



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

JAN 5 2015

Mr. D. Lee Currey, Director
Science Services Administration
Maryland Department of the Environment
1800 Washington Blvd., Suite 540
Baltimore, Maryland 21230-1718

Dear  Mr. Currey:

The U.S. Environmental Protection Agency (EPA), Region III, is pleased to approve the report, *Total Maximum Daily Loads of Trash and Debris for the Middle Branch and Northwest Branch Portions of the Patapsco River Mesohaline Tidal Chesapeake Bay Segment in Baltimore County and Baltimore City, Maryland*. The TMDL report was submitted by the Maryland Department of the Environment (MDE) to EPA on September 1st, 2014, and received on September 9, 2014. The TMDL was established and submitted in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act to address impairments of water quality as identified in Maryland's Section 303(d) List.

The Maryland Department of the Environment (MDE) has identified the PATMH Tidal Chesapeake Bay Segment (Integrated Report Assessment Unit ID: PATMH) on the State's 2012 Integrated Report (IR) as impaired by multiple pollutants. The PATMH was listed in 2008 as impaired for trash in two specific segments within the PATMH— the Middle Branch and the Northwest Branch. More specifically, the "*Middle Branch from the mouth (Ferry Bar Park to Harbor Hospital Center) extending westward and the Northwest Branch from the Hull Street Pier to Canton Waterfront Park.*" This impaired shoreline receives drainage from three distinct Maryland 8-digit watersheds: Baltimore Harbor, Gwynns Falls, and Jones Falls, all within Baltimore City and Baltimore County. This TMDL addresses the trash impairment only.

In accordance with Federal regulations at 40 CFR §130.7, a TMDL must comply with the following requirements: (1) be designed to attain and maintain the applicable water quality standards; (2) include a total allowable loading and as appropriate, wasteload allocations for point sources and load allocations for nonpoint sources; (3) consider the impacts of background pollutant contributions; (4) take critical stream conditions into account (the conditions when water quality is most likely to be violated); (5) consider seasonal variations; (6) include a margin of safety (which accounts for uncertainties in the relationship between pollutant loads and instream water quality); and (7) be subject to public participation. In addition, these TMDLs



considered reasonable assurance that the TMDL allocations assigned to the nonpoint sources can be reasonably met. The enclosure to this letter describes how the trash TMDLs for Middle Branch/Northwest Branch satisfy each of these requirements.

As you know, any new or revised National Pollutant Discharge Elimination System permits must be consistent with the TMDL's wasteload allocation pursuant to 40 CFR §122.44(d)(1)(VII)(B). Please submit all such permits to EPA for review as per EPA's letter dated October 1, 1998.

If you have any questions or comments concerning this letter, please do not hesitate to contact Ms. Helene Drago, TMDL Program Manager, at 215-814-5796.

Sincerely,

A handwritten signature in black ink, appearing to read "Jon M. Capacasa". The signature is fluid and cursive, with a large initial "J" and "M".

Jon M. Capacasa, Director
Water Protection Division

Enclosure⁹

cc: Melissa Chatham, MDE-SSA
Jay Sakai, MDE-WMA



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Decision Rationale
Total Maximum Daily Loads 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


Jon M. Capacasa, Director

Water Protection Division

Date: 1/5/2015

Decision Rationale
Total Maximum Daily Loads 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

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed for those water quality limited segments identified as impaired by the State where technology based and other controls will not provide for attainment of water quality standards. A TMDL is a determination of the amount of a pollutant from point, nonpoint, and natural background sources, including a Margin of Safety (MOS), that can be present in a water quality limited waterbody without causing an impairment.

This document sets forth the U.S. Environmental Protection Agency's (EPA) rationale for approving the TMDL for trash and debris in portions of the Middle Branch and Northwest Branch of the Patapsco River Mesohaline Tidal Chesapeake Bay Segment. These TMDLs were established to address impairments of water quality, caused by trash and debris, as identified in Maryland's Section 303(d) List for water quality limited segments. The listing is limited to the shoreline of the "*Middle Branch from the mouth (Ferry Bar Park to Harbor Hospital Center) extending westward and the Northwest Branch from the Hull Street Pier to Canton Waterfront Park.*" The Maryland Department of the Environment (MDE) submitted the report, *Total Maximum Daily Loads 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* dated August, 2014, to EPA for final review on September 1, 2014, and was received on received on September 9, 2014. The basin identification for the basis is MD-PATMH-MiddleBranch_NorthwestHarbor.

EPA's review determined that the TMDLs meet the following seven regulatory requirements pursuant to 40 CFR Part 130.

1. The TMDLs are designed to implement applicable water quality standards.
2. The TMDLs include a total allowable load as well as individual wasteload allocations (WLAs) and load allocations (LAs).
3. The TMDLs consider the impacts of background pollutant contributions.
4. The TMDLs consider critical environmental conditions.
5. The TMDLs consider seasonal environmental variations.
6. The TMDLs includes a MOS.
7. The TMDLs have been subject to public participation.

In addition, these TMDLs considered reasonable assurance that the TMDL allocations assigned to nonpoint sources can be reasonably met.

II. Summary

These TMDLs specifically allocate the trash loads to be captured, prevented from entering, or removed from the Middle Branch and Northwest Branch Portions of the Patapsco River Mesohaline Tidal Chesapeake Bay Segment. This TMDL will address the trash impairment to the shoreline of the “*Middle Branch from the mouth (Ferry Bar Park to Harbor Hospital Center) extending westward and the Northwest Branch from the Hull Street Pier to Canton Waterfront Park.*” For the purpose of this TMDL, it is assumed that the source of the trash causing the impairment is primarily generated in the upland watershed draining to the tidal shoreline of the Middle Branch and Northwest Branch. Therefore, the spatial extent of this TMDL will include all areas directly draining to the impaired shoreline. This includes the portion of the Baltimore Harbor watershed directly draining to the impaired shoreline, as well as the upstream watersheds of the Jones Falls and Gwynns Falls. Further reference in this document to Baltimore Harbor watershed will refer only to those acres with direct drainage to the impairment. It was also determined by MDE that due to tidal and current conditions, trash loads downstream of the impairment will not likely contribute to the impairment.

Maryland’s current water quality standards have a narrative standard (COMAR 2012c) applicable to trash, but do not include relevant numeric criteria. Therefore, the TMDL target is set equal to 100 percent removal or capture of the baseline trash load to establish quantitative implementation for the narrative standard. Unlike most TMDLs, which are expressed in positive terms of the loads of a pollutant that may be added to a waterbody, these trash TMDLs are expressed in the negative, i.e., in terms of quantities of trash that must be captured, prevented from entering, or removed from the waterbody. In light of how trash is transported to the river, this negative expression is appropriate to the pollutant and water quality conditions to be addressed. See 40 C.F.R. § 130.2(i). The TMDLs are presented as both annual loads (pounds per year) and maximum daily loads (pounds per day) to be captured, prevented from entering, or removed from the watershed. A summary of the daily and annual trash TMDLs in the Middle Branch/Northwest Branch are presented in Tables 1 through 6. Individual annual and daily WLAs for permitted point sources are also provided in those tables.

There are one hundred and five (105) permitted point sources which are included in the WLA. The fact that the TMDLs do not assign WLAs to any other point sources in the watershed should not be construed as a determination by EPA or MDE that there are no additional point sources in the watershed that are subject to the National Pollutant Discharge Elimination System (NPDES) program. In addition, the fact that EPA is approving these TMDLs does not mean that EPA has determined whether some of the sources discussed in these TMDLs, under appropriate conditions, might be subject to the NPDES program.

Table 1. Annual trash TMDLs for Baltimore Harbor watershed

WLA (lbs/yr removed)		LA (lbs/yr removed)	MOS (5%)	TMDL (lbs/yr removed)
Baltimore City Phase I MS4	42,869.4	2,912.6	2,378.4	49,946.6
Baltimore City Other Point Sources	1,786.2			
Total WLA	44,655.6			

Note: lbs = pounds; MS4 = municipal separate storm sewer system

Table 2. Daily trash TMDLs for Baltimore Harbor watershed

WLA (lbs/day removed)		LA (lbs/day removed)	MOS (5%)	TMDL (lbs/day removed)
Baltimore City Phase I MS4	117.4	8.0	6.5	136.8
Baltimore City Other Point Sources	4.9			
Total WLA	122.3			

Table 3. Annual trash TMDLs for Gwynns Falls watershed

WLA (lbs/yr removed)		LA (lbs/yr removed)	MOS (5%)	TMDL (lbs/yr removed)
Baltimore City: Phase I MS4	93,519.3	21,271.1	9,717.4	204,065.0
Baltimore City: Other Point Sources	2,892.3			
Baltimore County: Phase I MS4	72,831.6			
Baltimore County: Other Point Sources	1,533.3			
State Highway Administration	2,300.0			
Total WLA	173,076.5			

Table 4. Daily trash TMDLs for Gwynns Falls watershed

WLA (lbs/day removed)		LA (lbs/day removed)	MOS (5%)	TMDL (lbs/day removed)
Baltimore City: Phase I MS4	256.2	58.3	26.6	559.0
Baltimore City: Other Point Sources	7.9			
Baltimore County: Phase I MS4	199.5			
Baltimore County: Other Point Sources	4.2			
State Highway Administration	6.3			
Total WLA	474.1			

Table 5. Annual trash TMDLs for Jones Falls watershed

WLA (lbs/yr removed)		LA (lbs/yr removed)	MOS (5%)	TMDL (lbs/yr removed)
Baltimore City: Phase I MS4	81,107.0	19,013.8	7,453.4	156,520.4
Baltimore City: Other Point Sources	1,655.2			
Baltimore County: Phase I MS4	45,399.4			
Baltimore County: Other Point Sources	472.9			
State Highway Administration	1,418.7			
Total WLA	130,053.2			

Table 6. Daily trash TMDLs for Jones Falls watershed

WLA (lbs/day removed)		LA (lbs/day removed)	MOS (5%)	TMDL (lbs/day removed)
Baltimore City: Phase I MS4	222.2	52.1	20.4	428.8
Baltimore City: Other Point Sources	4.5			
Baltimore County: Phase I MS4	124.4			

Baltimore County: Other Point Sources	1.3		
State Highway Administration	3.9		
Total WLA	356.3		

Table 7. List of Other Point Sources Permittees

MDE PERMIT #	NPDES #	FACILITY NAME	WATERSHED
01DP0307	MD0000264	CSX Transportation, Inc. – Riverside Yard	Baltimore Harbor
01DP0376	MD0001341	American Sugar Refining, Inc.	Baltimore Harbor
06DP0309	MD0002763	Locke Insulators, Inc.	Baltimore Harbor
99DP2312	MD0061930	Trigen Baltimore Energy – Spring Gardens Plant	Baltimore Harbor
06DP3066	MD0066877	Trigen Baltimore Energy – Saratoga Street Steam Plant	Baltimore Harbor
08DP3449	MD0069141	Patterson Park boat Lake	Baltimore Harbor
06DP3560	MD0069922	UMMS Ambulatory Care Center	Baltimore Harbor
08DP3635	MD0070092	Rowen Concrete, Inc.	Baltimore Harbor
09DP3652	MD0070467	University of Maryland School of Pharmacy	Baltimore Harbor
09DP3656	MD0070505	Frederick Douglas – Issac Myers Maritime Park	Baltimore Harbor
02SW1018		Baltimore City DPW – Central Garage	Baltimore Harbor
02SW0432		PQ Corporation	Baltimore Harbor
02SW1593		The Furst Brothers Company	Baltimore Harbor
02SW1622		Vac Pac Manufacturing Company, Inc.	Baltimore Harbor
02SW1784		University of Maryland Medical Center	Baltimore Harbor
02SW0704		Baltimore City DPW – Middletown Fueling Station	Baltimore Harbor
02SW0707		Baltimore City DPW - Fallsway Substation	Baltimore Harbor
02SW0832		H & S Bakery	Baltimore Harbor
02SW1885		Mid Atlantic Baking Company	Baltimore Harbor
02SW0989		Coca – Cola Bottling Co. – Baltimore	Baltimore Harbor
02SW1658		American Limousines, Inc.	Baltimore Harbor
02SW1676		MTA – Kirk Avenue Bus Division	Baltimore Harbor
05SF5501		Maryland Stadium Authority	Baltimore Harbor
01DP0015	MD0001295	The Sherwin Williams Company	Gwynns Falls
01DP0138	MD0001911	Kaydon Ring & Seal, Inc.	Gwynns Falls
01DP2119	MD0060640	Wheelabrator Baltimore, LP	Gwynns Falls
01DP2613	MD0063771	GEMS, INC.	Gwynns Falls
93DP0314	MD0066532	J.V. Wells Inc.	Gwynns Falls
93DP3202	MD0067792	Westivew Mall	Gwynns Falls
09DP3680	MD0070726	Former Carr - Lowrey Glass Company Property	Gwynns Falls
02SW0930		Estes Express Lines - Baltimore	Gwynns Falls
02SW0787		Houff Transfer, Inc.	Gwynns Falls
02SW0712		New England Motor Freight	Gwynns Falls
02SW0848		United Parcel Service – Vero Road	Gwynns Falls
02SW1656		Joe Corbi's Wholesale Pizza	Gwynns Falls
02SW1375		Mr. Martin L. Reese	Gwynns Falls
02SW1492		Crusader Chemical Company, Inc.	Gwynns Falls
02SW1778		Triad Incorporated	Gwynns Falls
02SW0864		P. Flanigan & Sons Inc. - Mpnroe Street	Gwynns Falls
02SW1912		Decker's Salvage Company, Inc.	Gwynns Falls
02SW1297		Winchester Homes, Inc.	Gwynns Falls

MDE PERMIT #	NPDES #	FACILITY NAME	WATERSHED
02SW1402		The Berg Brothers Recycling Company	Gwynns Falls
02SW1487		Depsco Services, Inc.	Gwynns Falls
02SW0681		Clean Harbors of Baltimore	Gwynns Falls
02SW1014		P. Flanigan & Sons, Inc.	Gwynns Falls
02SW1206		Trifinity Manufacturing Baltimore, LLC	Gwynns Falls
02SW1836		Patuxent Materials, Inc. - Baltimore	Gwynns Falls
02SW0739		Rubber Millers, Inc.	Gwynns Falls
02SW1785		MTA – Washington Blvd. Bus Division	Gwynns Falls
02SW1589		Dovco Industrial Fabricators, Inc.	Gwynns Falls
02SW1138		All Supplies & Parts, Inc. – Asap Compressors	Gwynns Falls
02SW2140		Masonville Dredged Material Containment Facility	Gwynns Falls
02SW0650		Southern Galvanizing	Gwynns Falls
02SW1495		Carroll Awning Company, Inc.	Gwynns Falls
02SW0779		Safety – Kleen Systems, Inc. – Baltimore	Gwynns Falls
02SW1216		United Iron and Metal, LLC	Gwynns Falls
02SW1248		Potts & Callahan, Inc. – Gwynns Falls	Gwynns Falls
02SW1884		Crispy Bagel Company	Gwynns Falls
02SW0703		Baltimore City DPW – Western Substation	Gwynns Falls
02SW0777		Emanuel Tire Company – Moreland	Gwynns Falls
02SW1016		Capitol Cake Company	Gwynns Falls
02SW1992		Beverage Capital Corporation Plant #1	Gwynns Falls
02SW0155		Nurad Technologies, Inc.	Gwynns Falls
02SW1657		Actavis – Baltimore	Gwynns Falls
02SW1053		Ligon and Ligon, Inc.	Gwynns Falls
02SW0868		Baltimore Concrete Products, Inc.	Gwynns Falls
02SW1978		P & J Contracting Company, Inc.	Gwynns Falls
02SW1964		Baltimore County Bureau of Highways – Shop 2	Gwynns Falls
02SW0705		Baltimore City DPW – Northwestern Substation	Gwynns Falls
02SW1307		Northwest Transfer Station	Gwynns Falls
02SW1677		MTA – Northwest Bus Division	Gwynns Falls
02SW1673		MTA – Metro Wabash Maintenance Facility	Gwynns Falls
02SW1027		National Instrument Company, Inc.	Gwynns Falls
02SW1996		MTA – Old Court Metro Maintenance Facility	Gwynns Falls
02SW0034		Foundry Service 7 Supply Co., Inc.	Gwynns Falls
02SW0025		Sweetheart Cup Corporation	Gwynns Falls
02SW0306		Quest International	Gwynns Falls
02SW2009		SHA – Ownings Mills Shop	Gwynns Falls
02SW1716		Shire U.S. Manufacturing, Inc.	Gwynns Falls
02SW1398		Daniel G. Schuster, LLC. – Ownings Mills	Gwynns Falls
06DP0075	MD0002101	Fleischmann's Vinegar, Inc.	Jones Falls
06DP2002	MD0059676	National Aquarium in Baltimore	Jones Falls
06DP2910	MD0065901	Teledyne Energy Systems	Jones Falls
07DP3397	MD0068888	Baltimore Country Club at Five Farms	Jones Falls
10DP3715	MD0071013	University of Baltimore	Jones Falls
02SW0659		Pitt Ohio Express, Inc. - Baltimore	Jones Falls
02SW0805		George G. Ruppertsberger & Sons, Inc.	Jones Falls
02SW0747		U.S. Postal Service – Oliver Street VMF	Jones Falls

MDE PERMIT #	NPDES #	FACILITY NAME	WATERSHED
02SW1675		MTA – North Avenue Lightrail facility	Jones Falls
02SW1156		Norfolk Railway Corporation – Flexi-Flo Terminal	Jones Falls
02SW1056		Veolia Transportation – Baltimore	Jones Falls
02SW1810		Potts & Callahan, Inc. – Repair Shop	Jones Falls
02SW2071		Beverage Capital Corporation Plant #2	Jones Falls
02SW0599		Pepsi Bottling Group, LLC	Jones Falls
02SW0255		Woodberry Quarry Landfill	Jones Falls
02SW0105		Hedwin Corporation – Roland Heights	Jones Falls
02SW1211		Cold Spring Landfill	Jones Falls
02SW0702		Baltimore City DPW – Northeastern Substation	Jones Falls
02SW2135		Mid – States Oil refining, LLC	Jones Falls
02SW0861		Hollins Organic Products, Inc.	Jones Falls
02SW1296		Cockey’s Enterprises, Inc.	Jones Falls
02SW1751		SHA – Brooklandville Shop	Jones Falls
02SW3028		Pall Filtration & Separations Group – Timonium	Jones Falls
02SW3030		Pall Filtration & Separations – Greenspring #2	Jones Falls
08DP3599		Mercy Medical Center Construction Dewatering Project	Jones Falls

A TMDL is a written plan and analysis established to ensure that a waterbody will attain and maintain water quality standards. The TMDL is a scientifically based strategy that considers current and foreseeable conditions, the best available data, and accounts for uncertainty with the inclusion of a MOS value. The option is always available to refine a TMDL for resubmittal to EPA for approval if environmental conditions, new data, or the understanding of the natural processes change more than what was anticipated by the MOS.

III. Background

The Patapsco Mesohaline Chesapeake Bay Segment (PATMH) is a tidal estuary, or embayment, located on the western shore of the Chesapeake Bay. The total watershed draining to PATMH covers 1,514 square kilometers (km²) (374,040 acres) and spans Baltimore City, Carroll, Howard, Anne Arundel, and Baltimore Counties. Only two specific segments within the PATMH are listed as impaired for trash – the Middle Branch and the Northwest Branch. More specifically, the “*Middle Branch from the mouth (Ferry Bar Park to Harbor Hospital Center) extending westward and the Northwest Branch from the Hull Street Pier to Canton Waterfront Park.*” This impaired shoreline receives drainage from three distinct Maryland 8-digit watersheds: Baltimore Harbor, Gwynns Falls, and Jones Falls, all within Baltimore City and Baltimore County. Approximately 5,700 acres of the MD 8-digit Baltimore Harbor watershed drain to the impaired shoreline. The entire Gwynns Falls watershed (approx 42,000 acres) drains to the Middle Branch impairment and the entire Jones Falls watershed (approx 37,000 acres) drains to the Northwest Branch impairment. All three contributing watersheds are highly urbanized, with mainly residential and commercial areas, especially within Baltimore City. The northern portions of both the Gwynns Falls and Jones Falls in Baltimore County include more forest land use as well as small amounts of crop land. The combined population of the three watersheds is approximately 725,000 (MDP 2012).

The Middle Branch of the PATMH drains a small amount of the Baltimore Harbor Watershed, including the industrial areas of Westport and Spring Garden, and both of Baltimore's major sports stadiums. The majority of the drainage to the Middle Branch is from the Gwynns Falls watershed. The total drainage area of the Middle Branch is approximately 45,000 acres, in Baltimore City and Baltimore County.

The Northwest Branch of the PATMH is the location of Baltimore City's celebrated Inner Harbor, and also receives drainage from the historical Baltimore City neighborhoods of Canton, Federal Hill, Fells Point, and Patterson Park, extending north to include Clifton Park. Additionally, the Jones Falls Watershed discharges into the Northwest Branch. The total drainage area of this segment is approximately 42,000 acres.

The Maryland Department of the Environment (MDE) has identified the PATMH Tidal Chesapeake Bay Segment (Integrated Report Assessment Unit ID: PATMH) on the State's 2012 Integrated Report (IR) as impaired by multiple pollutants. The IR includes listings for the entire PATMH, as well as specific embayments within the PATMH. See Table 8 for all IR listings associated with this tidal segment.

Table 8. 2010 Integrated Report Listings for PATMH

Assessment Unit	Designated Use	Year listed	Identified Pollutant	Listing Category*	Status
MD-PATMH	Seasonal Migratory fish spawning and nursery Subcategory	1996	TN	4a	TMDL 2008
		1996	TP	4a	TMDL 2008
	Aquatic Life and Wildlife	1996	Mercury, Copper, Nickel, & Cyanide	4b	Individual Control Strategy for related facility
	Aquatic Life and Wildlife	1996	Chromium, Zinc, & Lead in Sediments	5	
	Open Water Fish and Shellfish	1996	TN	4a	TMDL 2008
	Open Water Fish and Shellfish	1996	TP	4a	TMDL 2008
		Seasonal Shallow Water Submerged Aquatic Vegetation	1996	TSS	5
	Aquatic Life and Wildlife	2004	Impacts to Estuarine Biological Communities	5	
MD-PATMH	Seasonal Deep-Channel Refuge Use	1996	TP	5	TMDL 2010
		1996	TN	5	TMDL 2010
	Seasonal Deep-Water and Shellfish Subcategory	1996	TP	4a	TMDL 2008
		1996	TN	4a	TMDL 2008

Assessment Unit	Designated Use	Year listed	Identified Pollutant	Listing Category*	Status
	Aquatic Life and Wildlife	2008	Debris/Trash	5	
MD-PATMH-02130903	Aquatic Life and Wildlife	1998	Chlordane - sediments	4a	TMDL 2002
	Fishing	1998	PCBs	5	TMDL 2011
MD-PATMH-Bear_Creek	Aquatic Life and Wildlife	1998	Zinc (in sediments)	5	
			Chromium (in sediments)	5	
			PCBs (Sediments & Fish Tissue)	5	TMDL 2011
MD-PATMH-Bodkin_Creek	Open-Water Fish and Shellfish Subcategory	1996	TN	5	TMDL 2010
			TP		TMDL 2010
	Aquatic Life and Wildlife	1996	Copper	5	
			Lead	2	WQA 2009
			Zinc	2	WQA 2009
MD-PATMH-Curtis_Bay_Creek	Aquatic Life and Wildlife	1998	Zinc (in sediments)	5	
			PCBs (Sediments & Fish Tissue)	5	TMDL 2011
MD-PATMH-Furnace_Creek	Water Contact Sports	1998	Enterococcus	5	TMDL 2010
MD-PATMH-Marley_Creek	Water Contact Sports	1998	Enterococcus	5	TMDL 2010
MD-PATMH-MiddleBranch -- NorthwestHarbor	Water Contact Sports	2010	Enterococcus	5	
MD-PATMH-Middle_Harbor	Aquatic Life and Wildlife	1998	Zinc (in Sediments)	5	
MD-PATMH-Pine_Grove_Village_Beach	Water Contact Sports	N/A	Enterococcus	2	
MD-PATMH-Rock_Creek	Water Contact Sports	N/A	Fecal Coliform	2	

*Listing Category definitions – 2: attaining some standards but insufficient data to assess completely; 4a: impaired, TMDL completed; 4b: impaired, non-TMDL pollution controls required; 5: impaired TMDL required.

TMDL endpoints represent the water quality targets used to quantify TMDLs and their individual components. Maryland's current water quality standards have a narrative standard (COMAR 2012c) applicable to trash, but do not include relevant numeric criteria. Therefore, the TMDL target is set equal to 100 percent removal or capture of the baseline trash load to establish quantitative implementation for the narrative standard. The baseline load is defined as the annual trash load calculated from monitoring data obtained through storm drain monitoring and in-stream sampling. The baseline load, and therefore the TMDL removal load, is calculated as an average (because of high seasonal and annual variability) of the measured or estimated removal rate from point and nonpoint sources. The TMDL target is calculated as the amount removed relative to the baseline load to satisfy the narrative water quality standards for trash. Trash may be removed from anywhere within the spatial extent of the TMDL to achieve

compliance with the TMDL. Stormwater outfall and in-stream monitoring for trash were used to establish the nonpoint source and point source baseline loads.

Monitoring data used in this TMDL included data collected by the Baltimore City Department of Public Works (BCDPW) Water Quality Monitoring and Inspections Section (WQMIS) and Baltimore County Department of Environmental Protection and Sustainability (BCDEPS). Baltimore City WQMIS conducted a study between January and September 2011 which consisted of sampling at five stormwater outfalls, two within the Jones Falls Watershed and three within the Gwynns Falls watershed. No stations were sampled in the Baltimore Harbor Watershed due to several factors, including: lack of accessibility (under water), very high wet weather flow rates that damaged equipment, and the limitation of significant sub-watershed sizes. Sampling sites were selected based on a number of different contributing factors including accessibility, land use, and socioeconomics, in order to capture a robust sample of the Baltimore City trash load. The most important factor was accessibility. As mentioned above, many of the stormwater outfalls are under water and not accessible. The size and discharge amount of the outfall are also factors because of the sample device's ability to withstand excessive force of the water. Once the sample devices were installed, sampling occurred approximately every 2 – 4 weeks and was based on the amount of trash and other debris in the collection device. The organic debris was removed from the sample and the remaining trash was collected in a large industrial garbage bag. Every effort was made to minimize the amount of liquid in the sample. All containers that held liquid were emptied before weighing the sample. The dry weight of the trash was measured and recorded (BCDPW-WQMIS 2012).

BCDEPS conducted a study between October 2010 and October 2011 which included twenty in-stream sites and seventeen stormwater management facilities (SWMF) randomly selected in the Jones Falls and Gwynns Falls watersheds. The stream sites were selected based on a stratified selection criteria with at least one site in each subwatershed in the Baltimore County portion of Gwynns Falls and Jones Falls using a geographic information system (GIS) subroutine for the site selection. An excess of points were selected and randomly ranked for field site visits to investigate for access and safety. Ten sites were selected in Gwynns Falls and ten sites in Jones Falls. Within the stream, a 500 ft. reach was measured and marked for the survey. All trash was collected within the bankfull of the reach. SWMF were selected based on a number of criteria, including: facility type, ownership, drainage area, and land use. Field assessment of the SWMF was conducted to determine if the facility conditions were conducive to trash monitoring. Facilities that were excessively wet or provided access or safety problems were not selected. Facilities within a predominant land use category were investigated until sufficient facilities had been identified to provide a representative sample for that land use. At the SWMF sites, trash was collected within the fenced boundary of the facility (BCDEPS 2011).

In order to determine the amount of trash accumulated during the year-long study, trash was removed at each site prior to the initial seasonal sampling. Collected trash was brought back to the laboratory and spread out on tarps to dewater. Items were emptied of contents (liquids, sediment, etc.) that would affect the normal weight of the object collected. Trash was sorted into 5 categories: plastic bottles; glass bottles, aluminum cans; other; and dumping. Once sorted, the categories were weighed individually. Additionally, the bottles and cans were counted per item

in each category. The individual seasonal samples accumulated for a time period between 50 and 125 days. Baseline data was collected in October 2010 at each site. The project timeline was as follows: baseline sampling (October 2010 – November 2010); winter sampling (December 2010 – February 2011); spring sampling (April 2011 – May 2011); summer sampling (July 2011 – August 2011) and fall sampling (October 2011 – November 2011).

These monitoring data were used to establish the baseline point source and nonpoint source loads. To differentiate between the point source and nonpoint source loads, items that are generally considered too large to move through the storm drain system are considered part of the baseline nonpoint source load, and items that would generally be able to move through the storm drain system are considered part of the baseline point source load. The baseline loads do not include natural debris, such as sticks and leaves.

The trash sampling data was normalized by inches of precipitation, based on the strong correlation between trash and rainfall. More specifically, precipitation is the primary mode of transport for trash to enter storm drains and streams. Precipitation data used was from NOAA's National Climatic Data Center (NCDC) Climate Data Online website: <http://www.ncdc.noaa.gov/cdo-web/>. Three NCDC stations were used to normalize the trash sample data. One for Baltimore City sampling sites, located at Maryland Science Center in Baltimore; one for Baltimore County Gwynns Falls sampling, located at the northwestern tip of Gwynns Falls watershed; and one for Baltimore County Jones Falls sampling sites, located on the eastern border of Jones Falls Watershed. Additionally, 30-year climate normals from Baltimore Washington International (BWI) airport were used.

Point source baseline loading rates in Baltimore City were established using the data collected at the sampling sites described above. To calculate the baseline loading rate for each sampling event, the drainage acreage, start and end dates, and total weight for each sample event were taken from the BCDPW data. The precipitation for each sample period was determined using the NCDC data at the Maryland Science Center station. The total weight (lbs) was then divided by total acreage (ac) and the total precipitation (in) to get a normalized unit loading rate, expressed in units of lbs/ac/in. This value was then annualized by multiplying by the 30-year normal rainfall, also from NCDC data. The average of the individual samples was then taken, to determine a site unit loading rate. Based on the limited number of stations (5) and the overwhelmingly dominant type of land use (urban), it was decided by MDE to combine data from all sites to produce a single urban land use loading rate for Baltimore City. The urban land use loading rate was used for all acreage in Baltimore City, excluding the areas of Gwynns Falls and Jones Falls that are forested. These acres will use the Baltimore County forest land use loading rate.

The point source baseline loading rates in Baltimore County were established using the data collected by BCDEPS described above. The methodology used to calculate baseline loads is similar to that which was used in Baltimore City. The data used included only the SWMF sites. Data from stream sites were not used because it was determined that the methodology used for collecting the samples at the stream sites was not comparable to the methodology used for SWMF sites. Since Baltimore County conducted sampling on a seasonal basis, the baseline loading rate was first calculated at each sampling event by season. To calculate the baseline

loading rate for each sampling event, the drainage acreage, start and end dates, and total weight for each sample event were taken from the BCDEPS data. The precipitation for each sample period was determined using the NCDC data. As per the calculations for Baltimore City data, the total weight (lbs) was then divided by total acreage (ac) and the total precipitation (in) to get a normalized unit loading rate, expressed in units of lbs/ac/in. This value was then annualized by multiplying by the 30-year mean annual rainfall. Since the Maryland Science Center is the only station within the watershed with long term annual, the annual value of 41.88 inches/year was used in the calculations for Baltimore County. The four seasonal values were then averaged to determine the loading rate for each sampling site. Finally, the sites were grouped according to predominant land use type and the average for each land use was calculated.

Some land use types in Baltimore County, which were not represented by the sampling sites, were assigned baseline loading rates as follows: all agricultural land use acres will be assigned the open urban land use loading rate; industrial, extractive and bare ground land use will be assigned the commercial land use loading rate; and the water and wetlands were assumed to have a loading rate of zero.

In establishing the nonpoint source baseline loading rate, only items that are considered too large to enter the stormwater system through street-level storm drains were counted. It is generally assumed that these larger items have been intentionally and illegally dumped into the watershed. While it is easily understood how small items enter the storm sewer via street level storm drains and are transferred to the impaired shoreline, it may not be as clear as to how larger dumped items are transported. While dumping is generally considered a land based problem, these items all have the potential to be transferred into the stream system by rainfall or other means. Therefore, for the purpose of this TMDL, all dumped or nonpoint source loads are considered to have the potential to impact the impaired shoreline

Baltimore County collected nonpoint source trash data, when it was found, at all of its sampling sites. Nonpoint source trash was found at eight individual sampling sites, with a total of eleven nonpoint source data events. Baltimore City did not collect any nonpoint source trash data, and will therefore be assigned the same loading rate as Baltimore County.

To calculate the baseline loading rate for each sampling event, the drainage acreage, start and end dates, and total weight for each sample event were taken from the BCDEPS data. The total weight (lbs) was then divided by total acreage (ac) and the total number of days (day) to get a normalized unit loading rate, expressed in units of lbs/ac/day. The nonpoint source loading rate was normalized to days, as opposed to inches of rain used in the point source calculation, because it is not assumed that dumping activities are associated with rainfall. Once a normalized loading rate was calculated for each sample event, the average of the 11 values was taken to represent the nonpoint source loading rate. This rate was applied to 100% of the affected acres in Baltimore City and Baltimore County, as a conservative assumption for this TMDL.

CWA Section 303(d) and its implementing regulations require that TMDLs be developed for water quality limited segments identified as impaired by the State where technology based and other required controls do not provide for attainment of water quality standards. The trash TMDLs submitted by MDE are designed to allow for the attainment of applicable water quality

standards relevant to trash. Refer to Tables 1 through 6, above, for a summary of allowable loads.

IV. Discussion of Regulatory Conditions

EPA finds that MDE has provided sufficient information to meet all seven of the basic requirements for establishing trash TMDLs for the Middle Branch/Northwest Branch. EPA, therefore, approves the trash TMDLs for the Middle Branch/Northwest Branch. This approval is outlined below according to the seven regulatory requirements.

1) The TMDLs are designed to implement applicable water quality standards.

Water Quality Standards consist of three components: designated and existing uses; narrative and/or numerical water quality criteria necessary to support those uses; and an anti-degradation Statement.

Maryland’s water quality standards are established by COMAR Title 26 Subtitle 08, Chapter 2. All surface waters in Maryland are protected for water contact recreation, fishing and protection of aquatic life and wildlife (Use I). Additional segment specific designated uses, for all watersheds in the spatial extent of this TMDL are included in Table 9 (COMAR 2012a, d).

Table 9. Segment-specific designated uses in the Middle Branch/Northwest Branch

Water	Designated use	Description
PATMH	Use II	Migratory Spawning and Nursery Use; Shallow Submerged Aquatic Vegetation Use; Open Water Fish and Shellfish Use
Baltimore Harbor Watershed	Use I	Water Contact Recreation and Protection of Aquatic Life
Gwynns Falls	Use I/III/IV	Water Contact Recreation and Protection of Aquatic Life, Natural and Recreational Trout Waters
Jones Falls	Use I/III/IV	Water Contact Recreation and Protection of Aquatic Life, Natural and Recreational Trout Waters

Maryland does not currently have numeric water quality criteria for trash. However, Maryland has general narrative criteria, applicable to all surface waters (COMAR, Chapter 26.08.02.03), which states:

The waters of this State may not be polluted by:

- (1) Substances attributable to sewage, industrial waste, or other waste that will settle to form sludge deposits that:
 - (a) Are unsightly, putrescent, or odorous, and create a nuisance, or
 - (b) Interfere directly or indirectly with designated uses;
- (2) Any material, including floating debris, oil, grease, scum, sludge, and other floating materials attributable to sewage, industrial waste, or other waste in amounts sufficient to:
 - (a) Be unsightly;
 - (b) Produce taste or odor;
 - (c) Change the existing color to produce objectionable color for aesthetic purposes;
 - (d) Create a nuisance; or

(e) Interfere directly or indirectly with designated uses. (COMAR 2012c)

In its Section 303(d) list, Maryland has interpreted trash levels in the Middle Branch/Northwest Branch as exceeding the quantity of trash that would be consistent with the narrative water quality criteria referenced above. Accordingly, the objective of these trash TMDLs is to reduce trash loadings in the Middle Branch/Northwest Branch in order to meet the narrative water quality criteria and support the designated uses. EPA believes this is a reasonable and appropriate water quality goal.

The TMDL endpoint represents a numeric interpretation of in-stream conditions that will attain the applicable narrative water quality standard. In this case, the narrative water quality criteria of Maryland include terms, such as "nuisance" and "objectionable", that include a subjective component. Such narrative criteria require gap-filling by the appropriate regulatory agency. For the Middle Branch/Northwest Branch trash TMDLs, Maryland exercised their best professional judgment to identify a TMDL endpoint of 100 percent removal or capture of the baseline load, calculated as an average (because of high seasonal and annual variability) of the measured or estimated removal rate, as an in-stream condition that will attain the narrative water quality criteria. The baseline load represents a typical annual load, and is defined as the annual trash load calculated from monitoring data obtained through storm drain monitoring as well as in-stream sampling. The monitoring and sampling data on which the TMDLs are based are discussed above and in Section 3.0 of the TMDL report.

As interpreted by Maryland, the TMDL endpoint of 100 percent removal of the baseline load is not the same as zero (0) trash in the waterway, however Maryland concludes that achieving this TMDL endpoint will result in compliance with their narrative water quality standards. Maryland also indicates that removal of 100 percent of the baseline load would be sufficient to avoid interference with designated uses. EPA agrees that the TMDL endpoint represents a reasonable interpretation of Maryland's narrative water quality standards.

2) *The TMDLs include a total allowable load as well as individual wasteload allocations and load allocations.*

Total Allowable Load

As presented above, the narrative water quality criteria in Maryland describe unacceptable levels of trash in subjective terms such as *objectionable*, *nuisance*, and *unsightly*. EPA's *Quality Criteria for Water 1986* states with respect to aesthetic uses that such "concepts may vary within the minds of individuals encountering the waterway," i.e., a narrative was constructed because an objective, quantifiable threshold cannot be developed. Accordingly, the TMDL is expressed as the quantity of trash that must be captured, prevented from entering, or removed for the waterbody to achieve the narrative criteria. Unlike most TMDLs, which are expressed in terms of the loads of a pollutant that may be added to a waterbody, these trash TMDLs are expressed in the negative, i.e., in terms of quantities of trash that must be captured, prevented from entering, or removed from the waterbody. Section 303(d)(1)(C) of the Clean Water Act requires loads "to be established at a level necessary to implement the applicable water quality standards." Federal regulations at 40 CFR §130.2(i) provide flexibility on how the

TMDLs can be expressed in terms of “either mass per time, toxicity, or other appropriate measures.” In this case, given the nature of trash and how it is transported to the waterbody, expression of the WLAs and LAs in terms of trash to be captured, prevented from entering, or removed from the waterbody is an “appropriate measure.” The annual and daily trash TMDLs for the Middle Branch/Northwest Branch are presented in Tables 1 through 6, above.

EPA regulations at 40 CFR § 130.2(i) state *that the total allowable load shall be the sum of individual WLAs for point sources, LAs for any nonpoint sources, and any natural background concentrations.* The TMDLs for trash for the Middle Branch/Northwest Branch are consistent with 40 CFR § 130.2(i).

Wasteload Allocations

For the purposes of these TMDLs, items considered to have come from point sources include materials that are small enough to travel through a sewer system, such as glass bottles, aluminum cans, and plastic bags. WLAs were developed for the Baltimore City and Baltimore County Municipal Separate Storm Sewer (MS4) systems, the Maryland State Highway Administration, and other smaller point sources. Other facilities with NPDES permitted stormwater outfalls that drain to the impaired shoreline are addressed in aggregate. These facilities can include state and federally owned facilities and general industrial stormwater permittees.

WLAs were calculated using the land-use-based trash loading rates from stormwater outfall monitoring and the land use distribution within the watershed as discussed above. A description of the monitoring protocols is provided in the TMDL Report (Sections 3.1 and 3.2). For detailed information regarding the monitoring studies in Baltimore City and Baltimore County, contact Baltimore City Department of Public Works WQMIS and Baltimore County Department of Environmental Protection and Sustainability, respectively. A detailed description of the point source loading rate calculations is provided in the TMDL Report (Sections 5.1.1 and 5.1.2). A detailed breakdown of the WLAs assigned to permitted point sources in the Middle Branch/Northwest Branch is provided in Tables 1 through 6, above.

Federal regulations at 40 CFR § 122.44(d)(1)(vii)(B) require that, for an NPDES permit for an individual point source, the effluent limitations must be consistent with the assumptions and requirements of any available WLA for the discharge prepared by the State and approved by EPA. The CWA definition of “effluent limitation” is quite broad (effluent limitation is “any restriction...on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources...”). See CWA 502(11). For further guidance, refer to Benjamin H. Grumbles memo (November 15, 2006) titled *Establishing TMDL Daily Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015 (April 25, 2006) and implications for NPDES Permits.* To ensure consistency with this TMDL, if an NPDES permit is issued for a point source that discharges one or more of the pollutants of concern in the Middle Branch/Northwest Branch or tributaries that are part of this TMDL, any deviation from the WLAs set forth in the TMDL Report and described herein for a point source, must be documented in the permit Fact Sheet and made available for public review along with the proposed draft permit and the Notice

of Tentative Decision. The documentation should: (1) demonstrate that the loading change is consistent with the goals of the TMDL and will implement the applicable water quality standards; (2) demonstrate that the changes embrace the assumptions and methodology of the TMDL; and (3) describe that portion of the total allowable loading determined in the State's approved TMDL Report that remains for any other point sources (and future growth where included in the original TMDL) not yet issued a permit under the TMDL. It is also expected that the Fact Sheet will be provided for review and comment to EPA and to each point source included in the TMDL analysis, as well as, any local and State agency with jurisdiction over land uses for which LA changes may be impacted. It is also expected that MDE will require periodic monitoring of the point source(s) for trash, through the NPDES permit process, in order to monitor and determine compliance with the TMDL's WLAs.

Load Allocations

For the purposes of these TMDLs, items considered to have come from nonpoint sources include items that are too large to travel through a sewer system, such as construction materials, appliances, and carpet. The LAs for the Middle Branch/Northwest Branch are provided in Tables 1 through 6, above. According to Federal regulations at 40 CFR § 130.2(g), LAs are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and nonpoint source loadings should be distinguished.

LAs were calculated using data collected by Baltimore County at all of its sampling sites, when it was found. Baltimore City did not collect any nonpoint source trash data, and was therefore assigned the same loading rate as Baltimore County. The calculated loading rate was applied to 100% of the affected acres in Baltimore City and Baltimore County, as a conservative assumption for this TMDL. A detailed description of the stream survey protocols (Sections 3.2) and nonpoint source loading rate calculations (Sections 5.1.3) are provided in the TMDL Report.

Based on the foregoing, EPA has determined that the TMDLs are consistent with the regulations and requirements of 40 CFR Part 130.

3) The TMDLs consider the impacts of background pollutant contributions.

Unlike some pollutants, trash does not occur naturally in the environment. Also, the TMDLs account for the impact of any potential background pollutant contributions by considering the trash load from all land uses.

4) The TMDLs consider critical environmental conditions.

EPA regulations at 40 CFR § 130.7(c)(1) require TMDLs to account for critical conditions for stream flow, loading, and water quality parameters. The intent of the regulations is to ensure that TMDLs are protective of water quality during the times and under the conditions when water quality is most susceptible. Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in

identifying the actions that may have to be undertaken to meet water quality standards¹. Critical conditions are a combination of environmental factors (e.g., flow, temperature, etc.), which have an acceptably low frequency of occurrence. In specifying critical conditions in the waterbody, an attempt is made to use a reasonable worst-case scenario condition.

In the Middle Branch/Northwest Branch, the critical conditions for trash are high flow events because these events represent conditions during which trash is most easily transported to and through streams and the storm sewer system. These critical conditions are accounted for in this TMDL because data were collected over four seasons and included monitoring after rain events that led to high flow conditions. The annual rainfall for 2010 and 2011 were well above the long-term average annual rainfall of 41.88 inches (National Weather Service 2010). The 30-year average annual rainfall was used to account for long-term conditions in the watershed.

5) *The TMDLs consider seasonal environmental variations.*

Seasonality is considered in the monitoring data that is used to calculate the baseline trash load and TMDL target in the Middle Branch/Northwest Branch Portions. Data collection over the four seasons accounted for possible localized seasonal variation in trash loading due to the large number of sites at which data were collected.

6) *The TMDLs include a Margin of Safety.*

The requirement for a MOS is intended to add a level of conservatism to the modeling process in order to account for uncertainty. Based on EPA guidance, the MOS can be achieved through two approaches. One approach is to reserve a portion of the loading capacity as a separate term, and the other approach is to incorporate the MOS as part of the design conditions.

The Middle Branch/Northwest Branch Trash TMDL employs both an explicit and implicit MOS. An explicit MOS of 5 percent was incorporated into the TMDL due to the variability present in all trash collection data. Since the TMDL requires 100 percent removal of the baseline load, the MOS was incorporated as an additional 5 percent of the total baseline load that must be removed. Additionally, conservative assumptions were incorporated into the determination of the baseline loading rates (LA and WLA) and represent an implicit MOS. The WLAs are conservative estimates of actual loads because they were calculated under the assumption that all land in the watershed (including non – point source lands not regulated under NPDES stormwater permits) contributes to the point source trash load. The WLAs are also conservative because they were based on average and not median values, which in this instance lead to higher loading rates. The LAs are conservative estimates of actual loads because although dumping of large items into the watershed occurs on a site specific basis, the nonpoint source loading rate was applied to all acres in the watershed.

7) *The TMDLs have been subject to public participation.*

MDE provided an opportunity for public review and comment on the trash TMDLs for

¹ EPA memorandum regarding EPA Actions to Support High Quality TMDLs from Robert H. Wayland III, Director, Office of Wetlands, Oceans, and Watersheds to the Regional Management Division Directors, August 9, 1999.

Middle Branch/Northwest Branch. The public comment period for this TMDL began on September 13, 2012 and ended on October 29, 2012. MDE received six sets of comments during this period. All of these comments were considered and addressed appropriately.

A letter was sent to the U.S. Fish and Wildlife Service pursuant to Section 7(c) of the Endangered Species Act, requesting the Service's concurrence with EPA's findings that approval of this TMDL does not adversely affect any listed endangered and threatened species, and their critical habitats.

V. Discussion of Reasonable Assurance

TMDLs represent an attempt to quantify the pollutant load that can be present in a waterbody and still ensure attainment and maintenance of water quality standards. The Baltimore Harbor Trash TMDLs identify baseline loads, representative of typical annual trash loads to the watershed, and call for capture, prevention, and/or removal of 100 percent of the baseline loads, calculated as an average of the measured or estimated removal or capture rate. The reduction goal is distributed between both point and nonpoint sources of trash. WLAs are assigned to the Baltimore City MS4, Baltimore County MS4, the Maryland State Highway Administration, and otherwise regulated land uses and discharges and address trash items that can typically travel through a sewer system. The LA is assigned to larger trash and debris that are attributed to activities such as dumping.

When a TMDL is developed for waters impaired by point sources only, the issuance of an NPDES permit(s) provides the reasonable assurance that the WLAs in the TMDL will be achieved. That is because 40 CFR § 122.44(d)(1)(vii)(B) requires that effluent limits in permits be consistent with "the assumptions and requirements of any available WLA" in an approved TMDL. Furthermore, EPA has the authority to object to the issuance of an NPDES permit that is inconsistent with WLAs established for traditional point sources, as well as more diffuse point sources such as permitted MS4 systems.

When a TMDL is developed for waters impaired by both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur, the TMDL should provide reasonable assurances that nonpoint source control measures will achieve expected load reductions.

As previously noted, the trash TMDLs for the Middle Branch/Northwest Branch are expressed as the quantities of trash that must be captured, prevented from entering, or removed from the waterbody. Expressing the TMDLs in this manner allows for the use of a wide variety of best management practices (BMPs) to achieve the TMDL allocations. It is expected that entities assigned allocations in these TMDLs will develop methods to reliably and transparently quantify their capture, prevention and/or removal of trash from the watershed. The actual or estimated trash capture/prevention/removal rates achieved by each BMP will be used to assess compliance with the TMDL allocations.

In the case of the Middle Branch/Northwest Branch Trash TMDL, MDE states that there is reasonable assurance that the goals of these TMDLs can be met with proper watershed

planning, implementing pollution-reduction BMPs, and using strong political and financial mechanisms and permit enforcement. The TMDLs can be achieved through a comprehensive, adaptive approach that addresses the following:

- Appropriate storm drain capture technologies
- Enforcement of illicit dumping laws
- Regulatory and voluntary approaches to trash removal and prevention

Since the TMDL methodology is directly linked to monitoring data, MDE will make it a priority to revisit the TMDL allocation values to ensure the allocations are based on accurate, representative and up – to – date data. Because the implementation of the TMDL is strongly linked to the MS4 permit requirements, the TMDL will be reevaluated in coordination with the MS4 renewal process.

Criteria to be considered for reevaluating the TMDL allocations will include:

- Evaluation of all new data presented by Baltimore City, Baltimore County, and other third parties over the five-year permit cycle;
- Public participation in the reevaluation process.

Section 6.0 of the TMDL report provides additional details related to programs, policies and regulatory mechanisms available to ensure implementation of this TMDL.

Additionally, and in response to concerns raised by stakeholders during the public comment period, MDE included an appendix (Appendix D) in the TMDL Report which describes a number of issues to be taken into consideration in the implementation plans for the trash TMDLs. The information and discussion in this appendix focuses on issues that stakeholders have indicated to be of interest such as monitoring of trash, best management practices for reducing trash, trash reduction, and MS4 trash permits. For detail information regarding the considerations discussed in the document, see Appendix D of the TMDL Report.