The Clean Water Act and the Chesapeake

Enforcement's Critical Role in Restoring the Bay

ENVIRONMENTAL INTEGRITY PROJECT

December 2012

About the Environmental Integrity Project

The Environmental Integrity Project (EIP) is a nonpartisan, nonprofit organization dedicated to the enforcement of the nation's anti-pollution laws and to the prevention of political interference with those laws. EIP provides objective analysis of how the failure to enforce or implement environmental laws increases pollution and harms public health, and helps local communities obtain the protection of environmental laws.

Acknowledgement

EIP Attorney Tarah Heinzen, EIP Research Analysts Tom Lyons, Robbie Orvis, and Troy Sanders, EIP Executive Director Eric Schaeffer, Chesapeake Commons Administrator John Dawes, and EIP Attorney Adam Kron contributed to this report. Thank you to the Virginia Department of Environmental Quality, the Pennsylvania Department of Environmental Protection, the Maryland Department of the Environment, and the West Virginia Department of Environmental Protection for reviewing the draft report and providing additional data and feedback.

Data Limitations

EIP based its analysis of water discharges and pollutant loadings on publicly available data retrieved from EPA and state environmental agencies. Occasionally government data may contain errors, either because regulated entities inaccurately report it or because government agencies incorrectly transcribe it. EIP retrieved the data in this report in September 2012, and subsequent data retrievals may differ slightly as some companies and agencies correct prior reports.

EIP is committed to ensuring that the data we present are as accurate as possible. We will correct any errors that are verifiable.

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Executive Summary

Far too much nitrogen, phosphorus, and sediment pollution choke the Chesapeake Bay, making it impossible to sustain a healthy watershed. To restore the Bay and protect aquatic life, users will have to meet a pollution diet – a diet that the U.S. Environmental Protection Agency (EPA) has already set by establishing "Total Maximum Daily Loads" (TMDLs) to reduce nitrogen and phosphorus loadings to the Bay by 25% by 2025, and sediment loadings by 20%.[1] Measured in pounds, that means decreasing the nitrogen that flows to the Bay by more than fifty million pounds a year; phosphorous by more than three million pounds; and sediment by more than one and a quarter billion pounds.

Meeting these targets will require reducing loads from all of the sources polluting the Bay, including stormwater from construction sites, manure from concentrated animal feeding operations, nutrient runoff from farms, and air deposition of pollutants from power plants and cars. This report focuses on industrial and municipal point sources – the public sewage systems and industrial plants that account for about 20% of the nitrogen and nearly a quarter of the phosphorus that ends up in the Bay.

The TMDL sets out annual discharge limits, or "wasteload allocations" (WLAs), for 478 significant point sources, which facilities must meet by 2025. Reducing pollution from these sources will depend in part on public support for investments in sewage treatment upgrades, but will also require EPA and states to set clear limits in Clean Water Act permits, tighten them as needed to meet TMDL targets, obtain accurate monitoring and reporting of discharges, and take enforcement actions against Bay violators.

The Environmental Integrity Project (EIP) examined public data obtained from EPA and states to evaluate progress in meeting TMDL goals by the largest municipal and industrial sources of nutrients in the Chesapeake Bay watershed, focusing on nitrogen discharges. Using this data, which EIP obtained directly from state agencies or through EPA's Enforcement and Compliance History Online (ECHO) database, EIP compared loadings between 2010 and 2011; identified permits that lack numeric limits for TMDL pollutants; assessed rates of violations and failures to report among the most significant dischargers; and estimated the pollution attributable to illegal discharges. EIP also reviewed the Bay states' performance in inspecting dischargers, assessing penalties, and maintaining current permits.

[1] *See, e.g.*, EPA, Fact Sheet: Chesapeake Bay Total Maximum Daily Load (TMDL), http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/BayTMDLFactSheet8_6.pdf.

Progress Reducing Nitrogen Pollution

EIP estimated annual nitrogen releases in 2011 from 334 significant facilities for which complete monitoring data was available, and which account for about 98% of total loadings from all 478 significant point sources in the watershed. Nitrogen discharges from the largest municipal and industrial plants dropped significantly in Virginia, Maryland, and West Virginia between 2010 and 2011, declining more than 25% in Virginia, 18% in Maryland, and 17% in West Virginia. These states will need additional reductions to meet wasteload allocation targets, but the progress to date is encouraging.

In contrast, reported nitrogen discharges from significant municipal and industrial sources increased about 500,000 pounds, or 4%, in Pennsylvania from 2010 to 2011, and increased slightly in New York. Pennsylvania will need to reduce nitrogen loads from these sources by approximately 24% to meet WLA targets, and New York by more than a third (though its contribution to overall loadings is much smaller). Though the Bay states have until 2025 to reach their TMDL limits, at least 60% of the load reductions need to be met by 2017, so early indicators of progress are important.

Significant Source Nitrogen Loadings, 2010 to 2011

State	WLA	2010 Load	2011 Load	% of 2010 Load Considered*
DC	4,689,000	4,887,769	3,922,271	100%
DE	204,710	114,540	120,852	91%
MD	6,774,444	12,378,488	10,149,543	94%
NY	1,545,956	2,366,407	2,430,786	99%
PA	10,410,089	13,117,163	13,678,361	96%
VA	15,255,948	22,403,004	16,716,922	100%
WV	360,721	609,702	503,633	99%
Total	39,240,868	55,877,073	47,522,368	98%

*These percentages indicate the fraction of the significant municipal and industrial facilities' nitrogen load considered in EIP's analysis, based on 2010 loadings (the most recent year for which EPA has compiled a complete Bay watershed model database).

Permitting

TMDL allocations do not exist in a vacuum; measuring progress in meeting Bay water quality goals will require enforceable pollution limits in permits and consistent monitoring of

discharges. The Bay TMDL required that all 478 significant dischargers have individual WLAs in part to aid permit writers in establishing appropriate permit limits on nitrogen pollution or setting schedules to get these restrictions in place.[2]

Among the 334 significant dischargers with available data considered in EIP's loadings analysis, EIP could not identify enforceable nitrogen limits for 64: 45 in Pennsylvania, 10 in New York, and 9 in Maryland. These 64 facilities discharged over 7.6 million pounds of nitrogen in 2011, accounting for over 15% of the significant facility load. EIP was only able to assess current permit limits; EPA's ECHO database may not reflect permit limits that have been established but which have not yet taken effect.

Significant Point Sources without Numeric Nitrogen Limits, 2010 to 2011

STATE	FACILITIES	2010 N LOAD	2011 N LOAD
MD	9	4,489,670	4,205,311
NY	10	309,213	327,214
PA	45	2,981,078	3,114,680
Total	**64**	**7,779,961**	**7,647,204**

Although they contribute millions of pounds of nutrient and sediment pollution to the Bay, EPA and the Bay states have not set individual WLAs for nearly 5,000 smaller municipal and industrial dischargers in the watershed. The agency estimated that nitrogen loadings from the largest 599 of these "nonsignificant" dischargers added up to about 5.6 million pounds of nitrogen in 2010, or just over 10% of the load from significant sources. But EIP's analysis indicates that some of these smaller sources may be larger than EPA's Bay watershed model assumes. For example, the PPL Brunner Island power plant in Pennsylvania released nearly 60,000 pounds of nitrogen to the Susquehanna in 2011, while Maryland City and Patuxent Water Reclamation plant discharged more than 40 thousand pounds of nitrogen to the Patuxent River the same year. If this monitoring data is accurate, such facilities belong on the list of significant plants with individual WLAs.

Violations

Of course, permit limits and WLAs mean little if dischargers do not meet them. Unfortunately, violations of permit limits for nitrogen, phosphorus, and sediment are common throughout the Bay states, even for significant dischargers. For example, 12% of the significant industrial and municipal dischargers violated nitrogen permit limits for at least a quarter of 2011. These estimates may understate the noncompliance rate, however, because the number of facilities that fail to even report discharge data is unacceptably high and appears to be rising. For example, 14% of dischargers failed to report nitrogen data for at least a quarter of 2011, compared to 11% in

[2] EPA, A Guide for EPA's Evaluation of Phase I Watershed Implementation Plans at 7 (April 2, 2010), *available at* http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/GuideforEPAWIPEvaluation4-2-10.pdf.

2009. Violators and non-reporting dischargers may also overlap because a facility can provide monitoring data showing it has violated a limit at some point in the year, while failing to report any data in other monitoring periods.

The water quality impacts of illegal discharges can add up quickly. For example, the 33 significant dischargers with violations exceeding 1,000 pounds of nitrogen released over 650,000 pounds of the pollutant *above* permit limits in 2011.[4] These estimates are conservative, because the excess discharges that result from violations of some permit limits cannot be easily quantified.

2011 Loadings due to Permit Limit Violations

STATE	Nitrogen (lbs.)[3]	Phosphorous (lbs.)
DC	0	0
MD	299,396	20,769
NY	12,510	5,312
PA	271,837	7,699
VA	33,174	810
WV	34,096	0
MD SSOs	66,378	9,329
HRSD SSOs	13,870	1,949
Total	731,261	45,868

Many of these violations are the result of exceeding nitrogen limits established to protect local water quality, and do not necessarily mean that the annual wasteload targets established to protect the entire watershed have been exceeded. But in the worst cases, such illegal discharges can undo the progress made by cities and companies that comply with their permits, many of which have upgraded to reduce pollution. Moreover, even illegal discharges that do not cause a facility to exceed its WLA can harm local water quality and contribute to the degradation of the Bay. The Bay TMDL is designed to protect the Bay itself and its tidal tributaries, and strategies that focus solely on meeting WLAs to protect the estuary will not necessarily protect the many rivers and streams that feed the watershed from harmful pollution events throughout the year.

Sanitary sewer overflows (SSOs) also contribute significant pollution loadings above permitted limits, and caused at least 80,000 pounds of nitrogen discharges to the Bay in 2011. These illegal discharges of untreated wastewater can occur due to mechanical failure, sewage pipe breaks, and stormwater infiltration of sewage systems. Combined, permit limit violations and SSOs illegally loaded over 730,000 pounds of nitrogen into the Bay in 2011. As shown in the chart above, EIP estimated SSO loadings from online reports filed by municipalities in Maryland and used an EPA methodology to estimate SSO loadings from Virginia's Hampton Roads Sewage District (HRSD); because EIP could not locate information from other states or cities in the watershed, these calculations underestimate the total impact of SSOs on the Bay. The Clean Water Act prohibits all SSOs, and the Bay TMDL assumes that the Bay states will eliminate all such releases by 2025.

[3] Many nitrogen violations were for ammonia permit limits as opposed to total nitrogen. In these cases, EIP estimated the total nitrogen discharge that occurred as a result of the ammonia violation. *See* Appendix D: Methodology for a more detailed explanation.

[4] EIP considered both significant and nonsignificant facilities and aggregated the impact of the 33 whose discharges were more than 1,000 pounds above the permit limit.

Data limitations make it difficult to determine whether state agencies and EPA have taken appropriate enforcement action in response to the specific violations noted above. A company that reports permit violations in 2011 may already be operating under a consent decree or enforcement order that requires compliance at some later date. But statistics available on EPA's ECHO database, which include inspections, violations, and penalties, indicate that inspections of the majority of facilities are rare, that penalties are collected for only approximately 15% of permit limit violations, and that many of these fines are too small to deter future misconduct.

EIP would like to acknowledge the Virginia Department of Environmental Quality, the Pennsylvania Department of Environmental Protection, the Maryland Department of the Environment, and the West Virginia Department of Environmental Protection for reviewing the draft report and providing additional data and feedback. Each of the Bay states has taken some promising steps towards increased transparency and better tracking of pollution data, such as Virginia's comprehensive database of loadings data, Maryland's online database of SSO discharges, and Pennsylvania's thorough reporting of nitrogen discharges to ECHO. However, EIP has the following recommendations to strengthen Bay state programs and move closer to meeting the Bay TMDL goals.

Recommendations

Achieving the TMDL goals and restoring the Chesapeake Bay will require pollution reductions from every contributing sector, including industrial and municipal facilities. If discharges from these sources do not decrease through improved compliance and technology upgrades, either other sectors will have to pick up the slack or we will fail to meet the TMDL's goal of restoring the Chesapeake Bay. Fortunately, the Bay states have begun making progress on certain fronts, despite the large financial investments required. For example, Maryland has committed to upgrading its largest 67 wastewater treatment plants to state of the art nutrient removal technology by 2017, and has already upgraded 25.

However, many point sources are not on track to clean up their share of Bay nutrient and sediment loadings, or even to comply with their current requirements. Industrial dischargers must pay their share to clean up the Bay, and users must share the costs of municipal wastewater treatment plant upgrades if we are to meet the TMDL's ambitious goals while protecting local water quality. EIP recommends that the Bay states take targeted actions to improve their point source permitting and enforcement programs, including:

Strong Permits

- Make TMDL wasteload allocations enforceable by incorporating numeric limits for nitrogen, phosphorus, and sediment into all dischargers' permits, prioritizing the most significant polluters that do not yet have numeric permit limits;

- Strengthen permit limits by incorporating compliance schedules to meet TMDL pollutant caps within the next permit cycle;

- Review the inventory of "nonsignificant" facilities to identify any sources that discharge large volumes of nitrogen or other TMDL pollutants, and make it a priority to establish wasteload allocations and permit limits for these dischargers;

- Require point sources to meet both concentration and mass limits for the TMDL pollutants, and require monthly mass limits as well as annual limits to protect local water quality and improve the accuracy of loadings calculations;

- Renew permits on schedule, and avoid "administrative continuances" of outdated discharge permits.

Pollution Tracking and Transparency

- Require frequent and consistent monitoring and reporting in all discharge permits, including permits for sources that the TMDL will not require to upgrade;

- Develop plans to address SSO discharges, and require facilities to report the amount and location of such discharges to a public database (as Maryland already requires);

- Do not allow facilities that have recently violated permit limits for TMDL pollutants or that have failed to meet monitoring and reporting requirements to participate in nutrient trading schemes;

- Improve reporting of pollution data for significant and nonsignificant sources to EPA's Enforcement and Compliance History Online (ECHO) database to improve public access to information and polluter accountability;

- Inspect every major facility at least once annually, and target inspections of minor sources based on non-compliance and loadings of nitrogen, phosphorus, sediment, and other pollutants of concern;

Paying for Stronger Programs

- Adopt mandatory minimum penalties based on the pounds of illegal pollution discharged to more effectively deter violations and support monitoring and enforcement programs;

- Establish user fees based on the amount of pollution discharged to further support state water quality programs.

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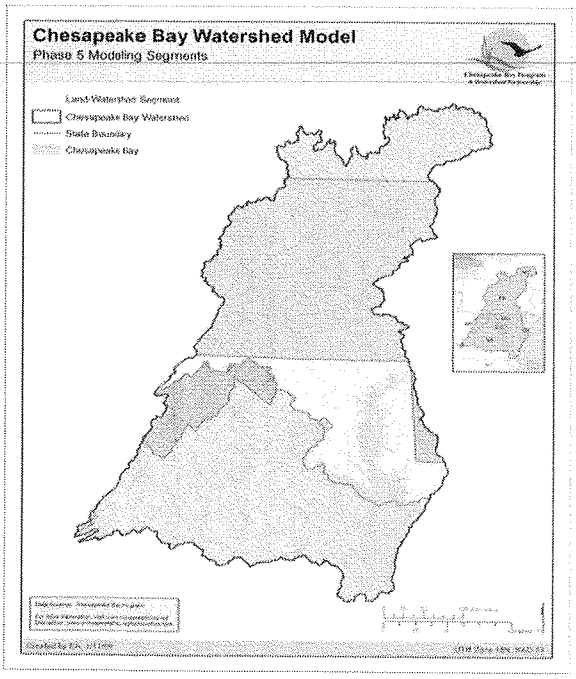
Introduction

The Chesapeake Bay is the nation's largest estuary, with a watershed spanning 16,000 square miles and containing more than 10,000 rivers and streams. The primary tributaries feeding the Bay are the Susquehanna, Potomac, James, Rappahannock, and York Rivers.[5] Because these rivers and streams receive runoff from such a large land area, the watershed includes parts of Maryland, Virginia, Pennsylvania, Delaware, West Virginia, and New York, as well as the entire District of Columbia.

For 40 years, the Clean Water Act has required EPA and states to limit pollution and ensure that our waters remain safe for fishing, swimming, and other important economic and aesthetic uses. The Act's National Pollutant Discharge Elimination System (NPDES) program is a critical piece of this scheme, requiring all "point sources" – sources of discrete discharges, like wastewater plants and factories – to obtain discharge permits that limit pollution.[6] In addition to issuing NPDES permits, states must inventory their waters, identifying those "impaired" waters that are not meeting their water quality standards and creating plans to clean them up. These plans, known as Total Maximum Daily Loads or TMDLs, place a cap on the total amount of a pollutant entering an impaired water body; this cap is then allocated among the sources discharging that pollutant into the waterway.[7] Because EPA and states maintain detailed data on discharges from industrial and municipal point sources, this report will focus on these two point source sectors in the Bay watershed.

Chesapeake Bay Watershed with State Boundaries



Source: http://www.chesapeakebay.net/maps.

The Chesapeake Bay states have long failed to meet their obligations under the Clean Water Act, and as a result nitrogen, phosphorus, and sediment from thousands of sources continue to flow into the estuary and its tributaries at rates too high to sustain the aquatic life, fishing, and recreation that have made the Bay one of the nation's most treasured and economically important waters. In response, in 2010 EPA issued Bay-wide TMDLs to cap these pollutants across the watershed. The Bay TMDL is EPA's effort to realize the promise of the Clean Water Act, reversing course and requiring the Bay states to fully implement the law, as well as potentially setting a precedent for similar actions in impaired watersheds across the country.

[5] EPA, *Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus, and Sediment* (December 29, 2010) [hereinafter Chesapeake Bay TMDL] at 2-1 (December 29, 2010), *available at* http://www.epa.gov/chesapeakebaytmdl; 76 Fed. Reg. 549 (Jan. 5, 2011).
[6] *See* 33 U.S.C. §§ 1342, 1362(14).
[7] *See id.* § 1313(d).

Nitrogen and Phosphorus

Nutrients are some of the most significant pollutants affecting the health and water quality of the Chesapeake. When excess nitrogen and phosphorus enter surface water, they can upset the nutrient balance of the waterway and contribute to increased algal growth. These algae blooms have multiple negative effects. Algae clouds the water, blocking sunlight that submerged aquatic vegetation (SAV) requires to photosynthesize. Due to the excessive nutrients in the water, algae initially flourish, but as these algae die off, the decomposition process depletes the water of its oxygen content. Extreme cases of this process, known as eutrophication, lead to hypoxic "dead zones" where aquatic life cannot survive; nutrient pollution from the Bay watershed causes such a dead zone to form each summer in the Chesapeake Bay. Some fish and crabs in these areas may escape to find oxygenated waters, but bivalves such as oysters cannot. Recent studies indicate that pollution controls have had an impact reducing these dead zones, though some experts have called reductions to date "slight."[8] And despite this slow progress, the 2011 dead zone was one of the largest ever, covering 83 miles – one third of the Bay.[9] This report focuses on nitrogen discharges into the Bay.

Sediment

Billions of pounds of sediment, or total suspended solids (TSS), pour into the Bay each year, carrying phosphorus, toxic chemicals, and other pollutants bound to the particles along with it. Tiny sediment particles hang in suspension, clouding the water. Like algae blooms, the sediment prevents sunlight from reaching the SAV that provides critical habitat for young fish and other animals in the ecosystem, reduces shoreline erosion, and adds oxygen to the water. The total acreage of Bay grasses declined more than 20 % in 2011,[10] indicating the need for more aggressive action. A healthy Bay will require nearly triple the current coverage of these grasses.[11] Removal of stabilizing vegetation for agriculture and development projects, as well as reduced vegetation in impaired tributaries and streams, also increases erosion and sediment loadings. Accumulation of larger sized sediment particles on the stream or Bay bottom buries plants and animals, such as clams, further damaging habitat and contributing to the decline of economically important species.[12] The chemicals carried into the Bay and its tributaries by sediment are also responsible for some of the fish consumption advisories in the watershed.[13]

The Bay TMDL

Serious efforts to clean up the Bay began in the 1980s, and the 1987 Chesapeake Bay Agreement sought to reduce nutrient pollution entering the Bay by 40% by 2000.[14] Despite this agreement and subsequent strategies, the

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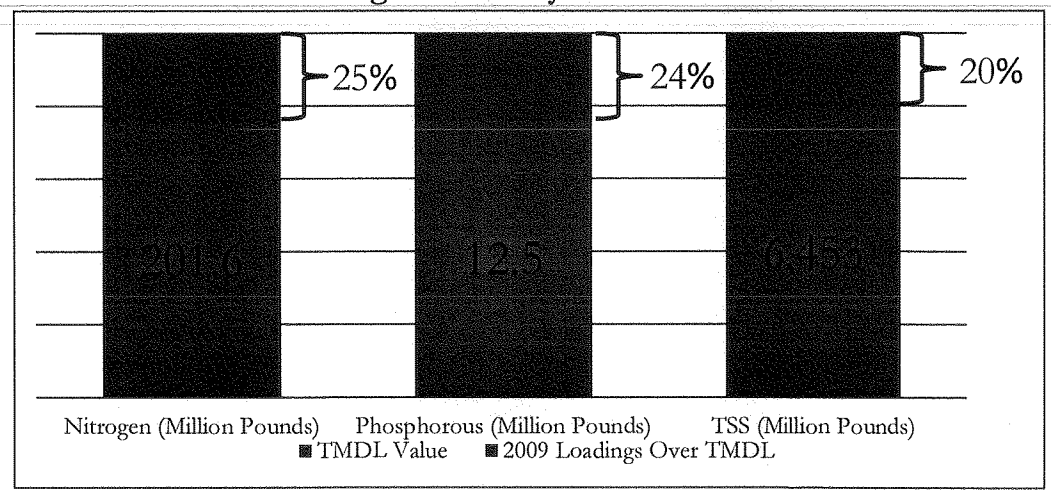
[8] Darryl Fears, WASHINGTON POST, "Chesapeake Bay study finds progress against dead zones," Nov. 4, 2011, *available at* http://www.washingtonpost.com/local/chesapeake-bay-study-finds-progress-against-dead-zones/2011/11/04/gIQAfHamnM_story.html.
[9] Darryl Fears, WASHINGTON POST, "Alarming 'dead zone' grows in the Chesapeake," July 24, 2011, *available at* http://www.washingtonpost.com/national/health-science/alarming-dead-zone-grows-in-the-chesapeake/2011/07/20/gIQABRmKXI_story.html.
[10] EPA Chesapeake Bay Program: Underwater Bay Grass Abundance (Baywide), http://www.chesapeakebay.net/indicators/indicator/bay_grass_abundance_baywide.
[11] *Id.*
[12] U.S. Geological Survey, *The Impact of Sediment on the Chesapeake Bay and its Watershed* (June 3, 2005), *available at* http://chesapeake.usgs.gov/SedimentBay605.pdf.
[13] EPA, Chesapeake Bay Program: Sediment, http://www.chesapeakebay.net/issues/issue/sediment#inline.
[14] EPA, Chesapeake Bay Program: Bay History, http://www.chesapeakebay.net/history.

Bay remained impaired and fisheries remained in decline. In 2000, yet another plan set out to clean up the Bay by 2010. However, the Bay remained polluted by this deadline, indicating that voluntary plans and agreements would not be adequate to reverse course in the watershed, and that real progress would require increased oversight and action by EPA.[15]

In December 2010, EPA finalized the Chesapeake Bay TMDL, a cleanup plan meant to limit nitrogen, phosphorus, and sediment pollution from sources throughout the Bay watershed.[16] The TMDL caps total discharges of these pollutants and establishes pollution allocations for 92 segments, as well as individual and group caps, known as wasteload allocations (WLAs), for "significant" facilities and aggregates of "nonsignificant" facilities.[17] Using EPA's Bay Watershed Model, EPA and states set these limits at pollution levels estimated to bring the Bay back into compliance with its Water Quality Standards – the standards in place to protect beneficial uses of the estuary, including bay grass habitat and shellfish. The pollution reductions required under the TMDL are meant to ensure that the Bay and its tidal tributaries and embayments will meet criteria for dissolved oxygen, chlorophyll *a*, water clarity and underwater Bay grasses.[18] Current pollution loads are 20 to 25 % above these levels, requiring millions of pounds of nutrient reductions and more than a billion pounds of sediment reductions across the watershed.[19]

Chart 1: TMDL Values and Percentage Reductions from 2009 Loadings Necessary to Meet TMDL



With EPA's oversight, the seven Bay jurisdictions must create and implement plans to tighten permit controls, limit agricultural pollution, and improve oversight, if we are to meet these goals. Both strong permits written to limit pollution loadings and require the best technology, and strong enforcement to ensure that those permit limits translate to real-world pollution reductions, will be essential to the success of the TMDL process.

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[15] *See, e.g.*, EPA, Fact Sheet: Chesapeake Bay Total Maximum Daily Load (TMDL), http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/BayTMDLFactSheet8_6.pdf.

[16] Chesapeake Bay TMDL, *supra* note 5.

[17] In the Bay TMDL, EPA designated municipal wastewater plants above a certain design flow (e.g. 0.5 million gallons per day for plants in Maryland) and industrial sources discharging more than 27,000 pounds of total nitrogen or 3,800 pounds of total phosphorus annually as "significant" point sources. EPA refers to smaller point sources as "nonsignificant." *Id.* at Table 4-4.

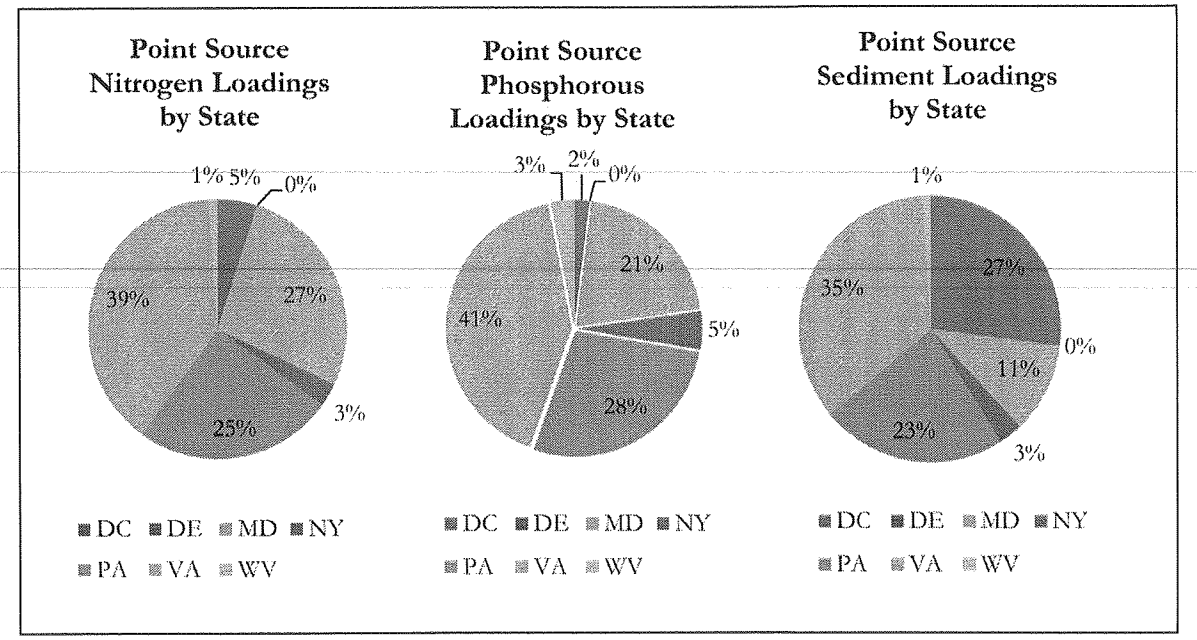
[18] *Id.* at ES-5.

[19] *Id.* at Tables 9-1 – 9-3, ES-1.

Sources of Bay Pollution

Virginia, Pennsylvania, and Maryland contribute the significant majority of the TMDL pollutants entering the Chesapeake Bay each year. Virginia sources are responsible for 27% of total nitrogen, 43% of total phosphorus, and 41% of total sediment loadings to the Bay. At 44% of total loadings, Pennsylvania is the leading source of nitrogen. Maryland sources contribute 20% of total nitrogen, 20% of total phosphorus, and 17% of total sediment pollution.[20] As shown in Chart 2 below, Virginia, Pennsylvania, and Maryland also overwhelmingly lead the Bay states in contributions of nitrogen and phosphorus from point sources throughout the watershed.[21]

Chart 2: Point Source Loadings by State



This pollution comes from a variety of sources, including municipal wastewater treatment plants, industrial facilities, concentrated animal feeding operations (CAFOs), and farms; however, the Clean Water Act's discharge permits apply only to non-farm "point sources." As much of the agricultural pollution choking the Bay remains outside of federal permitting authority, this report focuses on point sources currently subject to regulation and enforcement by EPA and the states.

Of the variety of point sources that contribute to pollution in the Chesapeake Bay, the Bay TMDL considers five broad categories: (1) municipal wastewater treatment plants, (2) industrial facilities, (3) permitted stormwater discharges, (4) combined sewer overflows (CSOs), and (5) permitted CAFOs.[22] For the purposes of this report, we will analyze the contributions of the first two of these sources of pollution, given the complexity of and lack of

[20] Chesapeake Bay TMDL at 4-1 – 4-2.
[21] *Id.*, Tables 4-1 – 4-3.
[22] *Id.* at 4-6.

consistently reported data for the latter three.[23] Though this report does not address stormwater, CAFO, or CSO discharges, these point sources do not warrant any less scrutiny. To the contrary, EPA and the Bay states should focus on requiring improved monitoring and reporting of these discharges to allow a more accurate assessment of their contribution to Bay pollution loadings.

Municipal Wastewater Treatment Plants

Municipal wastewater treatment plants are facilities that discharge treated wastewater from municipal sewer systems.[24] Under the TMDL, municipal wastewater treatment plants do not include CSO discharges – which, as noted above, have their own TMDL allocation – or sanitary sewer overflow (SSO) discharges, which are illegal discharges of raw sewage from sanitary sewage systems. The TMDL assumes full cessation of all SSO events, and they therefore do not have a TMDL allocation.[25]

Discharges from municipal wastewater treatment plants represent 17% of total nitrogen, 16% of total phosphorous, and a *de minimis* amount (i.e., less than 0.5%) of sediment loadings to the Bay.[26] Within the Bay watershed, there are 3,582 permitted municipal wastewater treatment facilities, of which EPA defines 402 as TMDL significant sources.[27] The vast majority of wastewater treatment plants are in Pennsylvania (183 significant/1,246 nonsignificant) and Virginia (101 significant/1,618 nonsignificant), with a large number also in Maryland (75 significant/163 nonsignificant).[28] Almost all of the nitrogen and phosphorous delivered to the Bay from this sector comes from Maryland, Pennsylvania, or Virginia.[29]

Industrial Discharge Facilities

Industrial discharge facilities are those facilities that discharge contaminated wastewater from industrial or commercial sources, such as poultry processors, manufacturers, or coal-fired power plants.[30] These facilities contribute an estimated 3% of total nitrogen, 8% of total phosphorous, and a *de minimis* amount of sediment to the Bay.[31] There are 1,679 total industrial discharge facilities in the Bay, of which 76 are significant sources.[32] As with municipal wastewater treatment plants, Pennsylvania (30 significant/409 nonsignificant), Virginia (24 significant/639 nonsignificant), and Maryland (12 significant/477 nonsignificant) permit nearly all such facilities in the Bay watershed, and these states are responsible for almost all of the nitrogen and phosphorous discharged from this sector to the Bay.[33]

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[23] EIP considered the Bay watershed point sources included in EPA's point source database for the Bay Watershed Model.
[24] Chesapeake Bay TMDL at 4-9.
[25] *Id.* at 4-21, 4-22.
[26] *Id.* at 4-10.
[27] *Id.* at ES-5; *see also* note 17.
[28] *Id.* at 4-10.
[29] *Id.*
[30] *Id.* at 4-13.
[31] *Id.*
[32] *Id.*
[33] *Id.*

Permitted Stormwater

Permitted stormwater discharges – discharges of stormwater from permitted industrial activity, construction activity, and municipal separate storm sewer systems (MS4s) – are the most newly regulated point sources of pollution to the Bay.[34] The 1987 Clean Water Act amendments requiring stormwater permits are now fully implemented by EPA regulations, and NPDES permits are required for sources of industrial stormwater, stormwater from construction activity one acre and greater, and stormwater from MS4s in urban areas above a threshold population size.[35]

The TMDL estimates that permitted stormwater discharges represent 16% of total sediment loadings, 15% of phosphorous loadings, and 8% of nitrogen loadings to the Bay.[36] As with the other point-source sectors, the vast majority of NPDES-permitted stormwater sources in the Bay watershed are in Maryland, Pennsylvania, and Virginia; 57.6% of all stormwater permittees in the Bay and nearly two-thirds of the construction stormwater permittees are in Maryland.[37]

Concentrated Animal Feeding Operations

CAFOs are a unique point source category of pollution to the Bay, in part because they are not yet fully regulated and accordingly do not provide a full data set. CAFOs need only obtain coverage under a NPDES permit if they actually discharge, and the Bay states are behind in identifying and permitting these dischargers.[38] As a result, many CAFOs do not have NPDES permits. Moreover, even those covered by permits are not required to monitor their discharges like other point sources. The Bay TMDL reflects this dearth of data, and does not include a 2009 contribution to loadings for this point source sector.[39] Due to the lack of permits and monitored discharge data on CAFO pollution in the watershed, this report does not address the important role that improved regulation of CAFO discharges can and should play in reaching the TMDL goals.

Combined Sewer Overflows

Combined sewer systems collect municipal and industrial wastewater and stormwater in one system, in contrast to MS4s and sanitary sewers, which separately collect stormwater and sanitary sewer waste.[40] At times of high precipitation, combined sewer systems can become overwhelmed, leading to an overflow of untreated combined wastewater into receiving waters.[41] While CSOs are considered point sources and have been assigned a WLA in the Bay TMDL, the limited data available for CSO discharges make direct and accurate loading comparisons

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[34] *Id.* at 4-22.

[35] *Id.*; 33 U.S.C. § 1342(p)(2)(E), (6). Although certain stormwater sources require NPDES permits, those construction sites, industrial sites, and MS4s do not typically report loadings like other point sources, and as a result EIP did not have comprehensive pollution data.

[36] Chesapeake Bay TMDL at 4-22.

[37] *Id.* at 4-25.

[38] For example, Maryland has issued permits to just a fraction of the CAFOs that have applied for coverage. *See* Center for Progressive Reform, *Manure in the Bay: A Report on Industrial Animal Agriculture in Maryland and Pennsylvania* at 32 (June 2012), *available at* http://www.progressivereform.org/articles/CAFOs_1206.pdf. Virginia has yet to issue a single Clean Water Act permit to a CAFO. Email from Betsy Bowles, Virginia DEQ Animal Feeding Operations Coordinator, to Tarah Heinzen (June 20, 2012)(on file at EIP).

[39] *See* Chesapeake Bay TMDL at 4-25 – 4-28.

[40] *Id.* at 4-17.

[41] *Id.*

impractical. EPA used the 10-year average of reported CSO loads from 1991 to 2000 as the TMDL baseline to establish CSO WLAs and mark progress.[42] Of the 64 CSO communities in the Bay watershed, the four largest are three cities in Virginia and the District of Columbia, and the vast majority overall are in the Susquehanna basin of Pennsylvania.[43]

State Programs

In addition to leading the watershed in overall and point source discharges of nitrogen, phosphorus, and sediment, Pennsylvania, Maryland, and Virginia are home to the significant majority of regulated point sources in the Bay watershed and the majority of those point sources designated as significant facilities. Consequently, these states' permit requirements, inspections, and enforcement programs will have a disproportionate effect on pollution entering the Bay. EIP looked at all of the Bay jurisdictions' track records in implementing these aspects of their Clean Water Act programs, to identify those areas for improvement likely to have the greatest water quality benefit.

A. Expired and Administratively Continued Permits

The Clean Water Act set ambitious goals for protecting U.S. waterways, including the goal of eliminating all discharges of pollution into navigable waters.[44] In establishing this goal, Congress did not anticipate that industries and wastewater plants would cease to exist, but rather that technology would continually improve and lead to reductions in pollution loads from new and existing sources. To ensure this progress, the Clean Water Act requires dischargers to meet technology standards that EPA establishes for different categories of polluters, known as technology-based effluent limitations.[45]

These standards, which for existing sources are set based on what technology best reduces discharges and is generally achievable for an entire industry, may improve over time as new methods develop and EPA revises the standards.[46] Certain facilities may also need to begin meeting more protective water quality-based limits if they are polluting a waterway that is not meeting its water quality standards. Regular permit re-issuances also provide opportunities for public participation throughout the existence of a discharging facility.[47] For these reasons, the Clean Water Act limits the duration of a NPDES permit to five years.[48]

Despite this requirement, however, many states allow discharge permits to expire without timely renewals, or adopt the practice of "administratively continuing" the permit without revisions, a review, or a public notice and comment process. Such practices can delay or prevent needed improvements to permits as standards for an industry become more protective of water quality, or as water monitoring provides better information about which waters are impaired. A review of the NPDES permits in effect in the Chesapeake Bay watershed in September 2012 show that

[42] *Id.* at 4-21.
[43] *Id.* at 4-18-4-19, 4-21.
[44] 33 U.S.C. § 1251(a)(1).
[45] *Id.* § 1314(b); 40 C.F.R. § 122.44.
[46] *See* 33 U.S.C. §§ 1311(b)(2)(A); 1314(b).
[47] *Id.* § 1342(b)(3).
[48] *Id.* § 1342(b)(1)(B).

a troubling number of facilities are operating with permits that have been allowed to expire or have been administratively continued after five years.

Regular permit renewals are critical opportunities to address large polluters and reduce total Bay loadings, so the widespread failure to maintain current permits is important to address if the region is to meet the TMDL goals for municipal and industrial point sources. Approximately one third of Bay permits are currently expired – nearly 2,000 facilities – and hundreds have been expired for more than 3 years.

Chart 3: Status (by %) of NPDES Permits in the Chesapeake Bay Watershed

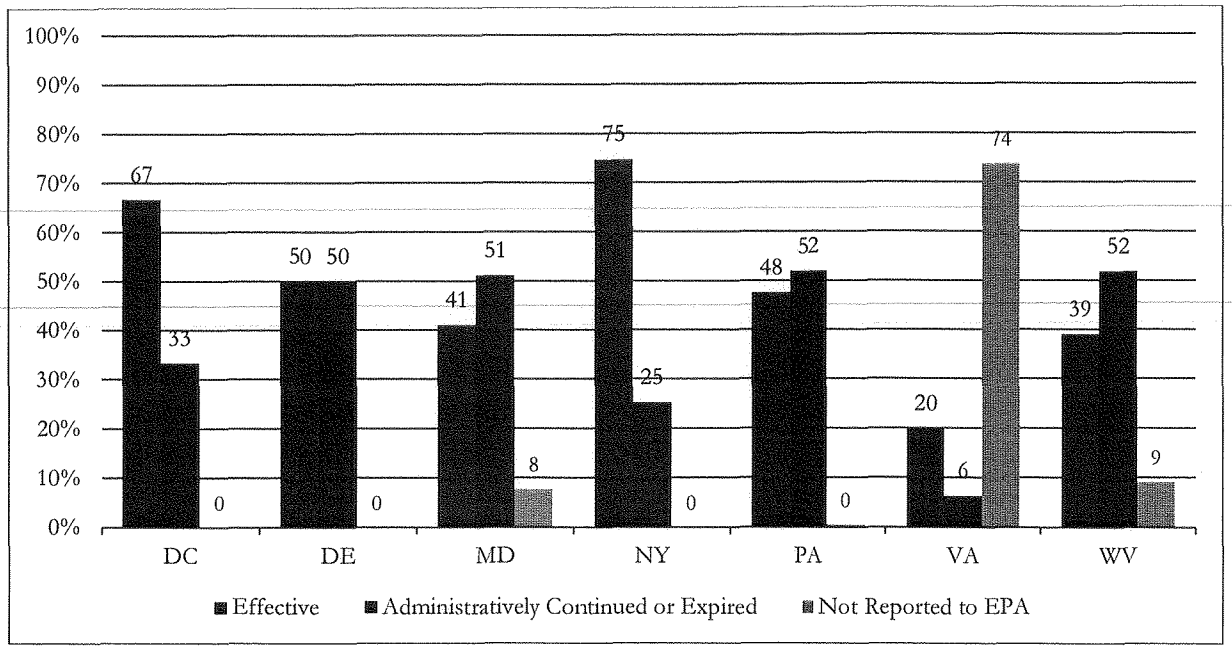

Chart 3 above shows the Bay states' poor record when it comes to timely review of discharge permits. Every jurisdiction allows at least a quarter of its discharge permits to expire, administratively continues permits past the five-year limit without a timely renewal, or abstains from reporting permit information to EPA.[49] The Bay states are not only lagging behind with respect to overall permit renewals; the proportion of major dischargers with expired or administratively continued permits is also troublingly high across the watershed. When EIP reviewed the currency of Bay permits in September 2012, more than two thirds of Delaware's major Bay watershed permits were expired or administratively continued, as were approximately 45 % of West Virginia's. Most of the Bay states have an even worse record when it comes to keeping minor permits current. More than half of Pennsylvania's, Maryland's, and

[49] States are only required to submit discharge data for major sources to EPA; those facilities for which ECHO has no record but which appear in the Chesapeake Bay watershed model database are represented in green as "Not Reported to EPA."

West Virginia's minor permits were expired or administratively continued as of September 2012. Virginia's failure to report most minor source data to EPA limits access to information about whether those permits are current.[50]

While this review provides only a snapshot of permit status across the Bay, it indicates that all of the Bay jurisdictions have fallen behind on basic components of administering their Clean Water Act programs: requiring polluters to maintain current discharge permits and providing for public participation. Facilities with expired or extended permits may be subject to upgrades and more stringent permit limits necessary to comply with the Bay TMDL or local TMDLs, and as states delay the permitting process, they also delay critical reductions in Bay pollution loads.

This analysis also demonstrates that some Bay states report much more complete data to EPA than others. Virginia does not report data on nearly three quarters of its dischargers to EPA; EPA's compliance database does not even show names and addresses for these facilities. The Bay point source database demonstrates that Virginia's unreported dischargers do exist, but EIP was unable to determine their permit status. While states are not required to submit minor source records to EPA, Virginia, Maryland, and West Virginia failed to report even basic information on a significant number of minor sources.

B. Inspections

EIP reviewed EPA's compliance database to compare state-wide inspection rates for major and minor facilities.[51] This allowed for a comparison of overall state programs, rather than looking only at facilities in the Chesapeake Bay watershed. Though states inspect major sources more frequently than minor sources, hundreds of major sources in the Bay states have gone without a single inspection over the past year.

Table 1: Major Source Inspection History

State	Major sources uninspected for the past year	Total major permits in ECHO	Percent of major dischargers without inspection in a year
DC	3	4	75%
DE	2	20	10%
MD	18	92	20%
NY	180	320	56%
PA	43	408	11%
VA	77	149	52%
WV	65	101	64%

EIP also looked at minor sources that have gone without inspection for the past five years, and found that the Bay states allow thousands of dischargers to go uninspected for entire permit cycles or longer. A state's decision

[50] EIP evaluated permit status for the minor sources for which Virginia did report basic information to EPA. Virginia did not include expiration dates for 2% of these.

[51] *See* EPA, Enforcement & Compliance History Online (ECHO), http://www.epa-echo.gov/echo/ (searched September 19, 2012). As with reporting of other data to ECHO, incomplete reporting of inspections by the Bay states may affect inspection rates reflected in this report. Virginia, Maryland, and West Virginia have not submitted information on certain minor sources to EPA. These facilities do not appear in ECHO, and therefore these inspection rates do not include those minor facilities.

to designate a source as "minor" does not mean the facility does not discharge large amounts of pollution; the TMDL definition of significant point sources includes numerous so-called minor facilities.

Table 2: Minor Source Inspection History

State	Minor sources uninspected for the past 5 years	Total minor permits in ECHO	Percent of minor dischargers without inspection in 5 years
DC	9	17	53%
DE	5	31	16%
MD	2,424	3,089	78%
NY	4,042	5,267	77%
PA	5,906	8,997	66%
VA	82	866[52]	9%
WV	528	828	64%

Overall, minor sources contribute approximately 16% of point source nitrogen, 30% of point source phosphorus, and 27% of point source sediment loadings to the Bay,[53] and yet the states exercise little oversight through inspections. Compounding this lack of accountability, states are not required to report minor source discharge data to EPA; the lack of discharge data limits EPA's ability to step in with targeted federal inspections and enforcement actions when states fail to act. Cleaning up the Bay will require improved oversight and compliance across the board, not only from the watershed's major facilities.

C. Violations and Enforcement Actions

Even where inspections lag, states have the opportunity to take enforcement actions when point sources self-report violations in their Discharge Monitoring Reports. EIP compared state-wide ECHO records of effluent exceedances – permit violations for surpassing a discharge limit on a specific pollutant – with records of monetary penalties assessed.[54] This comparison excluded other permit violations, such as failures to report on time.

EPA's compliance database records penalties over the past five-year period, but tracks effluent violations over the past three years, which may serve to inflate apparent penalty rates.[55] These records also combine state-assessed penalties and EPA-assessed penalties.

[52] While Virginia appears to surpass its neighboring states in its minor source inspection program, nearly three quarters of Virginia's minor permits are not included in ECHO. As a result, Virginia's overall inspection rate may be lower than the rate for facilities Virginia elected to report to EPA.

[53] EIP selected minor sources in the Bay watershed using ECHO data and calculated those facilities' share of total Bay loadings using EPA's Chesapeake Bay Watershed Model discharge data.

[54] *See* ECHO (searched September 19, 2012), *supra* note 51. As noted previously, incomplete or inconsistent reporting of violations and enforcement actions by states may affect the violation and penalty rates reflected in this report.

[55] Some penalties may also have been assessed for non-effluent violations, further inflating penalty rates for the violations in Table 3.

These records show that, even when looking only at actual pollution violations, states and EPA rarely assess penalties. Facilities facing a choice between non-compliance and costly upgrades have little incentive to invest in improved technology if they are unlikely to pay penalties for their permit violations.[57]

EIP also reviewed state-wide EPA records on repeat violators – selecting those Bay state dischargers that have experienced more than ten effluent violations in the past three years – and looked at the rates of formal enforcement actions taken against them. The states and EPA subjected only a minority of these chronic violators to formal enforcement actions.[58]

Table 3: Effluent Violations and Penalties

State	Facilities with effluent violations in the past 3 years	Facilities with monetary penalties in the past 5 years
DC	6	0
DE	31	4
MD	445	74
NY	1038	204
PA	375	56
VA	60[56]	14
WV	357	30

Across the Chesapeake region, EPA records demonstrate that the Bay states do not consistently select significant dischargers and bad actors for inspections, penalties, and use of their formal enforcement resources.

D. Permit Limits

To achieve the TMDL goals of reducing nitrogen, phosphorus, and sediment, it is vital that permits for sources of these pollutants in the Bay watershed contain enforceable numeric limits that cap the amount and concentration of pollutants that a source may discharge. States have often avoided including numeric limits in permits, instead relying on vaguer terms such as a general prohibition on violating certain narrative water quality standards. However, enforceable and measureable numeric limits are a fundamental first step towards reducing pollution.

Numeric limits offer a clear metric for the state permitting authority, the permittee, and the public to determine when a source is discharging too much of a pollutant to its receiving waters. Such numeric limits offer regulatory clarity to permittees, reduce the state authority's costs in monitoring and proving violations, and allow the state authority to control precisely how much of each type of pollutant is allowed to reach a receiving water. Each of these elements is even more crucial when a TMDL is in place; if individual discharges cannot be tracked and controlled, there is simply no way to guarantee that the TMDL, as the sum of numerous individual discharges, will be met.

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[56] Again, Virginia's numbers are skewed by the state's low minor permit reporting rate to ECHO. These figures do not account for the minor sources with effluent violations that are not represented in ECHO.

[57] For an in-depth analysis of Maryland's Clean Water Act enforcement program, *see also* Center for Progressive Reform, Failing the Bay: Clean Water Act Enforcement in Maryland Falling Short (April 2010), *available at* http://www.progressivereform.org/articles/mde_report_1004FINALApril.pdf.

[58] *See* ECHO (searched September 19, 2012). Maryland took formal enforcement action in 27% of cases, Pennsylvania in 42%, and Delaware and D.C. in one third of cases.

To assess whether any Bay states are behind on this fundamental aspect of regulating their most significant dischargers, EIP reviewed the individual permit limits for nitrogen, as reported to ECHO, for the 478 significant Bay point sources. The Bay states report data to ECHO for 379 of those 478 dischargers; among those 379, EIP considered the 334 dischargers with comprehensive ECHO data. As of October 2012, EIP could not identify enforceable nitrogen limits for 64 of those 334 – almost 20%. Table 4 provides a state-by-state breakdown of these findings. This analysis does not reflect Virginia's watershed general permit, which adopts annual mass limits for nutrients at some significant facilities in lieu of more frequent concentration and mass limits.[59]

Table 4: Significant Point Sources without Numeric Nitrogen Limits, 2010 to 2011

STATE	FACILITIES	2010 N LOAD	2011 N LOAD
MD	9	4,489,670	4,205,311
NY	10	309,213	327,214
PA	45	2,981,078	3,114,680
Total	**64**	**7,779,961**	**7,647,204**

EPA's implementation plan anticipated that all 478 significant dischargers would have permits with effluent limits designed to ensure the facilities would meet their WLAs.[60] The 64 facilities without numeric limits discharged over 7.6 million pounds of nitrogen in 2011, accounting for more than 15% of the significant dischargers' load. However, ECHO may not include permit limits that have been established but that have not yet taken effect. Some of the Bay states have also begun implementing nutrient trading programs, which may allow dischargers to purchase pollution credits instead of meeting their WLAs. Such trading schemes may lower costs for some facilities, but could also lead to unhealthy levels of TMDL pollutants in local tributaries of the Bay and limit transparency regarding actions to reduce pollution at specific facilities. For a complete list of nitrogen loadings by significant dischargers without numeric nitrogen limits, see the highlighted sections of Appendix B.

The Bay states should also take a closer look at some of the smaller "nonsignificant" facilities in the watershed that do not currently have individual WLAs, but that contribute large loadings and likely warrant individual WLAs. EPA estimated that nitrogen loadings from the largest 599 of these nonsignificant dischargers added up to about 5.6 million pounds of nitrogen in 2010, or just over 10% of the load from significant sources. EIP's analysis indicates that some of these smaller sources may also be larger than EPA's Bay watershed model assumes. For example, the PPL Brunner Island power plant in Pennsylvania released nearly 60,000 pounds of nitrogen to the Susquehanna in 2011, while Maryland City and Patuxent Water Reclamation plant discharged more than 40,000 pounds of nitrogen to the Patuxent River the same year. If this monitoring data is accurate, such facilities belong on the list of significant plants. The Bay states should conduct inventories of loadings from their larger nonsignificant facilities and should prioritize establishing numeric effluent limits and individual WLAs for those above the TMDL's significant facility threshold.

Achieving the Bay TMDL goals will depend on the cooperation and compliance of each of the Bay states; the fact that each state has imposed numeric permit limits on the most significant dischargers of TMDL pollutants is an important step. However, the severe impairment of the Bay demonstrates the inadequacy of relying on the

[59] For more information, *see* Virginia's General Permit for Nutrient Discharges to Chesapeake Bay, *available at* http://www.deq.virginia.gov/Programs/Water/PermittingCompliance/PollutionDischargeElimination/NutrientTrading.aspx.
[60] *See* Guide for EPA's Evaluation of Phase I Watershed Implementation Plans, *supra* note 2.

existence of permit limits alone as an indicator of success. The fact that a permit contains a numeric effluent limit does not mean that the limit is adequately protective of water quality. Permit limits should reflect a variety of factors, including the water quality standards and level of impairment of the receiving water, the ability of existing technology to achieve limits, and the WLA assigned to the facility under the Bay TMDL or local TMDLs. The existence of numeric limits alone does not demonstrate that the state took these factors fully into account. Moreover, even a strong permit limit does not indicate that a facility is in compliance, or that the state is effectively inspecting and taking enforcement actions when warranted. All of these considerations should help shape the Bay states' approaches to point source permitting and enforcement as the TMDL process continues.

Individual Facilities

A. Loadings Due to Violations

EIP reviewed EPA's 2011 violation and discharge data from all significant sources in the Bay watershed, as well as insignificant sources with at least one exceedance of a TMDL pollutant limit, to calculate the loadings in excess of permit limits and gauge the impact of violations.[62] These violations contribute noteworthy loadings of TMDL pollutants, indicating that improved compliance and enforcement alone could significantly reduce the share of pollution loadings to the Bay from municipal and industrial point sources.

Table 5: 2011 Loadings due to Permit Limit Violations

STATE	Nitrogen (lbs.) [61]	Phosphorous (lbs.)
DC	0	0
MD	299,396	20,769
NY	12,510	5,312
PA	271,837	7,699
VA	33,174	810
WV	34,096	0
MD SSOs	66,378	9,329
HRSD SSOs	13,870	1,949
Total	731,261	45,868

Total loadings above permit limits include a few dramatic violations. For example, the Ballenger Creek and Lower Lackawanna Valley Sanitary Authority Wastewater Treatment Plants each exceeded permit limits by more than 100,000 pounds of nitrogen in 2011 (111,158 and 103,883 pounds, respectively). Nine additional facilities had excess discharges of more than 10,000 pounds of nitrogen-related effluent.[63] All told, 33 facilities exceeded their nitrogen-based permit limits by more than 1,000 pounds.

EIP found similarly significant violations of phosphorous limits. For example, the Shippensburg Borough Sewage Treatment Plant exceeded its phosphorus limit by more than 7,700 pounds, and 12 additional facilities exceeded phosphorous limits by more than 500 pounds. When combined, Bay discharges due to permit violations added up to nearly 700,000 pounds of nitrogen and phosphorus in 2011. These violations threaten to counteract significant progress states are making to reduce pollution through targeted upgrades of certain facilities, particularly in the case of violators that will not have to upgrade to meet an individual WLA; the impact of violations underscores the critical role of enforcement in meeting the TMDL's ambitious goals. Not all of these violations led

[61] Many nitrogen violations were for ammonia permit limits as opposed to total nitrogen. In these cases, EIP estimated the total nitrogen discharge that occurred as a result of the ammonia violation. See Appendix D: Methodology for a more detailed explanation.
[62] *See* Appendix D: Methodology for an explanation of how EIP calculated loadings in excess of permitted limits.
[63] EIP looked at loadings of total nitrogen, ammonia nitrogen, kjeldahl nitrogen, and nitrites and nitrates, based on the constituents of nitrogen regulated under the permit.

to annual discharges in excess of WLAs; however, even illegal discharges that do not cause a facility to exceed its WLA can harm local water quality and delay Bay progress. The Bay TMDL is designed to protect the Bay itself and its tidal tributaries, and strategies that focus solely on meeting WLAs to protect the estuary will not necessarily protect the many rivers and streams that feed it from harmful pollution events throughout the year. Appendix A summarizes the Chesapeake Bay watershed dischargers that most significantly exceeded their permit limits for nitrogen, phosphorous, and total suspended solids in 2011.

EIP also considered the loadings of nitrogen and phosphorous associated with illegal Sanitary Sewer Overflows (SSOs). Maryland is the only state in the Chesapeake Bay watershed with a comprehensive database of SSOs.[64] EIP downloaded five years of data from Maryland's database and used a methodology developed by EPA's Chesapeake Bay Program Wastewater Treatment Workgroup to estimate annual nitrogen and phosphorous loads based on reported spill volumes.[65]

In 2011, Maryland SSOs discharged an estimated 66,000 pounds of nitrogen and nearly 10,000 pounds of phosphorous into the Bay. Although data on SSO discharges in the other Bay states is incomplete, EPA estimated that Virginia's Hampton Roads Sewage District discharged nearly 14,000 pounds of nitrogen into the Bay.[66] The Chesapeake Bay nutrient reduction strategy must consider the role of SSOs throughout the region in elevating nitrogen and phosphorous loadings, as the TMDL assumes that the Bay states will eliminate all illegal SSO loadings by 2025. Combined, permit limit violations and SSOs contributed at least 730,000 pounds of nitrogen loadings to the Bay in 2011.

Table 6: Maryland Nutrient Loads from Sanitary Sewer Overflows

Year	Est. Spill Volume (million gallons)	Est. Nitrogen Load (lbs.)	Est. Phosphorus Load (lbs.)
2006	125.67	43,339	6,091
2007	44.59	15,377	2,161
2008	161.17	55,581	7,811
2009	86.01	29,698	4,174
2010	57.92	31,300	4,399
2011	192.47	66,378	9,329
Average	**111.30**	**40,279**	**5,661**

B. TMDL Progress by Municipal and Industrial Point Sources

EIP compared 2010 municipal and industrial point source loadings of nitrogen and phosphorous to WLAs to identify the loadings reductions needed state-by-state to achieve 2025 reduction targets.[67] Table 7 summarizes nitrogen loadings by significant and nonsignificant municipal and industrial point sources in 2010[68] and compares them to 2025 WLAs.

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[64] *See* Maryland Department of the Environment (MDE), Maryland Reported Sewer Overflow Database, *available at* http://www.mde.maryland.gov/programs/water/overflow/pages/reportedseweroverflow.aspx.

[65] This methodology assumes that every 45 million gallons of sewage from SSOs yields 15,519 pounds of Nitrogen, and 2,182 pounds of phosphorous. *See Estimated Impact of Reducing Sanitary Sewer Overflows Relative to the Required Urban Nutrient Reductions* (March 2011), http://www.hrpdc.org/MTGS_%20AGDS/ChesBay/2011/November/Summary_HRSDEstimate_NRemoval.pdf.

[66] *Id.*

[67] *See* Chesapeake Bay TMDL, Appendices Q and R.

[68] 2010 is the most recent year for which a complete point source loadings dataset is available.

Table 7: Total 2010 Municipal & Industrial Point Source Nitrogen Loadings and Wasteload Allocations

State	2010 NITROGEN LOAD			EDGE OF STREAM NITROGEN WASTELOAD ALLOCATION		
	Nonsignificant	Significant	Total	Nonsignificant	Significant	Total
DC	32,432	4,887,769	4,920,201	60,985	4,689,000	4,749,985
DE	0	126,471	126,471	7,285	214,456	221,741
MD	1,109,328	13,139,717	14,249,045	1,019,910	8,523,598	9,543,508
NY	281,057	2,388,967	2,670,023	200,001	1,545,956	1,745,957
PA	3,004,333	13,693,185	16,697,518	3,006,666	12,455,951	15,462,617
VA	1,658,887	22,403,004	24,061,891	1,248,849	16,851,973	18,100,822
WV	91,656	617,391	709,047	240,406	338,372	578,778
TOTAL	6,177,692	57,256,504	63,434,196	5,784,101	44,619,307	50,403,408

To evaluate progress in loadings reductions from 2010 to 2011, EIP compared 2010 and 2011 nitrogen loadings from significant Bay point sources for which sufficient data was available on ECHO to estimate 2011 loads; i.e., the same facilities EIP reviewed for numeric permit limits. These 334 dischargers were responsible for 98% of all significant municipal and industrial point source loadings in 2010, and 88% of all industrial and municipal point source nitrogen loadings to the Bay in 2010, the latest year for which a complete loadings dataset is available. Table 8 summarizes initial progress reducing nitrogen pollution from these sources.

Overall, these significant sources reduced their nitrogen loads by 18% between 2010 and 2011. Looking forward, these dischargers will need to collectively reduce nitrogen loads by another eight million pounds by 2025 to meet their combined WLAs. Load reductions from 2010 to 2011 are promising, but not all of the Bay states are on track; while nitrogen discharges from these sources significantly declined in the District of Columbia, Maryland, Virginia and West Virginia, they increased by more than 560,000 pounds in Pennsylvania, more than 60,000 pounds in New York, and slightly in Delaware.

Table 8: Significant Source Nitrogen Loadings, 2010 to 2011

State	WLA	2010 Load	2011 Load	% of 2010 Load Considered*
DC	4,689,000	4,887,769	3,922,271	100%
DE	204,710	114,540	120,852	91%
MD	6,774,444	12,378,488	10,149,543	94%
NY	1,545,956	2,366,407	2,430,786	99%
PA	10,410,089	13,117,163	13,678,361	96%
VA	15,255,948	22,403,004	16,716,922	100%
WV	360,721	609,702	503,633	99%
Total	**39,240,868**	**55,877,073**	**47,522,368**	**98%**

*These percentages indicate the fraction of the significant municipal and industrial facilities' nitrogen load considered in EIP's analysis, based on 2010 loadings (the most recent year for which EPA's has compiled a complete Bay watershed model database).

Major dischargers' actions can have a large impact on overall Bay progress. For example, Maryland's Back River Wastewater Treatment Plant, the Chesapeake's third largest nitrogen discharger in 2010, reduced nitrogen loadings by more than 1.4 million pounds

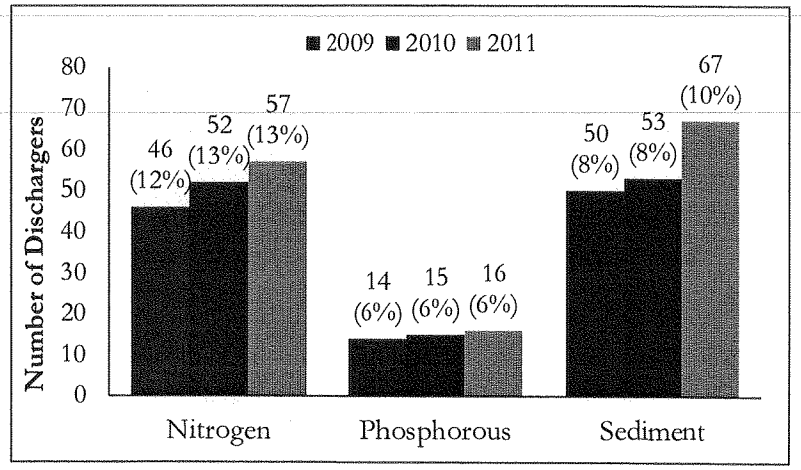
between 2010 and 2011. This brought the facility under its individual WLA. Conversely, Pennsylvania's Harrisburg Advanced Wastewater Treatment Plant moved further from its WLA in 2011, increasing its nitrogen load by more than 125,000 pounds.

Appendix B includes EIP's complete analysis of nitrogen loads from these 334 significant dischargers between 2010 and 2011, and Appendix D explains EIP's loadings calculation methodology. As permits expire, Chesapeake Bay states must take the opportunity to incorporate enforceable permit limits and compliance schedules where still lacking, ensuring that facilities upgrade as necessary over the next permit cycle to meet TMDL goals.

C. Chronic Violators

EIP cross-referenced EPA's database of Chesapeake Bay watershed point sources with the ECHO database records of effluence exceedances to identify facilities among the same 334 significant sources with repeated violations of permit limits for nitrogen, phosphorus, and sediment.[69] Appendix C shows the 25 most frequent violators for each type of permit limit, from 2009 through 2011. To more thoroughly assess the degree to which certain facilities are consistently in violation, EIP also determined how many Bay dischargers have been in violation of effluent limits for TMDL pollutants at least one quarter of the year for each of the past 3 years.

Chart 4: Significant Dischargers Exceeding Permit Limit for At Least Three Months per Year

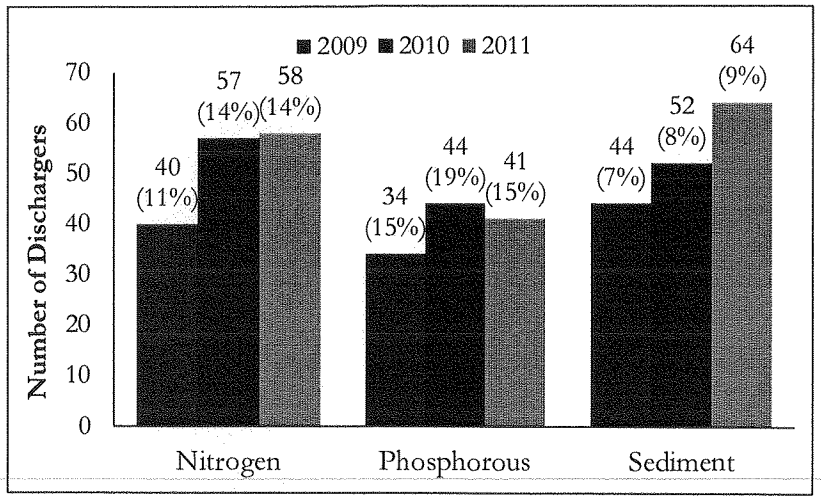


Numerous facilities regularly violate permit limits meant to restrict discharges of the TMDL pollutants, and the number of permitted dischargers exceeding their permit limits at least three months out of the year has increased from 2009 to 2011 for all three TMDL pollutants. Moreover, certain facilities regularly violate permit limits for more than one pollutant of concern. The frequency of violations at some facilities also indicates that the technologies in place may not be adequate to meet the concentration or mass-based pollution limits in certain permits. Some of these facilities have amassed dozens of permit violations in recent years, indicating that enforcement actions and penalties are failing to deter repeated illegal discharges.

[69] As with reporting of other data to ECHO, inconsistent or incomplete reporting of effluent exceedances by states may influence the trends in violations reflected in this report.

This noncompliance rate may be understated, as many dischargers also fail to report pollution data as required. In fact, the number of facilities that fail to fully report seems to be rising. For example, 14% of dischargers failed to report nitrogen data for at least a quarter of 2011, compared to 11% in 2009. Violators and non-reporting dischargers may also overlap because a facility can provide monitoring data showing it has violated a limit at some point in the year, while failing to report any data in other monitoring periods.

Chart 5: Significant Dischargers Violating Reporting Requirements for at Least Three Months per Year



Recommendations

If the Bay states are to meet the TMDL goals and begin restoring the Chesapeake, all sources – including industrial and municipal dischargers – must do their share and meet established wasteload allocations. Improved inspections, permitting, and enforcement will play critical roles in overseeing progress in these sectors. Each Bay jurisdiction should evaluate those areas in its Clean Water Act program that require the most improvement, as highlighted in this report.

- **Strong permits.** Permits should include numeric mass and concentration limits for all relevant pollutants. The Bay states should first focus on the most significant sources of nutrients and sediment when incorporating numeric limits into permits that lack them. Renewed permits should incorporate compliance plans to meet TMDL allocations within the next permit term. And all dischargers – including nonsignificant facilities that the TMDL will not require to upgrade – should be subject to rigorous monitoring and reporting requirements to more accurately track pollution in the Bay and local waterways. This reporting should include estimates of SSO loadings.

- **Deterrence.** The Bay jurisdictions should adopt mandatory minimum penalties for illegal discharges to remove the current incentive to violate permit limits. These penalties should be based on the pounds of pollution illegally discharged.

- **Funding.** Modest user fees for discharges, established to charge industrial and municipal sources by the pound of pollution, would supplement inadequate state funding for implementation of Clean Water Act permitting and enforcement programs.

- **Nutrient Trading.** States should not allow dischargers that have not stayed in compliance with permit requirements – including effluent limits, monitoring, and reporting – to participate in nutrient trading schemes, and they should not allow dischargers to meet existing permit requirements by purchasing nutrient credits.

- **Regular inspections.** States should inspect every major facility at least once annually, and should target inspections of minor sources based on non-compliance and loadings of TMDL pollutants and other pollutants of concern.

- **Transparency.** The Bay states – and particularly Virginia – should improve reporting of minor source discharge data and penalty data to EPA to facilitate EPA oversight and public participation.

- **Current permits.** The Bay states should improve permitting by renewing and strengthening those permits that have expired or that they have cursorily extended through the administrative process. Reliance on outdated permits delays needed improvements in water quality and stifles public participation.

Appendix A: Bay Point Sources with 2011 Discharges Significantly Above Permitted Levels

FACILITIES WITH 2011 NITROGEN AND NITROGEN-RELATED DISCHARGES MORE THAN 1,000 POUNDS ABOVE PERMIT LIMIT

NPDES ID	Facility Name	Designation	2011 Estimated Load over Limit (lbs./year)	Parameter
MD0021822	Ballenger Creek WWTP	Major	111,158	Nitrogen, total
PA0026361	Lower Lackawanna Valley Sanitary Authority WWTP	Major	103,883	Nitrogen, total
MD0000311	Grace Davison-Curtis Bay	Major	71,589	Nitrogen, total
MD0021679	Marlay-Taylor WWTP	Major	47,814	Nitrogen, total
PA0022209	Bedford WWTP	Major	40,043	Nitrogen, total
PA0044661	Lewisburg Area Joint Sewer Authority - College Park STP	Major	30,996	Nitrogen, total
MD0020001	Crisfield WWTP	Major	28,710	Nitrogen, total
VA0004049	Tyson Foods Inc. - Temperanceville	Major	21,067	Nitrogen, total
PA0021687	Wellsboro Municipal Authority	Major	12,721	Nitrogen, total
NY0023906	Erwin Town WWTP	Major	12,510	Nitrogen, total
MD0021652	Patuxent Water Reclamation Facility	Major	10,013	Nitrogen, ammonia total (as N)
VA0026514	Dahlgren District WWTP	Major	9,660	Nitrogen, Total as N
PA0021890	New Holland Borough WWTP	Major	9,418	Nitrogen, ammonia total (as N)
WV0022349	City of Charles Town	Major	8,560	Nitrogen, ammonia total (as N)
PA0030139	State Correctional Institution at Dallas	Minor	8,131	Nitrogen, total
WV0082759	Berkeley County Public Service Sewer District - Opeq/Hedgesville/Inwood/Baker Heights	Major	7,300	Nitrogen, ammonia total (as N)
PA0027316	Lebanon WWTP	Major	7,170	Nitrogen, ammonia total (as N)
PA0024228	BC Natural Chicken	Minor	6,868	Nitrogen, ammonia total (as N)
MDDRG2294	Hart - Miller Island Dredged Material Containment Facility	Minor	6,755	Nitrogen, ammonia total (as N)
MD0002658	Mirant Chalk Point, LLC.	Major	6,563	Nitrogen, total
MD0020532	Delmar WWTP	Minor	3,858	Nitrogen, ammonia total (as N)
MD0001503	Constellation Power Source, Inc.- Fort Smallwood Complex(Formerly Wagner Station)	Major	3,579	Nitrogen, total
WV0020150	City of Moorefield	Minor	3,204	Nitrogen, ammonia total (as N)

PA0021563	Gettysburg WWTP	Major	2,778	Nitrogen, ammonia total (as N)
PA0020826	Dover Township WWTP	Major	2,157	Nitrogen, ammonia total (as N)
MD0063207	Dorsey Run Advanced WWTP	Major	2,153	Nitrogen, total
PA0026875	Hanover Borough WWTP	Major	1,800	Nitrogen, ammonia total (as N)
MD0020524	La Plata WWTP	Major	1,776	Nitrogen, ammonia total (as N)
PA0021644	Dover Borough STP	Minor	1,775	Nitrogen, total
WV0103161	Berkeley County Public Service Sewer District - Spring Mills & Woods II Subdivision	Minor	1,593	Nitrogen, ammonia total (as N)
WV0088013	City of Charles Town - Tuscawilla Utilities	Minor	1,139	Nitrogen, ammonia total (as N)
WV0024775	Corporation of Shepherdstown	Minor	1,054	Nitrogen, Kjeldahl, total (as N)
PA0030643	Shippensburg Borough STP	Major	1,007	Nitrogen, ammonia total (as N)
VA0088331	Parham Landing WWTP	Major	1,001	Nitrogen, Kjeldahl, total (as N)

FACILITIES WITH 2011 PHOSPHOROUS DISCHARGES MORE THAN 500 POUNDS ABOVE PERMIT LIMIT				
NPDES ID	**Facility Name**	**Designation**	**2011 Estimated Load over Limit (lbs./year)**	**Parameter**
MD0021601	Patapsco WWTP	Major	7,741	Phosphorus, total (as P)
MD0021598	Cumberland WWTP	Major	6,149	Phosphorus, total (as P)
NY0031151	Oneonta City WWTP	Major	4,599	Phosphorus, total (as P)
MD0001503	Constellation Power Source, Inc.- Fort Smallwood Complex (Formerly Wagner Station)	Major	4,416	Phosphorus, total (as P)
PA0030139	State Correctional Institution at Dallas	Minor	3,273	Phosphorus, total
PA0021881	Westfield Borough	Minor	1,898	Phosphorus, total (as P)
MD0020281	Chesapeake Beach WWTP	Major	1,383	Phosphorus, total (as P)
PA0034576	Towanda Municipal Authority	Major	1,079	Phosphorus, total
VA0004049	Tyson Foods Inc. - Temperanceville	Major	810	Phosphorus, total As P
PA0009229	Norfolk Southern Railway Company	Major	759	Phosphorus, total (as P)
NY0025712	Painted Post Village STP	Major	713	Phosphorus, total (as P)
PA0024228	BC Natural Chicken	Minor	647	Phosphorus, total (as P)
MD0022551	Pocomoke City WWTP	Major	607	Phosphorus, total (as P)

Appendix B: Bay Point Source Dischargers' Nitrogen Loadings 2010-2011

- The table includes all 334 dischargers for which complete 2011 DMR data was available, and which were responsible for 98% of all significant municipal and industrial point source nitrogen discharges by mass in 2010.[70] For each Chesapeake Bay Watershed state, EIP included at minimum all facilities with individual WLAs that discharged at least 20,000 pounds of nitrogen in 2010. ECHO data is current as of October 2012.
- Dischargers with incomplete or insufficient 2011 DMR data were omitted from aggregate state-by-state comparisons of 2010 and 2011 loadings. Loads for Virginia dischargers were sourced directly from Virginia Department of Environmental Quality's 2011 Nutrient Load Analysis.[71]
- Yellow highlighted facilities lack numeric permit limits for nitrogen compounds.[72]

STATE	NPDES	FACILITY NAME	WASTELOAD ALLOCATION	2010 N LOAD	2011 N LOAD
DC	DC0021199	D.C. WASA (Blue Plains)	4,689,000	4,887,769	3,922,271
DE	DE0000035	Invista - Seaford Nylon Plant	171,818	90,913	97,966
DE	DE0020265	Seaford WTP	24,364	18,189	20,258
DE	DE0020125	Laurel STP	8,528	5,438	2,627
MD	MD0021555	Back River WWTP	1,583,691	3,118,927	1,712,380
MD	MD0021601	Patapsco WWTP	889,304	3,534,717	3,323,800
MD	MD0021741	Western Branch WWTP	372,777	172,632	172,190
MD	MD0021539	Piscataway WWTP	365,467	242,246	289,774
MD	MD0021491	Seneca WWTP	316,738	227,391	204,669
MD	MD0000311	Grace Davison - Curtis Bay	310,721	296,018	226,957
MD	MD0055174	Little Patuxent WRF	304,556	298,488	269,189
MD	MD0056545	Sod Run WWTP	243,645	382,018	410,410
MD	MD0021865	Mattawoman WWTP	243,645	133,976	65,403
MD	MD0021822	Ballenger Creek WWTP	219,280	113,716	123,340
MD	MD0021598	Cumberland WWTP	182,734	338,200	94,820
MD	MD0021661	Cox Creek WWTP	182,734	247,395	225,864
MD	MD0021814	Annapolis WRF	158,369	115,015	145,922

[70] *See* Appendix D for a detailed explanation of the methodology used to calculate 2011 N loads.
[71] *See* 2011 Nutrient Load Analysis (Amended May 4, 2012), http://www.deq.state.va.us/Portals/0/DEQ/Water/PollutionDischargeElimination/2011PublishedLoads-Amended_05-04-12.pdf.
[72] No Virginia facilities are highlighted because they are covered under that state's general permit, which includes annual mass limits.

MD	MD0001201	ISG Sparrows Point, Inc.	131,420	1,036,144	1,254,140
MD	MD0021571	City of Salisbury WWTP	103,549	408,222	275,216
MD	MD0021636	Cambridge WWTP	98,676	30,598	31,803
MD	MD0021776	Hagerstown Water Pollution Control	97,458	174,640	65,837
MD	MD0021610	Frederick City WWTP	97,458	169,279	163,875
MD	MD0021652	Patuxent WRF	91,367	102,831	95,974
MD	MD0021725	Parkway WWTP	91,367	94,605	88,348
MD	MD0021687	Upper Potomac River Commission STP	79,109	77,425	73,494
MD	MD0021679	Marlay-Taylor WWTP	73,093	112,007	120,907
MD	MD0021644	Broadneck WWTP	73,093	46,380	30,799
MD	MD0021831	Westminster WWTP	60,911	71,889	35,190
MD	MD0021717	Fort Meade WWTP	54,820	10,688	17,656
MD	MD0063509	Conococheague WWTP	49,947	33,554	31,649
MD	MD0021563	Aberdeen Advanced WWTP	48,729	19,849	27,179
MD	MD0021512	Freedom District WWTP	42,638	75,198	57,747
MD	MD0021628	City of Bowie WWTP	40,201	28,153	23,428
MD	MD0021229	U.S. Army Garrison - A.P.G.	36,547	19,970	11,521
MD	MD0020877	Fort Detrick WWTP	24,364	23,115	11,243
MD	MD0052027	Northeast River Advanced WWTP	24,364	22,393	21,724
MD	MD0024350	Broadneck WRF	24,364	18,785	21,827
MD	MD0001775	Erachem Comilog, Inc.	13,809	457,780	317,389
MD	MD0022446	Hampstead WWTP	10,964	31,804	33,299
MD	MD0020532	Delmar WWTP	10,355	26,443	10,682
MD	MD0061794	Mayo Large Communal WRF	9,989	22,446	25,602
MD	MD0020231	Boonsboro WWTP	6,100	23,053	21,398
MD	MD0022764	Snow Hill WWTP	6,091	20,496	16,899
NY	**Including 28 NPDES listed below**	**NY Significant WWTP Aggregate**	**1,545,956**	---	---

NY	NY0024414	Binghamton-Johnson Joint STP	NY AGG	399,265	408,339
NY	NY0027669	Endicott WPCP	NY AGG	394,358	379,700
NY	NY0035742	Chemung Co Elmiro SD STP	NY AGG	325,234	325,000
NY	NY0036986	Chemung Co SD#1 STP	NY AGG	185,960	191,665
NY	NY0027561	Leroy R Summerson WWTF	NY AGG	183,122	229,448
NY	NY0021423	Norwich WWTP	NY AGG	150,566	144,666
NY	NY0031151	Oneonta WWTP	NY AGG	132,046	134,958
NY	NY0025721	Corning WWTP	NY AGG	110,503	123,298
NY	NY0023647	Hornell WPCP	NY AGG	105,510	105,603
NY	NY0021431	Bath WWTP	NY AGG	45,365	48,431
NY	NY0031089	Waverly WWTP	NY AGG	40,089	29,289
NY	NY0029262	Owego STP	NY AGG	33,628	28,380
NY	NY0025798	Owego WPCP#2	NY AGG	32,113	36,791
NY	NY0029271	Sidney WWTP	NY AGG	31,677	34,462
NY	NY0031411	Richfield Springs STP	NY AGG	29,852	10,433
NY	NY0020672	Hamilton WPCP	NY AGG	20,084	31,218
NY	NY0023591	Cooperstown STP	NY AGG	17,418	19,281
NY	NY0004189	Argo Farma Inc	NY AGG	16,390	14,536
NY	NY0023906	Erwin WWTP	NY AGG	16,362	16,208
NY	NY0022730	Owego SD#1	NY AGG	15,771	17,902
NY	NY0004308	Kraft Foods Global, Inc.	NY AGG	13,820	6,599
NY	NY0020320	Addison WWTP	NY AGG	13,361	31,707
NY	NY0021466	Sherburne WWTP	NY AGG	12,652	12,379
NY	NY0021407	Greene WWTP	NY AGG	12,115	17,142
NY	NY0213781	Northgate WWTP	NY AGG	11,892	14,984
NY	NY0023248	Canisteo STP	NY AGG	10,725	8,726
NY	NY0025712	Painted Post STP	NY AGG	6,529	9,640
PA	PA0027197	Harrisburg Advanced WWTF	688,575	1,237,981	1,363,861

PA	PA0026743	Lancaster City WWTP	620,248	488,953	610,101
PA	PA0009024	Global Tungsten & Powders Corp	600,515	328,449	244,085
PA	PA0026107	Wyoming Valley Sanitary Authority WWTP	584,467	345,706	377,546
PA	PA0026263	York City WWTP	474,880	528,156	528,156
PA	PA0026492	Scranton Sewer Authority WWTP	365,292	716,578	771,656
PA	PA0042269	LASA - Susquehanna Water Pollution Control Central Facility	273,969	322,361	254,918
PA	PA0026808	Springettsbury Township WWTF	273,969	315,382	244,727
PA	PA0026921	Greater Hazleton Joint Sewer Authority WWTP	216,739	333,597	332,135
PA	PA0026727	Tyrone WWTP	166,231	79,853	79,234
PA	PA0027022	Altoona City Authority - Westerly WWTF	164,381	208,626	240,295
PA	PA0026239	Universal Area Joint Authority	164,381	182,017	164,381
PA	PA0027057	Williamsport Sanitary Authority Central Plant	153,423	399,734	418,199
PA	PA0027316	Lebanon WWTP	146,117	414,165	445,943
PA	PA0027014	Altoona City Authority - Easterly WWTP	146,117	209,995	209,037
PA	PA0020826	Dover Township WWTP	146,117	83,453	133,625
PA	PA0026077	Carlisle Borough	134,277	198,535	178,824
PA	PA0027090	Throop WWTP	127,852	308,866	340,032
PA	PA0027324	Shamokin Coal Township Joint Sewer Authority	127,852	73,664	167,219
PA	PA0026051	Chambersburg Borough STP	124,199	192,397	190,021
PA	PA0008869	PH Glatfelter Co	117,588	74,390	64,710
PA	PA0026735	Swatara Township WPCF	115,367	221,295	160,751
PA	PA0027189	Lower Allen Township WWTP	114,354	184,813	201,023
PA	PA0010553	Benner Spring State Fish Hatchery	110,347	58,522	57,069
PA	PA0026361	Lower Lackawanna Valley Sanitary Authority WWTP	109,588	173,479	213,471
PA	PA0027065	Archibald WWTP	109,587	54,250	75,109
PA	PA0043273	Hollidaysburg STP	109,587	42,586	50,992
PA	PA0080314	Roth Lane STP	101,997	28,174	64,505

PA	PA0008885	Procter & Gamble Paper Products Co	100,360	126,829	128,993
PA	PA0023248	Berwick Area Joint Sewer Authority WWTP	92,198	21,777	22,503
PA	PA0026484	Derry Township Municipal Authority - Clearwater Road WWTF	91,668	29,766	59,174
PA	PA0025933	Lock Haven WWTP	90,192	180,382	188,036
PA	PA0026875	Hanover Borough WWTP	83,441	180,774	187,296
PA	PA0023108	Elizabethtown Borough WWTP	82,191	23,594	38,446
PA	PA0026310	Clearfield Municipal Authority WWTP	82,191	163,118	118,897
PA	PA0037150	Penn Township WWTP	81,811	78,794	88,547
PA	PA0020273	Milton Regional Sewer Authority WWTP	80,040	25,816	111,399
PA	PA0027405	Ephrata Boro Authority - WWTP #1	79,049	115,903	116,493
PA	PA0040835	Bellefonte State Fish Hatchery	78,988	44,662	87,840
PA	PA0027171	Bloomsburg Municipal Authority WWTP	78,855	95,419	78,885
PA	PA0027049	Williamsport Sanitary Authority West Plant	77,547	198,338	184,052
PA	PA0026557	Sunbury City Municipal Authority WWTP	76,711	57,340	60,245
PA	PA0045985	Mountaintop Area Joint Sanitary Authority	75,981	49,641	80,675
PA	PA0026191	Huntingdon Borough WWTF	73,058	127,927	90,223
PA	PA0008443	PPL Montour LLC	72,749	71,003	73,256
PA	PA0020320	Lititz WWTP	70,319	43,025	48,977
PA	PA0028681	Kelly Township Municipal Authority	68,492	27,118	25,632
PA	PA0038415	East Pennsboro Township WWTP	67,579	84,758	94,590
PA	PA0023531	Danville STP	66,118	96,598	122,033
PA	PA0112127	Tylersville Fish Culture Station	63,339	37,837	21,097
PA	PA0030643	Shippensburg Boro STP	60,273	42,943	59,354
PA	PA0020486	Bellefonte Borough WWTP	58,812	73,770	57,738
PA	PA0010561	Pleasant Gap State Fish Hatchery	55,049	29,930	37,221
PA	PA0087181	Ephrata Boro Authority - WWTF #2	54,550	23,995	33,869
PA	PA0037141	Huntsdale Fish Hatchery	53,512	30,654	53,083
PA	PA0026280	Lewistown STP	51,470		

				107,204	114,828
PA	PA0110582	Eastern Snyder Co Regional Authority WWTP	51,141	38,712	52,672
PA	PA0023744	Northeastern York County Sewer Authority	46,535	40,738	10,358
PA	PA0026441	Lemoyne Borough STP	46,270	117,873	134,215
PA	PA0021687	Wellsboro WWTP	46,029	50,962	64,822
PA	PA0028576	Clarks Summit/South Abington Joint Sewer Authority	45,662	123,347	126,548
PA	PA0110540	Furman Foods Inc WWTF	45,450	24,709	4,914
PA	PA0021563	Gettysburg Municipal Authority WWTP	44,748	39,008	40,616
PA	PA0008419	Cherokee Pharmaceutical LLC	44,497	31,424	49,399
PA	PA0044661	Lewisburg Area Joint Sewer Authority - College Park STP	44,200	66,253	75,196
PA	PA0024406	Mount Carmel WWTF	41,095	64,418	16,191
PA	PA0043681	Valley Joint Sewer Authority	41,095	48,623	69,041
PA	PA0007919	Cascades Tissue Group - PA Inc	40,569	42,746	13,754
PA	PA0020664	Middletown WWTP	40,182	69,591	51,339
PA	PA0020885	Mechanicsburg WWTP	38,565	69,256	65,005
PA	PA0024040	Highspire Boro WWTP	36,529	51,750	27,646
PA	PA0026123	Columbia WWTF	36,529	44,204	53,594
PA	PA0070386	Shenandoah Municipal Sewer Authority WWTP	36,529	20,248	29,703
PA	PA0020923	New Oxford Municipal Authority WWTP	35,057	47,290	32,139
PA	PA0037966	Moshannon Valley Regional	31,634	64,174	77,846
PA	PA0024431	Old Mill Road WWTP	31,345	38,648	43,662
PA	PA0009270	Del Monte Corp	30,639	55,302	40,666
PA	PA0044113	South Middleton Township Municipal Authority STP	29,322	50,269	33,060
PA	PA0020621	Waynesboro STP	29,223	71,332	73,256
PA	PA0021067	Mount Joy Borough Authority WWTP	27,945	48,707	28,865
PA	PA0035092	Tyson Foods Inc	27,397	51,521	39,679
PA	PA0209228	Lycoming Co W&S Authority - Montoursville Regional Sewer System WWTF	27,397	22,234	10,400

PA	PA0022209	Bedford WWTP	27,397	58,053	62,542
PA	PA0024287	Palmyra Boro STP	25,936	56,923	44,686
PA	PA0024325	Muncy Boro Municipal Authority WWTF	25,570	21,299	25,851
PA	PA0021890	New Holland Borough WWTP	24,475	34,418	29,632
PA	PA0027553	Pine Creek Municipal Authority STP	23,744	53,082	96,569
PA	PA0083011	Newberry Township Municipal Authority	23,744	33,993	27,962
PA	PA0023558	Ashland WWTP	23,744	25,221	19,972
PA	PA0021814	Mansfield Boro WWTP	23,744	25,718	12,559
PA	PA0026654	New Cumberland WTF	22,831	57,340	27,741
PA	PA0032883	Duncansville Boro STP	22,228	13,841	11,660
PA	PA0024384	North Middleton Authority	22,020	23,544	25,637
PA	PA0007552	Empire Kosher Poultry Inc	21,928	45,959	16,856
PA	PA0080519	Antrim Township Municipal Authority STP	21,918	15,248	26,480
PA	PA0020893	Manheim Boro Authority WWTF	21,847	59,699	41,718
PA	PA0034576	Towanda Municipal Authority WWTP	21,187	21,326	27,159
PA	PA0020567	Northumberland Sewer Authority WTP	20,548	31,429	14,778
PA	PA0007498	Wise Foods Inc	19,957	28,911	29,384
PA	PA0028665	Jersey Shore Boro WWTP	19,178	64,723	69,807
PA	PA0024228	BC Natural Chicken LLC	18,982	28,844	66,655
PA	PA0022535	Millersburg Area Authority WTP	18,265	38,845	39,728
PA	PA0021229	Littlestown WWTF	18,265	26,717	36,846
PA	PA0035157	Farmers Pride Inc	16,438	87,639	113,693
PA	PA0020699	Montgomery Borough WWTP	15,525	79,328	98,778
PA	PA0060801	Montrose Municipal Authority	14,977	22,663	21,169
PA	PA0111759	Cargill Meat Solutions Corporation	14,612	205,460	333,330
PA	PA0029106	Greenfield Township Municipal Authority WTF	14,612	31,477	4,796
PA	PA0021806	Annville WTF	13,698	48,924	45,007
PA	PA0021245	Duncannon Borough STP	13,516	4,840	10,414

PA	PA0081868	Fairview Township	13,333	21,248	24,240
PA	PA0028738	Ralpho Township Municipal Authority WWTF	13,132	36,588	38,753
PA	PA0087661	Chestnut Ridge Area Joint Municipal Authority	12,877	27,149	31,586
PA	PA0027081	Clinton Township WWTP	12,786	22,611	21,701
PA	PA0062201	Schuykill County Municipal Authority	10,959	35,898	38,349
PA	PA0023141	Hastings Area Sewer Authority	10,959	32,317	16,542
PA	PA0110361	Freedom Township Water & Sewer Authority	10,959	22,524	20,330
PA	PA0023183	Mount Holly Springs WWTF	10,959	22,442	19,971
PA	PA0020508	McConnellsburg STP	10,959	22,440	23,859
PA	PA0110469	Patton WWTF	9,863	20,204	10,605
PA	PA0030139	Dallas State Correctional Institute	9,741	18,183	16,062
PA	PA0080438	Northern Lancaster Co Authority	8,219	30,439	29,243
PA	PA0020583	Middleburg Boro WWTP	8,219	22,313	18,739
PA	PA0060135	Shickshinny Sewer Authority	8,219	17,126	12,048
PA	PA0009911	Papetti's Hygrade Egg Products WTF	8,104	31,845	46,673
PA	PA0046272	Porter Tower WWTP	7,854	27,197	30,699
PA	PA0028673	Gallitzin Borough Sewer & Disposal Authority	7,306	24,489	20,832
PA	PA0028673	Allitzin Borough Sewage & Disposal Authority	7,306	24,489	20,832
PA	PA0080748	Jonestown WWTP	7,306	23,963	26,295
VA	**Including 39 NPDES listed below**	**VA James River Significant Source Aggregate**	**8,968,864**	---	---
VA	VA0063177	Richmond WWTP	VA AGG	2,378,027	1,299,130
VA	VA0066630	Hopewell WWTP	VA AGG	2,029,597	1,766,407
VA	VA0081264	HRSD - Chesapeake-Elizabeth STP	VA AGG	1,471,584	1,200,843
VA	VA0081299	HRSD - Nansemond STP	VA AGG	1,163,360	323,184
VA	VA0081272	HRSD - James River STP	VA AGG	1,069,797	699,686
VA	VA0081256	HRSD - Boat Harbor STP	VA AGG	1,058,823	1,057,115
VA	VA0063690	Henrico County WWTP	VA AGG	909,106	627,822

VA	VA0081281	HRSD - Virginia Initiative STP	VA AGG	855,059	739,114
VA	VA0081230	HRSD - Army Base STP	VA AGG	854,722	887,686
VA	VA0005291	Honeywell International Incorporated	VA AGG	846,023	1,089,072
VA	VA0025518	Moores Creek Regional STP	VA AGG	495,265	227,800
VA	VA0024996	Falling Creek WWTP	VA AGG	484,599	176,307
VA	VA0060194	Proctors Creek WWTP	VA AGG	440,097	392,386
VA	VA0025437	South Central Wastewater Authority	VA AGG	394,699	404,699
VA	VA0003646	MeadWestvaco Packaging Resources	VA AGG	321,200	314,500
VA	VA0081302	HRSD - Williamsburg STP	VA AGG	309,885	233,296
VA	VA0024970	Lynchburg City Sewage Treatment	VA AGG	276,182	240,065
VA	VA0003697	Babcock & Wilcox Nuclear Operation	VA AGG	237,234	201,632
VA	VA0004669	E I du Pont de Nemours & Company	VA AGG	154,800	158,564
VA	VA0003263	JH Miles & Company Inc	VA AGG	125,531	91,377
VA	VA0003026	GP Big Island LLC	VA AGG	116,830	71,466
VA	VA0006408	Greif Riverville LLC - Fibre Plant	VA AGG	73,833	51,133
VA	VA0024945	Lake Monticello STP	VA AGG	64,049	67,566
VA	VA0025542	Covington City - Sewage Treatment	VA AGG	58,263	60,298
VA	VA0088161	Lexington-Rockbridge Regional	VA AGG	51,361	17,069
VA	VA0020991	Buena Vista STP	VA AGG	48,008	50,357
VA	VA0026557	Philip Morris USA Incorporated	VA AGG	34,318	37,694
VA	VA0083135	Farmville WWTP	VA AGG	33,630	12,074
VA	VA0022772	Clifton Forge Town Wastewater	VA AGG	31,608	23,381
VA	VA0004031	Tyson Foods Incorporated - Glen Allen	VA AGG	17,981	13,650
VA	VA0004146	Dominion Virginia Power - Chesower Station	VA AGG	16,993	39,170
VA	VA0004677	Lees Carpets	VA AGG	9,128	5,967
VA	VA0027979	Alleghany County - Low Moor WWTP	VA AGG	6,521	4,551
VA	VA0031321	Rutledge Creek WWTP	VA AGG	4,433	2,579
VA	VA0020699	DOC Powhatan Correctional Center	VA AGG	3,284	2,509

VA	VA0020303	Crewe WWTP	VA AGG	2,572	1,991
VA	VA0002780	The Sustainability Park LLC	VA AGG	1,817	854
VA	VA0088480	Chickahominy WWTP	VA AGG	1,028	0
VA	VA0024988	UOSA - Centreville	1,315,682	1,154,997	1,177,634
VA	VA0025364	Noman M Cole Jr Pollution Control Plant	612,158	654,248	505,616
VA	VA0025160	Alexandria ASA Advanced Wastewater	500,690	435,167	446,687
VA	VA0025143	Arlington County WPCP	365,467	345,300	107,288
VA	VA0081311	HRSD - York River Sewage Treatment	274,100	677,677	188,913
VA	VA0003115	Smurfit Stone Container Corporation	259,177	229,089	227,122
VA	VA0060640	North River WWTF	253,391	96,688	65,800
VA	VA0025101	PWCSA - H L Mooney Wastewater	219,280	156,061	87,768
VA	VA0089915	Hanover County Totopotomoy WWTF	182,734	37,920	50,896
VA	VA0003018	Western Refining Yorktown Inc	167,128	237,589	83,871
VA	VA0091383	Broad Run WRF	134,005	34,820	45,502
VA	VA0065552	Opequon Water Reclamation Facility	121,851	72,974	51,767
VA	VA0092282	Leesburg Town - WPCP	121,822	103,299	62,113
VA	VA0025658	Massaponax Wastewater Treatment	97,458	59,610	62,589
VA	VA0076392	Little Falls Run Wastewater Treatment	97,458	33,134	33,346
VA	VA0064793	Middle River Regional STP	82,839	58,105	35,385
VA	VA0002160	INVISTA - Waynesboro	78,941	8,233	4,630
VA	VA0061590	Culpeper Wastewater Treatment	73,093	43,204	17,037
VA	VA0060968	Aquia Wastewater Treatment Plant	73,093	37,327	35,135
VA	VA0068110	FMC Wastewater Treatment Facility	65,784	39,701	32,522
VA	VA0075191	Parkins Mills WWTF	60,911	20,235	15,184
VA	VA0073245	MillerCoors LLC	54,820	100,935	15,264
VA	VA0025127	Fredericksburg Wastewater Treatment	54,820	96,339	72,465
VA	VA0062812	Front Royal STP	48,729	107,025	107,964
VA	VA0025151	Waynesboro STP	48,729	84,622	10,756

VA	VA0066877	Stuarts Draft WWTP	48,729	18,581	9,085
VA	VA0025291	Fishersville Regional STP	48,729	18,129	8,339
VA	VA0077763	Bear Island Paper Company LLC	47,328	45,681	56,098
VA	VA0002178	Merck Sharp & Dohme Corporation	43,835	32,505	20,857
VA	VA0024678	Dale Service Corporation - Plant #8	42,029	27,835	23,002
VA	VA0024724	Dale Service Corporation - Plant #1	42,029	26,714	19,677
VA	VA0024899	Ashland WWTP	36,547	32,918	15,298
VA	VA0021385	Orange Town STP	36,547	31,816	10,928
VA	VA0088331	Parham Landing WWTP	36,547	2,737	5,207
VA	VA0077402	Georges Chicken LLC	31,065	22,902	24,561
VA	VA0021172	Warrenton Town Sewage Treatment	30,456	21,401	18,582
VA	VA0076805	Remington Wastewater Treatment	30,456	11,643	10,103
VA	VA0002313	Virginia Poultry Growers Coopeerative	27,410	22,425	20,122
VA	VA0026468	Woodstock STP	24,364	7,823	4,151
VA	VA0090263	Town of Broadway Regional WWTF	23,390	31,222	7,142
VA	VA0004049	Tyson Foods Inc - Temperanceville	22,842	265,450	41,155
VA	VA0003867	Omega Protein - Reedville	21,213	4,750	3,657
VA	VA0028363	US Marine Corps - MCB Quantico	20,101	47,133	10,912
VA	VA0062642	Luray STP	19,492	18,120	3,732
VA	VA0024732	Massanutten Public Service STP	18,273	20,345	24,070
VA	VA0029521	Hanover County Doswell WWTP	18,273	16,854	16,771
VA	VA0026409	Colonial Beach Town of STP	18,273	12,213	2,794
VA	VA0022802	Basham Simms Wastewater Facility	18,273	6,364	4,230
VA	VA0021105	Gordonsville Sewage Treatment	17,177	1,940	940
VA	VA0083411	Wilderness Wastewater Treatment	15,228	22,414	15,198
VA	VA0020311	Strasburg STP	11,939	42,191	38,854
VA	VA0020460	Vint Hill Farms Station WWTP	11,573	917	887
VA	VA0075434	HRSD - Town of West Point Sewage	10,964	20,282	18,700

VA	VA0071471	Town of Tappahannock	9,746	10,359	3,690
VA	VA0073504	Caroline County Regional WWTP	9,137	24,897	16,426
VA	VA0021253	Town of Onancock WWTP	9,137	5,198	4,771
VA	VA0026514	Dahlgren District Wastewater Treatment	9,137	4,113	5,568
VA	VA0026212	Round Hill Town Wastewater Treatment	9,137	1,962	1,799
VA	VA0020532	Berryville STP	8,528	27,124	32,076
VA	VA0026441	Mt Jackson STP	8,528	4,274	3,052
VA	VA0031763	Marshall Waste Water Treatment	7,797	9,141	7,688
VA	VA0028380	Stoney Creek Sanitary District	7,309	4,097	5,336
VA	VA0090948	Rapidan WWTP	7,309	1,980	2,056
VA	VA0021067	US Naval Surface Warfare Center	6,578	5,092	3,510
VA	VA0032034	US Army - Fort AP Hill Operations	6,457	6,471	2,349
VA	VA0022853	New Market STP	6,091	28,678	-
VA	VA0022349	Weyers Cave STP	6,091	11,232	17,721
VA	VA0021288	Cape Charles Town - WWTP	6,091	8,814	9,172
VA	VA0020788	Kilmarnock Wastewater Treatment	6,091	2,342	2,141
VA	VA0089338	Hopyard Farm Wastewater Treatment	6,091	1,294	733
VA	VA0026891	Warsaw Aerated Lagoons	3,655	6,503	1,921
VA	VA0023469	VA Dept of Welfare - Haynesville Correctional Unit	2,802	6,043	3,382
VA	VA0060712	Reedville Sanitary District	2,436	2,117	1,565
VA	VA0028819	HRSD Mathews Courthouse Sewage	1,827	2,422	1,046
VA	VA0092134	Fairview Beach WWTP	1,827	444	564
VA	VA0086789	Oakland Park Sewage Treatment	1,706	3,780	3,755
VA	VA0072729	Montross Westmoreland WWTP	1,584	998	1,066
VA	VA0026263	HRSD Town of Urbanna Wastewater	1,218	3,086	3,563
VA	VA0067423	Tangier Town	1,218	2,469	2,142
VA	VA0027537	Riverside Shore Memorial Hospital	1,218	2,437	2,055
VA	VA0070106	Purkins Corner WWTP	1,096		

				6,786	6,473
WV	WV0082759	Berkeley County PSSD	89,844	129,421	106,305
WV	WV0112500	WV Division of Natural Resources - Spring Run Hatchery	65,480	16,038	35,405
WV	WV0023167	City of Martinsburg	45,683	123,074	91,752
WV	WV0022349	City of Charlestown	26,649	31,562	35,178
WV	WV0027707	Warm Springs PSD	26,496	3,282	5,233
WV	WV0021792	City of Petersburg	20,558	15,292	12,159
WV	WV0005649	US Dept of the Interior	18,273	15,912	9,419
WV	WV0116149	Conservation Fund	15,380	11,566	11,950
WV	WV0005495	Pilgrim's Pride Corporation - Fresh Facility	13,096	78,248	45,037
WV	WV0020150	City of Moorefield	9,137	40,236	31,591
WV	WV0047236	Pilgrim's Pride Corporation - Prepared Foods Facility	7,614	11,949	10,214
WV	WV0020699	City of Romney	7,614	12,836	13,246
WV	WV0041521	Fort Ashby PSD	7,614	7,380	7,506
WV	WV0024775	Corporation of Shepherdstown	6,091	14,896	12,668
WV	WV0024392	City of Keyser	1,192	57,206	38,382
WV	WV0005525	Virginia Electric & Power Company	0	40,804	37,588

Appendix C: Bay Point Sources Most Frequently Exceeding Permit Limits

Top 25 Significant Bay Dischargers with Nitrogen-Based Permit Limit Exceedances 2009-2011

PERMIT ID	FACILITY NAME	STATE	TOTAL NITROGEN-BASED PERMIT LIMIT EXCEEDANCES
MD0020265	Rising Sun WWTP	MD	143
MD0063282	Hearne-Meadows, LLC.	MD	66
MD0021571	City of Salisbury WWTP	MD	61
MD0021091	National Seashore Assateaque	MD	60
PA0024228	BC Natural Chicken LLC.	PA	59
PA0030139	Pennsylvania Department of Corrections	PA	58
MD0057487	Cedar Mobile Home Park WWTP	MD	44
MD0065757	Happy Hills Campground WWTP	MD	40
WV0103161	Berkeley County Public Service Sewer District	WV	31
PA0026808	Springettsbury Township WWTP	PA	30
PA0024091	Millville Borough WWTP	PA	26
WV0101524	Mountain Top Public Service District	WV	26
MD0020532	Delmar WWTP	MD	24
MD0055522	Colonel Richardson Middle & High School	MD	24
MD0020231	Boonsboro WWTP	MD	24
MDDRG2294	Hart - Miller Island Dredged Material Containment Facility	MD	23
MD0020095	Naval Air Station Patuxent River – Webster Field Annex	MD	23
WV0024970	Town of Franklin	WV	22
MD0057525	Swan Point WWTP	MD	21
MD0023043	Swan Harbour Dell WWTP	MD	21
MD0024317	Smithsburg WWTP	MD	21
WV0105830	Berkeley County Public Service Sewer District	WV	19
MD0053201	Relax Inn WWTP	MD	19
MD0069582	Tracey's Elementary School	MD	19
MD0052027	Northeast River Advanced WWTP	MD	19

Top 25 Significant Bay Dischargers with Phosphorous Permit Limit Exceedances 2009-2011

PERMIT ID	FACILITY NAME	STATE	TOTAL PHOSPHOROUS PERMIT LIMIT EXCEEDANCES
MD0020532	Delmar WWTP	MD	72
MD0021091	National Seashore Assateaque	MD	53
PA0030139	Pennsylvania Department of Corrections	PA	26
NY0004308	Kraft Foods Global, Inc.	NY	24
PA0030643	Shippensburg Borough STP	PA	23
MD0063282	Hearne-Meadows, LLC.	MD	19
PA0024228	BC Natural Chicken LLC.	PA	17
PA0086860	Springfield Township Hollow Creek WWTP	PA	17
MD0020842	USDA East-Side WWTP	MD	16
MD0069949	Cinnamon Woods WWTP	MD	14
PA0024040	Highspire Borough WWTP	PA	13
MD0020281	Chesapeake Beach WWTP	MD	12
PA0064025	KBM Regional Authority WWTP	PA	11
MD0022586	New Windsor WWTP	MD	11
MD0057525	Swan Point WWTP	MD	11
MD0020524	La Plata WWTP	MD	11
MD0024589	South Carroll High School WWTP	MD	10
MD0020672	Taneytown WWTP	MD	9
PA0040835	Bellefonte State Fish Hatchery	PA	8
MD0023469	Bohemia Manor High School WWTP	MD	8
MD0020303	Rock Hall WWTP	MD	6
PA0020893	Manheim Borough Authority WWTP	PA	5
PA0020923	New Oxford Municipal Authority WWTP	PA	5
MD0022551	Pocomoke City WWTP	MD	5
MD0069582	Tracey's Elementary School	MD	5

Top 25 Significant Bay Dischargers with TSS Permit Limit Exceedances 2009-2011

PERMIT ID	FACILITY NAME	STATE	TOTAL TSS PERMIT LIMIT EXCEEDANCES
MD0057487	Cedar Mobile Home Park WWTP	MD	64
MD0020265	Rising Sun WWTP	MD	56
MD0020095	Naval Air Station Patuxent River – Webster Field Annex	MD	47
MD0020532	Delmar WWTP	MD	44
MDG498002	Honeygo Run Reclamation Center, Inc.	MD	43
MD0069892	Washington Suburban Sanitary Commission – Bi-County Water Tunnel	MD	32
MD0024627	Highland View Academy WWTP	MD	24
MD0052256	Fairmount WWTP	MD	24
WV0005517	Ox Paperboard LLC.	WV	21
PA0021563	Gettysburg Municipal Authority WWTP	PA	19
WV0082759	Berkeley County Public Service Sewer District	WV	19
PA0026361	Lower Lackawanna Valley Sanitary Authority WWTP	PA	18
NY0071111	Harford Mills Terminal	NY	16
MD0020796	Port Deposit WWTP	MD	16
PA0027553	Pine Creek Municipal Authority STP	PA	15
PA0080519	Antrim Township WWTP	PA	14
PA0026743	Lancaster City WWTP	PA	14
WV0027405	Town of Paw Paw	WV	13
MD0051918	Chopticon High School WWTP	MD	13
PA0020826	Dover Township WWTP	PA	12
PA0020923	New Oxford Municipal Authority WWTP	PA	12
MD0023876	Eastern Pre-Release Unit WWTP	MD	12
MDG499873	Upper Marlboro Plant	MD	12
NY0156876	Village of Oxford STP	NY	11
PA0022209	Bedford WWTP	PA	11

Appendix D: Methodology

EIP assembled discharge and permit information on polluters in the Chesapeake Bay Watershed using a variety of publicly available databases. To begin, EIP requested discharge information from the EPA Chesapeake Bay Program. EPA provided EIP with the full list of NPDES-permitted facilities in the Chesapeake Bay watershed, as well as EPA's calculated discharges for 2010 as determined for use in EPA's TMDL Phase 5.3 Watershed Model. This list provided both a comprehensive dataset of the NPDES permits included in the Bay watershed and discharge information, both monitored and modeled, for these facilities.

EIP then downloaded the full datasets from EPA's Enforcement and Compliance History Online (ECHO) database, which contains information submitted by states to EPA on NPDES permitted facilities nationwide, and extracted data for those permits in EPA's Chesapeake Bay watershed database. Using this dataset, EIP analyzed various aspects of state permitting programs and individual dischargers within the watershed.

Permit Status

To determine permit status EIP identified the expiration date of permits with dates listed in EPA's databases and determined whether or not these facilities are past due for new permits. We last updated this list on September 19, 2012, and this report reflects permit status on that date. EIP relied on actual permit expiration dates rather than the description of permit status in the ECHO databases, and lists all facilities whose permit expiration dates have passed as "Administratively Continued or Expired." Some of these permits have been extended by states without a proper renewal process, while others have lapsed without any state action.

However, many of the permits in EPA's watershed database are not listed in ECHO because the Bay states have not submitted basic information on some minor sources to EPA. Moreover, some facilities that have basic information listed in ECHO do not have their permit expiration dates listed. These data limitations obscured some information about expired permits in the Bay watershed.

Permit Limits

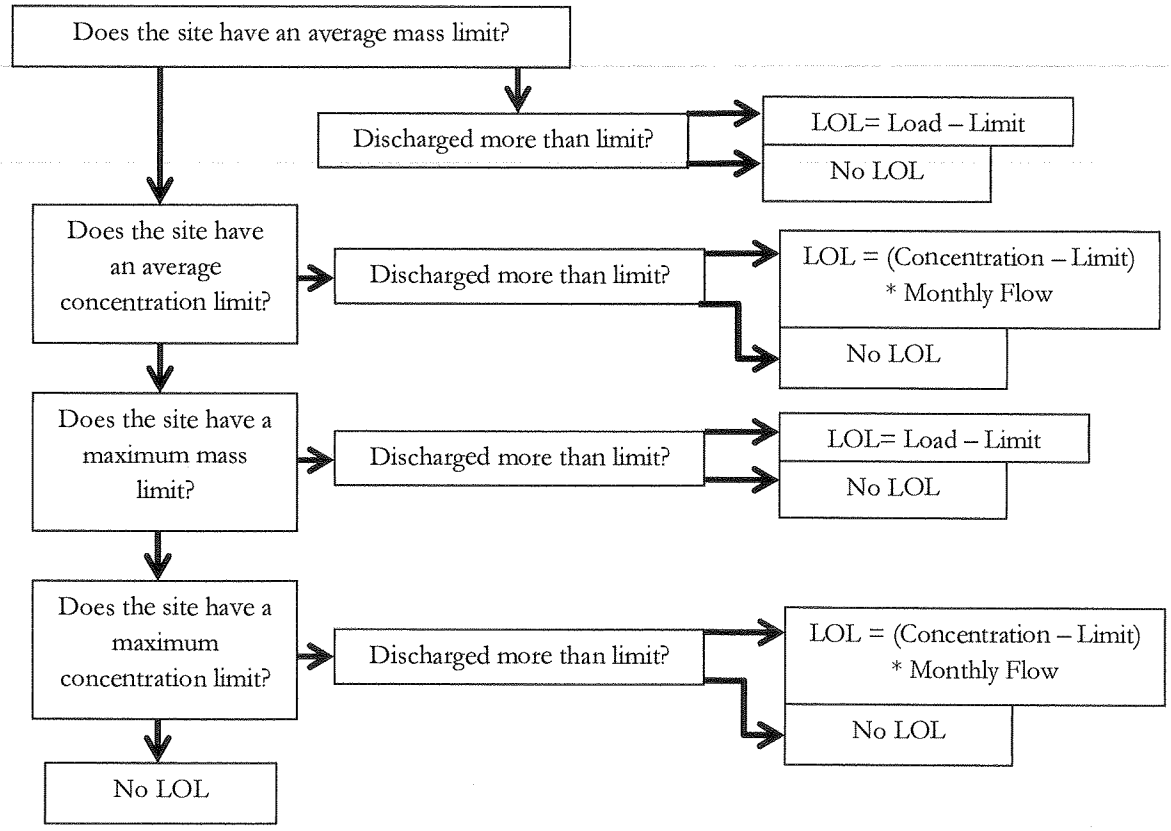
To determine whether or not a facility's permit has a numeric limit for nitrogen, phosphorus, or sediment, EIP downloaded all available effluent data for significant dischargers of the TMDL pollutants in the Chesapeake Bay watershed, as well as all nonsignificant sources with at least one effluent violation in the past 3 years. These data include the value of mass or concentration discharge limits for pollutants controlled under a facility's NPDES permit. If a facility has a numeric limit for any type of nitrogen, such as total organic nitrogen or total kjeldahl nitrogen, EIP assigned a "yes" value. We applied the same analysis to determine whether permits contain numeric phosphorus or sediment limits. This methodology did not include comprehensive permit reviews, and our conclusions are therefore constrained by the accuracy of EPA's ECHO database.

Loadings over Permit Limits

To estimate loadings in excess of permit limits for 2011, EIP again considered all effluent data for significant sources, as well as effluent data for all nonsignificant facilities in the Bay watershed with at least one effluent violation for a TMDL pollutant. We identified effluent exceedances by comparing the value of discharges to permit

limits, using a hierarchy of types of reported permit data and relying on loadings data where possible (see flow chart below). We first looked at whether facilities had violated an average loading limit in a given monitoring period. If the facility had an average load limit, but was within the limit, then it would be designated as not having a violation. However, if the facility did not have a loading limit or did not have information on the discharged mass, we looked to average concentration. Again, where a limit existed and was exceeded, we were able to calculate a load over limit. Where no data existed or no limit existed, we looked to maximum loading values, followed by maximum concentrations, using the same methodology described above. We then aggregated annual loads over limits to determine a final annual value.

Loadings over Limits Calculation Methodology
(Green=yes; Red=no; LOL=load over limit)



Estimating Total Nitrogen Associated with Ammonia Loadings over Limits

Because many of the nitrogen loadings over limits (See Table 5 and Appendix A) arose out of violations of ammonia permit limits, EIP developed a methodology to estimate the total nitrogen load that resulted from these ammonia permit limit violations. For all ammonia loadings over limits, EIP determined the ratio of total nitrogen to ammonia for the time period during which the violation occurred and applied that factor to the calculated loading

over limit. EIP adopted this approach to represent the full impact of nitrogen loadings associated with permit limit violations, as ammonia content represents just a fraction of total nitrogen that is discharged at a given facility. Total nitrogen is comprised of both inorganic and organic nitrogen, and ammonia makes up only part of the inorganic portion.

Total Inorganic Nitrogen = Ammonia + Nitrate + Nitrite

Total Nitrogen = Dissolved Organic Nitrogen + Total Inorganic Nitrogen

This ammonia→total nitrogen extrapolation methodology added approximately 57,000 pounds to EIP's estimate of nitrogen loadings to the bay due to permit limit violations. For example, the Gettysburg WWTP (PA0021563) exceed its monthly permit limit for ammonia as nitrogen three times in 2011, resulting in 2,778 pounds of illegal discharges of ammonia nitrogen. Its total ammonia nitrogen load during those three months was 7,262 pounds, while its total nitrogen load was 10,793 pounds. As shown below, EIP estimated that this ammonia permit limit exceedance resulted in an excess discharge of 4,129 pounds of total nitrogen.

(Total Nitrogen)/(Ammonia as N) = 10,793/7,262 = 1.49 = estimation factor.

(Estimation factor)*(Ammonia as N over limit) = 1.49*2,778= 4,129 pounds = estimated total N over limit

2011 Loadings Estimates

To estimate 2011 loadings for significant dischargers (see Appendix B), EIP considered all available discharge monitoring report (DMR) effluent data from EPA's ECHO database. Where available, EIP used total annual loadings data. If a total annual load was not reported in DMR data, EIP aggregated monthly or quarterly mass loadings reported to calculate an annual load. If no mass loadings data was available, EIP calculated loadings by aggregating the monthly or quarterly products of concentration and flow data. EIP did not calculate 2011 loadings for dischargers with insufficient DMR data in ECHO.

Limitations of Data

EPA's ECHO and Chesapeake Bay databases have several limitations. EIP's calculations for facility loadings of Bay pollutants are based on values contained in EPA's Phase 5.3 Watershed Model. This model includes every permitted point source in the Bay region; however, many of these facilities are classified as "minor," and EPA lacks monitoring data for most minor source discharges. EPA modeled these discharges due to a lack of reported data, and for the purposes of this report EIP took those modeled loadings at face value. After obtaining EPA's monthly discharge data for 2010 – the most recent complete EPA dataset – EIP aggregated the data by facility and by year to calculate estimated 2010 loadings from individual point sources. EPA's ECHO database has additional limitations. EPA updates facility records quarterly, and EIP downloaded the entire data set in September 2012. Therefore, this report may not reflect subsequent changes to the database since that date. Moreover, ECHO is limited by what states choose to report to EPA.

Finally, in evaluating whether facilities have numeric permit limits, EIP relied on discharge information available in ECHO, which should include limits where they exist. We used this dataset, rather than a review of actual permits, due to the large number of significant facilities in the watershed. It is possible that facilities identified in this

report as lacking numeric permit limits may in fact have limits, as states do not always submit complete information to EPA, and ECHO may contain data entry errors and omissions. Where possible, EIP omitted data that seemed to be the result of a reporting error, rather than an actual permit violation. Furthermore, EPA occasionally flags and revises numbers reported in ECHO that it believes may be inaccurate. As of this report's release, EPA had not flagged any relevant data points in this report for likely data quality problems, although it could flag and revise data included in EIP's analysis in the future.