

# BALTIMORE CITY MS4 ANNUAL REPORT

Reporting Period: July 1, 2014 to June 30, 2015



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BALTIMORE CITY

**DPW**

DEPARTMENT OF PUBLIC WORKS  
RUDOLPH S. CHOW, P. E.  
DIRECTOR

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Appendix A: Organization Chart

*Appendix B: Source Information*

- *Storm Drain Mapping Associated with GIS Coverage [Ref. MS4 Permit, Attachment A, Table A]*
- *Urban BMPs Associated with GIS Coverage [Ref. MS4 Permit, Attachment A, Table B]*
- *Impervious Surfaces Associated with GIS Coverage [Ref. MS4 Permit, Attachment A, Table C]*
- *Water Quality Improvement Project Locations Associated with GIS Coverage [Ref. MS4 Permit, Attachment A, Table D]*
- *Monitoring Site Locations with GIS Coverage [Ref. MS4 Permit, Attachment A, Table E]*
- *GIS shape files [Ref. MS4 Permit, Part III.C]*

Appendix C: Illicit Discharge Detection and Elimination

*Appendix D: Chemical Monitoring Results [Ref. MS4 Permit, Attachment A, Table F]*

Appendix E: Bacteria Monitoring [Ref. MS4 Restoration and TMDL WIP, Appendix G, dated August 2015]

*Appendix F: Biological and Habitat Monitoring [Ref. MS4 Permit, Attachment A, Table H]*

*Appendix G: Erosion and Sediment Control Program Data [Ref. MS4 Permit, Attachment A, Table K]*

Appendix H: Progress Status of MS4 and TMDL WIP Milestones [Ref. MS4 Restoration and TMDL WIP, Part 5, dated August 2015]

Appendix I: Progress Status of Projects, Programs, and Partnerships for 20% Restoration [Ref. MS4 Restoration and TMDL WIP, Appendix C, dated August 2015]

Appendix J: Progress of Chesapeake Bay TMDL [Ref. MS4 Restoration and TMDL WIP, Appendix D, dated August 2015]

Appendix K: Progress of Regional TMDLs [Ref. MS4 Restoration and TMDL WIP, Appendix E and F, dated August 2015]

## 1 Introduction

This report includes the progress of compliance for the period of Fiscal Year (FY) 2015, in association with Baltimore City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit (Permit Number: 11-DP-3315, MD0068292). The current permit was issued on December 27, 2013. Annual report periods follow the City's fiscal calendar: July 1 to June 30. This Annual report has been formatted to match the reporting requirements as listed in Part V of the permit.

### 1.1 Permit Administration

Designation of individual to act as a liaison between the City and MDE for the implementation of this permit:

Kimberly L. Grove, P.E.  
Chief, Office of Compliance and Laboratories  
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During FY 2015, the following changes occurred within the organization of Department of Public Works (DPW) related to the conditions of the MS4 permit:

- The Office of Compliance and Laboratories (previously Environmental Compliance and Laboratory Services Division) and the Office of Asset Management (previously Utility Asset Management Division) were transferred from the Bureau of Water and Wastewater to report to the Director of Public Works.
- Several engineering positions were created and filled within the Department, many funded by the stormwater utility to support the Office of Engineering and Construction and the Office of Compliance and Laboratories.
- The organization chart (as of June 30, 2015) is provided in Appendix A of this report.

### 1.2 Legal Authority

The City maintained adequate legal authority in accordance with NPDES regulations 40 CFR 122.26(d) (2) (i) during FY 2015.

## 2 Implementation Status

The following table is a summary of the status for implementing the components of the stormwater management program that are established as permit conditions.

**Table 1: Summary of Implementation Status**

Permit Condition	Component	Due	Status as of June 30, 2015
Part IV.C. Source Identification	GIS Data	Annual report	Appendix B includes database Tables A to E (MS4 permit, Attachment A) and associated GIS shape files.
Part IV.D.1 Stormwater Management	Identification of problems and modifications of ESD to MEP	Annual report	No problems identified during this reporting period.
	Modification to ordinances to eliminate impediments to ESD to MEP	Annual report	No modifications were initiated during this reporting period.
Part IV.D.2 Erosion and Sediment Control	Responsible personnel certification 3 / year	Annual Report	The City's program was replaced by MDE's on-line program.
	Inventory of projects > 1 acre	Initial 4/1/14 then quarterly	Included in Appendix G.
Part IV.D.3 Illicit Discharge Detection and Elimination	Alternative program for MDE submittal	12/27/14	The City is using the same alternative analysis (Ammonia Screening) as reported since 1998. Modifications and supplements to the IDDE program are discussed in Section 5.3.5. Results are provided in Appendix C.
	Annual visual surveys of commercial / industrial areas	Annual	See Section 5.3.
Part IV.D.4 Trash and Litter	Inventory and evaluation all solid waste operations	12/27/14	Submitted part of <i>Public Outreach Strategy for trash and Litter Programs for the City of Baltimore</i> , submitted 2/20/15.
	Public education and outreach strategy	12/27/14	See Section 5.5.
	Evaluation of effectiveness of education program	Annual Report	See Section 5.5.
Part IV.D.5 Property Management and Maintenance	NOIs and SWPPPs submitted for NPDES stormwater general permit coverage for industrial permits	6/30/14	NOIs and SWPPPs were submitted for the City's solid waste facilities, fleet maintenance facilities, and wastewater treatment plants.
	Alternative maintenance program	12/27/14	No alternative maintenance program is being proposed.
Part IV.D.6 Public	Maintain a compliance hotline	Annual Report	2 new customer service requests

Permit Condition	Component	Due	Status as of June 30, 2015
Education	for water quality complaints		to 3-1-1 system were added in November 2014. See Sections 5.2 and 5.3.
Part IV.E.1 Watershed Assessment	Detailed watershed assessments of entire City	12/27/18	No work was performed in FY 2015. Planned completion by the end of the permit term.
Part IV.E.2 Restoration Plans	Impervious surface assessment consistent with MDE methods = baseline	12/27/14	<i>MS4 Restoration and TMDL WIP</i> was submitted to MDE on 12/22/14. Public comment period ended 1/30/15, based on request for extension.
	Restoration of 20% of City's impervious surface area	12/27/18	Comments received from MDE on 3/23/15. See Section 6 and Appendices for more details.
	Restoration Plan for each WLA approved by EPA prior to the effective date of the permit	12/27/14	
	Restoration Plan for subsequent TMDL WLA	One year from approval	<i>TMDL for Trash and Debris for the Middle Branch and Northwest Branch Portions of the Patapsco River Mesohaline Tidal Chesapeake Bay Segment, Baltimore City and County, Maryland</i> was issued on January 5, 2015. Development of implementation plan was initiated in coordination with Baltimore County.
Part IV.E.4. TMDL Compliance	Annual assessment to evaluate the effectiveness of the City's restoration plans	Annual Report	See Section 6.
Part IV.F. Assessment of Controls	Continue assessments	Annual Report	See Appendix D.
Part IV.G. Program Funding	Fiscal analysis of the capital, operation, and maintenance expenditures necessary to comply with all conditions of this permit	Annual Report	See Section 4.

### 3 Narrative Summary of Data

#### 3.1 Stream Impact Sampling

DPW continued the Stream Impact Sampling program, which includes monthly sampling at 36 outfall locations. This sampling program was initiated in 1997; the results are available on-line at the City’s Cleanwater Baltimore website. The sampling program includes sampling results for nutrients, sediment, bacteria, metals, and other health indicators. The results of the sampling events for this reporting period are included in Appendix C.

##### 3.1.1 Nutrient Monitoring

The following table shows the evaluation of historic nutrient analysis (2009 through the reporting period), following a convention that the State used in its Maryland Water Quality Inventory, 1993-1995. A water quality level was assigned for each station’s sample sets: “normal if the percentage was less than 11%”; “elevated” if it was between 11% and 25%; and “high” if it was greater than 25%. Although the stations still remain at the same level using the cumulative data since January 2009 for both nutrients, the measurements in FY 2015 were predominantly lower. Nineteen (19) stations measured nitrogen below 3 mg / L for FY 2015. Stations at Linwood, Lakewood, and Gwynns Run Carrol Park measured phosphorus and/or nitrogen above the threshold level for more than 50% of the samples in FY 2015.

**Table 2: Summary of Nutrient Analysis for SIS Program**

Station	Percent of Samples Total Phosphorus >=0.1 mg/L			Percent of Samples Total Nitrogen >=3 mg/L		
	Jan. 2009 - June 2015	July 2014 - June 2015	Jan. 2009 - June 2014	Jan. 2009 - June 2015	July 2014 - June 2015	Jan. 2009 - June 2014
<i>Back River Watershed Herring Run Sub-watershed</i>						
PERRING PKWY	22%	20%	23%	3%	10%	2%
MT. PLEASANT GC	30%	20%	32%	8%	0%	9%
CHINQUAPIN RUN	19%	9%	21%	20%	18%	20%
TIFFANY RUN	13%	18%	12%	4%	0%	5%
HARFORD RD.	19%	9%	21%	6%	0%	7%
WRIGHT AVE.	26%	9%	30%	1%	0%	2%
PULASKI HWY.	13%	18%	12%	7%	0%	9%
<i>Back River Watershed, Moores Run Sub-watershed</i>						
MARY AVE.	41%	27%	44%	16%	0%	20%
HAMILTON AVE.	36%	27%	38%	42%	36%	43%
RADECKE AVE.	21%	10%	23%	12%	0%	15%
BIDDLE ST. & 62ND ST.	35%	18%	39%	1%	0%	2%
<i>Jones Falls Watershed</i>						

Station	Percent of Samples Total Phosphorus $\geq 0.1$ mg/L			Percent of Samples Total Nitrogen $\geq 3$ mg/L		
	Jan. 2009 - June 2015	July 2014 - June 2015	Jan. 2009 - June 2014	Jan. 2009 - June 2015	July 2014 - June 2015	Jan. 2009 - June 2014
SMITH AVE.	27%	17%	29%	3%	8%	2%
WESTERN RUN	26%	17%	28%	4%	0%	5%
STONY RUN	24%	25%	24%	27%	8%	31%
LOMBARD ST.	34%	17%	37%	7%	0%	8%
<i>Gwynns Falls Watershed</i>						
POWDER MILL	29%	20%	31%	16%	20%	15%
PURNELL DR.	24%	0%	28%	1%	0%	2%
DEAD RUN DNST.	33%	10%	37%	0%	0%	0%
GWYNNNS FALLS PKWY.	33%	0%	39%	11%	0%	13%
GRUN HILTON ST.	36%	30%	37%	13%	10%	13%
GF HILTON ST.	30%	20%	32%	0%	0%	0%
MAIDENS CHOICE	27%	0%	32%	8%	0%	9%
GRUN CARROLL PARK	61%	50%	63%	49%	50%	49%
WASHINGTON BLVD.	24%	10%	27%	2%	0%	2%
<i>Baltimore Harbor Watershed</i>						
LINWOOD & ELLIOTT <sup>1</sup>	50%	64%	40%	77%	82%	73%
LAKEWOOD & HUDSON <sup>1</sup>	46%	67%	33%	78%	56%	93%
CENTRAL & LANCASTER	48%	45%	48%	13%	9%	14%
LIGHT ST.	45%	18%	50%	11%	0%	13%
WARNER & ALLUVION	49%	45%	49%	21%	9%	24%
WATERVIEW AVE.	31%	27%	32%	16%	9%	17%
JANEY RUN	37%	36%	37%	14%	0%	17%
<i>Patapsco River Watershed</i>						
REEDBIRD AVE.	38%	27%	40%	11%	0%	13%
<sup>1</sup> Sampling began at LINWOOD & ELLIOTT and LAKEWOOD & HUDSON in March 2013.						
<b>Key</b>						
	Normal: $\leq 11\%$ of Samples					
	Elevated: Between 11-25% of Samples					
	High: $>25\%$ of Samples					

### 3.1.2 Bacteria Monitoring

DPW measures fecal bacteria with e. coli most probable number (MPN) counts at twenty-three (23) stations. Table 3 lists the percentage of surface water dry weather grab samples collected from November 2008 to June 2015, with a reference to the prescribed thresholds for recreation for each freshwater sampling station. The annual geometric mean for each station is shown graphically in Appendix E.

The portion of samples at or below the infrequent full body contact recreation threshold in FY 2015 was significantly greater than the portion of samples in the historic data, indicating a positive trend of the monitored waters to be used for recreation. Some stations remain at a high risk for recreation. Seven (7) of the stations showed results at or below infrequent full body contact recreation for less than 50% of the samples obtained in FY 2015.

**Table 3: Summary of e. Coli Sampling for SIS Program**

Station Name	At or Below Frequent Full Body Contact Recreation (235 MPN/100 ml)			At or Below Infrequent Full Body Contact Recreation (576 MPN/100 ml)		
	Nov. 2008- June 2015	July 2014- June 2015	Nov. 2008- June 2014	Nov. 2008- June 2015	July 2014- June 2015	Nov. 2008- June 2014
<i>Back River Watershed Herring Run Sub-watershed</i>						
PERRING PKWY	28%	60%	22%	49%	60%	47%
MT. PLEASANT GC	29%	60%	24%	43%	70%	38%
CHINQUAPIN RUN	30%	64%	24%	54%	73%	50%
TIFFANY RUN	42%	91%	33%	65%	100%	59%
HARFORD RD.	25%	64%	17%	52%	91%	45%
WRIGHT AVE.	33%	45%	31%	52%	64%	50%
PULASKI HWY.	42%	82%	34%	65%	91%	60%
<i>Back River Watershed Moores Run Sub-watershed</i>						
MARY AVE.	1%	0%	2%	16%	27%	14%
HAMILTON AVE.	4%	18%	2%	16%	27%	14%
RADECKE AVE.	13%	40%	9%	40%	70%	34%
BIDDLE ST. & 62ND ST	35%	55%	31%	54%	91%	47%
<i>Jones Falls Watershed</i>						
SMITH AVE.	74%	83%	73%	82%	83%	82%
WESTERN RUN	22%	17%	23%	54%	67%	52%
STONY RUN	50%	58%	48%	80%	92%	77%
<i>Gwynns Falls Watershed</i>						
POWDER MILL	21%	10%	23%	46%	30%	48%
PURNELL DR.	28%	40%	25%	58%	70%	56%
DEAD RUN DNST.	51%	60%	50%	78%	80%	78%
GWYNNNS FALLS PKWY.	54%	60%	53%	70%	60%	71%
GRUN HILTON ST.	7%	10%	7%	20%	30%	19%
GF HILTON ST.	40%	40%	40%	62%	50%	64%
MAIDENS CHOICE	37%	40%	36%	66%	60%	67%
GRUN CARROLL PARK	1%	0%	2%	1%	0%	2%
WASHINGTON BLVD.	1%	0%	2%	10%	10%	10%

DPW measures fecal bacteria with enterococci most probable number (MPN) counts at nine (9) stations. Table 4 lists the percentage of surface water dry weather grab samples collected from November 2008 to June 2015, with a reference to the prescribed thresholds for recreation for each freshwater sampling station. Five (5) of the stations showed results at or below infrequent full body contact recreation for the majority (50 to 65%) of the samples obtained in FY 2015. None of the FY 2015 samples showed an improvement in the water quality.

**Table 4: Summary of Enterococci Sampling for SIS Program**

Station	At or Below Frequent Full Body Contact Recreation (104 MPN/100 ml)			At or Below Infrequent Full Body Contact Recreation (500 MPN/100 ml)		
	April 2009- June 2015	July 2014- June 2015	April 2009- June 2014	April 2009- June 2015	July 2014- June 2015	April 2009- June 2014
<i>Patapsco River Watershed</i>						
REEDBIRD AVE.	42%	40%	43%	66%	65%	66%
<i>Baltimore Harbor Watershed</i>						
WATERVIEW AVE.	22%	20%	23%	57%	50%	59%
WARNER & ALLUVION	7%	0%	8%	24%	15%	26%
LIGHT ST.	40%	45%	39%	68%	65%	68%
CENTRAL & LANCASTER	8%	15%	7%	33%	25%	35%
LAKEWOOD & HUDSON <sup>1</sup>	9%	6%	11%	17%	11%	19%
LINWOOD & ELLIOTT <sup>1</sup>	2%	0%	3%	11%	11%	11%
JANEY RUN	35%	30%	36%	59%	65%	58%
<i>Jones Falls Watershed</i>						
LOMBARD ST.	7%	15%	6%	31%	50%	28%

<sup>1</sup> Sampling began at LINWOOD & ELLIOTT and LAKEWOOD & HUDSON in March 2013.

### 3.1.3 Biological and Habitat Monitoring

DPW collected macroinvertebrate samples in the spring of 2015; identification of the samples are in process and the results will be included in the FY 2016 MS4 Annual Report. Instead, DPW will present the results for the macroinvertebrate samples collected in the spring of 2014. DPW uses a combination of fixed and random sampling. There are eight (8) fixed stations, two (2) of which are associated with the long-term discharge characterization of Moore Run. The results for those two (2) stations will be discussed in Section 3.2. For the random sampling, one of three (3) watersheds is completed each year. During FY2014, random sampling was done in the Jones Falls watershed.

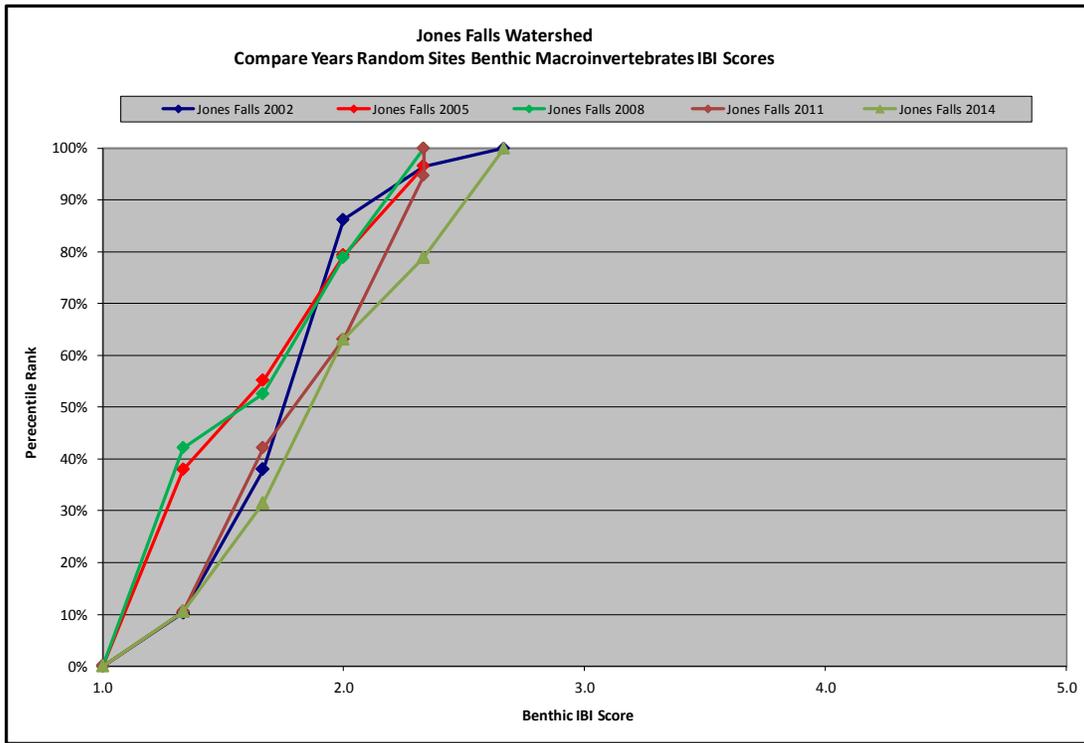
Table 5 presents the BIBI scores for six (6) fixed stations from 2002 through 2014. Five (5) out of six (6) stations were rated as “very poor” for their 2014 samples; and station 1053 on Stony Run, with a BIBI score of 2.0, was rated as “poor”. Five (5) out of six (6) stations had a higher BIBI score in 2014 compared to 2013; only station 1235 had a decrease.

**Table 5: Macroinvertebrate BIBI Scores for Fixed Stations**

Station	Stream	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14
<b>Gwynns Falls Watershed</b>														
250	Dead Run	1.7	1.0	1.0	1.0	1.7	---	---	1.3	1.3	2.3	1.0	1.0	1.7
430	Maidens Choice Run	---	---	---	---	---	---	---	---	1.0	1.7	1.0	1.0	1.3
<b>Jones Falls Watershed</b>														
880	Stony Run	---	---	---	---	---	---	---	---	1.3	1.3	1.0	1.0	1.7
949	Stony Run	---	---	---	---	---	---	---	---	1.7	1.0	1.0	1.0	1.3
1053	Stony Run	1.3	1.0	1.0	1.3	---	1.0	1.0	1.3	2.3	1.7	1.0	1.0	2.0
<b>Back River Watershed</b>														
1235	Biddison Run	---	3.3	1.3	1.9	1.3	1.3	1.6	1.0	1.9	1.3	1.6	2.1	1.9

There were 20 random stations sampled in the Jones Falls watershed in 2014. There were 12 samples with BIBI scores from 1.0 through 1.7, which rated as “very poor”; and 8 samples with BIBI scores from 2.0 through 2.7, which rated as “poor”. Random sampling was performed in the Jones Falls watershed in 2002, 2005, 2008, 2011 and 2014. Figure 1 illustrates the distribution of the BIBI scores for each of those five (5) years. The curve representing the distribution of the 2014 samples stands out as the best of the five (5) years.

**Figure 1: BIBI Scores for Macroinvertebrate Samples Random Sampling in the Jones Falls Watershed**



## 3.2 Watershed Assessment at Moore’s Run

### 3.2.1 Chemical Monitoring

During this reporting period, 11 base flow events and four (4) storm events were monitored at the Hamilton Avenue outfall station. Ten (10) base flow events and five (5) storm events were monitored at Radecke Avenue – the in-stream station associated with the long-term discharge characterization for the Moores Run. The results of these monitoring events are provided in Appendix D. DPW did not analyze the base flow samples analyzed for BOD or TPH, based on historic data showing results at or below reporting limit for these parameters.

DPW and USGS have modified their flow monitoring contract to add a water temperature sensor and a pH sensor at the Radecke Avenue station. As of October 1, 2015, all data collected at this location by the USGS station is published on-line. This additional monitoring enables DPW to compute event means for water temperature and pH for storms monitored at the Radecke Avenue station for future annual reports.

In addition to these monitoring events, these two (2) locations were monitored as part of the Ammonia Screening and Stream Impact Sampling program. These monitoring results are included in Appendix C of this Annual Report.

### 3.2.2 Biological Monitoring

DPW collects macroinvertebrate samples at two (2) fixed locations for the long-term discharge characterization of the Moores Run. Every sample from 2002 through 2014 at both stations has been rated as “very poor”.

**Table 6: Macroinvertebrate BIBI Scores for Fixed Stations Moores Run Watershed**

Station	Stream	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14
1367	Moores Run	1.3	1.3	1.0	1.3	1.7	1.3	---	1.3	1.3	1.3	1.7	1.3	1.7
1659	Moores Run Trib.	1.3	1.7	1.0	1.3	1.7	1.3	1.7	1.3	1.7	1.7	1.0	1.3	1.3

### 3.2.3 Habitat Assessment

DPW performed a habitat assessment survey of the upper Moores Run watershed on August 14, 2014. The results, along with nine (9) other assessments completed from May 18, 2005 through September 3, 2013, are included in Appendix F of this report. The following observations are based on a comparison of the ten (10) assessments:

- The condition of the banks from the latest assessment was the worst for any of the assessments.
- Riffle/Run quality made a slight rebound between September 3, 2013 and August 21, 2014; but is still down from its best assessment on 3/3/2011.

Approximately 1.5 miles of stream restoration is proposed for Moore’s Run as part of the MS4 Restoration and TMDL WIP, as shown in Appendix I of this report.

### 3.2.4 Geomorphic Monitoring

The City contracted with the U.S. Fish and Wildlife Service (USFW) to conduct a hydrogeomorphological assessment of the Moores Run during this reporting period. In FY 2015, the USFW completed the physical monitoring of the Moore’s Run site. The fieldwork was conducted from March 16 to 20, 2015. During the fieldwork, USFW reported no significant changes in overall conditions from previous years of physical monitoring. Initial analysis of the 2015 data does not show significant change. The Service draft monitoring report will be completed January 21, 2016.

### 3.2.5 Stormwater Management Assessment at Stony Run

In 2011, significant storm events occurred that moved some of the structural elements of ER4010 Lower Stony Run stream restoration project. The repair of these elements will be addressed as part of the scope for a repair and maintenance contract, scheduled for advertisement in FY 2016. The physical survey of the stream profile and of permanently monumented cross-sections in the Stony Run to evaluate channel stability will be postponed until the repairs are completed.

## 4 Expenditures and Proposed Budget

### 4.1 Expenditures and Budgets Related to MS4 Permit Compliance

DPW is predominantly responsible for compliance with the City's MS4 permit. Although the efforts of other City agency services are reported in this Annual Report for permit conditions like property maintenance, inspections, and enforcement, the expenditure and budget information shown in Table 7 is strictly limited to DPW's services.

**Table 7: Fiscal Analysis**

Description of Total Annual Cost	FY 2014 Expenditure	FY 2015 Proposed	FY 2015 Expenditure	FY 2016 Proposed
Legal authority	\$0	\$0	\$0	\$0
Source ID	\$121,115	\$283,484	\$180,324	\$425,631
Stormwater management	\$840,054	\$1,100,831	\$794,120	\$1,598,414
Erosion and sediment	\$396,893	\$1,004,844	\$791,818	\$1,570,937
Illicit detection/elimination (IDDE)	\$1,765,662	\$2,120,269	\$1,601,013	\$1,766,012
Trash elimination	\$1,301,384	\$1,584,866	\$533,723	\$750,239
Property management	\$5,469	\$5,332	\$14,321	\$79,332
Inlet cleaning	\$4,319,011	\$5,467,298	\$3,976,357	\$4,842,042
Street sweeping	\$4,217,840	\$3,264,308	\$5,048,864	\$4,942,590
Road maintenance - other	\$0	\$0	\$0	\$0
Public education	\$278,159	\$499,563	\$249,723	\$539,622
Watershed assessment	\$149,784	\$299,368	\$145,640	\$359,750
Watershed restoration (all projects)	\$1,960,750	\$5,928,296	\$1,953,544	\$5,622,503
Chemical monitoring	\$104,543	\$195,924	\$120,443	\$179,244
Biological monitoring	\$8,857	\$11,191	\$8,263	\$10,068
Physical assessment	\$0	\$0	\$0	\$0
Design manual monitoring	\$0	\$0	\$0	\$0
TMDL assessment	\$59,653	\$71,363	\$46,637	\$64,948
<b>Total NPDES program</b>	<b>\$15,529,175</b>	<b>\$21,836,937</b>	<b>\$15,464,791</b>	<b>\$22,751,333</b>
Other activities related to stormwater*	\$3,974,235	\$12,719,520	\$5,855,724	\$7,251,571
<b>Total Stormwater</b>	<b>\$19,503,410</b>	<b>\$34,556,457</b>	<b>\$21,320,515</b>	<b>\$30,002,904</b>
Funded by Stormwater Utility	\$17,904,501	\$22,707,524	\$17,215,709	\$25,368,023
Funded by W/WW Utility	\$1,598,835	\$1,417,655	\$1,580,371	\$1,913,121
Funded by General Fund	\$74	\$1,632,154	\$2,524,434	\$2,471,295
Funded by Other Sources	\$0	\$8,799,125	\$0	\$0

\***Note:** "Other activities" include the maintenance and remediation of stormwater infrastructure (collection system).

## 4.2 Stormwater Fee and Stormwater Utility.

The Stormwater Utility is an enterprise fund, established in 2013, to protect the use of revenue received from the stormwater restoration fee and other miscellaneous fees related to technical plans review and inspection penalties associated with stormwater management and erosion and sediment control. The predominant source of revenue for the stormwater utility is the stormwater restoration fee. Other sources of revenue are as follows:

- Plans review fees for stormwater management and erosion and sediment control
- Penalty fines for stormwater management and erosion and sediment control
- Fees in lieu of on-site stormwater management (quantitative and qualitative control)

The stormwater restoration fee was established in the City Code in June 2013; the first bills were issued in September 2013. The fee structure and rate was established to remain constant for four (4) years (FY 2014 through 2017). A summary of the fee structure is presented in Table 8. The total amounts billed for FY 2014 and 2015 are listed in Table 9, along with the amounts collected from other sources of revenue for the stormwater utility. The actual amount of revenue received and deposited in the stormwater utility from the stormwater restoration fee has not been determined at this time, but it is anticipated to be less than the amount billed due to uncollectable. Table 10 lists the expenditure of percentage of funds in the local watershed protection and restoration fund (aka Stormwater Utility) spent on each of the purposes provided in the Environment Article of the Annotated Code of Maryland § 4-202.1(h)(4). This amount reflects expenditures of the stormwater utility for the time periods listed, based on transactions completed by June 30, 2015.

**Table 8: Summary of the Stormwater Restoration Fee Structure**

Customer Type	Basis of Fee	Fee Rate	No. Properties
Single-family Residential Tier I	< 820 sq. ft impervious area	\$10 / quarter	37,804
Single-family Residential Tier II	820 – 1,500 sq. ft impervious area	\$15 / quarter	109,576
Single-family Residential Tier III	> 1,500 sq. ft.. impervious area	\$30 / quarter	43,633
Non-single-family Residential	1 ERU = 1,050 sq. ft impervious area	\$15 / ERU / quarter	32,610

**Table 9: Summary of Revenue for the Stormwater Utility**

Revenue Source	FY 2014	FY 2015	FY 2016 Projected
Stormwater Remediation Fee	\$27,468,374	\$28,936,919	\$29,000,000
SWM/ESC Miscellaneous Fees	\$43,490	\$86,130	\$100,000
<b>Total</b>	<b>\$27,511,864</b>	<b>\$29,023,049</b>	<b>\$29,100,000</b>

**Table 10: Summary of Expenditures for the Stormwater Utility**

Purpose	FY 2014 Expenditure	FY 2015 Expenditure	FY 2016 Proposed
(i) Capital improvements for stormwater management, including stream and wetland restoration projects;	\$3,553,755 (20%)	\$6,781,052 (39%)	\$11,185,221 (44%)
(ii) Operation and maintenance of stormwater management systems and facilities;	\$11,566,718 (65%)	\$8,362,242 (49%)	\$10,266,771 (40%)
(iii) Public education and outreach relating to stormwater management or stream and wetland restoration;	\$282,830 (2%)	\$169,440 (1%)	\$437,264 (2%)
(iv) Stormwater management planning, including: <ol style="list-style-type: none"> <li>1. Mapping and assessment of impervious surfaces; and</li> <li>2. Monitoring, inspection, and enforcement activities to carry out the purposes of the watershed protection and restoration fund;</li> </ol>	\$1,348,445 (8%)	\$1,035,353 (6%)	\$1,380,263 (5%)
(v) To the extent that fees imposed under § 4-204 of this subtitle are deposited into the local watershed protection and restoration fund, review of stormwater management plans and permit applications for new development;	\$660,103 (4%)	\$613,076 (4%)	\$1,722,993 (7%)
(vi) Grants to nonprofit organizations for up to 100% of a project's costs for watershed restoration and rehabilitation projects relating to: <ol style="list-style-type: none"> <li>1. Planning, design, and construction of stormwater management practices;</li> <li>2. Stream and wetland restoration; and</li> <li>3. Public education and outreach related to stormwater management or stream and wetland restoration; and</li> </ol>	\$0 (0%)	\$102,107 (1%)	\$100,496 (0%)
(vii) Reasonable costs necessary to administer the local watershed protection and restoration fund.	\$492,651 (3%)	\$152,438 (1%)	\$275,015 (1%)
<b>Total</b>	<b>\$17,904,501</b>	<b>\$17,215,709</b>	<b>\$25,368,023</b>

## 4.3 Grant Funding

### 4.3.1 Grants Received by DPW

In FY 2015, the City received funding from State and federal grants for the following projects which will benefit the stormwater program and MS4 compliance:

- **Chesapeake Bay Trust (CBT) Watershed Assistance Grant Program:** In November 2014, DPW received \$58,110 to develop design standards for the installation of ESD practices specific to the City. The design standards will allow common, repetitive practices, like bio-retention bump-outs and bio-inlets, to be designed and reviewed more quickly, reducing the costs for non-profits, businesses, and public agencies while also ensuring design quality. This effort is proposed to be completed by the end of FY 2016.

### 4.3.2 Grant Support by DPW

DPW used the stormwater utility to provide direct funding for the following activities in FY15:

- **Growing Green Design Competition:** This competition, to reuse vacant land that incorporates community-based stormwater management, used \$100,000 from the City's Stormwater Utility Fund to leverage \$100,000 from the US EPA and \$100,000 from Baltimore City Department of Planning. The grant program was administrated by the Chesapeake Bay Program. The competition is described further in Section 5.5.3 of this Annual Report.
- **Green Registry and Stormwater Mapping:** DPW granted \$25,000 to the Baltimore Neighborhood Indicators Alliance (BNIA) to improve their existing interactive mapping tool (Green Registry) to support the Green Pattern Book by adding a stormwater element. The mapping tool was developed as part of the Urban Waters Federal Partnership, leveraging other funding from the U.S. Forest Service used for the initial development of the tool. The mapping tool is described further in Section 5.5.4 of this Annual Report.

In addition to the direct funding listed above, DPW provided letters of support to non-profits and academic institutions in grant applications that improve water quality in Baltimore City. DPW's support included staff participation in project meetings, providing GIS data, assisting in project review, and helping the various groups access both information and city agencies. In FY15, DPW provided letters of support to eleven (11) non-profit organizations and universities for grant proposals. The following six (6) grant proposals were successful in receiving a total of \$328,613 from federal, state, and local foundations:

- Downtown Partnership of Baltimore (\$87,500) to reduce impervious surfaces at McKeldin Plaza.
- Trash Free Maryland (\$25,000) for outreach and education to reduce trash pollution.
- Maryland Hospitals for a Healthy Environment (\$35,000) for education and outreach about stormwater in the hospital communities, using Harbor Hospital as a pilot.
- Blue Water Baltimore (\$14,863) for their Storm Drain Art program.
- Living Classrooms (\$70,602) to install bioretention facilities at Commodore Rogers School.

- WBC CDC (\$23,630) to develop a stormwater master plan for the Forest Park neighborhood.
- National Aquarium (\$72,000) for education and outreach to prevent marine debris, specifically in the Masonville Cove watershed.

#### 4.4 Capital Projects – Expenditures and Financing

The capital improvements for stormwater management include those projects listed in Appendix I of this report, plus the capital projects to remediate or replace stormwater infrastructure. These projects are funded by a combination of the stormwater utility, county transportation bonds, general obligation bonds, and grant funding. The capital costs listed in Table 10 include both the expenditure for contracted services, capitalization of in-house efforts, and the payment of debt service for capital contracted expenditures from previous years. In FY 2012 and 2014, the City was approved for a total of \$30.4 million in County Transportation Bonds and \$3.1 million in GO Bonds. Approximately \$15.6 million of that debt service amount will be used to finance projects specifically listed in the MS4 Restoration WIP. The stormwater utility is responsible for paying the principle, interest, and administrative costs related to these bonds. For FY 2015, the portion of the capital improvement expenditures for this debt service was \$196,017.

The stormwater fee was established at a constant rate (\$15/ERU) for the first four (4) years of implementation (FY 2014 through FY 2017). This will allow a surplus of revenue to accumulate, enabling the City to sell revenue bonds in FY 2018 when a significant increase in capital costs is anticipated. This financing schedule aligns with the construction schedule for most of the projects listed in the MS4 Restoration WIP.

In FY 2015, the City was approved for use of the State Revolving Loan Fund (SRLF) for the Chinquapin Run stream restoration projects and the Masonville Cove ESD Projects, which were listed in the MS4 Restoration WIP. The City will continue to pursue SRLF in order to finance restoration projects.

#### 4.5 Emergencies

In FY 2015, the City declared two (2) emergencies related to stormwater: (1) Biddison Run Slope Stabilization and (2) the storm tunnel at Eager Street. The Biddison Run emergency included a portion of the scope of the Biddison Run Phase 2 stream restoration project (listed as A09 in the MS4 Restoration WIP). This part of the work included approximately 75 LF of steep slope. The slope's stability was impacted by erosion at the toe, coinciding with a large concrete block (6 feet high by 10 feet long by 12 feet wide) which had been in the stream since 1997. The slope failure had encroached under Moravia Road, causing a lane closure. The emergency declaration did not require a re-allocation of funding, but it did enable DPW to accelerate the procurement process to complete the necessary repairs, allowing other construction State highway work related to the I-895 ramp to precede. The project also prevented further erosion. Sediment and nutrient load reductions related to this work are being evaluated and will be included in the Annual Report for FY 2016.

In the summer of 2012, the 2300 block of Monument Street was closed due to the collapse of a 10-foot stormwater sewer tunnel, constructed in the 1880's and located about 40 feet below ground surface. The emergency repairs took about 6 months to complete at a cost of over \$10 million. This watershed

storm drain system (known as Harris Creek watershed) services roughly 1,300 acres. A large portion of this watershed drains dense, urban portions of the City, including Johns Hopkins Hospital.

To avoid a similar disaster, a subsequent inspection and condition assessment of approximately 1 mile of that same pipe system was initiated in January 2015. During the inspection, a portion of the pipe was found to be in great distress with potential failure increased by constant infiltrating water. The source of infiltrating water was one of two 40-inch diameter water mains traversing the storm drain at that location. Eager Street was closed for public safety. Due to the 20-foot depth of the storm pipe, structural repairs were made to install approximately 150 linear feet of CIPP liner. The work was initiated in March 2015 and completed within 3 months for a cost of \$2.2 million. The cost of the emergency was funded by the stormwater utility fund.

## 5 Enforcement Actions, Inspections and Public Education

### 5.1 Stormwater Management Program

Programmatic and implementation information for the period of this Annual Report (July 1, 2014 to June 30, 2015) is as follows:

- Number of Concept Plans received: 130
- Number of Site Development Plans received: 94
- Number of Final Plans received: 94
- Number of Redevelopment projects received: 48
- Numbers of Stormwater exemptions issued: 148

DPW received and approved as-built drawings for 55 stormwater management BMPs between July 1, 2014 and June 30, 2015. The required data for these BMPs are in Appendix B of this report.

A summary of waivers and variances for this time period is provided in the following table:

**Table 11: Summary of waivers and variances**

Description	Requested	Granted
Quantitative Control Waiver	9	9
Qualitative Control Waiver	29	29
Redevelopment Waiver	48	48
Phased Development Waiver	0	0
Administrative Waiver	0	0
Variance	2	2
<b>Total</b>	<b>88</b>	<b>88</b>

No changes to the City’s ordinance or code related to the stormwater management program (Article 7, Division II) were pursued during this time.

During this reporting period, 2,164 inspections were conducted of the ESD treatment practices and stormwater management facilities during their construction phase, concurrent with the inspections of erosion and sediment control. No violations were issued related to stormwater management.

During this reporting period, 221 inspections of ESD treatment practices and structural stormwater management facilities were conducted as part of preventive maintenance inspections. One full-time inspector is dedicated to this effort. Of those inspections, 71 sites with approved as-built plans and 101 without certified approved as-built plans were inspected. A total of 24 sites required one or more follow-up inspections; one violation notice was issued, resulting in a fine of \$6,000.

## 5.2 Erosion and Sediment Control

Although listed as an MS4 permit condition, Table J of the Attachment A of the MS4 permit will not be submitted in this or future MS4 Annual Reports since the certification training is administered and documented by MDE.

The City added a new customer service request for erosion and sediment control. Complaints are reported via phone, internet or mobile phone application and tracked through the 3-1-1 system. During FY 15, a total of 53 service requests were received. Only 35 were properly classified and resulted in an inspection. In addition, all violation notices and complaints received are posted on the Baltimore City website.

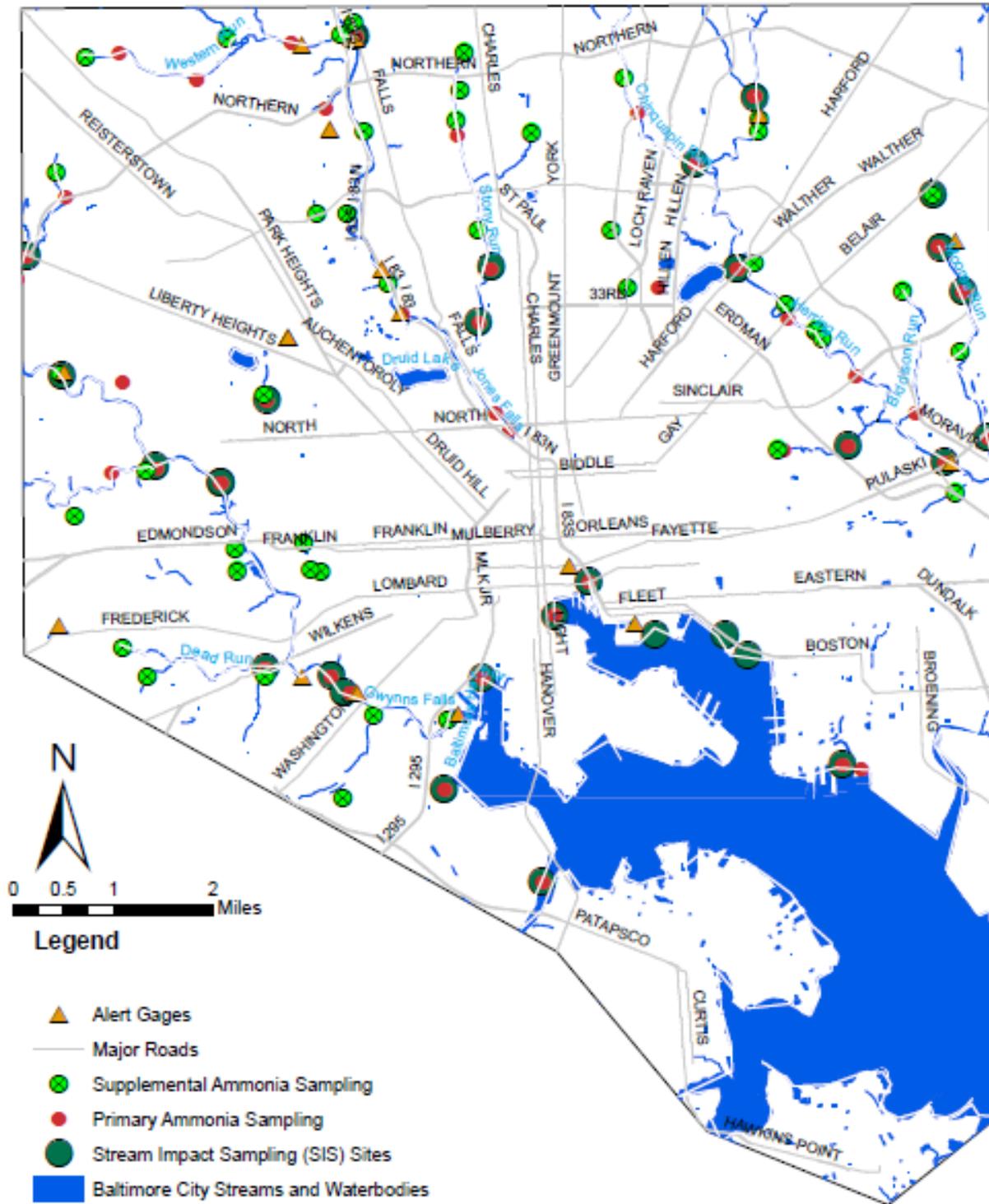
During this reporting period, 2,164 inspections were conducted for compliance with approved erosion and sediment control plans. A total of ten (10) violation notices were issued by the City, resulting in a sum of \$9,700 received as penalty fines and three (3) stop work orders. The summary information regarding earth disturbances exceeding one acre is included in Appendix G of this report.

No changes to the City's ordinance or code related to the erosion and sediment control program (Article 7, Division III) were pursued during this time.

## 5.3 Illicit Discharge Detection and Elimination (IDDE)

### 5.3.1 Routine Field Screening Locations

DPW relies on ammonia screening (AS) and stream impact sampling (SIS) to initiate pollution source tracking (PST) investigations. DPW has utilized this alternative method of IDDE since 1998, which allows a routine (weekly) field analysis of 45 outfalls in the City as part of the AS program. In FY 2015, DPW added 43 supplemental AS locations, which are sampled on a monthly frequency. The geographic distribution of AS and SIS sampling locations is shown in Figure 2, with geo-reference data provided in Appendix B. The monitoring results from the surveys for the AS and SIS programs for FY 2015 are included in Appendix C of this report. These monitoring results, plus historic data, are also available online at the Cleanwater Baltimore website.



**Figure 2:** Sampling Locations for the Ammonia Screening (AS) and Stream Impact Sampling (SIS)

## 5.3.2 Supplemental Field Screening

### 5.3.2.1 South Harbor Storm Drain Ammonia Survey

In the summer of 2014, DPW initiated a supplemental field survey of outfalls along the South Baltimore Harbor. The purpose of the survey was to conduct water quality sampling on smaller storm drain systems which were not part of the routine field screening programs. Sampling locations were not limited to outfalls, since many of the outfalls were inaccessible (private property) or were submerged by tidal waters. A total of 93 stormwater assets were sampled during the survey:

- 15 outfalls
- 69 manholes
- 7 open channels
- 2 storm drain inlets

Sampling was performed during low tide and dry weather (no rain event within 48 hours). The water samples were analyzed for ammonia-nitrogen. The sampling locations and results are included in Appendix C of this Annual Report. In areas where iron accumulation was observed within the pipe system, a sample was analyzed for enterococcus as a secondary water quality parameter for sewage. Seventy-five (75) of the assets in the survey had a base flow for ammonia-nitrogen analysis. Twenty-eight (28) of the samples yielded a measurement above 0.3 mg / L, but only ten (10) were related to sewage based on enterococcus analysis and therefore warranted the initiation of a pollution source tracking (PST) Investigation. The results of the PST investigations (which are also included in the list in Section 5.3.4 of this Annual Report) are as follows:

- Two (2) SSOs were identified and abated within the same day, both a result of sanitary mainline chokes.
- One dry weather sewer overflow from private property was identified and corrected after notifying the property owner of the problem.
- Two (2) direct connections were identified between the public sanitary and public storm systems; the connections were removed and re-routed properly.
- Two (2) direct connections from private property were identified, but only one was abated as of July 1, 2015. The remaining direct connection was referred to the Department of Housing and Community Development for code enforcement.
- One discharge was related to a leaking effluent pipe at the Patapsco WWTP, which has been abated.
- The other two (2) PST investigations were inconclusive and subsequent ammonia-nitrogen measurements have been low for several consecutive visits.

In addition to ammonia nitrogen measurements, area reconnaissance and the physical state of base flow (odor, color) resulted in the initiation of other PST investigations that found potable water main breaks and an oil spill. A similar survey is planned to be initiated FY 2016 for the remaining outfalls along the Harbor.

**5.3.2.2 Blue Water Baltimore Outfall Screening Blitz**

In the summer of 2014, Blue Water Baltimore (BWB) initiated an outfall screening blitz (OSB) along Chinquapin Run and Herring Run. A report of the results received from BWB is included in Appendix C. Based on their investigations, BWB requested PST investigations by DPW via e-mail. Between May 27, 2014 and September 3, 2015, BWB requested PST investigations for forty-four (44) locations, based on either fluoride or ammonia-nitrogen measurements. A summary of the OSB program is provided in Table 12. DPW also met with BWB on July 17, 2015 to discuss the OSB process and DPW’s observations during the PST investigations.

In response, DPW initiated PST investigations that found four (4) water main breaks and four (4) SDUOs. During the remaining 36 PST investigations, DPW found no discharge at the outfall, did not encounter similar results (ammonia-nitrogen measurements), or identified the sampling result as non-indicative of an illicit discharge (i.e. it was within the range for groundwater). The results of the PST investigations, plus any Further actions were reported to BWB via e-mail, as summarized in Appendix C of this Annual Report.

**Table 12: Summary of BWB Outfall Screening Blitz**

Sub-watershed	No. of Samples	No. initiating PST	Sample Date	PST request date
Chinquapin Run	13	6	6/9/2014	6/12/2014
Chinquapin Run	9	7	6/24/2014	6/25/2014
Chinquapin Run	13	4	6/30/2014	7/1/2014
Herring Run	12	5	5/27/2014	5/28/2014
Herring Run	14	10	6/16/2014	6/16/2014
Herring Run	2	2	6/27/2014	6/30/2014
Gwynns Falls	16	7	7/13/2014	7/15/2014
Gwynns Falls	9	3	9/19/2014	9/23/2014
Total	88	44		

**5.3.3 3-1-1 Customer Service Request for Polluted Water**

The City added a new customer service request for polluted waterways. Complaints are reported via phone, internet, or mobile phone application and tracked through the 3-1-1 system. During FY 15, a total of 57 service requests were received. Only 27 were properly classified and resulted in a pollution source tracking investigation.

**5.3.4 Pollution Source Tracking (PST)**

DPW initiates PST investigations based on the results of routine and supplemental field screening, in addition to 3-1-1 customer service requests and requests from other field monitoring programs (see Section 5.3.2.2). The monitoring results from the routine and supplemental field screening programs for FY 2015 are included in in Appendix C of this Annual Report. These monitoring results, plus historic data, are also available on-line at the Cleanwater Baltimore website.

During FY 2015, DPW developed an application for iPad™ tablets to improve the PST investigation process. The application is an update to an existing, outdated system which used field laptops with outdated GIS utility data, and required daily downloading to an unsupported version of MS Access databases. The new application is directly connected with current utility GIS data, houses historic reports, and provides routine reports plus real-time access to the system by multiple users. This application, coupled with a new SSO reporting application, has improved the transparency and efficiency of identifying and abating illicit discharges.

In addition to the new technology, DPW hired a full-time engineer in May 2015 for the dedicated purpose of managing the SDUO program. As shown below, SDUOs (sanitary discharges of unknown origin) and SSOs account for the majority of illicit discharges, in addition to being related to pollutant loadings for nutrients and bacteria. This function was previously distributed between several offices (and contracted services) within DPW. The consolidation and dedication of staff for this function has improved efficiency in abating the discharges and estimating the direct impact in pollution reduction. The estimated results will be included in the Annual Report for FY 2016, following the protocols included in the *“Recommendation of the Expert Panel to Define Removal Rates for the Elimination of Nutrient Discharges from Grey Infrastructure”* (2014).

During FY 2015, a total of 244 PST investigations were conducted: 194 PST investigations were initiated during FY 2015, and another 50 PSTs, which were initiated prior to FY 2015, were continued. There were 1,541 water quality analyses performed during FY2015 on these 244 PSTs. As a result of the PST investigations, the following illicit discharges were identified, with further details provided in Appendix C of this Annual Report:

- Fourteen (14) SDUOs, including illicit connections from private property:
  - Eleven (1) have been abated;
  - Two (2) were found that the initial repairs did not correct all problems and required more repairs. These repairs are currently pending.
  - One is pending completion of repairs by the private property owner.
- Forty-eight (48) dry weather sanitary sewer overflows (SSO) from the public sewer:
  - Forty-four (44) SSOs were abated: Chokes in the sanitary sewer lines accounted for 36 of these SSOs. Four (4) broken pipes were repaired. One siphon was cleaned. One leaking pipe was lined. Two (2) SSOs appeared to be a result of contracted constructed work.
  - Three (3) SSOs necessitated changes to best management practices (BMPs) at the Maryland Zoo, and monitoring is ongoing to determine whether these changes have resolved the issue;
  - One SSO was caused infiltration of sewage into an abandoned sanitary sewage line that is currently pending replacement.
- Forty-nine (49) drinking water transmission losses:
  - 14 have been confirmed as abated.
  - 35 are still under investigation.

- Thirteen (13) other types of illicit discharges:
  - Four (4) discharge of sediment related to water main breaks or repair.
  - One high chlorine discharge, apparently from a swimming pool.
  - One exterior brick cleaning with improper controls.
  - Four unpermitted industrial wastewater discharge; these were referred to DPW-Pollution Control and MDE for enforcement action.
  - One discharge due to a private washing machine connected to a sump pump.

### **5.3.5 FOG Program**

In November 2013, DPW initiated an inspection program to reduce fats, oils and grease (FOG) within the sanitary sewer system. The Program has a two-pronged approach that manages FOG from both the private and public sides of the property line by:

- Requiring all food services establishments (FSE) that have the potential to discharge FOG-laden wastewater to have an adequate grease control device (GCD), and
- Reducing build-up of fats, oils and grease in the sewer lines using a commercial grade degreaser.

FOG education efforts are focused on both residents and owners of FSEs. Flyers were included with water bills. Outreach at festivals and community meetings included distribution of education materials. All education materials are available on the Cleanwater Baltimore website.

The Pollution Control Section within DPW performs the inspections and educates FSEs about FOG best management practices. There were 3,356 inspections of FSEs during FY 2015: this is an increase of 170% compared to the 1,315 inspections during FY 2014. During FY 2015, 37% of FSEs were found not to be in compliance. There were 1,307 notices of violation (NOV) issued with two penalties assessed. A breakdown by type of NOV is included in Appendix C of this Annual Report. There were 486 follow-up inspections after notice of violation. The focus of this program continued to be on initial inspections during the first eight months of FY 2015. Excluding the Baltimore City Public School (BCPS) FSEs, 187 grease control devices (GCD) were needed to be installed within FSEs. Inspectors have confirmed that 78 were installed. For BCPS FSEs, 144 schools needed to install GCDs; however, BCPS had to budget for the devices in their FY 2016 budget, preventing compliance within the normal time frame.

### **5.3.6 Exterior Lead Paint Removal Waste Control Program**

This program is administered by the Pollution Control Section of the Environmental Services Division of the Bureau of Water and Wastewater. During FY 2015, there were 350 permitted sites. Inspectors made 208 site visits and issued 11 stop work notices requiring corrective action. There were no documented illegal discharges to the storm drain system.

### **5.3.7 NPDES Industrial Discharge Permits**

The City has 14 municipal facilities covered under the NPDES Industrial Discharge Permit, as listed in Table 13. During FY 2015, NOIs for these facilities and updated stormwater pollution prevention plans (SWPPPs) were submitted to MDE. Permit conditions related to staff training and routine inspections

are managed by the responsible agency. DPW plans to implement an internal environmental compliance audit program in FY 2016.

**Table 13 – Summary of NPDES Permitted Municipal Facilities**

<b>Facility Name</b>	<b>Agency</b>	<b>Address</b>	<b>State</b>	<b>SIC Description</b>
Northwestern Substation	DGS	4410 Lewin Ave	12SW0705	Sector P – fueling / maintenance
Fallsway Substation	DGS	201 Fallsway	12SW0707	Sector P - fueling / maintenance
Mechanic Shop	DGS	6400 Pulaski Hwy	12SW0708	Sector P - maintenance
Mid-town Fueling Station	DGS	410 Front St	12SW0704	Sector P - fueling
Northeastern Substation	DGS	4325 York Rd	12SW0702	Sector P - fueling / maintenance
Western Substation	DGS	239 N Calverton Rd	12SW0703	Sector P - fueling / maintenance
Central Garage	DGS	3800 E Biddle St	12SW2123	Sector P - fueling / maintenance
Bowleys Lane Sanitation Yard	DPW	6101 Bowleys Lane	12SW0254	Refuse Systems
Quarantine Road Landfill	DPW	5701 Quarantine Rd	12NE0684	Refuse Systems
Quarantine Road Municipal Landfill	DPW	6100 Quarantine Rd	12SW0257	Refuse Systems
Reedbird Landfill	DPW	701 Reedbird Ave	12SW0252	Landfill Sector L3
Northwest Transfer Station	DPW	5030 Reisterstown Road	12SW1307	Refuse System
Back River WWTP	DPW	8201 Eastern Avenue	12SW0630	Sector T - WW Treatment
Patapsco WWTP	DPW	3501 Asiatic Ave	12SW0629	Sector T - WW Treatment

## 5.4 Property Management and Maintenance

### 5.4.1 Street Sweeping and Trash Reduction

In FY 2015, the mechanical street sweepers operated by DPW- Bureau of Solid Waste removed 11,338 tons of debris while sweeping 97,183 miles of street surface. This is an increase in both tonnage and mileage, despite a significant decrease in operation in the month of February 2015 due to snow and icy weather. The efficiency of the street sweeping operations, specifically in the expanded areas, is still hindered by the coordination of parked vehicles. DPW initiated the evaluation of the cost of improved efficiency against the costs for increased parking enforcement (signage and staff).

In June 2014, DPW initiated a municipal trash can pilot program in the Belair-Edison and Four by Four neighborhoods in northeast Baltimore and several neighborhoods in the Greater Mondawmin area on the west side. Residents were given one 65-gallon municipal trash container (with an attached lid) per address with an embedded RFID chip, as well as a recycling container. The pilot program demonstrated that the municipal cans helped residents improve containment of household waste, a key factor in reducing litter and keeping neighborhoods cleaner. Further description of the impact on education and outreach are discussed in Section 5.5.6. Based on these results, Mayor Stephanie Rawlings-Blake announced a city-wide expansion of the municipal can pilot program. Beginning in 2016, approximately 210,000 64-gallon cans for mixed refuse collection will be distributed to residential households that are currently eligible for trash collection.

### 5.4.2 Inlet Cleaning

In FY 2015, the Utility Maintenance Division (UMD) of the Bureau of Water and Wastewater removed approximately 1,341 tons of debris from 6,345 inlets in the City's public storm drain system. Since Quarantine Road landfill prohibits the unloading of saturated debris, the weight measurement is based on the weight of the debris after it was spread and dried within a bermed area at the Back River Wastewater Treatment Plant.

In January 2015, DPW advertised for the installation of screens and inserts for 414 inlets which would improve the efficiency of inlet cleaning and street sweeping by preventing trash and debris from entering the storm pipe system. Modified inlets will be installed in five (5) neighborhoods: McElderry Park, Oliver, Baltimore-Linwood, Franklin Square, and Carrollton Ridge. The neighborhoods were selected based on the 3-1-1 service requests for choked inlets and dirty streets. The modifications are only being made to a portion of the 1,092 inlets located within the selected neighborhoods, based on inlet type and the proximity to routine street cleaning routes. The inlet modifications are scheduled to be completed in FY 2016. This first phase of the modified inlet project will allow the City to gauge community reactions to trash being prevented from entering inlets.

Routine preventive inlet cleaning is planned for all inlets in these five (5) neighborhoods. The initial operations will use contracted services to allow time DPW to gauge the work effort (crew size and efficiencies) to create positions and procure equipment. The request for proposal for contracted preventive inlet cleaning services was developed in June of 2015, with advertisement and implementation scheduled for FY 2016. The results of this effort will be included in the Annual Report for FY 2016.

### 5.4.3 Integrated Pest Management

During FY 2015, the Department of Transportation (DOT) applied the following herbicides: 30 gallons of Brushmaster and 50 gallons of Prosecutor Pro (Lesco brand equivalent of Round Up).

During FY 2015, the Department of Recreation and Parks (BCRP) applied approximately 60 gallons of the concentrated glyphosate (Round Up equivalent). BCRP has six (6) Public Agency Applicators who are certified by MDA (three (3) in Horticulture and three (3) in Parks). All have attended MDA approved trainings to maintain their certifications. Additionally, on August 26, 2014, the Chief Horticulturalist did a registered applicators training for newly registered staff and review for some existing staff. The Chief Horticulturalist plans to repeat that training in January 2016. All registered (not certified) applicators were re-registered with MDA as per the State process.

This is the second report for which the City has reported the amount of herbicides used by both DOT and BCRP. Under the previous MS4 permit, which expired January 3, 2010, the City was only asked to report on the use by DOT associated with roadside vegetation management. The current permit requires reporting on herbicide use at City-owned facilities including parks, roadways and parking lots. Previous pest management amount from Annual Reports for reporting periods prior to January 1, 2014 should not be used for comparison.

### 5.4.4 Deicing Materials

DOT applied 53,657 tons of sodium chloride during FY 2015. Although still significantly higher than the average sodium chloride application reported since 1999, this amount is a slight reduction when compared to the amount listed for the reporting period of January 1 to June 30, 2014. Sodium chloride is the only de-icing material used by DOT since 2002.

In FY 2015, there were 15 storm events (twice as many as the average amount from 2004 to 2010), which totaled 31.3 inches of snow and ice. In addition to the snow events, there were nine (9) other days when predicted icy road conditions required the application of road salt to protect public safety. Twelve (12) of the 24 sodium chloride applications occurred in the month of February, which coincided with decreased street sweeping operations.

## 5.5 Public Education and Outreach

### 5.5.1 Education and Outreach Activities

A summary of outreach events is provided in Table 14:

**Table 14: Summary of Outreach Activities for FY 2015**

Description	Details
Public Presentations on the MS4 WIP and Stormwater Fee Credit Program (encouraging the public to install stormwater practices)	<ul style="list-style-type: none"> <li>• MS4 presentation to the Community Development Network of MD (9/19/14)</li> <li>• Presentation on stormwater fee credits at 4th Council District community meeting (10/23/14)</li> <li>• Interfaith Partners for the Chesapeake (4/26/15)</li> <li>• Baltimore Colleges and Universities for a Sustainable Environment (6/16/15)</li> <li>• South Baltimore Business Alliance (6/24/15)</li> </ul>
School presentations providing information on trash reduction, recycling, rats, and storm drains, related to the health of the harbor	<ul style="list-style-type: none"> <li>• 33 presentations</li> <li>• 12 schools</li> <li>• 1,068 students</li> <li>• Post-presentation testing</li> </ul>
Community events where DPW provided educational materials on environmental topics	<ul style="list-style-type: none"> <li>• Liberty Reservoir Day (7/26/14)</li> <li>• Big Truck Day (5/23/15)</li> <li>• Baltimore EcoFest (4/18/15)</li> <li>• Mayor’s Spring and Fall Cleanups (4/25/15 and 10/25/14)</li> <li>• African American Heritage Festival (6/20-21/15)</li> <li>• Mayor’s Cabinet in the Community (various times throughout the year)</li> <li>• Mayor’s Public Safety Meetings (various times throughout the year)</li> <li>• Artscape (7/17-19/14)</li> <li>• Book Festival (9/25-27/14)</li> <li>• Various community meetings (various times throughout the year)</li> </ul>
Incentives related to trash reduction	<ul style="list-style-type: none"> <li>• E-cycling grant (\$38,000) (July 2014)</li> <li>• Municipal Can Pilot Program (July 2014)</li> <li>• Extended summer hours instituted at three trash drop-off centers</li> <li>• Free Community Shredding Day (May &amp; September 2014)</li> <li>• Clean Your Files Day (April 2014 &amp; 2015)</li> <li>• Mechanical Alley Sweeping pilot project (14</li> </ul>

Description	Details
	<p>neighborhoods) (August 2014)</p> <ul style="list-style-type: none"> <li>• Recycling bin sales on St. Valentine’s Day, St. Patrick’s Day, Big Truck Day, Independence Day, Mayor’s Fall Cleanup , and America Recycles Day</li> <li>• Sustainability Commission Town Hall (April 2015)</li> <li>• Household Hazardous Waste Collection (April 2014-October 2014/April 2015-June 2015)</li> <li>• Materials/Paint Exchange (April 2014-October 2014/April 2015-June 2015)</li> <li>• Community Recycling Bin Sales (February 2015, March 2015, May 2015, June 2015)</li> <li>• Youth Works: Clean Team (June 2014 - August 2014) – students distributed information on proper trash disposal in the neighborhoods where they were conducting cleaning and greening activities.</li> <li>• Continued to provide disposal service for the Water Wheel, a public-private project at the Jones Falls outfall to the Inner Harbor.</li> </ul>

Baltimore’s stormwater restoration fee has a credit program, which includes a fee reduction for participation in registered stormwater participation events. These include community clean-ups, stream and harbor clean-ups, tree plantings, and installation of community BMPs. Outreach efforts and information promoting these types of trash reduction efforts and BMP installations have included posting on the Cleanwater Baltimore website and DPW’s Facebook page, providing flyers at DPW attended events, reminders sent to City Council members for distribution, and at community and partner meetings attended by DPW liaisons. The results of the registered stormwater participation events, as reported to DPW, are as follows:

- 124 stormwater participation events completed
- 4,546 volunteers participated<sup>1</sup>
- 91.4 tons of trash collected<sup>2</sup>
- 1,635 trees planted<sup>3</sup>

<sup>1</sup> One event, Project Clean Stream, which consisted of dozens of projects city-wide, accounted for 1,550 volunteers and 47.5 tons of trash.

<sup>2</sup> See Footnote #1

<sup>3</sup> Trees are reported as afforestation.

### 5.5.2 Growing Green Design Competition

The “Baltimore City Growing Green Design Competition: Vacant Lots Transformed” was launched in conjunction with the Mayor’s Growing Green Initiative in May, 2014 to showcase innovative concepts for retrofitting vacant lots, creating community spaces, and reducing and treating stormwater. DPW provided \$100,000 in stormwater utility funds, which was matched by the Department of Planning, and the U.S. Environmental Protection Agency for a total of \$300,000. The grant was administrated by the Chesapeake Bay Trust (CBT). The competition was an opportunity to pilot community-based stormwater management that would help the City meet its MS4 compliance. It was also unique in that it required evidence of collaboration between the implementers and the community where the project would be located.

Three (3) competition workshops were held between May and July 2014. At the end of July, 14 entries were received. A Technical Review Committee was created by CBT to review and select the winning entries. In September 2014, seven (7) projects were selected to receive funding to implement their designs, but only the following six (6) projects proceeded through the design and implementation phase:

1. Dayspring Green Parking Lot: This project by Civic Works will create a pocket park with ‘green’ parking spaces for visitors and locals.
2. Lots of Art: The Hollins Roundhouse Association will repurpose two (2) vacant corner lots into a green space that can be used for passive recreation and a public arts space.
3. Riggs Avenue Community Space: The project by the Chesapeake Bay Foundation focuses on impervious removal and native plantings.
4. Gateway Garden: Another project by Civic Works, the community green space will include a rain garden, native plantings, and public art.
5. Flower Factory at Broadway East: This project by Real Food Farm integrates stormwater management with a new brand of urban agriculture - cut flower production.
6. Peace Park: Druid Heights Community Development Corporation will redevelop two (2) adjacent lots into a community gathering space that incorporates rain gardens and permeable paving.

From October 2015 through the remainder of FY2015, DPW worked with the competition winners, the Department of Planning, and CBT to develop the necessary stormwater management plans, approve maintenance agreements, and submit for permits. This was done to ensure that the projects would receive the necessary oversight to make sure that they can count toward the MS4 restoration goal. All projects are scheduled for completion in Fiscal 2016.

### 5.5.3 Stormwater Advisory Committee

In November of 2014, DPW created the Stormwater Advisory Committee (SWAC). The purpose of SWAC is to advise the Department on stormwater projects, programs, and issues, and to help educate stakeholder groups on related matters. The SWAC is made up of volunteer members representing a

diversity of sectors, including environmental non-profits, businesses and industries, anchor institutions, and citizens. DPW and other City agencies serve as ex-officio members to support the committee. The original SWAC members were:

1. Jennifer Aiosa, Friends of Patterson Park / Blue Water Baltimore
2. Kimberly Brandt, 1000 Friends of Maryland
3. Bif Browning, Southwest Partnership
4. Debbie Cameron, Baltimore Tree Trust
5. Terry Cummings, Chesapeake Bay Foundation [Chair]
6. Brian Hammock, CSX / South Baltimore Business Alliance
7. *Diane Ingram, Concerned Citizens for a Better Brooklyn*
8. Matthew Kimball, Building Owners and Managers Association of Baltimore
9. Ashley Pennington, Johns Hopkins University Office of Sustainability
10. Joan Plisko, Maryland Hospitals for a Healthy Environment
11. Alan Pressman, BGE
12. Daryl Sabourin, ASR Inc., Domino Sugar / Baltimore Port Alliance [Vice-Chair]
13. *Eric Schwaab, National Aquarium*
14. Noah Smock, Baltimore Community ToolBank
15. Bonnie Sorak, Interfaith Partners for the Chesapeake

SWAC meets on a quarterly basis. Three (3) meetings were conducted in FY 2015: November 17, 2014; February 2, 2015; and May 4, 2015. Advisory Committee meetings are open to the public and are advertised in advance. Meeting dates, minutes of past meetings, and other information regarding the Stormwater Advisory Committee can be found at [www.cleanwaterbaltimore.org](http://www.cleanwaterbaltimore.org).

In April 2015, SWAC members created four (4) sub-committees, which meet between the Quarterly meetings. The sub-committees focus on different topic areas:

- **Policy:** The sub-committee was asked to review a request from a local port business regarding stormwater fee credits and the NPDES Industrial permit.
- **Outreach & Communications:** The initial focus was DPW's communication strategy regarding stormwater and outreach efforts to the MS4 WIP targeted neighborhoods.
- **Fiscal:** The sub-committee was provided a "Fiscal 101" briefing so as to better understand the stormwater fee, capital improvement program, and operational budget.
- **Innovation:** Met only once; it was put on hold after the chair resigned from SWAC.

#### **5.5.4 Baltimore City Water Industry Career Mentoring Program**

In January 2015, DPW and the Mayor's Office of Employment Development, together with the Chesapeake Water Environment Association (CWEA), launched the Baltimore City Water Industry Career Mentoring Program. The program had two goals: (1) educating local young adults about the water industry and its career opportunities; and (2) developing a pipeline of future workers with the right skills

to fill entry-level positions in the field. The mentoring program targeted City residents between the ages of 18 and 24 who had their high school diploma or GED, but were unemployed or underemployed, and not engaged in post-secondary education or job training.

The initial stage of the program served as an introduction of the role of DPW, including tours of facilities. Applicants were then screened and paired with DPW employees, who served as mentors. Fifteen (15) of the applicants were enrolled in the Youth Opportunity Baltimore Program (Youthworks). During the summer of 2015, these Youthworks employees participated in a job fair which included Baltimore City DPW, Anne Arundel County DPW, and some private employers. Thirteen (13) of the program participants have been hired by DPW, and two (2) others are working with private employers.

### **5.5.5 Green Registry**

Baltimore Neighborhood Indicators Alliance (BNIA) has been developing a Green Registry, a publicly accessible, interactive mapping tool that integrates and visualizes data on greening activities from multi-sector stakeholders ranging from public agencies, non-profits, and community groups. The mapping tool initially mapped all City Management Open Spaces (CMOS) within the City. In FY 2015, addressing the stormwater pattern, BNIA mapped all of the projects listed in the City's MS4 WIP, as well as projects identified in various Small Watershed Action Plans. Future versions of the map will track project status (potential, proposed, in progress, completed) as well as provide the ability for partner organizations to upload stormwater projects.

### **5.5.6 Effectiveness of Education Program for Trash and Litter**

In the summer of 2014, the City initiated a Municipal Can Pilot program in two (2) areas of the City. The purpose of the program was to provide an incentive for residents to improve waste management and prevent litter. The first area included the Belair-Edison and Four By Four neighborhoods, chosen based on their consistent types of properties and wide alleys that work well with municipal trash containers. DPW previously completed a successful rat eradication pilot program in the community.

The second area included five (5) neighborhoods in the Mondawmin area, with more varied properties and some of the narrowest alleys in Baltimore. This area was selected to test how the program could be adapted to every area of the city. The pilot neighborhoods consist of Mondawmin, Panway-Braddish Avenue, Liberty Square, Burleigh-Leighton, and Parkview-Woodbrook.

In each of the pilot areas, DPW provided one municipal trash container per address with an RFID chip. The municipal trash containers consisted of one 65-gallon cart of durable plastic with an attached lid. The cart included wheels, was designed for easy use and could be tipped and pushed with minimal effort. The purpose for assigning a municipal can per address was to provide all residents with a container regardless of economic constraints, reduce the frequency of stolen cans, and eliminate claims for damaged or lost cans and lids.

By July 5, 2014, municipal trash containers and recycling bins were delivered to approximately 9,250 residential properties. All containers were delivered with informational material on the Municipal Trash Can Program, how to take care of the municipal cart and an infographic of what can and cannot be recycled. Postcards announcing delivery of the municipal carts were sent to all residents in pilot

neighborhoods. Additionally, the DPW Communications and Community Affairs Office conducted outreach including robo calls to inform residents of the program.

Prior to the delivery of the carts, DPW conducted a trash can survey. Based on this survey, 68.5% of residents in the pilot areas were using trash cans prior to receiving municipal trash cans. Specifically, in the Mondawmin area, 31% of the residents were using cans without lids and 40% had no cans at all. In Belair Edison, 30% of the residents used cans without lids and 23% had no cans.

Mixed Refuse and Recycling tonnages were tracked for the Mondawmin and Belair Edison areas. In the Belair Edison pilot area, recycling tonnage increased nearly 32% while the mixed refuse decreased slightly. On average, recycling increased just over 15 tons per month in this area. Recycling in the Mondawmin area did not increase as dramatically; however, recycling tonnage did go up by 11.16%, an average of 4.65 tons a month.

At the start of the Municipal Trash Can Program, considerable outreach was conducted in the Pilot Neighborhoods. The literature, mailed and delivered, consisted of best waste management practices and instruction regarding the recycling of single stream materials. Consistent in the messaging is the explanation of and urging to call the 311 Service Request system to report all sanitation concerns, especially bulk items found in the alleys and on area streets. This educational outreach of the pilot may have led to exposing residents in the target areas to the 311 system for the first time, hence an increase of calls in some key categories.

Cans with tight-fitting lids provide vector (rodents) control and can thereby impact the pollution loadings for both trash (litter) and bacteria (rodent population). 311 Service Requests were tallied every month in the pilot neighborhoods. These were compared with the 311 Service Requests generated in the same neighborhoods for the same month the year before in order to gauge any change as a result of the Municipal Can Program. The impact was immediate, significant, and remained consistent throughout the course of the pilot. Rat Rubout Service Requests in the pilot areas decreased within a month of the program's start. Beginning in August 2014, the pilot areas had 8.8% fewer Rat Rubout Service Requests. In September 2014, there were 10% fewer requests and then 19.7% fewer requests in October. For the month of December of 2014, the pilot areas had 68.8% fewer Service Requests generated from the year before.

During the pilot program, Dirty Alley and Dirty Street Service Requests decreased in at least one of the pilot areas for eight (8) out of the 12 months; however, overall, both Dirty Alley and Dirty Street Requests increased slightly by 8.9% and 12.9% over last year's numbers, respectively. These service request types are an indicator of the potential for littering. Although service requests increased, this does not necessarily indicate an increase amount of trash within the streets and alleys.

## 6 Water Quality Improvements

### 6.1 MS4 Restoration and TMDL Watershed Implementation Plan (WIP)

The City submitted its WIP to MDE on December 22, 2014. The public comment period associated with the WIP ended on January 30, 2015, due to a request to extend the public comment period in consideration of the holiday season. The City received over 200 comments during the public comment period; the comments and the City's response were summarized in a Comment Response Document.

The City received comments on the WIP from MDE on March 23, 2015. On June 30, 2015, the City provided MDE with a revised calculation of the baseline impervious area, along with supporting GIS files and responses to the specific MDE comments. MDE approved the City's baseline impervious area and 20% restoration goal of 4,291 acres on July 28, 2015. The WIP was also revised based on public and MDE comments. Both the revised WIP and Comment Response Document were submitted to MDE on August 24, 2015 and posted on the Cleanwater Baltimore website. The proposed restoration plans cited in Section 6 of this Annual Report refer to the revised WIP and MDE approved baseline impervious area.

### 6.2 Milestone Schedule

The WIP included programmatic and project milestones as part of an accountability framework for restoring the Chesapeake Bay. The proposed milestone schedule and status as of June 30, 2015, related to the Chesapeake Bay TMDL, are included in Appendix H. All programmatic milestones were completed as scheduled. For the project milestones, the stream restoration project was delayed based on the prioritization of the Biddison Run slope stabilization and adjustment to the project delivery (advertisement package) for two (2) small stream restoration projects which had complete designs.

### 6.3 Project Implementation

The progress status of the projects listed in the WIP is provided in Appendix I of this Annual Report. The procurement process for the design phase of several projects was initiated in FY 2015, totaling over \$20 million in design efforts for 12 design contracts. The length of restoration for the Chinquapin Run project was increased to approximately two (2) miles to coincide with the scope of work for sanitary main rehabilitation within that stream reach. Design for the Chinquapin Run project is in progress. Any adjustments of the proposed projects within the Back River watershed will be addressed in the MS4 Annual Report for FY 2016.

The Powder Mill Run stream restoration project was going to be implemented by the Maryland Transit Authority as part of the Red Line transit project to meet stream impact mitigation requirements, allowing any restoration in excess to the mitigation requirements to go towards the City's MS4 restoration. The entire project can now be considered as restoration due to the Red Line's cancellation, but the City must re-prioritize other projects in the Gwynns Falls Watershed. Any adjustments of the proposed projects within the Gwynns Falls watershed will be addressed in the MS4 Annual Report for FY 2016.

## 6.4 Impervious Area Restoration

The progress status of implementation of proposed projects, programs, and partnership which proposed in the WIP, is provided in Appendix I. Since the projects are still in the design phase, the majority of the impervious area restoration is provided by programs, specifically street sweeping. Based on the tables listed in the Appendix I, the current impervious acre restoration achieved within this permit period is 3,225 acres. This is equivalent to 75% of the current permit goal.

## 6.5 Bay TMDL Compliance

The current status of proposed projects, programs, and partnerships were entered into the Maryland Assessment Scenario Tool (MAST) to evaluate compliance with the Chesapeake Bay TMDL. The output from this model included in Appendix J. An estimation of the pollutant removals using MDE's Guidance Document is also provided in Appendix J.

## 6.6 Regional TMDL Compliance

### 6.6.1 Nutrients and Sediment

An estimation of the nutrient and sediment removals, based on the current implementation status, using MDE's Guidance Document is provided in Appendix K. Currently, records for street sweeping and inlet cleaning are not geographically referenced, so the estimated reduction per watershed (regional TMDL comparison) is not accurate. This accuracy will be improved pending modifications of the data collection for these two (2) programs. As street sweeping and inlet cleaning are continuous activities, the removal estimates for these practices will be shown as a historic trend to account for any impacts due education, outreach, or enforcement.

IDDE efforts were not incorporated into the estimation for nutrient and sediment removal. The sediment loading prevention resulting from the Emergency Slope Stabilization project at Biddison Run is also not incorporated into the estimation. The estimates for these two (2) alternative practices will be included in the estimate in the FY 2016 Annual Report.

In the WIP, the City proposed a re-evaluation of the baseline load allocations for sediment based on a feasibility analysis. Coordination with MDE's Science Services Administration will be initiated in FY 2016.

### 6.6.2 Bacteria

The results of the City's routine stream sampling program for E.coli at monitoring stations in non-tidal waters are shown in Appendix E for the Jones Falls, Back River, and Gwynns Falls watersheds. There are no stream sampling stations in the Lower North Branch Patapsco watershed. A comparison of the historic monitoring results with the prescribed thresholds for frequent and infrequent full body contact recreation is provided in Table 3 of this Annual Report.

The City has made significant capital investments in rehabilitating the sanitary sewer system as a result of its consent decree for the wastewater collection system. This capital investment, in combination with IDDE operations listed in Section 5.3 and public education efforts, prevents bacteria loadings. Further

information on these efforts is provided in quarterly reports and posted on the City's website. The WIP milestone schedule will be updated as appropriate.

The sampling results for e.coli are presented as concentrations (MPN / 100 ml), while the TMDL waste load allocation is presented as an annual load. Further environmental statistical analyses to evaluate current loadings will be presented in the FY 2016 Annual Report.

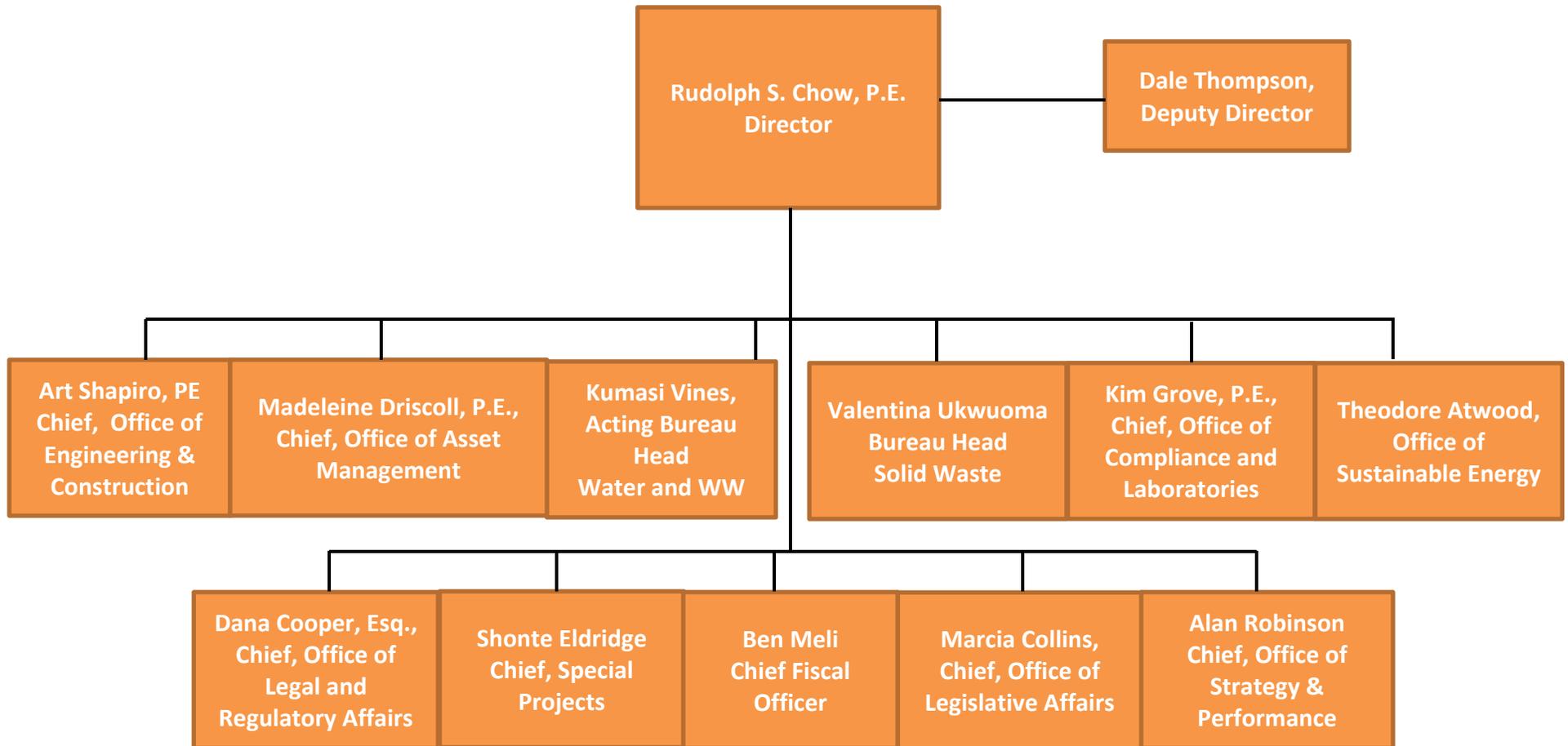
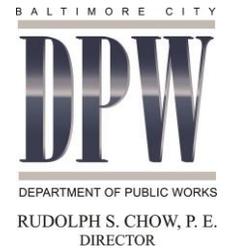
### **6.6.3 Trash**

On January 5, 2015, EPA approved the "*Total Maximum Daily Loads (TMDL) of Trash and Debris for the Middle Branch and Northwest Branch Portions of the Patapsco River Mesohaline Tidal Chesapeake Bay Segment, Baltimore City and County, Maryland*". In compliance with the MS4 permit, the City initiated the development of the Baltimore City Trash TMDL Implementation Plan to present strategies to meet the Total Maximum Daily Load (TMDL) waste load allocations. The City worked in coordination with the Baltimore County Department of Environmental Protection and Sustainability. In April 2015, a conceptual draft (30%) was presented to stakeholders for comment. The stakeholders include the Stormwater Advisory Committee (SWAC) and the Healthy Harbor Steering Committee.

## **Appendix A: Organization Chart**



# Department of Public Works Organization Chart\*



\*Note: Reflects organization structure as of June 30, 2015.

## **Appendix B: Source Information (electronic files only)**

- *Storm Drain Mapping Associated with GIS Coverage*
- *Urban BMPs Associated with GIS Coverage*
- *Impervious Surfaces Associated with GIS Coverage*
- *Water Quality Improvement Project Locations Associated with GIS Coverage*
- *Monitoring Site Locations with GIS Coverage*
- *GIS shape files*

## **Appendix C: Illicit Discharge Detection and Elimination**

- *IDDE Summary Database (electronic file only)*
- Table C-1: Summary of PST Investigations: SDUOs
- Table C-2: Summary of PST Investigations: SSOs
- Table C-3: Summary of PST Investigations: drinking water transmission losses
- Table C-4: Summary of PST Investigations: other illicit discharges
- Table C-5: Summary of reported results from Blue Water Baltimore Outfall Screening Blitz
- Table C-6: Summary of FOG Notices of Violations

Table C-1: Summary of PST Investigations: SDUOs

PST ID	PST NAME	LOCATION DESCRIPTION	ADDRESS	WATERSHED NAME	PST COMMENTS	COMPLAINT SOURCE	COMPLAINT RECEIVED	INVESTIGATION INITIATION	PST STATUS	REPAIR COMMENTS
984	105 W. 29th St Alley	Alley behind 105 W 29th St between Maryland Ave & Mace St	105 W. 29th St Alley	Jones Falls	Sewage percolating up onto alley surface at the base of a utility line pole in alley. WWE pinpointed the source to an illicit house connection at 15 W. 29th St. Problem abated.	Citizen	7/16/2014	7/16/2014	Resolved	SSO_Private
985	2433 Coldspring	Inside the storm drain system at 2433 Coldspring Ln.	2433 Coldspring Lane	Jones Falls	Sewage is entering the storm drain from the parrarel sanitary at 2433 Coldspring Ln.	DPW	7/10/2014	7/10/2014	Resolved	Installed sanitary mainline cured in place pipe liner and point repair of storm drain.
1005	3429 Ash St	Clipper Mill Rd. & Ash St. between manhole D23YY_028MH and D23YY-027MH	3429 Ash St	Jones Falls	Investigation found a section of pipe at Clipper Mill Ave and Ash St in which sewage is entering the storm drain. Dye test on 8/14 and 5/15 confirmed leaking sanitary sewer. CIPP installed on sanitary line along Ash St. Sewage discharge in storm drain slowed but was still present. Dye testing on 10/15 of 3729 Ash St confirms house connection is leaking. 17ft of house connection pipe was replaced (not the connection tho the manin) 11/16/15 followup shows manhole at Clipper Mill and Ash is dry. 5 ft down from the manhole at 3429 Ash the is a crack on the right side that is still leak sewage. Also the brick work in the vault is wet. The pipe below vault turns dry.	Blue Water Baltimore	8/12/2014	8/16/2014	Referred, Not Resolved	Referred on 5/14/15- Assigned 5/15/15 for CIPP. Needs more repair work.
1016	1119 Light Street	James Pharmacy (Epic) @ 1119 Light St	1119 Light St	Baltimore Harbor	Possible direct sanitary connection from rear bathroom of James Pharmacy to storm drain on Light St. Did not test upstairs apartments. Housing sent violation and notified OCAL (J.White) on 7/13/15 that violation was sent. Owner had plumber look into and found no issue. N.Mitrus spoke with owner on 7/13 he said they tore down building and rebuilt. The plumber tied into existing connection from previous building. Was supposed to get back in contact with N.Mitrus to set up dye test. As of 8/10 have not heard from owner Avi Pelta 410-752-5810. Spoke with Ryan Hoover of MD Septic and Tank (410-905-5609 ryan.hoover@mdsepticatank.com)on 8/20 who is hired to complete repair. NM provided him with connection card, and plans to locate residential connection on 8/24. As of 10/28 CCTV with lateral launch will be done by contractor to locate house connection.	DPW	9/23/2014	9/23/2014	Referred, Not Resolved	SSO_Private
1018	Denison St (BWB Outfall B01-GWN-102)	726 N. Hilton St. @ Denison St.	726 N. Hilton St. @ Denison St.	Gwynns Falls	BWB said, exceeded limits for ammonia 11.16 ppm. OCAL staff investigated and found disjointed sanitary line on Denison St. leaking wastewater underground and infiltrating storm drain system.	Blue Water Baltimore	9/23/2014	9/26/2014	Resolved	Onepoint repair abated the problem
1036	4117 Westchester 102814	4117 Westchester Rd.	4117 Westchester Rd	Gwynns Falls	High ammonia (0.35 mg/l) was recorded during Ammonia Survey. The problem was tracked to a collapsed storm drain with with sewage from a nearby sanitary seeping into it.	DPW	10/28/2014	10/28/2014	Resolved	Manhole replaced and point repair of storm drain.
1055	2301 Sidney Ave Alley Inlet	Inlet in alley behind 2301 Sidney Ave & Kent St	2301 Sidney Ave (rear)	Gwynns Falls	Found uncharted 6" pipe discharging sewage into southwest corner of inlet while investigating simular problem at 2301 Annapolis Rd Alley.	DPW	12/5/2014	12/5/2014	Resolved	Illicit connection reconnected to Sanitary collection system
1056	2301 Annapolis Rd Alley Inlet	Inlet in alley behind 2301 Annapolis Rd & Kent St	2301 Annapolis Rd (rear)	Gwynns Falls	High ammonia (>2.75 mg/L) found at 2047 Annapolis Rd Left while performing south harbor sampling (12/5). Investigation led staff to an inlet with an uncharted 6" pipe in SW corner . Pipe is discharging fluctuating volumes of sewage.	DPW	12/5/2014	12/5/2014	Resolved	Illicit connection reconnected to Sanitary collection system
1083	A.J. Michaels	AJ Michaels Heating, Cooling, & Plumbing building. (Storage Area & Center Office Bathrooms)	4512 York Rd	Back River	Confirmed using dye, two of the three bathrooms at A.J. Michaels are directly connected to the storm drain system. The center office bathroom and the storage area bathroom are tied into the storm drain system. The right (north) office bathroom is connected properly to the sanitary system.	DPW	1/22/2015	1/22/2015	Resolved	Illicit connection reconnected to Sanitary collection system
1092	Loyola Northway (2600 Block)	2600 Block of Loyola Northway.	2620 Loyola Northway	Jones Falls	Sewage in storm drain line. Flushed dye through the cleanout at 2620 Loyola Northway, with water hose. Dye can be seen entering the storm drain in front of 2620 Loyola Northway. House is vacant, so believe additional problems exist, with other house connections, within the 2600 block of Loyola Northway.	DPW	2/10/2015	2/12/2015	Referred, Not Resolved	Lining was performed, didn't abate the problem. Assigned to contractor but withdrew to be assigned to SC 943

**Table C-1: Summary of PST Investigations: SDUOs**

PST ID	PST NAME	LOCATION DESCRIPTION	ADDRESS	WATERSHED NAME	PST COMMENTS	COMPLAINT SOURCE	COMPLAINT RECEIVED	INVESTIGATION INITIATION	PST STATUS	REPAIR COMMENTS
1093	2500 Block W. Coldspring	2500 Block of W Coldspring Lane, between Pall Mall Rd and Fenney Ave.		Jones Falls	Sewage is escaping the system on W. Coldspring Ln, between Pall Mall and Fenney Ave and appears in the storm drain system at a 15" collapsed storm drain inlet pipe at 2426 W. Coldspring. Also the storm drain mainflow is escaping the system and reappear	DPW	2/10/2015	2/12/2015	Resolved	Installed sanitary mainline cured in place pipe liner
1108	McDonald's Cleanout Overflow	6005 Liberty Rd at parking lot exit, southeast corner of property	6005 Liberty Rd	Gwynns Falls	During biomonitoring, noticed gray water and toilet paper along the left bank of stream at the Powder Mill sampling site. Problem was tracked to McDonald's overflowing cleanout. Referred to Baltimore County's Emergency Sewer Service 410-887-7415	DPW	3/31/2015	3/31/2015	Resolved	SSO_Private
1119	4201 Pennington Ave Apartments	In the rear of 4201 Pennington Ave sewage from the apartment bldg can be seen entering the storm drain in the manhole.	4201 Pennington Ave	Baltimore Harbor	It appears that a portion or all of the apartment bldg. @ 4201 Pennington Ave is tied into the storm drain line. The pipes & sewage can be seen entering the storm drain at the manhole in the rear of the bldg in the concrete courtyard by the back door.	DPW	4/7/2015	4/7/2015	Resolved	Repairs completed
2003	5218 Curtis Ave Septic Tank Tied to Stormdrain	Septic and inlet located on east side of property.	5218 Curtis Ave	Baltimore Harbor	5218 Curtis Ave has an overflow on the septic tank tied to an adjacent inlet. Property owner plugged the pipe on the septic side with a mechanical plug. Still getting high ammonia and bacteria in the line at the manhole in street. Sample turned buffer on 6/16/15.	DPW	5/12/2015	5/14/2015	Resolved	SSO_Private

Table C-2: Summary of PST Investigations: SSOs

PST ID	PST NAME	LOCATION DESCRIPTION	ADDRESS	WATERSHED NAME	PST COMMENTS	COMPLAINT SOURCE	COMPLAINT RECEIVED	INVESTIGATION INITIATION	PST STATUS	REPAIR COMMENTS
989	3700 Greenspring Ave.	Next to bus stop shelter	3700 Greenspring Ave.	Jones Falls	Steel plate covering manhole. Sewage was discharging from under plate. Poop and TP in road. Flowing into inlet. NM found on drive in to work.	OCAL	7/28/2014	7/28/2014	Resolved	Relieved mainline choke with 200 ft of pressure truck on 8 in mainline, turned over for CCTV
991	3700 Green Spring Ave 08062014	Next to bus stop shelter		Jones Falls	Sewage discharging from under steel plate and spot in curb and street	OCAL	8/6/2014	8/6/2014	Resolved	Relieved mainline choke with 200 ft of pressure truck on 8 inch sanitary mainline
996	Eastern & S. Exeter	Southeast corner of Eastern Ave. & S. Exeter St.	Eastern Ave. & S. Exeter St.	Harbor	High ammonia (0.84 mg/l) recorded during survey, at the Central & Lancaster sampling site. The problem was tracked to a sanitary holding water/choked at the southeast corner of Eastern Ave. & S. Exeter St. Choked sanitary ID: S41K_019MH.	OCAL	8/14/2014	8/14/2014	Resolved	Choke. Released by UMD
1008	Gwynns Falls Trail Footbridge 091114	Sanitary is located at the southeast corner of the Gwynn Fall Trail footbridge, about a 0.25 mile downstream of Wilkens Ave.	2730 Wilmarco Ave (closest address)	Gwynns Falls	Sanitary sewer overflow at manhole reported to OCAL office. 10 GPM	Other	9/11/2014	9/11/2014	Resolved	Choke. Released by UMD
1015	Central & Bank 09162014	NW corner of Central & Bank	1220 Bank St.	Harbor	Choked Sanitary	OCAL	9/16/2014	9/16/2014	Resolved	Choke. Released by UMD
1020	600 Upper Ellicott Drive SSO	Sanitary pipe suspended above the Gwynns Falls is about 200 feet downstream from Edmondson Ave	200 feet downstream from Edmondson Ave	Gwynns Falls	BWB located an above-ground sewer pipe that crosses the Gwynns Falls, and is leaking from one of the junctions in the pipe. There is also a tree lying on of the pipe which may be the cause of the leak. Reported to Office of Asset Mgmt	Blue Water Baltimore	9/23/2014	9/24/2014	Resolved	Flushed and cleaned 10 inch sanitary mainline using 175 ft of pressure hose
1031	Central & Bank 100714	Northwest corner of Central Ave. and Bank St.	Central Ave. and Bank Street	Harbor	High ammonia recorded during ammonia survey. Problem tracked to recurring sanitary choke at the northwest corner Central Ave. and Bank St. Utility Maintenance was at site to unclog the sanitary.	OCAL	10/7/2014	10/7/2014	Resolved	Choke. Released by UMD
1033	Lazear 102114	Top of Lazear Rd east Branch		Gwynns Falls	Choked sanitary causing sewage to exit system at bottom of sanitary stack next to outfall	OCAL	10/21/2014	10/21/2014	Resolved	Choke. Released by UMD
1034	203 N Central Ave	Northbound lane at the southwest corner of 203 N. Central Ave	203 N Central Ave	Harbor	High ammonia (0.55mg/L) was found during Harbor Ammonia Screening on 10/17. OCAL staff investigated and found several sanitary manholes holding water along northbound lane at 203 N. Central Ave	OCAL	10/17/2014	10/17/2014	Resolved	Choke. Released by UMD
1035	800 Unetta Ave. SSO	Sanitary manhole is 20 ft behind rear fence.	720 Caton Ave	Gwynns Falls	Sanitary line blew out and multiple locations.	SSO Report	10/24/2014	10/24/2014	Resolved	Choke. Released by UMD
1038	Frederick Ave. Bridge @ Gwynns Falls	East bank of Gwynns Falls @ RR tracks below Frederick Ave. bridge	2804 Frederick Rd. (reported closest address)	Gwynns Falls	Sanitary sewer manhole overflowing at bridge construction site. Found to be choked sanitary line. SSO response generated and Utility Maint. arrived to begin clearing mainline choke. Problem abated (10/31)	Other	10/29/2014	10/29/2014	Resolved	Relieved sanitary mainline choke, removed rocks.
1044	3200 Carlisle Ave	Manhole in center of intersection with Rosdale	3200 Carlisle Ave	Gwynns Falls	Choke at intersection of Carlisle and Rosedale overflowing into adjacent storm which leads to 36" outfall at Hanlon Park.	OCAL	11/10/2014	11/10/2014	Resolved	Relieved mainline choke with 175 ft of pressure truck on 8 inch sanitary mainline
1045	1522 E. Biddle St Alley	Parking area in alley behind 1522 E. Biddle St.	1522 E. Biddle St.	Harbor	OCAL received a complaint of sewage odor in home at 1528 E. Biddle (SR#14-00857892). OCALIS field investigation found overflowing house clean out behind 1522 E. Biddle. Referred to Utility Mnt as SSO (SR#14-00855928)	Citizen	11/12/2014	11/13/2014	Resolved	Relieved house connection choke, removed grease, rags and debris
1049	Loyola Southway and Greenspring Ave. SSO 3396	Cleanout at top of hill behind apartment building		Jones Falls	Apartment cleanout discharging at 100 GPM, flowing downhill under fence into street.	OCAL	11/19/2014	11/19/2014	Resolved	Relieved house connection choke with 20 ft of pressure hose on 6 inch line
1051	4500 Wakefield	4500 Wakefield Road	4500 Wakefield Road	Gwynns Falls	High ammonia (1.10 mg/l) was recorded during watershed survey. Problem was tracked to choked sanitary at 4500 Wakefield Road.	OCAL	11/24/2014	11/25/2014	Resolved	Choke. Released by UMD
1052	19 W Barney St	Rear of 19 W Barney St @ Olive St	19 W Barney St	Harbor	High ammonia value (1.95mg/L) at Heath St & Clarkson St during South Baltimore Storm Drain Survey on 11/21/14. Tracked high ammonia to sanitary mainline choke behind 19 W Barney. Contacted Control One for SSO response and to clear line.	OCAL	11/21/2014	11/21/2014	Resolved	Choke. Released by UMD
1053	Fords & Fieldcrest	Fords Ln. & Fieldcrest Rd. (South Corner)	Fords Ln. & Fieldcrest Rd.	Jones Falls	High ammonia (>3.00 mg/l) recorded during watershed survey. It was tracked to a sanitary holding water/choked. WO#: 218412	OCAL	12/1/2014	12/1/2014	Resolved	Choke. Released by UMD
1058	2523 S Paca St	Front yard of 2523 S Paca St	2523 S Paca St	Gwynns Falls	High ammonia value (0.56mg/L) during South Baltimore Storm Drain Survey (12/10) led staff to sanitary mainline choke at 2523 S Paca St. SSO paper form filed.	OCAL	12/10/2014	12/10/2014	Resolved	Flushed and cleaned 8 inch sanitary mainline, used 50 ft of pressure hose

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PST ID	PST NAME	LOCATION DESCRIPTION	ADDRESS	WATERSHED NAME	PST COMMENTS	COMPLAINT SOURCE	COMPLAINT RECEIVED	INVESTIGATION INITIATION	PST STATUS	REPAIR COMMENTS
1059	109 N. Fremont SSO 3435	109 N. Fremont Ave. @ Vines St.	109 N. Fremont Ave.	Harbor	High ammonia (0.68 mg/l) was recorded during SIS. It was tracked to a sanitary holding water/choked at 109 N. Fremont Ave. City Works ID# 219612	OCAL	12/8/2014	12/11/2014	Resolved	Bypass pumping was needed to clear line and abate overflow
1065	4310 Lasalle Ave SSO 3439	Sanitary MH in sidewalk	4310 Lasalle Ave.	Back River	Sanitary is filled up to top of channel and flowing slow. Sewage discharging into SD through missing brick work. CCTV shows damaged sanitary line 119 feet from MH. Due to be lined on 12/19/14	OCAL	12/15/2014	12/15/2014	Resolved	Relieved mainline choke on 8 in mainline, used 200 ft of pressure hose. Removed rocks, rags and debris
1069	802 E. Coldspring Lane			Back River	SSO have been occurring from abandoned telephone utility manhole. Asset management requested we dye test to find source.		1/5/2015	1/5/2015	Resolved	Choke. Released by UMD
1071	2801 W. Mulberry	Sanitary manhole is off the northeast corner of the house	2801 W. Mulberry St.	Gwynns Falls	Choked sanitary entering the storm drain line in the alley along side 2801 W. Mulberry. Approx 30 gal per	OCAL	12/18/2014	12/18/2014	Resolved	Relieved mainline choke with 300ft of pressure truck on 8 inch mainline
1074	4720 York Rd SSO 3485	Sanitary in sidewalk	4720 York Rd	Back River	Choked sanitary found during 802 E. Coldspring investigation	OCAL	1/8/2015	1/8/2015	Resolved	Used 50 ft of pressure hose to relieve mainline choke, removed grease, rags and debris
1075	977 Ellicott Driveway SSO 3498	300 feet south of yellow gate. Manhole next to trail.		Gwynns Falls	SSO greater than 10,000 gallons (estimated 19,500 Gallons). OCAL notified through SSO reporting SOP.		1/15/2015	1/20/2015	Resolved	Relieved mainline choke with 50 ft of pressure hose on 8 inch sanitary mainline
1084	Loyola Southway & Greenspring SSO 3516			Jones Falls	Sewage coming from ground behind inlet and flowing into inlet and into street. 75 GPM.	OCAL	1/28/2015	1/28/2015	Resolved	Used 300 ft of pressure truck to relieve mainline choke on 8 in sanitary mainline
1085	252 N. Hilton SSO 3512	In woods across street.	252 N. Hilton	Gwynns Falls	10,00 gallon SSO	SSO Report	1/25/2015	1/27/2015	Resolved	Relieved mainline choke with 300 ft of pressure hose on 12 inch sanitary mainline
1097	252 N. Hilton SSO 3543	In woods across street.	252 N Hilton	Gwynns Falls	Discharging sewage 100 GPM	OCAL	2/9/2015	2/9/2015	Resolved	Relieved mainline choke with 300 ft of pressure truck on 12 inch sanitary mainline
1098	252 N. Hilton SSO 3554	In woods across street	252 N Hilton	Gwynns Falls	Sanitary discharging at 75 GPM	OCAL	2/18/2015	2/18/2015	Resolved	Relieved mainline choke with 300 ft of pressure truck on 12 inch line
1099	4720 York Rd	Manhole in street		Back River	Found choke while following up on 4720 York SSO 3485	OCAL	2/19/2015	2/19/2015	Resolved	Jetted line with pressure truck to relieve mainline choke
1100	Central & Fleet	Northwest corner of Central & Fleet	S. Central Ave & Fleet St	Harbor	High ammonia (0.39mg/L) reported on 2/11/15 during harbor survey. Staff found choked sanitary line at Central and Fleet. The blockage had the sanitary line backed up for several blocks.	OCAL	2/11/2015	2/12/2015	Resolved	
1112	1103 Sterrett St	Alley next to 1103 Sterrett St	1103 Sterrett St	Harbor	High ammonia (0.43mg/L) found while investigating another PST for cloudy discharge. High ammonia values led staff to sanitary mainline choke at 1103 Sterrett St.	OCAL	4/2/2015	4/2/2015	Resolved	
1117	3200 Carlisle Ave SSO 3638	Sanitary in middle of intersection		Gwynns Falls	Sewage at outfall lead to choked sanitary.	OCAL	4/6/2015	4/14/2015	Resolved	
1996	203 Chancery Rd SSO 3702			Jones Falls	100 GPM flowing from sanitary at 203 Chancery Rd into adjacent storm drain via 12 inch overflow structure in manhole S35CC1008MH. Discharge was entering Jones Falls from JF 11.5. Discovered during followup of Guilford Ave and 26th St SSO 3699.	OCAL	5/5/2015	5/5/2015	Resolved	Used 300 ft of pressure hose to relieve mainline choke
1998	2760 Wilkens Ave SSO 3706	Rear of 2760 Wilkens Ave next to RR tracks.	2760 Wilkens Ave.	Gwynns Falls	Sanitary sewer overflow found while performing macro invertebrate stream sampling in Gwynn's Falls	OCAL	5/7/2015	5/7/2015	Resolved	Pressure truck relieved the mainline choke with 450 ft of pressure hose
2049	2200 Presbury St (Holding Sanitary)	Alongside 2200 Presbury St in the alley	2200 Presbury St	Gwynns Falls	High ammonia value @ 123 N. Warwick Ave (0.39 ppm) received during Dead Maiden Survey. Lead to a holding sanitary @ 2200 Presbury St. It was entering the storm drain 15' below the manhole @ Presbury St alongside 1700 N. Smallwood St at approx 20 GPM.	OCAL	6/9/2015	6/10/2015	Resolved	Relieved Mainline choke with 210 ft of pressure truck on 8" two section pipe
2059	2747 Rayner Ave Overflowing Cleanout in the Rear	2747 Rayner Ave Rear	2747 Rayner Ave Rear	Gwynns Falls	We received high ammonia (0.46 ppm) @ our 2560 Lauretta Ave sample site for the Dead Maiden Survey. It lead us to an overflowing clean out in the rear of 2747 Rayner Ave. It was overflowing in the yard and running east down the alley and into the storm drain inlet located at Ashburton St. Intermittent flow.	OCAL	6/9/2015	6/16/2015	Resolved	Relieved house connection choke with 30ft of electric cable and H-Cutter, removed rags and roots

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PST ID	PST NAME	LOCATION DESCRIPTION	ADDRESS	WATERSHED NAME	PST COMMENTS	COMPLAINT SOURCE	COMPLAINT RECEIVED	INVESTIGATION INITIATION	PST STATUS	REPAIR COMMENTS
983	Gwynn's Falls Behind United Iron and Metal	Gwynn's Falls 500Ft upstream from Gwynns' Run on right bank behind United Iron and Metal	2545 Wilkens Ave (behind closest address)	Gwynns Falls	Sewage observed entering stream by BWB during outfall blitz sampling on 7/13/14 (BWB ID V11-GWN-107). OCAL investigation found sanitary line encasement leaking along side of stream.	Blue Water Baltimore	7/13/2014	7/16/2014	Resolved	Broken pipe. Repaired by UMD
994	Gwynns Falls Conservation Trail @ 2520 Talbot	500' north of Windsor Mill Rd along GF Conservation Trail behind 2520 Talbot St.	2520 TalbotSt.	Gwynns Falls	There is a small pool of sewage in an eroded section of the trail. An old sanitary line is collapsed below the trail. Possible connection to home a 2520 Talbot needs to be determined. Utility Maintenance at site make corrective repair.	Citizen	7/30/2014	7/30/2014	Referred, Not Resolved	
1068	500 Poplar Grove St Rear SSO ID 3445	Alley behind 500 Poplar Grove St	500 Poplar Grove St Rear	Gwynns Falls	Sewage entering adjacent storm. UM repaired of small section. Still active on followup dye test 5/12/15. referred to OAM. Section of pipe was relined. Followed up dye testing on 9/16 shows no dye in storm drain. Still getting high ammonia at mulberry & Poplar Grove. OCAL conclude SSO has been abated. Starting new investigation into high ammonia and bacteria.	OCAL	12/17/2014	12/17/2014	Resolved	CCTV mainline, found mainline break. Needs repair, turned over to construction for repair
1125	Guilford Ave & 26th St Under RR Bridge SSO 3699	Under RR bridge south of Guilford & 26th St.	Guilford Ave & 26th St	Jones Falls	High ammonia reported (>3.33mg/L) on 4/29 during JF ammonia survey. Investigation found discharge under RR bridge and sanitary line holding water . Bypass pump was deployed and SSO response by UMD 4/30. CCTV found breaks in the sanitary under Guilford	OCAL	4/29/2015	4/30/2015	Resolved	Bulkhead off of 12 inch mainline, bypass pumping was required to abate overflow
1120	Orville and Federal SSO 3645	Behind church on Horners Ln		Back River	Sanitary valve turned by contractor caused an SSO. 10,000 gallon sampling event	Citizen	4/7/2015	4/8/2015	Resolved	
2036	731 Ashburton St. Spinello Sanitary Pipe Lining	Sanitary line that runs though 731 Ashburton St	731 Ashburton St	Gwynns Falls	High ammonia (2.25mg/L) at Carroll Park on 5/28 during during GF Survey. OCAL staff tracked high ammonia to a sanitary lining at 731 Ashburton. Dye was deployed above and present in SD. Spinello re-routed a pump and sewage no longer entered SD.	OCAL	5/28/2015	5/29/2015	Resolved	
1121	2805 Forest View Ave	Bottom of hill next to stream.		Back River	Diego from Office Asset Mgmt asked us to look into sewage infiltration into abandoned sanitary line. The abandoned line had sewage present and flowing in it. We relayed that information back to them	Other	4/22/2015	4/22/2015	Resolved	
1066	Presbury & McKean	1700 McKean Ave & Presbury St	1700 McKean Ave & Presbury St	Gwynns Falls	Small volume of sewage entering storm drain in first and second segment joint below manhole. Contract crew installing a sanitary liner on 1/16 /15 abated the problem.	OCAL	12/19/2014	12/19/2014	Resolved	Leaking Pipe. Linner installed by contractor
2032	3300 Clipper Mill Rd Continuous Monitoring Effort	Sanitary manhole between tracks and highway	3300 Clipper Mill Rd	Jones Falls	OCAL installed Isco bubbler in ground channel and go-pro on catwalk. Recorded 14 SSO events in 7 days. OAM had manhole sealed and install flow monitor in pipe. Manhole is sealed. Continue to monitor manhole and upstream manhole for overflows. Met with WWE and Zoo. Flow data shows zoo is exceeding capacity of line with the penguin exhibit backwash. They have to backwash at this rate in order for backwash to work. The rate is 500 gpm per-filter. Polar bear exhibit also has filters but half the amount. Zoo line is 12" going into 8". Park Rec pools backwash once per week. Zoo hired engineer to address issue and find ways to decrease flows into sanitary line.	OCAL	4/21/2015	4/21/2015	Resolved	Cleaned siphon
995	3300 Clipper Mill Rd	Outfall behind 3300 Clipper Rd on opposite side of Jones Falls	3300 Clipper Rd	Jones Falls	Suspected sewage reported discharging from outfall on 8/12/14. OCAL investigation on 8/13/14. Outfall was dry. There was evidence that a sanitary sewer did recently overflow into storm drain at light rail tracks, however no longer active.	Blue Water Baltimore	8/12/2014	8/13/2014	Stopped	Receiled lower manhole. BMP to decrease the discharge from zoo operation
1116	3300 Clipper Mill SSO 3626			Jones Falls	Pipe leading to light rail track discharging sewage from overflowing zoo sanitary line.		4/1/2015	4/1/2015	Resolved	
2031	3300 Clipper Mill Rd SSO 3745	Manhole between tracks and highway	3300 Clipper Mill Rd	Jones Falls	Zoo perform routine filter backwash of 1 of 4 Penguin exhibit filters of 2400 gallons. Took 5 min to reach MH and discharged for 8 minutes.	OCAL	5/20/2015	5/20/2015	Resolved	Assessing Maryland Zoo opertaing practices to mititgate high flows through this sewer pipe

**Table C-3: Summary of PST Investigations: drinking water transmission losses**

PST ID	PST NAME	LOCATION DESCRIPTION	ADDRESS	WATERSHED NAME	PST COMMENTS	COMPLAINT SOURCE	COMPLAINT RECEIVED	INVESTIGATION INITIATION	PST STATUS	REPAIR COMMENTS
986	Cylburn Ave at Service Driveway Hydrant Leak	Cylburn Ave, about 500 feet Greenspring Ave.		Jones Falls	Leaking Hydrant spraying from top and sides. Tried to close valve, unsuccessful	DPW	7/23/2014	7/23/2014	Resolved	Leaking Hydrant spraying from top and sides
993	Northwood & Lenton (BWB V09-CHI-111)	100' east of intersection at Northwood Dr & Lenton Ave	Northwood Dr. & Lenton Ave.	Back River	BWB reported high fluoride (0.7 ppm) during outfall blitz program on 6/30/14. OCAL investigation found water line leaking into storm drain at nearby intersection. problem abated 09/04/15.	Blue Water Baltimore	7/1/2014	7/25/2014	Resolved	BWB reported high fluoride (0.7 ppm) during outfall blitz program on 6/30/14. OCAL investigation found water line leaking into storm drain at nearby intersection. problem abated 09/04/15.
997	Water Break 4001 Baltimore St	South side of the road @ 4001 Baltimore St	4001 Baltimore St	Harbor	Linwood & Elliott was extremely turbid with orange colored sediment by the time we arrived at the problem Water Maintenance was already fixing the broken water line.	DPW	8/19/2014	8/19/2014	Resolved	Broken water line. Repaired by UMD
998	Eastern Ave & Linwood Ave Drinking Water	In the middle of the intersection coming out of the Water Main Valve manhole	Eastern Ave & Linwood Ave	Harbor	Water overflowing out of the Water Main Valve manhole in the middle of the intersection	DPW	8/19/2014	8/19/2014	Resolved	
1002	3900 Block Hillen Water Main	North bound side at the curb in the upper part of 3900 block of Hillen Rd., about 100 feet south of Roundhill Rd.	3900 Block of Hillen Rd.	Back River	Found water main break while investigating Tiffany Run fish kill. This is not the cause of the fish kill.	DPW	8/27/2014	8/27/2014	Resolved	Water main break
1003	3500 Block of Hillen Water Main	Center north bound lane on Hillen Rd. about 600 feet north of 35th St. (across from Mervo High School's tennis courts)	3500 Block of Hillen Rd.	Back River	Found water main break will investing the cause of fish kill in Tiffany Run stream. The is not the cause of the fish kill.	DPW	8/21/2014	8/21/2014	Resolved	Water main break
1007	2019 E. Lafayette	Sidewalk in front of 2019 E. Lafayette St.	2019 E. Lafayette St.	Harbor	Found leaking water meter, while investigating Lakewood & Monument West Branch. The flow is not above ground, but see the water pouring through the east wall inside of storm drain inlet.	DPW	9/5/2014	9/5/2014	Resolved	leaking water meter
1010	1940 Belair Rd	At the curb at the far leftside in front of 1940 Belair Rd.	1940 Belair Rd.	Harbor	Potable water leaking from the curb in front of 1940 Belair Rd. Water is leaking from the street, about a foot from the water valve cover.	DPW	9/9/2014	9/9/2014	Resolved	
1017	Hanlon Park Uncharted Outfall	Peak's Branch approximately 100 ft upstream Gwynn's Falls Pkwy	Gwynns Falls Pkwy & Longwood Rd.	Gwynns Falls	High chlorine reported on 9/24/14 during ammonia screening. OCAL staff investigation found high volume (~80-100 GPM) of chlorinated water discharging from uncharted outfall (18"x10"). Possible damaged water main or relief structure.	DPW	9/24/2014	9/26/2014	Referred, Repairs Pending	Leak exists near the southern part of Hanlon Park, west of Gwynns Run. Unable to locate the water valve to listen for leak. Recently acquired metal locating device to aid investigation efforts.
1022	Madison & Edison Water Valve	In the intersection of E. Maidson St. & Edison Hwy.	E. Maidson St & Edison Hwy	Harbor	In-line water valve leak	DPW	9/30/2014	9/30/2014	Resolved	
1040	3125 Bancroft Rd Water Leak	108 feet up stream in the storm drain line from the manhole at 3125 Bancroft Rd	3125 Bancroft Rd Cross Country Manor Apartments	Jones Falls	Water was leaking into the storm drain line at multiple joints between pipe segments. Problem is located 108 feet upstream from manhole D01EE2037MH at 3125 Bancroft Rd.Approx 30 GPM	DPW	10/30/2014	10/30/2014	Resolved	
1041	West Garrison Ave & Greenspring Ave Water Problem	Problem is located at intersection of W. Garrison Ave & Greenspring Ave.	West Garrison Ave & Greenspring Ave	Jones Falls	Water is entering the line at a joint. It's 12 feet downstream from storm drain manhole D15QQ1040MH. There is a water valve cover on the surface that is very close to where the potable water is entering the line. Flow is 40 GPM.	DPW	10/30/2014	10/30/2014	Resolved	On 11/4/14, OAM located the leak and passed it on to UMD for repair. On 3/13/15, UMD closed out the work order "no problem found".
1057	83 W West St	83 W West St & Race St	83 W West St	Harbor	Water valve observed leaking onto street surface while performing south baltimore storm drain survey	DPW	11/4/2014	12/4/2014	Referred, Not Resolved	On 12/4/14, UMD repaired the valve.
1061	Worcester @ Russell (Horseshoe Casino)	2000 Worcester St. at Russell St. (next to Horseshoe Casino)	2000 Block of Worcester St at Russell St	Harbor	Water main break, >100 GPM was spotted during SIS	DPW	12/1/2014	12/1/2014	Resolved	
1079	Lombard St & Haven St	Haven St next to 4100 Lombard St	4100 Lombard St	Harbor	OCAL Staff noticed light flow onto the street surface from leaking water valve. Problem abated 4/23	DPW	1/16/2015	1/16/2015	Resolved	light flow onto the street surface from leaking water valve. Problem abated 4/23
1080	524 W. Franklin St	Sidewalk in front of 524 W. Franklin St	524 W. Franklin St	Harbor	OCAL staff noticed heavy flow of water leaking from a water meter cover on sidewalk in front of 524 W. Franklin St.	DPW	1/16/2015	1/16/2015	Resolved	flow of water leaking from a water meter cover on sidewalk in front of 524 W. Franklin St.
1087	Ellamont & W. Baltimore			Gwynns Falls	Water coming from crack in street and water valve. Water main break.	DPW	2/2/2015	2/2/2015	Resolved	Water main break

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1088	4720 York Rd Water	Storm drain in sidewalk		Back River	Heavy flow of water flowing through abandoned 18" terra cotta pipe coming from the north.	DPW	1/22/2015	1/22/2015	On-going Investigation	
1094	Hanover St. Bridge Water Main	Under northbound Hanover St bridge at Patapsco River		Patapsco	Potable water leaking from joint in 30" water main under bridge. problem abated 09/04/15.	DPW	2/12/2015	2/12/2015	Resolved	
1096	Water Problem@ Baltimore Rowing & Resource Center	Along the footpath	3301 Waterview Ave	Harbor	The outfall on the left has drinking water is flowing out of it and it seems to be between the outfall and inlet in the corner of the parking lot.	DPW	2/12/2015	2/12/2015	Referred, Not Resolved	Assigned to OAM on 9/14/15. Will be investigated ASAP
1122	Old Northbridge and Leo St	NW corner		Patapsco	Hydrant leaking	DPW	4/15/2015	4/15/2015	Referred, Not Resolved	
1123	4508 Frankford Ave Water Valve	4508 Frankford Ave	4508 Frankford Ave	Back River	Water leaking from water valve onto street surface.	DPW	3/27/2015	3/27/2015	Resolved	
1124	W. Canton Ave & Monastery Ave Water Valves	W. Canton Ave & Monastery Ave	W. Canton Ave & Monastery Ave	Gwynns Falls	Water Leaking from water valves onto street surface	DPW	2/12/2015	2/12/2015	Resolved	
1999	501 Wheeler	In the center of Wheel Ave at Franklinton Rd.	501 Wheeler Ave.	Gwynns Falls	Low flow water valve leak at the center of Wheel Ave at Franklinton Rd.	DPW	5/1/2015	5/1/2015	Resolved	On 7/10/15, UMD repaired valve
2000	1036 Poplar Grove	Riggs Ave at 1036 Poplar Grove St.	1036 Poplar Grove	Gwynns Falls	Low flow water valve leak	DPW	5/1/2015	5/1/2015	Resolved	water valve leak
2004	W Caton Ave & N Culver St Water Leak	Water valve leaking in the middle of the intersection. About 5 GPM.	W Caton Ave & N Culver St	Gwynns Falls	Water valve leaking in the middle of the intersection. About 5 GPM. Saw it while driving down the street. SR #15-00061666	DPW	1/27/2015	1/27/2015	Resolved	Water valve leaking
2009	3000 W. Baltimore St Water Leak	Water leaking out of water valve in the middle of the street.	3000 W. Baltimore St	Gwynns Falls	Water leaking out of water valve in the middle of the street. Less than 1 GPM. Found while driving. SR # 15-00099245 (Closed not fixed) SR# 15-00102652	DPW	2/11/2015	2/11/2015	Resolved	Water leaking out of water valve
2010	1107 Poplar Grove St	1107 Poplar Grove St	1107 Poplar Grove St	Gwynns Falls	OCAL staff noticed water leaking from water meter at medium volume onto sidewalk and street surface	DPW	5/1/2015	5/1/2015	Resolved	
2011	23rd & Huntingdon (Water Main Leak)	W. 23rd St & Huntingdon Ave.	W. 23rd St & Huntingdon Ave.	Jones Falls	Smell strong chlorine from a 24" drain at 23rd St, while conducting lateral sampling of JF11.5. Appears to be a water main leak to locate, at the intersection of W. 23rd St & Huntingdon Ave. Approximate flow to be 25-30 GPM.	DPW	5/13/2015	5/15/2015	Referred, Not Resolved	On 6/15/15, OAM located the leak at 2227 Huntingdon Ave and passed it on to UMD for repair. On 8/11/15, UMD gave work to RE Harrington to complete repairs.
2012	118 W. Hamburg St Water Leak	On the Bevan St side of 118 W. Hamburg St	118 W. Hamburg St	Harbor	On the Bevan St side of 118 W. Hamburg St the water meter was leaking at about 30 GPM. Found while driving. SR #15-00104219.	DPW	2/13/2015	2/13/2015	Resolved	Water meter leakage
2013	E Cold Spring Ln & Hillen Rd Water Valve	Center of intersection of Cold Spring Ln & Hillen Rd	E Cold Spring Ln & Hillen Rd	Back River	OCAL Staff noticed water leaking from water valve onto street surface in the intersection. problem abated 09/04/15	DPW	5/7/2015	5/7/2015	Resolved	water leaking from water valve
2014	2517 W Cold Spring Ln Water Valve	2517 W Cold Spring Ln	2517 W Cold Spring Ln	Jones Falls	OCAL staff noticed water leaking from water valve onto street surface. problem abated 09/04/15.	DPW	5/8/2015	5/8/2015	Resolved	
2015	York Rd & Radnor Rd Water Leak	In the street on the northwest corner of York Rd & Radnor Rd next to the Post Office parking lot.	York Rd & Radnor Rd NW corner	Back River	Water valve leaking out from under the lid. Less than 1 GPM. SR# 15-00050909. Found while driving.	DPW	1/22/2015	1/22/2015	Resolved	On 3/17/15 UMD investigated and found valve repaired
2017	501 Richwood Ave Water Leak	York Rd & Richwood Ave	501 Richwood Ave	Back River	Water is leaking out of a seam in the road at a heavy rate in multiple locations. SR# 15-00122655. Found while driving.	DPW	2/19/2015	2/19/2015	Resolved	
2018	3214 Elgin Ave Water Leak	3214 Elgin Ave Water Leak on the Hilton side of the house in the northbound lane of N. Hilton St	3214 Elgin Ave Water Leak on the N. Hilton St side of the house	Gwynns Falls	Moderate flow of drinking Water is flowing from a crack in the street onto the road surface	DPW	2/20/2015	2/20/2015	Resolved	
2020	2884 W. Baltimore St Water Meter Leak	2884 W. Baltimore St Water Meter Leak	2884 W. Baltimore St Water Meter Leak	Gwynns Falls	Water flowing out of water meter on the sidewalk at 2884 W. Baltimore St. SR# 15-00154090	DPW	2/27/2015	2/27/2015	Resolved	
2022	1719 E. 35th St Water Leak across the street	Where the sidewalk meets the street at Mervo Highschool's side entrance or across the street from 1719 E. 35th St.	Across the street from 1719 East 35th St	Back River	Water overflowing out of the ground along the seems of the in the street along the sidewalk at a medium flow. SR# 15-00219207. Found while Driving. problem abated 09/04/15	DPW	3/19/2015	2/19/2015	Resolved	
2024	3030 Mallview Rd Water Leak	Water leaking out of water meter and out from under the sidewalk at 3030 Mallview Ave	3030 Mallview Rd	Harbor	Water leaking out of water meter and out from under the sidewalk at 3030 Mallview Ave. Moderate flow of about 2GPM. SR# 15-00277591. Found while driving.	DPW	4/9/2015	4/9/2015	Resolved	
2025	Leo St & Old Northbridge Ave Leaking Fire Hydrant	Leo St & Old Northbridge Ave northwest corner of the intersection	Leo St & Old Northbridge Ave	Harbor	Hydrant leaking at the base and water is coming up from under it. The hydrant is located at the northwest corner of Leo St & Old Northbridge Ave on the Fru-Con which is city property.	DPW	4/21/2015	4/21/2015	Resolved	On 7/13/15, UMD installed a new hydrant

Table C-3: Summary of PST Investigations: drinking water transmission losses

PST ID	PST NAME	LOCATION DESCRIPTION	ADDRESS	WATERSHED NAME	PST COMMENTS	COMPLAINT SOURCE	COMPLAINT RECEIVED	INVESTIGATION INITIATION	PST STATUS	REPAIR COMMENTS
2026	W. Baltimore St & S. Hilton Ave Leaking Water Valve	In the middle of the intersection at W. Baltimore St & S. Hilton Ave	W. Baltimore St & S. Hilton Ave	Gwynns Falls	Water valve leaking in the middle of the intersection, at a moderate flow. found while driving. SR# 15-00356776.	DPW	5/7/2015	5/7/2015	Resolved	
2028	N. Hilton Pkwy & W. North Ave water valve leak	In the northeast quadrant of the intersection of N. Hilton Pkwy & W. North Ave.	N. Hilton Pkwy & W. North Ave	Gwynns Falls	There is a leaking water valve in the street, at a moderate flow. Found while driving. First, SR# 15-00349552 & Second SR# 15-00397971. Rereported because it was closed and it was still active. Problem abated 09/13/15	DPW	5/5/2015	5/5/2015	Resolved	
2029	1525 W. 41st St water meter leak	1525 W. 41st St water meter in front of the building on the sidewalk.	1525 W. 41st St	Jones Falls	the water meter is leaking and it is overflowing into the curb drain pipe and flowing out of it. Found while driving. SR# 15-00319384.	DPW	4/23/2015	4/23/2015	Resolved	
2030	Union Ave & Conduit Ave overflowing water main manhole	At Union Ave & Conduit Ave on the road median of Conduit Ave on the north side of the intersection.	Union Ave & Conduit Ave	Jones Falls	At Union Ave & Conduit Ave there is an overflowing water main manhole on the road median on Conduit Ave. It's flowing approx 50 GPM. Found while driving. SR# 15-00320334. problem abated 9/4/15	DPW	4/23/2015	4/23/2015	Resolved	
2033	833 S Linwood (Water Leak)	At the curb at 833 S. Linwood Ave	833 S Linwood Ave	Harbor	Potable water leaking at the curb of the street at 833 S. Linwood Ave. Approximate rate at 10-15 GPM. Found problem while driving to Linwood & Elliott survey site.	DPW	5/28/2015	5/28/2015	Resolved	
2034	Braddish @ 2606 Lafayette Water Main Leak	Braddish Ave on east side of 2606 Lafayette Ave.	2606 Lafayette Ave	Gwynns Falls	Water main leak found while investigating another PST. Water is leaking into storm drain through two inlets and a manhole.	DPW	5/29/2015	5/29/2015	Resolved	
2035	Monroe & Wilhelm Water Valve	Intersection of S. Monroe St & Wilhelm St	320 S Monroe St	Gwynns Falls	Water leaking from water valve onto street surface observed by OCAL staff while investigating another PST	DPW	5/29/2015	5/29/2015	Resolved	
2041	838 E Fort Ave Broken Water Line to Sump Discharge (Cityworks ID#191080)	Sump pump discharge on east side of property on Lawrence St	838 E Fort Ave	Harbor	Received cityworks complaint about discharge on side of vacant restaurant. found a sump discharge pipe with frequent intermittent flow suspected to be result of broken water line. Water service suspended.	Citizen	5/24/2015	5/27/2015	Resolved	
2057	2802 Oakford (Water Meter)	Sidewalk in front of 2802 Oakford Ave	2802 Oakford Ave	Jones Falls	Discovered problem while conducting follow up sampling at 2431 W. Coldspring Ln storm drain manhole. The was unusual heavy flow of water with chlorine smell at manhole. So the follow sampling was cancelled to track the heavy flow of potable water. The heavy flow was tracked to a broken water meter at 2802 Oakford Ave., approx. 25-30 GPM	DPW	6/11/2015	6/11/2015	Resolved	
2058	3817 Clifton (Water Meter)	At the curb of 3817 Clifton Ave	3817 Clifton Ave	Gwynns Falls	Found exterior water leak at the curb while driving, approx. 5 GPM.	DPW	6/17/2015	6/17/2015	Resolved	

Table C-4: Summary of PST Investigations: other illicit discharges

PST ID	PST NAME	LOCATION DESCRIPTION	ADDRESS	WATERSHED NAME	PST COMMENTS	COMPLAINT SOURCE	COMPLAINT RECEIVED	INVESTIGATION INITIATION	PST STATUS	REFERRED AGENCY	PROBLEM DESCRIPTION
981	5400 Block Whitwood Rd	Section of street around 5464 Whitwood Rd	5400 Block of Whitwood Rd	Back River	Excessive sediment in Moores Run observed during Herring Run ammonia screening. The sediment was no longer traveling in the flow but enough had deposited in the stream bed and storm drain bottom to track problem to a water main repair on Whitwood Rd.	DPW	7/2/2014	7/2/2014	Resolved	DPW	Erosion/ Sediment Control
1000	Roosevelt Park Pool	Southwest corner of pool near the end of Poole St	3500 Poole St.	Jones Falls	Strong Chlorine odor was observed by OCAL staff while investigating BWB sewage complaint. High Chlorine (>2.2mg/L) was tracked to leak at pool and backflushing event due to previous night's heavy rain. Park and Rec scheduled repairs for after labor day.	DPW	8/13/2014	8/13/2014	Resolved	Other	Chlorine
1023	1002 Iris Ave	Alley at 1002 Iris Ave	1002 Iris Ave.	Back River	Citizen complaint to U.S. EPA of resident washing machine is discharging directly into alley. Residence appears to have added a clothes washer to an enclosed back porch and it is suspected that they plumbed the discharge line into sump discharge pipe. Laundry wash water was redirected to wastewater connection. Problem abated.	EPA	10/2/2014	10/2/2014	Resolved	DPW	Polluted Water/Discharge
1060	Edison & Hoffman	Edison Hwy at Hoffman St.	Edison Hwy at Hoffman St.	Back River	Heavy sediment at Wright Ave sampling site was tracked to a broken water main at Edison Hwy at Hoffman St. Utility Maintenance was at site repairing the water main.	DPW	11/19/2014	11/19/2014	Resolved	DPW	Erosion/ Sediment Control
1062	710 Pacific St Sediment		710 Pacific St	Jones Falls	Muddy water being discharged from hose leading to excavated pit behind house, flowing in gutter in the west direction.	DPW	12/30/2014	12/30/2014	Resolved	DPW	Erosion/ Sediment Control
1063	Big Brothers Marble	Discharge point is on Franklin Ave	330 North Warwick Avenue, Baltimore, MD 21223	Gwynns Falls	Discharging cutting water and material along with some type of petroleum product from hose. The discharge was flowing into inlet. Company found in violation by state. Did not have NPDES industrial permit. Company said they will collect all waste.	DPW	12/18/2014	12/18/2014	Resolved	MDE	Other
1077	Michael & Son Services, Inc.	Michael & Son Services, Inc., 6420 Erdman Ave., vehicle wash bay located at the far north end of building.	6420 Erdman Ave.	Back River	US EPA Region 3 received the a citizen concern regarding a potential illicit connection to the city's storm sewer system. Investigation concluded wash bay water enters the sanitary by way of sand filters. Pollution Control is requiring M&S to submit sanitary permit.	Citizen	1/5/2015	1/14/2015	Resolved	DPW - Pollution Control	Polluted Water/Discharge
1081	3200 Reisterstown (Car Wash)	3200 Reisterstown Rd at Chowan Ave	3200 Reisterstown Rd.	Gwynns Falls	Contractor working in sanitary air quality alarm was triggered, when car wash's floor drain connection to sanitary was discharging. Owner of car wash stated that only car care products are washed into the floor drain. Reported to Pollution Control.	Other	1/21/2015	1/27/2015	Resolved	Pollution Control Section	Polluted Water/Discharge
1107	3501 Asiatic Ave (PWWTP)	Outfall behind guard house at PWWTP entrance	3501 Asiatic Ave 21226	Patapsco	High ammonia (12 ppm) and grey water discharge at outfall. Originally found during South Harbor Incident Tracking (3/25/15). WWTP had Effluent water exiting from a pipe (500 GPM) into field behind grit facility. Stopped discharge on 4/21/2015.	DPW	3/25/2015	3/25/2015	Resolved	Gary Wagner Pat WWTP Plant Manager	Ammonia
1115	Deepdene Rd	Stream at end of Deepdene Rd		Jones Falls	311 complaint about Stoney Run being grey. Utility crew repairing water main. Concrete cuttings and debris present at Boxhill and Northern Parkway	Citizen	3/23/2015	3/23/2015	Resolved	DPW	Polluted Water/Discharge
1118	Loyola Ridley Sports Complex SWM Pond			Jones Falls	Found water with ammonia of 33ppm flowing across JF Trail behind Coldspring Landfill. Leads to Loyola pond which have high ammonia.. Loyola contact Tom Hettleman Env health and safety. High ammonia and CL in pipes from track and lax fields. Elevated ammonia, Cl, TKN, Nitrate Nitrogen from pipes from fields. Believe it is from the landfill. They mentioned issues with water getting into their methane pipe which are all over the property. The landfill leachate has not been pumped in years. Conclude pond is no longer overflowing. Leachate may be infiltrating into piping or the backfill material may have something that is causing the high values.	DPW	4/7/2015	4/7/2015	Resolved		Ammonia
2023	409 S Durham ST Brick Dust		409 S DURHAM ST	Harbor	Cityworks complaint about brick work. Found some dust on sidewalk. Pollution Control issued a stop work notice.	Citizen	5/18/2015	5/19/2015	Resolved	DPW - Pollution Control	Polluted Water/Discharge

Table C-4: Summary of PST Investigations: other illicit discharges

PST ID	PST NAME	LOCATION DESCRIPTION	ADDRESS	WATERSHED NAME	PST COMMENTS	COMPLAINT SOURCE	COMPLAINT RECEIVED	INVESTIGATION INITIATION	PST STATUS	REFERRED AGENCY	PROBLEM DESCRIPTION
2061	7202 Lighthouse Point	Outfall is locate at waters edge mid parking lot	7202 Lighthouse Point, 21224	Harbor	Building is flushing their sprinkler system at a rate of 3,000 GPM for 30 minutes every week. Spoke with Facility Manager . Claim Baltimore City Fire dept. requires it. Nick M. spoke with MDE (Kevin Weis acting div. head of compliance/ enforcement) and they do not have a NPDES permit for the discharge and will not issue one for this type of discharge.	Citizen	6/22/2015	6/22/2015	Referred, Not Resolved	MDE	Chlorine

Table C-5: Summary of reported results from Blue Water Baltimore Outfall Screening Blitz

Outfall ID Code	Date	Start Time	End Time	GPS COORDINATES	Discharge Present?	Discharge Residue?	Sample Collected?	Ammonia-Nitrogen (mg/L)	Surfactants MBAS (mg/L)	Potassium (mg/L)	Turbidity (NTU)	Fluoride (ppm)	Optical Brighteners (ppm)	Flow Rate (gph)	Instrument & Sampling QA/QC Notes	Discharge Color	Discharge Scent	Physical Evidence	Other
H06-HER-101	6/16/2014	10:01	10:02	39.354409, -76.572822	N	N	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	LOTS OF RAIN LAST WEEK, MODERATE TRASH
H06-HER-102	6/16/2014	10:07	10:08	39.355454, -76.573198	N	Y	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	WET IN OUTFALL BUT NO FLOW	N/A
H06-HER-103	6/16/2014	10:09	10:11	39.355454, -76.573198	Y	Y	Y	0.43	0.5	1	0.2	0.9	0.383	13.1	BUILT PUTTY DAM	CLEAR	NO ODOR	DARK STAINS UNDER FLOW	N/A
H06-HER-104	6/16/2014	10:13	10:14	39.355545, -76.573209	N	Y	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	DARK STAINS UNDER OUTFALL	N/A
H06-HER-105	6/16/2014	10:16	10:19	39.355536, -76.573082	Y	Y	Y	0.57	0.25	4	7.07	0.6	9.784	5194.8	N/A	CLOUDY	NO ODOR	DARK AND CLOUDY BELOW OUTFALL, EXTREMELY DARK GREY POOL, QUITE DEEP AND TURBID CAN'T SEE BOTTOM,	N/A
H06-HER-106	6/16/2014	10:26	10:26	39.356171, -76.573105	N	N	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NO STAINS, NO TRASH
H06-HER-107	6/16/2014	10:30	10:34	39.356675, -76.573014	Y	Y	Y	4.08	0.25	3	3.06	0.3	23.53	N/A	UNABLE TO COLLECT FLOW	CLEAR DISCHARGE	NO ODOR	DARK STAINS ON PIPE	DISPERSED FLOW
H06-HER-108	6/16/2014	10:43	10:48	39.3579391, -76.5735026	Y	Y	Y	0.58	0	2	4.04	0.2	19.26	7.8	N/A	CLEAR DISCHARGE	NO ODOR	IRON EATING BACTERIA IN PIPE	N/A
H06-HER-109	6/16/2014	10:53	10:58	39.358187, -76.573912	Y	Y	Y	0.01	0.25	1	1.42	1	3.875	4455.3	N/A	CLEAR DISCHARGE	NO ODOR	ALGAE LINING BOTTOM OF OUTFALL, VERY LARGE OUTFALL	LITTLE TRASH
H06-HER-110	6/16/2014	11:17	11:25	39.360924, -76.573743	Y	Y	Y	1.32	FAILED	1	2.46	0.2	5.438	N/A	USED PUTTY DAM, TOO SHALLOW TO MEASURE FLOW, SURFACTANTS FAILED	N/A	NO SCENT	LOTS OF IRON EATING BACTERIA LINING BOTTOM OF OUTFALL	RACCON TRACKS IN PIPE NO TRASH
V06-HER-201	6/16/2014	10:26	10:30	39.368241, -76.574567	Y	Y	Y	0.3	FAILED	0	0.21	0	2.417	496	SURFACTANTS FAILED	N/A	N/A	GRASS GROWING JUST OUTSIDE OF PIPE	N/A
V06-HER-202	6/16/2014	10:40	10:44	39.366946, -76.574605	Y	N	Y	0.34	0.25	3	0.55	0.2	9.116	248.6	COLLECTED SAMPLE WITH PUTTY DAM	N/A	NO SMELL	N/A	N/A
V06-HER-203	6/16/2014	10:50	10:58	39.364711, -76.573801	Y	Y	Y	0.88	FAILED	2	11.5	0.2	11.98	15009.6	SURFACTANTS FAILED	N/A	SEWAGE SMELL	HEAVY ALGAL GROWTH (GREEN AND ORANGE) IN AND DOWNSTREAM OF OUTFALL STRUCTURE	N/A
V06-HER-204	6/16/2014	11:07	11:17	39.364117, -76.573994	Y	Y	Y	0.43	0	6	4.32	0.1	5.461	N/A	COULD NOT DETERMINE FLOW PUTTY DAM	N/A	N/A	LOTS OF DEBRIS INSIDE PIPE, SOME RUSTY COLORED ALGAE/SEDIMENT	PIPE INSIDED OUTFALL IS DISCONNECTED/BROKEN
V07-HER-201	6/17/2014	10:27	10:31	39.368918, -76.57359	Y	N	Y	0.24	0.25	0	1.04	0.5	3.113	N/A	WE USED THE PUTTY DAM/ COULDN'T DETERMINE FLOW (TOO LOW)	N/A	N/A	N/A	N/A
V07-HER-202	6/17/2014	10:35	10:38	39.369671, -76.572945	Y	N	Y	0.32	0	0	0.35	0.2	5.442	N/A	PUTTY DAM WAS USED, FLOW TOO LOW TO DETERMINE	N/A	N/A	N/A	N/A
H08-CHI-101	6/24/2014	9:54	9:54	39.359744, -76.598114	Y	N	Y	0.5	0	5	0.36	0.2	3.552	7708.9	N/A	CLEAR	NO ODOR	WARNING SIGN ABOVE OUTFALL ILLEGIBLE	ALGAE ON BOTTOM OF PIPE
H08-CHI-102	6/24/2014	10:00	10:06	39.358628, -76.597831	Y	N	Y	0.43	0	3	1.8	0.1	5.383	226.7	N/A	CLEAR	NO ODOR	ALGAE LINING BOTTOM	OUTFALL LINED WITH BRICK, LOW FLOW
H08-CHI-103	6/24/2014	10:08	10:11	39.358494, -76.597922	Y	Y	Y	0.42	0.25	3	0.63	0.1	4.292	1895.4	N/A	CLEAR	NO ODOR	ORANGE RESIDUE IN PIPE	N/A
H08-CHI-104	6/24/2014	10:17	10:20	39.356409, -76.596048	Y	Y	Y	0.32	0.25	2	0.86	0	6.721	39.4	N/A	CLEAR	GARBAGE ROTTEN ODOR	ALGAE LINING BOTTOM	N/A

Table C-5: Summary of reported results from Blue Water Baltimore Outfall Screening Blitz

H08-CHI-105	6/24/2014	10:20	10:26	39.356511, -76.595965	Y	N	Y	0.63	0	3	2.09	0.6	12.11	N/A	USED PUTTY DAM, FLOW TOO LOW TO CALCULATE	CLEAR	NO ODOR	FULL OF DEBRIS NO RESIDUE	N/A
H08-CHI-106	6/24/2014	10:29	10:31	39.356195, -76.595901	Y	Y	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	FLOW TOO LOW TO COLLECT	CLEAR	NO ODOR	DARK STAINS IN PIPE	N/A
H08-CHI-107	6/24/2014	10:38	10:39	39.355567, -76.595183	N	N	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
H08-CHI-108	6/24/2014	10:41	10:44	39.354817, -76.594969	Y	Y	Y	0.36	0.25	5	0.73	0.1	2.073	5984.4	N/A	N/A	STRONG SEWAGE SMELL	GREY RESIDUE IN PIPE AND IN POOL BELOW, IRON EATING BACTERIA BEHIND	WATERFALL WITHIN PIPE
H08-CHI-109	6/24/2014	10:46	10:49	39.354558, -76.594689	Y	N	Y	0.1	0.25	2	0.84	0.5	3.116	11195.3	FLOW MEASURED FROM INSIDE PIPE BECAUSE OF BACK FLOW NEAR MOUTH OF OUTFALL	CLEAR DISCHARGE	STRONG FOUL ODOR	N/A	WATER POOLING IN STREAM AT OUTFALL
H11-GWN-101	7/13/2014	14:15	14:16	39.270486, -76.646089	N	N	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
H11-GWN-102	7/13/2014	14:23	14:28	39.270458, -76.646514	Y	Y	Y	0.15	0	1	1.31	0.4	1.176	2337.5	REAGENT BLANK .24	CLEAR DISCHARGE	NO ODOR	BROWN RESIDUE AND ALGAE IN PIPE	N/A
H11-GWN-103	7/13/2014	14:35	14:37	39.270795, -76.647147	Y	N	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	FLOW TOO LOW TO COLLECT SAMPLE	N/A	N/A	N/A	N/A
H11-GWN-104	7/13/2014	14:40	14:46	39.270683, -76.647317	Y	Y	Y	0.27	0.25	5	10.34	0.3	10.4	N/A	REAGENT BLANK .21 .48 SAMPLE AND REAGENT	N/A	N/A	LOTS OF IRON DEPOSIT STRONG GASOLINE SMELL, HEAVY FLOW CAN'T CALCULATE FLOW	N/A
H11-GWN-105	7/13/2014	14:48	14:53	39.271216, -76.647939	Y	N	Y	0.1	0.25	2	0.68	0.2	9.325	3905.3	REAGENT BLANK -.15	CLEAR DISCHARGE	SLIGHT GASOLINE SMELL	DARK REDDISH BROWN STAIN IN PIPE	N/A
H11-GWN-106	7/13/2014	14:56	14:59	39.271328, -76.647797	Y	N	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	FLOW TOO LOW TO COLLECT SAMPLE	N/A	N/A	N/A	N/A
H11-GWN-107	7/13/2014	15:08	15:09	39.272064, -76.651169	Y	N	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TOO TRECHEROUS TO REACH AND TAKE A SAMPLE	N/A	N/A	HEAVY FLOW FROM OUTFALL	N/A
H11-GWN-108	7/13/2014	15:14	15:18	39.272747, -76.653244	Y	Y	Y	0.13	0	3	0.41	0.5	10.51	N/A	USED PUTTY DAM, FLOW TOO LOW TO CALC FLOW REAGENT BLANK .17 METER READING .30	CLEAR DISCHARGE	SEWAGE SMELL IN AREA	MOSS IN PIPE	N/A
H11-GWN-109	7/13/2014	15:23	15:27	39.273217, -76.653542	Y	Y	Y	0.24	0.5	6	1.91	0.2	15.36	N/A	CAN'T ACCESS TO CALCULATE FLOW .16 REAGENT BLANK, .40 SAMPLE	CLOUDY	SEWAGE	DARK STAINS ON ROCKS BELOW DISCHARGE	N/A
V11-GWN-101	7/13/2014	14:16	14:21	39.27752, -76.661262	Y	N	Y	0.02	0.25	3	0.36	0.2	4.262	N/A	COLLECTED SAMPLE FROM INSIDE OUTFALL. REAGENT BLANK .27 SAMPLE REAGENT .29	N/A	SLIGHT SEWAGE SMELL	OUTFALL IS PARTIALLY SUBMERGED WATER IN POOL GREEN COLOR CLOUDY	N/A
V11-GWN-102	7/13/2014	14:28	14:30	39.277116, -76.661668	Y	N/A	Y	0.08	FAILED	5	0	0.3	0.739	1.5	REAGENT BLANK .16 SAMPLE .24	N/A	SEWAGE SMELL	ALGAE ON DOWNSTREAM ROCKS SUDS ON SURFACE	N/A
V11-GWN-103	7/13/2014	14:38	14:42	39.277059, -76.662000	Y	Y	Y	0.13	FAILED	1	0.94	0.4	1.172	10.8	REAGENT BLANK .20 SAMPLE .13? SURFACTANTS FAILED	N/A	STRONG SEWAGE SMELL	SEWER STACK JUST UP THE HILL FROM OUTFALL WITH GUSHING WATER NOISES	N/A
V11-GWN-104	7/13/2014	15:04	15:05	39.274818, -76.660070	N	N	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
V11-GWN-105	7/13/2014	15:24	15:29	39.275726, -76.657590	Y	N	Y	0.01	0.25	7	0.72	0.3	23.92	N/A	REAGENT BLANK .20 SAMPLE .21 COULD NOT DETERMINE FLOW	N/A	NO ODOR	N/A	N/A

Table C-5: Summary of reported results from Blue Water Baltimore Outfall Screening Blitz

V11-GWN-106	7/13/2014	15:42	15:47	39.275894, -76.655351	Y	Y	Y	6.45	0.5	39	4.93	0.5	29.68	N/A	REAGENT BLANK .11 RECEIVED ER2 REAGENT BLANK .10 1:5 DILUTION READING 1.29MG/L	N/A	HEAVY SEWAGE SMELL	ORANGE RESIDUE ON CONCRETE AROUND OUTFALL JUST DOWNHILL FROM SEWER STACK. I THINK IT IS LEAKING OUT OF THE CONCRETE RETAINING WALL, SEE V12-GWN-107	N/A
V11-GWN-107	7/13/2014	15:48	15:50	39.275894, -76.655351	Y	Y	Y	5.65	FAILED	10	13	0.5	41.48	N/A	AMMONIA SAMPLE ER 2 REAGENT BLANK .07 1:5 DILUTION 1.13	GREY	STRONG SEWAGE SMELL	WHITE PARTICULATE MATTER FLOWING	WATER COMING FROM UNDERNEATH RETAINING WALL ON LEFT SIDE LOOKING DOWNSTREAM AT TRESTLE BRIDGE
B01-GWN-101	9/19/2014	9:42	9:50	39.301639, -76.673620	Y	Y	Y	0.24	0	1	1.04	N/A	0.423	7	0.5	12	0.93	N/A	SWIFT. VERY HEAVY. FLUORIDE METER MALFUNCTIONING; NO READINGS.
B01-GWN-102	9/19/2014	10:32	10:45	39.296452, -76.669323	Y	Y	Y	11.16	1.5	3	N/A	N/A	39.49	2.5	0.6	18	1.095	N/A	DRIBBLE (CONSTANT) FLUORIDE METER MALFUNCTIONING; NO READINGS.
B01-GWN-103	9/19/2014	11:17	11:19	39.294907, -76.669846	Y	Y	Y	0.15	0.25	0	0.05	N/A	2.436	N/A	N/A	N/A	N/A	N/A	SLOW FLUORIDE METER MALFUNCTIONING; NO READINGS.
B01-GWN-104	9/19/2014	11:20	11:21	39.294907, -76.669846	Y	Y	Y	0.23	0.25	2	7.17	N/A	1.594	3	0.6	18	2.26	N/A	N/A FLUORIDE METER MALFUNCTIONING; NO READINGS.
V13-GWN-201	9/19/2014	10:15	10:22	39.290906, -76.666932	Y	Y	Y	0.74	0	1	3.65	N/A	11.44	5	0.125	24	1.35	N/A	N/A FLUORIDE METER MALFUNCTIONING; NO READINGS.
V13-GWN-202	9/19/2014	10:32	10:37	39.291904, -76.667676	Y	Y	Y	0.26	0	1	0.09	N/A	2.199	N/A	N/A	N/A	18.15	125	THERE ARE ~12 OUTFALLS ALL DISCHARGING FROM THE LARGE CONCRETE WALL. ALL LOOK IDENTICAL, WATER SAMPLE ONLY TAKEN FROM 1 OUTFALL. FLUORIDE METER MALFUNCTIONING; NO READINGS.
V13-GWN-203	9/19/2014	11:00	11:14	39.293704, -76.669980	Y	Y	Y	39.1	3	3	38.8	N/A	29.02	N/A	N/A	N/A	N/A	N/A	FLOW TOO SLOW TO CALCULATE; WATER IS DRIPPING FROM THE SEAL BETWEEN TWO PIPE JUNCTIONS. FLUORIDE METER MALFUNCTIONING; NO READINGS. Reported to 311, SR # 14-00710131, 710175, 714166
V13-GWN-204	9/19/2014	11:18	11:19	39.293877, -76.670145	N	N	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	OUTFALL IMPACTED WITH DIRT. ON RIGHT BANK LOOKING DOWNSTREAM. FLUORIDE METER MALFUNCTIONING; NO READINGS.
V13-GWN-205	9/19/2014	11:20	11:21	39.294105, -76.669874	N	N	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SAND IS ERODED BELOW OUTFALL; EVIDENCE THAT IT DOES DISCHARGE DURING RAIN EVENTS. LOCATED IN BRIDGE ABUDMENT. FLUORIDE METER MALFUNCTIONING; NO READINGS.

**Table C-6: Summary of FOG Notices of Violations**

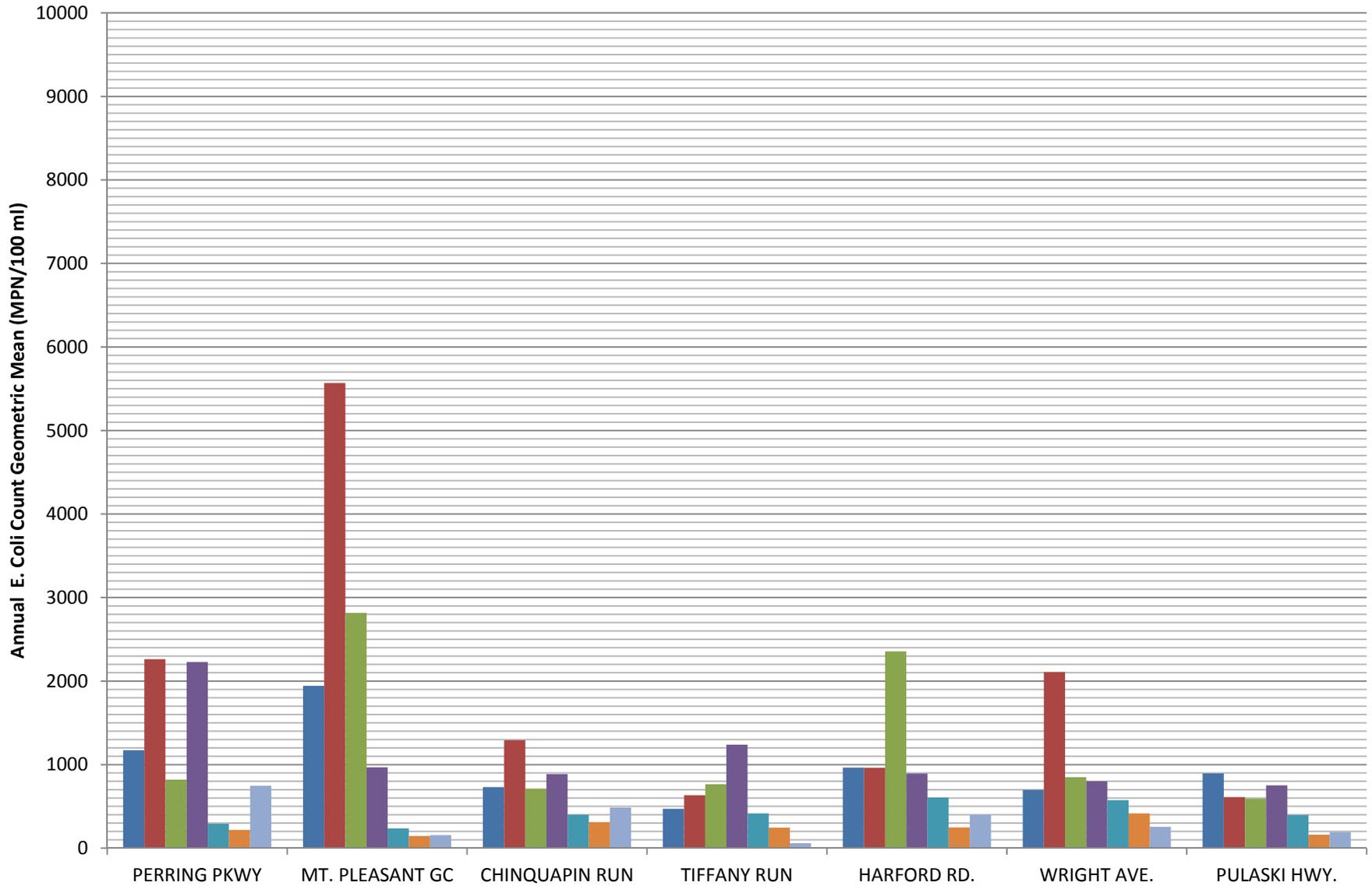
<b>Action</b>	<b>Violation Type</b>	<b>Total</b>
No GCD	Unauthorized discharge	327
Failed 25% Rule	Unauthorized discharge	277
Failed 25% Rule 2nd Notice	Unauthorized discharge	91
Failed 25% Rule 3rd Notice	Unauthorized discharge	84
Plumbing Code	Plumbing Code	114
Refused Admittance	Refused Admittance	38
Inaccessible GCD	Inaccessible GCD	32
No GCD 2nd notice	Unauthorized discharge	25
Rescind NOV	None	(5)
No Maintenance Log	Inadequate/No Maintenance Log	322
Missed Milestone Date	Missed milestone or final compliance date	1
Inadequate Maintenance of GCD, overflow, waste/recycle grease area	Inadequate maintenance of waste/recycle grease area	1
<b>Total</b>		<b>1,307</b>

**Appendix D: Chemical Monitoring Results (electronic files only)**

## **Appendix E: Bacteria Monitoring**

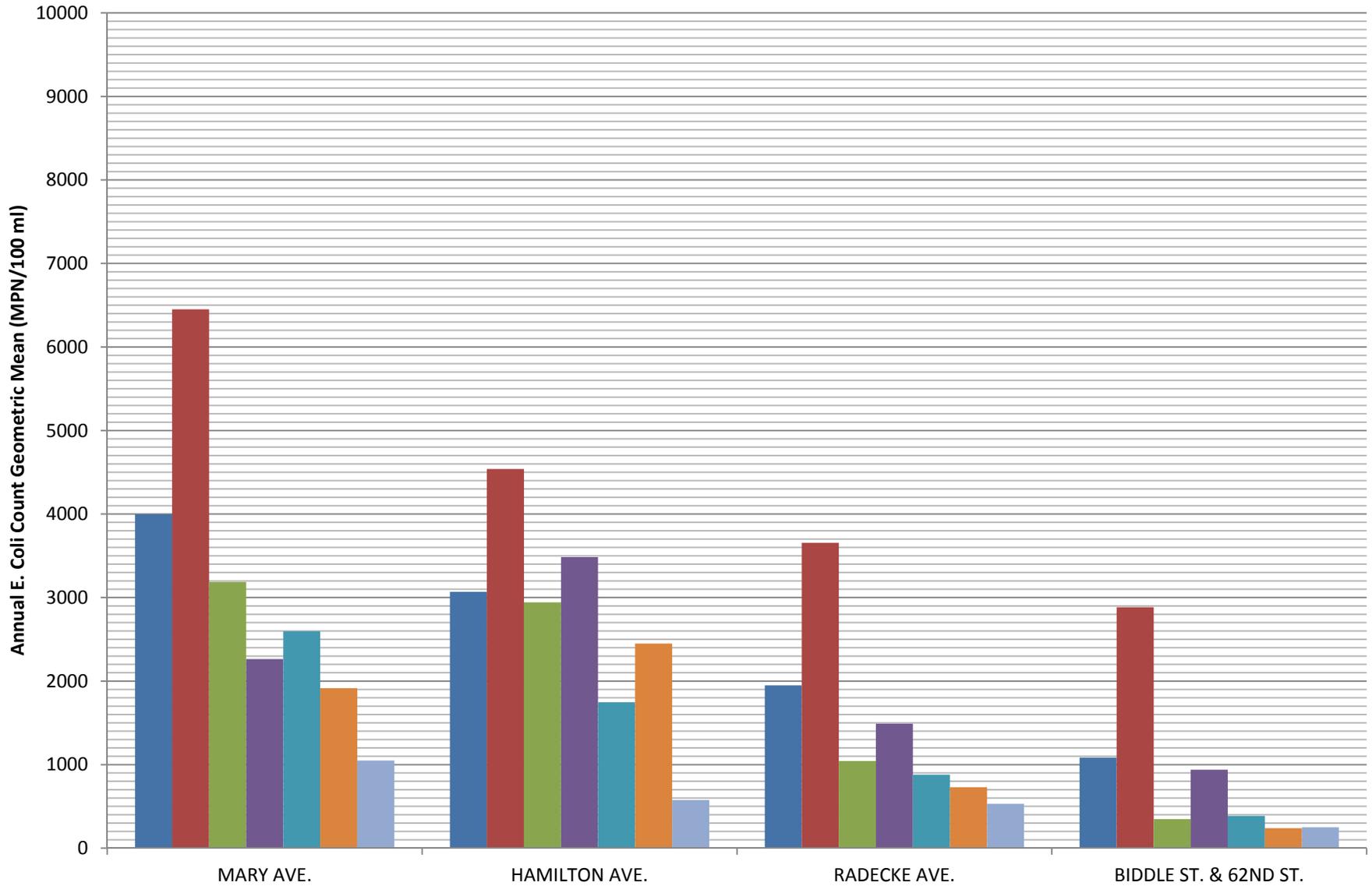
# Herring Run SIS E. Coli MPN Count Geometric Means by Year by Station

2009 2010 2011 2012 2013 2014 2015 (through 11/13/2015)



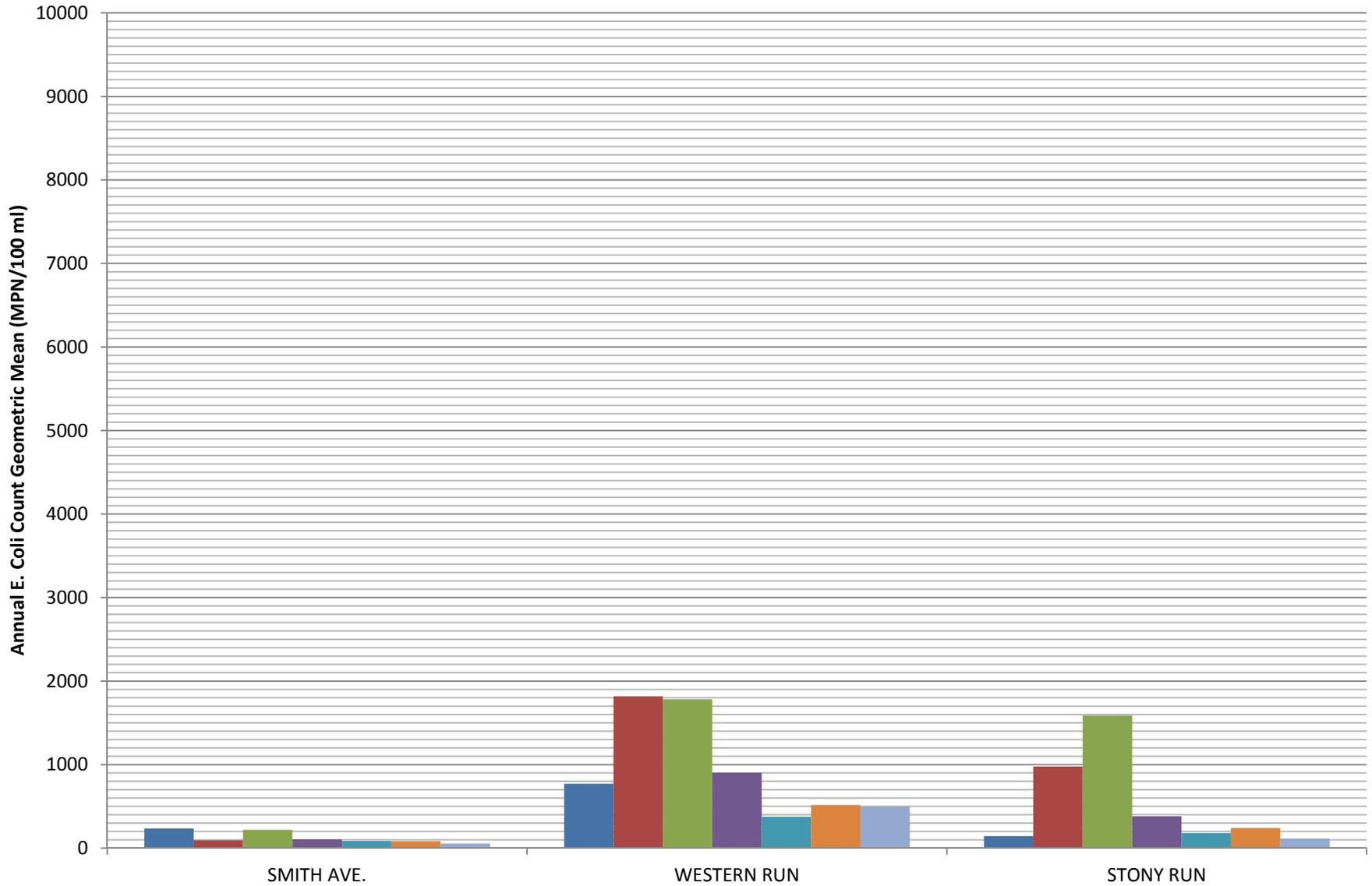
# Moores Run SIS E. Coli MPN Count Geometric Means by Year by Station

■ 2009 ■ 2010 ■ 2011 ■ 2012 ■ 2013 ■ 2014 ■ 2015 (through 11/13/2015)



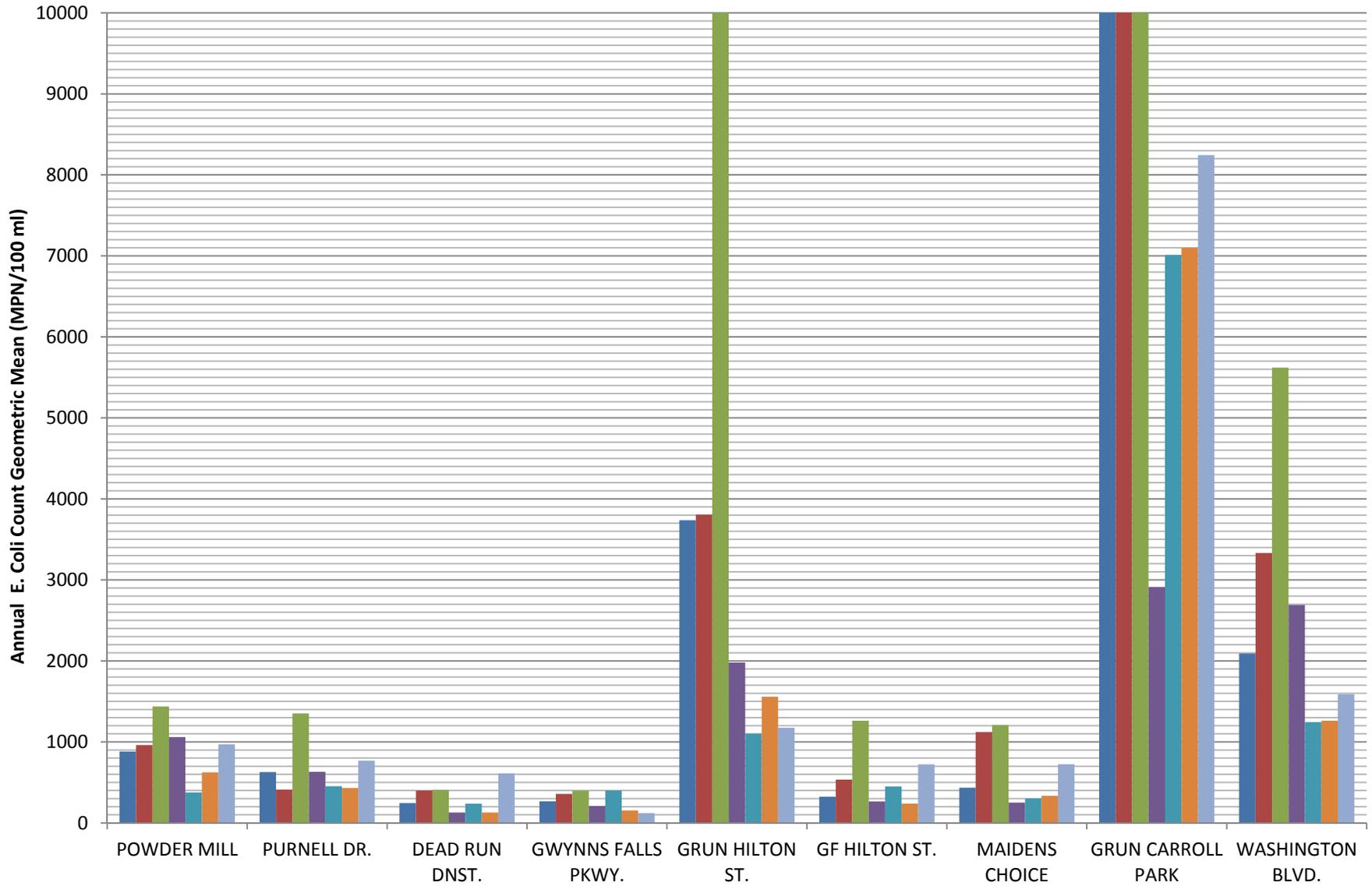
# Jones Falls SIS E. Coli MPN Count Geometric Means by Year by Station

■ 2009 ■ 2010 ■ 2011 ■ 2012 ■ 2013 ■ 2014 ■ 2015 (through 11/13/2015)



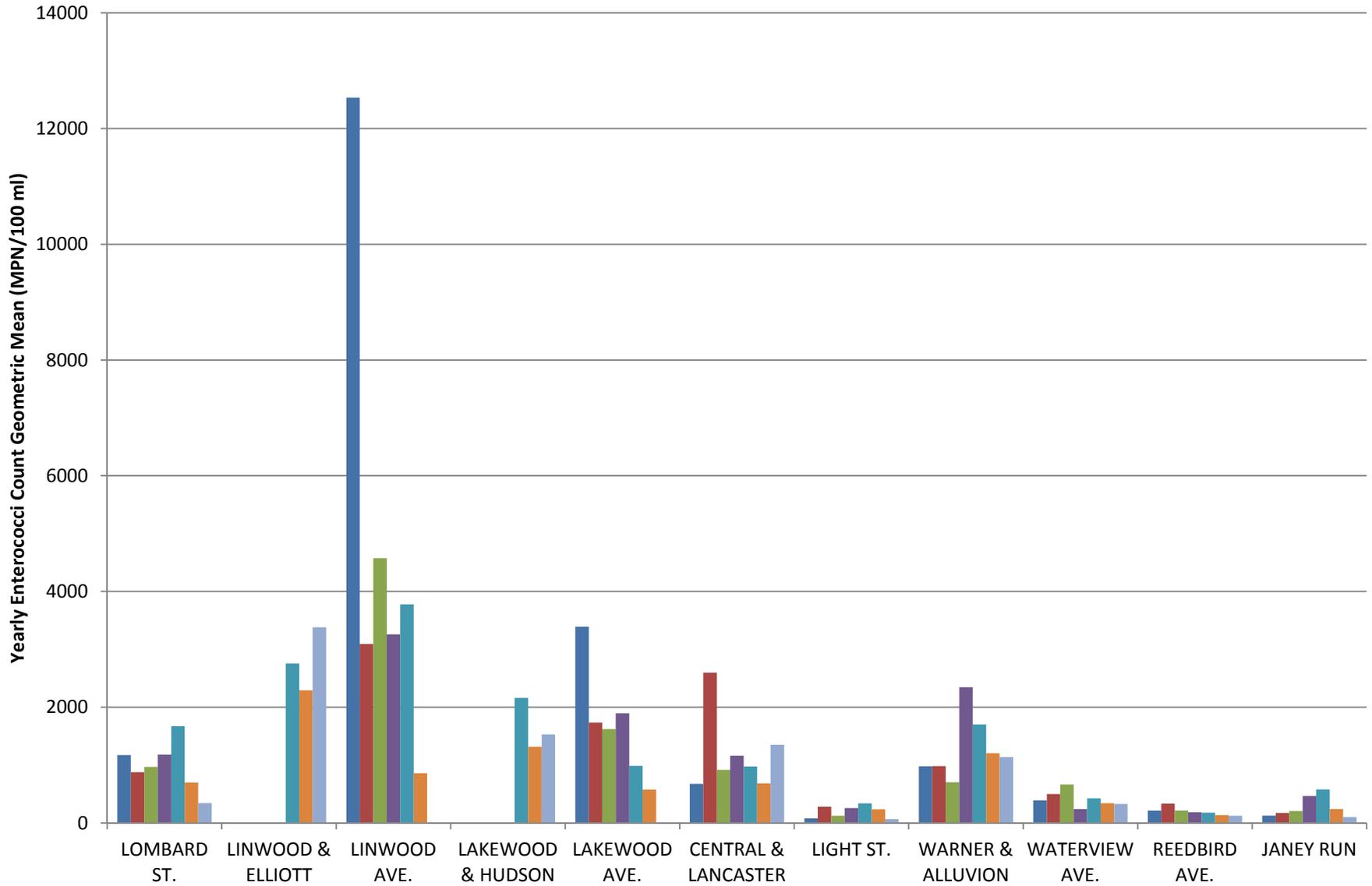
# Gwynns Falls SIS E. Coli MPN Count Geometric Means by Year by Station

■ 2009 
 ■ 2010 
 ■ 2011 
 ■ 2012 
 ■ 2013 
 ■ 2014 
 ■ 2015 (through 11/13/2015)



# Harbor SIS Enterococci MPN Count Geometric Means by Year by Station

■ 2009 
 ■ 2010 
 ■ 2011 
 ■ 2012 
 ■ 2013 
 ■ 2014 
 ■ 2015 (through 11/13/2015)



**Appendix F: Biological and Habitat Monitoring (electronic files only)**

**Appendix G: Erosion and Sediment Control Program Data (electronic files only)**

## **Appendix H: Progress Status of MS4 and TMDL WIP Milestones**

**Appendix H: Progress Status of MS4 and TMDL WIP Milestones for FY 2015**

Program Milestones	Status
Increase staff by 13 FTE by hiring or contracting for engineering, monitoring and enforcement.	Complete. 8 FTE were hired to support the SW program. Contracted services for inlet cleaning (6 FTE) were procured.
Implement preventative inlet cleaning in targeted neighborhoods of the City. The effort will be in collaboration with inlet screen installation and expanded street sweeping operations.	Complete. SOPs were developed and contracted services were procured.
Create integrated tracking database for SWM/ESC plans review and inspections, including GIS elements, standard reports, paperless field report / input, and work order assignments.	Completed conceptual work flow using On-Base system (document mgt) and Cityworks (work order). Database completed for plans review and initiated modification for new geodatabase (MDE).
Expand Urban Waters interactive mapping tool to include SWM BMPs.	Complete as Green Registry. See Section 5.5.5.
Begin working with 4 neighborhoods on stormwater planning.	Initiated as part of Growing Green Initiative. See Section 5.5.2.
Initiate Stormwater Advisory Committee (SWAC, previously identified as WIP Task Force) to represent various stakeholders.	Complete. See Section 5.5.3.
Initiate the Technical Work Group.	Complete. See Section 5.5.3.
Develop a 5-year plan for public education and outreach plan, including initiating the Outreach Work Group.	Plan is incorporated in Trash TMDL implementation plan. Work group was initiated. See Section 5.5.3.
Work with the Office of Sustainability and DPW Solid Waste to create a community-based "Baltimore Clean Corps"	Complete. Launch occurred in Fall Baltimore Clean-up Program.
<b>Project Milestones (construction initiated)</b>	
0.4 miles of stream restoration.	Delayed due to emergency.
5,000 trees planted.	Only 1,635 trees planted as part of Tree Baltimore.

## **Appendix I: Progress Status of Projects, Programs, and Partnerships for 20% Restoration**

- Table I-1: Progress Status of Projects
- Table I-2: Progress Status of Programs
- Table I-3: Progress Status of Partnerships

Table I-1: Progress Status of WIP Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		Status as of 6/30/2015	NOTES
						TN	TP	TSS		Design	Construction		
<b>Structural / Traditional BMPs</b>													
S01	SW Pond Retrofit	Gwynns Falls	Gwynns Run, Carrolton Park	38	25	132	17	15,525	\$505,000	2016	2018		
				38	25	132	17	15,525	\$505,000	2016	2018	Pending	
S02	SW Pond Retrofit	Gwynns Falls	Seton Business Park Park	62	41	214	27	25,169	\$795,000	2016	2018		
				62	41	214	27	25,169	\$795,000	2016	2018	Pending	
S03	Pond Retrofit and New Pond	Back River	North Point Road @ Kane and Quad	92	60	317	40	37,260	\$3,290,000	2015	2016		
				92	60	317	40	37,260	\$3,290,000	2015	2016	Pending	
S04	Wetland / Pond	Back River	Perring Parkway at Cloville (HR-R28B)	23	15	63	13	8,484	\$344,000	2016	2018		
				23	15	63	13	8,484	\$344,000	2016	2018	Pending	
S05	Wetland / Pond	Back River	Herring Run Park below Shannon at Lyndale (HR-R15C)	31	20	84	17	11,465	\$550,000	2016	2018		
				31	20	84	17	11,465	\$550,000	2016	2018	Pending	
S06	Wetland	Back River	Herring Run Park below Shannon at Kavon Ave (HR-R39)	31	20	84	17	11,465	\$550,000	2016	2018		
				31	20	84	17	11,465	\$550,000	2016	2018	Pending	
S07	Wetland	Back River	Herring Run Park below Parkside at Sinclair (HR-R15A)	100	65	275	56	37,260	\$1,600,000	2016	2018		
				100	65	275	56	37,260	\$1,600,000	2016	2018	Pending	
S08	Wetland	Back River	Chinquapin Run Park between Belvedere and Alameda (CH-R6A)	69	45	190	39	25,795	\$1,840,000	2016	2018		
				69	45	190	39	25,795	\$1,840,000	2016	2018	Pending	
S09	Bioretention Area	Baltimore Harbor	Faring Baybrook Park Rec Center (MC-18a)	5	3	17	3	1,702	\$160,000	2016	2018		
				5	3	17	3	1,702	\$160,000	2016	2018	Pending	
S10	Bioretention Area	Gwynns Falls	Park Hts Virginia + Homer	3	2	11	2	1,135	\$60,000	2016	2018		
				3	2	11	2	1,135	\$60,000	2016	2018	Pending	
S11	Shallow extended detention wetland	Jones Falls	West Coldspring and Brand Ave (LJ-R9)	14	9	46	8	4,624	\$212,000	2016	2018		
				14	9	46	8	4,624	\$212,000	2016	2018	Pending	

Table I-1: Progress Status of WIP Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		Status as of 6/30/2015	NOTES
						TN	TP	TSS		Design	Construction		
S12	Shallow wetland	Jones Falls	Woodheights and La Plata (LJ-R38)	6	4	21	3	2,102	\$96,000	2016	2018		
				6	4	21	3	2,102	\$96,000	2016	2018	Pending	
			<b>Subtotal Structural / Traditional (WIP):</b>	<b>475</b>	<b>309</b>	<b>1,455</b>	<b>243</b>	<b>181,986</b>	<b>\$10,002,000</b>				
			<b>Subtotal Structural / Traditional (Current):</b>	<b>475</b>	<b>309</b>	<b>1,455</b>	<b>243</b>	<b>181,986</b>	<b>\$10,002,000</b>				
<b>ESD Practices</b>													
E01	Micro-bioretenion	Baltimore Harbor	Cloverleaf - northwest of I-895 and Frankfurst Ave (MC-30)	0.5	0.4	2.1	0.34	217	\$50,000	2016	2019		
				0.5	0.4	2.1	0.34	217	\$50,000	2016	2019	Pending	
E02	Micro-bioretenion	Baltimore Harbor	Bush St. Curb bump-out	0.3	0.2	1.2	0.20	127	\$80,000	2011	2016		Design is complete. Construction adv. scheduled for FY 2016.
				0.3	0.2	1.2	0.20	127	\$80,000	2011	2016	Under Design	
E03	Micro-bioretenion	Baltimore Harbor	Lafayette inner block retrofit.	0.9	0.7	4.0	0.64	411	\$240,000	2011	2016		Design is complete. Construction adv. scheduled for FY 2016.
				0.9	0.7	4.0	0.64	411	\$240,000	2011	2016	Under Design	
E14	Micro-bioretenion	Baltimore Harbor	Bay Brook MS (MC-18b)	0.3	0.3	1.5	0.2	157	\$54,000	2015	2016		
				0.3	0.3	1.5	0.2	157	\$54,000	2015	2016	Pending	
E15	Micro-bioretenion	Baltimore Harbor	Bay Brook MS (MC-18c)	0.2	0.2	1.1	0.2	115	\$46,800	2015	2016		
				0.2	0.2	1.1	0.2	115	\$46,800	2015	2016	Pending	
E16	Micro-bioretenion	Baltimore Harbor	Bay Brook MS - parking lot (MC-18d)	0.2	0.2	1.1	0.2	115	\$34,800	2015	2016		
				0.2	0.2	1.1	0.2	115	\$34,800	2015	2016	Pending	
E18	Micro-bioretenion	Baltimore Harbor	Brooklyn / Curtis Bay	1.1	0.9	5.0	0.8	513	\$19,800	2015	2016		
				1.1	0.9	5.0	0.8	513	\$19,800	2015	2016	Pending	
E19	Micro-bioretenion	Baltimore Harbor	Patterson Park (HA-R5A)	0.3	0.2	1.4	0.2	139	\$40,000	2016	2018		
				0.3	0.2	1.4	0.2	139	\$40,000	2016	2018	Pending	
E20	Micro-bioretenion	Baltimore Harbor	Ellwood Park (HA-R8)	0.2	0.1	0.7	0.1	72	\$21,000	2016	2018		
				0.2	0.1	0.7	0.1	72	\$21,000	2016	2018	Pending	

Table I-1: Progress Status of WIP Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		Status as of 6/30/2015	NOTES
						TN	TP	TSS		Design	Construction		
E21	Micro-bioretenion	Baltimore Harbor	Patterson Park Adjunct (HA-R6)	0.8	0.6	3.6	0.6	362	\$105,000	2016	2018		
				0.8	0.6	3.6	0.6	362	\$105,000	2016	2018	Pending	
E22	Micro-bioretenion	Baltimore Harbor	Patterson Park / Highlandtown / Baltimore Highlands	5.1	4.1	24.1	3.79	2,446	\$710,000	2016	2018		
				5.1	4.1	24.1	3.79	2,446	\$710,000	2016	2018	Pending	
E23	Micro-bioretenion	Back River	Frankford / Greater Lauraville / Belair-Edison / Cedonia	4.6	3.6	21.6	3.40	2,198	\$671,000	2016	2018		
				4.6	3.6	21.6	3.40	2,198	\$671,000	2016	2018	Pending	
E24	Micro-bioretenion	Back River	Erdman Avenue	1.4	1.2	6.8	1.07	694	\$128,000	2016	2018		
				1.4	1.2	6.8	1.07	694	\$128,000	2016	2018	Pending	
E25	Micro-bioretenion	Back River	Belair Road	0.3	0.2	1.2	0.20	127	\$77,000	2016	2018		
				0.3	0.2	1.2	0.20	127	\$77,000	2016	2018	Pending	
E26	Micro-bioretenion	Jones Falls	Hampden / Remington / Wyman Park	6.3	5.0	29.7	4.67	3,020	\$850,000	2016	2018		
				6.3	5.0	29.7	4.67	3,020	\$850,000	2016	2018	Pending	
E27	Micro-bioretenion	Gwynns Falls	Howard Park / Grove Park / West Arlington / Fairmount	3.1	2.5	14.9	2.34	1,510	\$420,000	2016	2018		
				3.1	2.5	14.9	2.34	1,510	\$420,000	2016	2018	Pending	
E28	Micro-bioretenion	Gwynns Falls	Hunting Ridge / Rognel Hts / Edmondson Village / Edgewood	3.1	2.5	14.9	2.34	1,510	\$420,000	2016	2018		
				3.1	2.5	14.9	2.34	1,510	\$420,000	2016	2018	Pending	
E29	Micro-bioretenion	Baltimore Harbor	Sharp-Leadenhall / Federal Hill / Otterbein / S. Baltimore	1.6	1.3	7.4	1.17	755	\$215,000	2016	2018		
				1.6	1.3	7.4	1.17	755	\$215,000	2016	2018	Pending	
E30	Micro-bioretenion	L. N. Branch Patapsco	Cherry Hill	3.1	2.5	14.9	2.34	1,510	\$500,000	2016	2018		Study/ concept design initiated in Spring 2015.
				3.1	2.5	14.9	2.34	1,510	\$500,000	2015	2018	Under Design	
E31	Micro-bioretenion	Baltimore Harbor	Lakeland / Mt. Winans / Westport	1.6	1.3	7.4	1.17	755	\$420,000	2016	2018		
				1.6	1.3	7.4	1.17	755	\$420,000	2016	2018	Pending	
E32	Micro-bioretenion	Baltimore Harbor	McElderry Park / CARE / Milton-Montford / Patterson Place	3.1	2.5	14.9	2.34	1,510	\$438,000	2016	2018		
				3.1	2.5	14.9	2.34	1,510	\$438,000	2016	2018	Pending	

Table I-1: Progress Status of WIP Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		Status as of 6/30/2015	NOTES
						TN	TP	TSS		Design	Construction		
E33	Micro-bioretenion	Gwynns Falls	Greater Mondawmin / Walbrook / Rosemont / NW Community Action /	3.1	2.5	14.9	2.34	1,510	\$438,000	2016	2018		
				3.1	2.5	14.9	2.34	1,510	\$438,000	2016	2018	Pending	
E34	Micro-bioretenion	Jones Falls	Mt. Washington / Glen / Cheswolde / Cross Country	6.3	5.0	29.7	4.67	3,020	\$1,350,000	2016	2018		
				6.3	5.0	29.7	4.67	3,020	\$1,350,000	2016	2018	Pending	
E35	Micro-bioretenion	Back River	Cameron Village / Chinguapin Park (upstream to Chinguapin Run)	5.0	4.0	23.8	3.74	2,416	\$680,000	2017	2019		
				5.0	4.0	23.8	3.74	2,416	\$680,000	2017	2019	Pending	
E36	Micro-bioretenion	Back River	De Wees Park	1.3	1.0	5.9	0.93	604	\$180,000	2017	2019		
				1.3	1.0	5.9	0.93	604	\$180,000	2017	2019	Pending	
E37	Micro-bioretenion	Back River	Orchard Ridge / Armistead Gardens / Orangeville	6.3	5.0	29.7	4.67	3,020	\$630,000	2017	2019		
				6.3	5.0	29.7	4.67	3,020	\$630,000	2017	2019	Pending	
E38	Micro-bioretenion	Jones Falls	Central Park Heights / Towanda Grantley / Lucille Park	3.1	4.0	14.9	2.34	1,510	\$513,000	2017	2019		
				3.1	4.0	14.9	2.34	1,510	\$513,000	2017	2019	Pending	
E39	Micro-bioretenion	Gwynns Falls	MorrellPark / Wilhelm Park / Gwynns Falls / Carroll-South Hilton	3.1	6.0	14.9	2.34	1,510	\$625,000	2017	2019		
				3.1	6.0	14.9	2.34	1,510	\$625,000	2017	2019	Pending	
E41	Micro-bioretenion	Back River	Clifton Park	0.3	0.2	1.2	0.19	121	\$35,000	2017	2019		
				0.3	0.2	1.2	0.19	121	\$35,000	2017	2019	Pending	
E42	Micro-bioretenion	Back River	Clifton Park	2.9	2.3	13.7	2.15	1,389	\$400,000	2017	2019		
				2.9	2.3	13.7	2.15	1,389	\$400,000	2017	2019	Pending	
			<b>Subtotal ESD Practices (WIP):</b>	<b>69</b>	<b>60</b>	<b>328</b>	<b>52</b>	<b>33,359</b>	<b>\$10,391,400</b>				
			<b>Subtotal ESD Practices (Current):</b>	<b>69</b>	<b>60</b>	<b>328</b>	<b>52</b>	<b>33,359</b>	<b>\$10,391,400</b>				
<b>Alternative BMPs (Stream Restoration)-- Drainage Area = Stream Restoration Length (LF)</b>													
A01	Stream Restoration	Gwynns Falls	Leakin Park Stream Restoration at Fairmount Storm Drain	2,080 LF	31	156	141	62,400	\$700,000	2010	2014		
				2,080 LF	31	156	141	62,400	\$700,000	2010	2014	Completed	

Table I-1: Progress Status of WIP Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		Status as of 6/30/2015	NOTES
						TN	TP	TSS		Design	Construction		
A02	Stream Restoration	Jones Falls	Lower Lower Stony Run	4,500 LF	68	338	306	135,000	\$4,030,000	2015	2016		Construction advertisement scheduled for FY 2016
				4,500 LF	68	338	306	135,000	\$4,030,000	2015	2016	Under design	
A03	Stream Restoration	Gwynns Falls	Powder Mill Phase 1	3,900 LF	59	293	265	117,000	\$3,420,000	2009	2017		Permitted. Ownership transferred back to City, based on decision of Red line.
				3,900 LF	59	293	265	117,000	\$3,420,000	2009	2017	Under design	
A04	Stream Restoration	Jones Falls	East Stony Run Project 1	800 LF	12	60	54	24,000	\$839,000	2014	2017		Construction advertisement scheduled for FY 2016
				800 LF	12	60	54	24,000	\$839,000	2014	2017	Under design	
A05	Stream Restoration	Back River	Chinquapin Run Project 1	2,200 LF	33	165	150	66,000	\$3,670,000	2014	2017		
				2,200 LF	33	165	150	66,000	\$3,670,000	2014	2017	Pending	
A06	Stream Restoration	Back River	Chinquapin Run Project 2	2,600 LF	39	195	177	78,000	\$1,772,000	2015	2017		
				2,600 LF	39	195	177	78,000	\$1,772,000	2015	2017	Pending	
A07	Stream Restoration	Gwynns Falls	Franklintown Culvert	2,400 LF	36	180	163	72,000	\$1,700,000	2015	2018		
				2,400 LF	36	180	163	72,000	\$1,700,000	2015	2018	Pending	
A08	Stream Restoration	Back River	Lower Moore's Run Project 2	2,500 LF	38	188	170	75,000	\$1,960,000	2015	2018		
				2,500 LF	38	188	170	75,000	\$1,960,000	2015	2018	Pending	
A09	Stream Restoration	Back River	Biddison Run Project 2	3,030 LF	45	227	206	90,900	\$3,590,000	2014	2018		Priority slope stabilization completed in summer 2015, to be reported as part of this project.
				3,030 LF	45	227	206	90,900	\$3,590,000	2014	2018	Under design	
A10	Stream Restoration	Jones Falls	Western Run at Kelly Avenue	800 LF	12	60	54	24,000	\$1,324,600	2015	2018		
				800 LF	12	60	54	24,000	\$1,324,600	2015	2018	Pending	
A11	Stream Restoration	Jones Falls	East Stony Run Project 2	1,340 LF	20	101	91	40,200	\$2,040,000	2015	2018		
				1,340 LF	20	101	91	40,200	\$2,040,000	2015	2018	Pending	
A12	Stream Restoration	Back River	Biddison Run Projects 3	3,850 LF	58	289	262	115,500	\$1,800,000	2014	2018		Will be advertized with A12 - Biddison Run Project 2.
				3,850 LF	58	289	262	115,500	\$1,800,000	2014	2018	Under design	
A13	Stream Restoration	Back River	Moore's Run Restoration Project 1	2,500 LF	38	188	170	75,000	\$1,822,000	2015	2018		
				2,500 LF	38	188	170	75,000	\$1,822,000	2015	2018	Pending	

Table I-1: Progress Status of WIP Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		Status as of 6/30/2015	NOTES
						TN	TP	TSS		Design	Construction		
A14	Stream Restoration	Back River	Moore's Run Restoration Project 2	2,800 LF	42	210	190	84,000	\$1,822,000	2015	2018		
				2,800 LF	42	210	190	84,000	\$1,822,000	2015	2018	Pending	
A15	Stream Restoration	Back River	Herring Run stream	2,665 LF	40	200	181	79,950	\$2,702,000	2015	2018		
				2,665 LF	40	200	181	79,950	\$2,702,000	2015	2018	Pending	
A16	Stream Restoration	Jones Falls	Druid Hill Park Stream Project	1,875 LF	28	141	128	56,250	\$2,702,000	2015	2018		
				1,875 LF	28	141	128	56,250	\$2,702,000	2015	2018	Pending	
A17	Stream Restoration	Gwynns Falls	Lower Gwynns Falls	2,600 LF	39	195	177	78,000	\$2,702,000	2015	2018		
				2,600 LF	39	195	177	78,000	\$2,702,000	2015	2018	Pending	
A18	Stream Restoration	Gwynns Falls	Lower Gwynns Falls	2,600 LF	39	195	177	78,000	\$2,702,000	2015	2018		
				2,600 LF	39	195	177	78,000	\$2,702,000	2015	2018	Pending	
A19	Stream Restoration	Gwynns Falls	Lower Gwynns Falls	2,300 LF	35	173	156	69,000	\$2,702,000	2015	2018		
				2,300 LF	35	173	156	69,000	\$2,702,000	2015	2018	Pending	
A20	Stream Restoration	Gwynns Falls	Dead Run	2,200 LF	33	165	150	66,000	\$2,702,000	2016	2019		
				2,200 LF	33	165	150	66,000	\$2,702,000	2016	2019	Pending	
A21	Stream Restoration	Back River	Herring Run Western Branch	2,675 LF	40	201	182	80,250	\$2,702,000	2016	2019		
				2,675 LF	40	201	182	80,250	\$2,702,000	2016	2019	Pending	
			<b>Subtotal Alternative BMPs (Stream Restoration) (WIP):</b>	<b>52,215 LF</b>	<b>783</b>	<b>3,916</b>	<b>3,551</b>	<b>1,566,450</b>	<b>\$49,403,600</b>				
			<b>Subtotal Alternative BMPs (Stream Restoration) (Current):</b>	<b>52,215 LF</b>	<b>783</b>	<b>3,916</b>	<b>3,551</b>	<b>1,566,450</b>	<b>\$49,403,600</b>				
<b>Alternative BMPs (Other)</b>													
A22	Regenerative Step Pool Storm Conveyance	Gwynns Falls	Seamon Avenue	20	9	146	13	6,622	\$1,168,000	2015	2017		
				20	9	146	13	6,622	\$1,168,000	2015	2017	Under design	
A23	IA Removal, afforestation, bioretention	Baltimore Harbor	CARE Communities / McElderry Park / Milton-Montford	3.1	3.75	19.2	4.34	2,852	\$496,000	2016	2018		
				3.1	3.75	19.2	4.34	2,852	\$496,000	2016	2018	Pending	

Table I-1: Progress Status of WIP Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		Status as of 6/30/2015	NOTES
						TN	TP	TSS		Design	Construction		
A24	IA Removal, afforestation	Baltimore Harbor	Harford Hts ES (HA-R19)	0.9	0.60	3.3	0.92	523	\$110,000	2016	2018		
				0.9	0.60	3.3	0.92	523	\$110,000	2016	2018	Pending	
A25	IA Removal, afforestation, bioretention	Back River	Northwood ES and Rec Center (CH-R2A)	2.4	2.85	14.6	3.30	2,167	\$565,000	2016	2018		
				2.4	2.85	14.6	3.30	2,167	\$565,000	2016	2018	Pending	
A26	IA Removal, afforestation	Back River	Sinclair Lane ES (HR-R18)	1.9	1.31	7.3	2.03	1,154	\$260,400	2016	2018		
				1.9	1.31	7.3	2.03	1,154	\$260,400	2016	2018	Pending	
A27	IA Removal, afforestation	Back River	WEB DuBois (HR-R29A)	0.8	0.53	2.9	0.81	461	\$104,200	2016	2018		
				0.8	0.53	2.9	0.81	461	\$104,200	2016	2018	Pending	
A28	IA Removal, afforestation, bioretention	Back River	Various Schools	0.5	0.6	3.1	0.70	456	\$120,000	2016	2018		
				0.5	0.6	3.1	0.70	456	\$120,000	2016	2018	Pending	
A29	IA Removal, afforestation, bioretention	Gwynns Falls	Mt. Winans	3.1	3.75	19.2	4.34	2,852	\$496,000	2016	2018		
				3.1	3.75	19.2	4.34	2,852	\$496,000	2016	2018	Pending	
A30	IA Removal, afforestation, bioretention	Back River	Montebello ES (HR-R41A)	0.9	1.05	5.4	1.22	799	\$208,000	2016	2018		
				0.9	1.05	5.4	1.22	799	\$208,000	2016	2018	Pending	
A31	IA Removal, afforestation, bioretention	City-wide	Various Schools	1.5	1.76	9.0	2.03	1,335	\$350,000	2016	2018		
				1.5	1.76	9.0	2.03	1,335	\$350,000	2016	2018	Pending	
A32	IA Removal, afforestation, bioretention	Jones Falls	Pimlico ES (LJ-R6)	1.1	1.35	6.9	1.56	1,027	\$268,000	2016	2018		
				1.1	1.35	6.9	1.56	1,027	\$268,000	2016	2018	Pending	
A33	IA Removal, afforestation, bioretention	Jones Falls	Poly Western HS (LJ-R8C)	1.4	1.65	8.5	1.91	1,255	\$328,000	2016	2018		
				1.4	1.65	8.5	1.91	1,255	\$328,000	2016	2018	Pending	
A34	IA Removal, afforestation, bioretention	Baltimore Harbor	Duane Avenue Park - parking lot (MC-21)	0.3	0.35	1.8	0.40	262	\$42,000	2016	2018		
				0.3	0.35	1.8	0.40	262	\$42,000	2016	2018	Pending	
A35	IA Removal, afforestation	Baltimore Harbor	Oliver / Broadway East	4.0	2.8	15.6	4.32	2,461	\$496,000	2017	2019		
				4.0	2.8	15.6	4.32	2,461	\$496,000	2017	2019	Pending	

Table I-1: Progress Status of WIP Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		Status as of 6/30/2015	NOTES
						TN	TP	TSS		Design	Construction		
A36	IA Removal, afforestation	Gwynns Falls	Carrollton Ridge / Shipley Hill / Mill Hill / Pigtown / New Southwest / Union	4.0	2.8	15.6	4.32	2,461	\$496,000	2017	2019		
				4.0	2.8	15.6	4.32	2,461	\$496,000	2017	2019	Pending	
A37	IA Removal, afforestation	Baltimore Harbor	Harlem Park / Sandtown-Winchester / Uplands	2.0	1.40	7.8	2.16	1,230	\$248,000	2017	2019		
				2.0	1.40	7.8	2.16	1,230	\$248,000	2017	2019	Pending	
A38	IA Removal, afforestation	Baltimore Harbor	Various Schools	2.0	1.40	7.8	2.16	1,230	\$248,000	2017	2019		
				2.0	1.40	7.8	2.16	1,230	\$248,000	2017	2019	Pending	
A39	Aforestation of IA	Gwynns Falls	Central Park Heights	2.0	1.40	19.3	2.29	1,121	\$496,000	2017	2019		
				2.0	1.40	19.3	2.29	1,121	\$496,000	2017	2019	Pending	
A40	Aforestation of IA	Gwynns Falls	City-wide	8.3	5.81	90.2	13.19	6,793	\$496,000	NA	2017		
				8.3	5.81	90.2	13.19	6,793	\$496,000	NA	2017	Pending	
A41	Aforestation of IA	Jones Falls	City-wide	8.3	5.81	90.2	13.19	6,793	\$496,000	NA	2018		
				8.3	5.81	90.2	13.19	6,793	\$496,000	NA	2018	Pending	
A42	Aforestation of IA	City-wide	City-wide	4.2	2.91	45.1	6.59	3,396	\$248,000	NA	2019		
				4.2	2.91	45.1	6.59	3,396	\$248,000	NA	2019	Pending	
			<b>Subtotal Alternative BMPs (Other) (WIP):</b>	<b>72</b>	<b>53</b>	<b>539</b>	<b>85</b>	<b>47,250</b>	<b>\$7,739,600</b>				
			<b>Subtotal Alternative BMPs (Other) (Current):</b>	<b>72</b>	<b>53</b>	<b>539</b>	<b>85</b>	<b>47,250</b>	<b>\$7,739,600</b>				
			<b>Total Projects (WIP):</b>		<b>1,205</b>	<b>6,238</b>	<b>3,930</b>	<b>1,829,045</b>	<b>\$77,536,600</b>	<b>84</b>	<b>Projects</b>	<b>Proposed</b>	
			<b>Total Projects (Current):</b>		<b>1,205</b>	<b>6,238</b>	<b>3,930</b>	<b>1,829,045</b>	<b>\$77,536,600</b>	<b>84</b>	<b>Projects</b>	<b>Proposed</b>	
					920	4,710	2,679	1,275,576	\$61,169,600	74	Projects	Pending	
					254	1,372	1,110	491,069	\$15,667,000	9	Projects	Under Design	
					0	0	0	0	\$0	0	Projects	Under Construction	
					31	156	141	62,400	\$700,000	1	Projects	Completed	

Table I-1: Progress Status of WIP Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		Status as of 6/30/2015	NOTES
						TN	TP	TSS		Design	Construction		
<b>Summary Information: Current Projects Proposed for MS4 Permit listed by Watershed</b>													
		Back River			621	3,011	1,895	891,934		28	Projects	Proposed	
		Baltimore Harbor			26	148	29	17,955		21	Projects	Proposed	
		City-Wide			5	54	9	4,731		2	Projects	Proposed	
		Gwynns Falls			375	2,063	1,322	610,116		19	Projects	Proposed	
		Jones Falls			175	946	673	302,799		13	Projects	Proposed	
		L. N. Branch Patapsco			3	15	2	1,510		1	Projects	Proposed	
<b>Summary Information: Current Projects Proposed for MS4 Permit listed by BMP Type for Use in TMDL MAST</b>													
	Bioretention Area				5	29	5	2,837					Listed as Bioretention, C/D soils underdrain.
	Micro-bioretention				60	328	52	33,359					
	Aforestation of IA				16	245	35	18,102					Listed as impervious area removal.
	IA Removal, afforestation				11	60	17	9,520					
	IA Removal, afforestation, bioretention				17	88	20	13,005					
	Stream Restoration			52,215	783	3,916	3,551	1,566,450					Listed as stream restoration
	Pond Retrofit and New Pond				60	317	40	37,260					Listed as wet ponds and wetlands in MAST WIP.
	Regenerative Step Pool Storm Conveyance				9	146	13	6,622					
	SW Pond Retrofit				66	346	44	40,694					
	Shallow extended detention wetland				9	46	8	4,624					
	Shallow wetland				4	21	3	2,102					
	Wetland				130	549	112	74,520					
	Wetland / Pond				35	147	30	19,948					

Table I-1: Progress Status of WIP Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		Status as of 6/30/2015	NOTES
						TN	TP	TSS		Design	Construction		
<b>Summary Information: Completed Projects by Watershed</b>													
		Back River			0	0	0	0	\$0	0	Projects	Completed	
		Baltimore Harbor			0	0	0	0	\$0	0	Projects	Completed	
		City-Wide			0	0	0	0	\$0	0	Projects	Completed	
		Gwynns Falls			31	156	141	62,400	\$700,000	1	Projects	Completed	
		Jones Falls			0	0	0	0	\$0	0	Projects	Completed	
		L. N. Branch Patapsco			0	0	0	0	\$0	0	Projects	Completed	

Table I-2: Progress Status of WIP Programs

Project No. / Type	Debris Collected	Equivalent Impervious Area Restoration (ac)	Reference Metric		Estimated Pollutant Removal (lbs / yr)			NOTES
					TN	TP	TSS	
<b>Street Sweeping*</b>								
Collection within CY 2012	9,988 tons	699	96,000	lane miles	24,471	9,788	2,936,472	Ref: Baltimore's New and Improved Mechanical Street Sweeping Program (October 2013)
Anticipated Increase after City-wide expansion (Peak):	9,109 tons	1,184			22,317	8,927	2,678,046	Ref :Baltimore's New and Improved Mechanical Street Sweeping Program (October 2013)
<b>Sub-total Street Sweeping at full expansion (WIP):</b>	<b>19,097 tons</b>	<b>1,883</b>	<b>96,000</b>	lane miles	<b>46,788</b>	<b>18,715</b>	<b>5,614,518</b>	
<b>Sub-total Street sweeping (Current Annual):</b>	<b>11,338 tons</b>	<b>3,175</b>	<b>97,183</b>	lane miles	<b>27,778</b>	<b>11,111</b>	<b>3,333,372</b>	
<i>Street Sweeping (Current increase since Dec. 2009)</i>	<i>3,152 tons</i>	<i>883</i>	<i>27,040</i>	lane miles	<i>7,722</i>	<i>3,089</i>	<i>926,688</i>	<i>Ref: MS4 Annual Report for CY 2009. Reported tonnage of 8,186 tons. Used for TMDL MAST.</i>
<i>Street Sweeping (Planned increase since Dec. 2009)</i>	<i>10,911 tons</i>	<i>3,055</i>	<i>27,040</i>	lane miles	<i>26,732</i>	<i>10,693</i>	<i>3,207,834</i>	
<b>Preventive Inlet Cleaning &amp; Debris Collection</b>								
Anticipated Increase after Asset Management (4% Inlets cleaned quarterly):	990 tons	215	1,075	inlets	2,425	970	291,052	Ref: Preliminary Asset Management Program and CIP Schedule for Inlet Screens.
<b>Sub-total Preventive Inlet Cleaning (WIP):</b>		<b>215</b>			<b>2,425</b>	<b>970</b>	<b>291,052</b>	
<b>Sub-total Preventive Inlet Cleaning (Current Annual):</b>	<b>0 tons</b>	<b>0</b>	<b>0</b>	inlets	<b>0</b>	<b>0</b>	<b>0</b>	Routine quarterly inlet cleaning will be initiated in FY 2016.
<b>Illicit Discharge Detection and Elimination Program</b>								
Sanitary Direct**		NA	10	connections	100	18	NA	Pending asset management inventory for direct illicit connections.
Sewage Exfiltration**		NA	300	miles lined	5,000	909	NA	Lining as part of DPW's capital program for sanitary sewers.
Drinking Water Transmission**		NA	60	miles lined / replaced	1,500	273	NA	Estimated water line lining / replacement by 2018.
Dry Weather SSO**		NA	30	SSOs / yr red	350	64	NA	Asset management / FOG program, education, enforcement, and enanced IDDE
<b>Sub-total IDDE (WIP):</b>					<b>6,950</b>	<b>1,264</b>	<b>0</b>	
<b>Sub-total IDDE (Current up to FY 2015):</b>					<b>0</b>	<b>0</b>	<b>0</b>	Calculations will be reported in Annual Report for FY 2016. Not includedd in CB TMDL MAST.
<b>TOTAL Programs (WIP):</b>		<b>2,098</b>			<b>56,163</b>	<b>20,949</b>	<b>5,905,570</b>	
<b>TOTAL Programs (Current):</b>		<b>3,175</b>			<b>27,778</b>	<b>11,111</b>	<b>3,333,372</b>	

\* Assuming bi-weekly frequency.

\*\* Equivalent impervious area restoration conversions and TSS reductions have not been designated at this time. Estimates of nutrient reduction are very conservative in estimates.

Table I-3: Progress Status of WIP Partnerships

Project No. / Type	Source ID	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)		
					TN	TP	TSS
<b>Development - Refer to Table D in Appendix C of this MS4 Annual Report</b>							
Impervious area to pervious	DPW Plans Review	City-wide	City-wide	73.8	351	35	29,426
Treatment by ESD	DPW Plans Review	City-wide	City-wide	21.4	102	10	8,539
				9.6	26	1	875
Treatment by Traditional	DPW Plans Review	City-wide	City-wide	54.7	260	26	21,805
				9.0	24	1	822
			<b>Sub-total Development (WIP):</b>	<b>150</b>	<b>713</b>	<b>70</b>	<b>59,770</b>
<b>Sub-total Development (Actual Completed in Jan. 2010 to June 2015):</b>				<b>19</b>	<b>50</b>	<b>3</b>	<b>1,697</b>
<b>Voluntary</b>							
Impervious Removal	BWB	Jones Falls	Guilford ES/MS	0.28	0.4	0.1	33
Impervious Removal	BWB	Gwynns Falls	Calvin Rodwell ES	0.13	0.2	0.04	15
Micro-bioretenion	BWB	Baltimore Harbor	Library Square	1.1	5.3	0.5	261
IA Removal, Rain Garden	DOT	Baltimore Harbor	200 N. Duncan Street	0.45	2.3	0.5	342

**Table I-3: Progress Status of WIP Partnerships**

Project No. / Type	Source ID	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)		
					TN	TP	TSS
IA Removal, afforestation	DOT	Baltimore Harbor	2300-2400 Eager St	1.5	7.7	1.7	1141
IA Removal, afforestation, bioretention	GGI Design Comp	Gwynns Falls	2306-8 Riggs Street	0.81	4.2	0.9	616
IA Removal, afforestation, bioretention	GGI Design Comp	Back River	CHM Gateway 32nd & Harford	0.18	0.9	0.2	137
IA Removal, afforestation, bioretention	GGI Design Comp	Baltimore Harbor	Day Spring Green Parking 1100 block N. Bradford	0.36	1.8	0.4	274
IA Removal, afforestation	GGI Design Comp	Baltimore Harbor	Druid Heights Peace Park Bloom & Druid Hill Ave	0.15	0.8	0.2	114
IA Removal, afforestation	GGI Design Comp	Baltimore Harbor	Hollins Roundhouse Lots of Art1218-20 W. Lombard	0.06	0.3	0.1	46
IA Removal, afforestation, and rainwater harvesting	GGI Design Comp	Baltimore Harbor	Janes House of Inspiration A-maze-N Lot728 North Avenue	0.20	1.0	0.2	148
IA Removal, afforestation	GGI Design Comp	Baltimore Harbor	Flower Farm1400 block Gay Street	0.75	3.8	0.9	570
Aforestation of IA	Tree Baltimore	Baltimore Harbor	TBD	25.2	10.9	1.6	818

Table I-3: Progress Status of WIP Partnerships

Project No. / Type	Source ID	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)		
					TN	TP	TSS
Aforestation of IA	Tree Baltimore	Gwynns Falls	TBD	23.1	10.9	1.6	818
Aforestation of IA	Tree Baltimore	Jones Falls	TBD	19.6	10.9	1.6	818
Aforestation of IA	Tree Baltimore	Back River	TBD	21.0	10.9	1.6	818
			<b>Sub-total Volunteer (WIP):</b>	<b>95</b>	<b>72</b>	<b>12</b>	<b>6,971</b>
			<b>Sub-total Volunteer (Actual-Completed):</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
SW Fee Credit program							
Treatment BMPs	SAIS	City-wide	City-wide	24.0	206.7	26.5	16,157
Private tree planting (Reforestation on pervious)	SAIS	City-wide	City-wide	7.6	142.6	6.6	1596
				6.1	114.0	5.3	1277
Rain gardens	SAIS	City-wide	City-wide	2.0	17.2	2.2	1,346

Table I-3: Progress Status of WIP Partnerships

Project No. / Type	Source ID	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)		
					TN	TP	TSS
Rainwater harvesting	SAIS	City-wide	City-wide	0.5	12.4	1.0	485
			<b>Subtotal SW Fee Credit (WIP):</b>	<b>34.1</b>	<b>378.9</b>	<b>36.3</b>	<b>19,584</b>
			<b>Subtotal SW Fee Credit (Actual):</b>	<b>6.1</b>	<b>114.0</b>	<b>5.3</b>	<b>1,277</b>
			<b>Total for Partnerships (WIP):</b>	<b>279</b>	<b>1,164</b>	<b>119</b>	<b>86,325</b>
			<b>Total for Partnerships (Actual Completed 1/2010 -6/2015):</b>	<b>25</b>	<b>164</b>	<b>8</b>	<b>2,974</b>

## **Appendix J: Progress of Chesapeake Bay TMDL**

- Table J -1: Progress Status of Chesapeake Bay TMDL
- MAST Results for Baseline 2010
- MAST Results for 2015 Loadings
- MAST Results for 2018 Loadings

**Table J-1: Progress Status of Chesapeake Bay TMDL**

Location	Estimated Pollutant Removal (lbs / yr)			Reference
	TN	TP	TSS	
Chesapeake Bay Loading for Baltimore City	374,772	28,594	32,970,117	Bay TMDL MAST Scenario 2010 Loadings for Baltimore City MS4 Area
<i>Reduction Goal for Urban Stormwater:</i>	76,079	8,664	626,432	Maryland's Phase II WIP for the Chesapeake Bay, Oct. 2012, Executive Summary
	20.3%	30.3%	1.9%	
<b>Progress based on MAST</b>				
<b>Total Reduction by end of MS4 permit:</b>	8,279	5,131	21,670,865	Based on MAST Scenario file "2010 Baseload", Compared to MAST Scenario file "2018 Loadings".
<b>% Reduction by end of MS4 Permit:</b>	2.2%	17.9%	65.7%	
<b>Total Reduction (Current):</b>	469	197	-11,993,260	MAST Scenario file "2010 Baseload", Compared to MAST Scenario file "2015 Current".
<b>% Reduction (Current):</b>	0.1%	0.7%	-36.4%	
<b>Alternative Analysis based on MDE Accounting Guidelines</b>				
Structural/ Traditional BMPs	1,455	243	181,986	Table H-1
ESD Practices	328	52	33,359	Table H-1
Alternative BMPs (Stream Restoration)	3,916	3,551	1,566,450	Table H-1
Alternative BMPs (Other)	539	85	47,250	Table H-1
Street Sweeping at full expansion	46,788	18,715	5,614,518	Table H-2
Inlet Cleaning	2,425	970	291,052	Table H-2
IDDE*	6,950	1,264	0	Table H-2
Partnerships	3,928	282	130,175	Table H-3
<b>Total Reduction by end of MS4 permit:</b>	<b>66,329</b>	<b>25,161</b>	<b>7,864,790</b>	
<b>% Reduction by end of MS4 Permit:</b>	<b>18%</b>	<b>88%</b>	<b>24%</b>	
Total Reduction by Projects (Completed):	156	141	62,400	Table H-1
Total Reduction by Programs (Current):	27,778	11,111	3,333,372	Table H-2
Total Reductions by Partnerships (Current):	164	8	2,974	Table H-3
<i>Current Total Reduction Completed:</i>	28,099	11,261	3,398,746	
<b>% Reduction by end of MS4 Permit:</b>	<b>7%</b>	<b>39%</b>	<b>10%</b>	

\* Equivalent impervious area restoration conversions and TSS reductions have not been designated at this time. Estimates of nutrient reduction are very conservative in estimates.



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## 2010 Base loadings Baltimore City Summary Results

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**Description:** Baltimore City, Urban Stormwater Sector, 2010 Baseline loadings

**Initial Conditions:** 2010, revised: 10/2014

**Date Created:** 12/23/2015 3:30:54 PM

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### Total Loads

Load Type	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered	Lbs Phosphorus Edge of Stream	Lbs Phosphorus Delivered	Lbs Sediment Edge of Stream	Lbs Sediment Delivered
Landuse	639,556.6	418,242.7	46,208.1	32,869.7	19,225,815.1	18,180,434.7
Septic	0.0	0.0	0.0	0.0	0.0	0.0
Waste Water and Combined Sewer Output	3,490,488.6	3,488,926.9	95,678.6	93,617.2	1,328,007.9	1,324,138.4
<b>Total:</b>	<b>4,130,045.2</b>	<b>3,907,169.6</b>	<b>141,886.7</b>	<b>126,486.9</b>	<b>20,553,823.0</b>	<b>19,504,573.1</b>

### Total Annualized Costs

Sector	Total Annualized Cost
Urban Land	\$16,593,023
Septic	
Forest Land	\$1,439
Agricultural Land	\$0
Animal Manure	\$0
<b>Total:</b>	<b>\$16,594,462</b>

**Land Use Loads**Info on agreement with the Chesapeake Bay Program's Watershed Model 

Land Use	Pre-BMP Acres	Post-BMP Acres	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered	Lbs Phosphorus Edge of Stream	Lbs Phosphorus Delivered	Lbs Sediment Edge of Stream	Lbs Sediment Delivered
<b>Sector: Agriculture</b>								
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Sector: Forest</b>								
	2,247.7	2,247.7	7,384.8	4,546.9	114.9	67.4	308,983.8	298,309.3
<b>Sector: Urban</b>								
	49,534.8	49,534.8	629,451.9	411,731.5	45,946.8	32,701.3	18,916,830.0	17,882,130.0
<b>Sector: Water</b>								
	251.5	251.5	2,719.9	1,964.3	146.4	101.0	0.0	0.0
<b>Total:</b>	<b>52,034.0</b>	<b>52,034.0</b>	<b>639,556.6</b>	<b>418,242.7</b>	<b>46,208.1</b>	<b>32,869.7</b>	<b>19,225,820.0</b>	<b>18,180,430.0</b>

**Septic Loads**

Septic Zone	Pre-BMP Systems	Post-BMP Systems	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered
Critical Area	0.0	0.0	0.0	0.0
Within 1000 ft of a perennial stream	0.0	0.0	0.0	0.0
Outside of the Critical Area, not within 1000 ft of a perennial stream	0.0	0.0	0.0	0.0
<b>Total:</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

**Wastewater Loads**

Facility Type	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered	Lbs Phosphorus Edge of Stream	Lbs Phosphorus Delivered	Lbs Sediment Edge of Stream	Lbs Sediment Delivered
CSO	0.0	0.0	0.0	0.0	0.0	0.0
Major Industrial	309,811.9	309,811.9	1,257.2	1,257.2	159,900.8	159,900.8
Major Municipal	3,126,590.5	3,126,590.5	89,728.6	89,728.6	1,054,676.1	1,054,676.1
Minor Industrial	54,086.2	52,524.5	4,692.8	2,631.4	113,431.0	109,561.5

Total:	3,490,488.6	3,488,926.9	95,678.6	93,617.2	1,328,007.9	1,324,138.4
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## 2015 Loadings Summary Results

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**Description:** Model showing conditions as of end of FY 2015

**Initial Conditions:** 2010, revised: 10/2014

**Date Created:** 12/23/2015 3:00:29 PM

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### Total Loads

Load Type	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered	Lbs Phosphorus Edge of Stream	Lbs Phosphorus Delivered	Lbs Sediment Edge of Stream	Lbs Sediment Delivered
Landuse	638,831.7	417,774.3	45,922.8	32,672.9	31,255,907.3	30,173,703.2
Septic	0.0	0.0	0.0	0.0	0.0	0.0
Waste Water and Combined Sewer Output	3,490,488.6	3,488,926.9	95,678.6	93,617.2	1,328,007.9	1,324,138.4
Total:	4,129,320.3	3,906,701.2	141,601.4	126,290.1	32,583,915.2	31,497,841.6

### Total Annualized Costs

Sector	Total Annualized Cost
Urban Land	\$12,950,839
Septic	
Forest Land	\$1,439
Agricultural Land	\$0
Animal Manure	\$0
Total:	\$12,952,278

**Land Use Loads**Info on agreement with the Chesapeake Bay Program's Watershed Model 

Land Use	Pre-BMP Acres	Post-BMP Acres	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered	Lbs Phosphorus Edge of Stream	Lbs Phosphorus Delivered	Lbs Sediment Edge of Stream	Lbs Sediment Delivered
Sector: Agriculture								
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sector: Forest								
	2,247.7	2,247.7	7,384.8	4,546.9	114.9	67.4	308,983.8	298,309.3
Sector: Urban								
	49,534.8	49,534.8	628,727.0	411,263.1	45,661.5	32,504.5	30,946,920.0	29,875,390.0
Sector: Water								
	251.5	251.5	2,719.9	1,964.3	146.4	101.0	0.0	0.0
Total:	52,034.0	52,034.0	638,831.7	417,774.3	45,922.8	32,672.9	31,255,910.0	30,173,700.0

**Septic Loads**

Septic Zone	Pre-BMP Systems	Post-BMP Systems	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered
Critical Area	0.0	0.0	0.0	0.0
Within 1000 ft of a perennial stream	0.0	0.0	0.0	0.0
Outside of the Critical Area, not within 1000 ft of a perennial stream	0.0	0.0	0.0	0.0
Total:	0.0	0.0	0.0	0.0

**Wastewater Loads**

Facility Type	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered	Lbs Phosphorus Edge of Stream	Lbs Phosphorus Delivered	Lbs Sediment Edge of Stream	Lbs Sediment Delivered
CSO	0.0	0.0	0.0	0.0	0.0	0.0
Major Industrial	309,811.9	309,811.9	1,257.2	1,257.2	159,900.8	159,900.8
Major Municipal	3,126,590.5	3,126,590.5	89,728.6	89,728.6	1,054,676.1	1,054,676.1
Minor Industrial	54,086.2	52,524.5	4,692.8	2,631.4	113,431.0	109,561.5

Total:	3,490,488.6	3,488,926.9	95,678.6	93,617.2	1,328,007.9	1,324,138.4
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## BaltimoreCity\_2017\_Urban\_2015Aug\_2018 Loadings Summary Results

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**Description:** Baltimore City, Urban Stormwater Sector, Anticipated loading by the end of MS4 permit period

**Initial Conditions:** 2010 original

**Date Created:** 11/17/2011 1:22:33 PM

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### Total Loads

Load Type	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered	Lbs Phosphorus Edge of Stream	Lbs Phosphorus Delivered	Lbs Sediment Edge of Stream	Lbs Sediment Delivered
Landuse	632,201.9	413,894.9	40,299.2	29,058.8	18,555,200.0	17,750,581.5
Septic	85.6	85.6	0.0	0.0	0.0	0.0
Waste Water and Combined Sewer Output	3,490,488.6	3,488,926.9	95,678.6	93,617.2	1,328,007.9	1,324,138.4
Total:	4,122,776.1	3,902,907.4	135,977.8	122,676.0	19,883,207.9	19,074,719.9

### Total Annualized Costs

Sector	Total Annualized Cost
Urban Land	\$25,870,194
Septic	
Forest Land	\$1,201
Agricultural Land	\$0
Animal Manure	\$0
Total:	\$25,871,395

**Land Use Loads**Info on agreement with the Chesapeake Bay Program's Watershed Model 

Land Use	Pre-BMP Acres	Post-BMP Acres	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered	Lbs Phosphorus Edge of Stream	Lbs Phosphorus Delivered	Lbs Sediment Edge of Stream	Lbs Sediment Delivered
Sector: Agriculture								
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sector: Forest								
	1,875.8	2,063.6	6,781.1	4,117.6	105.4	60.6	285,740.8	271,720.6
Sector: Urban								
	49,906.7	49,719.0	622,700.9	407,813.0	40,047.4	28,897.2	18,269,460.0	17,478,860.0
Sector: Water								
	251.5	251.5	2,719.9	1,964.3	146.4	101.0	0.0	0.0
Total:	52,034.0	52,034.1	632,201.9	413,894.9	40,299.2	29,058.8	18,555,200.0	17,750,580.0

**Septic Loads**

Septic Zone	Pre-BMP Systems	Post-BMP Systems	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered
Critical Area	5.0	5.0	85.6	85.6
Within 1000 ft of a perennial stream	0.0	0.0	0.0	0.0
Outside of the Critical Area, not within 1000 ft of a perennial stream	0.0	0.0	0.0	0.0
Total:	5.0	5.0	85.6	85.6

**Wastewater Loads**

Facility Type	Lbs Nitrogen Edge of Stream	Lbs Nitrogen Delivered	Lbs Phosphorus Edge of Stream	Lbs Phosphorus Delivered	Lbs Sediment Edge of Stream	Lbs Sediment Delivered
CSO	0.0	0.0	0.0	0.0	0.0	0.0
Major Industrial	309,811.9	309,811.9	1,257.2	1,257.2	159,900.8	159,900.8
Major Municipal	3,126,590.5	3,126,590.5	89,728.6	89,728.6	1,054,676.1	1,054,676.1
Minor Industrial	54,086.2	52,524.5	4,692.8	2,631.4	113,431.0	109,561.5

Total:	3,490,488.6	3,488,926.9	95,678.6	93,617.2	1,328,007.9	1,324,138.4
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## **Appendix K: Progress of Regional TMDLs**

- Table K-1: Progress Status of Back River Nutrient TMDL
- Table K-2: Progress Status of Baltimore Harbor Nutrient TMDL
- Table K-3: Progress Status of Gwynns Falls Sediment TMDL
- Table K-4: Progress Status of Jones Falls Sediment TMDL
- Table K-5: Progress Status of Lower N. Patapsco Sediment TMDL

**Table K-1: Progress Status for Nutrient TMDL for Back River**

MS4 WIP Project ID	BMP Type	Location	Estimated Pollutant Removal		NOTES
			TN	TP	
<b>MS4 Baseline Load:</b>			<b>73,429</b>	<b>8,315</b>	
<b>Reduction Goal:</b>			15%	15%	
<b>BMPs installed between 2005 and 2010:</b>					
	Stream Restoration	Biddison Run Phase I	113	102	Previous MS4 Annual Reports. 1,500 LF restored.
	Private / Other City BMPs	12 BMPs	24	3	Appendix B of WIP.
		<b>Total removal between 2005 and 2010:</b>	<b>136</b>	<b>105</b>	
<b>Projects proposed within current MS4 permit:</b>					
		Total Projects (WIP):	3,011	1,895	Table H-1.
		Total Projects (Current Planned):	3,011	1,895	
		Total Projects (Current Completed):	0	0	
<b>Programs</b>					
	Street Sweeping		10,761	4,304	Table H-2, estimated distribution based on Table 1 of WIP.
			6,389	2,556	
	Inlet Cleaning		558	223	
			0	0	
	IDDE		1,599	291	
			0	0	
		<b>Total Programs (WIP):</b>	<b>12,918</b>	<b>4,818</b>	
		<b>Total Programs (Current):</b>	<b>6,389</b>	<b>2,556</b>	
<b>Partnerships</b>					
	Development		164	16	Table H-3, and Appendix B data (Table B).
			3	0	
	Voluntary		12	2	Table H-3, estimated distribution based on Table 1 of WIP.
			0	0	
	Stormwater Fee Program		87	8	Table H-3, estimated distribution based on Table 1 of WIP.
			26	1	
		<b>Total Partnerships (WIP):</b>	<b>263</b>	<b>26</b>	
		<b>Total Partnerships (Current):</b>	<b>29</b>	<b>1</b>	
<b>Total Reduction by end of MS4 Permit:</b>			16,328	6,844	
<b>% Reduction by end of MS4 Permit:</b>			22%	82%	
<b>Total Reduction Current Completed:</b>			6,554	2,662	
<b>% Reduction Current Completed:</b>			9%	32%	

**Table K-2: Progress Status for Nutrient TMDL for Baltimore Harbor**

MS4 WIP Project ID	BMP Type	Watershed	Location	Estimated Pollutant Removal (lbs / yr)		NOTES
				TN	TP	
<b>MS4 Baseline Load</b>				<b>260,323</b>	<b>28,177</b>	
<b>Reduction Goal</b>				15%	15%	
<b>BMPs installed between 2007 and 2010:</b>						
	ESD Practices	Gwynns Falls	Watershed 263 (5 locations)	20.4	3.26	Previous MS4 Annual Reports.
	Stream Restoration	Jones Falls	Lower Stony Run	139	126	Previous MS4 Annual Reports. 1,850 LF restored.
	Stream Restoration	Gwynns Falls	Maiden's Choice	203	184	Previous MS4 Annual Reports. 2,700 LF restored.
	Private / Other City BMPs	Gwynns Falls	4 BMPs	4	1	Appendix B of WIP.
	Private / Other City BMPs	Jones Falls	13 BMPs	84	10	Appendix B of WIP.
	Private / Other City BMPs	Baltimore Harbor	21 BMPs	34	5	Appendix B of WIP.
			<b>Total removal between 2007 and 2010:</b>	484	328	
<b>Projects proposed within current MS4 permit:</b>						
			Total Projects (WIP):	3,415	2,372	Table H-1
			Total Projects (Current Planned):	3,212	2,032	
			Total Projects (Current Completed):	156	141	
<b>Programs</b>						
	Street Sweeping			34,623	13,849	Table H-2, estimated distribution based on Table 1 of WIP.
				20,556	8,222	
	Inlet Cleaning			1,795	718	
				0	0	
	IDDE			5,143	935	
				0	0	
			<b>Total Programs (WIP):</b>	<b>41,561</b>	<b>15,502</b>	
			<b>Total Programs (Current):</b>	<b>20,556</b>	<b>8,222</b>	
<b>Partnerships</b>						
	Development			528	52	Table H-3, and Appendix B data (Table B).
				710	70	
	Voluntary			60	10	Table H-3, estimated distribution based on Table 1 of WIP.
				0	0	
	Stormwater Fee Program			280	27	Table H-3, estimated distribution based on Table 1 of WIP.
				84	4	
			<b>Total Partnerships (WIP):</b>	<b>868</b>	<b>89</b>	
			<b>Total Partnerships (Current):</b>	<b>794</b>	<b>74</b>	
<b>Total Reduction by end of MS4 Permit:</b>				<b>46,328</b>	<b>18,291</b>	
<b>% Reduction by end of MS4 Permit:</b>				18%	65%	
<b>Total Reduction Current Completed:</b>				<b>21,990</b>	<b>8,766</b>	
<b>% Reduction Current Completed:</b>				8%	31%	

**Table K-3: Progress Status for Sediment TMDL for Gwynns Falls**

MS4 WIP Project ID	BMP Type	Watershed	Location	Estimated Pollutant TSS (lb)	NOTES
<b>MS4 Baseline Load</b>				<b>14,410,000</b>	Listed as 7,205 tons (Table 2 of WIP)
<i>Reduction Goal</i>				49%	
<b>Projects proposed within current MS4 permit:</b>					
			Total Projects (WIP):	905,197	Table H-1
			Total Projects (Current Planned):	610,116	
			Total Projects (Current Completed):	62,400	
<b>Programs</b>					
	Street Sweeping			1,403,630	Table H-2, estimated distribution based on Table 1 of WIP.
				833,343	
	Inlet Cleaning			72,763	
				0	
			<b>Total Programs (WIP):</b>	<b>1,476,392</b>	
			<b>Total Programs (Current):</b>	<b>833,343</b>	
<b>Partnerships</b>					
	Development			14,943	Table H-3, and Appendix B data (Table B).
				82	
	Voluntary			1,450	Table H-3, estimated distribution based on Table 1 of WIP.
				0	
	Stormwater Fee Program			4,896	Table H-3, estimated distribution based on Table 1 of WIP.
				319	
			<b>Total Partnerships (WIP):</b>	21,288	
			<b>Total Partnerships (Current):</b>	401	
<b>Total Reduction by end of MS4 Permit:</b>				<b>2,402,878</b>	
<b>% Reduction by end of MS4 Permit:</b>				17%	
<b>Total Reduction Current Completed:</b>				<b>896,144</b>	
<b>% Reduction Current Completed:</b>				6%	

**Table K-4: Progress Status for Sediment TMDL for Jones Falls**

MS4 WIP Project ID	BMP Type	Watershed	Location	Estimated Pollutant TSS (lb)	NOTES
<b>MS4 Baseline Load</b>				<b>9,466,000</b>	Listed as 4,733 tons (Table 2 of WIP)
<b>Reduction Goal</b>				26.3%	
<b>Projects proposed within current MS4 permit:</b>					
			Total Projects (WIP):	296,825	Table H-1
			Total Projects (Current Planned):	302,799	
			Total Projects (Current Completed):	0	
<b>Programs</b>					
	Street Sweeping			1,179,049	Table H-2, estimated distribution based on Table 1 of WIP.
				700,008	
	Inlet Cleaning			61,121	
				0	
			<b>Total Programs (WIP):</b>	<b>1,240,170</b>	
			<b>Total Programs (Current):</b>	<b>700,008</b>	
<b>Partnerships</b>					
	Development			12,552	Table H-3, and Appendix B data (Table B).
				69	
	Voluntary			1,464	Table H-3, estimated distribution based on Table 1 of WIP.
				0	
	Stormwater Fee Program			4,113	Table H-3, estimated distribution based on Table 1 of WIP.
				0	
			<b>Total Partnerships (WIP):</b>	<b>18,128</b>	
			<b>Total Partnerships (Current):</b>	<b>69</b>	
<b>Total Reduction by end of MS4 Permit:</b>				<b>1,555,123</b>	
<b>% Reduction by end of MS4 Permit:</b>				16%	
<b>Total Reduction Current Completed:</b>				<b>700,077</b>	
<b>% Reduction Current Completed:</b>				7%	

**Table K-5: Progress Status for Sediment TMDL for Lower North Branch Patapsco**

MS4 WIP Project ID	BMP Type	Watershed	Location	Estimated Pollutant TSS (lb)	NOTES
<b>MS4 Baseline Load</b>				<b>1,220,000</b>	Listed as 610 tons (Table 2 of WIP)
<b>Reduction Goal</b>				25.1%	
<b>Structural / Traditional BMPs</b>					
			Total Projects (WIP):	3,663	
			Total Projects (Current Planned):	1,510	
			Total Projects (Current Completed):	0	
<b>Programs</b>					
	Street Sweeping			112,290	Table H-2, estimated distribution based on Table 1 of WIP.
				66,667	
	Inlet Cleaning			5,821	
				0	
			<b>Total Programs:</b>	<b>118,111</b>	
				<b>66,667</b>	
<b>Partnerships</b>					
	Development			1,315	Table H-3, and Appendix B data (Table B).
				0	
	Voluntary			0	Table H-3, estimated distribution based on Table 1 of WIP.
				0	
	Stormwater Fee Program			431	Table H-3, estimated distribution based on Table 1 of WIP.
				0	
			<b>Total Partnerships (WIP):</b>	<b>1,746</b>	
			<b>Total Partnerships (Current):</b>	<b>0</b>	
<b>Total Reduction by end of MS4 Permit:</b>				<b>119,857</b>	
<b>% Reduction by end of MS4 Permit:</b>				10%	
<b>Total Reduction by end of MS4 Permit:</b>				<b>66,667</b>	
<b>% Reduction by end of MS4 Permit:</b>				5%	