MAMWA COMMENTS ON PROPOSED WATER QUALITY TRADING REGULATIONS

JANUARY 8, 2018

I. INTRODUCTION

The Maryland Association of Municipal Wastewater Agencies, Inc. (MAMWA) is comprised of local wastewater treatment agencies that own and operate municipal wastewater treatment plants (WWTPs), also known as publicly-owned treatment works (POTWs), serving approximately 95% of the state's sewered population.

MAMWA served as a Member of the State's Water Quality Trading Advisory Committee (WQTAC), and attended the meetings that led up to the Maryland Department of the Environment's (MDE's) issuance of proposed water quality trading regulations (Proposed Regulations).

MAMWA's clean water agency members are demonstrated leaders in Chesapeake Bay clean-up. In 2016, EPA praised the wastewater sector across the Bay Watershed for exceeding pollutant reduction goals. EPA explained that upgrades and operational efforts at WWTPs resulted in "steep reductions in nitrogen and phosphorus pollution" that "put the sector at the forefront of Bay restoration efforts." The wastewater sector met its 2025 nutrient reduction goals from the Bay TMDL by 2016. EPA noted Maryland's financial commitment to funding upgrades ($1.25 billion in grants), as well as the expected reductions in total nitrogen (10 million pounds per year) and in total phosphorus (1 million pounds per year) from the wastewater sector.[1] No other sector has kept pace.

MAMWA has reviewed MDE's December 8, 2017 Notice of Proposed Action, proposing to add a new COMAR chapter, 26.08.11 (Maryland Water Quality Trading Program). MDE's goal is to establish a trading program that "provides greater flexibility and reduces the cost of achieving the total maximum daily load (TMDL) established for the Chesapeake Bay while being protective of local water quality." *Md. Register* at p. 1189.

MAMWA supports nutrient and sediment trading. Trading programs in other states allow dischargers to exchange nutrient credits voluntarily in order to reduce pollutants at a lower cost to local citizens. The Chesapeake Bay Program as a whole, EPA, the Chesapeake Bay Commission, other Bay Watershed states, and numerous other stakeholders also support trading as an implementation option.

[1] A copy of *Chesapeake Bay Progress: Wastewater Pollution Reduction Leads the Way* (EPA, June, 2016) is attached as Appendix A.

MAMWA is very disappointed that just one month before issuing the Proposed Regulations and after nearly two years of WQTAC discussions, MDE has proposed to change the basic rules for calculating how a WWTP generates nutrient credits.

MAMWA cannot support the Proposed Regulations in their current form.

Until November 9, 2017, when MDE recirculated revised draft regulations, MDE had proposed to allow WWTPs to trade credits they generated below 4 mg/l for TN, the Bay TMDL wasteload allocation (WLA) concentration basis. MDE's Proposed Regulations limit WWTPs to trading credits generated based on performance below 3 mg/l for TN. This will chill, if not entirely eliminate, any WWTP interest in participating in the trading program. This artificially constricts the number of credits available to the market, which will likely drive up the cost for nutrient and sediment reductions. The effect is that the State will artificially increase the cost of the (underfunded) Bay restoration, and impose these costs on the public.

This approach for WWTPs will also drive up costs and may price municipal separate storm sewer systems (MS4s) out of the trading market, putting them at risk for permit non-compliance. MS4s need available, cost-effective credits so they can do their part for Bay clean-up without endangering the financial health of the cities, towns, and counties that own these regulated stormwater systems. Maryland's localities should not be forced to choose between funding public safety needs and education and Bay restoration because the State is restricting, without any justification, the temporary use of wastewater-generated credits that citizens are paying for with their BRF fees. MAMWA notes that stakeholders who have objected to allowing WWTPs to provide these needed credits based on performance below 4 mg/l TN have proposed no reasonable alternatives to help MS4s address Bay restoration at a reasonable cost.

Maryland's taxpayers have funded the enhanced nutrient removal (ENR) plant improvements that have generated nutrient reductions below 4 mg/l for TN. Taxpayers, therefore, should enjoy the benefits of those reductions and not be forced instead to purchase credits at a higher cost, leaving unused nitrogen credits on the table. MDE's proposed approach runs counter to the notion of cost-effectiveness and is closer to double-charging the State's citizens for Bay clean-up.

MAMWA's full comments in opposition to the Proposed Regulations follow.

II. COMMENTS

A. MDE Should Set The Performance-Based Benchmark for WWTP at 4 mg/l TN

The WQTAC had numerous discussions on setting the parameters for wastewater trading. MAMWA and its sister stormwater association, the Maryland Municipal Stormwater Association (MAMSA), advocated in February, 2016, for trading rules that would allow wastewater plants to trade both flow fraction credits and performance fraction credits.

After discussions with the WQTAC, MDE decided that it would only allow WWTPs to generate credits based on performance below 4 mg/l for TN, eliminating any trading of flow fraction

credits. This decision already makes the Proposed Regulations very conservative in limiting credit generation to performance fraction credits. Then, approximately one month before publication of the Proposed Regulations, MDE decided it would only allow WWTPs to generate credits based on performance below 3 mg/l TN.

Some trading opponents have argued that flow credits and credits above 3 mg/l TN are "paper credits," based on the mistaken belief that these credits are not actual reductions that will benefit the Bay.[2] Setting aside the fact that the wastewater sector has done more for Bay clean-up than any other sector, this argument fails for the reasons set out below.

1. 3 mg/l Is Lower than Bay TMDL Allocations and the State's Cap Load Strategy

MDE's decision to set the baseline at 3 mg/l for TN means the State is requiring WWTPs to go below the current limit-of-technology in order to participate in trading. This is unfair, and will likely result in most, if not all, of the State's WWTPs being shut out of this important and beneficial program. MDE's Proposed Regulations are inconsistent with Bay TMDL allocations and the State's long-held cap strategy for WWTPs.

The State's significant WWTPs have Bay TMDL WLAs that are based on the State's cap load strategy, which uses 4 mg/l as the concentration for TN and design capacity for flow.[3] The resulting WLAs, which are incorporated into the appendices of the 2010 Bay TMDL, along with other sector reductions, result in an assimilative capacity for the Watershed that complies with all applicable water quality standards. In addition, MDE uses 4 mg/l for TN for WWTP permitting. As explained below, 4 mg/l is even lower than the concentration assumed by EPA and the Bay Partnership as a part of its mid-point assessment (MPA) of the implementation of the Bay TMDL. MDE has no basis for reducing the WWTP performance-based benchmark below a level that is fully protective of water quality, particularly when MDE has removed the option for generating flow credits.

In the MPA, the Chesapeake Bay Program (CBP) has recognized that treating below 3 mg/l for TN is unrealistic, and has reaffirmed that 3 mg/l TN is "E3" for WWTPs. E3 stands for "Everything by Everyone, Everywhere," and represents the maximum amount of treatment that could be accomplished by dischargers to the Chesapeake Bay free of financial and/or operational limitations. E3 does not represent a realistic level of reduction; it can only be accomplished if we have unlimited budgets and no limits to our ability to require advanced treatment across the entire Watershed. As a part of the MPA, EPA and the other Bay Partners will set state allocations based on the difference between a no-action scenario (the loadings if no one took any steps to reduce nutrients) and an E3 scenario. The CBP calls this the controllable load, because

[2] Another argument is that State BRF funds should not be used to generate credits. Not only is this incorrect factually – typically ENR upgrades are only partially funded by BRF dollars with the remainder from local funds—but, it hypothesizes that the State's citizens served by MS4s would rather pay millions of dollars for stormwater BMPs when they could temporarily use more cost-effective wastewater nutrient credits. This makes no sense financially.

[3] In its 2017 Annual Status Report, the BRF Advisory Committee confirmed that annual nutrient cap loads for significant WWTPs are based on 4 mg/l TN at design capacity. *Bay Restoration Fund Advisory Committee Annual Status Report January 2017 (12th Report)* at p. 29, fn. 1. This is the consistent with the State's policy as expressed in the 2008 Tributary Strategy.

it can be accomplished (although at a large cost) and because it will reduce pollutants to a level that is no higher than the Bay's assimilative capacity.

To develop these allocations, which will be used to develop the State's Phase III Watershed Implementation Plan (WIP), wastewater is given a heavier burden as compared to other sectors. Here is a graphic presented at the December 19, 2017 Principals' Staff Committee (PSC) meeting that shows the different approach taken for wastewater:

Although the CBPO has established 3 mg/l for TN as the E3 boundary for wastewater treatment, it factors reductions of between approximately 67% and 90% of E3 into allocations. On a concentration basis, TN is set between 4.5 mg/l and 8 mg/l depending on location of the discharge. As noted above, reductions set at this level, along with reductions from other sectors, will ultimately result in the Bay meeting needed water quality criteria.

If 4.5 mg/l TN is acceptable to EPA for MPA purposes, and 4 mg/l is acceptable to MDE for permitting purposes, and both are fully protective of water quality, it is hard to understand why MDE would impose an artificially low 3 mg/l TN as the performance-based benchmark in the Proposed Regulations. There is no justification or basis for 3 mg/l as the appropriate benchmark. This concentration is well below what all Bay stakeholders have agreed is the controllable level of nitrogen for the wastewater sector.

Contrary to the concerns expressed by other stakeholders, WWTPs that operate below 4 mg/l TN will not be "gaming the system" or creating "paper credits." They will be operating below their permit requirements and Bay water quality (TMDL) requirements, which they are not obligated

to do, in order to provide needed cost-effective credits to other sectors (MS4s) that are struggling with Bay-related compliance. This is behavior that should be encouraged, not prohibited.

2. Most Plants Cannot Sufficiently, Consistently, and Reliably Operate Below 3 mg/l TN

MDE has stated that it chose 3 mg/l TN because recent discharge monitoring reports (DMRs) suggest WWTPs would have a few hundred thousand TN credits available to trade below that concentration level.

MAMWA submits that the fact that some facilities may have achieved 3 mg/L TN does not mean that most facilities could achieve sub-3 mg/l values under long-term operational conditions, due to the following factors:

- Process Variability **–** WWTPs experience process variability due to weather and other factors outside of their control. This means that performance in only one year or just a few years may not be representative of all operating conditions as these plants operate over time.

- Flow Availability – As noted above, WWTPs design facilities for growth over a long period. Achieving less than 3 mg/L performance in 2017 does not mean that the plant and the ENR technology can consistently perform below 3 mg/L after reaching a fully hydraulically and organically (and N) loaded annual condition.

- Operational and Regulatory Realities – WWTPs must operate below limits to comply with discharge permits. This operational margin of safety is vital to compliance. If the trading program sets 3 mg/l as the performance baseline, plants would have to go even lower than that value to keep that margin of safety intact. MDE fails to recognize the fact that maintaining an operating buffer is critical to operating a WWTP on a day-to-day basis. If the baseline is 3 mg/l, WWTPs would in reality have to adjust operations to <u>below</u> 3 mg/l to allow for an operational buffer—that is, enough of a cushion in TN concentration that they could agree to generate credits below the 3 mg/l TN level.

MAMWA's Members are inherently conservative about how they operate their plants. As a general rule, they will not be interested in participating in a voluntary program if it means pushing their plants below the limits of technology, promising part of their necessary future flow capacity, and/or risking permit non-compliance. Based on the initial responses of our Members, few will even entertain participating in the trading program as it is proposed. Without cost-effective TN pounds from wastewater, parties wishing to buy credits, like MS4s, will be forced to consider fewer and more expensive TN pounds from private aggregators.

MAMWA questions whether MDE considered the following factors that would reduce available credits: (1) the potential that less than 100% of WWTPs will want to participate in trading; (2) the fact that some percentage of WWTPs will underperform in a given year for various reasons; (3) whether the cost of additional power and chemicals needed to attempt to operate sufficiently below 3 mg/l (including a buffer for operational variability) will make participating economically unattractive; and (4) whether certain plants will only pledge a percentage of

available credits to hedge against upsets and/or avoid breach of contracts for credit generation. It is also unclear whether MDE has included the 5% reserve in the Proposed Regulation when it estimated available credits.

3. 3 mg/l TN is More Stringent than Required by EPA or Other Trading Programs

EPA and many Bay stakeholders strongly support nutrient trading. In 2013, EPA's Principal Deputy Assistant Administrator for Water testified that trading has "significant potential to help reduce nutrient pollution."[4] Among its benefits:

- Lower Cost – It "allows one source to meet its regulatory obligations by using pollutant reductions created by another source that has lower pollution control costs…"
- Economies of Scale – It can "control cost differentials among and between sources…"
- Oversight – Trading is "usually implemented through enforceable state or federally issued permits…"
- Pollutant Reductions – Where there are "multiple upstream sources of pollution that contribute to the impairment of a downstream waterbody…reducing pollutant loads in the downstream water could be achieved by reducing the pollution generated by upstream sources."

EPA also endorsed nutrient trading in the Bay TMDL itself. EPA stated that it "supports implementation of the Bay TMDL through such programs, as long as they are established and implemented in a manner consistent with the CWA, its implementing regulations, and EPA's 2003 Water Quality Trading Policy [footnote omitted] (USEPA 2003e) and 2007 Water Quality Trading Toolkit for NPDES Permit Writers [footnote omitted] (USEPA 2007d)."[5]

EPA's policy is to set wastewater baselines based on individual wasteload allocations as expressed in NPDES permits ("where a TMDL has been approved or established by EPA, the applicable point source waste load allocation or nonpoint source load allocation would establish the baselines for generating credits.")[6] WLAs for the State's significant WWTPs were set in the Bay TMDL based on 4 mg/l and design flow; the Proposed Regulations are significantly more stringent than EPA would otherwise require in a trading program.

In Virginia, the State allows point sources to generate credits based on the "difference between (i) the WLA for a permitted facility specified as an annual mass load of total nitrogen, and (ii) the monitored annual mass load of total nitrogen discharged by that facility, where clause (ii) is less than clause (i), and where the difference is adjusted by the applicable delivery factor and expressed as pounds per year of delivered total nitrogen load."[7] Maryland's Proposed

[4] Testimony of Michael H. Shapiro, EPA Principal Deputy Assistant Administrator for Water Before the Subcommittee on Water and Wildlife, Committee on Environment and Public Works, United States Senate (May 22, 2013).
[5] Chesapeake Bay TMDL at p. 10-3.
[6] United States Environmental Protection Agency, Office of Water, Water Quality Trading Policy (Jan. 13, 2003).
[7] Va. Code §62.1-44.19:13.

Regulations are more stringent than a nearby Bay jurisdiction that has had great success in establishing a point source trading program.[8]

MDE's Proposed Regulations will doom trading before it starts. There is no justification for doing so; EPA would allow WWTP credit generation below 4 mg/l TN and it is consistent with Virginia's successful program.

For all of the reasons above, MAMWA requests that MDE revise the Proposed Regulations to allow WWTPs to generate TN credits at performance levels at or below 4 mg/l TN.

B. MDE Should Allow Wastewater Trading Without A Major Permit Modification

Section .07(C) states that wastewater credits will be certified "through issuance of an NPDES permit." During WQTAC discussions, MDE stated that it did not believe it would require POTWs to go through a major permit modification to authorize nutrient trading under the new regulations.

MAMWA supports this decision. Requiring each WWTP that wishes to trade to go through a lengthy, costly permit modification will delay implementation and redirect scarce State and local resources for no reason. Once trading is lawful based on adoption of the new COMAR chapter, dischargers will be acting within the bounds of a lawful program established through a public process. Any non-compliance will be subject to enforcement. Moreover, any trading between a WWTP and a third party can be reflected in DMRs, which are signed under oath, eliminating any concerns regarding accountability or tracking for these pounds.[9]

C. MDE Should Revise Its Overly Stringent Prohibitions

Section .08(E) gives MDE the discretion to prohibit certain entities from engaging in trading, including, *inter alia*, a permittee who is not in compliance with permit terms and any person who has previously violated the Environment Article of the Maryland Code or any related regulation.

MAMWA does not object to MDE banning bad actors from the trading program. However, there is a distinction between violating a part of the trading regulations and violating a totally unrelated section of a permit, the Code, or regulations. For example, a wastewater plant could face non-compliance allegations related to sampling a particular parameter; there is no reason to bar the plant from trading for an unrelated issue that may be as simple as a miscommunication with a plant employee. Such a severe approach is overly broad and runs counter to MDE's expressed interest in having a vibrant, voluntary, market-based trading program.

MAMWA recommends fine-tuning this text to tie trading prohibitions to related infractions. Suggested edits follow:

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[8] The USDA's Natural Resources Conservation Service praised Virginia's trading program in an article entitled *Stoking Demand for Nutrient Credits in Virginia: Good News for Farmers and for the Chesapeake Bay* (available at: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/emkts/?cid=nrcseprd354814).

[9] MAMWA supports the exemption in the Proposed Regulations for wastewater-point-source to wastewater-point-source trades in Section .04(D)(1) for the same reasons.

F. Prohibitions. At its discretion, the Department may prohibit the following persons from generating credits:

(1) A permittee in noncompliance with permit terms directly related to the discharge of nutrients or sediment or the reporting thereof;

(2) A nonregulated source or owner of an on-site sewage disposal system that is not in compliance with COMAR 26.04.03, 26.17.01, 26.17.02, 26.17.04, 26.23 or 26.24, if applicable;

(3) An agricultural operation that is not in compliance with COMAR 15.20.12; or

(4) A person who has previously violated ~~any provision of the Environment Article or~~ any regulation adopted under the Environment Article in COMAR 26.08.11.01-.14.

If MDE will not agree to these changes, MAMWA trusts that MDE will use its discretion wisely and not prohibit trading for unrelated or minor non-compliance with the regulations.

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APPENDIX A

Chesapeake Bay Progress: Wastewater Pollution Reduction Leads the Way

Wastewater Treatment Plants Exceed Pollution Reduction Goals: Nitrogen Cut 57%, Phosphorus Cut 75% Since 1985

Impact of Bay TMDL

Upgrades and operational efficiencies at wastewater treatment plants (WWTPs) throughout the Chesapeake Bay watershed have resulted in steep reductions in nitrogen and phosphorus pollution and put the sector at the forefront of Bay restoration efforts. Since 1985, the wastewater sector has cumulatively prevented over 900 million pounds of nutrient pollution (nitrogen and phosphorus) from entering the Bay's tributaries—reducing nitrogen to the Bay by 57 percent and phosphorus by 75 percent. For the first time, annual progress in this sector effectively meets its 2025 nutrient pollution limits in the landmark Chesapeake Bay "pollution diet," or Bay Total Maximum Daily Load (Bay TMDL).

In partnership with the U.S. Environmental Protection Agency (EPA) and the seven Chesapeake Bay watershed jurisdictions, WWTP owners and operators have made these major gains despite increases in human population and wastewater volume.

Treatment plant upgrades – driven by advances in technology, enforceable Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES) permits and funding from multiple local, state and federal sources – along with phosphorus detergent bans and operational reforms have produced local water quality improvements and widespread environmental and economic benefits. Many facilities are removing more nitrogen from wastewater than had been thought possible and are achieving reductions well below what their permits require. Moving forward, additional plants are scheduled to be upgraded and new treatment technologies and trades will be employed to help maintain the sector's progress in the face of continued growth in population.

Key Facts and Figures

- In 1985, wastewater represented 28 percent of total nitrogen loading to the Bay and 39 percent of the total phosphorus loading. In 2015, however, WWTPs represent a much smaller proportion of the total load, as indicated on the charts on Page 4 of this fact sheet.
- Over the last 30 years, treatment improvements at the 10 largest WWTPs in the Bay watershed have cumulatively prevented 240 million pounds of nitrogen and 48 million pounds of phosphorus from entering the Bay.
- Since the Bay TMDL was established in 2010, the wastewater sector cut nitrogen levels from 52 million pounds to 38 million pounds annually. This reduction far exceeds the 2017 interim pollution goal for the sector under the Bay TMDL, and at present, effectively meets the 2025 Bay TMDL target of 38 million pounds, according to Chesapeake Bay Program analysis (bit.ly/nutseddrop).

Keys to Progress

The 472 municipal and industrial WWTPs in the Chesapeake Bay watershed have been designated as significant sources by the states and EPA and have annual nutrient pollutant limits in their CWA NPDES permits, providing the public with legally enforceable assurance that pollutant reductions will be achieved. Many of the WWTPs in the Bay watershed have also been substantially upgraded. Continuing investments in advanced wastewater treatment have exceeded $7 billion in the Bay watershed. The investments were largely triggered by a 2004 Nutrient Permitting Approach that called for placing enforceable permit limits on pollution from wastewater treatment plants by EPA, the six Bay watershed states and the District of Columbia (bit.ly/NutrientApproach). The limits have since been reflected in the Bay TMDL (bit.ly/ChesBayTMDL) and accompanying state-led, locally driven Watershed Implementation Plans (WIP).

Municipal authorities have leveraged federal, state, and local resources helping to make the wastewater initiative the largest and most successful program in the nation at reducing nitrogen and phosphorus pollutant loads from WWTPs.

Wastewater treatment technological advances fueling these witnessed pollutant load reductions are due in large part to early research pioneered by the Chesapeake Bay Program's Scientific and Technical Advisory Committee in cooperation with academic organizations and the WWTP owners and operators on biological nutrient removal (BNR) and later enhanced nutrient removal (ENR). EPA continues to invest in new tools to help communities reduce energy use and optimize operations to promote additional nutrient removal at WWTPs.

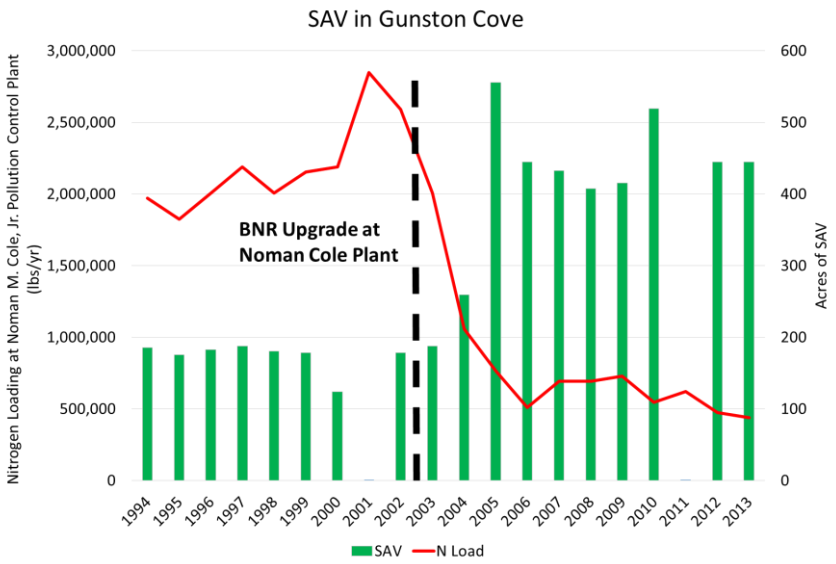
The wastewater sector success has been aided by state laws setting strict limits on the amount of phosphorus in consumer cleaning products, including laundry and dishwasher detergents. With about 18 million people living in the Chesapeake Bay watershed, these restrictions prevent Bay watershed homes from sending significant amounts of phosphate pollutants to their local WWTPs.

Local Waters and Communities Benefit from a Cleaner Bay

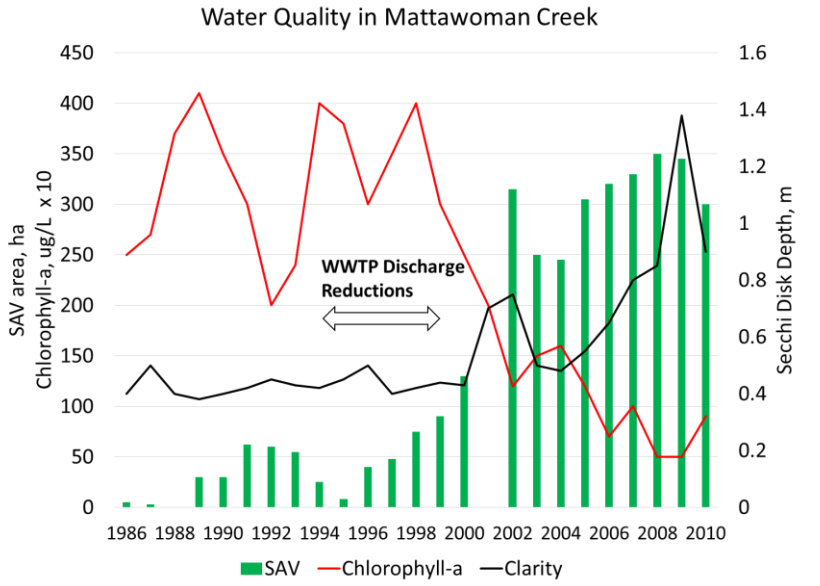
Upgrades to WWTPs are creating jobs while keeping human waste from entering our rivers and streams, removing the pollution that causes fish-killing algal blooms, and improving the overall quality of life throughout the Bay watershed.

Local streams, rivers, lakes, and the Chesapeake Bay are benefitting from the reductions in pollution made by WWTPs. In April 2016, the Chesapeake Bay Program reported the results of the winter dredge survey, finding 92 percent more adult female blue crabs than last winter (bit.ly/bluecrabs). Underwater grass abundance also increased by 21 percent between 2014 and 2015 to 91,000 acres, surpassing the 2017 restoration target two years ahead of schedule (bit.ly/BaySAV).

The charts on the right show a correlation between WWTP upgrades and improvements in submerged aquatic vegetation (SAV). These charts are derived from "Lessons from Chesapeake Bay Restoration Efforts: Understanding the role of nutrient reduction activities in improving water quality" (bit.ly/ChesBayInsights).



Wastewater treatment plant upgrades to BNR in the metropolitan Washington, D.C. area resulted in reductions in phosphorus and nitrogen concentrations. These nutrient reductions led to decreases in toxic cyanobacteria and helped submerged aquatic vegetation recover in the tidal Potomac River, such as those shown at Gunston Cove in Fairfax, Virginia. Note: 2001 and 2011 data not available. (bit.ly/ChesBayInsights)



Phosphorus loads decreased significantly in the Bay watershed following the early 1980s ban on phosphorus-based laundry detergents. Yet, water clarity improved, chlorophyll levels dropped, and Bay grasses really began to rebound after wastewater treatment plant effluent was reduced as shown by the case Mattawoman Creek, above. Note: SAV data not available for 1988 and 2001. (bit.ly/ChesBayInsights)

A Team Effort by Municipal Authorities, States, and EPA

Pennsylvania
Since 1985, Pennsylvania utilities have invested more than $1.4 billion in Bay restoration including state loan and grant programs that enabled upgrades at 190 WWTPs. The resulting impact is a reduction of more than 3 million pounds (28 percent) in nitrogen and over 1 million pounds (62 percent) in phosphorus from the wastewater sector.

Delaware
In Delaware, the Seaford Wastewater Treatment Plant and local industrial wastewater facility INVISTA integrated a nutrient trade agreement into their NPDES permits.

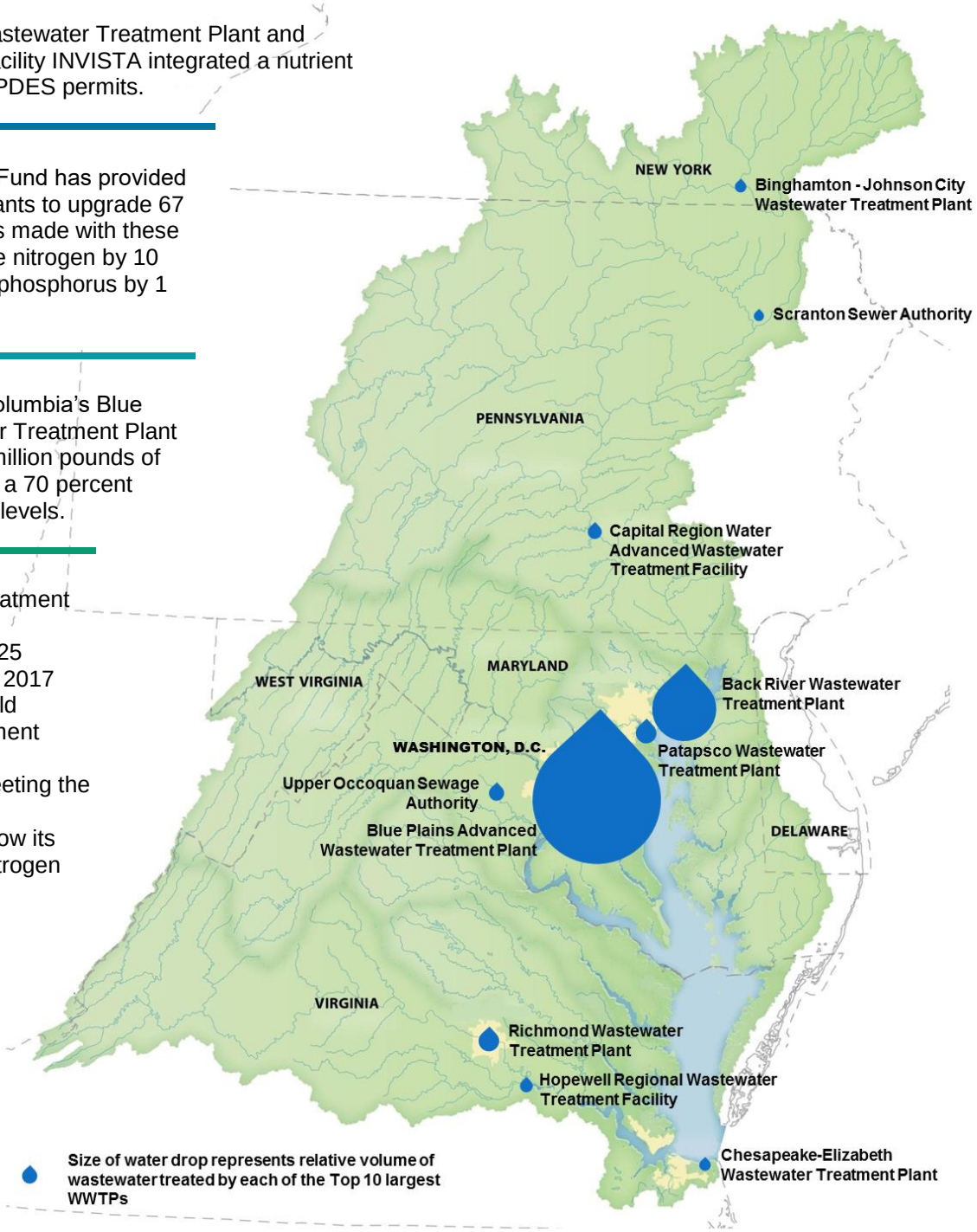
Maryland
Maryland's Bay Restoration Fund has provided more than $1.25 billion in grants to upgrade 67 wastewater plants. Upgrades made with these funds are expected to reduce nitrogen by 10 million pounds per year and phosphorus by 1 million pounds per year.

Washington, D.C.
Since 2011, the District of Columbia's Blue Plains Advanced Wastewater Treatment Plant has discharged less than 4 million pounds of nitrogen per year, more than a 70 percent decrease compared to 1990 levels.

West Virginia
All significant wastewater treatment facilities in West Virginia are expected to achieve their 2025 wasteload allocations by the 2017 deadline. The new Moorefield Regional Wastewater Treatment Plant, which went online in November 2013 is key to meeting the state's Chesapeake Bay commitments and is well below its discharge permit limits for nitrogen and phosphorus.

Virginia
With over $800 million in state funding, Virginia's Water Quality Improvement Fund has invested in 65 grants to wastewater facilities that are expected to reduce more than 21 million pounds of nitrogen and more than 4 million pounds of phosphorus.

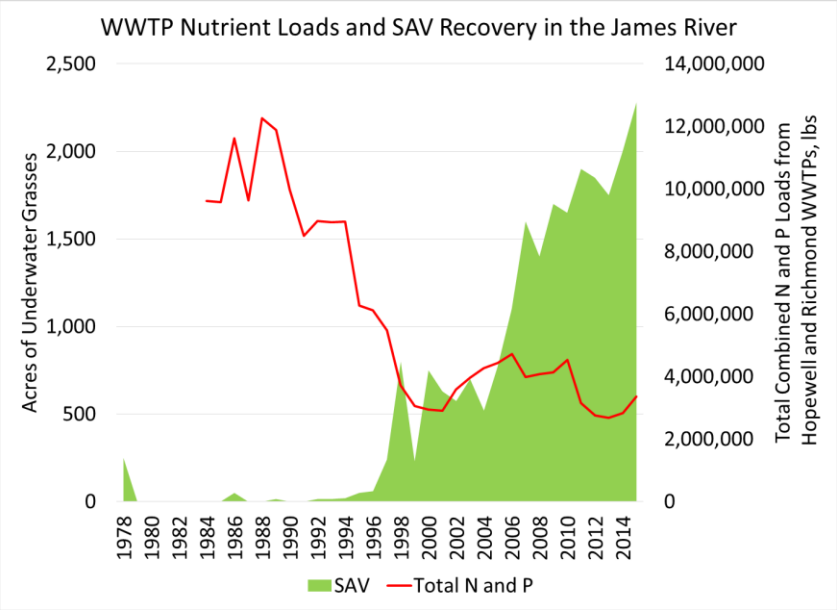
New York
New York has implemented an innovative "bubble" permit, where multiple dischargers are assigned an aggregate nitrogen limit in addition to their individual limits. Beginning with five significant treatment plants in 2015, the aggregate permit limits will enable trades and offsets between 29 facilities by 2017. The bubble permit currently includes 24 facilities.



Moving Forward

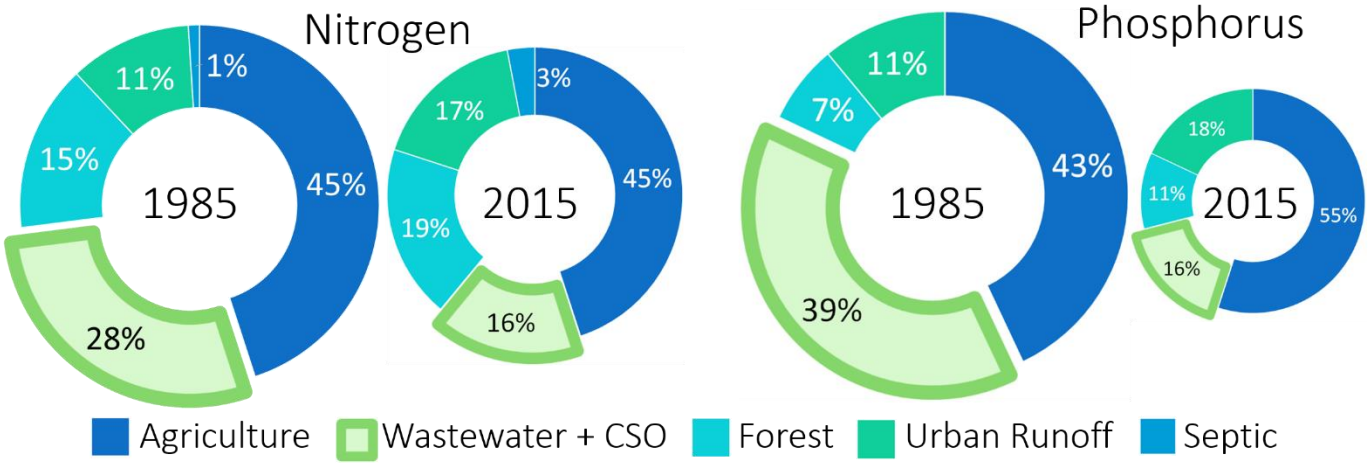
The wastewater sector reductions, made possible through significant publically-funded grant and loan programs, have been paramount to improving the health of the Chesapeake Bay. Investments in cutting-edge technology over the last three decades has led to improved water quality in many watersheds and river segments. Moving forward, the wastewater sector will need to ensure the maintenance of the nutrient pollutant limits in the face of population growth, climate change and other factors, using innovative water reuse, nutrient optimization and energy recovery technologies. The next step for WWTP owners and operators will be addressing pollution from other plants and considering trading programs that assist other pollutant source sectors in reducing nutrients, while still maintaining local water quality standards.

Leadership demonstrated by WWTP owners and operators in meeting the nutrient reduction challenge must be replicated by other pollutant source sectors (e.g. agriculture, urban stormwater, septic systems) in the watershed to ensure full attainment of Bay restoration goals. In the meantime, incremental progress is occurring in Bay and local water quality health.



Underwater grasses, an essential source of food and habitat for fish, crabs, and waterfowl, have substantially recovered in the James River. SAV growth is an excellent indicator of the health of the Bay as it responds to improvements in nutrient loadings, water clarity and sediment loading. Looking forward, there is still more work to do to ensure that the recovery continues and reaches the goal of 3,408 acres established within Virginia's water quality standards regulations. (bit.ly/StateofJames)

Chesapeake Bay Watershed Loads



For more information, visit the Chesapeake Bay Program at www.chesapeakebay.net/trackprogress or the U.S. EPA at www.epa.gov/chesapeake-bay-tmdl