MARYLAND
TRADING and OFFSET
POLICY and GUIDANCE
MANUAL
CHESAPEAKE BAY WATERSHED

4.17.17 Update

ACKNOWLEDGEMENTS

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SECTION I

2017 Maryland Trading and Offset Policy and Guidance Manual

Protecting and restoring the water resources of the Chesapeake Bay and the many tributaries within its watershed present a great challenge to Maryland's citizens and businesses, as well as State, county, and local governments. Nutrient trading offers an attractive alternative to more traditional approaches for improving water quality and has the potential achieve results faster and at a lower cost. Maryland's new trading program provides expanded opportunities for all point and nonpoint sources by giving them access to a water quality marketplace and flexibility in meeting and maintaining their load limits by acquiring credits and/or offsets generated from load reductions elsewhere.

The Maryland Nutrient Trading Policy Statement, released on October 23, 2015, detailed a roadmap for the development of a cross-sector, market-based trading program and manual that use innovation, economies of scale, and public/private partnerships to accelerate the restoration of the Bay and local rivers and streams. The new 2017 comprehensive Water Quality Trading Manual builds on the foundation developed by the Maryland Departments of the Environment (MDE) and Agriculture (MDA) through the 2008 trading policies and guidance for the generation and acquisition of water quality credits for both point and nonpoint sources (Phase I, Point Source Policy; and Phases II A and B: Guidelines for the Generation and for the Exchange of Agricultural Nonpoint Source Credits, Maryland's Trading Marketplace).

This new manual has been developed through the consultation and advice of the Maryland Water Quality Trading Advisory Committee (WQTAC) and other stakeholders. Its provisions add more flexibility and opportunities for the regulated local governments and State and federal agencies with Municipal Separate Storm Sewer Systems permits (commonly known as MS4 permits) to engage in trading. MS4 entities and industrial stormwater dischargers with permits authorizing trading can meet a permit specified portion of their impervious area restoration requirement and Bay nutrient and sediment reduction requirements through trading with point and/or nonpoint sources. This manual consolidates and replaces the 2008 trading documents, and in addition to changes in polices for regulated MS4 entities, establishes that other sectors such as non-MS4 entities are eligible to acquire certified agricultural and /or approved point source credits that follow the State's trading and offset program rules and regulations.

This manual will use the terms credit generators and credit sellers, as well as credit users and credit buyers and credit purchase and acquisition, interchangeably in the text below. In addition, the term "point source" includes not only municipal wastewater treatment plants (WWTPs) and industrial facilities discharging wastewater under National Pollutant Discharge Elimination System (NPDES) permits, but also the NPDES-regulated dischargers of stormwater. To distinguish between these point sources, this manual will refer to NPDES-permitted sewage treatment or industrial wastewater dischargers as *wastewater point sources*, but regulated stormwater dischargers will be referred to as *stormwater point sources*. Section III of this manual addresses trading by MS4 stormwater point sources. Other stormwater point sources may trade to the extent authorized by their permits.

Background

History, Goals, and Strategies

The original 1983 Chesapeake Bay Agreement called for the signatory Bay entities of the states of Maryland, Virginia, and Pennsylvania and the District of Columbia to work cooperatively with the U.S. Environmental Protection Agency (EPA) and the Chesapeake Bay Program (CBP) to address pollution entering the Bay. Over the years, the first Chesapeake Bay Agreement was renewed and amended periodically, each time building off the last revision: adding numeric reduction goals in 1987; calling attention to not only the Bay itself, but also its tributaries in 1992; and in 2000, focusing on accelerating implementation by 2010 and capping/maintaining nutrient and sediment loads. On December 31, 2010, the EPA established Total Maximum Daily Loads (TMDLs) for nutrients and sediment entering the Chesapeake Bay. In addition to setting these TMDLs, EPA provided guidance for the Bay watershed jurisdictions in developing statewide Watershed Implementation Plans (WIPs) that explained how they planned to meet their major river basin targets by 2025. In June 2014, a new Chesapeake Bay Watershed Agreement was signed by the Bay partnership members, adding both climate change and toxic contamination to the list of challenges whose solutions will ultimately increase the resiliency of the Bay and its tributaries.

Subsequent to the issuance of the Chesapeake Bay TMDLs (Bay TMDL), Maryland developed its 2010 Phase I and 2012 Phase I WIPs. (See http://www.mde.state.md.us/programs/Water/TMDL/TMDLHome/Pages/ Final_Bay_WIP_2010.aspx and http://www.mde.state.md.us/programs/Water/TMDL/TMDLImplementation/Pages/FINAL_PhaseII_WIPDocument_Main.aspx.) The State is also required to develop and implement two-year milestones that, together with the WIPs, detail Maryland's strategy for meeting its two-year goals and allocations by 2025.

The Role of Trading

The EPA supports trading if it is consistent with the Clean Water Act (CWA) implementing regulations, and current Agency policy and guidance. The EPA has indicated that market-based approaches such as water quality trading can provide greater flexibility in achieving water quality and environmental benefits, can result in early reductions and progress toward water quality standards, and can reduce the cost of implementing TMDLs for impaired waters. In 2001, the CBP and its Bay partners established a policy framework for trading with the publication of "Chesapeake Bay Program Nutrient Trading Fundamental Principles and Guidelines." In 2003, EPA issued its own Water Quality Trading Policy detailing national guidelines and delineating the purpose and potential benefits of trading, along with common elements deemed essential to the development of credible, sustainable trading programs. In 2007, EPA issued its first version of the Water Quality Trading Toolkit for Permit Writers, which was further updated in June 2009. These documents provided the basis for the development of initial trading programs in Maryland.

In January 2008, MDE finalized a document entitled "Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed" (Phase I 2008 Cap Management Policy). Among the stakeholders participating in the development of this policy under the leadership of MDE were: the Maryland Association of Municipal Wastewater Agencies (MAMWA); the Waterkeepers Alliance; the Maryland State Builders Association and the National Association of Homebuilders; the Chesapeake Bay Foundation; representatives from the

Maryland's Tributary teams; and MDA, as well as the Maryland Departments of Natural Resources and Planning.

During the development of the Phase I Cap Management Policy, it was recognized that trading between point and nonpoint sources presented some unique issues. Therefore, a second stage was initiated with the MDA taking the lead in the development of Phase II Policy and Guidelines, which focused on policies and procedures for generating credits in the agricultural sector and exchanging those credits. To assist in this effort, the Maryland Agricultural Nonpoint Trading Advisory Committee was convened with representation from a cross-section of public, not-for-profit, and business interests. The Committee provided guidance during the formulation of policy and procedures and the development of the infrastructure to support trading in Maryland.

Taken together, Phase I and II policies and guidance provided the framework for trading by defining the requirements and obligations of credit users and generators, buyers and sellers, and intermediaries (aggregators and brokers). The policies defined eligibility rules for point and nonpoint sources, baselines, geographies, the use of trading ratios, mechanisms of exchange, protocols for verification and assurance, compliance requirements for State TMDL-based allocations, and local water quality standards.

EPA's expectations for trading and offset programs are articulated in the Chesapeake Bay TMDLs, Section 10, and Appendix S, which can be found on EPA's website at https://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-document. EPA conducted an assessment of the Bay jurisdictions' programs during 2012 and found the Maryland Trading Program to be generally consistent with the CWA and the Bay TMDLs. Findings of the assessment are available at https://www.epa.gov/sites/production/files/2015-07/documents/mdfinalreport.pdf.

In 2013, EPA began the process of developing Technical Memoranda (TMs) to assist the Bay jurisdictions in developing or updating various aspects of their trading programs. TMs elaborate on the expectations set out in Section 10 and Appendix S of the Bay TMDL but are not regarded as rules, regulations, or official agency guidance and do not establish any binding legal requirements. To date, TMs have been issued on Sector Load Growth Demonstration; Accounting for Uncertainty in Offset and Trading Programs; Local Water Quality Protection when Using Credits for NPDES Permit Issuance and Compliance; Evaluation of Sampling Variability in Chesapeake Bay Wastewater Treatment Plant Discharges; Components of Credit Calculation; Permanence of Credits Used for NPDES Permit Issuance and Compliance; Certification and Verification of Offset and Trading Credits in the Chesapeake Bay Watershed, Establishing Offset and Trading Baselines in the Chesapeake Bay Watershed and Net Improvement Offsets for New or Increased Loads. The full text of each TM is available at https://www.epa.gov/chesapeake-bay-tmdl/trading-and-offset-technical-memoranda-chesapeake-bay-watershed

1. Maryland Water Quality Nutrient Policy Statement

Introduction

The Chesapeake Bay is the nation's largest estuary and one of the most complex ecosystems in the world. The Bay's vast watershed stretches across some 64,000 square miles and encompasses parts of six states and the entire District of Columbia. The cumulative impact of human activities throughout the watershed has caused increasing pollution from an overabundance of nutrients, primarily nitrogen and phosphorus, resulting in serious degradation of the waters of the Bay and the many rivers, streams, and creeks that flow into it.

Nutrient and sediment loads come from a variety of sources, including agriculture, wastewater treatment plants, septic systems, urban stormwater run-off, and atmospheric deposition. Despite extensive restoration efforts by the Bay states, the lack of significant progress prompted the EPA to establish the Chesapeake Bay TMDLs, setting annual limits for nutrient and sediment loads and providing accountability through state WIPs detailing targeted reductions from all sectors.

Achieving these reductions and maintaining the loading caps while accommodating continuing economic and population growth will be challenging. Total cost estimates for adopting best management practices and/or installing controls to reduce nutrient and sediment discharges vary widely from sector to sector. Since the costs of meeting the TMDLs will be borne by all segments of society and all levels of government, it is imperative to identify and implement strategies. to lower those costs.

Nutrient trading has emerged as a promising strategy for introducing cost-effectiveness and market-driven efficiency to the realization of nutrient reductions. Under this approach, sectors are given the flexibility to meet and maintain their load limits by acquiring credits and/or offsets generated from load reductions elsewhere. The likelihood that this option will be selected increases if the credit purchase is less expensive than other alternatives and the purchased reduction is deemed credible and verifiable.

Accordingly, attention has shifted to the agricultural community and other sources where compliance may be accomplished and exceeded at a much lower cost per pound than pollution reduction on site. MDE and MDA have been working collaboratively to establish a voluntary, market-based program to promote the use of trading as a viable option for achieving the State's load reduction goals. This program envisions trading not only within and between sectors, but ultimately between Maryland and the other Bay states.

Guiding Principles

The State of Maryland is committed to a new trading program that:

- Accelerates the restoration of the Chesapeake Bay while reducing the cost of implementation
- Maintains consistency with the federal Clean Water Act, the Chesapeake Bay and State TMDLs, Maryland law and regulation, and any other applicable requirements

- Offers competitive alternatives for accomplishing both regulatory and environmental goals
- Protects local water quality
- Supports the preservation of productive agricultural and forest lands
- Uses the best available science and appropriate metrics to estimate and/or measure pollution reductions, manage risk, and ensure the validity of credits
- Provides accountability, transparency, and accessibility for all interested parties
- Includes necessary compliance and enforcement provisions
- Creates incentives for investment, innovation, and job creation
- Fosters collaborative partnerships between public and private entities and among diverse stakeholders and
- Positions Maryland to participate in interstate trading activities

Cross-Sector Trading

Maryland recognizes that the primary drivers for trading are the regulatory programs that require pollutant reductions. MDE opened the door to trading and the generation and use of nutrient credits and offsets in the point source sector by WWTPs under the auspices of the Cap Management Policy adopted in 2008. Given the advances made by MDA in developing a web-based suite of tools to support trading, it is time for the State to implement policies that will broaden the availability of trading among sectors.

A number of studies have shown that there is a potential for substantial cost savings when the scope and scale of trading expands and regulated stormwater sources participate in trading. Under Maryland's cross-sector trading program, trades may occur between point sources, including for the first time, the MS4 community, and between point sources and nonpoint sources, such as between MS4s and agricultural operations. The regulated MS4 entities with permits authorizing trading can enter into cross-sector trading to meet a portion of their impervious surface restoration and Bay TMDLs nutrient and sediment reduction requirements through the purchase of credits.

In addition, there may be some benefits in common with carbon trading and practices that reduce greenhouse gas (GHG) emissions. Since many of the agronomic, land use, and structural practices store carbon and lower other GHG emissions, the nutrient marketplace could provide a platform for the addition of a voluntary carbon component once it is fully developed and the nutrient marketplace is fully functioning.

Private Sector Role

All sectors could benefit from public/private partnerships. The development of a public marketplace for trading provides new employment opportunities for individuals and organizations offering services to support an emerging environmental restoration economy. Beyond the benefits of retaining and creating jobs and generating supplemental income, the assessment and verification of credits, the need for annual inspections, the design and installation of structures and systems, and the acquisition, management, and re-sale of credits are expected to be sources of revenue for consultants, technical advisors, engineers, contractors, aggregators, environmental bankers, brokers.

2. Key Provisions for All Sectors

2.1 Pollutants Eligible for Trading

Nitrogen (TN), phosphorus (TP), and sediment (TSS) may be traded. Trades should involve comparable pollutants (e.g. nitrogen traded for nitrogen

2.2 Protection of Local Water Quality

Trading may not cause nor contribute to local water quality impairments, delay the attainment of local water quality standards or violate water quality standards.

2.3 Pollutant Reduction Credits

Pollutant Reduction Credits (credits) are the units of trade generated by load reductions that are greater than those required of the credit generator by a regulatory requirement or established under a TMDL. The resulting credits are expressed as mass per unit time (e.g. pounds per year for TN and TP or in the case of TSS, tons per year).

2.4 Eligible Credit Generation Practices

Credits can be generated by Best Management Practices (BMPs) that are approved (accepted and defined) by the Chesapeake Bay Program (CBP) Partnership for its annual progress review.

2.5 Credit Certification

Credit certification is the formal application and approval process of the credits generated from an eligible BMP. Certification occurs after project review and is the last step before credits can be used toward a compliance obligation or any other purpose. All eligible agricultural credit generating practices must first be certified by MDA. For WWTP generated credits or credits generated by connecting retired OSDS to upgraded WWTP facility, issuance of a final discharge permit becomes the certification for credits referenced under the permit.

2.6 Trading Baselines

The baselines applicable to sources within an individual sector must be achieved and complied with to be eligible to generate credits. Either performance-based or practice-based methods for defining baselines and calculating credits can be used. Specific baselines for wastewater point sources and agriculture are described in the Sections II and IV. Baselines for stormwater point sources will be established during the development of the regulatory and permitting frameworks.

2.7 Additionality

Agricultural credit generating practices are expected to reduce loads beyond the baseline and result in pollutant load reductions beyond what would have occurred in the absence of a potential offset or trade. For NPDES and State discharge regulated permittees, loads discharged below the TMDL baselines are considered a credit generating practice and meet EPA expectations that additionality

has been addressed.

2.8 Credit Life

Credit life is one calendar year. Thus, credits generated from certified projects or practices are valid for one calendar year (January through December). Credits may be applied (used) only in the year during which they are generated. Because practices will be installed at different times during the year, the total estimated annual credits generated from any practice installed within a given year will be considered to be generated the following year starting January 1. For example, installing a wetland in June of 2017 means that the annual credit will be given to that project beginning with calendar year 2018. Credits cannot be banked for future years. For example, if a best management practice (BMP) generates 100 credits each year and has been certified for five years, 500 credits cannot be applied in year five.

2.9 Certification Duration.

At a minimum, permittees are required to secure certified credits, to be generated on an annual basis, for the duration of the authorized discharge, which is typically 5 years. However, in cases where credit-generating projects are permanent and never need to be certified again, the project certification may be perpetual and verified annually. Maryland currently recognizes on-site septic hookups to municipal wastewater plants as permanent projects whose credit duration, once verified upon project completion, is perpetual.

2.10 Eligible Participants

Subject to applicable laws, any person or entity, whether regulated and non-regulated, listed below may create, purchase, sell, retire, or otherwise acquire and use credits for the purpose of creating an alternative solution/option for the achievement of regulatory and environmental goals or to comply with TMDL allocations as long as the alternative conforms to this Trading Policy. Trading cannot be used to comply with existing technology-based effluent limits except as expressly authorized by federal regulations.

Point sources (wastewater and stormwater)

- Nonpoint sources
  - Septic systems
  - Agriculture
- State of Maryland and its entities
- Federal agencies
- Any person or entity engaged in the eligible practice which provides nutrient and/or sediment removal from the environment
- Aggregators and brokers
- Third parties
- Any combination of the above

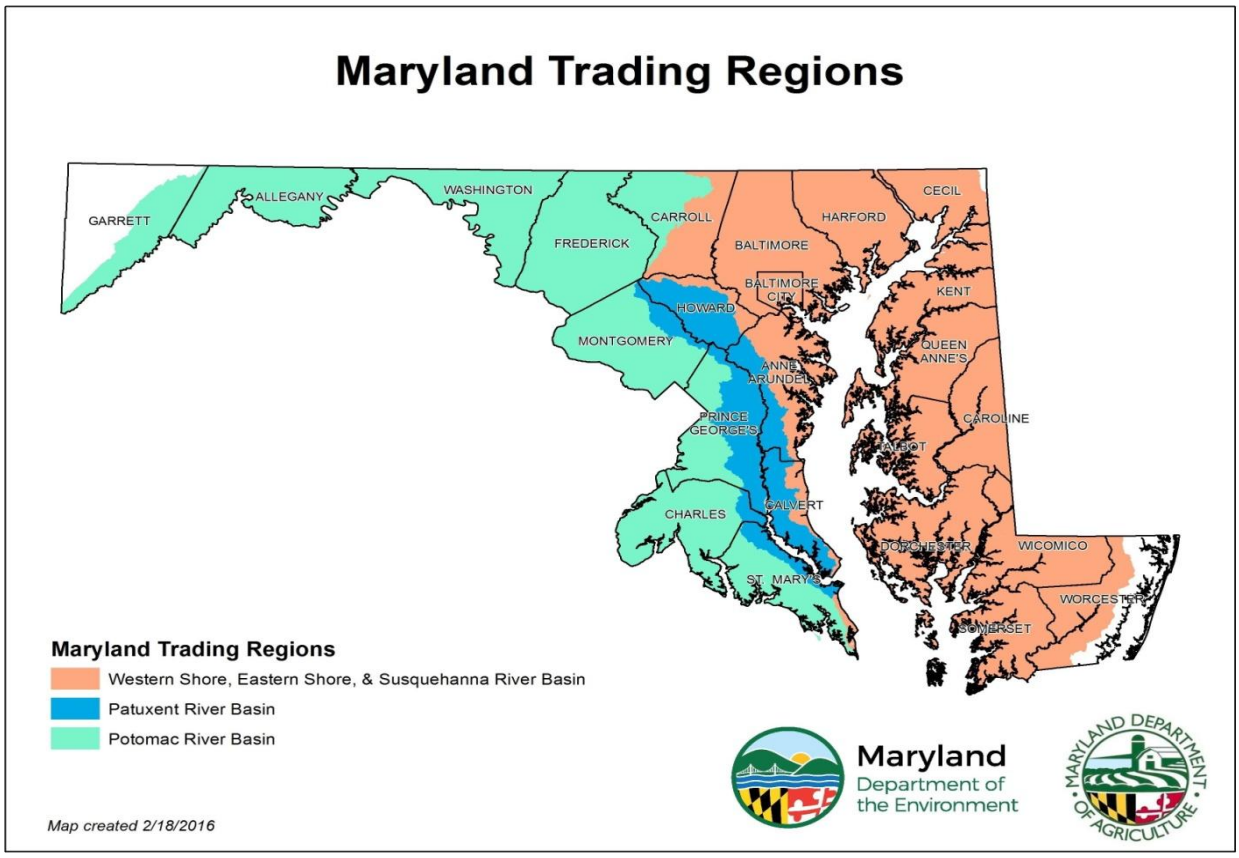
MDE may, at its own discretion, exclude from participation those permittees in significant noncompliance with their permit if the noncompliance is an indicator that the goals and purposes of environmental trading may not be achieved. MDA may also exclude persons or entities that do not

comply with the eligibility requirements in the regulations for the Agricultural Nutrient and Sediment Certification Program (COMAR 15.20.12.03).

2.11 Trading Regions

Maryland's three trading regions listed and shown below are based on the geographical boundaries for the three large watersheds within Maryland. These trading regions were adopted originally in Maryland's 2008 Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed and reflect the intention to ensure the protection of the waterbody to which an area drains.

- Potomac River Basin
- Patuxent River Basin
- Eastern Shore and Western Shore River Basins, including a portion of the Susquehanna watershed



In Maryland, the main driver for the trading program is to efficiently achieve the nutrient and sediment reductions necessary to reach and to maintain water quality standards for the main stem of the Chesapeake Bay. Although this objective is a high priority, it is necessary to balance this with other water quality objectives. Keeping trades within the Potomac and Patuxent river basins helps those specific rivers. Analogously, the waterbody to which Maryland's Western Shore and Eastern

Shore drain is the main stem of the Chesapeake Bay. Implementation of various credit generating BMPs on and associated reductions from these two shores provide nearly equivalent water quality response for the main stem of the Bay.

Interstate trading can offer another opportunity for a cost-effective solution to the Bay restoration, but it is appropriate only if reciprocity among programs has been established and protection of the local water quality ensured. For interstate trading to fully succeed, barriers to trading market entry must be minimized through general consistency between states' programs and a resolution of the current differences in the baselines, standards, and methodologies

2.12 Trading Ratios

A trading ratio is a numeric value used to address various forms of risk and uncertainty by adjusting the available credits for the seller or the credit obligation of the buyer. Different types of trading ratios are imposed for different reasons, and one or more may be applied in any given trade. The types of trading ratios used in Maryland are described below and where relevant in Sections II through IV.

Delivery Ratios or Factors

Delivery factors are used to account for differences in the relative impact of delivered pollutant loads due to location in the watershed and the distance from the mainstem of the Bay. Delivery factors will not be applied to loads involving trades between buyers and sellers that trade in one of the same watershed segment in Maryland.

Uncertainty Ratio

Uncertainty ratios are applied to compensate for possible discrepancies in estimated pollution reductions resulting from inaccuracy in credit estimation methodology or variability in project performance. The application of an uncertainty ratio can also provide a margin of safety in the achievement of water quality goals. An uncertainty ratio of at least 2:1 will be applied to transactions involving credits generated by nonpoint sources and acquired by wastewater point sources, unless otherwise justified, while an uncertainty ratio of 1:1 will be applied to stormwater point sources trading with nonpoint sources.

Retirement Ratio

Retirement ratios are generally used for the purpose of accelerating and securing overall improvement in water quality. Currently no retirement ratio is applied to trades although that may change in the future.

Reserve Ratio

Reserve ratios set aside a portion of generated credits that are used to create a cache or pool of credits. Reserve pool credits may be used by the State at its discretion and can be applied annually with priority given to the sector that provided the reserve to:

- Address a lack of readily available term or permanent credits for new or expanding wastewater point sources in need of offsets at startup
- Provide an additional margin of safety to compensate for project failure and/or underperformance
- Use for overall water quality improvement during a year when the reserve is not being used to manage the above situations

Reserve ratios may vary by sector and may be adjusted over time. Currently, reserve ratios of at least five percent (5 %) will be applied to all term and permanent trades.

2.13 Credit Calculation and Verification

Credits will be quantified using methodologies consistent with appropriate assumptions and provisions of the Bay TMDLs and the Chesapeake Bay Watershed Model (CBWM). For agricultural practices, independent verification by certified third parties is mandatory, and depending on the practice, may be annual or biannual. For all point sources, NPDES reporting requirements will be stipulated by MDE in the permit.

2.14 Use of Federal, State, County and Grant Funds

Federal, State, and County grant funding can be used to meet all sectors' baselines for trading.

2.15 Accountability and Tracking

Credits will be tracked and reported with transparency and accessibility for all interested parties.

2.16 Enforcement and Compliance

Credits generators must follow the state's trading and offset program rules, or otherwise, face enforcement action. Trading documents should include appropriate compliance and enforcement provisions. Sanctions and/or penalties resulting from permit or contractual provisions or regulation do not preclude further punitive action that may be taken by any public or private entity.

3. Stakeholder Involvement and Public Process

The State of Maryland has been and will continue to be committed to working with a broad set of stakeholders in the development and implementation of this Trading Policy. Ongoing program enhancements will provide further opportunities for both the public and members of the stakeholder Advisory Committee to participate and comment on all aspects of the trading program.

MDE and MDA believe that clear and transparent procedures and timely presentations of results are keys to establishing and maintaining the credibility of the trading program. The use of NPDES permits by MDE ensures transparency and tracking of point source credits and offers an opportunity for public notice and comment during the permitting process. NPDES permits that specifically or conditionally authorize trading and have already been subject to public comment during the draft permit public process will not require additional public outreach and any subsequent trades meeting the conditions of the permit will be implemented without formally reopening the permit (i.e.

implemented as a minor permit modification). Standard website posting will be maintained. All credit acquisitions/purchases by the regulated MS4 entities will be reported in annual reports, and made available to the public by posting them on MS4 entity's website. Additional reporting requirements may be specified in the operator's permit. Other sectors, such as non-MS4 stormwater entities, are eligible to acquire certified agricultural and /or approved wastewater point source credits that follow the state's trading and offset program rules and regulations. An individual or general state discharge permit may be developed and issued if and when such credits need to be formally accounted for under the Bay TMDL process, for example. Trades and agricultural credit certifications will be posted on the state and other applicable websites available to the public.

The registry component of the web-based trading platform developed by MDA in collaboration with MDE and the states of Pennsylvania and Virginia also provides a transparent, easily accessible location for conveying relevant information about credits and trades to all interested parties and the public at large and insures against the double-counting of credits. The registry has been designed to document, catalogue, track, and display credits, verification activities, completed trades, and credit usage records for all sectors. MDE will be evaluating the extent to which its permitting program information, already available through various web access methods, needs to be cross-referenced on the registry with the goal of optimizing public access to information by either uploading information directly onto the registry or providing links to MDE's permit-tracking databases.

MDA and MDE will continue working with EPA to support credit tracking for CBP modeling and reporting on the progress toward pollution reductions from all sources. Future statewide program evaluations will provide additional opportunities for trades and credit tracking enhancements.

Effect of 2017 Policy and Guidance Manual

This manual consolidates and replaces the 2008 trading documents, and in addition to changes in polices for regulated MS4 entities, establishes that other sectors such as non-MS4 entities are eligible to acquire certified agricultural and /or approved point source credits that follow the State's trading and offset program rules and regulations. Nothing in this document reduces or replaces existing regulatory requirements. The policies and procedures herein are not legislation or a regulation.

This document outlines the framework for the generation and use of wastewater point and nonpoint source credits between and among WWTPs, MS4 permit holders and agricultural credit generators. It describes what may be traded, who is eligible to trade, where trading may occur, options for generating credits, wastewater point source trade implementation by MDE via NPDES permits, and options for MS4s to engage in trading to meet a portion of their impervious surface and Bay nutrient and sediment restoration requirements. Maryland's General Permit for Stormwater Associated with Industrial Activity established an option for trading in order to meet a total nitrogen condition for industrial stormwater. That permit condition was issued prior to the creation of this policy manual and remains in effect until it is revised in the next renewal of that permit. Also included is MDA's administrative and regulatory discretion for the verification, certification, and registration of agricultural credits.

The State will undertake program modifications and enhancements as deemed appropriate in the future and as new practices are approved through the CBP protocols. Neither the load allocations nor the credits generated or used under guidance provided by this manual are a property right.

Effective Date: April 2017, 2008
Updated April 2017

Authority

Trading should satisfy conditions of the following:
Federal:
Federal Water Pollution Control Act, 33 U.S.C. § 1251 et seq. (commonly referred to as "Clean Water Act").
Clean Water Act's NPDES using EPA's implementing regulations as authorized by EPA.
U.S. EPA's Final Water Quality Trading Policy, January 13, 2003.
U.S. EPA's Permit Writers Toolkit for Trading, August 2007 and updated June 2009 at https://www.epa.gov/npdes/water-quality-trading-toolkit-permit-writers.
EPA Technical Memoranda at: https://www.epa.gov/ chesapeake-bay-tmdl/chesapeake-bay-tmdl-document.
Chesapeake Bay Program Nutrient Trading Fundamental Principles and Guidance (U.S. EPA, 2001).
Maryland:
MDE, Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed, 2008.
MDA, Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed Phase II-A: Guidelines for the Generation of Agricultural Nonpoint Nutrient Credits, 2008, 2010, 2012.
MDA, Voluntary Agricultural Nutrient Credit Certification Program. ch. 447, §§8–901 through 8–904, Annotated Code of Maryland, Agriculture, 2010.
MDA, Voluntary Agricultural Nutrient and Sediment Credit Certification Program, Agriculture Article, §§2-103(b), 8-902, and 8-903, Annotated Code of Maryland, 2012.
MDA, Maryland Agriculture Certainty Program, §§8-1001 *et seq.*, Annotated Code of Maryland, 2015.
MDA, Agricultural Nutrient and Sediment Credit Certification Program, Agriculture Article, §§2-103(b), 8-902, and 8-903, Annotated Code of Maryland, 2016

SECTION II

Wastewater Point Source (WWTPs) Cap Management and Trading

Background

To achieve Maryland's water quality standards for the Chesapeake Bay, Maryland developed WIPs that include strategies for each sector. The central elements of the WIP's WWTP Point Source Strategy are: (1) continue to upgrade all significant (a.k.a., major) and some minor WWTPs to state of the art Enhanced Nutrient Removal (ENR), and (2) maintain the nutrient load caps for all point sources.

In other states in the Chesapeake Bay watershed, nutrient trading has played a role in either reducing nutrient loads from point sources to meet Bay TMDLs WLAs or to maintain them. In Maryland, 100 percent grant funding was made available by the Bay Restoration Fund (BRF) Act for ENR upgrades of significant and publicly owned WWTPs, and therefore, trading was not allowed as a substitute for the upgrades of significant facilities. In Maryland, since 2008 wastewater point source trading has been used primarily to *maintain* point source Waste Load Allocations (WLAs), i.e., to offset increases in WWTPs loads associated with growth. MDE already has issued a number of NPDES permits utilizing offset options outlined in the original 2008 Cap Management Policy. The 2017 Trading Manual updates 2008 Cap Management Policy for wastewater point sources while adopting its Key Principles and implementation and enforcement of wastewater point source trades via NPDES permits.

1. Key Principles

In addition to the Guiding Principles and Key Provisions, which are delineated in Section I, and apply to all trading parties, the following Key Principles apply specifically to wastewater point source trading:

- A wastewater point source does not become eligible for trading until WLAs, consistent with the Bay TMDLs and/or State TMDLs, are adopted in its discharge permit as baselines for generating credits. Such baselines will be adopted in its discharge permit via the standard state and federal public participation process and will invoke EPA review under Maryland's federal NPDES delegation agreement with EPA
- New or expanding wastewater treatment facilities with no allocation in the 2010 Bay TMDLs are required to either obtain an existing allocation through trading or otherwise offset the loadings from the new facility or the increased loadings from the expanding facility
- Wastewater point source trades must be consistent with the approved County Water and Sewerage Plan
- Wastewater point sources seeking to sell credits based on a determination that they are capable of producing credits must evaluate the impact of the trade on current and projected sewer allocations using methodology consistent with MDE's Wastewater Capacity Management Plan Guidance and consider Local Growth Plans

- A minor WWTP is not considered to have a specific nutrient load allocation except where it has been included in a discharge permit as a wasteload allocation.
- A minor WWTP is not eligible to participate in trading unless an applicable WLA is included in a discharge permit as a permit limitation
- Groundwater dischargers may participate in the nitrogen trading with other point sources once a cap for nitrogen is included in the State groundwater permit as WLA and a methodology has been established for the quantification of delivered load
- MDE will require the application of at least five (5) percent reserve ratio to each point-source (term or permanent) generated credit
- MDE may require additional documentation in permits such as backup plans and alternative options to address failures by nonpoint sources to provide the contracted credits
- The State reserves its authority to adjust any new allocation if it is determined to be necessary
- Maryland's General Permit for Stormwater Associated with Industrial Activity established an option for trading with "a wastewater point source capacity allocation" in order to meet a total nitrogen condition in the stormwater permit. That permit condition was issued prior to the creation of this policy manual and remains in effect until it is revised in the next renewal of that permit.

2. Minimum Duration for Credit Commitments for New or Expanding Point Sources

- A new or expanding sewage treatment facility submitting a trading proposal must demonstrate that it has secured the contractual right to credits for at least two (2) full five year permit terms, and
  - The facility must submit a plan showing how it intends to acquire the necessary credits for at least 10 years beyond the two permit terms for a total planning horizon of 20 years
  - At each subsequent NPDES permit renewal, the facility must demonstrate the securing of credits for the coming ten-year permit period, and update its plan for acquiring them over the subsequent 10-year horizon
- Industrial facilities may secure credits for various other planning horizons on a case-by-case basis

3. Trading Baselines

The baselines for wastewater point source trading are the WLAs adopted in the discharge permit and consistent with the key principles outlined above. WLAs for significant wastewater point sources are based on the 2010 Bay TMDLs. WLAs for minors are determined individually as described below in subsection 3.2, and are based on the annual nutrient load goals established in the 2004 Point Source Tributary Strategy. This strategy was part of the Maryland's Chesapeake Bay Tributary Strategies Statewide Implementation Plan. The goals for minors were based on the design capacity in 2000 or the projected flow for year 2020, whichever was less, and a concentration of 18 mg/l TN and 3 mg/l TP. These goals were aggregated into a WLA for minors in the 2010 Bay TMDLs.

The 2010 Bay TMDLs individual and aggregate wastewater point source target loads can be found

in Appendix B1 of the Maryland Phase I WIP: "Detailed Targets and Reduction Schedule." In addition, Appendix C, "NPDES Dischargers in the Maryland Bay Watershed," provides a comprehensive list of significant and non-significant municipal and industrial wastewater facilities within the State's Bay watershed area, along with locations and available permit information on these point sources.

MDE requires all permittees wishing to participate in trading to first achieve and comply with their appropriate WLAs and other pertinent permit requirements. For example, BRF funded ENR facilities are required to comply with not only WLAs, but also with the assigned concentration based annual loading requirements, a.k.a., floating caps. ENR facilities are not restricted to trading only performance-based credits, except where trading with MS4s.

Wastewater point sources trading with stormwater point sources (MS4s) will be restricted to performance-based credits, determined using concentration-based benchmarks.

While the State has the authority to propose an update to the Bay TMDL with reallocations from the wastewater point source sectors to stormwater point sources (i.e., MS4s), less permanent transactions are preferred because the MS4s will continue to be accountable for meeting both their local water quality obligations and their Bay TMDL obligations. Therefore, MDE reserves the right to authorize MS4 acquisition of available nutrient allocation (i.e. capacity) from ENR facilities if the trading market with other sources, including agriculture, does not reasonably meet the demand in a reliable and cost effective manner. For all other trade scenarios, ENR facilities' floating caps serve as one of the eligibility requirements.

Sections below describe various wastewater point source baselines basis.

3.1 Trading Baselines for Significant Municipal Wastewater Treatment Facilities – Trading with other Wastewater Point Sources

Significant municipal WWTPs in Maryland are those with a design capacity of 500,000 gallons per day (gpd) or greater. Maryland significant facilities were required to upgrade to ENR. Their Bay TMDL/trading baselines are based on a design flow capacity consistent with the approved local water and sewer plan as of April 30, 2003 and an annual average concentration of 4.0 mg/l TN and 0.3 mg/l TP, a.k.a, ENR treatment. Local TMDLs requiring more stringent baselines are applied as additional limits in the discharge permit where applicable.

3.2 Trading Baselines for Municipal Minor Wastewater Point Sources

Minor municipal WWTPs in Maryland are those with a design flow capacity of less than 500,000 gpd. Minor dischargers that want an option to generate credits would have to modify their permit to include WLAs, and implement nutrient upgrades to meet and comply with assigned permit requirements.

Trading baselines for upgraded municipal minors will be based on *a design capacity at the time of the upgrade.*

Baselines for upgrades not utilizing State BRF funding should not exceed either (1) the previously

assigned 2004 Point Source Tributary Strategy TN and TP loading goals for the facility, or (2), if greater than 6,100 lbs/yr TN load cap and 457 lbs/yr TP load cap, then no more than 50% of the amount that is above 6,100 lbs/yr TN load cap and 457 lbs/yr TP load cap. The other 50% that is in excess of 6,100 lbs/yr of TN and 457 lbs/yr of TP will revert back to the State as a reserve and may be reallocated by MDE on case-by-case basis.

Baselines for upgrades utilizing State BRF funding should not exceed either (1) the previously assigned 2004 Point Source Tributary Strategy TN and TP loading goals for the facility, or, (2) 6,100 lbs/yr TN load cap and 457 lbs/yr TP load cap, whichever is less. The other remaining allocation that is in excess of 6,100 lbs/yr of TN and 457 lbs/yr of TP will revert back to the State as a reserve and may be reallocated by MDE on case-by-case basis.

For existing minors not participating in the trading program, 2004 Point Source Strategy loading goals have been designated as permit goals instead of limits unless the permit involves an increase in design capacity to ≥0.10 mgd.

3.3 ENR-to-MS4 Trading Baselines for Generating Performance Credits

Trading baselines for publicly owned treatment works (POTW) upgraded to ENR that want an option to generate performance credits to sell to stormwater point sources (MS4s) would be based on the performance concentrations and phased-in schedule provided below for TN. The baseline performance concentration for total phosphorus will be 0.3 mg/l. Corresponding concentration-based annual loading benchmarks will be added to the ENR permit through a permit modification and calculated based on the annual total discharged flow and the performance concentrations of TN and TP.

a. For the first three years after the effective date of this trading policy manual, the baseline total nitrogen performance shall be 4 mg/l.
b. After three years, the baseline performance concentration for total nitrogen shall be 3.0 mg/l.

3.4 Trading Baselines for Industrial Facilities

Trading baselines for significant industrial facilities identified in the Maryland WIP for the Bay TMDLs, are based on a combination of (1) historical performance levels; (2) the amount of loading reductions already achieved since the initial baselines established in 1985; and (3) establishment on a case by case basis of additional potential loading reductions. Industrial facilities with a minimum TN discharge of 75 pounds per day or minimum TP of 10 pounds per day are categorized as significant industrials and their annual load goals are included as WLAs in their discharge permits. For all other minor industrials, they may enter into trading upon inclusion of the appropriate baseline WLA cap in their discharge permit and where the permit terms are consistent with the provision of this policy manual.

4. Options for Generating and Acquiring Credits

Credits may be generated and/or acquired through any of the options listed below, as well as other options that may be proposed on a case-by-case basis through the NPDES public participation

process:

- Upgrade of an existing municipal minor WWTP
- Retirement of an existing municipal minor WWTP after connecting to ENR facility
- Performance of significant industrial facility better than its current applicable allocation limit,
- For minor industrial facility, implementation in the permit of limit regulating applicable TMDL loading allocation as a trading baseline
- Retirement of an existing (as of April 2008) OSDS by connecting to an ENR facility
- Land application of wastewater with pre-treatment and nutrient management controls
- ENR facility reduction in the design flow basis of its nutrient WLA
- ENR facility reduction in its concentration-based permit loading limitations
- ENR facility permit addition of performance benchmark for providing performance-based credits to MS4s

These options are described further below.

The CWA forbids a permitting authority from issuing a permit that would result in a violation of water quality standards. Prior to approving any credit purchases, MDE will assess the potential impact from the proposed discharge to determine if there would be a violation of any existing water quality standard applicable to the receiving water.

4.1 Upgrade of an Existing Municipal Minor WWTP

4.1.1 Municipal Minor WWTP Upgrades Without Utilizing State Grants

All existing municipal minor WWTPs may generate credits for trading without utilizing State grants. When a credit buyer, a new facility, or an expanding facility obtains consent of the minor facility to upgrade the existing facility, MDE will allocate the appropriate loading to that buyer/discharger as follows.

The participating minor facility will be given a permit limit effective upon completion of the upgrade corresponding to WLAs not to exceed the value as presented above in Section 3.2 (Trading Baselines). In addition, the minor facility may also choose to further trade some of its resulting permit WLA consistent with this policy.

4.1.2 Municipal Minor WWTP Upgrades with State Grants

The participating municipal minor facility will be given a permit limit effective upon completion of the upgrade corresponding to WLAs not to exceed 6,100 TN load cap and 457 lbs/yr TP load cap. A minor facility upgraded to ENR using State grants may trade after it meets its WLA.

4.2 Retirement of an Existing Municipal Minor WWTP after Connecting to ENR Facility with State Grants

MDE will allocate to the permittee, subject to ensuring the protection of local water quality, the

same loading as though the existing minor sewage treatment plant had been upgraded prior to being taken off-line.

4.3 Upgrade of Industrial Point Sources

Technology-based upgrade requirements may be applied on a case-by-case basis. Other appropriate approaches that generate credits through reductions in discharges, including, but not limited to, implementation of pollution prevention and recycling.

4.4 Retirement of an Existing OSDS (as of April 2008) by Connecting to an ENR Facility.

MDE may provide a nitrogen loading allocation to an ENR facility (or a facility with plans to upgrade to ENR) based upon 50 percent of the original OSDS load and proximity of the retired residential OSDS to surface waters. For an ENR plant producing effluent nitrogen of 4 mg/l, the transfer of flow from a residential OSDS to the treatment plant would generate the following credits:

A. In critical areas – 9.28 lbs/yr TN
B. Within 1,000 feet of any perennial surface water – 5.8 lbs/yr TN
C. All other – 3.48 lbs/yr TN

These credits are based on 5.3.2 model assumptions used by the CBP for nitrogen and phosphorus. MDE assumes an 80 percent delivery rate in critical areas; a 50 percent delivery rate within 1,000 feet from any perennial surface water; and a 30 percent delivery rate from distances greater than 1,000 feet from any perennial surface water (i.e., all other systems). These figures may change when CBP adopts the Phase 6 model in 2017.

With regard to phosphorus, the CBP assumes the average residential OSDS delivers *no TP*. Therefore, the allocation approval would require demonstration that the proposed significant ENR facility will meet its existing permit requirements for phosphorus after accounting for projected increased phosphorus loading of 0.23 lbs of TP per house connected.

MDE intends to provide flexibility to minor facilities with BRF funded upgrades regarding phosphorus loadings from OSDS connections. If available, the State would use the surplus TP WLA coming from the minor upgrade to provide adjusted phosphorus WLA for an OSDS connection as long as no local hot spot is created by this arrangement. A phosphorus credit of 0.23 lbs per year per equivalent dwelling unit (EDU) will be the basis of the plant load allocation for OSDS connections to an upgraded facility. This credit will allow minor facilities to connect OSDSs without the need to achieve lower than 0.3 mg/l TP concentration.

Credits for connecting non-residential systems will be established on a case-by-case basis. Credits may also be considered on a case-by-case basis when OSDSs are connected to a decentralized system that is highly efficient at removing nitrogen.

4.5 Land Application of Wastewater with Pre-treatment and Nutrient Management Controls

A surface water discharger may reduce its discharge loadings and create credits by directing some

or all of its discharge to land application. Appropriate pretreatment and nutrient management controls will be required under a state groundwater discharge permit. The permit will consider the balance calculations, the hydraulic loading rate, and the crop to be planted (if spray or drip irrigation is the method of discharge), storage during the winter months, and other BMPs in order to achieve targeted nitrogen concentration in the groundwater percolate and protect public health and the environment. However, the amount of the credits resulting from such a permit will not be based solely on the resulting groundwater permit limitations because a percentage of the groundwater discharge will still ultimately reach surface waters. The specific loads that are still expected to reach surface waters will be calculated and determined during the groundwater permit issuance process consistent with the current accepted technical calculation methodology at that time. Finally, before MDE can process a municipal groundwater discharge permit, proposed municipal projects must be included in the County Water and Sewer Plan.

4.6 ENR Facility Reduction in the Design Flow Basis of Its Nutrient WLA

Eligible ENR facilities can request a permit modification to generate credits by maintaining flow at less than the design flow basis of the assigned nutrient WLA. The permittee may then request MDE to implement such reduction through a permit modification of the ENR facility's permitted flow basis and nutrient allocation limit. The new allocation limit shall reflect the corresponding reduction in its permitted flow basis. The resulting credit shall be based on the original baseline loading allocation for the facility (the WLA), minus the nutrient loading calculated at the reduced flow capacity of the treatment system at the permitted performance level. All credit exchanges must be consistent with the point source Key Principles outlined in this section.

4.7 ENR Facility Reduction in Its Concentration-Based Permit Loading Limitations

Eligible ENR facilities can generate credits through a permit modification of the ENR facility's limits based on a voluntary change in the concentration basis used to implement both the floating cap and the TMDL allocation. The available credits shall be based on the difference between the existing WLA and the loading determined at the revised, more stringent, permit concentration basis at the permitted flow capacity. The projected new concentration shall not be based on assumed improved performance beyond demonstrated historical performance levels unless data from a similar representative facility is available and relevant. In addition to changing the WLA, the floating cap limitation will also be adjusted to reflect the more stringent concentration basis.

4.8 ENR Facility Permit Addition of Performance Benchmark for Providing Performance-Based Credits to MS4s

The allowed process for acquisition of credits for eligible MS4 permittees from wastewater point source credit generators will be initiated and specified through modification of the wastewater point source permit that is to provide credits to the stormwater permittee. The wastewater point source permit shall implement a benchmark concentration level corresponding to the baseline requirements in Section 3.3, and shall also include a requirement that the permittee report monthly on its Discharge Monitoring Reports (DMRs) to demonstrate the level of the reductions it has achieved beyond the permit benchmark. The permit will also require submission of an annual report to the Department and to the MS4 trading partner documenting the total annual loading reduction achieved by the ENR facility, as verified by the facility's permit-required monitoring of the effluent

discharges and demonstrated on the facility's certified discharge monitoring reports.

Additionally, the corresponding stormwater permittee shall submit copies of the modified WWTP permit and the WWTP annual report as part of their required stormwater permit annual reports to the MS4 permitting authority in WMA. WMA will verify that the annual reports accurately reflect the DMR reporting for the year and provide a copy to MDE's TMDL program to ensure consistency in progress reporting to the Chesapeake Bay Program.

Under-achievement of the anticipated performance-based reductions will not be a permit violation for the ENR facility generating credits to an MS4 permittee. Where the resulting reductions at the end of a reporting year are less than the MS4 anticipated in the trade, the MS4 must address it within its MS4 permit terms just as it has to address other anticipated or unanticipated BMP underperformance or failure and corresponding revisions to the progress in its restoration program implementation. The MS4 in its trading agreement with the WWTP may choose to build in obligations for that facility to report directly to the MS4 how it is performing throughout the year so the MS4 can be well informed.

5. Incorporating Trades in NPDES Permits

5.1 Individual Permits

Wastewater point source trades will be implemented and enforced through discharge permits. The trade itself or the process by which credits will be calculated and the extent to which trading may be implemented must be specified within the permit under enforceable terms or the permit will have to be reopened to implement any subsequent trade.

5.2 Bubble or "Overlay" Permits

A Bubble or Overlay permit is an alternative group permitting approach available to owners of multiple facilities for implementing the nutrient caps. Instead of multiple caps, one for each facility in a watershed, the central owner may elect to receive a single permit with one nutrient loading cap for all of the facilities it operates in the watershed. Technology-based treatment requirements for nutrients at each of the individual facilities will be included either in the bubble permit or in the permits required for each individual facility. Any State TMDL-based limits applicable to facilities in sub-watersheds would continue to apply to the individual facilities in addition to the overall loading cap. Additionally, the bubble permit does not preclude any individual non-nutrient permit limits. All discharge flows must continue to be consistent with the local Water and Sewerage Plan as well as the permitted design flows for the individual facilities.

A single combined bubble permit may be issued to multiple owners in a watershed electing to form an association and obtain a single permit as co-permittees. Under any bubble permit approach, individual discharge permits issued to each individual facility would continue to specify monitoring and reporting requirements for nutrients as well as the requirements for other regulated pollutants.

Finally, all eligibility requirements otherwise applicable to individual permittees, as well as all Guiding Principles, Key Provisions, and Key Principles of this policy manual, continue to apply to all permittees under any bubble permit approach.

5.3 Voluntary Allocation Transfers by POTWs

A municipal wastewater authority may request, as part of an NPDES permit renewal or modification application, to reassign capacity for treating wastewater flows among its NPDES permitted facilities. Such voluntary allocation transfers among its facilities is not considered trading when it involves a single owner or where it is regulated under a single permit issued to two or more co-permittees, i.e., "bubble permit."

5.4 Wastewater Point Source Flow Transfers

When a redirection of flow is planned from an existing WWTP facility to a separately owned permitted facility, trading can be used subject to the constraints summarized below.

Bay Restoration Funding for treatment, and nutrient allocations for discharge, were both provided by the State to certain POTWs to, in part, ensure that their service area user allocation commitments, as determined under their approved water and sewer plan, can be met under the Bay TMDL. Appropriate allocations for the resulting effluent treated by the POTW shall remain associated with that effluent if discharging to waters of the state regardless of whether the effluent is transferred to a different permittee, such as for reuse prior to discharge to waters of the state.

For example, a POTW may send its ENR treated effluent to another (private) facility for reuse prior to discharge by the private facility to surface waters of the state. The POTW does not retain the allocation associated with their effluent by otherwise attempting to require the private facility to separately obtain new offset credits to allow discharge to waters of the State from the private facility. This would, in effect, be evading the POTWs obligation to successfully discharge the effluent after being fully funded to treat the effluent and being provided with an allocation from the State to then discharge that effluent.

However, in the example above where the effluent is being delivered to a different permittee (e.g., for reuse), to the extent that the levels of nutrients being discharged by the private facility to waters of the state are less than the POTW permit allocation otherwise associated with the reclaimed water, the credit difference (surplus) may be returned to the POTW facility. This can be allowed on an annual or permit-term basis, depending on the certainty of the credit generation during the associated time. A trading agreement would be required between the two parties and the discharge permits updated to implement the trade consistent with the requirements of this trading policy

6. NPDES Trading Review and Documentation Requirements

This section describes the documentation requirements for MDE's discharge permits implementing water quality trades. MDE will review and evaluate permit application(s) involving trading based on the requirements described in this manual. MDE may request additional information to evaluate trading proposals from MS4 entities and/or other trading partners. Unless additional information is requested, the application will be accepted, accepted with conditions, or denied. MDE review is not final unless the NPDES permits have been modified as necessary to address trading and after compliance with the trading terms of the issued permit (with exceptions noted in other sections of this policy document). Public notice will be required for all permit renewals and major

modifications that specify that trading is being proposed in the draft permit.

6.1 Wastewater Point Source Credit User Documentation

The user acquiring wastewater point source credits shall provide any or all of the information on the following matters as required by MDE in the permit application process or as part of the terms of the issued permit:

- The need for the trade, including WLA status, flow, and load projections
- The consistency of the trade with the following: the approved County Water and Sewerage Plan, planned service areas, priority funding areas, TMDLs, and once adopted, Water Resources Element of the Land Use Plan
- The location of the facility, including a facility location map, the eight-digit River Basin designation of the discharge point, and the Chesapeake Bay Program watershed model delivery factor
- The credit acquisition plan. A new or expanding facility must document contractual arrangements that secure an adequate number of credits for 10 years (i.e. two NPDES permit terms). In addition, it must provide a plan showing how it intends to acquire sufficient credits for the subsequent 10 years beyond the 10-year contractual period.
- Credit Generator/Supplier Information

6.2 Wastewater Point Source Credit Generator/Supplier Documentation

The wastewater facility providing discharge credits shall provide any or all of the following information/documentation as required by the Department either for the permit application process or under terms of the issued permit:

- How the discharge credits will be generated by the facility
- The consistency of the trade with the facility's growth and infrastructure planning, including the approved County Water and Sewerage Plan
- Evaluation of the impact of the trade on current and projected sewer allocation, using a methodology consistent with MDE's Wastewater Capacity Management Plan Guidance and consideration of Local Growth Plans, as described above in the Key Principles for point sources
- The location of the facility, including a facility location map, the eight-digit River Basin designation of the discharge point, and the Chesapeake Bay Program watershed model delivery factor
- The credit life
- The contract terms
- The credit user information

6.3 Public Participation

For point sources, NPDES reporting requirements will be stipulated in the discharge permit after the appropriate public participation process regarding the trading terms and provisions of the discharge permit. MDE is required to maintain interest lists pertaining to NPDES permits, and an interest list

will be maintained for any parties who want to be informed when a permit is being proposed to include trading. When a permit is being revised to incorporate trading, the public notice required for all permit renewals and major modifications will now also specify that trading is being proposed in the draft permit.

7. Verification and Enforcement

Verification and enforcement of the trading provisions of the permit will follow the standard tools and procedures of the national NPDES program, including but not limited to certified Discharge Monitoring Reports, appropriate annual reports, inspections, and any other reporting terms specified within the permit. Credits generated by wastewater point sources will be verified by MDE's Water Management Administration (WMA) via standard permit compliance protocols.

Ongoing information regarding permits can be tracked by using EPAs national tool at https://echo.epa.gov/facilities/facility-search?mediaSelected=cwa. MDEs own tool for permit status and permit documentation is located at http://mes-mde.mde.state.md.us/WastewaterPermitPortal/.

Finally, see the Agricultural Trading Section IV of this manual for specifics covering Agricultural credits, which will drive the required regulatory terms of the discharge permit.

8. Institutional Framework and Structure

MDE will be responsible for oversight and management of the wastewater point source portion of the trading program, including responsibility for policy decisions on issues such as eligibility, credit certification, verification, compliance monitoring, and enforcement. MDE may elect to contract some activities, such as credit verification or audits of transactions, to third parties.

Implementing procedures outlined in the Trading Manual requires staff resources. It is MDE's intention to work with other State agencies to get a trading program established using available resources. As the program evolves, a fee-based approach may be adopted.

Section III

MS4 Stormwater Point Source Trading

Background

One of the goals of the Maryland Nutrient Trading Policy is to accelerate progress toward meeting Bay nutrient and sediment reductions by providing additional options and flexibility for Phase I and Phase II MS4 permittees. Trading will allow MS4 permittees to achieve permit compliance with impervious surface area restoration requirements by acquiring nutrient and sediment credits from both wastewater point sources (e.g., WWTPs) and nonpoint sources, such as agricultural operations.

The goals of Maryland's NPDES MS4 permits are to control stormwater pollution, improve local water quality, work toward meeting water quality standards, and ensure Bay nutrient and sediment reductions. The permits require entities to perform watershed assessments and develop watershed restoration plans as part of a Chesapeake Bay TMDL urban stormwater strategy, which provides a schedule for taking actions to attain water quality goals. The restoration plans established to comply with the MS4 permits must be designed to attain all local receiving water quality criteria.

Maryland's Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated (Accounting Guidance) was incorporated into MS4 permits to help guide restoration work. The use of nutrient trading will be an acceptable option as outlined in this Trading Manual once the necessary regulatory and permitting frameworks have been established. Specifically, credits that are generated by agriculture nonpoint sources and wastewater point sources will be allowed to be used to meet a portion of the MS4 permit requirements.

1. Key Principles

In addition to Guiding Principles and Key Provisions that are delineated in Section I and apply to all trading parties, the following Key Principles apply to the acquisition of credits by MS4 stormwater point sources:

- MS4 permittees are ultimately responsible for ensuring that all of their permit restoration goals are met within the time limit specified in their permit
- MS4 permittees are allowed to treat a permit-specified portion of their impervious area restoration requirement through trading with wastewater point and/or nonpoint sources
- Wastewater point and agriculture nonpoint source credits can be acquired at any time during the permit term to contribute to an MS4 permittee's restoration requirement provided the credits conform to the schedule specified in the approved restoration plan
- MS4 permittees are subject to all applicable ratios during each cross-sector trade as described in the respective section of the Trading Manual
- MS4 permittees must report the number of acquired credits and the source of the credits in annual reports submitted to MDE
- MS4 permittees must acquire credits in perpetuity or replace expired term credits under approved trades with new credits and/or eligible stormwater management BMPs of equivalent impervious acres to maintain the level of restoration achieved in previous years

2. Eligibility Requirements

MS4 permittees are eligible to acquire credits if no unaddressed permit violations exist that are considered by MDE to be Significant Non-Compliance as defined in Section III.7 (Enforcement). MS4 permittees may only enter into a trade if the use of trading is specifically authorized under the terms of the MS4 permit.

3. Credit Requirements

The following requirements apply to all acquired credits:

- MS4 permittees must acquire the equivalent number of credits for all three pollutants (nitrogen, phosphorus, and sediment) to count toward one impervious acre of restoration
- Plans by MS4 permittees to utilize performance credits generated by wastewater point source permittees must be formalized through modification of the wastewater discharge permits

4. Applying Trading to MS4 Permit Restoration Requirements

All MS4 stormwater point sources have impervious area restoration requirements. Under MDE's Trading Manual, and new regulations or MS4 permits, a portion of each jurisdiction's impervious area restoration requirement will be allowed to be met through the purchase of nonpoint source or wastewater point source credits. As is shown in the table below, in the Phase I MS4 permit jurisdictions, an estimated 195,504 total impervious acres are untreated, a portion of which may be addressed through trading. These numbers are shown here for illustrative purposes only and may change as further information on impervious surface estimates is received and approved by MDE.

Table 1. Example: Phase I MS4 Impervious Area Restoration Requirements

Phase I MS4 Permittee	Untreated Impervious Area* (acres)
Anne Arundel	29,311
Baltimore City	21,455
Baltimore County	30,180
Carroll	6,720
Charles	7,048
Frederick	6,725
Harford	9,413
Howard	10,222
Montgomery	18,884
Prince George's	30,525

SHA	25,021
TOTAL	**195,504**
*Impervious acres are 2015 estimates based on approved or pending MS4 impervious area estimates and are for illustrative purposes only.	

MDE has developed a method in the Accounting Guidance to relate the reduction in pollutant loads from new and alternative treatment practices into an equivalent impervious acreage. For this Trading Manual, the load calculations from the Accounting Guidance have been updated to reflect new information provided in the CBWM version 5.3.2 and are to be used in estimating an equivalent number of nutrient credits.

The impervious area equivalent method is based on the difference in pollutant load, or the Delta, between one acre of urban impervious runoff and one acre of forested runoff. For example, when one acre of impervious land is converted through treatment to the equivalent of one acre of forested land, 12.26 lbs/acre/year of TN runoff is reduced at the Edge of Segment (EOS) (see Table 2 below). Because one impervious acre is equivalent to the load reduction of 12.26 lbs/acre/year of TN, 1.62 lbs/acre/year of TP, and 0.62 ton/acre/year of TSS; therefore one equivalent impervious acre of restoration is achieved through acquiring 12.26 TN credits, 1.62 TP credits, and 0.53 TSS credits. The MS4 permittee must acquire the equivalent number of credits for all three pollutants listed below to count toward one impervious acre of restoration but may acquire credits from multiple sellers and practices, either individually or through an aggregator or broker.

Table 2. CBP Pollutant Loads for Impervious and Forest Cover

Parameter	Impervious (lbs/acre/yr)	Forest (lbs/acre/yr)	Delta (lbs/acre/yr)
TN	15.34	3.08	12.26
TP	1.70	0.08	1.62
TSS	0.56*	0.03*	0.53*
*TSS is calculated in tons/acre/yr. Source: CBWM 5.3.2 Maryland statewide average urban loading rates without BMPs provided by the Science Services Administration (SSA), MDE, 2015.			

The table below illustrates the estimated total number of credits, based on the impervious acre equivalent of load reduction of 12.26 lbs of TN, 1.62 lbs of TP, and 0.53 tons of TSS, that are needed by Phase I MS4 permittees to treat all untreated impervious surfaces, a portion of which may be achieved through trading.

Table 3. Estimated Total Number of Credits Needed to Treat All MS4 Phase I Untreated Impervious Areas

Phase I MS4 Permittee	Untreated Impervious Acres[1]	TN Credits (lbs)	TP Credits (lbs)	TSS Credits (tons)[2]
Anne Arundel	29,311	359,353	47,484	15,535
Baltimore City	21,455	263,038	34,757	11,371
Baltimore County	30,180	370,007	48,892	15,995
Carroll	6,720	82,387	10,886	3,562
Charles	7,048	86,408	11,418	3,735
Frederick	6,725	82,449	10,895	3,564
Harford	9,413	115,403	15,249	4,989
Howard	10,222	125,322	16,560	5,418
Montgomery	18,884	231,518	30,592	10,009
Prince George's	30,525	374,237	49,451	16,178
SHA	25,021	306,757	40,534	13,261
TOTAL	**195,504**	**2,396,879**	**316,716**	**103,617**

[1]Impervious acres are 2015 estimates based on approved or pending MS4 impervious area estimates and are for illustrative purposes only.
[2]TSS credits are reported here in tons per year; a calculation must be made to convert to credits in pounds per year.

5. Achieving Local Water Quality Goals

One of the guiding principles of Maryland's Trading Policy is that trading may not cause nor contribute to local water quality impairments nor delay any approved schedule for attainment of local water quality standards. MS4 permits require entities to establish restoration plans to attain all local receiving water quality criteria. Costs of achieving nutrient and sediment reductions may be controlled by using alternative means such as trading, once specifically authorized under the terms of the MS4 permit. Trading will not relieve the stormwater sector from other restoration goals that have longer time horizons, but rather, is designed to allow the stormwater sector to meet nutrient and sediment goals sooner than would otherwise be financially feasible. Therefore, the restoration plans may use a combination of structural and nonstructural controls as well as trading to address Chesapeake Bay and local water quality protection. The use of trading does not relieve MS4 permittees of the responsibility to address local water quality issues as identified in their permits. Any trade involving an MS4 permittee must be reported in MS4 annual reports (see Section III.6.) that document and ensure that approved local TMDL implementation plans and end dates for meeting water quality criteria can be met.

6. Documentation and Reporting of Credits

When authorized in the MS4 permit, MDE will accept nonpoint source credits certified by MDA for application toward MS4 permit restoration requirements. MDE's WMA will require MS4 stormwater point sources to produce proof of nonpoint source credit purchases by providing

information on the number of acquired credits and their registration numbers. This documentation must be recorded, tracked, and clearly posted on the web-based registry as part of the public transparency protocols.

When authorized in the MS4 permit, MDE will accept credits generated by Maryland wastewater point source permittees for application toward MS4 permit restoration requirements. The MS4 permittees using this option shall submit in their annual reports copies of the modified WWTP permits and the required WWTP annual demonstration report.

7. Enforcement

MS4 permittees that do not maintain compliance with all conditions of their permits may be considered by MDE to be in Significant Non-Compliance and subject to MDE's enforcement procedures in accordance with the Environment Article of the Annotated Code of Maryland. Significant Non-Compliance, as determined by MDE, is defined as an activity that meets any of the following criteria:

- Represents willful, chronic, or recalcitrant behavior
- Substantially deviates from the terms of a permit, order, settlement agreement, or from statutory or regulatory requirement
- Is not corrected within 90 days or the permittee has not taken corrective action as directed by MDE

In the event of a default in a trade contract or the invalidation of credits, the MS4 permittee using those credits remains responsible for complying with MS4 permit requirements that would apply if the trade had not occurred.

8. Public Outreach and Stakeholder Involvement

All credit transactions by the MS4 will be reported in annual reports submitted to MDE as required by the MS4 permit. Each MS4 permittee is required to make these reports available to the public by posting them on the jurisdiction's website.

Section IV

Agricultural Credit Generation and Acquisition Guidelines

Background

Section I of this Trading Manual outlines Guiding Principles for Trading in Maryland and delineates Key Provisions applicable to all sources and trading partners. Section IV uses the 2008 Phase II–A and Phase II-B Policy and Guidance documents as the basis for describing Key Principles and policy to provide guidance governing the generation and exchange of agricultural nutrient and sediment credits. The two initial documents have now been combined to provide essential information on the requirements and procedures for participating in trading with agricultural nonpoint source partners. It is anticipated that the water quality trading with the agricultural community will provide financial incentives to farmers and landowners, who would be the credit generators and sellers, for the implementation of additional practices to prevent and/or reduce runoff and emissions. The potential users, or the buyers of agricultural credits, would be public and private entities, regulated and non-regulated sources, and other interested watershed stakeholders. This section is both an extension and an integral part of the Maryland Trading Policy.

Maryland Nutrient Trading/Tracking Tool (MNTT)

Maryland's agricultural trading program is a performance, not a practice-based, program. To quantify credits and facilitate trading with agricultural operators and landowners, MDA developed the MNTT, which is a state-specific version of the calculation component incorporated into the web-based trading platform known as the Chesapeake Bay Nutrient Trading/Tracking Tool (CBNTT). This Maryland-specific calculation tool is utilized to determine baseline compliance, estimate nutrient and sediment loads and reductions, and compute credits generated by agricultural BMPs. The use of the MNTT for agricultural trades is mandated by regulation and it can be found on the Maryland Nutrient Trading Program website, www.mdnutrienttrading.com.

1. Key Principles

In addition to Guiding Principles and Key Provisions, which are delineated in Section I and apply to all trading parties, the following Key Principles specifically apply to the generation and sale of agricultural nutrient and sediment credits:

- Agricultural credit generators must be in compliance with all local, state, and federal laws, regulations, and programs
- Nitrogen, phosphorus, and sediment baselines are calculated and treated individually. Any generator of agricultural nonpoint source credits must first demonstrate that baseline water quality requirements for the watershed have been met
- The entire farm tract in aggregate must meet the more stringent of the applicable Bay TMDLs for each watershed or the State TMDLs that has been adopted for an impaired waterbody
- BMPs funded by federal or state cost-share or county mitigation banking programs cannot be used to generate credits during the contractual life span of the practice

- Water quality trading is not intended to accelerate the loss of productive farmland. Therefore, credits will not be generated under this policy by taking whole or substantial portions of farms out of production solely to provide nutrient credits for use off site
- An agricultural practice can generate credits only when it has been verified as installed or placed in operation

2. Eligibility

2.1 Eligible Participants

Eligible generators and sellers include the following:

- Owners of agricultural operations
- Renters or lessees who can demonstrate permission from the owner to generate and sell credits for the term of the credit certification
- Aggregators and brokers who can demonstrate permission from the owner to submit credits for certification and/or sell nutrient and sediment credits
- Parties engaged in removing agricultural nutrients from the environment able to demonstrate permission by the owner to conduct such removal activities
- Maryland state entities

2.2 Eligibility Requirements

Determination of eligibility is a two-step process. The first step consists of an assessment of eligibility to trade and the ability to generate credits above the baseline requirements. The second step involves the certification, verification, and registration of credits. In order to be eligible for participation, agricultural operations need to meet the following prerequisite in addition to those listed in Section I:

- Must have a current Nutrient Management Plan (NMP), an implemented Soil Conservation and Water Quality Plan (SCWQP), and, if applicable, a Waste Management System Plan (WMSP) or a Comprehensive Nutrient Management Plan (CNMP)

3. Agricultural Baselines

Owners and/or operators of agricultural entities wishing to generate credits are required to have achieved a level of nutrient or sediment reduction known as a baseline.

3.1 Baseline Requirements

Baselines are applied to the crop or pasture fields being used to generate credits. To establish baseline compliance, a seller must first achieve the more stringent of:

a) The annual Chesapeake Bay TMDL allocations for agriculture in the applicable basin, or
b) The annual State TMDL allocations adopted for the watershed segment where the credits are generated.

An agricultural operator/landowner has to ensure that the entire farm operation in aggregate has achieved the appropriate loading rate. Any animal confinement area must be in compliance with specific practice-based requirements in order for the whole tract to meet baseline.

3.2 Baselines as Annual Loading Allocations

Baselines, or numeric per-acre annual loading allocations, for each of the State's five major basins are determined by the calculation of nitrogen, phosphorous, and sediment EOS loads (in pounds per acre) derived from the CBWM 5.3.2., consistent with the Bay TMDL. State TMDL load reductions for impaired watersheds are established by MDE.

3.3 Individual Nitrogen, Phosphorus, and Sediment Baselines

If baseline is met for one pollutant, credits can be generated and traded for that one pollutant, nutrient or sediment, even if the baselines for other pollutants are not met.

3.4 Eligible Practices

Any combination of current documented agronomic practices and existing adopted and installed structural BMPs in the Bay Program-approved Category I (see 4.1 and "Credit Generating Practices" below) can be utilized to meet baseline load reductions. Category 2 practices required by State regulation also will be applied to baseline calculations. Baseline requirements may necessitate the implementation of additional BMPs to achieve needed load reductions.

3.5 Use of the Maryland Nutrient Trading/Tracking Tool

Determination of whether the agricultural operation has reached the baseline (i.e., target per-acre loading) shall be made using the MDA-approved, performance-based calculation tool (MNTT) available online at the trading program's website.

4. Credit Generation

Once it has been determined that baseline requirements for the watershed have been achieved, the implementation of additional water quality improvements can produce tradable credits. Detailed below are the guidelines for the generation of agricultural credits.

4.1 Generation of Tradable Credits

Tradable credits can be generated from any Category I planned agronomic, land conversion, or structural practice, which is shown to reduce nutrient and sediment loadings below the applicable baseline. Credits will be determined using BMP efficiency rates that utilize the latest scientific and technical information and are derived from the CBWM. Consistent with the CBWM, multi-year projects with variable credit production capacity will be assumed to generate credits that reflect average annual performance. MDA will consider all aspects of the credit generation proposal and methods, as well as calculations for determining nutrient reductions from activities that decrease nutrient application, increase nutrient uptake and retention, or result in net export of nutrients from

the watershed.

4.2 Duration of Credit-Generating BMPs and/or Practices

A practice can generate credits only when it is installed and functioning. Credit-generating BMPs and/or practices may be certified for more than one year and the number of years a credit-generating BMP and/or practice is valid will be included in the credit registration.

4.3 Application of Credits

Credits may only be applied in the year in which they are generated and cannot be banked for future years.

5. Credit Generating Practices

Agricultural credit-generating practices include BMPs in three categories. At present, only those in Category 1 may be used to generate credits. All practices must be installed and maintained according to U.S. Department of Agriculture (USDA)/Natural Resource Conservation Service (NRCS) or MDA's approved specifications and standards.

5.1 Category 1 Practices: BMPs with the Bay Program-Approved Load Reductions

Category 1 practices are those currently in widespread use in the Chesapeake Bay watershed. They have well-documented installation and maintenance specifications and well-established and understood removal efficiencies. These practices have received rigorous peer review by the CBP, and their efficiencies have been incorporated into the CBP loading and water quality models. They also are incorporated into the online calculation tool, which will apply their appropriate loading rates. Table 1 below lists all "Approved BMPs" currently in this category.

Annual Agronomic Practices

Credits can be generated from existing or planned Category 1 agronomic load reduction practices that do not count toward the baseline requirements. Such agronomic practices reduce or minimize runoff or air emissions, and examples include reductions in nitrogen fertilizer application, precision agriculture, cover crops, and no-tillage. Since these practices must be done every year to generate credits, they are considered annual practices for the year they are employed, regardless of what year the practices were first initiated.

Structural Practices

Planned structural Category 1 practices may generate credits and may generate them over multiple years as long as they are properly maintained. Such practices reduce or minimize nutrient or sediment loss through the construction or installation of physical edifices, barriers, or systems to trap, block, or filter pollutants and examples include manure sheds, grassed waterways, and constructed wetlands. Credits can be generated from existing structural investments that do not count towards the baseline requirements if the structure was funded through state or federal cost-share or county mitigation programs but has exceeded its "funded lifespan," i.e. the standard NRCS

structural lifespan or Maryland agricultural cost-share (MACS) requirement, and is now being maintained by the owner/operator at his own expense. These latter structural practices will require inspection to ensure that they have been properly maintained and are still functioning effectively.

Agricultural Land Conversion

Credits can be generated from the conversion of several types of agricultural land to a less nutrient-intense land use. Examples include riparian forest buffer, riparian grass buffers, wetlands, and conversion to alternate crops, hayland, or pasture. Credits cannot be approved for the idling of whole or substantial portions of productive farm for the sole purpose of providing nutrient credits. Credits can only be generated for conversions that do not count towards the baseline and meet all the eligibility criteria of a structural practice.

5.2 Potential Future Trading Options

Category 2 Practices: BMPs Requiring Technical Review

Category 2 practices are currently in use in the Chesapeake Bay watershed but require additional scientific and technical review to ascertain appropriate installation and maintenance specifications and removal efficiencies. This category may also include those practices required by State regulation. MDA and its Technical Review Committee reserve the right to adjust the uncertainty ratio applied to these practices to reflect a higher degree of uncertainty in performance. Some of these practices may be in the initial stage of the CBP peer review process and already may have been given interim efficiencies. Practices in this category are also listed in Table 1 below.

Category 3 Practices: Other BMPs

Category 3 practices are new technologies or innovative BMPs that are not yet in widespread use and for which no recognized estimates of removal capacity exist. These practices will be examined by MDA and the Technical Review Committee to ascertain appropriate specifications and determine an appropriate uncertainty ratio. The use of any BMP in this category will require submission of a credit proposal that details project installation, operation, maintenance, and monitoring. Practices that fall into this category are listed in Table 1 below.

Category 2 and 3 practices will be reviewed on a case-by-case basis and may include requirements for demonstration projects, the collection of sufficient data to evaluate results, and any other information needed to determine the validity of the credits. In some cases, development of the specifications and certification of the credits in these categories could be a multi-year process.

TABLE 1. TRADEABLE BMP'S

Category 1 **BMPs with Approved Load Reductions**	**Category 2** **BMPs Requiring Technical Review**	**Category 3** **Other BMPs Requiring Technical Review**
Riparian/Conservation Forest Buffers	Phosphorus Sorbing Materials	Bioreactors
Riparian/Conservation Grass Buffers	Oyster Aquaculture	Greenseekers
Wetland Restoration	Algal Turf Scrubbers	

Tree Planting	Floating Wetlands	
Water Control Structures	Irrigation Management	
Stream Restoration	Manure Management	
Horse Pasture Management	Need to update status of some of these	
Cover Crops (Early and Late Planting)		
Commodity Cover Crops		
Alternative Crops		
Cropland Conversion		
Dairy Precision Feeding		
Precision Grazing		
Decision Agriculture		
Enhanced Nutrient Management		
Conservation Tillage		
Continuous No-Till		
Animal Waste Management: Livestock		
Animal Waste Management: Poultry		
Barnyard Runoff Control		
Loafing Lot Management		

Table 1 represents the most current list of practices for credit generation. This list is not inclusive and will be modified as needed.

6. Trading Ratios

Trading Ratios are used in determining the credits that can be derived from nutrient and sediment reduction activity. The following ratios are applied to agricultural credit calculations.

6.1 Delivery Ratios and Factors

For agricultural nonpoint sources, two types of Delivery Ratios are applied. The MNTT will automatically apply the appropriate ratios during the credit calculation process.

Edge of Segment (EOS) Delivery Factor

The EOS load is the amount of land-applied nutrients expected to reach the surface waters at the boundary of the watershed model segment through surface runoff, groundwater flows, and atmospheric deposition. The EOS delivery factor represents an adjustment between the edge-of-field nutrient load as calculated by USDA's national Nutrient Tracking Tool (NTT) and the edge-of-segment load as defined by the CBWM.

In-Stream Delivery Factor

The in-stream delivery factor represents the pollutant effect of the reductions between upstream and downstream points and is largely the function of the distance from the edge of the watershed segment to the fall line of the Chesapeake Bay. This factor is derived directly from the CBWM.

6.2 Uncertainty Ratio

Uncertainty ratios are used to compensate for possible discrepancies in the relationship between credit generation models and actual resulting pollution reductions resulting from various BMPs. The discounted efficiencies of eligible BMPs in the CBWM are automatically applied by the MNTT. An uncertainty ratio of at least 2:1 will be applied to transactions involving credits generated by nonpoint sources and acquired by wastewater point sources, unless otherwise justified, while an uncertainty ratio of 1:1 will be applied to stormwater point sources trading with nonpoint sources.

6.3 Reserve Ratio

The reserve ratio applies to all agricultural credits at the time of sale and will be set at 5 percent.

7. Agricultural Credit Certification Process

The completion of a Maryland Agricultural Nutrient Credit Certification and Registration Form (CCR), (Attachment A), is necessary to enable MDA to review all aspects of the credit generation proposal and to ensure that the existing farm conditions and proposed enhancements will meet the requirements of the trading program. CCR forms can be downloaded from the Maryland Nutrient Trading Program website (www.mdnutrienttrading.com). The completed form and all other required information should be submitted to the Maryland Department of Agriculture, 50 Harry S. Truman Parkway, Resource Conservation, Annapolis, MD 21401 Attention: Nutrient Certification Program.

7.1 Application/Credit Review

A person who applies to MDA for approval of agricultural nonpoint source nutrient or sediment credits must submit the following:

- A complete and signed CCR form
- A copy of the Farm Summary Worksheet generated by the MNTT
- A copy of the current NMP
- A copy of the current SCWQP with a map identifying the location and boundaries of the operation and showing field identification numbers, field acreage, and the location of BMPs
- The specifics of any credit generation proposal

MDA will review applications to verify that:

- Generator is eligible to sell credits
- All legal and regulatory compliance requirements are met
- Baseline requirements are met
- All credit generating improvements qualify for certification

- The landowner and the operator have consented in writing to all of the requirements and the waiver of confidentiality for any information submitted to MDA, including but not limited to the operator's NMP and SCWQP
- Credit calculations and all other information, are correct, and
- Necessary identifying and USDA/FSA tract information has been provided

8. Verification

8.1 Initial Verification and Approval of Credits

MDA or its designee shall visit the farm operation to verify that the baseline requirements are met and that the applicant's credit generation proposal is effective and appropriate for reducing the discharge of nutrients and/or sediment from the farm. In addition, credit certifications pending implementation of a BMP or other improvements are subject to further inspection to verify that the proposed generating practice is in place and functioning properly before final certification is granted.

Proposals for improvements for generating credits will be reviewed by MDA, and may include requirements for:

- Demonstration projects
- Collection of sufficient data to evaluate results, and
- Any other information needed to determine the validity of the credits

In some cases, as noted in 5.2 above, development of the specifications and certification of the credits could be a multi-year process.

Once verification is complete, MDA:

- May issue a pre-certification of credits based on pending implementation of the proposed improvements
- May request more information and/or require a technically proficient and certified third-party verifier to conduct an on-site examination prior to the final certification of credits.
- May require additional contractual obligations and/or direct monitoring to ensure the load reductions are met

MDA shall only certify credits once the practice or practices generating those credits are installed and fully operational. All back-up documentation shall be maintained for a minimum of 10 years. Upon completion of the review and approval of any application for agricultural nutrient and sediment credits, MDA will:

- Assign each credit a unique registration number, which will recorded in the online registry
- Track each registered credit

For projects not meeting MDA's certification standards, MDA will:

- Return documents which do not meet credit certification standards to the applicant with the reason(s) for non-approval
- Document the basis for denying an application and provide this information in writing to the applicant

As required by law, all records concerning the certification of credits shall be maintained by MDA and shall be made available for public review in accordance with requests made under the Maryland Public Information Act.

8.2 Annual Verification and Reporting

All trades involving agricultural credits certified by MDA require, at minimum, annual credit verification and reporting. Inspections will be scheduled as appropriate to practice type. An MDA-approved verifier who does not hold an interest in the agricultural operation generating the credits or was not in involved in the original application or qualification of the credits is eligible to perform inspections. Following the site visit to the agricultural operation, the verifier shall provide the following to MDA:

- Information as required on a Verification Report form, and
- Information following an inspection and review of the records for the agricultural operation including:
  - Review of the current NMP and documentation that it continues to be implemented in accordance with MDA's regulations
  - Review of the current SCWQP and documentation that it continues to be implemented and addresses all nitrogen, phosphorus, and sediment runoff and emission issues as specified
  - Documentation that the agricultural management and BMPs implemented continue to meet baseline compliance and that all credit generating practices continue to be operated and maintained in accordance with NRCS standards and the terms of the trading contract, and
  - Confirmation that no deficiencies exist and no corrective measures are needed or a detailed description of deficiencies and required corrective actions.

MDA and MDE, the buyer and the seller, and the owner and/or operator shall receive a copy of the report prepared by the verifier conducting any inspection and records review within 30 days. MDA may issue a corrective action order which allows a time period for repairs or other remedies to bring any deficiencies into compliance. MDA may require additional inspections and written substantiations that corrective measures have been taken. Any such action(s) by MDA does not preclude MDE from exercising its authority when agricultural credits are incorporated into issued discharge permits.

Within 30 days of receiving a copy of the report, an owner or operator may dispute information in the report that owner or operator believes is in error or does not accurately represent the condition or management of the operation and may address these concerns by writing to MDA with a copy to the verifier.

8.3 Departmental Review

MDA shall schedule site reviews and records inspection on at least 10 percent of all traded credits. MDA will assign an approved verifier who meets the same requirements as in 8.2 above.

8.4 Verification Process Protocols

Verifiers approved by MDA to conduct interim inspections and reviews shall:

- Contact the operator in advance of the inspection to make an appointment so the operator or his representative can be present and have records available for the review
- Present a photo identification at the time of the inspection as proof of credentials, and
- Adhere to all biosecurity and other measures necessary to protect health and safety at the operation

An owner or operator may dispute information in the report that the operator believes is in error or does not accurately represent the condition or management of the operation and may address these concerns in writing to MDA and copying the verifier within 30 days of receiving a copy of the report.

MDA may conduct an investigation that may include additional inspections to determine the actual condition and management of the operation.

8.5 MDA Approved Verifiers

MDA shall maintain a list of approved verifiers who:

- Meet MDA's qualifications as described below
- Do not hold an interest in the agricultural operation generating certified credits and are not the same individuals who conducted either the assessment or verification of the operation at the time of application

8.6 Verifier Approval Protocol

An individual may not be approved to act as a verifier unless the individual meets the following requirements:

- Education and experience
- Training, and
- Continuing education

MDA may approve a verifier who meets the following eligibility requirements:

- Has three (3) or more years of experience developing SCWQPs or qualifies as a USDA/NRCS Conservation Planner, Level II
- Is certified in Maryland to prepare NMPs, and
- Has completed MDA's training in the use of the MNTT

A verifier may only remain eligible to perform verifications by completing at least 6 hours of

MDA's approved training within the first year, and 12 hours thereafter every three years.

After the opportunity for a hearing, MDA may deny, suspend, or revoke the approval of any verifier who:

- No longer meets eligibility requirements
- Violates any of the regulatory requirements of this chapter
- Provides MDA with any misleading, false, or fraudulent report
- Fails to promptly provide any report or any record required to be kept
- Fails to meet the continuing education requirements for verifiers
- Is determined to be negligent or incompetent, or
- Fails to act in such a manner that MDA determines provides other good cause to deny, suspend, or revoke approval

9. Enforcement

9.1 Suspension or Revocation of Credit Certification

MDA may suspend or revoke certification of an agricultural nonpoint source nutrient credit for any violation of Title 8, Subtitle 9 of the Agriculture Article, Annotated Code of Maryland, or the following:

- Failure to adopt or install any practice or activity certified pending implementation in conformity with standards and specifications or to differ substantially from the original credit generation proposal
- Failure to maintain any practice or activity as required by the operation's SCWQP
- Failure to take timely steps to remedy any deficiencies reported by the verifier, in response to a corrective action order by MDA, or as a result of MDA's review
- Failure to continue to meet baseline
- Failure to sell credits during their certified lifespan, and
- Performance of any other action or failure to act in such a manner that MDA determines provides other good cause to suspend or revoke the certification

MDA will initiate the decertification process with a corrective action order and will notify MDE of the intent to decertify credits. Failure to resolve the situation in a timely manner and pass re-inspection will result in the issuance of a decertification notice from MDA to the registered credit owner, MDE, and all other affected parties. Notice of decertification will also be published on the trading program website.

An owner or operator may dispute findings of violations or failures by requesting an opportunity to be heard in writing to the Secretary of Agriculture within 30 days of receiving notice. Suspension or revocation of credit certification does not preclude any other punitive action that may be taken by another public or private entity.

Section V

Credit Market Structure

Section V describes the conduct of trades and provides information and guidance on the trading infrastructure, the use of intermediaries, and other elements related to trading. Most of this material was developed in the drafting of the Phase II-B policy and guidance document.

1. Trading System

Trading in Maryland is based on voluntary participation using free market principles. The State provides the infrastructure (see "Trading Infrastructure" in 3. below) to support trading but does not set prices nor transact trades. The marketplace component of the online trading platform enables participants to post and track available or needed credits, but the actual exchange of credits is conducted through permits and/or individual agreements between the buyer and the seller. Separate markets are maintained for nitrogen, phosphorus, and sediment, and the three pollutants may be traded independently or in any combination.

2. Credit Pricing

Credit prices will be determined by the open market through the forces of supply and demand and negotiations between the buyer and the seller. Prices will be a function of these market activities and will not be set by the State or any other entity not party to the trade.

3. Trading Infrastructure

To facilitate trading in the Chesapeake Bay, MDA collaborated with MDE and the states of Pennsylvania and Virginia to develop a web-based trading platform with five components known collectively as the Chesapeake Bay Nutrient Trading/Tracking Tool (CBNTT). The CBNTT was built on the World Resources Institute's NutrientNet suite of tools and is comprised of an agricultural assessment tool, a registry, a marketplace, an administrative module, and an interactive mapping feature. All components of the CBNTT can be accessed through the trading website, www.mdnutrienttrading.com or directly at www.cbntt.org.

3.1 Agricultural Assessment Tool

The Maryland Nutrient Trading/Tracking Tool (MNTT) is a state-specific version of the online calculation tool that incorporates both Chesapeake Bay Watershed Model input and county-specific agronomic data from the national NTT developed by USDA/NRCS. The use of the MNTT is mandatory for determining agricultural baseline eligibility and credit generation capacity.

3.2 Registry

The central online registry is a database system employed to document, catalogue, and track term and permanent credits and completed trades for all sectors. The registry has been designed to track and display credit-generating projects, verification activities, credits, trades, and credit usage

records for all sectors. Each credit entered in the registry has a unique serial number that remains associated with the credit throughout its lifespan as it is issued, traded, and applied. The registry can accommodate both EOS and delivered credits and apply customized trading ratios as necessary.

The registry also serves as a transparent, easily accessible medium for conveying relevant information about credits and trades to all interested parties and the public at large. Besides displaying the information noted above, search functionality provides the capability to summarize data by various parameters, including credit term, pollutant type, trading basin, year, and permit type or number. Public users do not need to open an account to access the registry, but individuals and entities involved in trading, such as aggregators, brokers, verifiers, or jurisdictions, can establish accounts to manage the entire process, from the submission of a proposed project for administrative or technical review to the notification of credit use by the buyer.

3.3 Marketplace

The marketplace serves as central location, accessible either directly on the trading website or through the registry, to assess trading activity, post available credits or credit needs, and exchange information between potential trading partners. Credit sellers may create listings linked to their accounts to display offers while buyers may solicit credits and advertise bids. The marketplace affords a convenient setting for both parties to negotiate prices and trading terms, but its use is not required. Whether the online marketplace plays a role or not, the actual transaction, as noted above, takes place off line between the seller and the buyer.

3.4 Other Components

The administrative module is available only to designated agency or jurisdiction staff and can assist them in the supervision of the overall program and the generation of relevant reports. The interactive mapping feature is used by the assessment tool to delineate field or parcel boundaries and retrieve and forward allied information through the platform interface.

4. The Role of Aggregators and Brokers

Trading may take place between any combination of eligible parties, whether public or private, described earlier in this Section I, 2.8). Although sellers and buyers may trade directly, the State recognizes that aggregators and brokers can play a valuable role in trading when credit purchases entail multiple sellers and/or permitted entities. An individual or an entity may function as either an aggregator or a broker and may act as one or the other depending on the circumstances of the trade. Generally, an aggregator funds, owns, assembles, and manages credits resulting from a number of practices and/or projects. The aggregator may, in turn, sell credits from a single project or from projects pooled together. The aggregator either will have negotiated the right to own credits or will have purchased credits that already have been certified. Alternately, a broker does not own the credits but simply matches credit sellers and credit buyers and helps to negotiate trades between them. This distinction is particularly important because when an aggregator in involved, the buying entity will enter into an agreement directly with the aggregator while when dealing with a broker, the buying entity will enter into an agreement with the underlying credit generator and not the broker (See Trading Involving Permitted Entities in 5.2 below).

Any individual or entity wishing to acquire and/or sell credits and act as an aggregator and/or a broker must meet the following requirements:

- Compliance with all applicable federal, state, and local laws, requirements, and programs
- Demonstration of the ability to acquire and deliver sufficient credits from one or multiple projects or sites to cover both the sale and any reserve requirements
- Provision of written permission by the credit generator to resell credits
- Documentation that the credit generator meets all compliance and eligibility requirements

5. Liability and Risk

5.1 Liability and Protection Against Loss

Since credits are estimated pollution reductions and credit suppliers can be subject to a variety of factors outside of their control, credit purchasers have an interest in protecting themselves from credit failure or default in a trade. Usually, permits and/or contractual agreements (see "Contracts" in 6. below) between the trading partners provide the necessary protection.

5.2 Trades Involving Permitted NPDES Entities

It is anticipated that some of the demand for credits will come from permitted sources and will require trades to be incorporated into an NPDES permit. Under the CWA, the responsibility for meeting all permit requirements rests solely with the permittee. The liability for any violation, including noncompliance with the trading provisions of a permit and failure of the credit supplier to produce the required quantity of credits, remains with the permittee, and any necessary enforcement action will be taken against that entity. Since liability cannot be transferred, the permittee's agreement with a credit supplier is likely to include provisions to address credit supplier violation of terms or failure to produce the required quantity of credits. These provisions may include monetary compensation and/or delivery of alternate credits.

5.3 Trades Not Involving Permitted Entities

For all other trades, agreements between trading partners also should contain provisions for dealing with the violation of contract terms or credit failure. In the event of default by a credit supplier to a non-permitted entity, the contract is the legally enforceable vehicle for imposing monetary damages or other forms of relief.

6. Contracts

MDE and MDA do not impose specific contract provisions and the use of standardized contracts is not required. In drawing up a contract, however, liability and other substantive issues involved for both the seller and the buyer should be fully delineated and understood. Any proposed contract should be reviewed by legal counsel before signing. Typical contracts should contain the elements enumerated below:

- Identification and contact information of the parties, with signatures

- Location of credits
- Duration of the contract in years
- Quantity of credits to be exchanged in each year of the contract
- Method(s) of credit generation
- Credit prices
- Obligations of the seller, including agreement to:
  - Supply sufficient credits
  - Properly maintain BMPs or other specified facilities
  - Allow regular inspections
  - Comply with all applicable federal, state, and local requirements
  - Continue to meet and maintain baseline compliance
- Obligations of the buyer, including agreement to:
  - Perform required inspections, and if needed, through a certified third party
  - Provide annual inspection reports to MDE, MDA, and other interested parties
  - Purchase additional credits necessary to meet mandated retirement ratio
  - Make prompt payment based on contract provision
- Provisions for violation of the contract terms, including monetary compensation and/ or delivery of alternate credits

In addition to the above, the parties may add supplementary elements to address individual requirements or preferences. The confidentiality of contracts may depend on the use of the credits and whether the purchaser is a permitted entity or not.

7. Trade Approval

For approval of point source trades, see Section II. For trades with MS4 jurisdictions and industrial stormwater permittees, see Section III. If the trade is between a generator/seller of agricultural nutrient credits and a buyer/user not subject to a permit, MDA will provide review and enter trade into central registry. The buyer's applications for such trades shall provide specific information and include the following:

- The owner of the credits
- The purchaser of the credits, and if applicable, permit number
- The trading basin
- The time period (number of years) for the trading arrangement
- The number and type of credits to be exchanged each year during this period
- How the number of required credits to be exchanged was determined
- Source of the credits

MDA requires the submission of an approved CCR form (see Attachment A) along with the trade request. Additional information or an onsite examination may be required prior to approval of a trade. All supporting documentation shall be maintained for a minimum of 10 years. The State reserves the right to limit the quantity and type of credits bought by any entity.

GLOSSARY

The terms in this glossary are meant to be, at a minimum, consistent with the Federal Clean Water Act and EPA's 2003 Trading Policy.

Aggregator: A person or entity that collects and compiles credits from individual agricultural nonpoint sources to resell them.

Agronomic Practices: Annual crop and/or soil practices that reduce or minimize the probability of nutrient or sediment loss into surface and/or ground waters.

Agricultural land: Land used to produce food, feed, fiber, sod, animals, plants, trees, or plants in containers, or for out-of-ground production. Such land has an Agricultural Use Assessment as determined by the Maryland Department of Assessments and Taxation.

Baseline (Trading Baseline): Pollutant control requirements, practices, actions, loading rates or levels of reductions that must be in place before credits can be generated. All credit generators and/or sellers must first meet trading baseline, as defined in the Trading Policy, before they can enter trading market and participate in a trade, exchange or sale of credit.

Best Management Practice or BMP: BMPs include, but are not limited to, agricultural and urban, structural and nonstructural pollution control, operation, and maintenance procedures and practices that prevent or reduce pollutants and/or mitigate flooding.

Bubble or "Overlay" Permit: A NPDES permit issued to a group of point source dischargers that supplements individual permits by establishing permit limits and other requirements for one or more pollutant of concern that are not fully addressed in the existing individual permits. A "bubble" or "overlay" permit is an alternative group permitting approach available to either multiple owners or single owners of multiple facilities for implementing the nutrient caps. Instead of multiple caps, one for each facility in a watershed, the central owner may elect to receive a single permit with one nutrient loading cap for all of the facilities it operates in the watershed. Technology-based treatment requirements for nutrients at each of the individual facilities may also be included either in the overlay permit or in each of the required individual permits.

Cap: A legally enforceable aggregate mass load limit contained in a discharger's permit.

Capacity Credits: Credits generated by a WWTP by maintaining flow at less than the design flow basis on which the assigned nutrient WLA is based.

Capacity Management Plan: MDE's Guidance Document to assist local governments and other community WWTP owners in Maryland to determine plant capacity and to track the remaining available capacity for allocation,

Chesapeake Bay Watershed Model: The Chesapeake Bay Watershed Model simulates loading and transport of nitrogen, phosphorus, and sediment from pollutant sources throughout the Bay

watershed and provides estimates of watershed nitrogen, phosphorus, and sediment loads resulting from various management scenarios.

Credit or Pollutant Reduction Credit: A measured or estimated unit of pollutant reduction per unit of time at the discharge location that can be generated and sold or exchanged in a trade A credit is generated by load reductions that are greater than those required of the credit generator by a regulatory requirement or established under a TMDL, a.k.a. baseline. The resulting credits are expressed as mass per unit time (e.g. pounds per year for TN and TP, or in the case of TSS, tons per year) adjusted to account for applicable trading ratios.

Credit Generators/Sellers: Sources that reduce pollution beyond their baseline requirements, and generate credits that can be exchange or sold to credit users/buyers.

Credit Users/Buyers: Entities that acquire and/or purchase credits to meet their regulatory obligations; offset new loads; or contribute towards water quality improvements, or as a reserve, insurance against credit failures.

Edge of Segment (EOS) Load: The amount of land-applied nutrients expected to reach the surface waters at the boundary of a Chesapeake Bay Watershed Model segment through surface runoff, groundwater flows, or atmospheric deposition.

Effluent Limitation Guidelines and Standards (ELGs): A regulation published by EPA under section 304(b) of the CWA that establishes national technology-based effluent requirements for a specific industrial category.

Enhanced Nutrient Removal (ENR): A wastewater treatment technology that is capable of reducing the nitrogen and phosphorus concentrations in wastewater effluent to achieve permit limits equivalent to concentrations of no more than 4 milligrams per liter TN and 0.3 milligrams per liter TP, as calculated on an annually averaged basis.

Expanded Point Source: Point Source requiring a higher wasteload allocation than its existing wasteload allocation.

Floating Cap: An effluent limitation applicable to an ENR facility financed by the BRF. The floating cap is calculated at the end of each calendar year using the actual annual flow for the facility times a concentration of 4 mg/l TN or 0.3 mg/l TP and converted to units of pounds per year (lbs/yr).

Industrial Stormwater (Stormwater Discharges Associated with Industrial Activity): The discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under Part 122. For the categories of industries identified in this section, the term includes, but is not limited to, stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters; sites used for the storage and maintenance of

material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with stormwater drained from the above described areas. Industrial facilities include those that are federally, State, or municipally owned or operated that meet the description of the facilities listed in 40 CFR 122.26(b)(14). The term also includes those facilities designated under the provisions of 40 CFR 122.26(a)(1)(v). See 40 CFR 122.26(b)(14).

Impervious surface: Any surface that does not allow stormwater to infiltrate into the ground.

Impervious surface area: The total extent of all impervious surfaces.

Minor (Non-significant) WWTP: WWTPs with the design capacity of less than 500,000 gallons per day.

Minor Permit Modification: A discharge permit revision not requiring a formal public participation process.

Municipal separate storm sewer system (MS4): A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes; (ii) Designed or used for collecting or conveying storm water; and which is not a combined sewer or part of a Publicly Owned Treatment Works. See 40 CFR 122.26(b)(8) for full definition.

New Point Source: A point source with no wasteload allocation in the 2010 Chesapeake Bay TMDLs.

Non-regulated municipal stormwater: Stormwater runoff from a conveyance or system of conveyances owned or operated by a municipality or other public body not covered under a NPDES MS4 permit.

Nonpoint Source: A source of pollution that is not from a discernible, confined and discrete conveyance or other point source as defined in Section 502(14) of the Clean Water Act, 33 U.S.C. § 1342. The pollutants are generally carried off the land by stormwater. Common nonpoint sources include agriculture, forestry, urban sites, and mining.

Nonpoint Source Credit (see Credit or Pollutant Reduction Credit (Nonpoint Source Credit))

Nutrient Reduction: (see Pollutant Reduction)

Offset: 1.) n. Offsite treatment implemented by a regulated point source for the purposes of meeting its permit limit. 2.) n. Load reductions that are acquired by a new or expanding point source from other point sources, and/or nonpoint sources, or load reductions obtained through the transfer of flow from an OSDS to an ENR facility to offset the new point source discharge within an impaired watershed, such as the Chesapeake Bay or a local tributary. 3.) v. to compensate for increased loads beyond the facility's loading baseline.

Onsite Sewage Disposal System (OSDS): A sewage system that discharges treated effluent into the ground, such as a septic system.

Performance Credits: Credits based on the difference between the existing floating cap and a floating cap based on the new projected optimized annual average effluent concentrations. The projected new concentrations shall not be based on assumed improved performance beyond demonstrated historical performance levels unless data from similar representative facility is available and relevant.

Phase I MS4: A municipal separate storm sewer system owned and operated by a municipality or other public body with a population of greater than or equal to 100,000 and covered under a National Pollutant Discharge Elimination System (NPDES) MS4 permit. For full definition see 40 CFR. 122.26(b)(4) - for large MS4, and 40 CFR 122.26(b)(7) - for medium MS4.

Phase II MS4: A municipal separate storm sewer system owned and operated by a municipality or other public body with a population of less than 100,000 and covered under a National Pollutant Discharge Elimination System (NPDES) MS4 permit. For full definition see 40 CFR 122.26(b)(16).

Point Source: Any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture. See Section 502(14) of the Clean Water Act, 33 U.S.C. 1362. .

Pollutant Reduction (Nutrient and/or Sediment Reduction): The difference in nutrient and/or sediment discharges to surface and/or ground waters achieved by activities such as best management practices or technical upgrades, compared to the current load or the applicable baseline after meeting eligibility requirements. In addition, point sources may generate credits by maintaining flow at less than the design flow basis of the assigned nutrient WLA.

State TMDLs (or State-established TMDLs): TMDLs developed either by the State of Maryland alone, or in as part of a multi-jurisdictional effort (with other states or the District of Columbia).

Registry: A system utilized to record, manage, and track certified credits and other pertinent data.

Regulated MS4 jurisdiction/regulated MS4 community: A municipality or other public body or group of municipalities or public bodies covered under a Phase I or Phase II NPDES MS4 permit.

Retirement Ratio (see Trading Ratios)

Significant POTW or WWTP: A publicly owned treatment works (POTW) or a federal or privately owned sewage treatment plant with a design capacity of 500,000 gallons per day or greater, or an industrial point source with daily discharge loadings of nitrogen or phosphorus equivalent to a significant POTW.

Stormwater: Water that originates from a precipitation event.

Stormwater Point Sources: Regulated MS4 stormwater dischargers, such as Phase I and Phase II MS4 entities

Structural Controls (Agriculture): Practices with multi-year life spans that are engineered and installed to meet or exceed NRCS Standards in order to reduce or eliminate the introduction of pollutants into surface and/or ground waters.

Technology-Based Effluent Limitation (TBEL): A permit limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration. TBELs for POTWs are derived from the secondary treatment regulations (40 Code of Federal Regulations Part 133) or state treatment standards. TBELs for non-POTWs are derived from national effluent limitation guidelines, state treatment standards, or on a case-by-case basis from the best professional judgment of the permit writer.

Third Party: Any entity or person that assist in facilitating credit exchanges and/or verifying Best Management Practices (BMPs).

Total Maximum Daily Load: A calculation for an impaired waterbody of the maximum amount of a pollutant the waterbody can receive and still meet applicable water quality standards.

Trading: A transaction, the sale or other exchange, through a contractual agreement between credit generators and/or credit sellers and credit users and/or credit buyers of credits that have been authorized or certified by the appropriate State agency.

Trading ratios: Trading ratios are numeric values used to address various forms of risk and uncertainty by adjusting the available credits for the seller or the credit obligation of the buyer. Different types of trading ratios are imposed for different reasons, and one or more may be applied in any given trade. The following are examples of trading ratios used in Maryland:

> **Delivery Ratios:** Delivery Ratios apply discount factors to compensate for a pollutant's travel over land or in water (or both) and may be applied to all, point and nonpoint, sources. Delivery ratios generally account for attenuation (i.e., the rate at which pollutants are reduced through natural processes, such as hydrolysis, oxidation, and biodegradation, on their way through tributaries to the mainstem of the water body). The ratio varies depending on the location of the source from the mainstem of the Bay. Generally, the greater the distance the pollutant has to travel, the greater the pollutant loss will be, although this is not necessarily the case for TSS. This ratio would work to equalize a trade between a source in the headwaters and one near the mainstem. This ratio is also often termed as "location ratio." Delivery ratios will be based on information from applicable and accepted data sources, such as the CBWM. Delivery factors will not be applied to loads involving trades

between buyers and sellers that trade within one of the same watershed segments in Maryland.

Retirement Ratio: The retirement ratio represents the percentage of the total generated credits to be retired to accelerate/contribute toward net water quality benefit. Currently no retirement ratio is applied to trades although that may change in the future.

Reserve Ratio: A ratio that sets aside a portion of generated credits into a pool or cache of credits. Reserve pool credits may be used by the State at its discretion and can be applied annually with priority given to the sector that provided the reserve to:

- Address a lack of readily available term or permanent credits for new or expanding wastewater point sources in need of offsets at startup
- Provide an additional margin of safety to compensate for potential project failure and/or underperformance
- Use for the overall improvement of water quality during a year when the reserve is not being used to manage above situations

Reserve ratios may vary by sector and may be adjusted over time. Currently, reserve ratios of at least 5 % (percent) will be applied to all term and permanent trades.

Uncertainty Ratios: Uncertainty ratios are applied to compensate for possible discrepancies in estimated pollution reductions resulting from inaccuracy in credit estimation methodology or variability in project performance. The application of an uncertainty ratio can also provide a margin of safety in the achievement of water quality goals.

Wasteload Allocation (WLA): The portion of receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs implemented in discharge permits constitute a type of water quality-based effluent limitation (40 CFR 130.2(h)).

Wastewater Point Sources: NPDES-permitted sewage treatment or industrial facilities.

Table of Acronyms

BMP	best management practice
BNR	biological nutrient removal
BRF	Bay Restoration Fund
CBNTT	Chesapeake Bay Nutrient Trading/Tracking Tool
CBP	Chesapeake Bay Program
CBWM	Chesapeake Bay Watershed Model
CWA	Clean Water Act
ENR	enhanced nutrient removal
EOS	edge of stream
EPA	U.S. Environmental Protection Agency
GPD	gallons per day
LA	load allocation
MDA	Maryland Department of Agriculture
MDE	Maryland Department of Environment
MGD	million gallons per day
MNTT	Maryland Nutrient Tracking Tool
MS4	municipal separate storm sewer system
NRCS	Natural Resources Conservation Service
NPDES	National Pollutant Discharge Elimination Systems
OSDS	onsite sewage disposal system
POTW	publicly owned treatment works
SSA	Science Services Administration
TBEL	technology based effluent limitations
TM	technical memorandum
TMDLs	total maximum daily loads
TN	total nitrogen
TP	total phosphorus
TSS	total suspended solids
USDA	U.S. Department of Agriculture
WMA	Water Management Administration
WIP	watershed implementation plan
WLA	wasteload allocation
WQBEL	water quality based effluent limitations
WWTPs	wastewater treatment plants

Attachment A (This will be updated)

State of Maryland
Maryland Department of Agriculture
Nutrient Credit Certification and Registration Form

1. Applicant Information: _____
First Name MI Last Name

_____
Company Name (if applicable) Title

2. Applicant Address: _____
Number Street

_____
Town State Zip

3. Property Information:
If the applicant is not the property owner or renter with control, enter the name of the owner or party in control of the property: _____
First MI Last

4. Property Address: _____
Number Street

_____
Town State Zip

5. Property Description (optional): _____

_____

6. Property County: _____ Watershed: _____

Tract Number: _____ Watershed Segment ID: _____

MD Property View Acct. ID(s): _____ Latitude: _____
_____ Longitude: _____
_____
_____

7. Total Annual Credits Generated: _____ (N); _____ (P)

Total Years: _____

8. Indicate BMPs that will be used to generate credits:

#	Land Conversion/Streambank BMPs		Acres
☐	Wetland		
☐	Land use conversion: hay		
☐	Land use conversion: grass		
☐	Land use conversion: forest		
☐	Land use conversion: perennial crop*		
☐	Forested buffer/fencing		
☐	Grass buffer/fencing		
☐	Streambank restoration	Feet	

#	Field Management BMPs		Acres
☐	Conservation tillage*		
☐	Continuous no-till*		
☐	Enhanced nutrient management*		
☐	Decision agriculture		
☐	Water control structure		
☐	Cover crop*		
		Type	
☐	Commodity cover crop*		
		Type	

#	Livestock Area BMPs
☐	Clean water diversion
☐	Heavy use area protection
☐	Heavy use area pad
☐	Runoff collection & infiltration
☐	Vegetated swales
☐	Water control structure
☐	Treatment wetland

#	Ammonia BMPs
☐	Lagoon cover
☐	Poultry litter treatment
☐	Biofilters
☐	Vegetated environmental buffers

#	Pasture BMPs	Acres
☐	Alternative watering facility	
☐	Horse pasture management	
☐	Prescribed grazing/PIRG	
☐	Fencing (forest buffer)	
☐	Fencing (grass buffer)	

Manure Management
Dairy precision feeding*
Manure export*
Poultry/swine phytase*
Manure injection*

* These BMPs are reflected in crop management scenarios as differences in crop rotation, tillage practices, manure N/P concentrations, nutrient application regimes, etc.

9. Describe any BMP used to generate credits that is not listed above:

_____

_____

10. If any BMPs are not fully implemented, list below those planned and contingent on sale, along with contingency sale date:

_____

_____

11. Category 2 and 3 BMPs (consult BMP list in Users Guide) require additional analysis and technical review. List below any BMPs in those categories:

_____

_____

12. Compliance Statements:

A. I attest that all occupied lands under my operation (owned or rented) are in compliance with Maryland Nutrient Management requirements and I maintain a current Soil and Water Quality Plan, and if applicable, a Waste System Management Plan. Furthermore, I confirm that I am following all recommendations of my plan(s). _____ (initial)

or

B. I attest that I have the authority to represent the owner or controlling party named above and affirm that the referenced lands are in compliance with Maryland Nutrient Management requirements and operate under a current Soil and Water Quality Plan, and if applicable, a Waste System Management Plan. Furthermore, I confirm that all recommendations in any of those plan(s) are being followed. _____ (initial)

C. I attest that all existing BMP's submitted to generate credits are not or no longer subject to contractual obligations under funding provided by any NRCS or MACS program: _____ (initial)

13. Any other pertinent information or additional comments may be entered in box below:

This Form Must be Accompanied by Farm Summary Worksheet from the Maryland Trading Program Website (or Similar Document) and Any Project Proposals for Planned BMPs

14. Signature: _____ _____
Date