7.0 Permit Requirements

D. Management Programs

5. Property Management and Maintenance

a. Baltimore County shall ensure that a Notice of Intent (NOI) has been submitted to MDE and a pollution prevention plan developed for each County-owned municipal facility requiring NPDES stormwater general permit coverage. The status of pollution prevention plan development and implementation for each County-owned facility shall be reviewed, documented, and submitted to MDE annually.

b. The County shall implement a program to reduce pollutants associated with maintenance activities at County-owned facilities including parks, roadways, and parking lots. The maintenance program shall include these or MDE approved alternative activities:

i. Street sweeping;

ii. Inlet inspection and cleaning;

iii. Reducing the use of pesticides, herbicides, fertilizers, and other pollutants associated with vegetation management through the use of integrated pest management;

iv. Reducing the use of winter weather deicing materials through research, continual testing and improvement of materials, equipment calibration, employee training, and effective decision-making; and

v. Ensuring that all County staff receive adequate training in pollution prevention and good housekeeping practices.

The County shall report annually on the changes in any of the maintenance practices and the overall pollutant reductions resulting from the maintenance program. Within one year of permit issuance, an alternative maintenance program may be submitted for MDE approval indicating the activities to be undertaken and associated pollutant reductions.

7.1 Introduction

Baltimore County has a number of county owned facilities that are required to have NPDES stormwater general permit coverage (Section 7.2). The Department of Environmental Protection and Sustainability (EPS) has identified these sites and is assisting various departments in developing their stormwater pollution prevention plans, which includes good housekeeping and best management practices to prevent contaminants from leaving the site during rainstorms or a spill.

Baltimore County has established programs to reduce the amount of pollution that reaches the stream systems. Both the Storm Drain Cleaning Program (Section 7.3.1) and the Street Sweeping Program (Section 7.3.2) are the responsibility of the Baltimore County Department of Public Works (DPW) (Section 7.3). The Storm Drain Cleaning Program was originally created to remove the sediment from the storm drain systems in the watersheds of dredged tidal creeks,

thereby increasing the longevity of the original dredging. The program has since been expanded to clean the county's entire storm drain system, including the drain inlets, connecting pipes and outfalls. Debris, sediment, and pollutants can also be taken off the streets before they enter the storm drain system. This is accomplished with the Street Sweeping Program.

The County tracks its use of chemicals involved in vegetation maintenance (herbicides, pesticides, fertilizers) and deicing materials for winter weather conditions (Section 7.3), as well as Household Hazardous Waste (Section 7.4).

EPS coordinates with other county agencies through the NPDES Management Committee (Section 7.5).

7.2 General Permit for Stormwater Discharges Associated with Industrial Activity - Compliance of County Facilities with the General Industrial Stormwater Discharge Permit

The State of Maryland's current General Permit for Stormwater Discharges Associated with Industrial Activities went into effect on January 1, 2014. It is also referred to as the General Discharge Permit No. 12-SW, or simply "12-SW". It is administered by Maryland Department of Environment (MDE).

7.2.1 Regulated County Facilities - Status of NOIs and SWPPPs

County-owned industrial facilities requiring NPDES stormwater general permit coverage include general government sites such as highway shops, utility yards, vehicle/equipment maintenance and fueling facilities. Other public industrial sites, such as school bus yards and college campus maintenance facilities are also covered under this permit. These municipal industrial operations fall under various county agencies, including Public Works, Property Management, Public Schools, and the Baltimore County Community College.

7.2.1.1 Status of General Government Sites

The Department of Public Works (DPW) has assumed responsibility for ensuring that regulated general government facilities comply with the new permit requirements. Consultants conducted stormwater assessments on industrial sites, developed Stormwater Pollution Prevention Plans (SWPPPs), and designed restoration plans to address untreated impervious surface area as required by the county's NPDES-MS4 permit.

Table 7-1 shows the status of county facility compliance with the General Permit for Industrial Stormwater Discharge (12-SW) by agency or bureau. In FY 2016, there were a total of 32 permits in effect for general government industrial activities: DPW/Highways (18), DPW/ Utilities (4), DPW/Traffic Engineering (1), OBF/Vehicle Operations and Maintenance (3), and OBF/Property Management (6). Several sites have multiple permits due to multiple industrial uses on a shared site. Each industrial operator is responsible for maintaining their own permit and related requirements. There are no pending permits or Notice of Terminations. All documentation is centrally accessed on a system called "Dashboard". Table 7-1 also indicates if quarterly and annual inspections available on Dashboard, as well as images of sign in sheets for staff SWPPP training. In some cases, make up training sessions were held; they are shown with a second date.

EPS provides guidance to county agencies on preparation of the Notice of Intent (NOI) or No Exposure Certification (NEC), and the Stormwater Pollution Prevention Plan (SWPPP) as needed. In accordance with the requirements of the 12-SW permit, NOIs and SWPPPs have been prepared and submitted to MDE for all regulated general government sites. A Letter of Coverage from MDE states that all of these sites are covered, effective October 1, 2014. All Baltimore County municipal sites are in compliance.

DPW has contracted with the Maryland Environmental Service (MES) to conduct monitoring, maintenance, and updating of SWPPPs, handling of corrective actions, maintenance of data, tracking and reporting data, and training of staff at the regulated general government sites. MES has developed a customized database for tracking the data, and for generating notifications and work orders to established contacts when issues arise. They prepare quarterly reports on the inspections; see Miscellaneous Documents.

7.2.1.2 Status of Other County Agencies

This group includes public sites managed separately by Baltimore County Public Schools (13 sites) and the Community College of Baltimore County (3 campuses). All BSPS and CCBC sites are in compliance and are also included in Table 7-1.

Table 7-1: General SW Discharge Permit (12-SW) – FY 2016 Compliance Status of Baltimore County Industrial Sites

County Dept.	Bureau	Facility	Quarterly Inspections	Annual Inspections	SWPPP Training – date (# staff)
DPW	Highways	Bosley Avenue (Shop 5)	yes	yes	11/5/15 (11) 11/17/15 (11)
DPW	Highways	Brady Avenue (Shop 1)	yes	yes	10/29/15 (14) 12/3/15 (1)
DPW	Highways	Clarks Lane (Shop 3)	yes	yes	11/9/15 (12)
DPW	Highways	DPW Training Academy	yes	yes	11/17/15 (10) 12/3/15 (1)
DPW	Highways	Emala Ave (Shop 8)	yes	yes	11/12/15 (19)
DPW	Highways - EOM	Fullerton (EOM)	yes	No report on Dashboard	11/18/15 (40, EOM sites combined)
DPW	Highways - EOM	Glen Arm (EOM)	yes	yes	11/18/15 (see Fullerton)
DPW	Highways - EOM	Hunt Valley (Gilroy Avenue - shared EOM & Utilities; Notice of Termination, June 2015)	n/a	n/a	n/a

County Dept.	Bureau	Facility	Quarterly Inspections	Annual Inspections	SWPPP Training – date (# staff)
DPW	Highways	Hydes Road (Shop 7-2)	yes	yes	11/10/15 (13)
DPW	Highways	Industry Lane (Salt Dome)	yes	yes	unmanned
DPW	Highways - EOM	Inwood (EOM)	yes	No report on Dashboard	11/18/15 (see Fullerton)
DPW	Highways	Longview (Shop 6)	yes	yes	11/17/15 (6)
DPW	Highways	Middletown Road (Shop 4-2)	yes	yes	11/3/15 (9)
DPW	Highways	Perry Road (Shop 7-1)	yes	yes	11/10/15 (14)
DPW	Highways	Pikesville (Salt Dome)	yes	yes	unmanned
DPW	Highways	Ridge Road (Shop 4-1)	yes	yes	11/3/15 (8)
DPW	Highways	Sparrows Point (Shop 9)	yes	yes	11/12/15 (15)
DPW	Highways	White Hall (Shop 4-3)	yes	yes	11/3/15 (14)
DPW	Highways	Windsor Mill (Shop 2)	yes	yes	10/29/15 (13)
DPW	Utilities	Brady Avenue	yes	yes	11/19/15 (2)
DPW	Utilities	Essex	yes	yes	11/19/15 (2)
DPW	Utilities	Fullerton	yes	No report on Dashboard	11/19/15 (8) 12/3/15 (4)
DPW	Utilities	Pikesville	yes	yes	11/19/15 (2)
DPW	Traffic Engineering	Glen Arm	yes	yes	No sign in sheet on Dashboard
OBF	VOM	Randallstown (Liberty Road)	yes	yes	11/10/15 (2)
OBF	VOM	Hunt Valley (Gilroy Avenue)	yes	yes	11/10/15 (1) 12/3/15 (1)
OBF	VOM	Essex (Mace Avenue, satellite shop)	yes	yes	11/10/15 (1)
OBF	PM	Chesterwood Park (indoor storage only, not maintenance)	yes	yes	11/3/15 (12, PM sites combined)

County Dept.	Bureau	Facility	Quarterly Inspections	Annual Inspections	SWPPP Training – date (# staff)
OBF	PM	Double Rock Park	yes	yes	11/3/15 (see Chesterwood)
OBF	PM	Inwood	yes	No report on Dashboard	11/3/15 (see Chesterwood)
OBF	PM	Sparrows Point	yes	yes	11/3/15 (see Chesterwood)
OBF	PM	Special Forces	yes	yes	11/3/15 (see Chesterwood)
OBF	PM	Texas	yes	No report on Dashboard	11/3/15 (see Chesterwood)
BCPS	Transportation and Grounds	Arbutus Bus and Grounds			
BCPS	Transportation and Grounds	Cockeysville Transportation and Grounds			
BCPS	Transportation	Hopkins Creek Bus			
BCPS	Transportation	Inwood Transportation			
BCPS	Transportation	Kenwood			
BCPS	Grounds	Larchmont Grounds			
BCPS	Grounds	Loch Raven Grounds			
BCPS	Transportation and Grounds	North Point Transportation, Bus and Grounds			
BCPS	Transportation	Parkton Bus			
BCPS	Transportation	Providence Road Bus			
BCPS	Transportation	Rosedale Bus			
BCPS	Transportation	Wabash Bus			
BCPS	Transportation	Windsor Mill Bus			
CCBC		Catonsville Campus			

County Dept.	Bureau	Facility	Quarterly Inspections	Annual Inspections	SWPPP Training – date (# staff)
CCBC		Dundalk Campus			
CCBC		Essex Campus			

BCPS = Baltimore County Public Schools
CCBC = Community College of Baltimore County
DPW = Department of Public Works
EOM = Equipment Operation and Maintenance
OBF = Office of Budget and Finance
PM = Property Management
VOM = Vehicle Operation and Maintenance

7.2.2 Restoration Plans for Permitted Sites (General Government)

Phase One restoration projects to assist towards meeting the impervious surface area treatment requirement of the NPDES-MS4 permit were completed in 2014. Phase Two sites are mostly complete, four sites remain and are expected to be bid out during FY 2017. MES is under contract to maintain the BMPs implemented at the general government sites. See Section 10 for the list of restoration projects, the pollutant load reductions, and impervious surface credit calculations.

7.2.3 Employee Training

Training of on-site employees is an essential part of compliance with the 12-SW permit. All county industrial sites are required to conduct regular training and to keep a record of the training with their SWPPP at the site; documentation is also available on Dashboard.

7.2.3.1 Department of Public Works (DPW)

Training was conducted by Maryland Environmental Service (MES) on site at each facility with support from DPW (in some cases, sessions at related sites were combined). Sign in sheets for each facility represented are stored at the facility as required.

7.2.3.2 Baltimore County Public Schools (BCPS)

Between December 2015 and May 2016, 185 BCPS Transportation and Grounds employees completed SWPPP training.

BCPS employs over 1,000 bus drivers that work at various sites around the county. At the end of the school year, bus drivers have annual meetings. The BCPS Department of Facilities developed a Power Point presentation to train bus drivers on permit requirements and their role in maintaining a clean site.

7.2.4 Site Inspections by MDE

MDE inspected a number of county facilities for 12-SW permit compliance in the 2016 fiscal year; corrections were made as required. The county maintains its documentation on Dashboard.

7.3 Pollution Reduction Due to County Maintenance Programs

7.3.1 Storm Drain Cleaning

The initial compilation of the Baltimore County DPW storm drain geodatabase is complete. The geodatabase will be maintained with the results of field investigations, quality control, and compilation from recent storm drain drawings.

The Baltimore County storm drain system consists of approximately 1,447 active miles of storm drain pipes, channels, and swales, 55,535 inlets, 30,908 manholes, 20,217 in-network structures, and 7,784outfalls. Approximately 30-40% of inlets in older neighborhood are not found in the geodatabase or the storm drain drawing plans. Substantial field work will be needed if the County were to capture the locations of all the inlets in older neighborhoods.

In order to keep the entire storm drain system clean of trash, debris, and sediment, the Department of Public Works Bureau of Utilities maintains six Vactor 2100 Combination cleaning trucks and employs three crews of two men each on a daily basis to clean the storm drains and pipes. Removing the material from the storm drain system reduces street flooding, a potential safety hazard, reduces the amount of trash and sediment from entering streams, and aids in the detection of illicit connections. Please refer to PLRC_SOP_RT-022 for protocols on how inlet and pipe cleaning is conducted and how pollutant load calculations are performed in Baltimore County.

7.3.1.1 Storm Drain Cleaning Data Analysis

The removal rates for 1993 through 2016 are presented in Table 7-2. Inlet data are reported as the average annual cubic feet of material removed per inlet, and pipe data are reported in cubic feet of material removed per linear foot of pipe. Figure 7-1 shows a yearly comparison of the number of inlets cleaned and the total volume of material removed. Figure 7-2 shows the mean volume of debris removed per inlet. Figure 7-3 shows a yearly comparison of the length of pipe cleaned and the amount of material removed, and Figure 7-4 shows the mean volume of debris removed per linear foot of pipe.

Table 7-2: Removal Rates of Inlet and Pipe Cleaning by Year

Year	Inlet Vol. Cu. Yd.	# Inlets	Vol. / Inlet Cu. Yd.	Pipe Vol. Cu. Yd.	Length in feet	Vol. / Ft. Cu. Yd.
1993	760	8,955	0.08	1,186	68,830	0.0172
1994	769	2,615	0.29	347	21,193	0.0164
1995	642	1,532	0.42	306	14,491	0.0211
1996	1,536	1,347	1.14	1,558	67,676	0.0230
1997	1,731	1,485	1.17	2,822	119,900	0.0235
1998	2,059	1,178	1.75	988	93,918	0.0105
1999	662	462	1.43	446	38,451	0.0116
2000	689	580	1.19	672	89,145	0.0075
2001	902	746	1.21	585	46,319	0.0126
2002	919	602	1.53	409	34,384	0.0118
2003	660	428	1.54	519	30,374	0.0171
2004	898	653	1.37	1,169	54,795	0.0213
2005	1,385	888	1.56	1,001	53,069	0.0189
2006	950	659	1.44	538	30,891	0.0174
2007	429	223	1.92	179	10,257	0.0175
2008	664	377	1.76	238	16,572	0.0144
2009	591	373	1.58	288	19,450	0.0148
2010	354	313	1.13	172	13,310	0.0129
2011	466	605	0.77	441	28,069	0.0157
FY 2012*	407	619	0.66	434	25,761	0.0168
FY 2013	221	286	0.77	229	14,342	0.0160
FY 2014	260	209	1.24	439	19,372	0.0226
FY 2015	407	854	0.48	645	42,615	0.0151
FY 2016	225	181	1.20	150	25,791	0.0058
Totals	**18,586**	**26,170**	**0.71**	**15,761**	**978,975**	**0.0161**

* The analysis for 2012 was projected in terms of the 2012 fiscal year using data from January-June 2012, which was added to the ½ the value of the 2011 data.

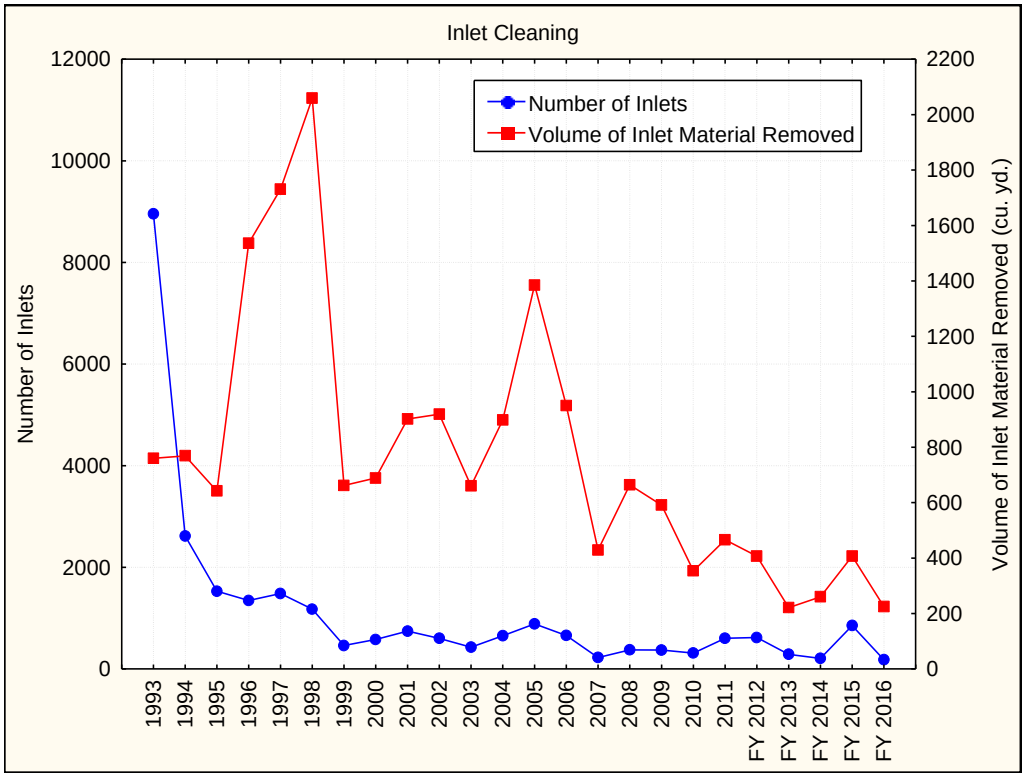

Figure 7-1: Inlets Cleaned and Volume of Material Removed per Year

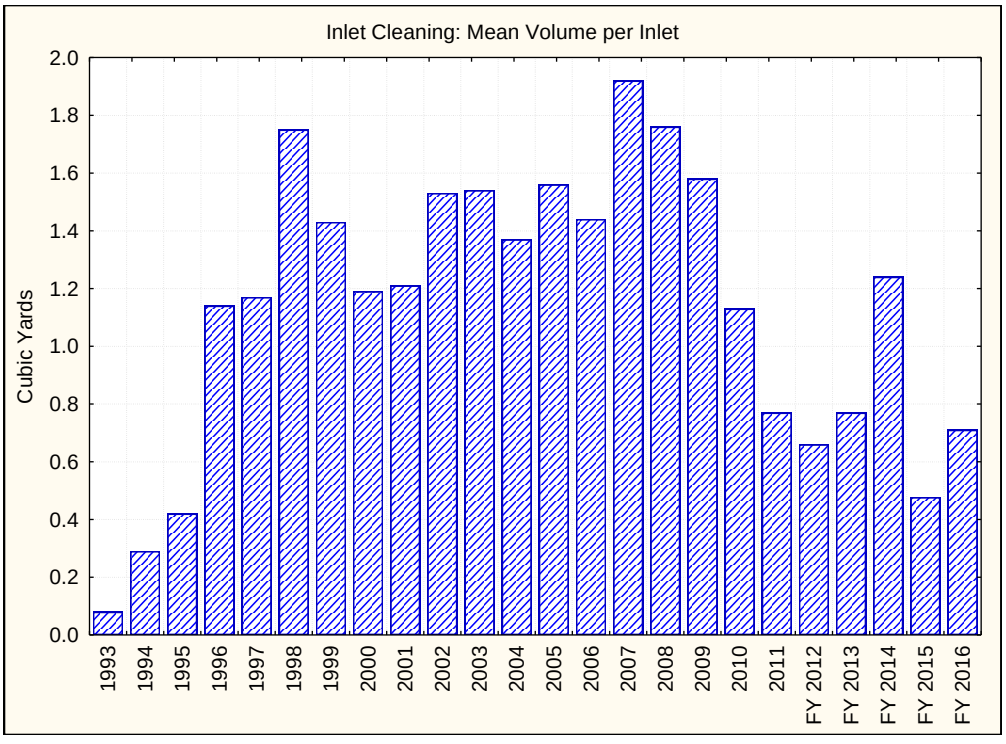

Figure 7-2: Annual Inlet Debris Removal Rates

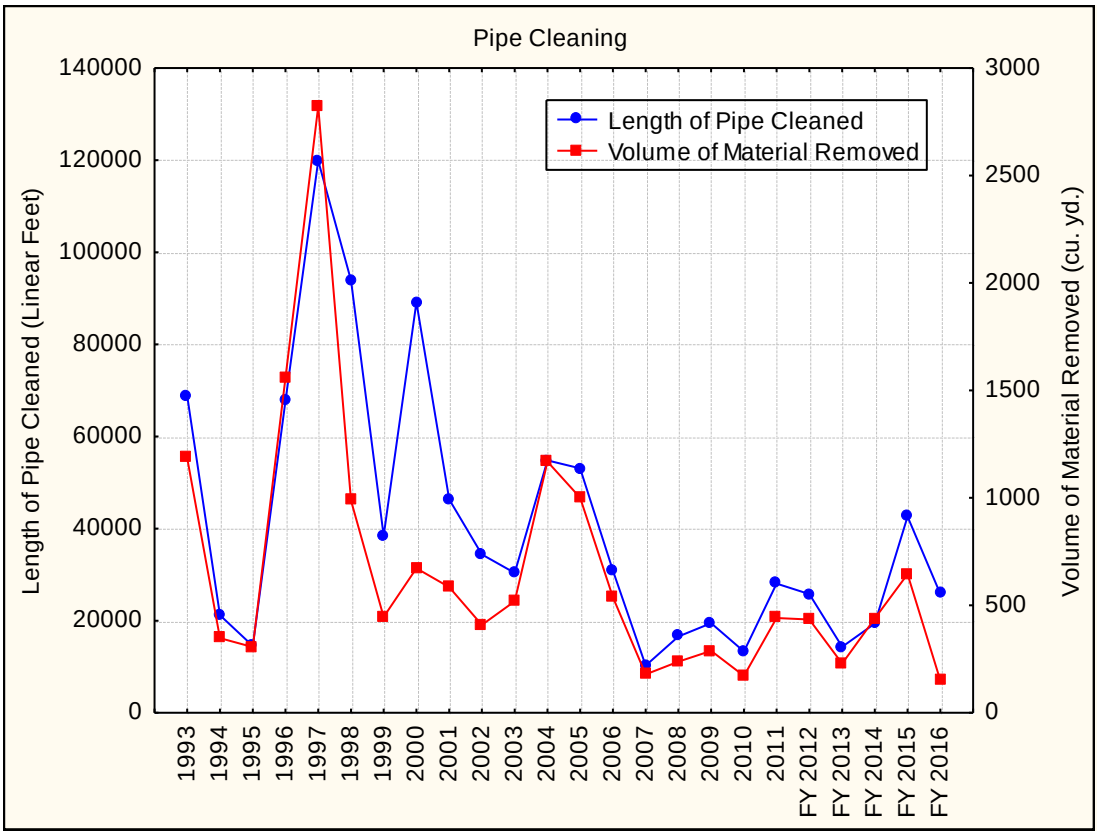

Figure 7-3: Length of Pipe Cleaned and Volume of Material Removed per Year

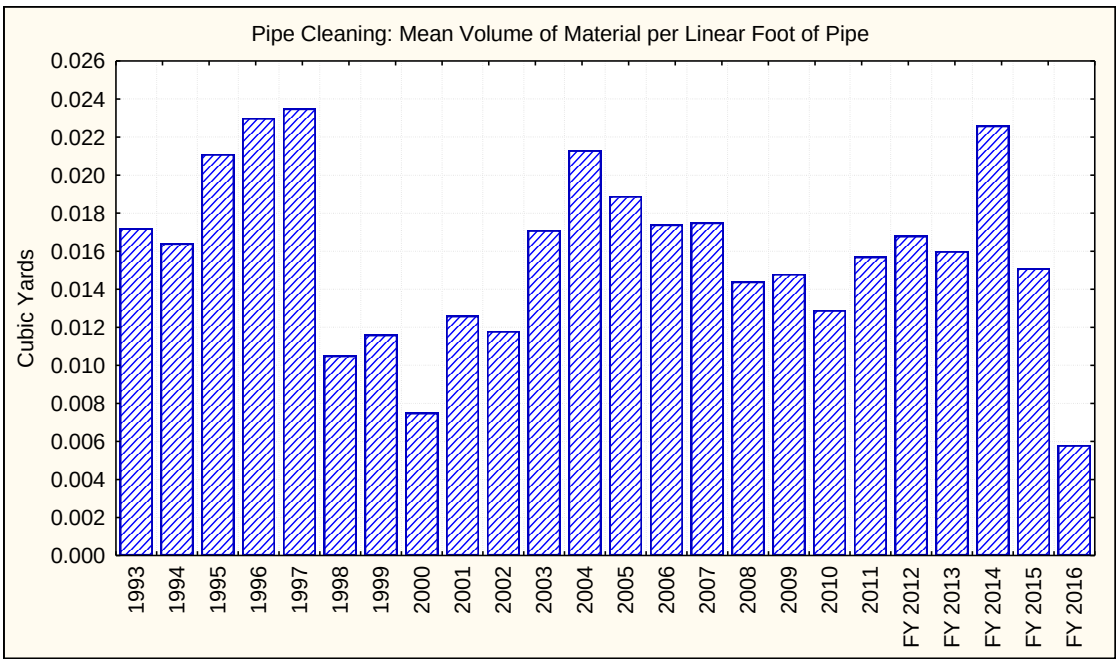

Figure 7-4: Annual Pipe Debris Removal Rates

For the period from 1993 through 1998, the average number of inlets cleaned was ~2,850 per year in contrast to ~627 per year in the 1999-2006, ~418 in the 2007-2012 time periods, and ~240 during 2013-2014. The number of inlets cleaned increased significantly in FY 2015 to 854 but then significantly decreased to 181 for FY 2016. The volume of material removed from inlets grew beginning in 1993 and peaked in 1998, at over 2,000 cubic yards of material removed (Figure 7-1). The total amount of material removed was lower for the years 1999 through 2003. There was an upward trend in 2004 and 2005 after which the volume of material removed has been consistently lower except in FY 12 when it rose slightly. In FY's 2014 and 2015, the amount of inlets cleaned and material removed rose substantially, however, the removal of material per inlet decreased. In 2016 the amount of inlets cleaned decreased substantially due to budget issues.

In the early years of the program (1993-1995), all inlets within the county were cleaned, some with little or no accumulation of material. This resulted in low volumes of material removed per inlet cleaned. This method was changed after 1995. The current storm drain cleaning program is driven by comments or complaints received via phone and web requests from citizens. There are also emergency based cleanings due to pipes or inlets being clogged.

The volume of material removed from pipes has steadily declined from an average of ~1,200 cubic yards between 1993 and 1998, ~667 cu. yd. between 1999 and 2006, and down to ~321 cu. yd. between 2007 and 2016 (see Figure 7-4). The average volume of material removed from pipes cleaned in these time periods has also declined. The volume removed per linear has varied.

Over the years the assumption of how full the pipe was before cleaning has been revised. In FY 2015 and 2016 it was assumed the pipe was 50% full before cleaning and then the volume of debris was determined. In previous years, 100% and 75% assumptions have been used.

It should also be noted that drought conditions from 1999 through 2002 might have resulted in less material being washed into the storm drain system. That material was likely removed by street sweeping. Conversely, the increase in removal rates in the 2003 to 2005 period was probably due to above average levels of precipitation. In general, it's typically smaller diameter pipes that get clogged and need cleaning whereas larger pipes receive more volume of water and are able to flush the debris more easily.

7.3.1.2 Storm Drain Cleaning Data by Watershed

The Storm Drain Cleaning data for the 2016 fiscal year, showing the total number of inlets and lengths of pipe cleaned for each of Baltimore County's fourteen (14) major watersheds, are displayed in Table 7-3.

Table 7-3: FY 2016 Material Removed in Cubic Yards by Watershed

Watershed	Inlets Cleaned	Inlet Volume Cleaned (Cu. yd.)	Length of Pipe Cleaned (Ft.)	Pipe Volume Cleaned (Cu. yd.)	Total Volume (Cu. yd.)
Upper Western Shore					
Deer Creek	1	1.2	200	1	**1.7**
Prettyboy Reservoir	0	0	0	0	**0**
Loch Raven Reservoir	6	3.9	1,515	9	**12.9**
Lower Gunpowder Falls	11	9.3	1,560	9	**18.3**
Little Gunpowder Falls	1	7.4	321	2	**8.9**
Bird River	7	4.4	1,649	8	**12.4**
Gunpowder River	1	-	670	3	**2.5**
Middle River	6	4.9	960	8	**12.4**
Upper Western Shore Totals	**33**	**31**	**6,875**	**38**	**69.2**
Patapsco/Back River					
Liberty Reservoir	0	-	273	5	5.0
Patapsco River	36	26.6	2,226	16	42.6
Gwynns Falls	28	47.0	3,780	19	66.0
Jones Falls	21	16.9	2,429	15	31.9
Back River	52	81.8	8,023	42	123.8
Baltimore Harbor	11	20.9	2,185	15	35.9
Patapsco/Back River Totals	**148**	**193.3**	**18,916**	**112**	**305.3**
County Totals	**181**	**224.5**	**25,791**	**150**	**374.5**

Approximately 82% of the material removed from the storm drain system was removed from the heavily urbanized Patapsco/Back River Basin, with Gwynns Falls, Jones Falls, and Back River having the highest amounts removed.

The amount of each pollutant removed and urban impervious area treated from each major watershed in the county during the 2015 Fiscal Year is shown in Table 7-4. Impervious Urban Area Treated was calculated by multiplying the tons of material removed by 0.40 as per MDE (2014). The pollutants removed from the Patapsco/Back River Basin watersheds were about five times the amounts removed from the Upper Western Shore watersheds. Please refer to PLRC_SOP_RT-022 for protocols on how inlet and pipe cleaning is conducted and how pollutant load calculations are performed in Baltimore County.

Table 7-4: FY 2016 Storm Drain Cleaning Program Pollutant Removal (Pounds) and Impervious Urban Acres Treated

Watershed	Debris (Cu. yd.)	Debris, non-trash (Tons)	TN Pounds	TP Pounds	TSS Pounds	EIUA[1]
Deer Creek	1.70	0.26	0.90	0.36	107.99	0.07
Prettyboy Reservoir	0.00	0.00	0.00	0.00	0.00	0.00
Loch Raven Reservoir	12.91	1.95	6.83	2.73	819.77	0.55
Lower Gunpowder River	18.35	2.77	9.71	3.88	1,165.22	0.78
Little Gunpowder Falls	8.94	1.35	4.73	1.89	567.74	0.38
Bird River	12.39	1.87	6.56	2.62	786.75	0.52
Gunpowder River	2.50	0.38	1.32	0.53	158.79	0.11
Middle River	12.43	1.88	6.58	2.63	789.62	0.53
UWS Totals	**69.21**	**10.47**	**36.63**	**14.65**	**4,395.89**	**2.93**
Liberty Reservoir	5.00	0.76	2.65	1.06	317.57	0.21
Patapsco River	42.63	6.45	22.56	9.03	2,707.55	1.81
Gwynns Falls	66.04	9.99	34.96	13.98	4,194.64	2.80
Jones Falls	31.87	4.82	16.87	6.75	2,024.33	1.35
Back River	123.83	18.73	65.54	26.22	7,864.77	5.24
Baltimore Harbor	35.95	5.44	19.03	7.61	2,283.28	1.52
Patapsco/Back River Totals	**305.32**	**46.17**	**161.60**	**64.64**	**19,392.15**	**12.93**
County Totals	**374.53**	**56.64**	**198.23**	**79.29**	**23,788.04**	**15.86**

[1]EIUA = Equivalent Impervious Urban Acres

7.3.1.3 Program Summary – Storm Drain Cleaning

Over the past twenty-three years, the storm drain cleaning program has removed ~34,347 cubic yards of material from the Baltimore County storm drain system. At 331 pounds per cubic yard, that amounts to approximately 11.4 million pounds. Without intervention, this material would have eventually entered our waterways.

7.3.2 Street Sweeping Overview

Removing materials such as trash, sediment, and debris, from public streets also results in a reduction of the pollutant load (toxins and nutrients) that could have entered waterways. Baltimore County removes these materials by utilizing a mechanical street sweepers managed by the Bureau of Highways. Please refer to PLRC_SOP_RT-021.02 for protocols on how street sweeping is conducted and how pollutant load calculations are performed in Baltimore County.

Table 7-5: Annual Street Sweeping Summary

Year	Miles Swept	Tons Debris Collected (wet)
1991	7,566	3,792
1992	6,663	3,161
1993	6,300	3,108
1994	8,532	7,473
1995	5,333	2,990
1996	8,605	2,990
1997	14,785	3,177
1998	24,863	2,792
1999	24,968	2,880

Year	Miles Swept	Tons Debris Collected (wet)
2000	21,949	2,491
2001	12,147	1,395
2002	7,800	2,364
2003	8,640	2,592
2004	6,617	1,985
2005	6,126	1,838
2006	6,306	1,892
2007	5,133	1,540
2008	4,110	1,233
2009	3,972	1,192
2010	3,937	1,181
2011	3,107	932
*2012	3,638	1,091
FY 2013	2,569	771
FY 2014	N/A	2,166
FY 2015	N/A	1,854.4
FY 2016	N/A	1,420.5

* The analysis for 2012 was projected in terms of the 2012 fiscal year using data from January-June 2012, which was added to the ½ the value of the 2011 data.

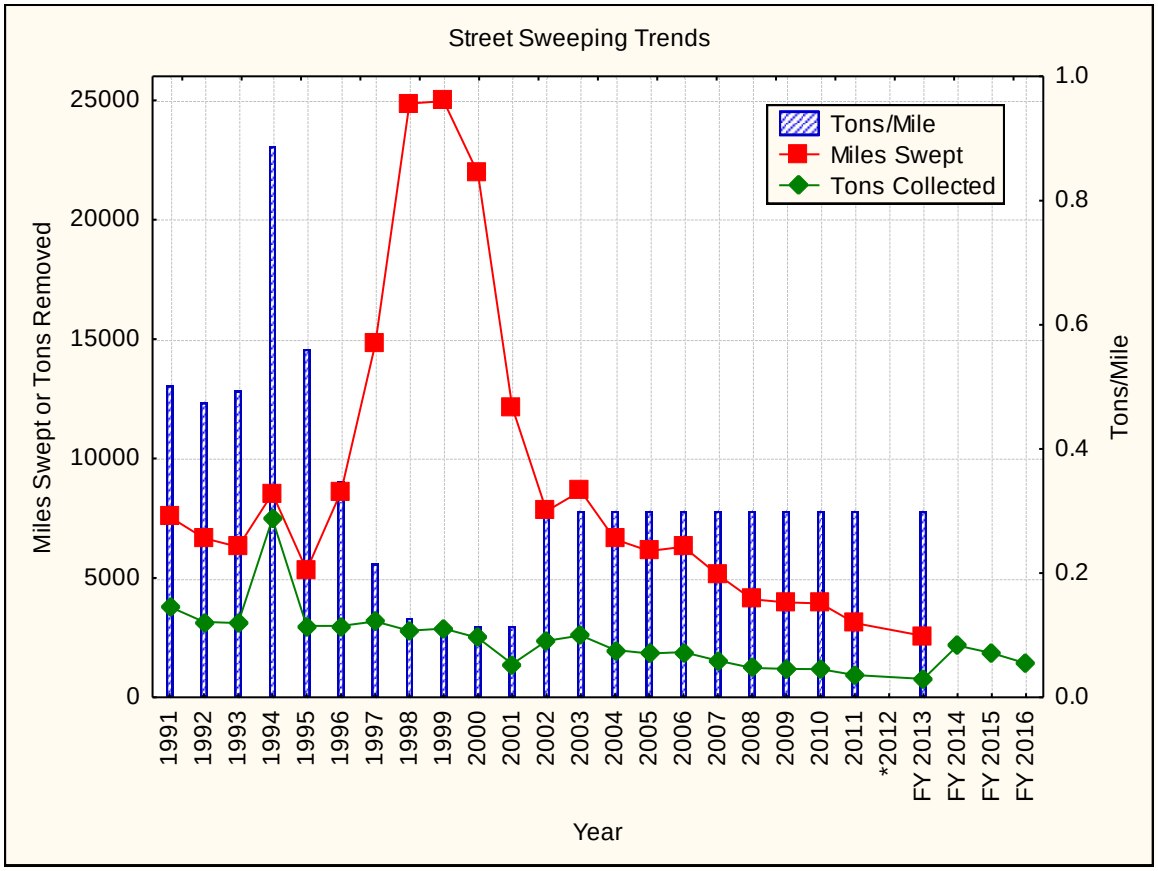

Figure 7-5: Miles of Street Swept, Tons of Material Removed, and Tons/Mile Swept

7.3.2.1 Street Sweeping by Watershed

Street sweeping data is reported as tons collected per highway shop. There are 11 highway shops in Baltimore County. Street sweeping is conducted only on roads with curb and gutters. Some alleys, County parking lots, and open roadways (without curb and gutter) are swept when requested. State Routes such as S.R. 45 (York Road) are not handled by the County; State Highway Administration is responsible those roads. Please refer to PLRC_SOP_RT-022 for protocols on how street sweeping is conducted and how pollutant load calculations are performed in Baltimore County. Table 7-6 shows the amount of each pollutant removed and urban impervious area treated from each major watershed in the county during the 2016 Fiscal Year.

Table 7-6: FY 2016 Street Sweeping Program Pollutant Removal (Pounds) and Impervious Urban Acres Treated

Watershed	(wet) Debris (Tons)	Debris, non-trash (tons)	TSS Pounds	TN Pounds	TP Pounds	EIUA[1]
Deer Creek	0.0	0.0	0.0	0.0	0.0	0.0
Prettyboy Reservoir	0.0	0.0	0.0	0.0	0.0	0.0
Loch Raven Reservoir	206.0	187.6	78,810.7	656.8	262.7	52.5
Lower Gunpowder Falls	94.9	86.5	36,318.7	302.7	121.1	24.2
Little Gunpowder Falls	15.7	14.3	6,015.1	50.1	20.1	4.0
Bird River	100.1	91.2	38,313.6	319.3	127.7	25.5
Gunpowder River	27.8	25.3	10,618.6	88.5	35.4	7.1
Middle River	77.2	70.3	29,536.3	246.1	98.5	19.7
UWS Totals	**521.7**	**475.3**	**199,612.8**	**1,663.4**	**665.4**	**133.1**
Liberty Reservoir	1.6	1.4	604.9	5.0	2.0	0.4
Patapsco River	59.9	54.5	22,904.7	190.9	76.3	15.3
Gwynns Falls	148.4	135.2	56,798.8	473.3	189.3	37.9
Jones Falls	88.5	80.6	33,858.6	282.2	112.9	22.6
Back River	320.6	292.1	122,678.2	1,022.3	408.9	81.8
Baltimore Harbor	279.8	254.9	107,042.3	892.0	356.8	71.4
P/Back River Totals	**898.8**	**818.8**	**343,887.6**	**2,865.7**	**1,146.3**	**229.3**
Annual County Totals	**1,420.5**	**1,294.0**	**543,500.4**	**4,529.2**	**1,811.7**	**362.3**

[1]EIUA = Equivalent Impervious Urban Acres

7.3.2.2 Program Summary - Street Sweeping

From 1991 to June of 2016, the Street Sweeping program removed 60,301 tons of debris from Baltimore County streets (Table 7-5). Without this program, this debris would have entered waterways.

The Street Sweeping program appears to have reached a maintenance level and now needs to be evaluated to determine where the most significant amounts of sediments are consistently collected. The number of times each route is swept each year, the land use, and other variables need to be factored into the program to increase its efficiency.

Both the Storm Drain Cleaning and Street Sweeping programs make a contribution to the County's overall goal of reducing sediment and other pollutants, including toxics and nutrients that enter the waters of the State. The tonnage collected by the street sweepers and storm drain cleaning trucks is not just pollutant-laden sediment, but includes significant amounts of paper, plastic, glass, wood, aluminum cans, and metal objects. During rainy weather the lighter, more floatable debris is washed into the storm drains, which is then removed by the Storm Drain Cleaning program instead of by the street sweepers.

7.3.3 Fertilizer, Pesticide, and Deicing Statistics

Members of the Baltimore County NPDES Management Committee have submitted statistics for usage of fertilizers, pesticides and deicing materials. Quantities of fertilizers and pesticides are reported in pounds, tons, gallons, and ounces. All results have been converted to pounds for this report. Fluid measure is assumed to have a density of 7.0 pounds per gallon. The statistics for FY 2016 (July 1, 2015 – June 30, 2016) by individual agencies are presented in Table 7-7. The amounts used by the entire county annually since 1999 are presented in Table 7-8, along with number of winter storms and snowfall in inches.

Table 7-7: July 1, 2015 – June 30, 2016 County Agency Fertilizer, Pesticide and Deicing Materials Use (in Pounds)

Golf Courses	Fertilizer	Pesticide	Deicing
Diamond Ridge	18,587	5,838	325
Greystone	17,690	6,450	450
Rocky Point	16,920	10,321	225
Fox Hollow	9,528	4,649	400
Woodlands	23,957	9,146	320
Golf Course Total	**86,682**	**36,404**	**1,720**
Agency	**Fertilizer**	**Pesticide**	**Deicing**
Catonsville Community College	0	9	63,460
Essex Community College	1,830	30	68,260
Dundalk Community College	0	14	27,000
County Public Schools	3,540	278	54,200
DPW - Bureau of Utilities	0	16	0
DPW - Bureau of Highways	0	280	89,502,000
DPW – Bureau of Solid Waste	5,600	0	2,400
Environmental Protection and Sustainability[1]	350	248	0
Property Management (athletic fields)	150,225	9,362	121,150
Non-Golf Course Total	**161,545**	**10,237**	**89,838,470**
Total County Pounds	**248,227**	**46,641**	**89,840,190**

1. EPS fertilizer use is only for tree nursery potting mix, not turf.

Recreation and Parks sites are maintained by Property Management, and DPW's forestry practices are included under the reporting for the Bureau of Highways.

7.3.3.1 Fertilizer

In 1998, the Maryland Legislature passed the Water Quality Improvement Act, also known as the nutrient management law. This law requires farms to develop and implement nutrient

management plans for application of fertilizer, animal manure and sludge. Non-agricultural nutrient applicators, including commercial lawn care companies, landscapers, golf course managers and public groundskeepers, are required by law to follow Maryland Cooperative Extension guidelines when applying nutrients to lawns, athletic fields or other landscapes ten acres or greater in size. Nutrient management plans were required to be developed by December 31, 2001 and implemented by December 31, 2002. Since implementation of the Water Quality Improvement Act, there has been an overall downward trend in fertilizer use by county agencies, with the recent exception of Property Management as it is enhancing its athletic fields (described below). In 1999, the first year that data was reported and just prior to the start of implementation of the Water Quality Improvement Act, a total of over 275,000 pounds of fertilizer was applied. From 2005 through 2011, the average amount of fertilizer used annually was about 150,000 pounds, which is 44% less than the 1999 high point, Baltimore County's data generally reflects the decrease in fertilizer use expected by this law.

In 2011, Maryland passed the Fertilizer Use Act of 2011, an environmental law designed to reduce the amount of nutrients washing into the Chesapeake Bay from lawns, recreation areas, golf courses, parks, and other non-agricultural areas. The law limits the amount of phosphorus contained in lawn fertilizer products sold to the public, establishes a training, certification and licensing program for people who are hired to apply fertilizer to non-agricultural landscapes, limits fertilizer amounts applied to turf, and requires the implementation of a homeowner education program about best management practices to be followed when using fertilizers. While certain restrictions on fertilizer use and application have been in place for farmers since 2001, only limited restrictions applied to commercial lawn care applicators and no restrictions applied to homeowners prior to the Fertilizer Use Act. The law was fully implemented by October 1, 2013. The Act contains new content requirements and labeling instructions for all lawn fertilizer products sold in Maryland. These changes are designed to help homeowners maintain healthy lawns without applying unnecessary amounts of certain nutrients. (From the Maryland Department of Agriculture, Fact Sheet: Fertilizer Use Act of 2011) For the full fact sheet: http://mda.maryland.gov/resource_conservation/Documents/fertilizerwebpage.pdf

In addition to the effects of the Water Quality Improvement Act of 1998, a number of factors have contributed to the highs and lows of fertilizer application, such as the number of county golf courses in operation (either five or six depending on the year) and whether agency data was reported. Among the county agencies that apply fertilizer products, golf courses were consistently the biggest users of these materials until FY 2015 when they lost the title to Property Management who tends the county's athletic fields. The all-time high year for total county fertilizer application remains 1999 at 275,400 pounds, with 2015 next highest at 264,900; 2016 was 248,200 pounds. The average amount of fertilizer used in FY 2016 by a county golf course was 17,300 pounds, with a total for the fiscal year of 86,682 pounds. A turf enhancement program for county athletic fields began in FY 2014 by Property Management resulting in a significantly higher amount of fertilizer applied. Over 69,000 pounds of fertilizer was applied to improve the condition of the county athletic fields in 2014, nearly 132,000 pounds in 2015, and 150,000 pounds in 2016. Property Management follows MDA guidelines and University of Maryland fertilizer specifications. This is about 101,874 pounds higher than the average annual county total from 2005 to the 2013 of 146,353 pounds (January – June 2012 data excluded), prior to the athletic field enhancement program. The average annual county total from the past three years since the athletic field enhancement program began is 237,335 pounds of fertilizer applied.

In FY 2016, Property Management was responsible for applying 60% of the total amount of fertilizer used by the county.

7.3.3.2 Pesticides

The chemicals that make up the category known here as "pesticides" include herbicides, insecticides, and fungicides. As a group, golf courses are the largest users of pesticides. There is not a distinct trend in pesticide use. FY 2016 brings an all-time high for pesticide use of 46,600 pounds. Over the years, reported pesticide use by county agencies has ranged from 21,000 pounds to the new high. Of that total amount, golf courses have reported collectively using from 19,000 to 36,000 pounds. In 2004, when the Gunpowder Falls Golf Course opened, an unusually high amount of pesticide was applied to that site (13,000 pounds), which accounts for the spike in pesticide use that year. Otherwise, there does not appear to be a relationship between the number of golf courses in operation and the amount of pesticide used. From 1999 to 2015, non-golf course use of pesticide ranges from 1,730 to 4,370, though in 2016 there was a sharp increase to over 10,000 pounds. The spike of 2016 results from a many-fold increase in use by Propery Management (athletic fields). Golf courses reported higher than average pesticide application in 2009, 2010, 2013, 2014, and 2015 (all between 32,000 and 36,000 pounds) contributing to the high totals for those years. In 2016, golf courses applied 36,400 pounds of pesticide.

7.3.3.3 Deicing

Deicing materials (road salts) are used by several county agencies. As expected, because of its responsibility to clear roads, the DPW Bureau of Highways remains the biggest user of deicing materials. In 2016, the Bureau of Highways applied 89,838,470 pounds, or 99.99% of the road salt applied by the county. Efforts will continue to be made to reduce the amount of deicing materials used through research, testing, equipment calibration, employee training, and effective decision making.

The amount of deicing materials used depends not only on accumulation of snow, but also the number of winter weather events. 2014 broke the record on the amount of deicing material used with 249,938,000 pounds applied. A total of 39 inches of snow fell in 20 separate storms that winter; icy road conditions are not tracked at this time. The January – June 2012 deicing data was included in the graph; although not a full year, autumn snow is uncommon in Baltimore County.

Table 7-8 shows the annual usage of fertilizer, pesticides and deicing material from 1999 through June 2016. As of 2016, EPS obtains winter storm data from DPW Highways. Snowfall is measured at the Highways shops. Only storms which have road treatment by the county are included in the number of storms. There is a complex relationship of snowfall and amount of deicer used due to size/frequency of storms, freezing rain events, and the effect of freeze and thaw on localized road treatment. Due to its location along the boundary of the Piedmont Plateau and Coastal Plain geographic provinces, the county experiences considerable weather variability.

Prior to 2016, snowfall data was obtained from NOAA's online preliminary monthly weather (summary) data archive. The number of winter weather events is attributable to the events with measurable snowfall ("heavy snow" and "snow" categories); the number of winter storms does not include "freezing rain" events, although road salt may be applied for these storms as well. (Note: there is a considerable difference in data between the data sources, but the Highways data

reflects actual conditions in the county. Conditions at BWI are often different than Baltimore County, hence the change. For example, if the NOAA data had been used for 2016, the report would show 35.1" of snow and 13 storms.)

Figure 7-6 shows data for Fertilizer and Pesticide Trends and Figure 7-7 shows the data for Deicer and Snowfall. The analysis for 2012 only reflects data collected between January and June 2012; this data was intentionally not included in the graph, as it does not represent an entire growing season. Since 2013, data is reported by the fiscal year (July 1 – June 30), not the calendar year.

Table 7-8: Annual Fertilizer, Pesticide and Deicing Materials Used By County Agencies (in Pounds)

Year	Fertilizer	Pesticide	Deicing Mat.	Snowfall (in.)	Number of Winter Weather Events
1999	275,400	34,320	83,978,000	12.4	8
2000	213,114	21,028	94,467,750	27.2	7
2001	221,609	21,509	48,566,400	7.4	5
2002	200,060	21,229	100,437,859	12.0	7
2003	191,726	22,137	205,164,341	58.0	8
2004	227,309	34,762	147,537,040	8.7	5
2005	133,881	20,899	185,118,740	24.5	7
2006	166,870	29,607	23,888,950	13.1	1
2007	131,191	26,362	156,690,026	14.4	11
2008	113,435	32,059	65,456,420	4.3	15
2009	170,175	35,279	151,208,045	28.6	9
2010	181,573	38,587	162,724,620	58.1	7
2011	158,866	29,778	133,892,760	13.2	7
2012*	90,546	14,878	23,162,196	1.8	3
2013 FY	170,644	37,244	65,614,500	8.0	3
2014 FY	198,889	56,325	251,133,425	39.0	20
2015 FY	264,889	36,920	205,325,015	28.7	20
2016 FY**	248,227	46,641	89,838,190	38.5	7

*2012 data is for January – June only

**As of FY 2016, weather data obtained from Baltimore County DPW - Highways

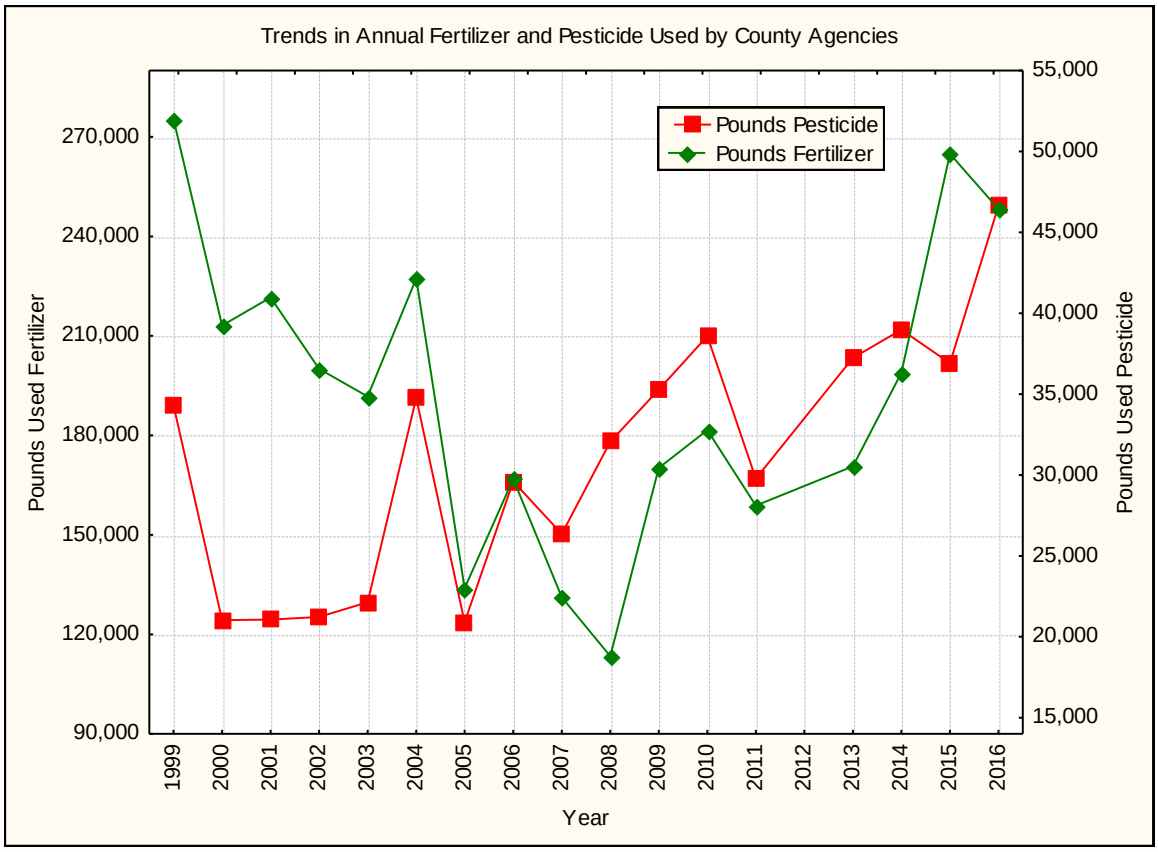

Figure 7-6: Trends in Annual Fertilizer and Pesticide Used by County Agencies

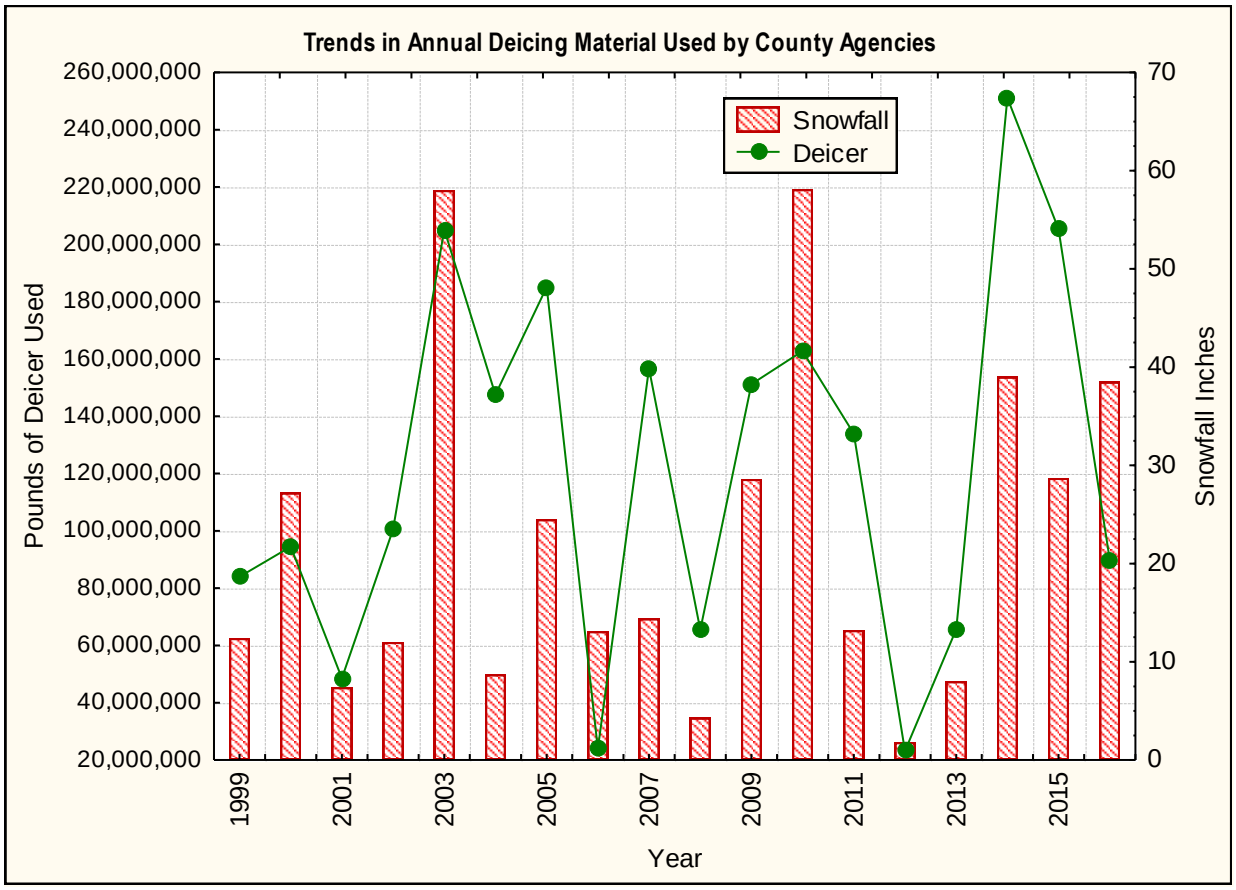

Figure 7-7: Trends in Annual Deicing Material Used by County Agencies

7.4 Household Hazardous Waste

There is one permanent drop off center at the Eastern Sanitary Landfill Solid Waste Management Facility, where Baltimore County citizens can drop off all household hazardous waste (HHW) materials year round (paints, automotive fluids, solvents, pesticides and herbicides, swimming pool chemicals, corrosive materials, rechargeable batteries, fluorescent light bulbs, mercury thermometers and thermostats, etc.). The landfill and on-site HHW collection facility is operated by the Department of Public Works (DPW).

There are also two permanent satellite collection facilities at the Central Acceptance Facility (CAF) in Cockeysville, and Western Acceptance Facility (WAF) in Halethorpe that accept some household hazardous waste materials year round (motor oil, anti-freeze, rechargeable batteries, fluorescent light bulbs, mercury thermometers and thermostats). Recently, gasoline collection year round was added at the CAF, and one day a year we collect all household hazardous waste materials at each of these two facilities. The spring collection day is at CAF, and the fall collection day is at WAF. These satellite locations are operated by MES, under contract with DPW. EPS oversees all three facilities, pays for the contractors, equipment and supplies. Table 7-9 provides a listing of material collected from all the facilities, including the one-day events, over the past eight years (2009-2016). Older reports have data from prior years.

Table 7-9 was modified in 2015 to more closely follow the reporting of materials collected as it comes to EPS. A number of the category names have been changed to more accurately reflect the

materials in that category. The listing has been alphabetized. There are a few entities (agencies and contractors) responsible for reporting amounts of materials collected. It is common for significant lag times occur between collection of materials and reporting of data to the EPS. Ultimately, over 25 different vendors are engaged in the recycling and disposal of household hazardous waste materials. To avoid data gaps, amounts have been estimated in some cases as indicated.

As evidenced by the continued citizen participation, EPS's recycling program for Household Hazardous Wastes continues to be a successful program. The contribution to reducing nonpoint source pollution remains significant.

Table 7-9: Household Hazardous Waste Recycled (2008-2016)

Material Type	2009	2010	2011	2012*	2013 FY	2014 FY	2015 FY	2016FY
Liquid Materials (gallons)								
Ammonia	****	****	****	****	****	****	****	****
Antifreeze	4,548	6,906	3,238	2,876	5,752	4,546	4,500	7,000
Gasoline	3,607	4,235	4,663	1,912	4,158	6,240	5,340	8,580
Motor oil	81,353	113,166	55,108	56,602	113,204	103,143	100,000	74,577
Paint (Latex)	13,560	13,690	18,905	9,303	12,793	14,130	20,454	13,905
Solvents/Oil Based Paint	7,260	7,975	9,460	4,305	6,340	9,400	6,215	11,580
Liquid Totals (gallons)	110,328	145,972	91,374	74,998	142,247	137,459	136,509	115,642
Solid and Liquid Materials (pounds)								
Asbestos Waste	***	111,180	119,940	63,000	126,000	81,380	69,240	80,080
Batteries (auto)	176,320	131,800	80,220	37,920	75,840	68,160**	72,460	75,100
Batteries (rechargeable)	1,238	2,089	2,169	2,453	5,253	5,433	4,471	7,080
Corrosives, combined	11,681	7,400	7,200	3,550	6,201	15,300	*****	*****
Corrosives/acid							5,700	3,800
Corrosives/base							9,900	5,225
Electronics	2,386,580	4,488,940	3,496,060	1,843,590	3,687,180	425,640	800,000	697,720
Explosives/ Fireworks							6	pending
Freon (white goods)	742	863	1,018	392	784	1,224**	877	***
Medicines (Pharmaceuticals)	***	***	***	120	240	1,735	520	364
Mercury	42	54	51	95	120	102	50	See below
Oxidizers	1,796	500	1,370	500	731	1,262	1,124	611
PCB Oil	1	1,690	2,310	1,836	2,081	2,298	1,100	0

Pesticides	11,031	6,870	10,400	5,275	9,987	27,135	19,600	19,850
Propane Cylinders	14,560	11,460	14,400	4,000	8,000	7,160**	6,000	See below
Reactives	21	1	5	25	25	42	30	0
Toxics	12	61	0	36	41	86	20	0
Solid/Liquid Totals (pounds)	2,604,024	4,762,908	3,735,143	1,962,792	3,922,483	560,413**	991,098	889,830
Number of Items								
Ammunition, Rounds	815	2,779	2,026	1,015	2,029	125	1,033	pending
Flares, Road/ Marine							55	pending
Fluorescent Light Bulbs	22,449	46,767	69,615	30,388	50,102	59,289	69,153	64,696
Number Totals	**23,264**	**49,546**	**71,641**	**31,403**	**52,131**	**59,414**	**70,241**	**64,696**

* 2012 data is only for Jan. – June, due to transition to fiscal year reporting

** Updated or newly added data from a previous year; data was not available at the time of the previous report

*** Not recorded for these years, or no longer tracked

**** Ammonia is now being included with the corrosives – base

***** Corrosives are reported separately as acid or base, as of 2015

1. Mercury was not recycled in FY16, and is being consolidated for future shipment
2. Propane cylinders no longer tracked separately, combined with scrap metal

Numbers in red are estimates based on past collection results; data was not available at the time of the report

7.4.1 Materials Reported in Gallons

In addition to the liquid materials described in this section, there are other liquids reported in pounds due to methods of collection and transport, such as corrosives and pesticides.

7.4.1.1 Ammonia

Starting in 2008, ammonia was combined with corrosive liquids (base). It is disposed through the waste water treatment system.

7.4.1.2 Antifreeze

Collection of antifreeze has ranged from about 3,000 to 7,000 gallons over the past ten years. Antifreeze is recycled throughout the county at drop-off facilities operated by DPW, in cooperation with the Maryland Environmental Service (MES). Over 100,000 gallons of anti-freeze have been recycled in Baltimore County since 1991.

7.4.1.3 Gasoline

The amount of recycled gasoline had remained relatively steady in a range of 2,000 to 3,000 gallons per year, until 2009 when over 3,600 gallons were collected. With the exception of 2012 (half year data), over 4,000 gallons of gasoline has been collected each year since 2010 with a new all-time high of 8,580 gallons reported for 2016.

7.4.1.4 Motor Oil

Motor oil remains the most frequently recycled household hazardous waste. Motor oil is recycled throughout the county at drop-off facilities operated by DPW, in cooperation with the Maryland

Environmental Service (MES). Statistics for recycled motor oil for all participating collection facilities have been reported since 1991. Oil and antifreeze recycling is reported through MES, local government, and private facility partnership efforts. Additional unreported recycling of oil and anti-freeze occurs through a network of 65 private sector collection centers across the county, most of which are neighborhood gas/service stations. EPS provided assistance in establishing the motor oil and antifreeze recycling program at the DPW facilities. County drop-off sites include landfills, transfer stations, two rural DPW Highways shops, and the Bowley's Quarters Marina.

As can be seen in Figure 7-8, the recycling of motor oil was typically between 90,000 and 100,000 gallons from 1998 to 2005. It was between 75,000 and 85,000 for the following four years. In 2010 and FY 2013, motor oil collection reached a high of over 110,000 gallons. A total of over 2,000,000 gallons of motor oil has been collected for recycling since 1991. 74,577 gallons of motor oil was collected in 2016.

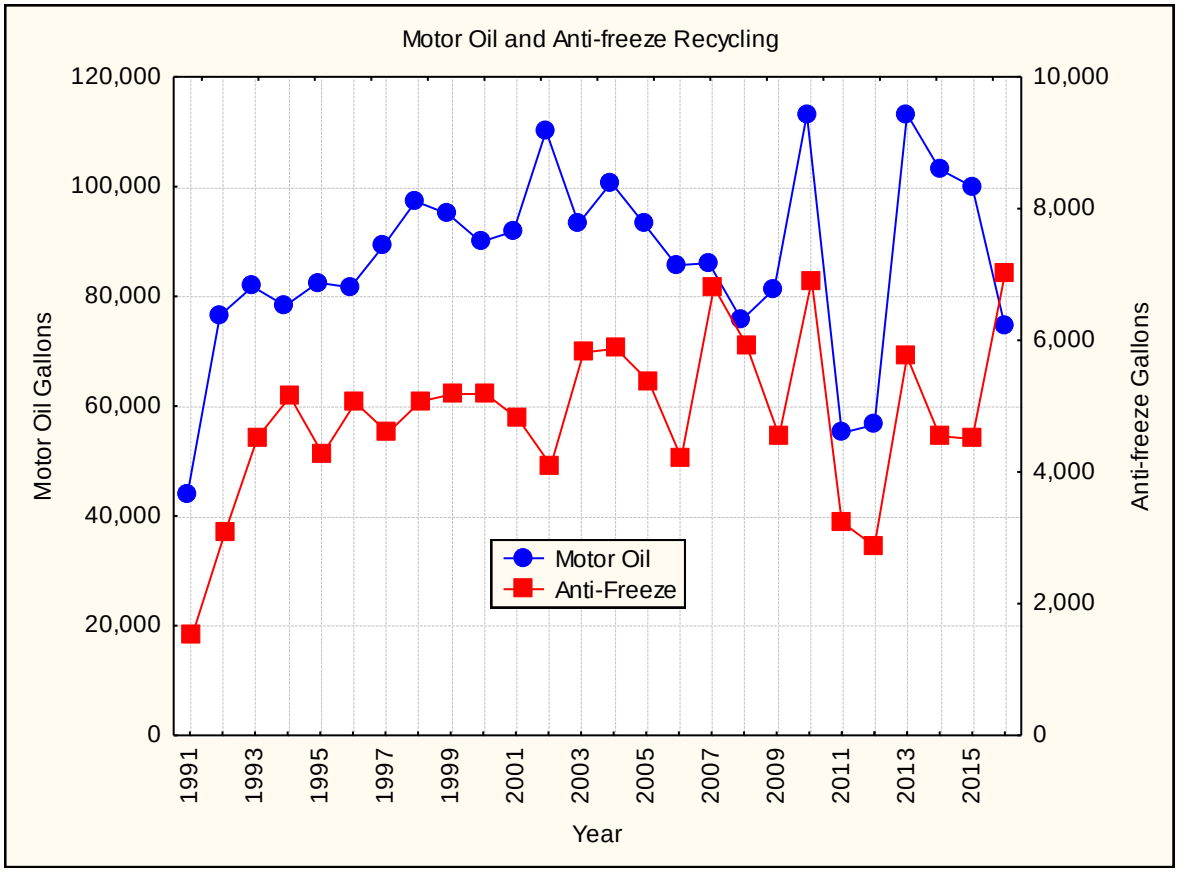

Figure 7-8: Motor Oil and Anti-freeze Recycled from 1991 through FY 2016
*** 2012 data reflects on January – June of that year**

7.4.1.5 Paint (Latex)

Collected water-based paints are distributed for re-use through the Loading Dock in Baltimore City, a non-profit building materials re-use facility. An all-time high was reached in 2015 of over 20,000 gallons; 13,905 gallons were collected in 2016.

7.4.1.6 Solvents/Oil Based Paint (includes flammables)

In previous reports this category was reported as "flammables". The materials in this category are all combustible, however they are not all flammable, as determined by a substance's flash point temperature. Paint sludge is now bulked together into the same drums with other combustible material (solvents). Over the past ten years, the amount of solvents collected has ranged between about 4,000 and 9,000 gallons per year. In 2015, a high mark of 11,580 was reached.

7.4.2 Materials Reported in Pounds

7.4.2.1 Asbestos

Asbestos waste has been handled appropriately since the 1980's, however it was not reported as household hazardous waste until 2010. From 2010 to 2013, over 110,000 pounds of asbestos were collected each year (data for the 2012 column is only half the year). Since 2014, the quantity has averaged around 77,000 pounds, with 2016 at 80,080 pounds.

7.4.2.2 Batteries – Auto

There was a decrease in auto batteries recycled in 2008 likely due to the sluggish economy. People may have sold their batteries to salvage yards, instead of dropping them off at the landfill. Also in 2008, auto batteries were being stolen from the landfill, and as a result the area was fenced and locked. In 2009, the quantity of batteries collected returned to a more typical level, but since 2011 collected amounts have been between 68,000 and 80,000.

7.4.2.3 Batteries – Rechargeable

Generally, there has been an increase in rechargeable batteries collected for recycling with over 4,400 pounds collected each year from 2013 to 2015. A jump in the amount was seen in 2016 with over 7,000 pounds.

7.4.2.4 Corrosives

There are acid and base corrosives. These are liquid materials, but they are reported in pounds due to collection and transport methods, including partially filled containers. As of this report, the acid and base corrosives are shown separately, instead of being combined. Acid corrosives are stabilized and disposed of in the landfill (3,800 pounds in 2016). Base corrosives, which includes ammonia, are disposed through the waste water treatment system (5,225 pounds in 2015).

7.4.2.5 Electronics

Beginning in October 2009, it became illegal in Baltimore County for residents to dispose of household electronics as trash. Collection of unwanted electronics for recycling began that year and very quickly became a major source of material to be diverted from the waste stream. Electronics contain mercury, lead, cadmium, and arsenic which should not go into a landfill or waste-to-energy facilities. Types of electronics collected for recycling include computer equipment, VCRs, DVD players, telephones, stereos, fax machines, and video display devices. Televisions were excluded from the collection in 2015, due to market factors. In 2010, the quantity of electronics collected was 4,488,940 pounds, a near doubling of the amount collected in the fall of 2009. Roughly, 3,500,000 pounds per year were collected from 2011 through 2013,

however less than 1,000,000 pounds were collected each year since 2014. Nearly 700,000 pounds of electronics were collected in 2016. Three drop off centers accept electronics throughout the year.

7.4.2.6 Explosives/Fireworks

No data was available for this category for 2016. Explosives and fireworks are destroyed by the Baltimore County Police Bomb Squad.

7.4.2.7 Freon from White Goods

All refrigerators and air conditioners are separated out at the landfill and transfer stations for the Freon to be removed for recycling. Between 400 and 1,200 pounds of Freon were recycled per year over a nine year period. As of 2016, data on Freon is no longer tracked.

7.4.2.8 Medicines (Pharmaceuticals)

Beginning in 2009, expired and un-wanted medicines were collected for proper disposal by the Police Department at one-day events. Initially, approximate weights of the materials collected were included in the "toxics" category. In 2012, medicines were shifted to a separate category for tracking. As of September 2013, unwanted/expired medicines were accepted at police stations in outdoor locked drop-off boxes, which has resulted in a big jump in the amount of material collected. There was a surge in collection in 2014 of approximately 1,735 pounds, but the past two years have seen between 364 and 520 pounds collected. Pharmaceuticals are disposed of by incineration.

7.4.2.9 Mercury

Mercury TMDLs are in effect for the Prettyboy and Loch Raven Reservoirs in fish tissue. Liberty Reservoir has been de-listed for mercury due to an adequate reduction of mercury in fish tissue samples, so the Liberty mercury TMDL is no longer in effect. Future fish tissue sampling may also lead to de-listing in Prettyboy and Loch Raven. Although mercury contamination is mainly attributed to atmospheric deposition, the Household Hazardous Waste Program helps to meet the reduction of mercury that could potentially end up in our waterways. Mercury was added to the list of household hazardous wastes in 2001, when 168 pounds were collected. Since then, collected amounts have ranged from 22 to 125 pounds per year. Mercury was not recycled in 2016, it is being consolidated for future shipment.

7.4.2.10 Oxidizers

Between 500 and 1,800 pounds of oxidizers have been collected per year over the past ten years. In 2016, 611 pounds of oxidizers were collected. This material is stabilized and landfilled.

7.4.2.11 Polychlorinated Biphenyl Oil (PCBs)

TMDLs are in effect for PCBs in the Jones Falls, Back River and Baltimore Harbor watersheds. There is PCB oil and PCB ballasts from fluorescent bulbs. Variation from year to year for PCB ballasts is in part due to the limited collection amount and timing of shipping a drum to the recycler/disposer. A drum is only shipped out when it is full. In 2016, there was no data for PCB oil or ballast shipments. Ballasts are recycled, and oil is incinerated.

7.4.2.12 Pesticides

TMDLs for chlordane, a pesticide banned since 1988, are in effect for the Back River and Baltimore Harbor watersheds. The Jones Falls has been de-listed for chlordane, so its chlordane TMDL is no longer in effect. The quantity of pesticides collected has varied greatly over time with a high of 27,000 pounds collected in 2014. The previous high was 18,256 pounds in 2007. In 2010, just 6,870 pounds of pesticides were collected. Over 19,000 pounds of pesticide were collected in 2015 and 2016. Solid and liquid pesticides are collected, but both are reported in pounds. There is no differentiation of types of pesticides collected. These chemicals are disposed by incineration.

Figure 7-9 displays the estimated statistics for recycled flammables, gasoline and pesticides.

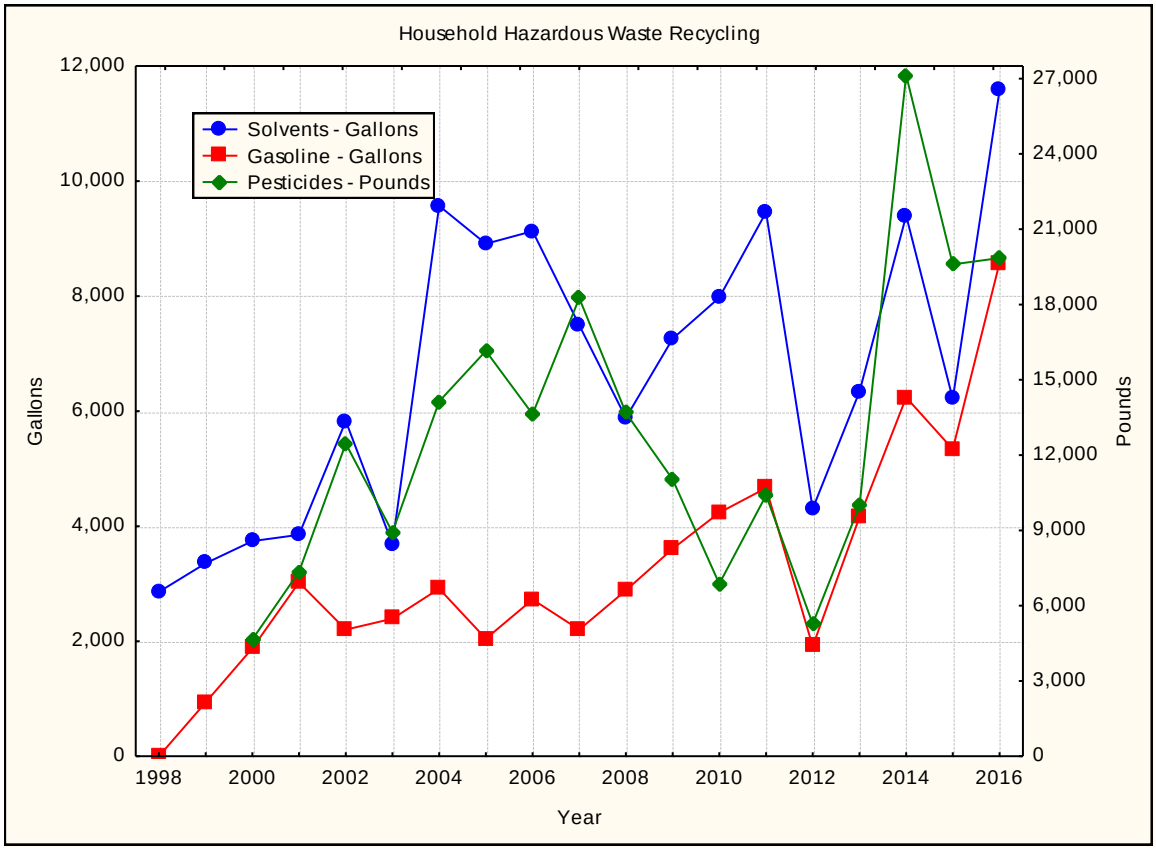

Figure 7-9: Household Hazardous Waste Recycling of Solvents, Gasoline, and Pesticides from 1998 to FY 2016

* Only one collection event held in 2003; fall collection was cancelled due to a hurricane.
** 2012 data reflects on January – June of that year

7.4.2.13 Propane Cylinders

Between 4,000 and 42,000 pounds of propane cylinders have been collected per year over the past ten years. As of 2016, propane cylinders are no longer being tracked; they are recycled along with other scrap metal.

7.4.2.14 Reactives

Between one and 42 pounds of reactive materials have been collected per year over the past ten years for incineration. No reactives were reported for 2016.

7.4.2.15 Toxics

Up to 257 pounds of toxic materials have been collected in a year for disposal by incineration. No toxics were reported for 2016.

7.4.3 Materials Reported by Number

7.4.3.1 Ammunition Rounds

The Baltimore County Police Department Bomb Squad destroys ammunition that is brought to the Household Hazardous Waste collections. Over the past ten years, from about 100 to 2,800 rounds of ammunition were collected. Results are pending for 2016.

7.4.3.2 Flares, Roadside/Marine

Various types of flares are destroyed either at the Eastern Sanitary Landfill, or by the Bomb Squad (one day events). Fifty-five flares were collected in 2015, the only year that this material was reported. It was either combined with explosives (by weight) or flares were not collected.

7.4.3.3 Fluorescent Light Bulbs

In 2010, fluorescent light bulbs from county buildings were included in the Household Hazardous Waste tallies, which more than doubled the quantity of the previous year. The highest collection of these bulbs was in 2011 at 69,615. Over 64,000 fluorescent bulbs were collected in 2016 for recycling.

7.5 NPDES Management Committee

This committee is composed of representatives from several county agencies with responsibility for property management and maintenance of county facilities. The committee meets periodically to discuss issues related to NPDES-MS4 compliance. In the upcoming year, it is our intent to meet with the committee to discuss regulation of fertilizer and pesticide use, and potential ways to reduce the amount used.

There was not a general committee meeting in FY 2016, however the Department of Environmental Protection and Sustainability is in close contact with other agencies.

7.6 Sanitary Sewer Repair Tracking

In Baltimore County the population that lives inside the metropolitan district is primarily supported by the sanitary sewer system. The county has been making repairs to the sewer system, and these are expected to reduce bacteria entering our waterways. This section outlines the sanitary sewer repairs and our method of tracking these repairs. Bacteria TMDLs are in effect for Back River (Herring Run only), Gwynns Falls, Jones Falls, Liberty Reservoir, Loch Raven Reservoir, Lower North Branch of Patapsco River, and Prettyboy Reservoir.

7.6.1 Data Sources and Methodology

Bacteria monitoring locations were used as reference points to summarize the records of sewer repairs. Drainage areas for these locations were digitized in GIS using ArcHydro and manual

delineation using topography and county and city digital elevation model (DEM) data. Figure 7-10 below shows the locations of the bacteria monitoring points used to summarize the data in this section. Monitoring locations that have drainage areas entirely outside the metropolitan district (public sewer service area) are not included in this section as well as areas that do not have any sewer repair data.

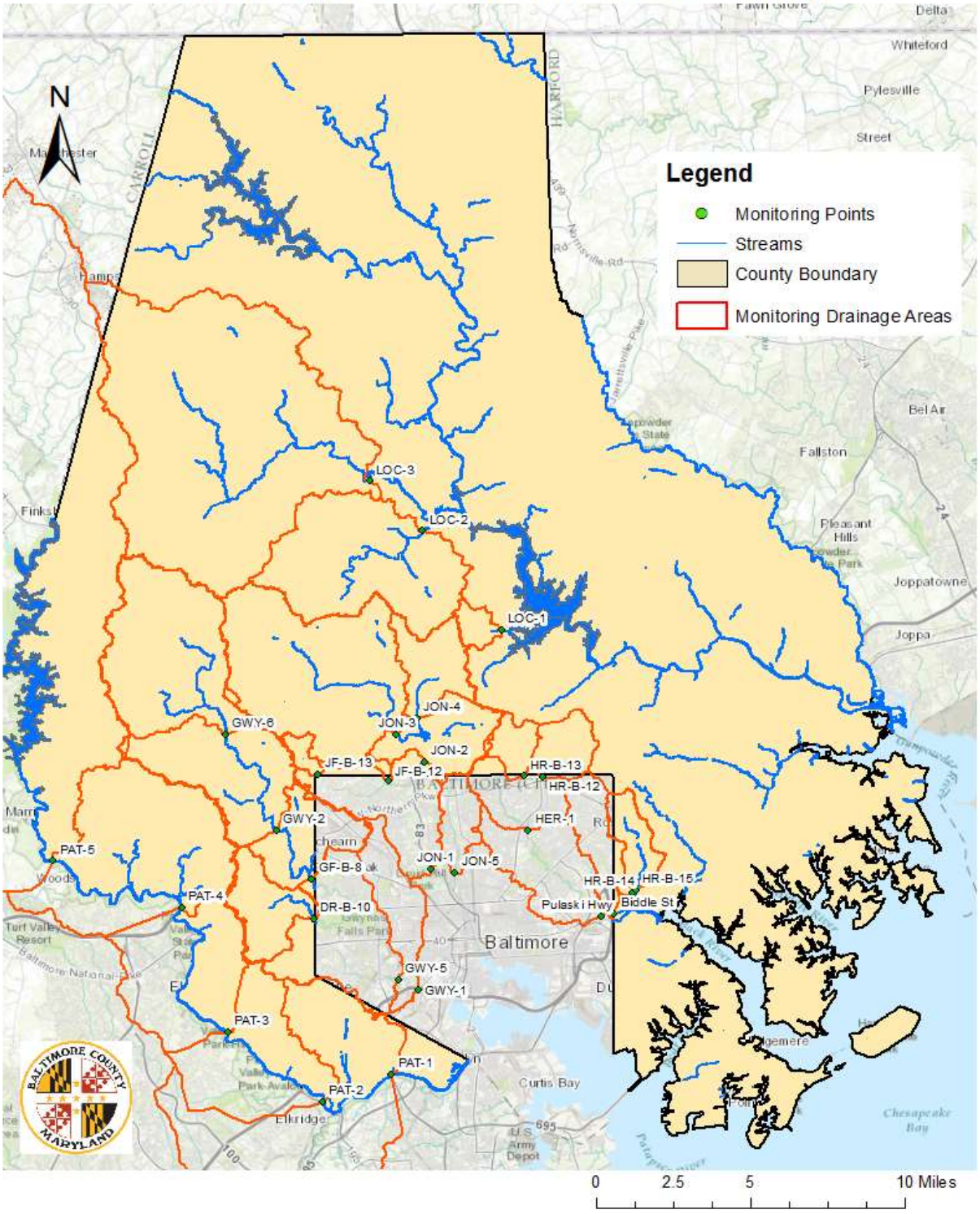

Figure 7-10: Baltimore County Bacteria Monitoring Locations with Sewer Repair Data

The consent decree mandated in 2005 by the EPA and MDE requires the County to complete repairs to sanitary sewer overflow structures (SSOs) and pump station structures. Using data compiled from the Department of Public Works and consent decree appendices we summarized the progress of these repairs. We completed an overlay analysis of the SSO repairs to each of our bacteria monitoring drainage areas to get the count and status of repairs. SSOs were either substantially completed with the overflow pipe plugged (completed) or substantially complete with the overflow pipe open (to be completed). Pumping stations labeled as substantially complete were tallied for the complete 'pump station repairs' column of the tables below. There were no incomplete pump station repairs in the consent decree appendices.

The development and implementation of sewer replacement, repair, and rehabilitation (SRRR) plans is also required as a part of the consent decree. SRRR plan information was taken from the consent decree monthly report from June 2015 and assigned to the corresponding sewershed in order to associate each SRRR plan with an area in the county, creating a SRRR plan feature class. Using the bacteria monitoring drainage areas and sewer SRRR plan feature class, an implementation date for each drainage area was recorded and is shown in the tables below. Multiple sewersheds can fall within a monitoring drainage area, and therefore multiple SRRR plans with varying implementation dates can be associated with the same drainage area. The 'SRRR Plan Imp. Date' is the last implementation date of the SRRR plans that fall within that drainage area.

The CAPs geodatabase developed by the Bureau of Utilities is a compilation of sewer line and manhole repairs specified by the SRRR plans including: repair type, status of repair, and repair location. This data was used to derive the total number of sewer line and manhole repairs completed and proposed (to be completed) within the drainage areas of each of the county's bacteria monitoring locations. The types of sewer repairs tallied for the 'sewer pipe repair' column in the tables below include the following: grout, grout lateral, pipe replacement, open cut point repair, segmental liners, t- liner, upsize 6" to 8" PVC, lining, and pipe bursting. 'Manhole repairs' include: frame seal, cementitious lining, chimney seal, rebuild bench and channel, replace, reset frame and cover and replace frame and cover. These repairs were intersected to drainage areas using overlay analysis in GIS. From this analysis we were able to get a count of manhole and sewer line repairs in each bacteria monitoring drainage area shown in Table 7-10 through Table 7-19 below.

7.6.2 Summary of Sewer Repairs Associated with Bacteria Monitoring

The status of sanitary sewer system repairs and plans is presented in this section, organized by watershed.

7.6.2.1 Lower North Branch Patapsco Watershed

The Lower North Branch Patapsco watershed has five sampling locations for the bacteria monitoring program. The drainage areas for these monitoring points are all nested meaning they fall within each other and there is an overlap in repairs for each area. PAT-1 has the largest drainage area and includes the area of PAT -5 through PAT-2 and areas downstream of PAT-2. Repairs in PAT-1 include all repairs in PAT-2 through PAT-5, repairs in PAT-2 include all repairs in PAT-3 through PAT-5, and so on. As shown in Table 7-11 and 7-12 all the overflow pipes required by the consent decree have been repaired and all SRRR plans should be implemented by September 6, 2018.

Table 7-10: Lower North Branch Patapsco River – Completed Sanitary Sewer Repairs

Monitoring Stations					Overflow Pipe Plugged	Pumping Station Repairs	Manhole Repairs	Sewer Pipe Repaired (length, ft)	SRRR Plan Imp. Date
Downstream	Nested 1	Nested 2	Nested 3	Nested 4					
PAT-1					3	7	14	9,432	9/6/2017
	PAT-2				3	6	0	0	9/6/2017
		PAT-3			2	2	0	0	9/6/2017
			PAT-4		1	2	0	0	9/6/2017
				PAT-5	0	0	0	0	9/6/2018

Table 7-11: Lower North Branch Patapsco River – To Be Completed Sanitary Sewer Repairs

Monitoring Stations					Overflow Pipe Plugged	Pumping Station Repairs	Manhole Repairs
Downstream	Nested 1	Nested 2	Nested 3	Nested 4			
PAT-1					0	1	240
	PAT-2				0	1	157
		PAT-3			0	1	93
			PAT-4		0	1	1
				PAT-5	0	0	0

7.6.2.2 Jones Falls Watershed

The Jones Falls watershed has five bacteria monitoring locations that fall within the county boundaries. Monitoring site JON-1 has the largest drainage area which encompasses the drainage areas for JON-2, JON-3 and JON-4. The drainage areas for JF-B-12 and JF-B-13 do not overlap with the other Jones Falls monitoring drainage areas. Table 7-12 and Table 7-13 show that one overflow pipe detailed in the consent decree still needs to be plugged and all pumping station repairs have been completed but there are 96 manhole repairs that still need to be completed in the Jones Falls.

Table 7-12: Jones Falls – Completed Sanitary Sewer Repairs

Monitoring Stations			Overflow Pipe Plugged	Pumping Station Repairs	Manhole Repairs	Sewer Pipe Repaired (length, ft)	SRRR Plan Imp. Date
Downstream	Nested 1	Nested 2					
JON-1			3	2	64	5,958	9/6/2018
	JON-2		3	2	64	5,837	9/6/2018
		JON-3	0	2	0	0	9/6/2019
		JON-4	1	0	0	0	4/18/2024
	JF-B-12		0	0	0	0	9/6/2019
	JF-B-13		0	0	0	0	9/6/2019

Table 7-13: Jones Falls – To Be Completed Sanitary Sewer Repairs

Monitoring Stations			Overflow Pipe Plugged	Pumping Station Repairs	Manhole Repairs
Downstream	Nested 1	Nested 2			
JON-1			1	0	96
	JON-2		0	0	91
		JON-3	0	0	68
		JON-4	0	0	2
	JF-B-12		0	0	0
	JF-B-13		0	0	0

7.6.2.3 Gwynns Falls Watershed

There are four bacteria monitoring locations in the Gwynns Falls watershed in the county. Two additional locations for Gwynns Falls (GWY-1 and GWY-2) lie in the city potion of the watershed but are included in this section because their drainage areas extend into the County. The most downstream and largest drainage area is GWY-1with all other drainage areas nested within it. Seven overflow pipes still need to be plugged and 10 manhole repairs are needed for the GWY-5 drainage area as shown in Table 7-14 and Table 7-15.

Table 7-14: Gwynns Falls –Completed Sanitary Sewer Repairs

Monitoring Stations				Overflow Pipe Plugged	Pumping Station Repairs	Manhole Repairs	Sewer Pipe Repaired (length, ft)	SRRR Plan Imp. Date
Downstream	Nested 1	Nested 2	Nested 3					
GWY-1				10	2	27	29,174	9/6/2017
	GWY-5			10	2	27	29,174	9/6/2017
		DR-B-10		2	0	8	14,357	9/6/2017
		GF-B-8		7	2	0	115	9/6/2017
			GWY-2	5	2	0	0	9/6/2019
			GWY-6	0	2	0	0	9/6/2018

Table 7-15: Gwynns Falls –To Be Completed Sanitary Sewer Repairs

Monitoring Stations				Overflow Pipe Plugged	Pumping Station Repairs	Manhole Repairs
Downstream	Nested 1	Nested 2	Nested 3			
GWY-1				7	0	10
	GWY-5			7	0	10
		DR-B-10		0	0	2
		GF-B-8		4	0	1
			GWY-2	0	0	1
			GWY-6	0	0	0

7.6.2.4 Loch Raven Reservoir Watershed

In the Loch Raven Reservoir watershed the county has seven bacteria monitoring locations. Four of these (LOC 1- 4) include area that is served by the sewer system and are included in the table below, the other 3 (LOC 5-7) are served by septic systems and are not included. The drainage areas for these four areas that are served by the sewer system are not nested. As shown in Table 7-16 and Table 7-17 Loch Raven does not have any repairs to be completed.

Table 7-16: Loch Raven Reservoir –Completed Sanitary Sewer Repairs

Monitoring Stations				Overflow Pipe Plugged	Pumping Station Repairs	Manhole Repairs	Sewer Pipe Repaired (length, ft)	SRRR Plan Imp. Date
Downstream	Nested 1	Nested 2	Nested 3					
LOC-1				0	0	0	0	4/18/2024
LOC-2				0	0	0	0	4/18/2024
LOC-3				0	0	0	0	9/6/2018
LOC-4				0	0	0	0	*

* The SRRR plan for this area is still being developed and an implementation date has not been set yet.

Table 7-17: Loch Raven Reservoir – To Be Completed Sanitary Sewer Repairs

Monitoring Stations				Overflow Pipe Plugged	Pumping Station Repairs	Manhole Repairs
Downstream	Nested 1	Nested 2	Nested 3			
LOC-1				0	0	0
LOC-2				0	0	0
LOC-3				0	0	0
LOC-4				0	0	0

7.6.2.5 Back River Watershed

The Back River watershed has seven bacteria monitoring locations. The HER-1 monitoring location is downstream of HRB-12 & HRB-13 and is nested within the Pulaski Hwy monitoring drainage area that is the farthest downstream. HR-B-14, HR-B-15, and the Biddle Street monitoring locations are not nested within any other monitoring drainage areas. Table 7-18 and Table 7-19 below show that two pump station repairs have been completed and four overflow pipes still need to be plugged in Back River.

Table 7-18: Back River –Completed Sanitary Sewer Repairs

Monitoring Stations			Overflow Pipe Plugged	Pumping Station Repairs	Manhole Repairs	Sewer Pipe Repaired, length (ft)	SRRR Plan Imp. Date
Downstream	Nested 1	Nested 2					
Pulaski Hwy			4	0	32	11,164	9/6/2024
	HER-1		4	0	32	11,164	9/6/2024
		HR-B-12	2	0	0	398	9/6/2024
		HR-B-13	0	0	32	10,765	4/18/2026
HR-B-14			0	0	0	0	4/18/2024
HR-B-15			0	0	0	349	9/6/2024
Biddle St			0	0	0	0	9/6/2024

* The SRRR plan for this area is still being developed and an implementation date has not been set yet.

Table 7-19: Back River –To Be Completed Sanitary Sewer Repairs

Monitoring Stations			Overflow Pipe Plugged	Pumping Station Repairs	Manhole Repairs
Downstream	Nested 1	Nested 2			
Pulaski Hwy			2	0	83
	HER- 1		2	0	83
		HR-B-12	2	0	36
		HR-B-13	0	0	44
HR-B-14			0	0	0
HR-B-15			0	0	0
Biddle St			0	0	0