storage” for liquid and solid manure systems “means the provision of at least four months holding capacity of liquid or solid manure in accordance with State Technical Standards (7 *Del. Admin. C.* §7201, Section 9.5.2.1). An NPDES-permitted CAFO is also required to maintain records of the “manure storage activities, length of storage, amount stored, and maintenance of manure storage facilities” (7 *Del. Admin. C.* §7201, Section 9.5.6.2.2.1.1.2). Delaware’s NPDES CAFO permits do not explicitly require an animal waste management system that includes a waste management structure. Many NPDES-permitted CAFOs will have waste management structures due to their larger size, but an NPDES-permitted CAFO could comply with the permit requirements through a waste management system that does not include a waste management structure. For example, an NPDES-permitted poultry operation may move poultry litter directly from the poultry houses to fields for land application, may store poultry waste in a stockpile that is covered to protect it from precipitation and wind, or may sell the poultry litter to another farmer or broker who collects the poultry litter from inside the poultry houses and takes the litter off-site. Therefore, Delaware NPDES CAFO permits require an animal waste management system that may or may not include a waste management structure.

Delaware’s one NPDES CAFO permit does not require a conservation plan, and Delaware’s regulations indicate that future NPDES CAFO permits will not require a conservation plan.

Delaware’s one NPDES CAFO permit requires barnyard runoff control structures to be implemented, and Delaware’s regulations indicate that all future NPDES CAFO permits will require barnyard runoff control structures to be implemented as part of the nine minimum elements of an NMP for a CAFO. The NMP for an NPDES-permitted CAFO is required to “provide a description and action plan to divert or segregate all clean water as appropriate from the production area and for collecting all water coming in contact with the production area,” including “approved methods in accordance with State Technical Standards to prevent direct contact between animals and Waters of the State” and “approved methods in accordance with State Technical Standards to prevent runoff from coming into contact with manure, litter, or process wastewater” (7 *Del. Admin. C.* §7201, Section 9.5.5.1.4.4).

Delaware’s one NPDES CAFO permit does not require mortality composting, and Delaware’s regulations indicate that all future NPDES CAFO permits may or may not require mortality composting as part of the nine minimum elements of an NMP for a CAFO. The NMP for an NPDES-permitted CAFO is required to “provide a detailed animal mortality plan” that includes:

1. “A statement acknowledging that burial of dead animals is prohibited;”
2. “A description of the methods and procedures for daily handling and disposal of dead animals in a manner to prevent contamination of Waters of the State. Disposal of mortalities is strictly prohibited in liquid manure, storm water, or process wastewater storage or treatment areas;” and
3. “Methods and procedures for handling catastrophic mortalities in accordance with State Technical Standards.”

The NPDES CAFO permit requires an NMP that identifies how the operation is handling mortalities, but the operation can choose whether to handle mortalities using mortality composting or another method, such as incineration or off-site rendering. Therefore, an NPDES CAFO permit may or may not require mortality composting.

Table 17. Priority BMPs, NPDES CAFO Program.

Priority BMP	Required Component?	Notes
Nutrient Management	Required	7 Del. Admin. C. §7201, Section 9.5.5
Animal Waste Management Systems	Required	7 Del. Admin. C. §7201, Section 9.5.5.1.3.1
Conservation Plans		
Barnyard Runoff Control	Required	7 Del. Admin. C. §7201, Section 9.5.5.1.4.4
Mortality Composting	May be required	7 Del. Admin. C. §7201, Section 9.5.5.1.4.5.2

8.6 NPDES CAFO Program – Observations

- In FY2013, the NPDES CAFO Program had a total budget \$70,326 and approximately 1.375 FTEs dedicated to the NPDES CAFO Program.
- The NPDES CAFO Program is implemented jointly by DNREC and DDA through an MOA. DDA manages the day-to-day operations, including inspections, while DNREC administers the program, including issuing permits.
- The MOA between DDA and DNREC will need to be updated since currently it only provides responsibilities for issuing individual CAFO permits and does not include provisions for issuing a CAFO general permit.
- Delaware has issued one NPDES CAFO permit, with 439 pending applications for NPDES CAFO permits statewide, including 318 in the Chesapeake Bay watershed.
- Delaware intends to issue this general permit by the end of 2015 to meet its 2014-2015 WIP Programmatic Milestones.
- DDA conducts Permit Audits for CAFOs that submitted NPDES CAFO permit applications in order to determine whether DDA had the necessary paperwork and information in order to process the permit application. Of the 30 files reviewed by EPA, 20 had received a Permit Audit. The Permit Audits were fairly detailed, with DDA noting both areas where the facilities were excelling as well as areas of concern that needed to be addressed, either immediately or prior to permit issuance. Most files (70%) were missing documentation (current NMPs/AWMPs, etc.) that will need to be submitted by the farmer to DDA before DDA can issue the operation NPDES CAFO permit. DDA stated that DDA is not required to receive and maintain these documents in DDA’s files until the facility receives NPDES CAFO permit coverage.
- Delaware’s NPDES CAFO Program requires three or four of the five priority BMPs. Delaware’s NPDES CAFO Program requires nutrient management, animal waste management systems, and barnyard runoff control. Delaware’s NPDES CAFO Program may require mortality composting.

9.0 Summary

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

Delaware's Animal Agriculture WIP BMPs

1. Delaware's regulatory programs require some but not all of the priority WIP BMPs. The NMP Program and the NPDES CAFO Program both require nutrient management and animal waste management systems for AFOs. The NPDES CAFO Program also requires barnyard runoff control and in some cases mortality composting.
2. Delaware is relying on both regulatory and voluntary programs in order to increase BMP implementation to meet Delaware's WIP goals.
3. Delaware's regulatory programs currently cover one CAFO under the NPDES CAFO Program and 1,072 AFOs (including CAFOs) and crop only farm operations under the Nutrient Management Program. All of the AFOs covered by these regulatory programs are required to implement two priority BMPs: nutrient management plans and animal waste management systems. The on permitted CAFO is also required to implement barnyard runoff control.
4. There is currently uncertainty if and how Delaware will achieve the projected reductions through the voluntary programs, particularly given the funding gaps that Delaware has identified between cost-share demand and availability.
5. Delaware is relying heavily on programs with voluntary participation, such as cost-share programs, and better data collection efforts in order to increase BMP implementation and account for conservation practices that are currently on the ground to meet Delaware's WIP goals. Tracking BMP implementation is an additional challenge for Delaware.
6. In the event that Delaware is unable to keep up with or make progress toward meeting its agricultural implementation goals, Delaware may need to act on its commitment outlined in the WIP to enact new policy measures and explore mandatory BMP compliance options, as well as considering prohibiting manure-source phosphorus application on high phosphorus soils.

Nutrient Management Program

6. In FY2013, the Nutrient Management Program had a total budget of \$103,335 and approximately 1.625 FTEs dedicated to the Nutrient Management Program.
7. Delaware's Nutrient Management Program is broad in coverage, requiring NMPs for all AFOs with greater than eight animal units (AUs) and for any farmer who applies nutrients to more than 10 acres under their control. All NMPs must be developed by a certified nutrient consultant.
8. Currently, there are approximately 1,072 AFOs and crop land farm operations in Delaware regulated by the Delaware Nutrient Management Law, representing approximately 57% to 68% of the farms that meet the USDA definition of a farm in Delaware over 10 acres or with more than \$10,000 in sales, respectively.
9. The DNMC reports that 100% of cropland and nutrient-applied acres were managed under a current NMP developed by a certified consultant.

10. NMPs do not need to be submitted to the DNMC for approval but must be kept on-farm and made available to DDA to review.
11. In 2013, DDA conducted nutrient management compliance visits at 85 out of the 1,072 regulated AFOs (including CAFOs) and crop land farm operations in Delaware (approximately 8%).
12. During the nutrient management compliance visits, DDA is determining whether or not the farmer's NMP contains the information required under Delaware's Nutrient Management Program and whether the farmer has current nutrient management certification, has an up-to-date manure analysis, and has the required records of land application and manure export. According to DDA, DDA also determines whether or not the farmer is complying with the requirements in the NMP by inspecting the farmer's records of implementation. Upon inspecting those documents, DDA determines whether or not the farmer complied with the requirements of the NMP.
13. For the 30 CAFO files reviewed by EPA, 22 files (approximately 73%) contained a nutrient management compliance visit and eight files (approximately 27%) did not contain a nutrient management compliance visit. All 22 files with a nutrient management farm audit had a nutrient management compliance visit conducted in 2011, and seven of the 22 files contained a second nutrient management compliance visit conducted after 2011.
14. For the 30 files reviewed by EPA, DDA determined that "Utilization of Nutrient Management Plan," (i.e. compliance with the NMP) was adequate at eight out of the 30 nutrient management compliance visits (approximately 27%), while DDA did not make a determination at the remaining 22 out of the 30 nutrient management compliance visits (approximately 73%).
15. The 30 CAFO files reviewed by EPA contained 18 nutrient management annual reports for 2011, 22 annual reports for 2012, 17 annual reports for 2013, and 15 annual reports for 2015. The annual report response rate for these 30 farms from 2011 to 2014 ranged from 50% to 73%.
16. Delaware's Nutrient Management Program requires two of the five priority BMPs. Delaware's Nutrient Management Program requires nutrient management and animal waste management systems for AFOs.

NPDES CAFO Program

17. In FY2013, the NPDES CAFO Program had a total budget of \$70,326 and approximately 1.375 FTEs dedicated to the NPDES CAFO Program.
18. The NPDES CAFO Program is implemented jointly by DNREC and DDA through an MOA. DDA manages the day-to-day operations, including inspections, while DNREC administers the program, including issuing permits.
19. The MOA between DDA and DNREC will need to be updated since currently it only provides responsibilities for issuing individual CAFO permits and does not include provisions for issuing a CAFO general permit.
20. Delaware has issued one NPDES CAFO permit, with 439 pending applications for NPDES CAFO permits statewide, including 318 in the Chesapeake Bay watershed.

21. Delaware intends to issue this general permit by the end of 2015 to meet its 2014-2015 WIP Programmatic Milestones.
22. DDA conducts Permit Audits for CAFOs that submitted NPDES CAFO permit applications in order to determine whether DDA had the necessary paperwork and information in order to process the permit application. Of the 30 files reviewed by EPA, 20 had received a Permit Audit. The Permit Audits were fairly detailed, with DDA noting both areas where the facilities were excelling as well as areas of concern that needed to be addressed, either immediately or prior to permit issuance. Most files (70%) were missing documentation (current NMPs/AWMPs, etc.) that will need to be submitted by the farmer to DDA before DDA can issue the operation NPDES CAFO permit. DDA stated that DDA is not required to receive and maintain these documents in DDA's files until the facility receives NPDES CAFO permit coverage.
23. Delaware's NPDES CAFO Program requires three or four of the five priority BMPs. Delaware's NPDES CAFO Program requires nutrient management, animal waste management systems, and barnyard runoff control. Delaware's NPDES CAFO Program may require mortality composting.

10.0 References

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