

## Technical Memorandum

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### ***Significant Nutrient Point Sources in the Baltimore Harbor (Patapsco River Mesohaline) Watershed***

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The U.S. Environmental Protection Agency requires that Total Maximum Daily Load (TMDL) allocations account for all significant sources of the impairing pollutant or pollutants. The TMDL analysis for Baltimore Harbor addresses the total nitrogen (TN) and total phosphorus (TP) loads for the growing season conditions (May-October) and for average annual conditions. This technical memorandum identifies, in detail, the significant surface water discharges of TN and TP used as modeling input when computing the TMDLs. These are conceptual values that are within the TMDL thresholds. Whereas, actual effluent limits and related permit conditions will be established at the time of permit issuance or renewal through the permit process. The Maryland Department of the Environment (MDE) expressly reserves the right to allocate the loads among different sources using the above mentioned *permit process* in any manner that is reasonably calculated to achieve water quality standards.

Potential waste load allocations have been identified for National Pollutant Elimination System (NPDES)-regulated municipal and industrial wastewater treatment plants (WWTP) and municipal separate stormwater discharges in the Baltimore Harbor watershed. There are two municipal WWTPs contributing nutrient loads to the Baltimore Harbor: the Patapsco WWTP and the Cox Creek WWTP. In addition to these two municipal WWTPs, there are six industrial point sources contributing to the total nutrient loads into the Harbor: International Steel Group (ISG), WR Grace, Erachem-Comilog, US Gypsum, Envirotech and Millennium Specialty. Waste load allocations (WLAs) have been identified for these point sources based on their permitted or actual discharge flows. Potential annual waste load allocations are also identified for five jurisdictions with municipal stormwater discharges in the Baltimore Harbor watershed to address nutrient loads from urban sources during storm events. Baltimore City, Baltimore County, Anne Arundel County, Carroll County and Howard County are all covered under NPDES Phase I stormwater permits. Potential annual waste load allocations have been identified for these stormwater discharges based on the 1995-1997 watershed model. The stormwater nutrient loads account for contributions from urban land. The land use information was based on 1997 Maryland Department of Planning data.

The nutrient reductions for point sources, reflected in the TMDL analysis, are designed to protect water quality in the Baltimore Harbor and the Chesapeake Bay. It is likely, however, that future Chesapeake Bay Agreement nutrient goals may entail more ambitious point source nutrient reductions to protect the water quality of the Bay.

Tables 1a, 1b, 2a, and 2b, below, identify the potential nitrogen and phosphorus allocations attributed to the point sources in the Baltimore Harbor: municipal and industrial WWTPs, and NPDES urban stormwater discharges. Following the approval of the TMDL by EPA in December 2007, changes were made to the list of allocated facilities. In 2015, as a result of a permit request for the Envirotech facility, the WLA has been adjusted to include the discharge from the facility. The revision of the WLA to accommodate the requested load necessitated a corresponding decrease in a load for another facility. Note the Envirotech facility never discharged. In 2018, as a result of a permit request for the US Gypsum facility, the WLA has been adjusted to include the discharge from the facility. The revision of the WLA

to accommodate the requested load necessitated a corresponding decrease in a load for another facility. These changes do not affect the overall TMDL calculation or the total WLA for point sources. In 2022, as a result of two permit requests, Yara North America, Inc. and Tradepoint Atlantic – Sparrows Point, the WLA has been adjusted to include the discharge from these facilities. Also, facility names have been updated. The revision of the WLA to accommodate the requested loads necessitated a corresponding decrease in a load for another facility. These changes do not affect the overall TMDL calculation or the total WLA for point sources.

**Table 1a**

**Loads Attributed to Point Sources (WWTPs) Used to Compute the Growing Season TMDL (May 1<sup>st</sup> - October 31<sup>st</sup>)**

Point Source Name	Permit Number	Nutrient Loads (lbs/growing season)		Flow	Concentration (mg/l)	
		TN	TP	(MGD)	TN	TP
Patapsco WWTP	MD0021601	333,330	33,330	73	3	0.3
Cox Creek WWTP	MD0021661	68,484	6,852	15	3	0.3
Back River WWTP <sup>1</sup>	MD0021555	304,590	15,230	50	4	0.2
Tradepoint Atlantic - Sparrows Point	MD0001201-014	158,388	7,632	26	4	0.19
Tradepoint Atlantic - Sparrows Point <sup>2</sup>	MD0001201-022	52,392	2,622	8.6	4	0.2
W. R. Grace	MD0000311	155,370	1,236	4.066	25	0.2
Prince Specialty Products, LLC <sup>3</sup>	MD0001775	47,502	6	0.128	244	0.03
US Gypsum <sup>4</sup>	MD0001457	466	73	0.017	18	3
Yara North America, Inc. <sup>5</sup>	MD0071838	221.5	8.2	0.0144	10.1	0.37
Reserved <sup>6,7</sup>	N/A	31,263	226.4	0.864	24.2	0.2
Reserved <sup>6,7</sup>	N/A	17,058	2,814	2.8	4	0.66
Reserved <sup>4,7,8</sup>	N/A	4,064	0	0.080	35.58	0
Reserved <sup>7,8</sup>	N/A	6,750	0	0.545	8.13	0
Reserved <sup>5,7</sup>	N/A	310.5	29.4	0.0700	5	0.35
MPA Nutrient Overlay for Harbor DMCFs <sup>4,9</sup>	MDDRG3796	52,601	2,513	1.2	28.8	1.4
<b>Total</b>		<b>1,232,790</b>	<b>72,572</b>			

<sup>1</sup> This is Baltimore City effluent from the Back River WWTP to the Patapsco River flowing through the Sparrows Point site.

<sup>2</sup> Load has been transferred from MD0001201 Outfall 021 to new Outfall 022. Both outfalls are at the same facility.

<sup>3</sup> Formerly called Erachem-Chemilog.

<sup>4</sup> Allocations to these facilities were updated in March 2018. The US Gypsum facility received an increase in allocations from the MD0001279 (Millennium) allocation for TN and the reserve load created by the MPA Nutrient Harbor Overlay Permit which includes Cox Creek DMCF for TP. The total WLA did not change.

<sup>5</sup> The facility, Envirotech was added in August 2015 and never operated/discharged. A portion of the allocation has been transferred to Yara North America, Inc. and a portion is reserved.

<sup>6</sup> This load is now reserved. It was formerly assigned to NPDES Permit # MD0001201 located on Sparrows Point.

<sup>7</sup> A ‘reserved’ allocation has been set aside, should the Department determine that some or all of this allocation remains applicable if these permits are renewed and the facilities come back online, or if the permit(s) is transferred to another operation in the watershed.

<sup>8</sup> This load is now reserved. It was formerly assigned to the now closed Millennium Specialties Chemical plant, #MD0001279.

<sup>9</sup> The Chesapeake Bay Phase II Watershed Implementation Plan (WIP) establishes an allocation for Cox Creek DMCF that is half the allocation provided in the original Baltimore Harbor Nutrient TMDL. (NOTE: This allocation was subsequently transferred to the MPA Nutrient Overlay Permit, #MDDRG3796.) The adjustment to phosphorus allocation for US Gypsum in March 2018 was made to the portion of the allocation that is no longer assigned to the Cox Creek DMCF permit.

**Table 1b**

**Loads Attributed to Point Sources (Urban Stormwater) Used to Compute the Growing Season TMDL (May 1<sup>st</sup> - October 31<sup>st</sup>)**

<i>Geographic Area*</i>	<i>Nutrient Loads (lbs/growing season)</i>	
	<b>TN</b>	<b>TP</b>
<b>Baltimore City For Growing Season TMDL</b>	102,306	10,164
<b>Anne Arundel County For Growing Season TMDL</b>	73,662	7,314
<b>Baltimore County For Growing Season TMDL</b>	167,784	16,662
<b>Carroll County For Growing Season TMDL</b>	28,644	2,844
<b>Howard County For Growing Season TMDL</b>	36,828	3,660
<b>Total</b>	409,224	40,644

\*The loads associated with these areas are attributed to County/City MS4 permits, State and Federal MS4 permits and other NPDES regulated stormwater entities.

**Table 2a****Loads Attributed to Point Sources (WWTPs) Used to Compute the Average Annual Conditions TMDL**

<i>Point Source Name</i>	<i>Permit Number</i>	<i>Nutrient Loads (lbs/year)</i>		<i>Flow</i>	<i>Concentration (mg/l)</i>	
		TN	TP	(MGD)	TN	TP
Patapsco WWTP	MD0021601	889,453	66,709	73	4	0.3
Cox Creek WWTP	MD0021661	182,764	13,707	15	4	0.3
Back River WWTP <sup>1</sup>	MD0021555	609,185	30,459	50	4	0.2
Tradepoint Atlantic - Sparrows Point	MD0001201-014	316,776	15,267	26	4	0.2
Tradepoint Atlantic - Sparrows Point <sup>2</sup>	MD0001201-022	104,785	5,240	8.6	4	0.2
W. R. Grace	MD0000311	310,737	2,475	4.066	25	0.2
Prince Specialty Products, LLC <sup>3</sup>	MD0001775	95,000	12	0.128	244	0.03
US Gypsum <sup>1</sup>	MD0001457	933	155	0.017	18	3
Yara North America, Inc <sup>5</sup>	MD0071838	443	16.3	0.0144	10.1	0.37
Reserved <sup>6,7</sup>	N/A	62,525	451.4	0.864	24.2	0.2
Reserved <sup>6,7</sup>	N/A	34,114	5,625	2.8	4	0.66
Reserved <sup>4,7,8</sup>	N/A	8,121	0	0.080	35.58	0
Reserved <sup>7,8</sup>	N/A	13,495	0	0.545	8.13	0
Reserved <sup>5,7</sup>	N/A	622	58.3	0.070	5	0.35
MPA Nutrient Overlay for Harbor DMCFs <sup>4,9</sup>	MDDRG3796	462,164	7,149	1.2/20*	28.8/38*	1.4/0.3*
<b>Total</b>		<b>3,091,117</b>	<b>147,324</b>			

\*Cox Creek DMCF estimated discharge of 1.2 mgd; TN = 28.8 mg/l and TP = 1.4 mg/l from April 1 to January 31. From February 1 to March 31 (maximum activity period) discharge of 20 mgd; TN = 38 mg/l and TP = 0.3 mg/l.

<sup>1</sup> This is Baltimore City effluent from the Back River WWTP to the Patapsco River flowing through the Sparrows Point site.

<sup>2</sup> Load has been transferred from MD0001201 Outfall 021 to new Outfall 022. Both outfalls are at the same facility.

<sup>3</sup> Formerly called Erachem-Chemilog.

<sup>4</sup> Allocations to these facilities were updated in March 2018. The US Gypsum facility received an increase in allocations from the MD0001279 (Millennium) allocation for TN and the reserve load created by the MPA Nutrient Harbor Overlay Permit which includes Cox Creek DMCF for TP. The total WLA did not change.

<sup>5</sup> The facility, Envirotech was added in August 2015 and never operated/discharged. A portion of the allocation has been transferred to Yara North America, Inc. and a portion is reserved.

<sup>6</sup> This load is now reserved. It was formerly assigned to NPDES Permit # MD0001201 located on Sparrows Point.

<sup>7</sup> A 'reserved' allocation has been set aside, should the Department determine that some or all of this allocation remains applicable if these permits are renewed and the facilities come back online, or if the permit(s) is transferred to another operation in the watershed.

<sup>8</sup> This load is now reserved. It was formerly assigned to the now closed Millennium Specialties Chemical plant, # MD0001279.

<sup>9</sup> The Chesapeake Bay Phase II Watershed Implementation Plan (WIP) establishes an allocation for Cox Creek DMCF that is half the allocation provided in the original Baltimore Harbor Nutrient TMDL. (NOTE: This allocation was subsequently transferred to the MPA Nutrient Overlay Permit, #MDDRG3796.) The adjustment to phosphorus allocation for US Gypsum in March 2018 was made to the portion of the allocation that is no longer assigned to the Cox Creek DMCF permit.

**Table 2b**

**Loads Attributed to Point Sources (Urban Stormwater) Used to Compute the Average Annual Conditions TMDL**

<i>Geographic Area*</i>	<i>Nutrient Loads (lbs/year)</i>		<i>Flow</i>	<i>Concentration (mg/l)</i>	
	<b>TN</b>	<b>TP</b>	<b>(MGD)</b>	<b>TN</b>	<b>TP</b>
<b>Baltimore City For Average Annual TMDL</b>	221,274	23,951	N/A	N/A	N/A
<b>Anne Arundel County For Average Annual TMDL</b>	159,318	17,245	N/A	N/A	N/A
<b>Baltimore County For Average Annual TMDL</b>	362,890	39,279	N/A	N/A	N/A
<b>Carroll County For Average Annual TMDL</b>	61,957	6,706	N/A	N/A	N/A
<b>Howard County For Average Annual TMDL</b>	79,659	8,622	N/A	N/A	N/A
<b>Total</b>	885,098	95,803	N/A	N/A	N/A

\*The loads associated with these areas are attributed to County/City MS4 permits, State and Federal MS4 permits and other NPDES regulated stormwater entities.