

# BALTIMORE CITY

## MS4 RESTORATION AND TMDL WIP



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## **ACRONYMS / GLOSSARY**

BMP – Best Management Practice (for controlling pollutant discharges)

DOT – Department of Transportation

DPW – Department of Public Works

ENR – Enhanced Nutrient Reduction

ESD-Environmental Site Design (aka Low Impact Development / LID), comprehensive strategy for maintaining predevelopment runoff characteristics by integrating site design, natural hydrology, and smaller controls to capture and treat runoff at the source.

EPA – Environmental Protection Agency

Impervious Surface-surfaces that prevent stormwater from infiltrating to below the ground, includes rooftops, pavement, and gravel.

MDE – Maryland Department of the Environment

MD DNR – Maryland Department of Natural Resources

MEP – Maximum Extent Practicable

MS4 – Municipal Separate Storm Sewer System

NPDES – National Pollutant Discharge Elimination System

Nutrients – Total phosphorus and total nitrogen

TMDL – Total Maximum Daily Load, the maximum amount of a pollutant a water body can receive and still meet water quality standards; “pollution diet”.

TN – Total Nitrogen

TP – Total Phosphorus

TSS – Total Suspended Solids

Watershed – an area of land that drains down slope to the lowest point, discharging to a river, river system or other body of water.

WIP – Watershed Implementation Plan; document that sets the way an agency will meet the regulatory requirements.

WLA – Waste Load Allocations

WQA – Water Quality Analysis, developed when supplemental data indicates the water body is meeting water quality standards for that substance

## EXECUTIVE SUMMARY

On December 27, 2013, the Baltimore City MS4 Permit was issued, initiating the development of the Baltimore City Municipal Separate Storm Sewer System (MS4) and Watershed Implementation Plan (WIP). As required by the Permit, the WIP presents strategies to meet the 20% impervious restoration requirement and Total Maximum Daily Load (TMDL) waste load allocations for each receiving water body.

Specifically, the WIP will provide the City basis to:

1. Provide Best Management Practices (BMPs) to restore an equivalent 20% of the existing impervious area where stormwater runoff is currently not managed to the maximum extent practicable (MEP).
2. Meet TMDL Waste load Allocations (WLAs) approved by the Environmental Protection Agency (EPA).
3. Educate and involve residents, businesses, and stakeholder groups in achieving measurable water quality improvements.
4. Establish a reporting framework that will be used for annual reporting as required in the City's National Pollutant Discharge Elimination System (NPDES) MS4 Permit.
5. Identify necessary maintenance, adaptive management, staffing, and financial strategies to implement the WIP.

### **Baltimore: Existing Conditions and Challenges**

The City's MS4 Permit encompasses land within the legal City boundary; the City's properties associated with Back River Wastewater Treatment Plant; and the drinking water reservoirs at Loch Raven, Pretty Boy, and Liberty. For MS4 Permit restoration and TMDL compliance, the WIP focused solely on property within City boundaries, which includes five 8-digit watersheds, as defined by the Department of Natural Resources:

1. Back River
2. Baltimore Harbor
3. Jones Falls
4. Gwynns Falls
5. Lower North Branch of the Patapsco River (LN Branch Patapsco)

The entire City is a part of the Chesapeake Bay watershed and therefore subject to the Chesapeake Bay TMDL, which mandates a significant reduction in nutrients and sediment by 2025. Each of the City watersheds are listed as impaired for nutrients, sediment, bacteria, chlordane and/ or PCBs and have been issued TMDLs associated with the pollutant.

The City is characterized by a high amount of impervious area (over 45%) with large public green space clustered along existing streams. The density of development, coupled with highly compacted clayey soils and a practice of directly connecting roof drains to the street gutter or storm drain collection system, facilitate the conveyance of stormwater, but also limit the potential for intercepting stormwater for treatment. The City was predominantly developed prior to any stormwater regulations. Only 45 BMPs, constructed to meet development requirements, provide qualitative stormwater control.

Many of the City's streams are conveyed through pipes, which, like much of the City's infrastructure, is over 60 years in age and failing. Additionally, the City is unable to manage and fund infrastructure improvements when approximately 14,000 City lots are vacant, and 19% of Baltimore households live below the poverty line.

### **Six Pillars of Practical Watershed Planning**

In developing the WIP, the City used available guidance documents from the U.S. Environmental Protection Agency (EPA) and the Maryland Department of the Environment (MDE), in addition to the following pillars for practical watershed planning:

1. Plan for more projects than necessary: Identification of contingency projects that could be used if the originally planned projects were found to not be practicable. These projects would also be available for potential off-site mitigation of stormwater development requirements.
2. Plan for resources that will affect funding needs: Evaluation of the capacity and limitations of available public lands (and therefore need for land acquisition), in addition to opportunities for use of local and re-purposed materials and local labor forces.
3. Plan to maintain: Evaluation long-term maintenance resources and costs for both projects and programs, plus education / outreach.
4. Plan to be a part of a bigger picture: Consideration of existing environmental, social, and economic development initiatives in the City.
5. Plan for effective public participation: Engagement of various stakeholders to develop, implement and maintain the projects, programs, and partnerships in the WIP.
6. Plan to adapt: Identification of methods for tracking, reporting, and evaluating progress, with allowances for modify the approach due to changes in regulatory compliance accounting practices, legal mandates, and innovative technologies.

### **Meeting our Goals**

To meet the 20% restoration goal, the City will restore over 4,291 acres of impervious surface area by the end of the current permit period, using a diverse approach throughout the City, including the following:

- Installing stormwater management projects, such as traditional/ structural Best Management Practices (BMPs), environmental site design (ESD) practices, and alternative BMPs selected;
- Employing a variety of operational programs, such as mechanical street sweeping, preventive inlet cleaning, and illicit discharge detection and elimination (IDDE); and
- Fostering partnerships to encourage stormwater management implementation on private lands, coupled with an increase in environmental stewardship within the communities.

Project selection built upon previous studies and current City initiatives, including:

1. Priority projects listed in the Watershed Assessments and vacant lot feasibility studies;
2. Neighborhoods adjacent to and/or upland from stream restoration project;
3. Neighborhoods adjacent to and/or upland from flood prone areas;
4. Neighborhoods adjacent to DPW storm drain projects (inlet screens) or other DPW initiatives (Municipal Trash Container Pilot, alley sweeping, etc);
5. Other identified stormwater projects and partnerships (schools, parks, etc);
6. CIP project locations by other agencies. In particular, DPW will coordinate with the Department of Transportation as they develop streetscape and Complete Streets plans, including a Complete Streets plan for the Casino Area Master Plan;
7. Neighborhoods with Year 1 and Year 2 Vacants to Value demolition clusters.

8. Neighborhoods with large numbers of vacant properties AND in or adjacent to Vacants to Value development clusters; and
9. Priority Planting Areas for increasing tree canopy.

The City's proposed approach for meeting the 20% restoration requirements will account for significant reductions of nitrogen, sediment and phosphorus, in compliance with the state's Phase II WIP for the Bay TMDL. However, the majority of the construction work will be completed in the last 18 months of the permit period (July 2017 to December 2018), instead of 2017, which was supposed to be the end of Phase II of the WIP. The delay was due to the issuance of the MS4 permit by MDE. It is still feasible for the City to meet the respective pollutant reductions for the Bay TMDL by 2025. The estimated restoration requirements in subsequent MS4 permits would be significantly less to meet the 2025 goal.

The proposed projects, programs, and partnerships are applicable to the local TMDLs for nutrients and sediment. The WIP forecasts that the City will meet the WLA for the local phosphorus and nitrogen TMDLs based on the estimated pollutant reductions for the proposed projects, programs, and partnerships to be implemented within this current permit period. However, the three local TMDLs for total suspended solids will not be met within this current MS4 permit, based on the current baseline loads for the respective watersheds. Although significant reductions are proposed within this permit period; the City has demonstrated that the compliance with these local TMDLs is not feasible utilizing currently available stormwater BMPs. The City proposes a re-evaluation of the baseline load allocations, in addition to assessments of quantified benefits of suspended solids removal efficiencies for IDDE. Upon the re-evaluation baseline, the schedule for compliance will be established.

Education and enforcement programs focused on illicit discharges, in concert with sanitary sewer infrastructure improvements, will be used to comply with the bacteria TMDLs for four of the five watersheds. Although e.coli concentrations exceed prescribed thresholds for infrequent full body contact recreation, routine stream impact sampling has shown a decrease of geometric mean concentrations since 2009 in the Jones Falls, Back River, and Gwynns Falls watersheds. The final schedule for compliance of the bacteria TMDL will be dependent on the approved schedule, or any changes hereafter, for the consent decree in Civil Action No. JFM-02-1524 regarding unpermitted discharges from the City's wastewater collection system. Although significant reductions are anticipated for human sources, the City does expect an increase in bacteria loadings from wildlife over the next ten years due to habitat restoration, reforestation, stream restoration, and other stormwater BMPs. The City proposes microbial source detection studies in 2019 (following current permit) and at the end of the City's Consent Decree to evaluate the changes in bacteria sources and any resultant WLAs for the impaired waters.

TMDLs were issued for PCBs for Back River and Baltimore Harbor. Compliance with these TMDLs cannot be achieved using the same practices used for nutrient, sediment, and bacteria reduction. Disposal of PCB-contaminated sediment is the only method for pollutant reduction. The City proposes to complete source targeting and decision of monitoring locations by 2020. Monitoring and load reduction is proposed to occur by 2040.

TMDLs were issued for chlordane for Back River and Baltimore Harbor watersheds; however, no WLAs were established for this pollutant because "Maryland states there are no significant point sources or overland runoff sources for chlordane"<sup>1</sup>. Since the MS4 permit requires restoration plans for only for approved WLAs, the WIP did not address chlordane.

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<sup>1</sup> EPA decision letters for TMDLs for Back River and Baltimore Harbor



## 1 INTRODUCTION

On December 27, 2013, The Maryland Department of the Environment (MDE) reissued a National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer (MS4) permit to the City of Baltimore. This permit lasts for five years and covers stormwater discharges from the municipal separate storm sewer system owned or operated by Baltimore City.

In order to reduce contaminated stormwater runoff, Baltimore's MS4 permit requires the City to develop a watershed implementation plan (WIP) by the end of 2014. The WIP will restore 20% of the City's impervious surface area that is not currently managed to the maximum extent practicable (MEP). Twenty percent restoration represents 4,291 acres – the equivalent of 3,000 football fields or 2,000 row house blocks.

The City MS4 Permit requires the permittee to manage, implement, and enforce a stormwater management program in accordance with the Clean Water Act (CWA) and corresponding stormwater NPDES regulations, 40 CFR Part 122. The following conditions are required:

1. Effectively prohibit pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with Maryland's receiving water quality standards;
2. Attain applicable waste load allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with Title 33 of the U.S. Code (USC) §1342(p)(3)(B)(iii); 40 CFR §122.44(k)(2) and (3); and
3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

One condition of Baltimore's MS4 Permit is to make progress toward implementation of TMDL load reduction allocations in the City watersheds. In addition to the Chesapeake Bay TMDL, there are 11 local TMDLs for Baltimore City Watersheds covering nutrients (nitrogen and phosphorus), sediments, and bacteria (e. Coli).

Understanding the physical, economic, social, hydrologic, and organizational conditions of Baltimore will allow the City to craft an implementation plan that best achieves our restoration goal. The WIP is divided into 6 Sections and an Appendix:

1. Background – this section sets the stage for the WIP strategy, identifying the existing conditions, current initiatives, and other information that form the basis of decision-making.
2. Projects, Programs, and Partnerships – this section includes a brief description of the strategy for implementing the WIP, including public outreach and maintenance.
3. Milestones – this section summarizes year-by-year goals to track progress within the permit period. Progress of the milestones will be included in Annual MS4 Reports submitted to MDE.
4. Adaptive Management –this section includes the plan for evaluating and adjusting the implementation plan.
5. Financial Strategy – this section identifies the funding sources and strategies for financing implementing and maintaining the projects and programs identified in the WIP.
6. Resources – this section includes a list of resources, publications, and website referenced.
7. Appendixes C to F – these appendices include detailed charts for tracking proposed projects and progress to meeting TMDLs. Status summaries of the charts will be included in the Annual MS4 Reports submitted to MDE.

## 2 BACKGROUND

### 2.1 Existing Conditions

#### 2.1.1 Geography

Baltimore is in north-central Maryland on the Patapsco River close to where it empties into the Chesapeake Bay. The city is also located on the fall line between the Piedmont Plateau and the Atlantic Coastal Plain. The City's elevation ranges from sea level at the harbor to 480 feet in the northwest corner near Pimlico. Baltimore borders with Baltimore County in most directions. It is bordered by Anne Arundel County to the south.

The city has a total area of 92.1 square miles, of which 81.6 sq mi is land and 10.5 sq mi is water. Baltimore can be defined as an “ultra-urban environment” - a densely developed urban area in which little pervious surface exists. Not only has most of the city already been developed, but this development occurred prior to the Clean Water Act. This means that there are few stormwater management controls in place.

#### 2.1.2 History<sup>2</sup>

Many of Baltimore's small streams and tributaries have been buried over the years. By the late 19th century, in an effort to manage floods and protect property, Baltimore placed many streams in man-made channels or in massive pipes. In Baltimore, contractors installed storm water mains in 1873. On average, the age of Baltimore's storm drain system is 80 years old.

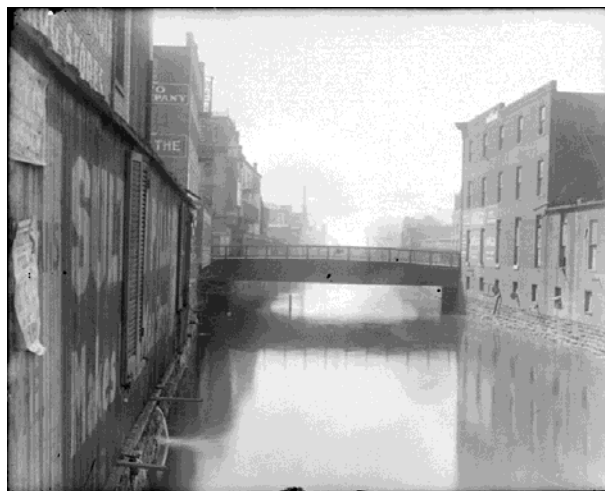
By the turn of the Twentieth century, the Lower Jones Falls had become “an odorous, poisonous water hole” according to a local Baltimore paper of the time. Sewage and stormwater ran into the river, and the factories and mills along its banks poured industrial waste into the Jones Falls. (Figure 1) Baltimore had the highest typhoid rate in the country, and public health officials encouraged the conversion of the last two miles of the river into an underground drain. A major engineering operation channeled the river into a huge culvert emerging at the Inner Harbor. The City completed the project by 1915, and at the dedication the master of ceremonies, Henry Barton Jacobs claimed he had come to “bury the Jones Falls—not to praise it”.

On February 7, 1904, the Great Baltimore Fire destroyed downtown but it provided the impetus to rebuild bigger and better. In 1905, voters backed a plan for a comprehensive system of building separate storm and sanitary sewers including primary and secondary treatment of human and industrial wastes before returning the treated wastewater to the Bay, thus resulting in the City's municipal separate storm sewer system.

#### Sanitary Sewers

In 2002, eight Combined Sewer Overflow Structures were identified in the Forest Park and Walbrook areas. Under the City's Consent Decree, all of the identified sewers were disconnected by 2006. (See Section 2.7 Other Regulatory Factors).

*Figure 1: Lexington Street bridge over the Jones Falls, ca. 1910-1914 (Source: Baltimore City Life Museum Collection, Maryland Historical Society)*



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<sup>2</sup> From “History of the System” on the Baltimore City Department of Public Works web site <http://publicworks.baltimorecity.gov/Bureaus/WaterWastewater/SurfaceWater/HistoryoftheSystem.aspx>.

### 2.1.3 Neighborhoods

Baltimore is known as a city of neighborhoods. According to the Live Baltimore website, there are 245 neighborhoods throughout the city, some only a few blocks in size while others have tens of thousands of residents.<sup>3</sup> Baltimore’s neighborhoods are often combined into Community Statistical Areas (CSAs) as a way to more easily collect and track data. The Baltimore Neighborhood Indicators Alliance (BNIA) has identified 55 CSAs using clusters of Census Tracts that correspond to Baltimore’s neighborhoods boundaries (Figure 2). For the purposes of planning, this WIP will use both the CSAs, as well as neighborhoods, for project location identification.<sup>4</sup>

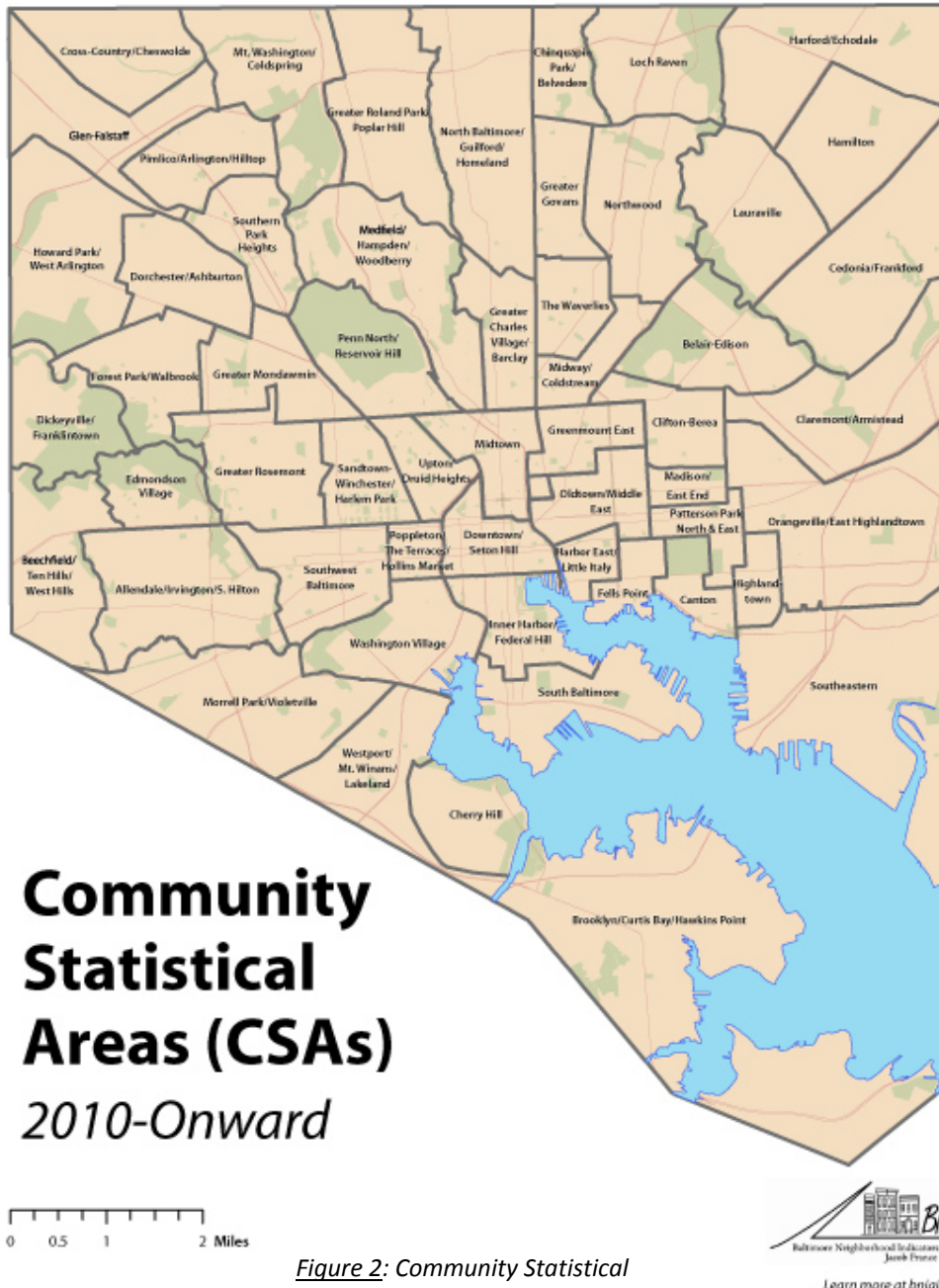


Figure 2: Community Statistical

<sup>3</sup> <http://livebaltimore.com/neighborhoods/>

<sup>4</sup> The maps on pages 10-13 are from BNIA’s Vital Signs 12 report and represent data mapped according to the Community Statistical Areas.

### 2.1.4 Population Trends

Baltimore is the largest city by population in Maryland and the fourth largest jurisdiction. In 2013, the population was estimated at 622,104<sup>5</sup>, an increase of 1,143 people (.2%) from 2010 census. African-Americans make up 63.3% of the population, followed by Caucasian (non-Hispanic) 28.3%, Hispanic or Latino 4.6%, and all others 3.8%. Hispanic and Latino residents are the fastest growing demographic.

Population change can also be characterized by age group. In the report entitled, “Who’s Moving to the Cities, Who Isn’t: Comparing American Cities”, Allan Mallach studied population changes from 2000 to 2012 for several cities, including Baltimore. His study found that in Baltimore there was a decrease in population for the age groups 45-64 and 65+ (empty nesters and retirees), with a slight gain in the 35-44 age group. The most significant increase in population were ages 25-34 (recent graduates and young adults)<sup>6</sup>, with Baltimore doing better than the state average.<sup>7</sup>

Based on the 2008-2012 American Community Survey, the median income in Baltimore was \$40,803. Nearly 35% of the City’s households earn less than \$25,000 annually, with nearly 19% of the households in Baltimore City were living below the poverty line (Figure 3). Slightly more than 23% of households earn more than \$75,000 annually.

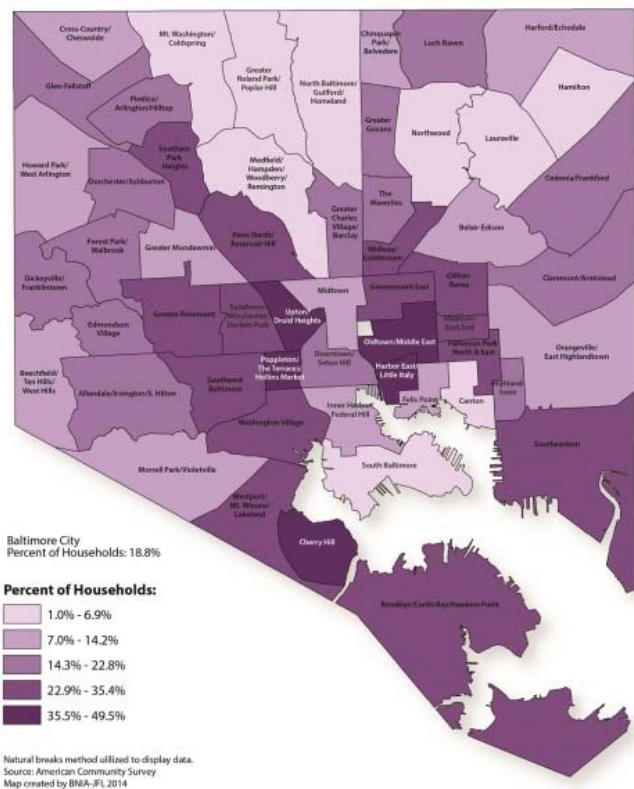
### 2.1.5 Transportation Infrastructure

Like stormwater, Baltimore City has an extensive transportation infrastructure<sup>8</sup>, consisting of:

- 2,000 miles of roadways
- 7 miles of interstate highways
- 298 bridges and culverts
- 3,600 miles of sidewalks, curbing, and gutters
- 456 miles of alleys
- 100 miles of bike lanes and bicycle-friendly streets
- 39 miles of off-road trails

The Department of Transportation is responsible for the planning, designing, building and maintenance of this system. Although funding and coordination are provided by the State Highway Administration (SHA), they do not have jurisdiction in Baltimore (which means that SHA’s MS4 Permit does not extend into the City).

**Percent of Households in Poverty  
By Community Statistical Area, 2008-2012**



*Figure 3: Percentage of Households in Poverty*

<sup>5</sup> <http://quickfacts.census.gov/qfd/states/24/24510.html>

<sup>6</sup> <http://www.baltimoresun.com/business/bs-bz-millennials-20141025-story.html#page=1>

<sup>7</sup> Who’s Moving to Cities, Who Isn’t: Comparing American Cities”, Allan Mallach, Center for Progress, September 2014

<sup>8</sup> <http://archive.baltimorecity.gov/Government/AgenciesDepartments/Transportation/TransportationSystemOverview.aspx>

### 2.1.6 Development Trends<sup>9</sup>

Mayor Stephanie Rawlings-Blake has set a goal of attracting 10,000 new households to Baltimore by the next decade. One of the initiatives established by the Mayor to achieve this is Baltimore Housing’s Vacants to Value program (V2V). V2V runs several different programs to market and develop vacant property. While many are city-wide (like the sale of individual properties or the Adopt-a-Lot program), others are more targeted. Community Development Clusters facilitate investment near areas of strength, including Barclay, Hollins Market, Oliver, Park Heights, and Sandtown. Additionally, V2V assembles larger tracks of land for major redevelopment; two recent projects are the Uplands in west Baltimore and O’Donnell Heights in southeast Baltimore. (See Section 2.8 Environmental Initiatives)

Redevelopment of residential and commercial properties is also increasing. The percentage of residential and commercial properties with rehabilitation permits in excess of \$5,000 increased slightly from 2011 to 2012. Between 2011 and 2012, new construction permits also increased. The geographic trend for permitting is shown in Figure 4.

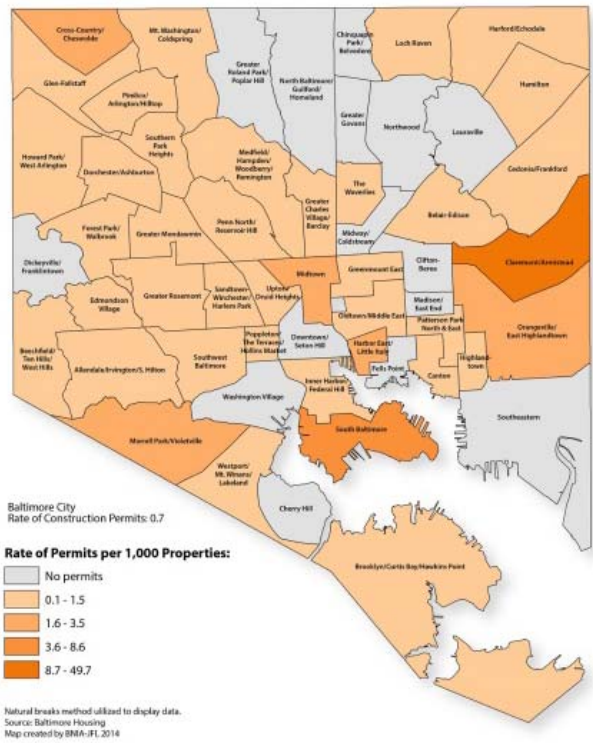
Because Baltimore is mostly built-out, it is projected that a majority of construction and building projects will be considered “redevelopment” as outlined by MDE.

### 2.1.7 Vacant Properties

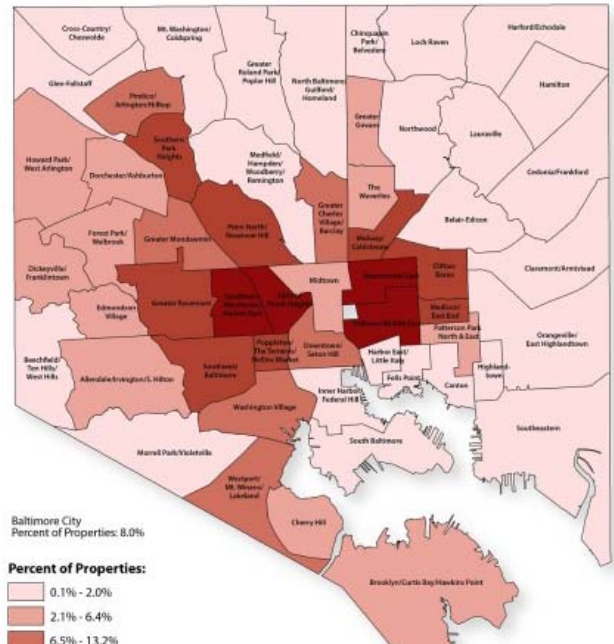
It is estimated by Baltimore Housing that there are approximately 16,000 vacant buildings and 14,000 vacant lots in the city. More than 75% of all vacant properties in Baltimore are privately owned. Figure 5 illustrates those CSA’s with the highest percentage of vacant and abandoned properties; the darker the color the higher the percentage.

Between 2011 and 2012, the rate of demolition permits increased from 1.6 to 1.9 per 1,000 homes. This increase can be attributed to Baltimore Housing’s blight elimination effort. Additionally, the V2V program is targeting an additional 4,000 vacant houses to be demolished over the next 10 years.<sup>10</sup> (See Section 2.8 Environmental Initiatives)

**Rate of Construction Permits  
By Community Statistical Area, 2012**



**Percent of Properties that are Vacant and Abandoned  
By Community Statistical Area, 2012**



*Figure 4: Construction Permits (above)  
Figure 5: Vacant and Abandoned Properties (below)*

Source: Baltimore Housing  
Map created by BNA-JF, 2014

<sup>9</sup> From Vital Signs 12, unless otherwise noted

<sup>10</sup> City of Baltimore, Change to Grow: Ten-Year Financial Plan. 2013. Pg. 14.

### 2.1.8 Sanitation

Dirty streets and alleys not only diminish the quality of life of neighborhoods, they also carry pollutants into waterways.

The rate of reported dirty streets and alleys increased from 65.3 per 1,000 residents in 2011 to 70.5 per 1,000 residents in 2012. These areas are predominantly in the near west and east sides, and the Park Heights corridor in northwest Baltimore (Figure 6).

In order to reduce the amount of trash and litter in the city's streets and alleys, DPW expanded its mechanical street sweeping program in April, 2014. Instead of sweeping only the Central District and main commuter routes, all neighborhoods in the city are now swept at least once a month. (See Section 4.2 Programs)

In June of 2014 Baltimore, also piloted a municipal trash can program in the Belair-Edison / Four by Four and Greater Mondawmin neighborhoods. Residents were provided with 64-gallon trash containers with lids, as well as recycling bins.

Finally, in August, 2014, proactive alley sweeping was initiated in eleven neighborhoods.

### 2.1.9 Flooding

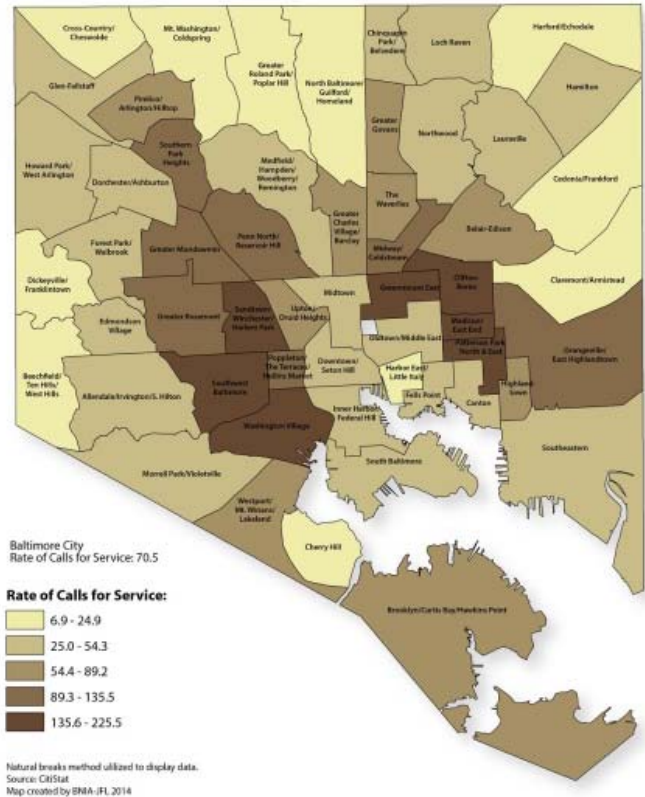
The rate of reported clogged storm drains decreased from 6.4 per 1,000 residents in 2011 to 6.2 per 1,000 residents in 2012 (Figure 7, also see Section 4.2 Programs). The areas reporting the most service requests coincide with the dirty street and alley map. In addition, the following areas have continual flooding problems:

- North Point Road
- Clipper Mill
- Mt. Washington Village / Whole Foods
- Kenwood Ave at Pulaski
- Cherry Hill at Patapsco Ave

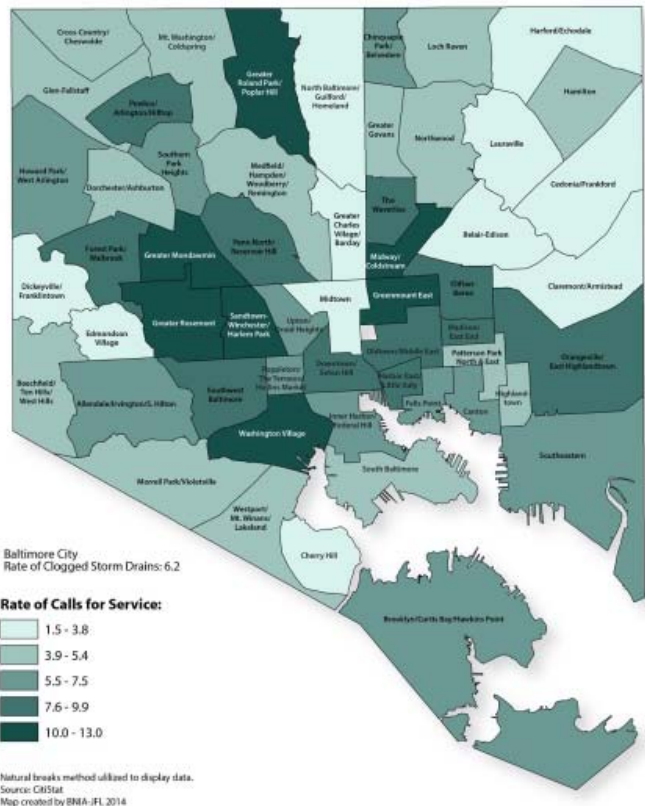
*Figure 6: Dirty Streets and Alleys (above)*

*Figure 7: Clogged Storm Drains (below)*

### Rate of Dirty Streets and Alleys per 1,000 Residents By Community Statistical Area, 2012



### Rate of Clogged Storm Drains per 1,000 Residents By Community Statistical Area, 2012



**2.1.10 Stormwater Infrastructure and Streams**

Baltimore City has about 116 miles of streams, with about 45 miles along main stems (see Section 4.1.3.1). However, this represents a fraction of what was originally a network of small streams and creeks that were piped and paved over as the city developed in the late 19<sup>th</sup> and the early 20<sup>th</sup> centuries. Many of these streams were either entirely buried or significantly covered, like Harris Creek (originally running from Patterson Park to the Harbor) and the Gwynns Run. Replacing the historic hydrology of the City is a storm drain infrastructure, primarily installed prior to 1950, that includes:

- 1,146 miles of storm drain pipes
- 52,438 storm drain inlets
- 27,561 manholes
- 1,709 outfalls.



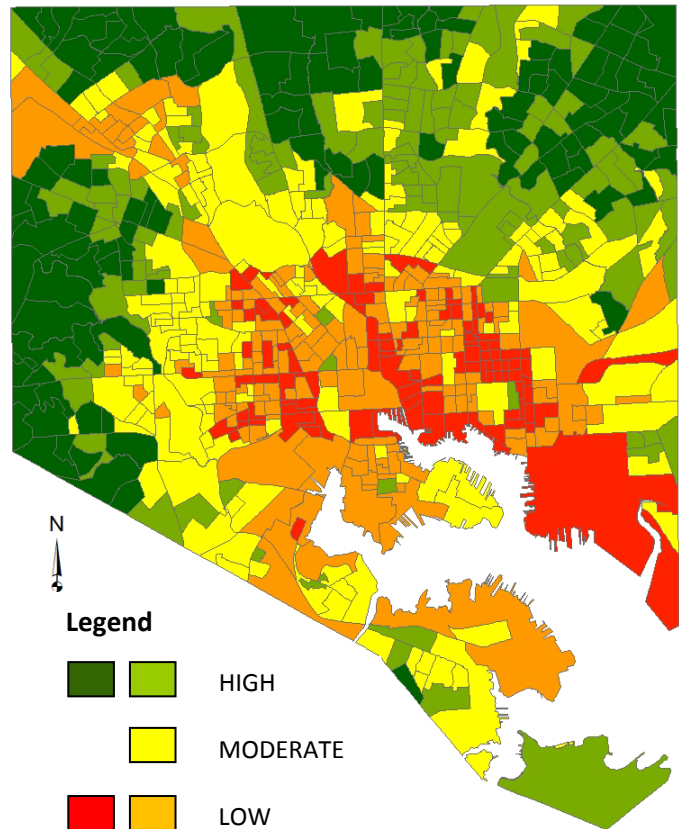
*Figure 8: Gwynns Falls Stream (Source: Van Sturtevant)*

**2.1.11 Shoreline<sup>11</sup>**

Baltimore has approximately 59 miles of coastline. Over half of the coastline (55%) is open pervious. (Open pervious areas present potential buffer re-establishment opportunities.) The amount of coastline buffer that is forested is approximately 7%, while wetland areas make up approximately 1% of the coastline buffer. There is a relatively high percentage of impervious area in the coastline buffer zone; approximately 38%. (See Section 2.7 Other Regulations)

**2.1.12 Tree Canopy**

In 2007, the City’s tree canopy cover was 27.5%. Figure 9 illustrates tree canopy, with dark green having the highest canopy cover and dark red the lowest. Inner Harbor, Downtown, and the surrounding dense rowhouse neighborhoods have the lowest canopy cover. (See Section 2.8 Environmental Initiatives).



*Figure 9: Tree Canopy Cover (Source: TreeBaltimore)*

<sup>11</sup> Direct Harbor Water Characterization Report Draft – July 2013

### 2.1.13 Land Usage and Zoning

Water has always been important in defining Baltimore. The city was founded and first populated along its harbor and the Jones Falls. As the city grew, it expanded outward and uphill, with industry filling in along the waterfront and the Jones Falls and Gwynns Falls stream valleys.

This pattern of growth and development is still evident today (Figure 10). The downtown (dark red and magenta) surrounds the Inner Harbor. Dense rowhouse neighborhoods (bright yellow) surround the downtown, extending to the northwest in Park Heights, to the north along the east side of York Road, and in Brooklyn/Curtis Bay and Cherry Hill in south Baltimore. Further out, less dense row houses and single family houses (pale yellow) can be found, including neighborhoods like Roland Park, Homeland, Mt. Washington, Hamilton, and Ten Hills.

Industrial areas (purple) are typically clustered around the outer harbor, the lower Gwynns Falls area in the southwest, and in east Baltimore near the Back River. Commercial corridors follow the arterial roads extending outward from the central downtown.

Several parks (green) are located along or adjacent to streams, including Leakin Park and Carroll Park (Gwynns Falls), Druid Hill Park, Cylburn, and Stony Run (Jones Falls / Stony Run), and Herring Run and Chinguapin Park (Herring Run / Chinguapin Run). The Middle Branch Park borders the Direct Harbor and mouth of the Lower North Branch of the Patapsco.

Transform Baltimore is the first comprehensive update of the zoning code since 1971. At that time, the focus was on auto-oriented development, separation of uses, and preserving the City's heavy manufacturing base. Over the past 40 years, the economic realities and design goals of the City have evolved, and the current Code is no longer able to move Baltimore forward. The goal of Transform Baltimore is to preserve and enhance the long-term economic health of the City of Baltimore well into the 21st century.

In 2008, the Department of Planning began a process to review and rewrite the current Zoning Code. A Zoning Advisory Committee (ZAC) was established, made up of stakeholders from City Agencies, Community Leaders, and the local development community. In addition, a series of community meetings took place centered on specific topics related to zoning, design and development. In September 2013 the new Zoning Code was approved by the Planning Commission and is currently being reviewed by the City Council for final approval.

One of the goals in the re-write of the Zoning Code is, "To promote the principles and standards enacted in the Baltimore City Sustainability Plan". This includes:

- A Landscape Manual was developed to support the new zoning code. The Zoning Code and the Landscape Manual are cross-referenced, and the Landscape Manual also references related regulations including the Stormwater Design Manual, Critical Area Management Program, and Forest Conservation.
- To control stormwater runoff and promote on-site groundwater recharge, the zoning code includes a maximum allowable percentage of impervious surfaces for all residential zoning districts.
- Green roofs are encouraged in Commercial (Title 10) and Industrial (Title 11) zoning districts.
- Rain barrels, compost piles, greenhouses, hoop houses, and recycling collection stations are considered permitted encroachments in the appropriate yard area.



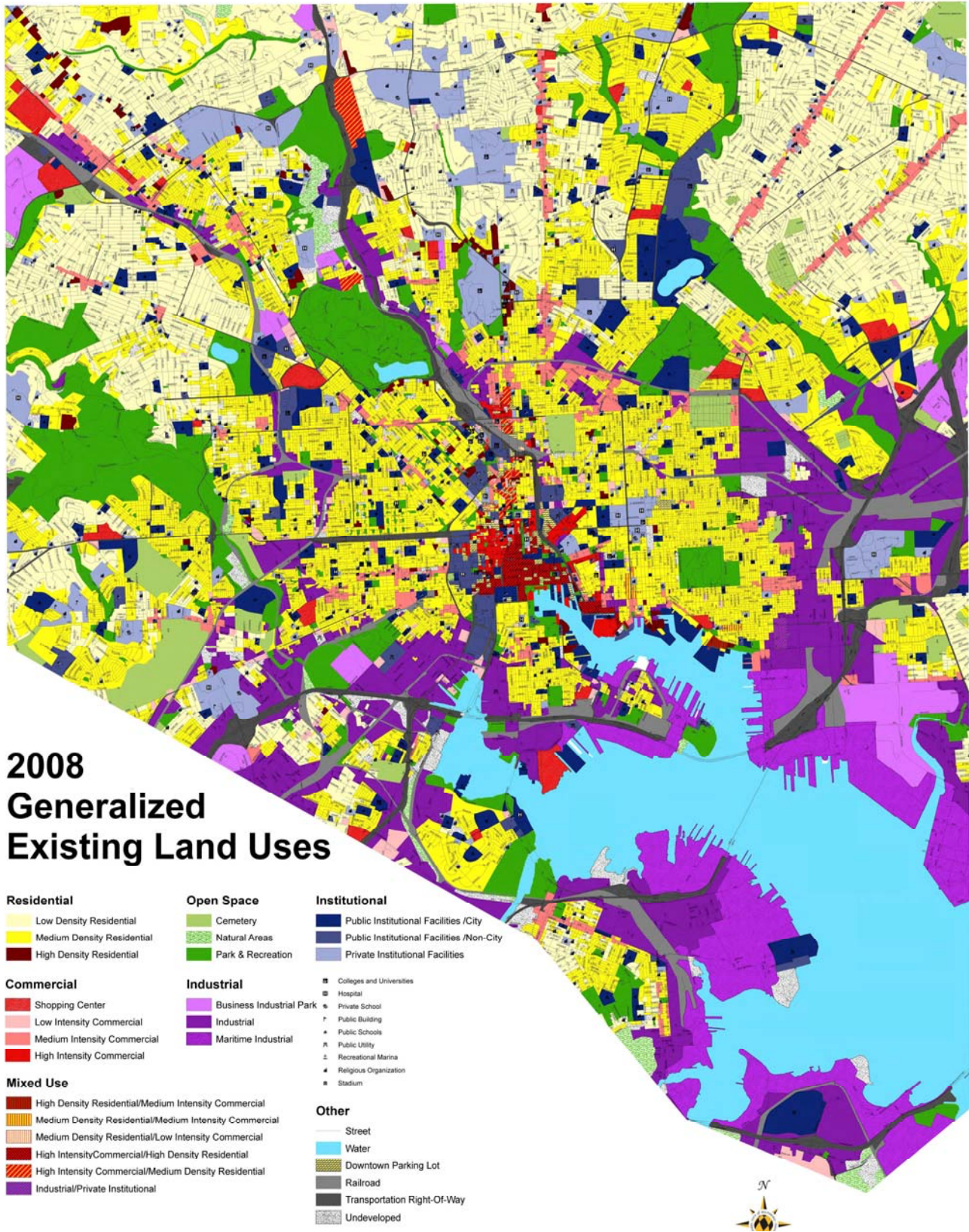


Figure 10: Land Use Map (Source: Baltimore City Department of Planning)

## **2.2 MS4 Permit Coverage**

The land area within the Baltimore City geographic boundary encompasses about 81.6 square miles. The City is responsible for the right-of-way. Although state and federal funding may be used for maintaining the roadways, the MS4 jurisdiction of the State Highway Administration (SHA) does not extend to the City. Two Phase II MS4 jurisdictions (Maryland Stadium Authority and Maryland Port Administration) are located within the City. Several state universities and colleges are located in Baltimore but are not specifically listed within the Phase II MS4 jurisdiction related to the University of Maryland. Over 200 industrial facilities subject to the NPDES Industrial Discharge Permit and No Exposure Certifications are located within the City, primarily along the water's edge of the Baltimore Harbor and Back River. Some of these properties have industrial surcharge permits, allowing for surface water to be discharged to the wastewater collection system and treated at the City's wastewater treatment plants.

In addition to this area, the City owns approximately 17,580 acres (27.47 square miles) of forested watershed property surrounding three reservoirs – Loch Raven and Prettyboy Reservoirs on the Gunpowder Falls and Liberty Reservoir on the North Branch Patapsco River. The watershed properties are forested with the majority of the water draining into the reservoir for treatment at either the Ashburton Water Filtration Plant or Montebello Water Filtration Plants for distribution in the public drinking water system. The reservoirs are listed as impaired; however, Baltimore County and Carroll County will be responsible for the associated TMDL implementation plans associated with the drainage areas that discharge to the source surface waters (streams) of the reservoirs.

Additionally, the City owns and operates the 466-acre Back River Wastewater Treatment Plant (WWTP). The facility is in the process of an Enhanced Nutrient Reduction (ENR) technology upgrade, which is part of the Maryland Phase II WIP for the Bay TMDL for wastewater treatment facility source sectors. The facility has also been issued an NDPEs Industrial Discharge permit, requiring the restoration of 20% of impervious area. The implementation plan for this 20% restoration will be submitted separately.

The City maintains jurisdiction for the management programs conditions listed in the MS4 permit for the reservoirs and Back River WWTP. For the purposes of this WIP, the City-owned properties located outside of the City limits were not included in the baseline impervious area calculation and subsequent 20% goal estimate.

### **2.2.1 Watersheds**

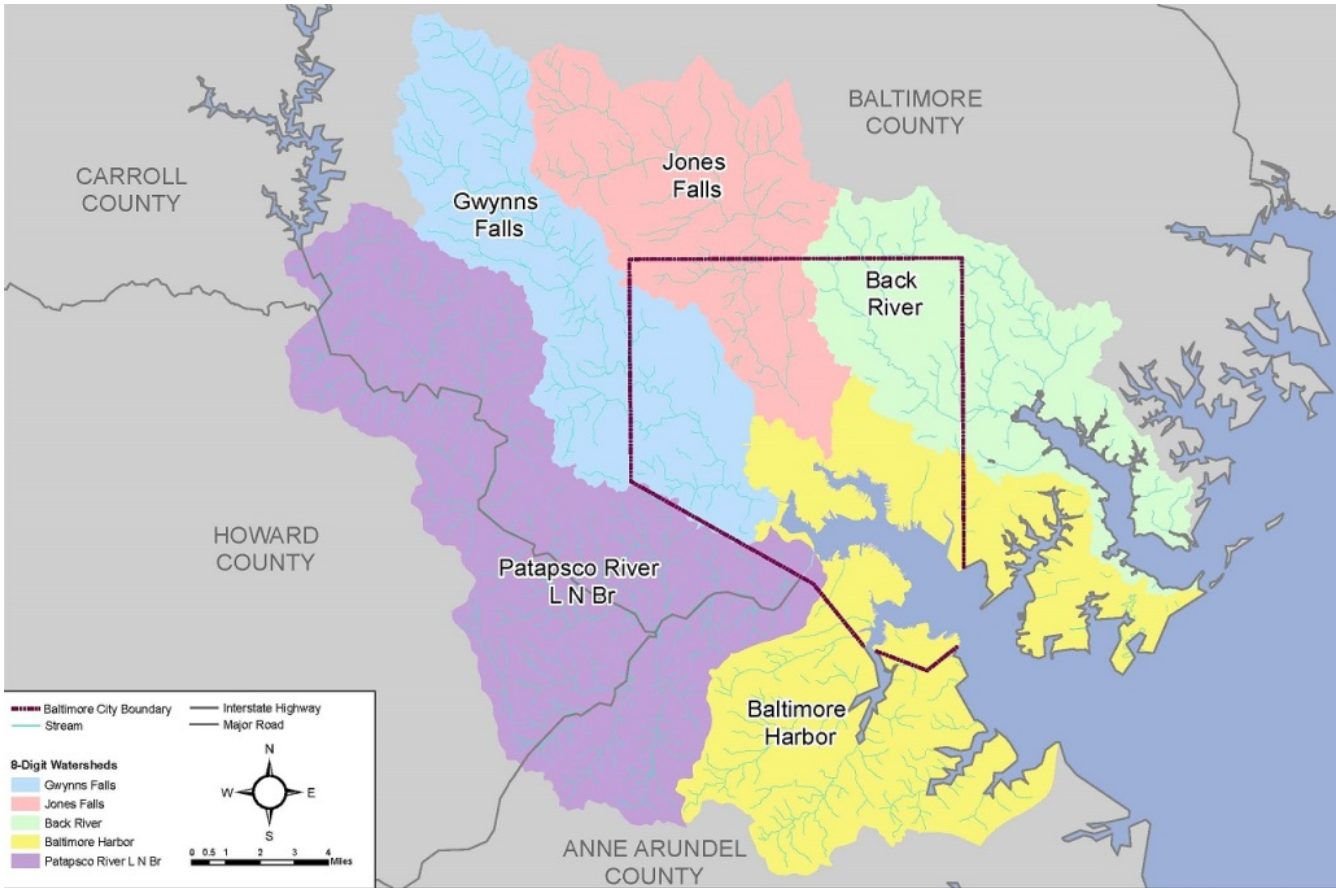
Baltimore has five 8-digit watersheds as designated by the Maryland Department of Natural Resources:

- Back River
- Baltimore Harbor
- Jones Falls
- Gwynns Falls
- Lower North Branch of the Patapsco River (LN Branch Patapsco)

The drainage area for these five watersheds is 339.6 square miles, of which 81.6 square miles are within Baltimore City limits (24%) [Table 1<sup>12</sup>]. The remainder of the drainage area is shared by Baltimore County (Back River, Gwynns Falls, Jones Falls, Baltimore Harbor, L N Branch Patapsco), Anne Arundel County (Baltimore Harbor, L N Branch Patapsco), and Howard County (Patapsco River L N Branch). Of Baltimore's five watersheds, Baltimore Harbor is the only one that is tidally influenced. While the Baltimore Harbor watershed has the largest drainage area (28%), it has the smallest percentage of open streams (6%).

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<sup>12</sup> Data derived from the "Watershed Needs Assessment" report by Parsons Brinckerhoff, 2010.



*Figure 11: 8-digit Watersheds (Source: Watershed Needs Assessment)*

Table 1: 8-digit Watersheds and Subwatershed

8-digit watershed	MDE 8-digit ID	Subwatersheds	Total Area (sq miles)	Area within City Limits (sq miles)	% within City Limits
<b>Upper Back River</b>	02130901	West Branch Herring Run	2.9	<b>0.7</b>	24%
		East Branch Herring Run	4.2	<b>0.8</b>	19%
		Herring Run Mainstream	6.9	<b>6.7</b>	97%
		Chinquapin Run	2.6	<b>2.0</b>	77%
		Tiffany Run	1.4	<b>1.4</b>	100%
		Armistead Run	0.6	<b>0.6</b>	100%
		Biddison Run	1.2	<b>1.2</b>	100%
		Moores Run	4.4	<b>3.6</b>	82%
		Redhouse Run	4.7	<b>1.0</b>	21%
		Unnamed Tributary	0.9	<b>0.9</b>	100%
		Stemmers Run	5.8	<b>0.2</b>	3%
		Drainage Area Outside of City Limits	7.7	<b>0</b>	
		<b>TOTAL DRAINAGE AREA</b>	<b>43.3</b>	<b>19.1</b>	<b>44.3%</b>
<b>Baltimore Harbor</b>	02130903	SW Harbor	5.9	<b>5.9</b>	100%
		Middle Branch	5.0	<b>5.0</b>	100%
		Inner Harbor	6.2	<b>6.2</b>	100%
		East Patapsco	5.4	<b>5.4</b>	100%
		Drainage Area Outside of City Limits	65.9	<b>0</b>	
		<b>TOTAL DRAINAGE AREA</b>	<b>88.4</b>	<b>22.5</b>	<b>25.4%</b>
<b>Lower Jones Falls</b>	02130904	Western Run	5.6	<b>3.2</b>	57%
		Stony Run	3.5	<b>3.5</b>	100%
		Lower Jones Falls	11.5	<b>10.8</b>	94%
		Drainage Area Outside of City Limit	5.5	<b>0</b>	
		<b>TOTAL DRAINAGE AREA</b>	<b>26.1</b>	<b>17.5</b>	<b>67.0%</b>
<b>Gwynns Falls</b>	02130905	Gwynns Run North	3.4	<b>3.4</b>	100%
		Gwynns Run South	2.3	<b>2.3</b>	100%
		Lower Gwynns Falls	8.0	<b>7.8</b>	97.5%
		Middle Gwynns Falls	9.7	<b>0.1</b>	1%
		Dead Run	7.9	<b>1.4</b>	18%
		Maidens Choice	4.8	<b>3.2</b>	67%
		Powder Mill	4.0	<b>2.5</b>	62.5%
		Drainage Area Outside of City Limit	25.4	<b>0</b>	
		<b>TOTAL DRAINAGE AREA</b>	<b>65.4</b>	<b>20.7</b>	<b>31.5%</b>
<b>Patapsco River L N Br</b>	02130906	Upper Portion	1.8	<b>1.8</b>	100%
		Drainage Areas Outside of City Limit	114.7	<b>0</b>	
				<b>TOTAL DRAINAGE AREA</b>	<b>116.4</b>
		<b>DRAINAGE AREA W/IN CITY LIMITS</b>	<b>339.6</b>	<b>81.6</b>	<b>24%</b>

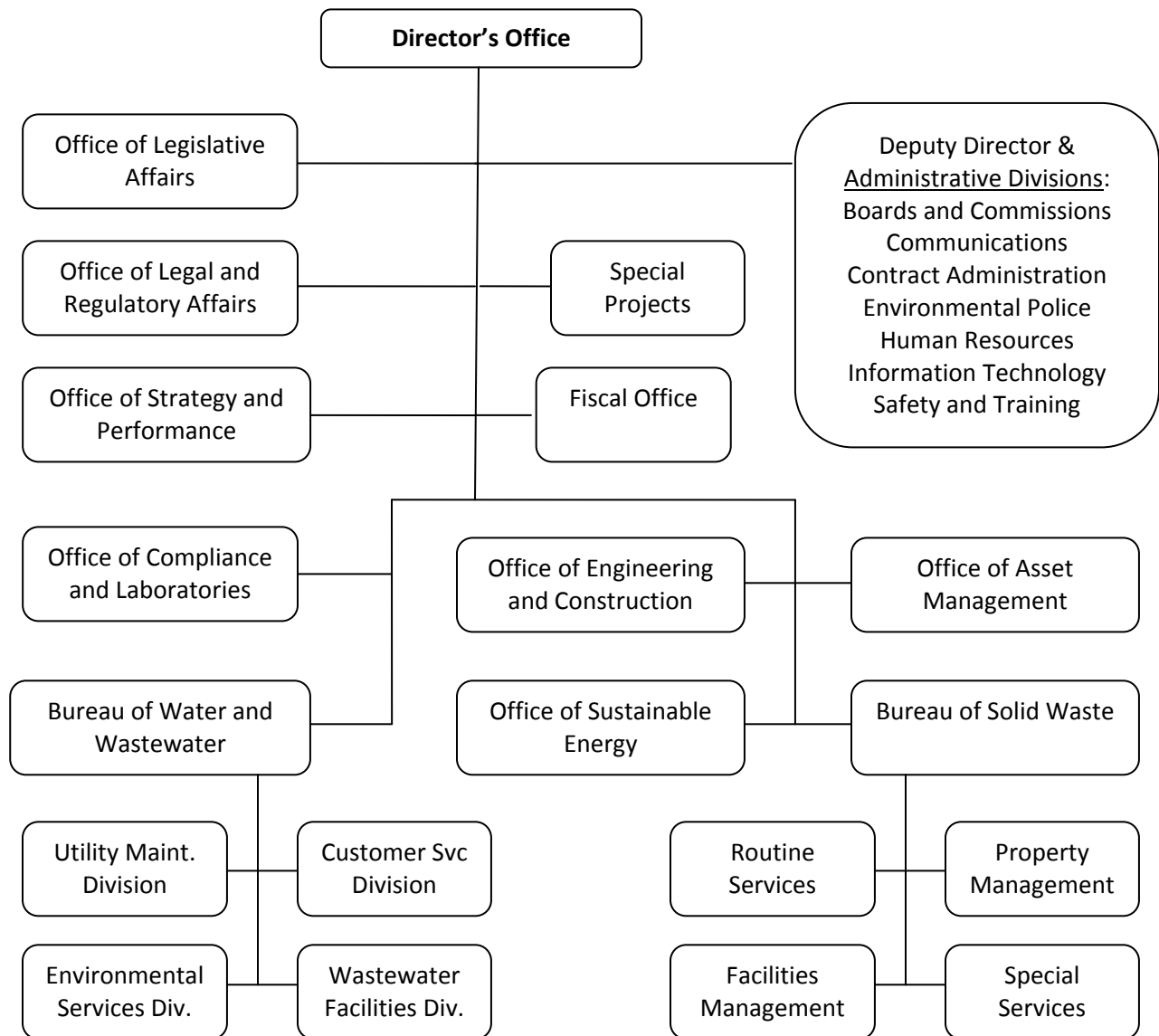
Note: Reservoirs are part of the MS4 Permit area, but strategy for MS4 WIP only within the city.

**2.3 Local Government**

Implementing the MS4 WIP and compliance with the City's MS4 permit requires a collaborative effort among city agencies, local non-profits, community partners, and the private sector. This collaboration will focus on the planning, design, construction, implementation, and maintenance of projects and programs.

Department of Public Works

The Department of Public Works (DPW) is primarily responsible for the planning, implementation, maintenance, monitoring, and reporting related thus MS4 WIP. An organization chart of the DPW is shown Figure 12. Further descriptions of the DPW divisions are as follows:



**Figure 12:** Organization Chart of the Department of Public Works

**Director of Public Works**

- Final approval of proposed policy, financial planning, rate structure and budget recommendations related to DPW to be submitted to the Mayor and / or City Council for adoption
- Final approval of proposed WIP and other MS4 deliverables to be submitted to MDE for review and agreement
- Co-chair of the Growing Green Initiative (with Department of Planning)
- Co-chair of the Healthy Harbor Steering Committee (with Waterfront Partnership of Baltimore)
- Oversight of Communications and Community Affairs Office for outreach and education materials, including the management of the Cleanwaterbaltimore.org website

**Office of Compliance and Laboratories**

- Point of contact for the MS4 permit
- WIP development and annual reporting for the MS4 permit
- Partnership coordination for grant funding, community engagement, education content
- Stormwater management and erosion and sediment control program for development (plans reviews and inspections)
- Response and investigation for erosion and sediment control and polluted surface waters response
- Maintenance of GIS information related to planned and completed Stormwater management facilities
- Surface water quality monitoring - sampling and analysis
- Illicit discharge detection and elimination (IDDE) program
- Facility management and hot spot investigations

**Office of Engineering and Construction**

- Implementation of the capital projects listed in this MS4 WIP
- Design and construction of stormwater management facilities related to design requirements for other DPW capital projects
- Development of design standards and specifications for stormwater management and erosion and sediment control, as used in the City's capital projects
- Compliance with NPDES General Construction permit of all DPW capital projects
- Coordination of City and other utility capital improvement projects to reduce land (soil) disturbance

**Office of Asset Management**

- Maintenance of GIS information related to the public storm drain system.
- Preventive inlet cleaning program (transition from Bureau of Water and Wastewater in FY 2017)
- Preventive DPW stormwater facility maintenance program (transition from Bureau of Water and Wastewater in FY 2017)
- Routine waterway maintenance and large debris collection system program (transition from Bureau of Water and Wastewater in FY 2017)
- Infrastructure inventory and condition assessment program (transition from the Office of Engineering and Construction in FY 2017)

**Bureau of Water and Wastewater / Utility Maintenance Division**

- Immediate response to repair and replace infrastructure as it relates to flooding, sewer overflows, and water main breaks

**Bureau of Water and Wastewater / Wastewater Facilities Division**

- Compliance with NPDES Industrial permit
- Operation of ENR upgrades at wastewater treatment plants
- Fats, oil, and grease (FOG) inspection and abatement program
- Industrial surcharge program (tracking of properties where stormwater runoff is collected within the sanitary sewer system)
- Pollution control program related to exterior lead based paint removal

**Bureau of Water and Wastewater / Customer Service and Support Division**

- Management of customer data (impervious area and fee reduction) related to the stormwater management fee

**Bureau of Solid Waste**

- Mechanical street sweeping
- Alley sweeping
- Recycling education and outreach programs
- Vacant property management: land management of vacant lots
- Rat abatement program
- Operation of solid waste facilities under NPDES industrial permit

Other City Agencies: Various agencies will contribute to the implementation of the WIP. Their roles include:

**Department of Planning** (includes the Office of Sustainability)

- Co-chair of the Growing Green Initiative
- Transform Baltimore (zoning code)
- Forest Conservation Program
- Critical Area Management Program
- Planning Commission and Sustainability Commission
- Floodplain management program and disaster preparation related to climate change

**Department of Recreation and Parks**

- Management of waterway recreation programs
- Education / outreach for nature / environmental initiatives
- Tree Baltimore

**Baltimore Department of Housing Community Development**

- Vacants to Value program
- Building and grading permitting
- International Green Construction Code (IgCC)/ Housing code enforcement

**Department of Transportation**

- Green streets program
- Right of way capital project coordination
- Bike Baltimore program
- Coordination with MTA and public transit programs
- Snow management (de-icing materials)
- Right of way permitting (as of July 1, 2015)

**Department of General Services**

- Preventive maintenance for fleet management
- Operation of fleet substations under NPDES industrial permit

**Mayor's Office of Emergency Services**

- Response to and reporting of hazardous materials spills

**Baltimore City Health Department, Mayor's Office of Neighborhoods and Constituent Services, Baltimore Office of Promotion and the Arts, and Baltimore City Public Schools**

- Outreach / education content and distribution

**Real Estate**

- Vacant land ownership and disposition

**2.4 Non-government Organizations (NGOs)**

Baltimore is fortunate to have a number of NGOs that have been active in addressing stormwater issues, providing education, advocacy, and project implementation. The City will continue to work with the following NGOs on various aspects of the MS4 WIP:

Alliance for the Chesapeake Bay – an environmental non-profit that works to educate, train, and advise all those with an interest in the health of the Chesapeake Bay. The Alliance sponsors conferences, organizes on-the-ground clean-ups and projects, and educates the public on restoration and pollution prevention. Although the Alliance works at a regional level, they collaborate on projects and with various partners in Baltimore and are a member of the Urban Water Federal Partners (see 1.4 Other Regulatory Factors).

Baltimore Community Foundation – the Foundation provides support to many of the City's sustainability efforts, including the Healthy Harbor Trash Work Group (see Section 4.6 Public Outreach: Partnering and Collaborating).

Baltimore Ecosystem Study – The Baltimore Ecosystem Study (BES) is a long-term ecological research project funded by the National Science Foundation. BES scientists conduct research on the soil, plants, and animals on the land and in streams, as well as water and air quality. Most importantly, BES studies how social and political decisions affect ecological processes. Researchers work with DPW on various studies, helping to expand our understanding of the City's urban watersheds and inform our actions related to water quality.



Baltimore Port Alliance (BPA) - The BPA is a non-profit group of maritime business representatives dedicated to addressing the needs and interests of businesses and individuals who make their living and support their families through maritime commerce. Through information advocacy and service, BPA seeks to protect the business climate for Marylanders by promoting the importance of the Maritime Industry in Maryland through sponsoring community and legislative forums, keeping elected officials informed, and fostering better communications with state and federal resource agencies.

Blue Water Baltimore (BWB) – In September, 2010, BWB was formed with the merging of the Jones Falls Watershed Association, Herring Run Watershed Association, Gwynns Falls Watershed Association, and the Baltimore Harbor Watershed Association. Blue Water Baltimore’s mission is to restore the quality of Baltimore’s rivers, streams and harbor to foster a healthy environment, a strong economy, and thriving communities. BWB runs several programs, including the Water Audit program (installation of residential stormwater practices), Blue Water Congregations (faith-based communities), Baltimore Harbor WaterKeeper, and Storm Drain Art program.

Chesapeake Bay Foundation – founded in 1967, the Chesapeake Bay Foundation (CBF) is the largest independent organization dedicated solely to saving the Bay. CBF provides education, advocacy, and litigation, as well as coordinating various restoration efforts. They have recently expanded their efforts by establishing a Baltimore initiative to work in closer partnership with the City, local non-profits, and the business community.

Civic Works / Center for Green Careers - Founded in 1993, Civic Works’ mission is to strengthen Baltimore’s communities through education, skills development, and community service. Central to this mission is the Community Lot Team, which transforms vacant and abandoned lots in Baltimore City into community gardens and green spaces, and the Baltimore Center for Green Careers. The Center is dedicated to the creation of business and employment development initiatives that contribute to environmental sustainability and are open to all Baltimore job seekers. In addition to providing training for residential energy retrofit and brownfields remediation, Civic Works is developing a program for green infrastructure installation and maintenance training.



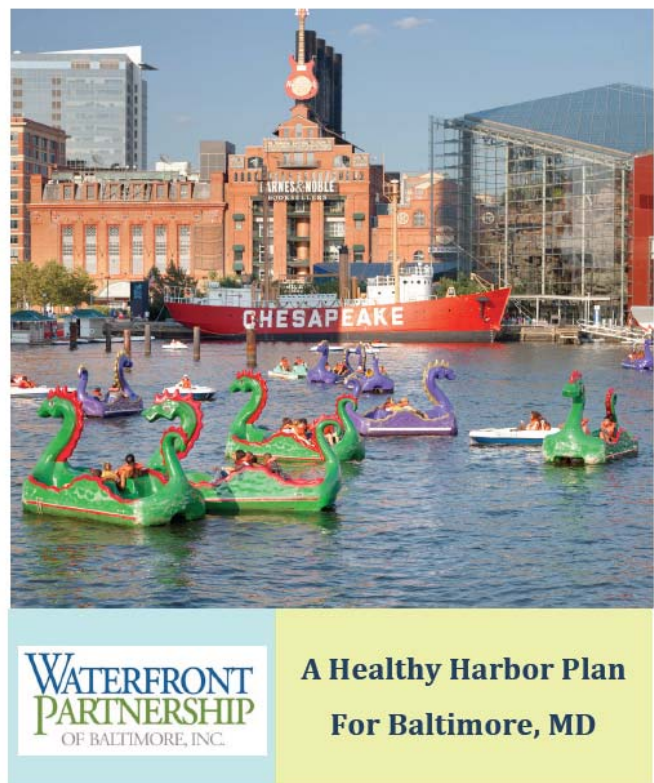
*Figure 13: Civic Works Community Lot Team  
(Source: Civic Works)*

Living Classrooms Foundation – Living Classrooms offers hands-on environmental education and job training for the City’s youth and young adults by using urban, natural, and maritime resources as “living classrooms”. Living Classrooms focuses on under-served and minority populations. Their Workforce Development Center contracts with Baltimore City to provide maintenance of vacant properties and landscaping services.

National Aquarium - National Aquarium is a nonprofit aquatic education and conservation organization whose mission is to inspire conservation of the world’s aquatic treasures. The National Aquarium provides education, school programs, and community engagement. The Aquarium Conservation Team (ACT!) provides volunteers hands-on opportunities to help restore habitats, learn about watershed dynamics and develop the knowledge and skills to serve as participants and leaders in environmental stewardship.

Parks & People Foundation (Parks & People) –Parks & People is dedicated to supporting a wide range of recreational and educational opportunities; creating and sustaining beautiful, lively parks; and promoting a healthy natural environment for Baltimore City. They host a number of programs that have an impact on the environment and recreation spaces including the Community Greening Resource Network (CGRN), the Mayor's PowerInDirt Initiative, Community Greening grants, Environmental Education, and Green Infrastructure project implementation. In 2003-2004, the Parks & People Foundation initiated the Watershed 263 Project, a 930-acre storm drain area in west and southwest Baltimore City that encompasses part of 12 urban neighborhoods and empties into the Middle Branch near the mouth of Gwynns Falls. Over the years Parks & People have led efforts in the City to plant trees, remove impervious surfaces, install stormwater BMPs, and educate residents on best practices for stormwater reduction and community greening.

Waterfront Partnership of Baltimore – Working in partnership with the City, the Waterfront Partnership of Baltimore, was created in 2005 to manage, promote and advocate on behalf of the waterfront. Waterfront Partnership provides programming, maintenance, and greening, within their service area (currently bounded by the Rusty Scupper on the south and extending around the harbor to Bond Street Wharf), as well as special projects like the Inner Harbor Plan 2.0. In 2010 the Waterfront Partnership created the Healthy Harbor Initiative and the subsequent Healthy Harbor Plan. (See Section 2.8 Environmental Initiatives)



*Figure 14: Healthy Harbor Plan (Source: Waterfront Partnership)*

## 2.5 Impervious Area Coverage

As previously mentioned, the City’s MS4 Permit requires treatment of an additional 20% of impervious cover not currently receiving treatment to the MEP. The baseline impervious area and subsequent impervious area restoration estimate are shown in Table 2<sup>13</sup>.

**Table 2: Impervious Area**

Description	Area (acres)
<b>Existing Impervious Area within City’s boundaries</b>	<b>24,479</b>
Properties not part of the MS4 jurisdiction	
Federal-owned property (39 parcels, excludes Public Housing)	-77
Federal-owned property (840 parcels, HABC and HUD)	-114
Phase II – Maryland Port Administration (8 parcels)	-215
Phase II – Maryland Stadium Authority (7 parcels)	-62
Other State-owned property (618 parcels)	-856
NPDES General Industrial Discharge Permit (144 parcels)	-646
NPDES Individual Industrial Discharge Permit (36 parcels)	-393
NPDES No Exposure Certification (79 parcels)	-297
<b>City MS4 jurisdiction</b>	<b>21,819</b>
Existing Treated Impervious Area (as of 2010)	-363
<b>Baseline Impervious Area (as of 2010)</b>	<b>21,456</b>
Estimated 20% Impervious Area Restoration	<b>4,291</b>

The existing impervious area estimate is based on aerial photo-imagery flown in 2011. A list of the federal, state, and other NPDES regulated facilities are provided in Appendix A. NPDES permit information is based on MDE’s on-line database<sup>14</sup> (updated as of May 2015), including adjacent parcels under similar ownership and data received as a part of the City’s stormwater fee credit program.

About 35% of the impervious area within the City MS4 jurisdiction is located within the right of way, used for existing public roadways, bus stops, on-street parking, pedestrian crosswalks, and sidewalks, underlain by a network of utilities. City-owned properties account for an estimated 1,290 acres of the impervious area, which is less than 9% of the total area outside of the right-of-way within the City’s MS4 jurisdiction.

### 2.5.1 Restoration Prior to 2010

Table 3 summarizes the estimate of the existing treated impervious area (as of 2010). As part of the previous MS4 permit conditions, several projects and programs were implemented to treat stormwater runoff and improve water quality. Stream restoration projects included Biddison Run Phase 1, Upper Stony Run, Middle Stony Run, Lower Stony Run, and Maiden’s Choice. Western Run Stream restoration was not included since the project was completed as mitigation for the Masonville Cove project. DPW installed two volume control facilities at Gwynns Run and Brooklyn Park, in addition to pilot installations for ESD practices in Watershed 263. Facility greening projects included asphalt removal, soil amendment, and tree planting at three schools and one vacant lot. Specific information related to the equivalent impervious area restoration calculation for DPW projects is presented in Appendix B, Tables B-1 and B-2.

<sup>13</sup> Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated Guidance for National Pollution Discharge Elimination System Stormwater Permits, MDE, August 2014, pgs 5 – 7.

<sup>14</sup> <http://mes-mde.mde.state.md.us/WastewaterPermitPortal/>

**Table 3: Restoration Prior to 2010**

Treatment	Description	Impervious Acres Restored
DPW Stream restoration	13,225 linear feet	167
DPW BMPs	3 projects	161
Private / Other City BMPs	45 facilities	35
<b>TOTAL</b>		<b>363</b>

The City has reviewed and approved as-built information for stormwater BMPs installed by City agencies and private developers between 2002 and 2010 as part of the development requirements under Article 7, Division II of the City Code. A summary of the private / other City BMPs is included in Appendix B, Table B-3. Although more BMPs were approved, permitted, and possibly constructed within that time period, these BMPs could not be counted as restored impervious acres because the as-built plans had not been received, reviewed, and / or approved by DPW at the time of this WIP. As-built information received following this WIP will be counted towards the baseline impervious area in subsequent MS4 Annual Reports (see Section 5.1 Tracking Mechanisms).

### 2.5.2 Watershed Assessments

Since 2001, Baltimore City has had 11 watershed assessments completed (Table 4) following the EPA’s guidance for watershed assessment and small watershed action plans (known as the “A thru I” criteria). To date, no watershed assessment has been completed for the Lower North Branch of the Patapsco that is within the City’s boundaries. A draft Direct Harbor Watershed Characterization Report was completed in 2013; the full assessment is scheduled for completion in 2016.

**Table 4: Watershed Assessment**

Planning Area	Major Watershed	Report Title	Year
Upper Back River	Back River	Small Watershed Action Plan	2008
Biddison Run	Back River	SW Improvement Feasibility & Conceptual Design	2006
Herring Run	Back River	Stream Assessment & Restoration Concept Plan	2004
Moores Run	Back River	Watershed Restoration Plan	2001
Direct Harbor	Baltimore Harbor	Watershed Characterization Report	On Hold
Masonville Cove	Baltimore Harbor	Small Watershed Action Plan	2014
Watershed 246	Baltimore Harbor	Small Watershed Action Plan	2010
Watershed 263	Baltimore Harbor	Management Plan	2006
Lower Jones Falls	Jones Falls	Small Watershed Action Plan	2008
Western Run	Jones Falls	Stream Assessment	2004
Stony Run	Jones Falls	Watershed Restoration Plan	2001
Gwynns Falls	Gwynns Falls	Water Quality Management Plan	2004
Powder Mill	Gwynns Falls	Targeted Watershed Assessment	2004
Maidens Choice	Gwynns Falls	Watershed Restoration Plan	2001

## **2.6 TMDLs**

### **2.6.1 Chesapeake Bay Total Maximum Daily Load (TMDL)**

The Chesapeake Bay Total Maximum Daily Load (TMDL), established by the US Environmental Protection Agency (EPA), set pollution limits for nitrogen, phosphorus, and sediment in the Chesapeake Bay Watershed. This TMDL, established under provisions of the Clean Water Act, is in response to the slow progress by states within the watershed to limit their pollutants to levels which meet water quality standards in the Bay and its tidal tributaries. Total limits set in the Bay TMDL for the states of Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia are “185.9 million pounds of nitrogen, 12.5 million pounds of phosphorus and 6.45 billion pounds of sediment per year – a 25 percent reduction in nitrogen, 24 percent reduction in phosphorus and 20 percent reduction in sediment”<sup>15</sup>. The TMDL also sets rigorous accountability measures for state compliance. The State has completed Phase I and Phase II of the WIP for all source sectors.

Baltimore City presented local approaches for the Maryland Phase II WIP and has since provided its 2-Year Milestone schedules. The City only has two primary source sectors: wastewater treatment plants and regulated stormwater. The City owns and operates the two largest wastewater treatment plants in the State; both are in the process of implementing Enhanced Nutrient Reduction (ENR) technology upgrades. The ENR upgrades are part of the State’s WIP to significantly reduce the nitrogen waste loads, and thus are partially funded by revenues from the state-managed Chesapeake Bay Restoration fund.

Pollutant loadings from regulated stormwater are expected to be addressed within the state’s timeline through the 20% impervious area restoration goal of the MS4 permit. Estimated reductions for nutrients and sediments associated with the 20% reduction are shown in Appendix C. However, the majority of the construction work will be completed in the last 18 months of the permit period (July 2017 to December 2018), instead of 2017, which was supposed to be the end of Phase II of the WIP. The delay was due to the issuance of the MS4 permit by MDE. The goals for phosphorus reduction and sediment reduction will be attained by the end of this permit period. Additional restoration efforts (less than half of the restoration requirements of the current permit) would be required following this permit period in order to achieve the reduction goals for nitrogen by 2025. These additional efforts are listed by BMP type in Appendix D.

### **2.6.2 Local Baltimore City TMDLs**

One condition of Baltimore’s MS4 Permit is to make progress toward implementation of TMDL load reduction allocations in the City watersheds. The City has a number of watersheds where EPA-approved TMDLs have established pollutant loading limits for water bodies. These loading limits represent the maximum amount of a pollutant that the water body can receive and still meet water quality. Pollutant loads must be reduced by implementing a variety of measures.

Table 5 lists the local TMDLs and impairments per watershed. Due to the regional focus of the Chesapeake Bay TMDL, quantified nutrient and sediment reduction benefits have been established for various practices and programs.

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<sup>15</sup> USEPA December 2010

**Table 5: Baltimore City TMDL Summary by Impairment**

Impairment	Watershed	Issue Date	Pollutant	MS4 Baseline Load	WLA	Units	Description	% Reduction	Source
Nutrients	Back River	2005	TN	73,429	62,415	LBS/year	Annual Avg.	15%	Total Maximum Daily Loads of Nitrogen and Phosphorus for Back River in Baltimore City and Baltimore County, Maryland
	Baltimore Harbor (includes Jones Falls, Gwynns Falls, and Lower N. Branch of the Patapsco)	2007	TN	260,323	221,274	LBS/ year	Annual Avg.	15%	Total Maximum Daily Loads of Nitrogen and Phosphorus for the Baltimore Harbor in Anne Arundel, Baltimore, Carroll and Howard Counties and Baltimore City, Maryland
	Back River	2005	TP	8,316	7,069	LBS/ year	Annual Avg.	15%	Total Maximum Daily Loads of Nitrogen and Phosphorus for Back River in Baltimore City and Baltimore County, Maryland
	Baltimore Harbor (includes Jones Falls, Gwynns Falls, and Lower N. Branch of the Patapsco)	2007	TP	28,177	23,951	LBS/ year	Annual Avg.	15%	Total Maximum Daily Loads of Nitrogen and Phosphorus for the Baltimore Harbor in Anne Arundel, Baltimore, Carroll and Howard Counties and Baltimore City, Maryland
Sediments	Gwynns Falls	2010	TSS	7,205	3,712	Tons/year	Annual Avg.	48.5%	Total Maximum Daily Load of Sediment in the Gwynns Falls Watershed, Baltimore City and Baltimore County, Maryland
	Jones Falls	2011	TSS	4,733	3,489	Tons/year	Annual Avg.	26.3%	Total Maximum Daily Load of Sediment in the Jones Falls Watershed, Baltimore City and Baltimore County, Maryland
	Lower N. Branch Patapsco	2011	TSS	610	457	Tons/year	Annual Avg.	25.1%	Total Maximum Daily Load of Sediment in the Patapsco River Lower North Branch Watershed, Baltimore City and Baltimore, Howard, Carroll and Anne Arundel Counties, Maryland

Baltimore City MS4 and TMDL Watershed Implementation Plan

Impairment	Watershed	Issue Date	Pollutant	MS4 Baseline Load	WLA	Units	Description	% Reduction	Source
Bacteria	Back River (Herring Run)	2007	E.coli	5,860,942	214,920	Billion MPN/year	Annual Avg.	96.3%	Total Maximum Daily Loads of Fecal Bacteria for the Herring Run Basin in Baltimore City and Baltimore County, Maryland
	Gwynns Falls	2007	E.coli	98,157	322	Billion MPN/day	Daily	99.7%	Total Maximum Daily Loads of Fecal Bacteria for the Non-Tidal Gwynns Falls Basin in Baltimore City and Baltimore County, Maryland
	Jones Falls	2008	E.coli	8,608	314	Billion MPN/day	Daily	96.4%	Total Maximum Daily Loads of Fecal Bacteria for the Non-Tidal Jones Falls Basin in Baltimore City and Baltimore County, Maryland
	Lower N. Branch Patapsco	2009	E.coli	5,393	3,902	Billion MPN/year	Annual Avg.	27.6%	Total Maximum Daily Loads of Fecal Bacteria for the Patapsco River Lower North Branch Basin in Anne Arundel, Baltimore, Carroll, and Howard Counties, and Baltimore City, Maryland

Source: <http://www.mde.state.md.us/programs/Water/TMDL/CurrentStatus/Pages/Programs/WaterPrograms/TMDL/Sumittals/index.aspx>

Other TMDLS

Back River: Chlordane (Approved 1999) – no WLA listed; PCBs (Approved 2012)

Baltimore Harbor: Chlordane (Approved 2001)- no WLA listed; PCBs (Approved 2012)

The following WQAs (Water Quality Analysis) have been approved by EPA (date in parentheses); no TMDLs are needed for the impairments listed:

Back River: Zinc (2004)

Baltimore Harbor, Northwest Portion: Zinc & Lead (2005); Chromium (2012)

Gwynns Falls: Nutrients (2010)

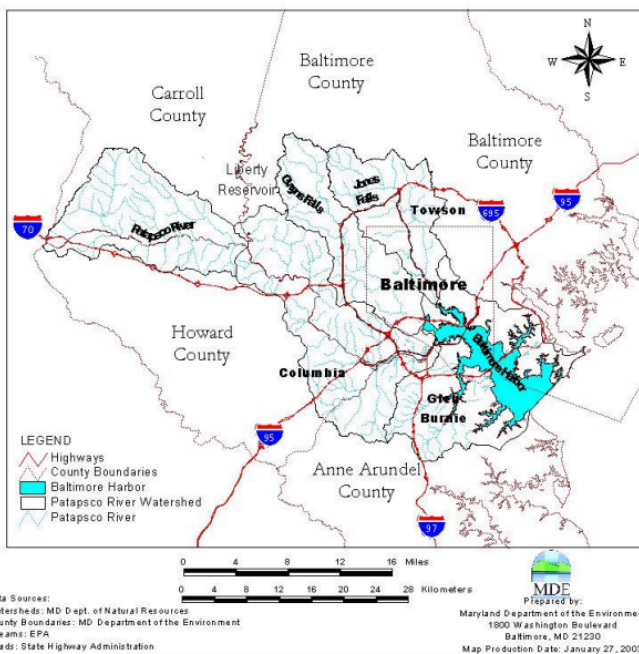
Jones Falls: Zinc (2003); Copper & Lead (2004); Nutrients (2010)

Lower North Branch of the Patapsco: Metals (2005)

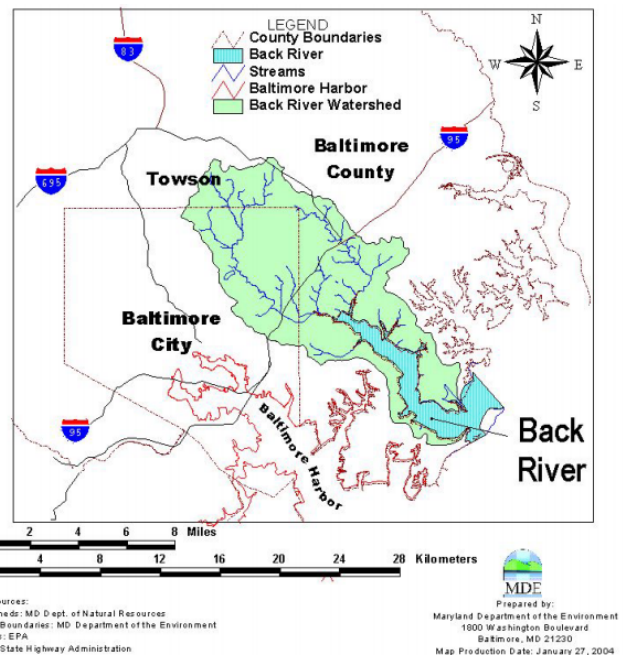
2.6.2.1 Local TMDLs for Nitrogen and Phosphorus

MDE has designated the Patapsco River Mesohaline Stream Segment and Back River as impaired for nitrogen and phosphorus. Nitrogen and phosphorus (also known as nutrients), act as a fertilizer leading to the excessive growth of aquatic plants. These plants eventually die and decompose, leading to bacterial consumption of dissolved oxygen (DO). Decreased DO concentrations result within the water column particularly when stratification of layering prevents oxygen in the surface layers from mixing with deeper layers. High concentrations of nutrients result in eutrophication, expressed as high levels of chlorophyll a and low concentrations of DO. These conditions may be harmful for fish, shellfish, and other underwater life. Sources of nutrients can include atmospheric deposition, lawn fertilizers, and septic / sewage systems.

Although listed as Baltimore Harbor, the watershed area is not referencing the 8-digit watershed but the Baltimore Harbor estuary of the Patapsco River Watershed. This drainage area extends through Baltimore City, in addition to Anne Arundel, Baltimore, Carroll and Howard Counties (as shown in Figure 15). The drainage area for the Back River TMDL is shown in Figure 16. It includes tributaries of Herring Run, Moore’s Run, Biddison Run, Armistead Run, and Chinquapin Run.



**Figure 15:** Drainage Area for Baltimore TMDL for Nitrogen and Phosphorus.



**Figure 16:** Drainage Area for Back River TMDL for Nitrogen and Phosphorus.

The WLAs for the local TMDLs for nitrogen and phosphorus are within the WLAs for the Chesapeake Bay TMDL. The proposed projects, programs, and partnerships listed in Appendix B are applicable to the local TMDLs for nutrients and sediment. Tables E-1 and E-2 (Appendix E) demonstrate how the WLA for the local phosphorus and nitrogen TMDLs will be achieved for the respective drainage area, accounting for existing BMPs and the proposed restoration of 20% of the baseline impervious area.



### 2.6.2.2 Local TMDLs for Total Suspended Solids (TSS/ Sediment)

MDE designated three watersheds as impaired for total suspended solids (TSS or sediment): Gwynns Falls, Jones Falls, and Lower North Branch of Patapsco River. The objective of the sediment TMDL is to establish sediment loads to support the Use I- III designations of the impaired streams and tributaries. Currently, Maryland has not established specific criteria that quantify the impact of sediment on the aquatic health of nontidal systems. MDE used an analysis of sediment loads, biological stressor identification methodology and biocriteria to establish the base line loads and WLAs. Previous studies have demonstrated the relationship between high amounts of connected impervious surfaces and stream degradation. This degradation includes excessive stream bank and stream bed erosion. Therefore, stream restoration is an effective practice for decreasing sediment loadings.

Similar to the local TMDLs for nitrogen and phosphorus, the proposed projects for 20% restoration are applicable and may be counted towards the achieving the WLA for sediments. However, none of the three local TMDLs for total suspended solids will be met within this current MS4 permit, based on the current baseline loads for the respective watersheds. Tables F-1 to F-3 (Appendix F) show the estimated reductions for both existing and proposed restoration of 20% of the baseline impervious area within the respective watersheds. It should be noted that no reductions have been quantified for sediment using IDDE.

Although significant reductions are proposed within this permit period, it is not feasible to achieve the WLAs for the local sediment TMDLs using available stormwater BMPs. Appendix F includes worksheets for each watershed comparing pollutant load methods and estimated reductions using MDE approved methods<sup>16</sup>. First, a comparison was made using the estimated sediment loading for the City from the Maryland Assessment Scenario Tool (MAST) for the Chesapeake Bay TMDL. This comparison showed that the land area for the respective watersheds should only yield about 58 to 75% of the baseline loadings of the local TMDL. Second, a comparison was made using the sediment loading rates prescribed by MDE based on land type. This second comparison estimated that the respective watersheds should only yield about 33 to 60% of the baseline loadings of the local TMDL. These two comparisons show that more land area (and thus more stormwater runoff) would be required to achieve the baseline loadings.

The worksheets also include an evaluation of the amount of effort to achieve the required sediment reduction to meet the respective WLAs. Two approaches were used: filtration BMPs (typical for an urban environment with poorly draining soils) and restoration (replacing impervious area with a good stand of forest). The worksheets show that the required restoration exceeds the available capacity (land area) for the Gwynns Falls watershed. Over 66% of the other two watersheds would have to be restored using filtration BMPs. The WLAs could be achieved if 47 to 79% of the existing impervious area of the Jones Falls and Lower North Branch Patapsco watershed were removed and replaced with a good stand of forest. Both of these scenarios are not practicable. Therefore, the City proposes a re-evaluation of the baseline load allocations, in addition to assessments of quantified benefits of suspended solids removal efficiencies for IDDE. Upon the re-evaluation baseline, the schedule for compliance will be established.

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<sup>16</sup> MDE's "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated" guidance document

### 2.6.2.3 Local TMDLs for Bacteria

Four of the five watersheds in Baltimore have been listed as impaired for bacteria. The City is under a consent decree in Civil Action No. JFM-02-1524 for unpermitted discharges from the wastewater collection system (see Section 2.7.2); however, the City's routine surface water monitoring program has shown bacteria levels during the dry weather periods, due to failing sanitary sewer infrastructure, undocumented / unpermitted sanitary connections, consumer behavior and poor pet waste management. Maryland has established bacteria indicator criteria (e.coli and enterococci) for the use for water contact recreation<sup>17</sup>.

The results of the City's routine stream sampling program of e.coli at monitoring stations in non-tidal waters are shown in Appendix G for the Jones Falls, Back River, and Gwynns Falls watersheds. There are not stream sampling stations in the Lower North Branch Patapsco watershed. Although e.coli concentrations exceed prescribed thresholds for infrequent full body contact recreation (576 MPN/ 100 ml), the sampling results show a decrease of geometric mean concentrations since 2009.

The documented trend in e.coli concentrations is primarily due to the City's significant investment in the rehabilitation of the wastewater collection system as required by the aforementioned consent decree. Although the original design intent was to decrease inflow and infiltration into the sanitary collection system, pipe replacement and re-lining will also reduce the potential for exfiltration. In addition to exfiltration, the City plans to document and estimate bacteria load reductions due to decreased wet weather overflows resulting from consent decree capital improvement projects. The final schedule for compliance of the bacteria TMDL will be dependent on the approved schedule, or any changes hereafter, for the consent decree.

Although several studies have been published related to the estimated efficiency of bacteria for traditional BMPs and ESDs, MDE has not established specific bacteria load reductions. The loading models would have to assume that the bacteria loadings were made at the ground surface, not subsurface like sewage exfiltration. There is also a potential for increased bacteria from wildlife due to habitat restoration from reforestation, stream restoration, and other stormwater BMPs. The City proposes microbial source detection studies in 2019 (following current permit) and at the end of the consent decree to evaluate the changes in bacteria sources and any resultant WLAs for the impaired waters.

Current and future education and enforcement programs focus on consumer behavior related to pet waste management and causes of dry weather SSOs (fats, oils, grease and other unsuitable materials for flushing). The City also plans to increase the efforts of its Illicit Discharge Detection and Elimination (IDDE) Program. Monitoring and inspection efforts will be increased to identify and eliminate direct illicit connections. These efforts are discussed further in Section 4.2.3 of the WIP. The City proposes a study to establish standard bacteria load reduction relationships for IDDE (similar to the nutrient reductions) by 2018 for the various efforts discussed in this section. These relationships will be similar to the nutrient reductions approved by the Chesapeake Bay Program<sup>18</sup>. The proposed study will also evaluate equivalent impervious area restoration and sediment load reductions. The final schedule for compliance of the bacteria TMDL is shown in Table 6:

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<sup>17</sup> COMAR 26.08.02.03-3 Table 1 Bacteria Indicator Criteria for Frequency of Use

<sup>18</sup> Recommendations of the Expert Panel to Define Removal Rates for the Elimination of Discovered Nutrient Discharges from Grey Infrastructure, Final Approved Report by Tom Schueller and Bill Stack, approved 11/10/2014.

**Table 6: Schedule for Bacteria TMDL Compliance**

Description	Schedule
Initiate the education/ outreach elements for pollution reduction listed in the Milestone Schedule (see Section 5).	FY 2018
Complete study to establish relationships between infrastructure rehabilitation / IDDE and bacteria load reductions.	FY 2018
Complete Phase I of microbial source detection study to evaluate impact of 20% restoration, infrastructure improvements, and education / outreach. Propose any changes to TMDL baseline and WLA based on changes to non-point source contribution.	FY 2019
Complete capital improvement projects in compliance with the consent decree.	Per schedule approved by EPA, currently under negotiation.
Complete Phase I of microbial source detection study to evaluate impact of completed consent decree capital projects and education / outreach. Propose any changes to TMDL baseline and WLA based on changes to non-point source contribution	Per schedule approved by EPA, currently under negotiation.
Complete investigation for illicit direct connections to stormwater main of 30 inches or greater.	FY 2025
Eliminate illicit direct connections to stormwater main of 30 inches or greater.	FY 2027
Maintain education / outreach elements for pollution reduction related to bacteria, allow 20 years to demonstrate sustainability of effectiveness.	FY 2038

**2.6.2.4 Local TMDLs for PCBs**

MDE has designated the embayments of the Back River and Baltimore Harbor as impaired for the Polychlorinated Biphenyls (PCBs) in fish tissue. These watersheds are similar to those shown in Figures 15 and 16. PCBs are a class of man-made, carcinogenic compounds with both acute and chronic toxic effects, which are also bioaccumulative and do not readily breakdown in the natural environment. PCBs are a concern to human health, as regular consumption of fish containing elevated levels of PCBs will cause bioaccumulation within the fatty tissues of humans, which can potentially lead to the development of cancer. The overall objective of the PCB TMDL is to ensure that the “fishing” designated use, which is protective of human health related to the consumption of fish, in the impaired waters is supported, in addition to ensuring the protection of all other applicable designated uses within the embayments.

Compliance with the PCB TMDLs cannot be achieved using the same practices used for nutrient, sediment, and bacteria reduction. Disposal of PCB-contaminated sediment is the only method for pollutant reduction. The City proposes to complete source targeting and decision of monitoring locations by the end of FY 2020. Monitoring and load reduction is proposed to occur by the end of FY 2040.

## 2.7 Other Regulatory Factors

In addition to the MS4 Permit and the designated TMDLs, several other regulatory factors exist for Baltimore City. These factors impact and intersect with the WIP, and include other NPDES permits, design guidelines for stormwater management facilities, afforestation and reforestation requirements, and development guidelines:

### 2.7.1 National Pollutant Discharge Elimination System Permits

As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. The NPDES permit program is administered by MDE. In addition to the MS4 Permit, three NPDES permits regulate activities in Baltimore City:

- NPDES General Construction Permit

Stormwater discharges from construction activities (such as clearing, grading, excavating, and stockpiling) that disturb one or more acres, or smaller sites that are part of a larger common plan of development or sale, are regulated under the NPDES stormwater program. Prior to discharging stormwater, construction operators must obtain coverage under an NPDES permit. The General Construction Permit, with its increased regulations, will result in less sediment entering Baltimore's waters.

- NPDES Industrial Permit (General Permit Number 12-SW)

MDE authorizes the discharge of stormwater associated with industrial activity to waters of the state under the NPDES General Permit Number 12-SW. This permit replaces the General Permit Number 02-SW that was issued in December, 2002. The permit contains provisions that require industrial facilities in 26 different industrial sectors to, among other things, implement control measures and develop site-specific stormwater pollution prevention plans (SWPPP) to comply with NPDES requirements.

The stormwater management requirement for the restoration of impervious surfaces is a significant change from MDE's 02SW Permit. The new requirement is to provide for treatment of 20% of the impervious surfaces not currently treated to the standards of the Department's Stormwater Design Manual for the first inch of runoff, or equivalent, to be accomplished within the 4 years of the permit term. The restoration requirements apply to any permittee whose facility is 5 acres or greater in size and is located within the Chesapeake Bay Watershed within a Phase I or Phase II MS4 jurisdiction.<sup>19</sup> Permit holders who are not able to treat their 20% restoration on-site and require off-site mitigation may be added to the City's baseline; however, at the time of this WIP, no requests for off-site mitigation have been made to the City.

- Wastewater Treatment Plant Discharge Permits

The operations of the Patapsco and Back River Wastewater Treatment Plants are governed by NPDES Discharge Permits. These permits contain general operating restrictions as well as limitations on the contents of the plants' effluent. Compliance with these numeric effluent limits is determined by regular sampling and reporting to the MDE.

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<sup>19</sup>

[http://www.mde.state.md.us/programs/Permits/WaterManagementPermits/WaterDischargePermitApplications/Pages/Permits/watermanagementpermits/water\\_applications/stormwater.aspx](http://www.mde.state.md.us/programs/Permits/WaterManagementPermits/WaterDischargePermitApplications/Pages/Permits/watermanagementpermits/water_applications/stormwater.aspx)

### 2.7.2 Consent Decree for Unpermitted Discharges from the Wastewater Collection System

Like most large cities in the nation, Baltimore City faces the challenges of dealing with an aging infrastructure. In 2002, the City entered into a consent decree, with the U.S. Environmental Protection Agency and the Maryland Department of the Environment to inspect, identify, and improve the entire sanitary sewer system. This agreement focused primarily on the elimination of sewage overflows.

Since 2002, the Department of Public Works has invested over \$700 million in system improvements, including:

- Eliminated 60 engineered sewage overflow structures.
- Improved operations and maintenance for the sanitary sewer system.
- Completed 39 consent decree projects on schedule, at a cost of over \$300 million.
- Upgraded the Jones Falls Sewage Pumping Station from 35 to 55 million gallons per day.
- Constructed the 20 million gallon per day Stony Run wet weather sewage pumping station.
- Separated the Forest Park and Walbrook combined sewer systems.
- Upgraded the City's GIS and mapping database.
- Reduced wet-weather related sewage overflows citywide.

### 2.7.3 Baltimore City Critical Area Management Program

The State of Maryland Chesapeake Bay Critical Area Law establishes the Chesapeake Bay Critical Area Commission (CAC) and requires that the City of Baltimore and other jurisdictions prepare and adopt a Critical Area Management Program (CAMP) to:

1. Improve the water quality of the Bay by controlling pollution from stormwater runoff and;
2. To conserve and protect wildlife habitat along the shoreline of the Bay.

The City's CAMP establishes guidelines for development of properties within the 1,000-foot strip of land measured from the mean high tide line or the bulkhead. The Critical Area is also separated into additional sub-areas (Figure 17). The sub-areas are Intensely Developed Areas (IDA) and Resource Conservation Areas (RCA). Two of the requirements for development projects in the Critical Area are for IDA projects to reduce phosphorus levels in storm water runoff by 10% and RCA projects are required to limit lot coverage (impervious surfaces) to 15-25% of the lot, depending on the size of the lot.] Additionally, there are 12 Designated Habitat Protection Areas (DHPA) within the Critical Area. The DHPA function as additional overlay districts from the IDA and RCA areas and there may be some overlap on individual parcels.



*Figure 17: Critical Area Management Program (Source: Baltimore City Department of Planning)*

#### **2.7.4 Forest Conservation Act**

The Maryland Forest Conservation Act (FCA) was enacted in 1991 to minimize the loss of Maryland's forest resources during land development by making the identification and protection of forests and other sensitive areas an integral part of the site planning process. While the Maryland DNR Forest Service administers the FCA, it is implemented on a local level;<sup>20</sup> in Baltimore City, it is administered by the Department of Planning. Because conditions in the City are different from those in the counties of Maryland, certain changes have been made so that the Forest Conservation Act will work under urban conditions. In Baltimore City, the act is triggered by any application for a subdivision of a lot great that 20,000 square feet or any application for sediment/erosion control permit on a single lot which disturbs more than 20,000 square feet.<sup>21</sup> This results in stricter requirements for replacement, mitigation, and reforestation.

#### **2.7.5 Maryland Stormwater Management Act of 2007**

On April 24, 2007, Governor Martin O'Malley signed the "Stormwater Management Act of 2007" (Act), which became effective on October 1, 2007. Prior to this Act, environmental site design (ESD), was encouraged through a series of credits found in Maryland's Stormwater Design Manual. The Act requires that ESD, through the use of nonstructural best management practices and other better site design techniques, be implemented to the maximum extent practicable. In May 2010, Baltimore updated the City Code to address the Act, which resulted in increased requirements for redevelopment, from treating 20% of the existing impervious to treating or removing 50% of the existing impervious. DPW also added additional staff for plans review. Charged with implementation, MDE is in the process of addressing the requirements of the Act including changes to regulations, the 2000 Maryland Stormwater Design Manual, and other guidance materials.<sup>22</sup>

#### **2.7.6 Erosion and Sediment Control Act of 2011**

Maryland's Erosion Control Law and regulations specify the general provisions for program implementation; procedures for delegation of enforcement authority; requirements for erosion and sediment control ordinances; exemptions from plan approval requirements; requirements for training and certification programs; criteria for plan submittal, review, and approval; and procedures for inspection and enforcement. Proper design, installation, and maintenance of erosion and sediment control practices are essential to having an effective program. MDE has established minimum criteria for effective erosion and sediment control practices. The 2011 Standards and Specifications for Soil Erosion and Sediment Control are incorporated by reference into State regulations and serve as the official guide for erosion and sediment control principles, methods, and practices. In February 2013, Baltimore updated its City Code in accordance with the Act.<sup>23</sup>

#### **2.7.7 International Green Construction Code**

Beginning on April 1, 2015, the International Green Construction Code (IgCC) will replace the Baltimore City Green Building Standards as the regulations and process by which the City will ensure the design and construction of green buildings for public and private development in Baltimore. City Council Bill 14-0413, which adopted the IgCC, did not include the "Stormwater Management" section of the IgCC. Instead, the bill defers to

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<sup>20</sup> <http://www.dnr.state.md.us/forests/programapps/newFCA.asp>

<sup>21</sup>

<http://archive.baltimorecity.gov/Portals/0/agencies/planning/public%20downloads/Supplement2StateForestConservationManual.pdf>

<sup>22</sup> <http://mde.maryland.gov/programs/water/stormwatermanagementprogram/pages/programs.aspx>

<sup>23</sup>

<http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/SoilErosionandSedimentControl/Pages/programs/waterprograms/sedimentandstormwater/erosionsedimentcontrol/index.aspx>

the City standards for “Stormwater Management” in Article 7, Section II of the City Code, which are more stringent than what is required under IgCC.<sup>24</sup>

### **2.7.8 Baltimore City Landscape Manual**

As described earlier, Transform Baltimore is the new Zoning Code for Baltimore City (see Section 2.1.13 Existing Conditions: Land Use). One of the key components regarding the regulation of stormwater is the Landscape Manual. The Landscape Manual was developed in conjunction with and in support of the update of the Zoning Code and has been coordinated with the Critical Area Management Program, Forest Conservation, and Stormwater Management regulations.

One of the chapters specifically addresses stormwater management facilities. The intent of the Landscape Manual is not to create another regulation governing stormwater management, but to help integrate stormwater BMPs into the design and development review process, including:

- Identifying all existing and proposed stormwater BMPs on the landscape plan.
- Requiring that the stormwater BMPs meet the standards of the MD Stormwater Design Manual, Volumes I & II and the Baltimore City Stormwater Management Design Guidelines where applicable.
- Encouraging the use of Environmental Site Design (ESD) principles and practices.
- Using stormwater BMP landscaping to improve the edges of natural areas, create or strengthen connections to existing natural areas or open spaces, or increase the ecological potential of the site.

## **2.8 Environmental Initiatives**

The following are existing City initiatives and partnerships that DPW will continue working with to implement the MS4 Permit goals (Pillar #4: Plan to be part of the bigger picture):

### **2.8.1 Healthy Harbor Initiative / Plan**

In 2010, the Waterfront Partnership of Baltimore unveiled its Healthy Harbor Initiative (HHI) with a goal of making the harbor swimmable and fishable by 2020. Included in the initiative are pilot projects to help improve water quality and help educate the public about the Harbor’s health. The HHI is led by a Steering Committee, which is co-chaired by Baltimore City’s Director of Public Works and meets on a regular basis. The HHI also convenes a Trash Work Group to address harbor and neighborhood trash problems and clean-up efforts.

To reach the swimmable and fishable goal, the Waterfront Partnership commissioned the Healthy Harbor Plan. The plan was completed in 2011 by the Center for Watershed Protection and BioHabitats, with input from Baltimore City, Baltimore County, and Blue Water Baltimore. The plan outlines serves as a guide for the Healthy Harbor Steering Committee in achieving the goal of creating a swimmable and fishable harbor.

The Healthy Harbor Plan includes a number of strategies for reducing polluted stormwater that meet the goals of the MS4 WIP, including:

- Reduce stormwater pollution through redevelopment and controlling stormwater through green infrastructure;
- Utilize vacant properties to provide stormwater management as part of an offset and banking program;
- Install green infrastructure practices in neighborhoods as stormwater retrofits

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<sup>24</sup> International Code Council. 2012

- Implement a public education campaign for residents and businesses to encourage the reduction of stormwater pollution
- Restore stream channels degraded by runoff

### 2.8.2 Vacants to Value (V2V)

This program, administered by the Department of Housing and Community Development, is a multi-pronged strategy for redeveloping vacant and abandoned properties. One of the strategies is to demolish and maintain severely distressed blocks. Rather than using scattered site demolition, a whole block approach is utilized, with the goal of demolishing clusters of vacant houses to create more useable tracts of land. This supports large-scale redevelopment efforts as well as provides opportunities for new green spaces (see below).

### 2.8.3 Growing Green Initiative

The Growing Green Initiative (GGi) evolved from the Vacants to Value program. The goal of GGi is to use sustainable, innovative, and cost-effective practices for stabilizing and holding land for redevelopment, and reusing vacant land to green neighborhoods, reduce stormwater runoff, grow food, and create community spaces that mitigate the negative impacts of vacant properties and set the stage for growing Baltimore. One of the goals of GGi is to support the City’s MS4 stormwater permit requirements by providing opportunities to construct cost-efficient stormwater management practices on vacant land.

To facilitate the implementation of GGi, a “Green Pattern Book” (Figure 18) was created using funding and assistance from the Urban Waters Federal Partnership. The Green Pattern Book is a guide for the greening of vacant land by City agencies, NGOs, community-based organizations, and residents, and features eight green project types or patterns, one of which is Stormwater Management.

Although the Department of Planning leads the initiative, the Department of Public Works is co-chair of the Growing Green Work Group, an advisory committee for overseeing the implementation of the GGi. Other members of the work group include DOT, Recreation and Parks, Housing, and the Mayor’s Office.

Finally, Parks and People’s Power in Dirt program (a partnership with Baltimore Housing), will assist communities in planning for post-demolition greening projects, as well as providing technical assistance and resources for people adopting and re-using existing vacant lots as part of the Growing Green Initiative..

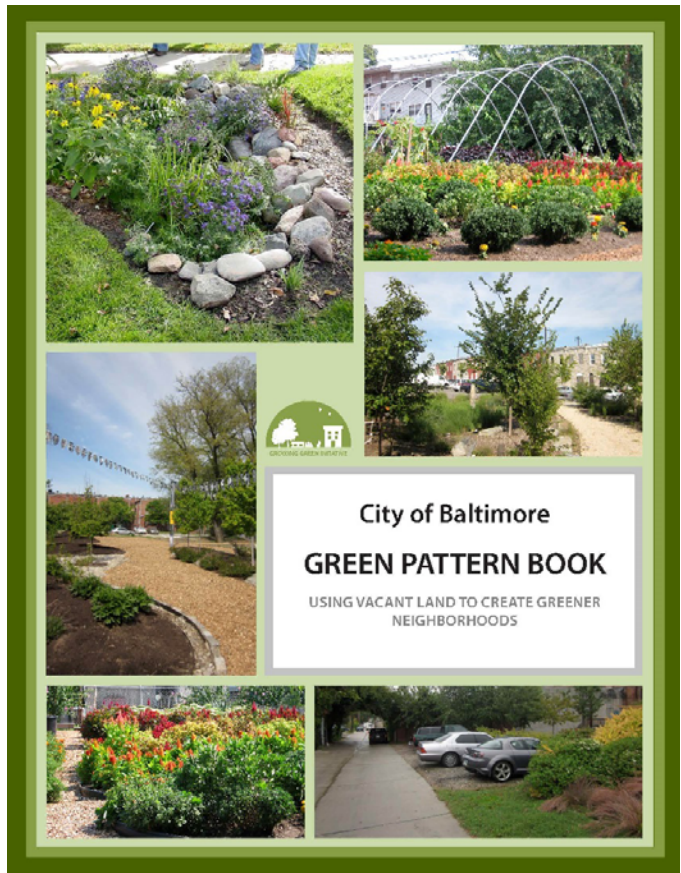


Figure 18: Cover of the Green Pattern Book, 2014  
(Source: Baltimore City Department of Planning)



#### **2.8.4 Waste to Wealth (W2W)**

The City of Baltimore throws away tons of valuable resources every day. Many of these resources could be captured and re-used as an engine of economic development, creating jobs and new products, supporting resident-led greening efforts, and revitalizing neighborhoods. The Waste to Wealth Program is designed to do this by targeting three high-value, primarily non-residential waste streams: food waste, construction and demolition waste, and urban wood waste. The City is exploring the establishment of a W2W Incubator with a sorting yard and addressing City operation and policy barriers to incentivizing private sector businesses for re-using waste. These efforts will support the proposed GROW Centers (see page 50).

#### **2.8.5 Tree Baltimore**

Tree Baltimore is a mayoral initiative led by the Baltimore City of Recreation and Parks to increase the City's tree canopy to 40% by 2030. It serves as the umbrella organization for all City agencies and non-profit organizations, like Blue Water Baltimore, the Parks & People Foundation, and the Alliance for the Chesapeake Bay. TreeBaltimore strives to increase the urban tree canopy through the establishment, management and preservation of trees, partnering with individual homeowners, as well as communities, schools, and businesses.

#### **2.8.6 Disaster Preparedness and Planning Project (DP3)**

In 2013, The Baltimore City Department of Planning and Office of Sustainability created the Disaster Preparedness and Planning Project, an effort to address existing hazards while simultaneously preparing for predicted hazards due to climate change. One of the most pressing challenges facing states and municipalities today is the quality and capacity of public infrastructure, such as stormwater, to withstand these hazards. Included in the DP3 are recommendations for enhancing and expanding the stormwater infrastructure system:

- Encourage urban landscaping requirements and permeable surfaces into community managed open spaces;
- Expand, protect, and restore riparian areas within the city;
- Create an interconnected network of green spaces to support biodiversity and watershed based water quality management; and
- Increase the urban tree canopy and target areas with urban heat island impacts.

#### **2.8.7 Baltimore City Public Schools' 10-Year Plan**

In 2013, the Board of School Commissioners approved the 10-Year Plan, with the goal of modernizing all school buildings over the next ten years. The plan will include renovating and adding to existing buildings, as well as demolishing and building new school buildings. One of the guiding principles of the plan is to, "Create school buildings on the cutting edge of technology and environmental sustainability". In addition to meeting the requirements of the Green Building Standards, the plan also encourages using school grounds for environmental education, including the installation of rain gardens, green roofs, and the removal of excess pavement. Other guiding documents for the school system include:

- MD Environmental Literacy Standards: COMAR 13A.03.02 requires that students graduate environmentally literate and that LEAs integrate environmental education in all grades
- MOU (City Schools, City of Baltimore, IAC, MSA): requires green building and integration of sustainability
- MD High Performance Building Act: requires all large new public construction and major renovation projects to achieve at least LEED Silver.

### **2.8.8 Baltimore Urban Waters Federal Partnership**

The Urban Waters Federal Partnership was established in 2011 to reconnect urban communities with their waterways by improving coordination among federal agencies and collaborating with community-led revitalization efforts to improve our Nation's water systems and promote their economic, environmental and social benefits. The Patapsco Watershed in Baltimore was one of the initial locations selected for this effort.

In Baltimore, the partnership includes the US Forest Service, USGS, US EPA, HUD, NOAA, and US DOT at the Federal level; MDE, Maryland Department of Natural Resources, and Chesapeake Bay Trust at the state level; the Departments of Public Works, Planning, and Recreation and Parks at the local level; and local non-profits like Blue Water Baltimore, Civic Works, and the Parks & People Foundation. The partnership has four focus areas: Mapping, Monitoring, Green Pattern Book, and Local Projects. This partnership has enabled the production of the Green Pattern Book, in addition to the development of the Green Registry, an interactive mapping tool to support the Green Pattern Book.

### 3 WIP DEVELOPMENT

In addition to the Watershed Assessments and the City's contribution to the Maryland Phase II Chesapeake Bay TMDL WIP, DPW developed "Six Pillars of Practical Watershed Planning" to guide the development of its MS4 WIP.<sup>25</sup>

1. Plan for more projects than you need
2. Plan for resources that will affect funding needs
3. Plan to maintain
4. Plan to be part of a bigger picture
5. Plan for effective public participation
6. Plan to adapt

#### 3.1 MS4 Public Meetings

During the summer of 2014, four public meetings were held for the MS4 WIP. These meetings were an opportunity to help educate people about the MS4 Permit and WIP, present preliminary recommendations, and receive public comments and questions, with each meeting addressing the various parts of the WIP.

Meeting invitations were sent to a stakeholder list of over 200 people as well as to the City's community association list. Meeting dates and locations were posted on [www.cleanwaterbaltimore.org](http://www.cleanwaterbaltimore.org) and advertised on the Mayor's weekly e-newsletter, DPW's Facebook page, and through partner organizations.

A total of 74 people attended the meetings, with several people attending more than one meeting. Attendees represented diverse sectors – environmental non-profits, businesses, consultants, City Council and agency representatives, and citizens. Presentations from each meeting, as well as notes and public comment, were made available on [www.cleanwaterbaltimore.org](http://www.cleanwaterbaltimore.org).

#### 3.2 Stakeholder Meetings

During the Spring and Summer of 2014, smaller stakeholder meetings were held to discuss issues, concerns, and recommendations. These meetings included:

- Environmental NGOs – including Blue Water Baltimore, Parks & People, National Aquarium, Chesapeake Bay Foundation, and the Alliance for the Chesapeake Bay.
- Community Development Corporations – including Southeast CDC, Belair-Edison Neighborhoods, Banner Neighborhoods, and the Community Development Network of Maryland
- Developers and Consultants – organized by 1000 Friends of Maryland, the meeting addressed the potential for stormwater banking.

In addition to public and stakeholder meetings, the Watershed Assessments, and Small Watershed Action Plans (SWAPs), the following studies and data were used in the development of the WIP.

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<sup>25</sup> These pillars are meant to supplement EPA's "A-I Criteria" that was used in developing the Watershed Assessments.

### **3.3 Vacant Lot Feasibility Studies for Stormwater Management**

Two separate studies were conducted in 2013 that evaluated the feasibility of using vacant land for stormwater management. The first was the Unified Planning Work Program (UPWP) conducted by the Baltimore City Office of Sustainability for the Department of Transportation. The purpose of the study was to identify the feasibility of using vacant land by the Baltimore City Department of Transportation for off-site stormwater mitigation.

The second study was conducted by the Center for Watershed Protection and the University of Maryland Environmental Finance Center for implementing a stormwater offset and banking system with the City. Included in the study was an assessment of vacant lots for treating stormwater to gauge whether there are enough sites to establish a mitigation bank and to generate an initial list of potential sites.

### **3.4 Flood prone areas**

There are several locations throughout the City that are prone to flooding (see Section 2.1 Existing Conditions). While the causes of the flooding vary from topographic low points, undersized storm drains, and failing infrastructure, what they all have in common is too much runoff. The neighborhoods adjacent to these areas will be studied as locations for BMPs in order to reduce the volume of water impacting these areas.

### **3.5 3-1-1 Service requests**

Through Baltimore City's 3-1-1 system, citizens can report any number of complaints and issues, including choked inlets, flooded streets, dirty streets and alleys, and illegal dumping. Service requests made regarding these complaints are tracked to identify "hotspots" – locations that are either repeat problems or where there are clusters of service requests – so as to best target services, maintenance, and enforcement.

### **3.6 Water Quality Data (SIS Data)**

The Stream Impact Sampling (SIS) program is a comprehensive water quality monitoring effort designed to document chemical analyzes of city streams over long spans of time. Each of the 33 sampling locations are visited once a month and laboratory analysis is performed on the samples for various parameters, including nutrients, sediments, and bacteria.<sup>26</sup> Historic data for the SIS Program are available on-line<sup>27</sup>. The purpose of this program is to evaluate the quality of our surface waters for any long-term trends and determine any capital investment programs or operational programs to implement. This sampling is performed in addition to the weekly ammonia screening program, which is conducted to meet the IDDE condition of the City's MS4 permit.

### **3.7 Priority Planting Map (TreeBaltimore)**

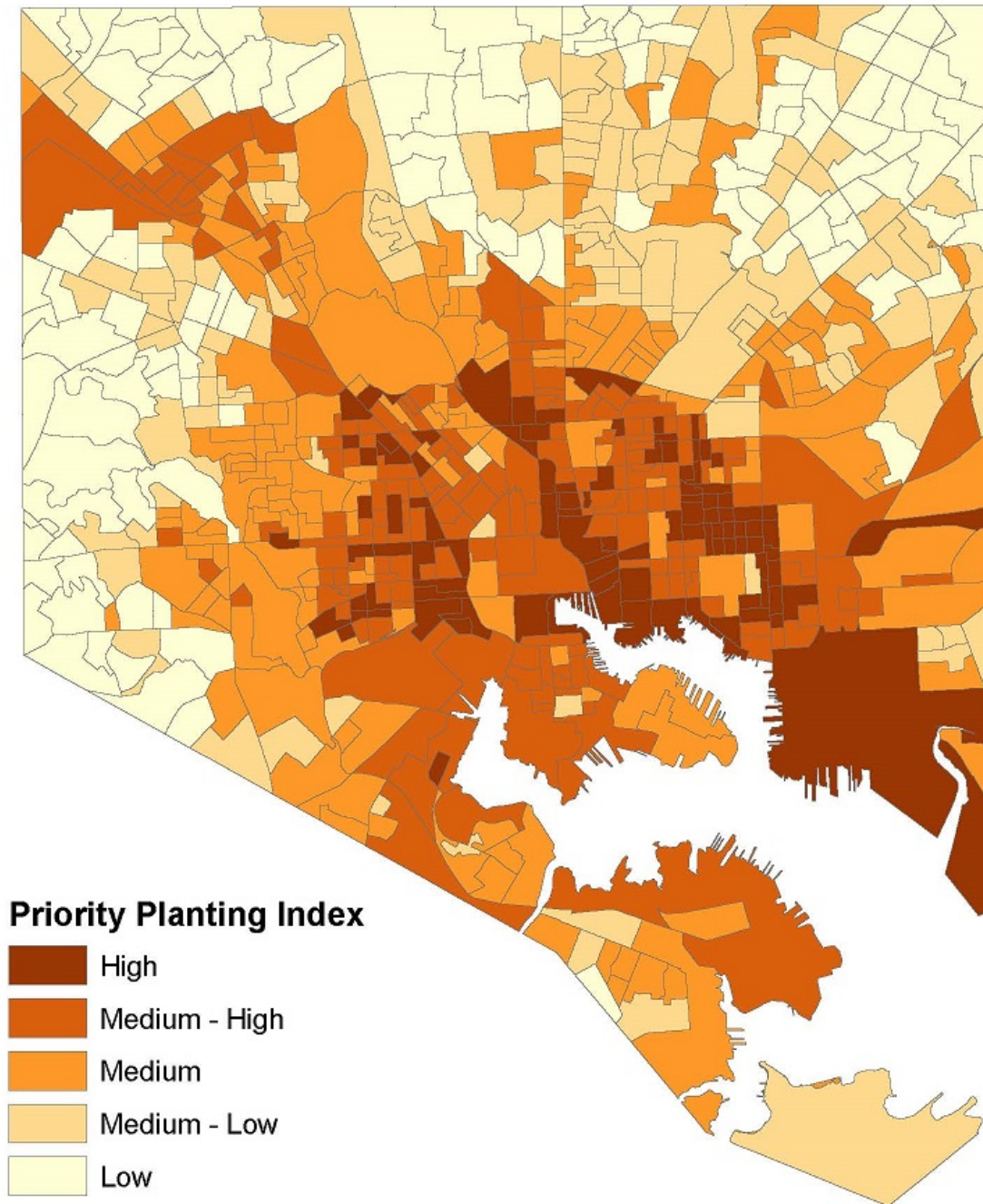
In 2012, TreeBaltimore, created a priority planting map to guide their work and that of their partners. The priority map considered multiple factors, including heat island effect, existing tree canopy, and impervious areas (see Section 2.1 Existing Conditions). These priority neighborhoods will also be considered as locations for various BMPs in order to complement the planting of trees. In addition, the plantings will also compensate for the loss of tree canopy due to the Emerald Ash Borer infestation (Figure 19).

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<sup>26</sup> <http://www.cleanwaterbaltimore.org/stream-impact-sampling>

<sup>27</sup> <https://data.baltimorecity.gov/Public-Works/Stream-Impact-Sampling-and-Ammonia-Screening/39h2-7kjs>

## Baltimore Priority Planting Map



*Figure 19: Priority Planting Areas (Source: TreeBaltimore)*

## 4 PROJECTS, PROGRAMS, AND PARTNERSHIPS

Given the ultra-urban nature of Baltimore, a diverse and comprehensive approach to meeting the 20% restoration and TMDL requirements is needed. This will include:

- Restoring streams;
- Installing “green” stormwater management facilities like bio-retention in public right-of-ways, parking lots, and vacant lots, as well as green roofs;
- Retrofitting and installing ponds and wetlands;
- Planting street trees and trees in parks and at schools;
- Removing impervious surfaces at schools and vacant lots and replacing with these with green spaces;
- Inspecting and eliminating illicit discharges into the storm sewer system;
- Reducing trash and litter with mechanical street sweeping and inlet cleaning; and
- Educating the public about what they can do to reduce polluted runoff.

To best organize this diverse suite of practices, the approach was divided into three categories:

1. **Projects** – capital projects like stormwater ponds, bio-swales, rain gardens, impervious surface removal, and reforestation resulting in a definable asset. DPW will either be the lead for the installation of these projects and/or work in collaboration with other city agencies and the school system to provide capital funding.
2. **Programs** – DPW support services and operations, including street and inlet cleaning, inspections, and public outreach and education.
3. **Partnerships** – stormwater facilities and practices that are installed as required by regulation or through voluntary installation by private and non-profit entities.

The following is a description of the strategies and goals for each of the above categories. A detailed list of the projects, programs, and partnerships is included in Appendix C . As shown in Appendix D, the proposed practices will result in restoration exceeding 20% of the baseline. This is based on Pillar #1 of Practical Watershed Planning “Plan for more projects than you need”. Identifying more projects than is needed will accommodate changes due to projects being determined not feasible, too expensive, or delayed. It also accommodates assumptions made for changes in allowable restoration credits that are being made for stream restoration, IDDE, erosion and sediment control, and public education.

### 4.1 Projects

Projects consist of three types: traditional BMPs, ESD Practices, and Alternative BMPs. All of the proposed projects area listed in Table C-1 (Appendix C).

#### Identifying and Prioritizing Project Locations

Project locations are a combination of specific locations (streams, schools, parks, streets) and targeted neighborhoods, and have been selected using the following data:

- Projects identified in various Watershed Assessments, including the Back River, Jones Falls, and Gwynns Falls Watersheds, as well as Watershed 263, Watershed 246, and Masonville Cove Small Watershed Action Plans.
- Other plans and studies, including the Middle Branch Master Plan and the Herring Run Park Master Plan.
- DPW Capital Improvement Program (CIP) project budget for FY2015 – FY2020.

- Information from agencies (Recreation & Parks, Schools) and non-profits (Blue Water Baltimore, Parks & People, Center for Watershed Protection).
- Vacant Lot Feasibility studies, one by the Center for Watershed Protection (2013) and the other by the Baltimore City Office of Sustainability (2013) and Sabra Wang (2014).

**4.1.1 Traditional BMPs**

For the purposes of the WIP, traditional BMPs, also known as structural BMPs, are practices that treat drainage areas of 5 acres or more, such as stormwater ponds, wetlands, detention basins, infiltration swales, and sand filters.<sup>28</sup> Unfortunately, Baltimore has limited space to install new ponds or large practices. However, there are several that were developed prior to 2010 that are candidates for retrofitting. These include the stormwater facilities at Gwynns Run, Seton Business Park, and North Point Road at Kane Street. Opportunities for installing new ponds, wetlands, and large bio-retention facilities are typically in parks or major right-of-ways; several have been identified in the Watershed Assessments and park master plans. For scheduling purposes, the project life cycle for traditional stormwater projects is 3 years: 18 months for design and permitting, 6 months for advertisement / bid, then 12 months for construction. Planting season can affect the schedule. Maintenance for traditional BMPs tends to be minimal on a regular annual basis, limited to grass mowing and plant maintenance. However, costs can escalate (totaling over \$150,000 / facility) due to sediment removal or major structural failure of the outfall or dam.

A summary estimated pollutant removal rates are provided in Table 7. Given the general soil conditions of the City, only filtration practices were proposed, limiting the pollutant removal efficiencies. During design, the removal efficiencies may increase based on site-specific soil conditions and opportunities for infiltration.

**Table 7: Summary of Traditional BMPs**

BMP Type	Pollutant Removal Efficiencies		
	TN	TP	TSS
SW Pond Retrofit	25	35	65
New Wetland / Pond	20	45	60
Bioretention	25	45	55

<sup>28</sup> 2000 Maryland Stormwater Design Manual Volumes I & II, Center for Watershed Protection and Maryland Department of the Environment Water Management Administration, Chapter 4

#### 4.1.2 ESD Practices

ESD Practices are small stormwater facilities that treat 5 acres or less, including micro-bioretenion, rain gardens, enhanced filters, permeable paving, and green roofs.<sup>29</sup> Given the small size of these practices, they fit well into Baltimore’s urban environment of streets, parking lots, small parks, and school grounds. Unfortunately, they can be expensive to install, limited by existing conduits, utilities, and soil conditions, and conflict with right-of-way needs like on-street parking or community acceptance.

Several ESD projects have been selected from previous studies, such as the Masonville Cove SWAP and Belair-Edison Green Streets study. Other projects will be identified during the Permit period of the WIP using a community planning process led by the Watershed Liaison Office. These neighborhoods, or clusters of neighborhoods, are:

- Brooklyn / Curtis Bay / Cherry Hill
- Cameron Village / Chinquapin Park / other neighborhoods adjacent to Chinquapin Run
- Coldstream-Homestead-Montebello
- Frankford / Belair-Edison / Greater Lauraville / Cedonia
- Greater Mondawmin / Walbrook / Rosemont / NW Community Action / Coppin Hts / Easterwood
- Hampden / Remington / Wyman Park
- Howard Park / Grove Park / West Arlington / Fairmont
- Hunting Ridge / Rognel Heights / Edmondson Village / Edgewood
- Lakeland / Mt. Winans / Westport
- McElderry Park / CARE Community / Milton-Montford / Patterson Place
- Morrell Park / Wilhelm Park / Gwynns Falls / Carroll-South Hilton
- Mt. Washington / Glen / Cheswolde / Cross Country
- Orchard Ridge / Armistead Gardens / Orangeville
- Central Park Heights / Towanda Grantley / Lucille Park
- Patterson Park / Highlandtown / Baltimore Highlands
- Sharp-Leadenhall / Federal Hill / Otterbein / South Baltimore



*Figure 20 (top):  
12th Avenue Green Street, Portland  
(Source: City of Portland, Environmental Services)*

*Figure 21 (bottom):  
Pierce’s Park bioretention, Baltimore  
(Source: Amy Gilder-Busatti)*

<sup>29</sup> 2000 Maryland Stormwater Design Manual Volumes I & II, Center for Watershed Protection and Maryland Department of the Environment Water Management Administration, Chapter 5



These neighborhoods were selected based on a combination of the following criteria:

1. Adjacent to and/or upland from stream restoration project
2. Adjacent to and/or upland from flood prone areas
3. Adjacent to DPW stormdrain projects or other DPW initiatives (Municipal Trash Container Pilot, alley sweeping, etc)
4. Other identified stormwater projects, partnerships, and initiatives (new and renovated 21<sup>st</sup> Century Schools, park master plans, Watershed 246, Clean Water communities, etc)
5. CIP project locations by other agencies. In particular, DPW will coordinate with the Department of Transportation as they develop streetscape and Complete Streets plans, including a Complete Streets plan for the Casino Area Master Plan.

For scheduling purposes, the project life cycle for ESD projects is over 1.5 years: 9 months for design and permitting, 6 months for advertisement / bid, then 6 months for construction. Planting season can affect the schedule. Maintenance needs are discussed further in 4.7. Only micro-bioretenion practices were proposed for this type of project. Just like traditional BMPs, each of the practices were assumed to be filtration and thus limited in pollutant removal efficiency. The pollution removal rates were 33% for nitrogen, 52% for phosphorus, and 66% for sediment.

#### **4.1.3 Alternative BMPs**

Alternative BMPs, as outlined in MDE's "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated" guidance document, include stream restoration, impervious surface removal and greening, and reforestation.<sup>30</sup> By far the largest percentage of impervious acres restoration by project in Baltimore's WIP is alternative BMPs.

##### **4.1.3.1 Stream Restoration**

Approximately 60% of Baltimore's streams are highly degraded along the main stem, with eroding banks, collapsing outfalls, and exposed sewer lines. Stream restoration is an opportunity to reduce erosion and sedimentation, increase natural channel flow, and improve the health of the stream and adjacent riparian areas. The WIP proposes to restore about 9 miles of streams, about 1/3 of the estimated length of degraded streams, as summarized in Table 8. The estimated efficiency listed in Appendix C assumes a holistic approach, including invasive species removal and habitat restoration. Therefore, the equivalent impervious area restoration was estimated higher (0.015 ac / LF) than listed in MDE's guidance document, but the pollutant removal efficiencies remained consistent.

For scheduling purposes, the project life cycle for stream restoration projects is 3 years: 18 months for design and permitting, 6 months for advertisement / bid, then 12 months for construction. This schedule is dependent on state and federal resources for plan review / permitting as part of the Joint Permit Application process. Planting season can affect the schedule. Maryland also restricts construction within the stream between March and June. To offset some of these predicted schedule delays, the City may use alternative project delivery methods, such as design-build.

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<sup>30</sup>

<http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/Documents/NPDES%20MS4%20Guidance%20August%2018%202014.pdf>

**Table 8: Summary of City Streams (Lengths listed in Miles)**

<b>Watershed</b>	<b>Main Stem</b>	<b>Unstable</b>	<b>Restored Before 2010</b>	<b>Proposed (WIP)</b>	<b>Remaining to Restore</b>
<b>Gwynns Falls</b>					
Gwynns Falls	8.1	3.9	0.0	2.7	1.2
Gwynns Run	0.4	0.2	0.0	0.0	0.2
Maidens Choice	2.1	1.0	0.5	0.0	0.5
Powder Mill Run	1.1	0.9	0.0	0.7	0.2
<b>Subtotal:</b>	<b>11.7</b>	<b>6.1</b>	<b>0.5</b>	<b>3.4</b>	<b>2.1</b>
<b>Back River</b>					
Herring Run	10.2	4.2	0.0	1.0	3.2
Moores Run	2.5	1.9	0.0	0.5	1.4
Biddison Run	1.7	1.7	0.3	1.3	0.1
Chinquapin Run	2.6	2.6	0.0	0.9	1.7
Armistead	1.3	1.3	0.0	0.0	1.3
<b>Subtotal:</b>	<b>18.4</b>	<b>11.8</b>	<b>0.3</b>	<b>3.7</b>	<b>7.7</b>
<b>Jones Falls</b>					
Jones Falls	7.7	3.8	0.0	0.4	3.4
Western Run	3.2	1.6	0.5	0.2	0.9
Stony Run	2.6	2.6	1.3	1.3	0.0
<b>Subtotal:</b>	<b>13.5</b>	<b>8.0</b>	<b>1.8</b>	<b>1.8</b>	<b>4.3</b>
<b>Baltimore Harbor</b>	1.9	0.9	0.0	0.0	0.9
<b>Total</b>	<b>45.4</b>	<b>26.8</b>	<b>2.6</b>	<b>8.9</b>	<b>15.0</b>

Impervious surface removal and lot greening are incorporated in a combination of school projects and vacant lot restoration and re-use. The Baltimore City Public School System (BCPSS) has completed several asphalt removal projects, some of these were a result of mitigation requirements for Masonville Cover Dredging project (funded by the Maryland Port Authority) while others were completed by NGO partners like Blue Water Baltimore and Parks & People. The schools listed in the WIP have been identified from various Watershed Assessments as well as conversations with the BCPSS. DPW will continue to work with the school system’s facilities planning and Green Schools Coordinator to identify opportunities for removing impervious surfaces and installing stormwater BMPs as part of the Baltimore City Public Schools’ 10-Year Plan.

As noted in the Background section of the WIP, many of Baltimore’s neighborhoods are plagued by nearly 30,000 vacant properties – which include existing vacant lots and vacant structures. While vacant properties are a problem, they also offer an opportunity as locations for impervious surface removal, small stormwater management practices, and tree planting. These facilities can also become new community green spaces, serving as amenities for redevelopment. DPW will continue to be a partner in the Mayor’s Growing Green Initiative to identify vacant properties for stormwater management and reduction as was tested in the Growing

Green Design Competition in 2014. Rather than targeting individual vacant properties, neighborhoods, or clusters of neighborhoods, have been identified<sup>31</sup>:

- Carrollton Ridge / Shipley Hill / Mill Hill / Pigtown / New Southwest / Union Square / Franklin Square
- Harlem Park / Sandtown-Winchester / Upton
- McElderry Park / CARE Community / Milton-Montford \*
- Mt. Winans\*
- Oliver / Broadway East
- Central Park Heights\*

Neighborhoods were chosen based on the following criteria:

1. Areas identified in the two vacant lot feasibility studies
2. Neighborhoods with large numbers of vacant properties
3. Neighborhoods in or adjacent to Vacants to Value development clusters
4. Neighborhoods with Year 1 and Year 2 demolition clusters as identified by Baltimore Housing
5. Areas with existing GGI projects and the potential for economic development

Finally, reforestation and tree planting efforts will coincide with the City’s TreeBaltimore Program. The Department of Recreation and Parks manages this program to meet the City’s goal of 40 percent tree canopy cover. This effort in turn supports Baltimore’s plans for increasing sustainability, improving surface water quality, and minimizing stormwater runoff. Locations will target TreeBaltimore’s Priority Planting Areas, which were identified as neighborhoods with minimal tree canopy, high heat island index, high asthma rates, and large amounts of impervious surfaces. The City will also coordinate with Baltimore Green Space and its Forest Patch Atlas to identify opportunities for enhancing Baltimore’s existing forest patches and riparian areas, including habitat restoration and invasive species removal.

For scheduling purposes, the project life cycle for an impervious area removal / facility greening project is about 18 months: 9 months for design and permitting, 6 months for advertisement / bid, then 3 months for construction. Planting season can affect the schedule. The use of standard design details can decrease the design schedule.

A summary of estimated pollutant removal rates are provided in Table 9. Given the general soil conditions of the City, only filtration practices were proposed, limiting the pollutant removal efficiencies. During design, the removal efficiencies may increase based on site-specific soil conditions and opportunities for infiltration.

**Table 9: Summary of Alternative BMPs**

BMP Type	Pollutant Removal Efficiencies		
	TN	TP	TSS
Stream Restoration	0.075 lb/LF	0.068 lb/ LF	30 lb / LF
IA Removal, afforestation, bioretention	6.15 lb / ac	1.39 lb / ac	913 lb / ac
IA Removal, partial afforestation	3.90 lb / ac	1.08 lb / ac	615 lb / ac
Aforestation of IA	10.86 lb / ac	1.59 lb / ac	818 lb / ac

<sup>31</sup> Neighborhoods marked with an \* are also targeted neighborhoods in the ESD strategy

## **4.2 Programs**

Programs are operations and services that reduce pollutants in stormwater runoff. It is projected that these programs could restore the entire goal of 20% of restoration; however the implementation is not permanent and may fluctuate significantly from year to year. The following are programs that the City is currently or will be undertaking:

### **4.2.1 Expanded City-wide mechanical street sweeping**

In April of 2014, DPW launched a citywide mechanical street sweeping program, covering neighborhoods which previously had no service or scattered, inefficient service. Instead of sweeping only the Central areas of the City and some of our main commuter routes, all neighborhoods are now being reached using a fleet of 36 vehicles. An additional eleven sweepers were purchased to replace older vehicles. During the initial 6 months, the program removed nearly 1,600 tons of trash and debris from City streets; however, the efficiency is shown to be significantly impacted by residents' willingness to move parked vehicles.

In addition, in August of 2014, custom designed sweeping machines were employed to clean alleys in nine neighborhoods. The sweeping schedule will be on days after regular trash collection. The neighborhoods in the alley sweeping program were chosen for wide, paved, and intact alleys, where the mechanical sweepers can be the most effective. If successful, the City will look to expand the program in coming years.

With increased public education and outreach, the City expects the amount of trash and debris collected by the mechanical street sweeping program to decrease over the course of this permit. The peak amount collected will be attributed to the mechanical street sweeping program. The decrease will be monitored and attributed to education and outreach programs.

### **4.2.2 Preventive cleaning of catch basins and debris collectors**

In 2015, approximately 760 storm drain inlet screens and inserts will be installed in five neighborhoods – McElderry Park, Baltimore-Linwood, Oliver, Franklin Square, and Carrollton Ridge. The purpose of these screens is to allow stormwater to pass through while keeping trash out, which will also reduce the number of clogged storm drains (for storm events of greater than 1 inch rain, the screens are designed to open so as to prevent flooding). If the pilot is successful, then additional neighborhoods will be added to the CIP program.

In conjunction with the installation of the storm drain inlet screens, DPW will be initiating a proactive catch basin and debris collector cleaning program. Using 3-1-1 "hot spot" information, DPW will also target problematic storm drains and catch basins and clean these on a regular schedule.

Additionally, over the next four years DPW will be installing several debris collection systems (also called trash interceptors), including Biddison Run, Bush Street, and the repair of Gwynns Run. These debris collectors will be cleaned on a regular, proactive basis.

### 4.2.3 Illicit Discharge Detection and Elimination (IDDE) program<sup>32</sup>

DPW is responsible for monitoring the quality of the streams and Harbor in the City of Baltimore. Ammonia screening (AS) is used as a field screening protocol to rapidly identify potential pollutants with the intent to initiate pollution source tracking (PST).<sup>33</sup> During the current permit period, OCAL will hire additional staff and increase equipment / technology in order to expand the AS program (doubling the sampling locations) and perform additional field screening programs such as outfall surveys, lateral surveys and hot spot investigations. Additionally, a 3-1-1 Service Request category has been created that will allow citizens to report polluted waters at outfalls. These efforts address the detection portion of the IDDE program and have an estimated annual operations budget of \$2.2 to 2.8 million.

The elimination efforts for IDDE require a coordinated effort of several divisions within DPW. Depending on the scope of work to eliminate the discharge, contracted services may be required. The City maintains urgent needs contracts for all three pipe systems to quickly provide these services. Some elimination efforts require coordination with private property owners and thus code enforcement by DHCD. During the permit period, DPW will review the enforcement regulations and procedures related IDDE to identify whether any changes are needed to achieve a quicker, more effective response to enforcement.

In November, 2014, an Expert Panel convened by the Chesapeake Stormwater Network evaluated approved eight discharge types for an annual nutrient reduction credit:

1. Laundry Washwater
2. Commercial Car Washing
3. Floor Drains
4. Miscellaneous High Nutrient Non-Sanitary Discharges
5. Sanitary Direct Connections
6. Sewage Pipe Exfiltration
7. Drinking Water Transmission Loss
8. Dry Weather Sanitary Sewer Overflows



*Figure 22: Pollution Control Analyst  
(Source: Van Sturtevant)*

The programmatic credit is contingent on documentation that their program elements are targeted to screen, detect and correct the nutrient discharges with the highest nutrient loading risk.<sup>34</sup> The increased infrastructure investment for wastewater, water, and stormwater systems, plus an increase in the workforce for stormwater maintenance, will improve the City's ability to eliminate illicit discharges. The estimated capital costs related to infrastructure replacement and urgent needs contracted repair are shown in the City's CIP documents and exceed \$1 billion during this permit period, but only those related to specific detected illicit discharges will be counted towards the nutrient reductions.

At the time of this WIP, the Chesapeake Bay Program (and MDE) has only accepted the reduction rates for nutrients. The City proposes a study to establish the relationship between IDDE and impervious area restoration and the reduction of bacteria and sediment loadings. This study is proposed to be completed by FY 2018.

<sup>32</sup> The Chesapeake Bay Program and MDE have not quantified the benefit in relation to impervious restoration at this time.

<sup>33</sup> The AS program is an alternative methodology to the prescribed sampling listed in the City's NPDES MS4 permit for Illicit Discharge Detection and Elimination (IDDE).

<sup>34</sup> <http://chesapeakestormwater.net/bay-stormwater/baywide-stormwater-policy/urban-stormwater-workgroup/illicit-discharge-detection/>

#### **4.2.4 Erosion and sediment control practices**

In 2013, Baltimore City adopted new legislation for erosion and sediment control (Baltimore City Code, Article 7). The legislation updates the City's erosion and sediment control law, provides clear guidance to developers and property owners, and provides additional authority to enforce violations. To better enforce these measures, OCAL will be hiring additional inspectors in FY 2015 and 2016. The inspectors have the authority to stop construction activities, in addition to issuing penalty fines.

The City will also provide continued education and training to contractors and other city agencies regarding erosion and sediment control. Finally, the City has implemented a 3-1-1 Service Request category allows citizens to report any erosion problems, whether construction sites, street work or from properties. This program is not currently listed in Table C-2 (Appendix C) because no quantified benefits for impervious area restoration and TMDL compliance have been determined at this time. The City proposes a study to establish relationship between erosion and sediment control and impervious area restoration and the reduction of nutrient and sediment loadings. This study is proposed to be completed by FY 2018.

#### **4.2.5 Public Education and Enforcement**

DPW recognizes that meeting the City's MS4 and TMDL requirements cannot be done solely by government – residents, faith organizations, schools, and businesses each play a role. In order to facilitate and expand public education and enforcement of stormwater best practices, OCAL will develop and provide educational material and training in support of the MS4 WIP and the Department's stormwater management efforts, and assist in the promotion and dissemination of this information. As with identifying project locations, public education and outreach for trash and litter reduction will target areas where storm drain inlet screens are being installed and 311 "hot spots" for clogged inlets and dirty streets and alleys. Encouraging the reduction of stormwater runoff from private properties will target those neighborhoods "upland" of stream restoration projects.

Additionally, DPW will be updating its SWM and ESC Guidelines per state regulation and local policies and making them available on the Clean Water Baltimore website, as well as providing training courses for developers, NGOs, and community leaders regarding the SWM/ESC plans review process. This program is not currently listed in Table C-2 (Appendix C) because no quantified benefits for impervious area restoration and TMDL compliance have been determined at this time. The City proposes a study to establish relationship between erosion and sediment control and impervious area restoration and the reduction of nutrient and sediment loadings. This study is proposed to be completed by FY 2018.

#### **4.2.6 Proposed Methods for Load Reductions**

The eligible BMPs approved by the Chesapeake Bay Program are very limited and very expensive in its applicability to ultra-urban environments like the City of Baltimore. In addition to the studies listed in the WIP, in order to offset some of the significant costs of the current and future MS4 permit compliance, the City will conduct studies to quantify the impervious area restoration and pollutant removal efficiencies of new, nontraditional BMPs, which include but are not limited to:

- Debris and leaf collection systems
- Dry sweep programs
- Eroded slope stabilization
- Pet waste management programs
- Soil amendments (subsoiling)
- Vacant lot management
- Forest patch conservation and enhancement

### 4.3 Partnerships

Partnerships are BMPs that are installed by the public, private and non-profit sectors, whether as a requirement for development, projects by environmental non-profits or stormwater fee credits. Although these practices may account for only a small portion of restoration and pollutant reduction, the City proposes these efforts to enhance stewardship and build the foundation for implementation of stormwater practices on private land for potential compliance of future MS4 permits.

#### 4.3.1 Development Requirements

Construction projects with 5,000 square feet of disturbed area or greater are required to meet stormwater management regulations – including city agencies, public and private institutions, and developers. Typical stormwater management projects within the City include bio-retention, rain gardens, swales, green roofs, and impervious surface removal. The projections for determining the equivalent acres restored used an average of years 2013 and 2014 along with an expected increase in redevelopment in the City (see Section 2.1 Existing Conditions).

#### 4.3.2 Voluntary Practices & Stormwater Management Credit Fee Program

Over the years, NGOs like the Parks & People Foundation and Blue Water Baltimore have secured funds to implement various types of BMPs. These projects include right-of-way bioretention, rain gardens, impervious removal at schools, and permeable paving. The projections for equivalent acres restored are based on projects completed in 2014 as well as future projects planned by these partners.

In 2013, the City implemented a stormwater management fee and established a credit program associated with the fee. The purpose of establishing the credit program was to provide a way for ratepayers to reduce their fees, and an incentive for them to implement stormwater management measures. These practices include the installation of rain gardens and BMPs, planting trees, harvesting rainwater, removing impervious surfaces, and volunteering for stormwater participation events.



*Figures 23 and 24: Stormwater Participation Events in Lyndhurst and Pigtown (Sources: Cynthia Shaw and Parks & People)*

**4.4 Suitability by Watershed**

Although the City may be considered in small in area compared to other MS4 jurisdictions, the variability of the land use conditions, population/ development density, and age / size/ density of infrastructure have determine the practicality of the implementation of BMPs for certain watershed. Table 10 illustrates the distribution of where BMPs will be targeted.

**Table 10: Suitability of BMPs by Watershed**

Gwynns Falls	Jones Falls	Back River	Direct Harbor	N. Patapsco
Stream Restoration	Stream Restoration	Stream Restoration		
BMP Retrofits		New BMPs		
Micro-practices	Micro-practices	Micro-practices	Micro-practices	
School Greening	School Greening	School Greening	School Greening	School Greening
Vacant lots	Vacant Lots		Vacant Lots	
Tree Planting	Tree Planting	Tree Planting	Tree Planting	Tree Planting
IDDE	IDDE	IDDE	IDDE	IDDE
Inlet Screens	Inlet Screens		Inlet Screens	Inlet Screens
Debris Interceptors	Debris Interceptors	Debris Interceptors	Debris Interceptors	
Street Sweeping & Inlet Cleaning	Street Sweeping & Inlet Cleaning	Street Sweeping & Inlet Cleaning	Street Sweeping & Inlet Cleaning	Street Sweeping & Inlet Cleaning

**4.5 Prioritization and Benefits**

Following Pillar 1, the City has identified more projects than what is needed to meet the current MS4 permit conditions. The surplus projects (listed in Appendix H) may be used by other NPDES permittees or developers meeting offsite mitigation requirements. As part of the selection process, projects were prioritized based on several factors (Table 11), including:

- Equitable distribution of implementation across City watersheds, neighborhoods, and demographics and potential to address environmental justice;
- Cost effectiveness of practice compared to load reduction capability;
- Collaboration opportunity with other environmental and sustainability initiatives within the City
- Social and economic benefits to areas surrounding the project location;
- Public outreach and stewardship opportunities to modify behaviors (increase secondary activity-based BMPs for pollution prevention) and decrease maintenance needs;
- Habitat restoration, beyond simple reductions of identified pollutants.



Additionally, while several neighborhoods are targeted for the location of EDS Practices and Facility Greening, other neighborhoods may be considered during the permit term. These adjustments will be made as part of the Adaptive Management process.

**Table 11: Benefits of Green Infrastructure**

	Pollutant Reduction	Community Engagement	Job Creation	Habitat Restoration	Reduced Flooding	Reduce Heat Island Effect	Neighborhood Enhancement	Traffic Calming	Recreation / Open Space	Public-Private Partnership / Funding Diversity
Stream Restoration	DEFINITELY A BENEFIT	MAYBE A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT		MAYBE A BENEFIT		MAYBE A BENEFIT	MAYBE A BENEFIT
Tree Planting	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT		DEFINITELY A BENEFIT	MAYBE A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT		DEFINITELY A BENEFIT
Using vacant land for sw management	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT		DEFINITELY A BENEFIT		DEFINITELY A BENEFIT	DEFINITELY A BENEFIT
Removing impervious surfaces	MAYBE A BENEFIT	MAYBE A BENEFIT	DEFINITELY A BENEFIT	MAYBE A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT		DEFINITELY A BENEFIT	DEFINITELY A BENEFIT
Micro-bioretenion and rain gardens - public space	DEFINITELY A BENEFIT	MAYBE A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	MAYBE A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	MAYBE A BENEFIT	MAYBE A BENEFIT
Micro-bioretenion and rain gardens - private	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	MAYBE A BENEFIT	MAYBE A BENEFIT	DEFINITELY A BENEFIT			DEFINITELY A BENEFIT
Green Roofs	MAYBE A BENEFIT		DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT				DEFINITELY A BENEFIT
Permeable Paving	MAYBE A BENEFIT		DEFINITELY A BENEFIT		MAYBE A BENEFIT	MAYBE A BENEFIT				DEFINITELY A BENEFIT
Street Sweeping	DEFINITELY A BENEFIT		MAYBE A BENEFIT				DEFINITELY A BENEFIT			
Inlet Cleaning	DEFINITELY A BENEFIT	MAYBE A BENEFIT	MAYBE A BENEFIT		DEFINITELY A BENEFIT		DEFINITELY A BENEFIT			DEFINITELY A BENEFIT
Illicit Discharge Detection and Elimination	DEFINITELY A BENEFIT									
Public Education	DEFINITELY A BENEFIT	DEFINITELY A BENEFIT		MAYBE A BENEFIT			DEFINITELY A BENEFIT		MAYBE A BENEFIT	DEFINITELY A BENEFIT
Erosion and sediment control enforcement	MAYBE A BENEFIT		DEFINITELY A BENEFIT		DEFINITELY A BENEFIT		DEFINITELY A BENEFIT			

**4.6 Public Outreach**

Pillar #5 of Practical Watershed Planning is, “Plan for effective public participation”. In order for the MS4 WIP to be successful, it will need an informed public and engaged partners to review and provide advice on the Plan as well as identify needs and issues that will need to be addressed. The Department of Public Works recognizes and is committed to the role that public outreach and stewardship will play if improved water quality conditions are going to be achieved. This will require engaging a broader and more diverse set of stakeholders who can serve as the leaders and champions for clean water in their communities, including greater participation from minority and faith-based groups, business groups, schools, and neighborhood associations. Additionally, this approach requires working collaboratively with other City agencies to look for better and more efficient ways to communicate messages, cross-train, and create synergies that result in greater engagement, greater awareness, and sustained changes in behavior.

In order to facilitate and lead public outreach and education for the MS4 WIP, the Department of Public Works established the Watershed Liaison Office. The responsibilities of the Watershed Liaison Office are:

- Provide community planning and outreach to neighborhoods where stormwater BMPs are to be located;
- Coordinate with other City agencies, non-profits, and community partners in the planning and implementation of stormwater BMPs;
- Serve as the Department's "point person" with other City initiatives, such as the Growing Green Initiative and the Casino Area Master Plan;
- Coordinate and staff the Department of Public Work's Technical Work Group (see below);
- Coordinate and host regular outreach meetings with stakeholder groups, such as the Baltimore Port Alliance, the Baltimore Development Work Group, and the Community Development Network of Maryland;
- Serve on partner-led committees and work groups, including the Healthy Harbor Steering Committee and Trash Work Group. Watershed 263 Council, Urban Waters Federal Partners Partnership, and the Baltimore Ecosystem Study;
- Develop educational and training material in support of the MS4 WIP and the Department's stormwater management efforts, and assist in the promotion and dissemination of this information;
- Provide outreach and tracking for the stormwater fee credit programs;
- Collect and track information on stormwater management projects by partner organizations; and
- Coordinate grant development and administration for Federal, State, and private foundation funding, as well as administer any DPW grant programs as part of the Stormwater Utility Fund.
- Write the Trash TMDL WIP, including data collection, public outreach, and coordination with DPW's Solid Waste and Recycling.<sup>35</sup>

The Watershed Liaison Office will work closely with other sections within DPW, including the Office of Communications and Community Affairs and the Office of Strategy and Performance.

As outlined above, public outreach will consist of a variety of methods, some led by DPW and others as a partner with other agency and non-profit led efforts. While many of the recommendations build upon existing programs, new outreach programs are also proposed in order to engage new partner groups.

#### **4.6.1 Leadership and Engagement**

The following efforts will be led by the Department of Public Works:

Stormwater Advisory Committee (SWAC) - Formed in November, 2014, this committee will advise the Director and the Department on stormwater projects, programs, and issues. The goal in forming this committee is to create a process that is fiscally transparent, has the support of the wider community, and benefits a range of groups in the city.

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<sup>35</sup> Baltimore City expects the Trash TMDL to be issued by the end of 2014.

Fifteen (15) members make up the Advisory Committee from the following stakeholder sectors:

1. Environmental Nonprofit Organizations
2. Industry Groups
3. Business and Development Groups
4. Religious Institutions
5. Anchor Institutions
6. Citizens

The Committee will meet quarterly, and will be staffed and facilitated by the Office of Strategy and Performance. Some of the topics that will be addressed by the Committee include the MS4 annual report, rules and regulations; proposed State legislation; public outreach and education around stormwater, workforce development, budget decisions, and adaptive management. In addition to advising the Director and Department, the SWAC, through the Committee members, will serve to educate stakeholder groups on the stormwater process and programs in place.

Technical Work Group - DPW will be forming a work group in 2015. The purpose of this work group is to share information, resolve issues, and foster collaboration concerning the implementation of stormwater management projects. Members of the workgroup will be from organizations and agencies who are actively working on putting stormwater projects in the ground. While this group is independent of the SWAC, it will report to the Committee at least once a year.

Outreach and Workforce Development Work Groups – Similar to the Technical Work Group, these groups will include partners who are engaged in various community outreach and workforce development efforts so as to share information, coordinate efforts, and identify target areas and resources needed.

Stakeholder Roundtables - Throughout the year, the Watershed Liaison Office will host meetings of various stakeholder groups from development, industry, religious organizations, and environmental NGOs. These meetings will be an opportunity to discuss the Department's stormwater programs and to solicit questions and issues from these groups in order to inform our adaptive management of the WIP.

Annual Public Progress Meeting - Beginning in FY2016, DPW will hold a public meeting to present progress on the MS4 WIP. The presentation will be a summary of our Annual Report, as well as a look at projects, programs, and partnerships for the coming year. Information presented at the meeting will be available on [www.cleanwaterbaltimore.org](http://www.cleanwaterbaltimore.org).

#### **4.6.2 Partnering and Collaborating**

In addition to leading outreach efforts, DPW will continue to serve on partner-led initiatives and work groups, including:

Healthy Harbor Steering Committee - The Healthy Harbor Steering Committee serves as the oversight group for the Healthy Harbor Initiative led by the Waterfront Partnership. The Steering Committee is co-chaired by the Director of Public Works and the Board Chair of the Waterfront Partnership.

Healthy Harbor Trash Work Group - A sub-group of the Healthy Harbor Steering Committee; this group addresses trash issues in Baltimore City as related to the quality of water and the harbor. DPW's Watershed Liaison, as well as other staff, are members.

Growing Green Work Group - This work group oversees the City's Growing Green Initiative (see Section 2.7 Other Regulatory Factors: Environmental Initiatives) and is made up of representatives of several city agencies. The Director of DPW is co-chair of the work group.

TreeBaltimore Steering Committee - DPW's Watershed Liaison serves on the committee and will work with the partner organizations to identify targeted planting areas as well as tracking tree planting efforts.

Watershed 263 Council - This group consists of representatives from the neighborhoods and major stakeholders located within the Watershed 263 boundaries in west and southwest Baltimore. The purpose of the Council is to share information and foster collaboration on community greening and stormwater projects. The DPW Watershed Liaison will continue to participate in the quarterly meetings.

Baltimore Urban Waters Federal Partnership - Formed in 2011, the partnership is made up of representatives of federal agencies, environmental non-profits, State agencies, and city and county representatives. Baltimore City DPW staff are members of the partnership and serve on various committees, including Mapping and Local Projects. As part of Urban Waters, DPW is working with the Baltimore Neighborhoods Indicators Alliance to create an interactive, web-based mapping tool for potential, proposed, in-progress, and completed stormwater management projects.

Baltimore Development Work Group / Baltimore Port Alliance / Community Development Network of MD - Maintaining a strong relationship with the business and development community is critical for sharing information and soliciting input on stormwater regulations, legislation, and credit programs. The Office of Compliance and Laboratories will continue to attend regular meetings of these groups.

Green Schools Network - The Baltimore Green Schools Network, which is made up of students, administrators, parents, teachers, and community partners, supports and advances opportunities for school communities to build understanding and to take action to further green and healthy learning and living. DPW will work with the BCPSS to identify opportunities to participate in this network.

Baltimore Ecosystem Study – DPW staff work with BES faculty and scientists on various types of stormwater research projects. This partnership includes providing study sites, staff support, and data sharing.

#### **4.6.3 Community / School Outreach and Education**

In 2012 DPW created the website [www.cleanwaterbaltimore.org](http://www.cleanwaterbaltimore.org). Clean Water Baltimore addresses "all things water" and provides an overview of the City's three water utilities – drinking water, wastewater, and stormwater – including compliance with the City's Federal Consent Decree. The website includes updates on capital projects, events, public meetings, information on how to reduce stormwater pollution, and customer support for billing, fees, and credit programs. MS4 public meetings, plans, and annual reports are also housed on Clean Water Baltimore. The website was redesigned in 2014. Information posted on the website is also posted on DPW's Facebook page and Twitter account.<sup>36</sup>

In addition to the web and social media, DPW's Watershed and Community Liaisons regularly provide presentations at community and civic meetings, including information on stormwater fee credits and methods that residents can undertake to reduce stormwater runoff. Increased attention will be given for outreach to minority communities, faith-based organizations, and businesses – not the typical water quality groups – as well as to young adults (ages 25-34) who tend to be more environmentally aware (see Section 2.1 Existing Conditions). This will be accomplished by:

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<sup>36</sup> <https://www.facebook.com/BaltimoreCityDepartmentofPublicWorks> and @BaltimoreDPW.

1. Hiring of additional staff for the Watershed Liaison Office, who will assist with these outreach efforts and partnerships;
2. Working in closer collaboration with the DPW Community Liaisons, the Mayor’s Office of Neighborhoods and Constituent Services, and the Department of Planning’s community planners;
3. Regular outreach to community associations, merchant groups (Main Streets), and faith-based organizations; and
4. Attending non-traditional events like the Baltimore Book Festival, African American Heritage Festival, and Artscape.

The Watershed Liaison Office will also assist DPW’s Community Liaisons with educational programs and outreach to public schools, including information on trash reduction, recycling, pet waste, and storm drains, with the connection between these efforts and the health of the harbor. During the 2013-2014 academic year, twenty-four presentations were made at 11 different schools, with 1,041 students participating. DPW will also work with the Baltimore Office of Sustainability and BCPSS’s Green Schools Coordinator to coordinate opportunities for presentations and curriculum-based projects.

In order to support these outreach efforts, DPW will implement the following:

1. Create a “one-stop shop” for resources and information on reducing stormwater pollutants on the cleanwaterbaltimore web site.
2. Implement a stormwater planning and outreach team in the Office of Compliance and Laboratories.
3. Create a consistent set of informational sheets, messages, and signage for reducing stormwater pollutants.<sup>37</sup> Bilingual versions of this material will be developed (similar to what was done as part of DPW’s Fats, Oils, and Grease (FOG) Program).
4. Given the large number of BMPs that will be installed across Baltimore, signage at these community locations is important for helping people understand a) how the project is reducing and cleaning stormwater, a) other community and environmental benefits, and 3) that the project is being paid for using stormwater fees. In addition, signage can recognize any funding partners as well as who to contact if there are any problems.
5. Create an MOU with the Baltimore Office of Promotion and the Arts (BOPA) to incorporate art into stormwater BMP projects, with a particular focus on using art to help educate people about water.



*Figure 25: Clean Water Baltimore web site (Source: DPW)*

<sup>37</sup> These recommendations focus on stormwater management BMPs; recommendations that target trash reduction will be developed when Baltimore City’s Trash TMDL is approved.

6. Create a pet waste campaign. Pet waste contributes to increased bacteria levels in stormwater runoff. The campaign will include community outreach, working with the Health Department, and developing signage and information that are bi-lingual.

#### **4.7 Maintenance**

Having a successful restoration program does not stop with the installation of the facilities. Maintaining public stormwater BMPs is critical to their ability to function as designed (Pillar #3: Plan to maintain). This was one of the top comments and concerns made at the MS4 WIP meetings.

While EPA guidance focuses on the function of facilities, a majority of these practices will be very visible to public, so they need to look good as well. Thus, maintenance can be classified as aesthetic and functional.

- Aesthetic maintenance focuses on how the stormwater facility looks, making sure that it is litter and trash free and that the plants are healthy and attractive. This includes routine maintenance like removing litter and debris, weeding, and mulching. Aesthetic maintenance provides opportunities for collaboration with residents, businesses, and civic groups.
- Functional maintenance makes sure that the facility is properly removing pollutants and filtering stormwater. This includes sediment removal, soil and medium replacement, and inspecting and repairing structural integrity like underdrains and curb/wall replacement. Functional maintenance requires a broader skill set; it is more than mowing or landscaping.

##### **4.7.1 Current Maintenance Practices**

Multiple public agencies have installed, and are responsible for, stormwater BMPs, including the Department of Transportation, the Public School System, Baltimore Housing, Department of General Services, Recreation and Parks, and the Department of Public Works. The responsibility for maintaining these BMPs rests with each agency. Some agencies have their own crews who maintain the BMPs, while other agencies use outside contractors to provide these services.

In meetings with city agencies, the following was identified:

- Need for an accurate list of facilities and corresponding responsible agencies;
- Need for maintenance standards; and
- Need for specific training on stormwater BMP maintenance for City staff, community groups, and NGOs.

From the meetings, it was agreed upon that the current system can be more effective and efficient. In order to improve maintenance of our current facilities, as well as meet the growing number of stormwater facilities that will be constructed to meet our MS4 and TMDL requirements, DPW will establish a Stormwater BMP Maintenance Team that will maintain all city-owned BMPs, regardless of the agency that installed or is responsible for the facility.<sup>38</sup>

With each set of BMPs, more crews will need to be hired for preventative maintenance. To determine the number of maintenance staff needed, it is estimated that one crew of 3 people can maintain 10 large BMPs (120 acres) or 60 small BMPs (60 acres) per year. Based on the WIP projections:

- Existing BMPs = 1 crew
- Large BMPs = 364 acres = 3 crews

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<sup>38</sup> Tree maintenance will be included in discussions regarding stormwater BMP maintenance roles and responsibilities.

- ESD practices = 66 acres = 1 crew
- Alternative BMPs (facility greening) = 38 acres = 1 crew (may be covered by another crew)

While the total number of crews needed would be 5 – 6 by 2018, an initial crew would be hired to maintain existing facilities. Depending on the length of time needed to establish the Stormwater BMP Maintenance Team, the consolidated maintenance might be contracted.

It is projected that the cost of 5 – 6 maintenance crews is \$1.1 million – \$1.4 million / year (based on \$230,000 needed for 1 crew). Utilizing Workforce Development Organizations might reduce the number of crews needed (although funding will be needed for these contract services). The goal is to have a Stormwater BMP Maintenance Plan approved by 2017.

#### **4.7.2 Workforce Development**

DPW sees the establishment of a Stormwater BMP Maintenance Team as an opportunity to promote workforce development and local hiring. DPW will explore opportunities for contracting stormwater maintenance to local workforce development organizations, such as Civic Works, Living Classrooms, Parks & People, and Humanim. DPW will also work with local workforce development organizations and employers to determine certification needs, training, and career advancement.

#### **4.7.3 Stewardship**

As identified in Appendix C, many of the City's BMPs will be installed at parks and schools, in the public right-of-way, and on vacant lots – highly visible locations that are in communities and neighborhoods. While DPW recognizes that the responsibility for these stormwater facilities lies with the city, they also offer opportunities for community partnership and stewardship for aesthetic maintenance.

DPW will work with partner organizations to promote existing programs, like Power in Dirt, Community Greening Resource Network (CGRN), and the Baltimore ToolBank, as well as identify education and training needs to help communities adopt maintenance. To further support community stewardship, the creation of GROW Centers will be studied.

GROW Centers will offer community members free or subsidized materials useful to the mitigation of polluted urban runoff: mulch, plants, soil media, leaf bags, rain barrels, etc. The GROW Center will also offer design assistance and advice for rain gardens, green roofs and other stormwater remediation measures. The brick and mortar Center will be complemented by an online Center, which will offer information about stormwater, plans for common projects, an advice forum, and a list of available materials and their prices.

Additionally, DPW will explore developing an Adopt-The-Green program that will give community groups incentives to become stewards of BMPs in their neighborhood. Modeled on the successful Adopt-A-Stream and Adopt-A-Road programs, various groups—corporate partners, local businesses, churches, neighborhood associations, and concerned individuals— will commit to maintaining and monitoring one or more BMPs. Each group will have an Adopt-a-Green sign that will identify them with the site. Providing stormwater fee credits for Adopt-a-Green will also be considered.

## 5 MILESTONE SCHEDULE

To promote continual progress, EPA’s accountability framework for restoring the Chesapeake Bay calls on states to identify milestones to be reached in two-year increments. The two-year milestones are also tracked closely by Maryland’s BayStat accountability system. There are two broad categories of milestones:

- Program enhancement actions needed to increase resources and improve the implementation processes to accelerate future restoration.
- Implementation actions are on-the-ground activities that will result in nutrient and sediment load reductions.

In 2011, Baltimore City submitted its Phase II WIP Milestones to MDE describing how they plan to reduce pollution from sources in the urban/developed sectors. These were updated for 2014-2015 and shown as bold text in Table 12.<sup>39</sup>

Baltimore’s Milestones are programmatic (staffing, policies and guidelines, program enhancement, etc.) and projects (stream restorations, ESDs, etc).

**Table 12: WIP Milestones Schedule**

Fiscal Year	Description
	<b>Program Milestones</b>
FY14	<b>Complete the Green Pattern Book, a guidance document focusing on green land uses such as stormwater management, community-managed open space, and urban forestry.</b>
	<b>Initiate a pilot design competition to test the Green Pattern Book and initial grant assignment. <i>Develop MOU for large grants (over \$10,000) for NGOs to implement projects as part of competition.</i></b>
	<b>Increase staff by 8 FTE by hiring or contracting for engineering, monitoring and enforcement.</b>
	<b>Initiate Street Sweeping Enhancement Plan</b>
	<b>Publish water quality (ammonia screening and stream impact sampling) on Cleanwater Baltimore website.</b>
	<b>Develop 311 Service Request to allow citizen complaints regarding Erosion and Sediment Control.</b>
	<b>Continue the Growing Green Initiative as a planning platform to identify vacant properties for potential green land use implementation</b>
	<b><u>Develop modifications to the demolition specifications regarding re-purposing of deconstruction materials, plus soil amendments.</u></b>
	<b>Complete first year evaluation of credit applications, reconciled with MS4 and TMDL reporting.</b>

<sup>39</sup> [http://www.mde.state.md.us/programs/Water/TMDL/TMDLImplementation/Documents/Milestones/2014-2015/Local/2014-2015\\_Baltimore\\_City\\_Milestones.pdf](http://www.mde.state.md.us/programs/Water/TMDL/TMDLImplementation/Documents/Milestones/2014-2015/Local/2014-2015_Baltimore_City_Milestones.pdf)



Fiscal Year	Description
FY 2015	Increase staff by 13 FTE by hiring or contracting for engineering, monitoring and enforcement.
	Implement preventative inlet cleaning in targeted neighborhoods of the City. The effort will be in collaboration with inlet screen installation and expanded street sweeping operations.
	Create integrated tracking database for SWM/ESC plans review and inspections, including GIS elements, standard reports, paperless field report / input, and work order assignments.
	Expand Urban Waters interactive mapping tool to include SWM BMPs.
	Begin working with 4 neighborhoods on stormwater planning
	Initiate <i>Stormwater Advisory Committee (SWAC, previously identified as WIP Task Force)</i> to represent various stakeholders.
	Initiate the Technical Work Group.
	Develop a 5-year plan for public education and outreach plan, <i>including initiating the Outreach Work Group.</i>
	Work with the Office of Sustainability and DPW Solid Waste to create a community-based “Baltimore Clean Corps”
FY 2016	Complete street tree survey, in coordination with the US Forest Service.
	Engage local universities for internships, research, and stewardship regarding water quality improvement
	Complete Casino Area Master Plan (Middle Branch) for use of funds from the Baltimore Casino.
	Develop MOU with NPDES Phase II MS4 (state) and NPDES Industrial Permit (state and local) regarding potential off-site mitigation within Baltimore City, focusing on BMP accounting, maintenance, and data sharing.
	<u>Update SWM and ESC Guidelines per state regulation and local policies to facilitate SWM and ESC Guidelines available on website.</u>
	<u>Initiate and provide training courses for developers, NGOs, and community leaders regarding the SWM/ESC plans review process</u>
	<u>Modify review process to facilitate restoration practices, including alternative plan review structure and technical certification requirements.</u>
	Create integrated tracking database for SWM/ESC plans review and inspections, including GIS elements, standard reports, paperless field report / input, and work order assignments
	<u>Approve the City’s revised zoning code with updates to the SWM requirements.</u>
	<u>Approve the City’s Landscape Manual which integrates ESD practices within landscape areas.</u>

Baltimore City MS4 and TMDL Watershed Implementation Plan

Fiscal Year	Description
FY 2016	Develop standardized designs and supporting calculations for ESD practices.
	<u>Complete feasibility studies for private participation incentive programs, such the Adopt the-Green program and STORM Centers (now called GROW Centers).</u>
	<u>Complete feasibility study for the use of recycled materials in BMP construction as a sustainable alternative to material disposal.</u>
	Develop Stormwater BMP maintenance plan for city-owned facilities, including staffing, budget, and funding.
	<b>Increase staff by 6 FTE by hiring or contracting for utility maintenance</b>
	Create a “one-stop shop” for resources and information on reducing stormwater pollutants
	Develop and implement 3 training workshops for community stormwater BMP maintenance.
	Begin working with 10 neighborhoods on stormwater planning
	Create a consistent set of informational sheets, messages, and signage for reducing stormwater pollutants.
FY 2017	Begin working with 3 neighborhoods on stormwater planning
	Increase staff by 2 FTE by hiring or contracting for community outreach
	Complete an analysis of city-owned facilities for possible impervious removal and sw retrofits
	Create an MOU with the Baltimore Office of Promotion and the Arts (BOPA) to incorporate art into stormwater BMP projects,
FY 2018	Complete studies for relationships for IDDE, education, and other non-traditional BMPs with impervious area restoration, nutrient, sediment, and bacteria reduction.
	Implement a pet waste campaign.
<b>Project Milestones (construction initiated)</b>	
FY2014	2,500 trees planted.
FY2015	0.4 miles of stream restoration.
	5,000 trees planted.
FY2016	0.85 miles of stream restoration.
	2.4 acres restored using ESD Practices.
	5,000 trees planted.
FY2017	Complete Watershed Assessment report for Lower North Branch of the Patapsco and Baltimore Harbor.
	1.8 miles of stream restoration

Fiscal Year	Description
	9 acres by regenerative step pool storm conveyance.
	5.8 acres of impervious removal and greening projects.
	5,000 trees planted
FY2018	Update the Watershed Assessment report for the Lower Gwynns Falls and Jones Falls.
	5.9 miles of stream restoration
	475 acres restored using Traditional BMPs
	35 acres restored using ESD Practices
	21.0 acres of impervious removal and greening projects
	5,000 trees planted
FY2019	Update the Watershed Assessment report for the Upper Back River
	1.0 mile of stream restoration
	53 acres restored using Traditional BMPs
	22.5 acres restored using ESD Practices
	12.7 acres of impervious removal and greening projects
	5,000 trees planted

**Note:** For program milestones, bold text indicates milestones separately submitted to MDE as part of the Chesapeake Bay TMDL. Underline bold text denotes a change from the original schedule. Italicized text denotes a variation in the language / description.

**5.1 Tracking Mechanisms**

The City will track all BMPs (both planned and constructed) using a Microsoft Access database and GIS tracking tool. All BMPs will be tracked with regard to impervious area restoration and pollutant reduction, regardless of the implementing party or the purpose of the construction, because the quantitative and qualitative control provided by the BMP will be used for future asset management. Table 13 demonstrates how the purpose of the construction will be applicable to the impervious area restoration requirement. The tracked data will coincide with MS4 permit annual reporting requirements for geodatabases. A majority of BMP implementation will be reported through the permitting process for construction activities, assuming the construction activities to install the BMPs will disturb more than 5,000 square feet of the land. Per the milestone schedule, the City will continue to work with partners to facilitate data reporting for restoration projects which disturb less than 5,000 square feet of land.

In addition to the permitting database, the City maintains a database for all stormwater fee credit applications related to private BMP implementation. The credit program includes an incentive for homeowners to report simple, small BMPs, such as rain gardens and tree planting. These activities do not require a technical review for the purpose of permitting. TreeBaltimore also maintains a database of all trees planted by their partners. These two databases will be combined with the permitting database and included in the City’s Annual MS4 report.

**Table 13: Stormwater Management Accounting Based on Construction Purpose**

<b>Purpose</b>	<b>New development</b>	<b>Quasi-redevelopment</b>	<b>Redevelopment</b>	<b>Restoration</b>
<b>Requirement</b>	Treat 1 inch of impervious area.	Treat 0.5 inch of ex. impervious area. Treat 1 inch of new impervious area.	Treat 0.5 inch of ex. impervious area.	No requirement.
<b>Credit</b>	Portion exceeding requirement.	Meets / exceeds requirement for existing impervious area. Portion exceeding requirement for new impervious area.	Meets / exceeds requirement for existing impervious area.	All treatment.
<b>Neutral</b>	Meeting the requirement.	Waiver met by fee-in-lieu for ex. Impervious area. Meeting the requirement for new impervious area.	Waiver met by fee-in-lieu for ex. Impervious area.	N/A
<b>Deficit</b>	Waiver met by fee-in-lieu.	Waiver met by fee-in-lieu for new impervious area.	N/A	N/A

### **5.2 Staffing**

Under this strategy, the pace of implementation is required to significantly increase. Meeting our MS4 and TMDL requirements will require an increase in the design and construction of stormwater capital projects, inspection of facilities, water quality testing and analysis, community outreach, and maintenance. This will require increased staffing and contractual services. New employees include engineers, scientists, inspectors, technicians, community planners, and maintenance staff (Table 14).

The most significant increases will be for plan review and inspections (in order to reduce plan review time and approval and increase the number of site inspections), project implementation (providing dedicated project management and in-house design and engineering), and education and outreach (build community capacity by targeting new partner groups that provide the necessary leadership, oversight, and sustained effort to change behaviors and foster stewardship).

**Table 14: Anticipated Staffing for DPW Related to the WIP**

<b>Program</b>	<b>Current</b>	<b>Future Increase</b>
Plan Review & Inspections	13	8-10
Water Quality Monitoring & IDDE	14	5-8
Project Implementation (Engineering & Construction)	13	20-30*
Education & Outreach	1	2-6
Stormwater BMP Maintenance	NA	15-18*
Inlet Cleaning	3	3

\* Some of the stormwater BMP maintenance may be contracted to Workforce Development organizations

## 6 ADAPTIVE MANAGEMENT

Sound implementation strategies require ongoing assessment and effective adaptation to respond to changing conditions, new technologies, and lessons learned. This will be the basis of the plan that will be used when benchmarks are not met and the projected funding is inadequate. (Pillar #6: Plan to adapt)

Adaptive management requires monitoring of a variety of measures that can be used to determine whether progress is being made towards meeting the MS4 and TMDL water quality objectives. Ultimately, it is the in-stream water quality and the loading limits with respect to the TMDLs that determine the success of implementation; however, it is unlikely that the impact of the implementation of specific projects will be demonstrated in water quality sampling by the end of this permit period. For example, afforestation projects will not reach their ultimate removal efficiency until the trees mature, which can take 10 to 15 years. Conversely, a structural BMP is likely to be the most efficient in its first year.

The projects, programs, and partnerships were selected based on the pollutant removal efficiencies, costs, and feasibility for implementation within the City based on the available information at the time of this WIP. During the permit period, the City will submit Annual Reports which will demonstrate progress of the execution of the WIP. In each report, the City will evaluate the progress and any potential changes based on the following:

- Actual implementation (schedule, costs, drainage area, and impervious area) of projects, programs, and partnerships.
- As-built information on historical BMPs (installed prior to 2010) received after the submittal of this WIP.
- New technology and innovation practices which may be more effective in pollutant removal.
- Changes to any stormwater laws, rules and regulations, which may affect development requirements or funding opportunities.
- Resource availability for materials and contracted labor.
- Results of studies on relationships between BMPs and pollutant reductions.
- Monitoring results for biology and chemistry that could contradict or supplement models initially used for TMDL development.

As described in the Public Outreach section, the Stormwater Advisory Committee will serve to advise the City on any proposed changes to the WIP. Any changes to the WIP as a result of adaptive management will be shared with the public on [www.cleanwaterbaltimore.org](http://www.cleanwaterbaltimore.org).

## 7 FINANCIAL STRATEGY

### 7.1 Stormwater Utility

The estimated cost for capital projects and operational programs are shown in Appendix C. In order to fund these projects and the operations to comply with the MS4 permit, a referendum was passed in 2012 to change the City Charter to create a Stormwater Utility. A Stormwater Utility is an enterprise fund that protects the revenues collected from stormwater remediation fees. It provides:

- A more equitable system: Contributors to stormwater runoff share based on a metric directly connected with the service provided.
- A stable level of funding: Ensures that stormwater management receives adequate support, independent of the City's tax rate and General Fund.
- A dedicated fund: Revenues are used solely for stormwater management purposes. This also allows the City to sell bonds which will keep rates stable for longer.

In September 2013, the City implemented the Maryland Stormwater Fee and began charging the fee to Baltimore City property owners on their quarterly water bill. The Stormwater Fee provides a sustainable, dedicated revenue source for maintaining, operating, and improving the City's stormwater management system, with the ultimate goal of reducing flooding and erosion, and keeping our waterways cleaner. The City's stormwater fees are based on the amount of impervious area on a property. In Fiscal Year 2014, the City billed about \$23.4 million in stormwater fees; however, the actual revenue is anticipated to be much less due to actual collections from ratepayers.<sup>40</sup> The fee was established at a specific rate through Fiscal Year 17 to allow an estimated revenue of \$24.6 M / year. Any changes to the stormwater rate after FY 2017 would require approval by the Board of Estimates. In addition to the stormwater fees, plans review fees and penalty fines provide about \$300,000 annual revenue to the Stormwater Utility.

The Stormwater Utility functions as an enterprise fund, which allows the City to build a reserve and use these funds to leverage revenue bonds. This is similar to the debt service mechanism used by the City's Water and Waste Water utilities to fund their capital improvement projects. For the purposes of this WIP, it is anticipated that the projects and programs listed in Appendix C will be funded by a combination of pay-go (direct use of revenue) and debt service mechanisms (bonds) that will be paid down using Stormwater Utility funds. Existing debt service, approved as part of the CIP process, includes about \$4.1 M in general obligation bonds and \$30.4 M in county transportation bonds. The stormwater fee was established to allow reserves to be accumulated to enable the City to issue revenue bonds by FY 2017.

### 7.2 Other City Funding

The water and wastewater utility have historically funded about \$1.5 M in operations for the IDDE program, since the sources of illicit discharges are typically related to potable water or sewage. Infrastructure improvements to the drinking water system or sanitary collection system as a result of IDDE are also funded by these two utilities. All consent decree projects are funded by the wastewater utility.

In Fiscal Year 2014, the entire mechanical street sweeping program was funded by the Stormwater Utility. In the following years, the program funding will be split equally between the Stormwater Utility and General Fund

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<sup>40</sup> The total amount of stormwater fee billings from September 15, 2013 through June 30, 2014 is \$23,390,580. This is an unaudited figure and therefore may not necessary represent the final stormwater fee revenue amount for FY2014.

(property tax revenue). Environmental initiatives, such as Tree Baltimore and the Growing Green Initiative, are funded by the General Fund.

### **7.3 Credit Program**

Customers may earn credits against their fee by adopting best management practices like installing rain gardens or planting trees. Single-family properties may also earn credits by participating in organized clean-ups or other approved activities. A credit system aims to protect water quality, create equity in the payment system, reduce public expenditures on stormwater management, and promote private sector stormwater management. The credit program also helps to foster private investment and stewardship at one's home and in their community. Projects that have been approved to receive a stormwater remediation credit, will be counted toward the MS4 restoration goal, and thus reduce the need to implement public projects for MS4 compliance.

### **7.4 Other Sources of Funds**

#### **7.4.1 Grants**

Currently, the City has a Chesapeake & Atlantic Coastal Bays Trust Fund grant from the Maryland Department of Natural Resources for the installation of two BMPs in Watershed 263. The City's goal is to increase the number of outside grants (Federal, State, Foundations) in order to leverage public dollars. To meet this goal, a grant procurement officer will be hired within the Department of Public Works.

DPW will also continue to work with our partner NGOs and the Baltimore Ecosystem Study to support grant proposals that they are submitting, providing guidance, letters of support, and matching funds, if necessary.

#### **7.4.2 Leveraging other Agency Capital Improvement Program (CIP) Funds**

One of the goals of our Watershed Implementation Plan is to work collaboratively with other city agencies in the installation of stormwater BMPs. Often there are CIP projects like roof replacements, new parking lots, or street reconstructions that could incorporate an ESD practice beyond its stormwater management requirements. DPW will continue to work with other agencies to identify opportunities for stormwater projects to leverage the City's stormwater utility fund dollars with other City funds.

#### **7.4.3 Casino Revenue**

The State legislation authorizing gaming in Maryland provided that a portion of the proceeds from each gaming facility must be used as local impact aid to benefit the surrounding communities. Local impact aid may be used for: infrastructure improvements, facilities, public safety, sanitation, economic and community development, including housing and other public services and improvements. Impact funds are allocated to the Mayor and City Council of Baltimore, but the City is required to develop a multi-year spending plan for the expenditure of these funds in consultation with the Baltimore Local Development Council (LDC).

The Department of Planning is spearheading a long-range master planning process – the Casino Area Master Plan – to account for the Horseshoe Casino that opened in Baltimore in 2014. The boundaries of the planning area extend from Cherry Hill in the south to Federal Hill and Sharp-Leadenhall on the east, Ridgely's Delight to the north, and Carroll-Camden and Lakeland to the west. This plan's recommendations and priorities will guide the development of future impact aid spending plans.

Several of the recommendations made in the plan address water quality, trash, and the quality of the Middle Branch. The Department of Public Works has been a partner in the development of the master plan and will continue to work with the Planning Department to identify funds that can be used for stormwater projects in the neighborhoods within the master plan boundaries.



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**Appendix A:**

**Properties Exempt from the Baseline Impervious Area**

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
2058A001	2058A	1	FED-NONPUBHOUS	1401 CONSTELLATION PLZ	336,206
3971K001	3971K	1	FED-NONPUBHOUS	3801 THE ALAMEDA	305,835
5460A002	5460A	2	FED-NONPUBHOUS	7000 HAMLET AVE	198,817
574002	574	2	FED-NONPUBHOUS	400 N GREENE ST	194,555
2058A002	2058A	2	FED-NONPUBHOUS	1301 WALLACE ST	166,141
7001001	7001	1	FED-NONPUBHOUS	2401 HAWKINS PT RD	159,714
8139G001	8139G	1	FED-NONPUBHOUS	5501 FREDERICK AVE	136,875
6874A014	6874A	14	FED-NONPUBHOUS	1900 BROENING HWY	127,059
0630034A	630	034A	FED-NONPUBHOUS	10 N GREENE ST	121,703
574001	574	1	FED-NONPUBHOUS	400 N GREENE ST	120,682
6332011	6332	11	FED-NONPUBHOUS	5520 EASTERN AVE	117,496
7.61E+23	7612E	20	FED-NONPUBHOUS	1500 CHERRY HILL RD	109,621
601024	601	24	FED-NONPUBHOUS	120 W LOMBARD ST	106,488
4099001	4099	1	FED-NONPUBHOUS	3000 HOMEWOOD AVE	102,055
425001	425	1	FED-NONPUBHOUS	50 W OLIVER ST	97,771
3100A007	3100A	7	FED-NONPUBHOUS	3500 DOLFIELD AVE	93,712
669001	669	1	FED-NONPUBHOUS	100 S HANOVER ST	82,406
5656015	5656	15	FED-NONPUBHOUS	6500 BELAIR RD	81,790
2058A003	2058A	3	FED-NONPUBHOUS	1401 CONSTELLATION PLZ	79,851
3511018	3511	18	FED-NONPUBHOUS	919 W 34TH ST	79,837
6135A019	6135A	19	FED-NONPUBHOUS	4200 SHANNON DR	75,900
6694137	6694	137	FED-NONPUBHOUS	6221 EASTERN AVE	71,913
1308002	1308	2	FED-NONPUBHOUS	1000 E LEXINGTON ST	58,718
319011	319	11	FED-NONPUBHOUS	1830 PENNSYLVANIA AVE	56,682
5210J007	5210J	7	FED-NONPUBHOUS	1800 E NORTHERN PKWY	56,322
1371001	1371	1	FED-NONPUBHOUS	40 S GAY ST	54,036
5053C008	5053C	8	FED-NONPUBHOUS	4908 YORK RD	44,126
2538040	2538	40	FED-NONPUBHOUS	340 S LOUDON AVE	27,950
5810006	5810	6	FED-NONPUBHOUS	4815 HARFORD RD	18,790
1384001	1384	1	FED-NONPUBHOUS	103 S GAY ST	16,519
2500003	2500	3	FED-NONPUBHOUS	3445 FREDERICK AVE	16,168
1371003	1371	3	FED-NONPUBHOUS	400 E LOMBARD ST	8,568
592043	592	43	FED-NONPUBHOUS	130 N GREENE ST	7,057
1371002	1371	2	FED-NONPUBHOUS	401 WATER ST	6,101
3100A010	3100A	10	FED-NONPUBHOUS	4220 WABASH AVE	5,039
3100A007C	3100A	007C	FED-NONPUBHOUS	3520 DOLFIELD AVE	1,371
3261A024	3261A	24	FED-NONPUBHOUS	2210 CLIFTON AVE	953
118112	118	112	FED-NONPUBHOUS	540 N BRICE ST	0
5898C034	5898C	34	FED-NONPUBHOUS	3704 EASTWOOD DR	0
7140001	7140	1	FED-PUBHOUS	4201 6TH ST	487,198
1310001	1310	1	FED-PUBHOUS	201-11 COLVIN ST	308,348
1202001	1202	1	FED-PUBHOUS	800-900 E MADISON ST	296,023
173003	173	3	FED-PUBHOUS	222 N FREMONT AVE	228,566
1202002	1202	2	FED-PUBHOUS	1000-1100 E MADISON ST	215,875
7623010	7623	10	FED-PUBHOUS	863-81 BETHUNE RD	177,020
28009	28	9	FED-PUBHOUS	1601 PRESSTMAN ST	166,007
1417001	1417	1	FED-PUBHOUS	1401 E PRATT ST	156,007
6771D011	6771D	11	FED-PUBHOUS	6301-03 O'DONNELL ST	144,210
7624002	7624	2	FED-PUBHOUS	1000-14 BETHUNE RD	134,974
7621001	7621	1	FED-PUBHOUS	2705-07 CARVER RD	120,641

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
7451013	7451	13	FED-PUBHOUS	2605-19 KENT ST	116,541
1418001	1418	1	FED-PUBHOUS	1501 E PRATT ST	115,927
2442D001	2442D	1	FED-PUBHOUS	1101-21 N ELLAMONT ST	101,066
1317001	1317	1	FED-PUBHOUS	1415 ORLEANS ST	96,958
1318001	1318	1	FED-PUBHOUS	1501 ORLEANS ST	89,882
1319019	1319	19	FED-PUBHOUS	1600-48 E FAYETTE ST	89,245
15029	15	29	FED-PUBHOUS	1700 BAKER ST	86,441
7623001	7623	1	FED-PUBHOUS	3301-3451 ROUND RD	85,856
22001	22	1	FED-PUBHOUS	1500-1514 N GILMOR ST	82,555
7623011	7623	11	FED-PUBHOUS	815-35 SEAGULL AVE	81,267
16031	16	31	FED-PUBHOUS	1602 BAKER ST	79,713
1426001	1426	1	FED-PUBHOUS	1400 BANK ST	79,060
1419026	1419	26	FED-PUBHOUS	1601 E PRATT ST	69,643
1427001	1427	1	FED-PUBHOUS	1500 BANK ST	67,894
457001	457	1	FED-PUBHOUS	1001 DRUID HILL AVE	63,788
435001	435	1	FED-PUBHOUS	1101 DRUID HILL AVE	62,455
475017	475	17	FED-PUBHOUS	907 DRUID HILL AVE	60,743
436001	436	1	FED-PUBHOUS	1100 MADISON AVE	57,414
458001	458	1	FED-PUBHOUS	1000 MADISON AVE	52,113
3345019	3345	19	FED-PUBHOUS	2601 OSWEGO AVE	45,674
2406116	2406	116	FED-PUBHOUS	1701-15 GERTRUDE ST &	45,090
361001	361	1	FED-PUBHOUS	521-41 MCMECHEN ST	41,216
3919001	3919	1	FED-PUBHOUS	601 WYANOKE AVE	40,359
7644090	7644	90	FED-PUBHOUS	2700-02 CARVER RD	39,146
7624001	7624	1	FED-PUBHOUS	3400-10 ROUND RD	36,852
7623009	7623	9	FED-PUBHOUS	800-18 BETHUNE RD	33,574
5028015	5028	15	FED-PUBHOUS	5218-22 YORK RD	30,622
3649028	3649	28	FED-PUBHOUS	119-23 W 29TH ST	30,615
1278002	1278	2	FED-PUBHOUS	633 AISQUITH ST	29,478
1295001	1295	1	FED-PUBHOUS	500 N CENTRAL AVE	26,406
3602013	3602	13	FED-PUBHOUS	11 W 20TH ST	26,237
3826028	3826	28	FED-PUBHOUS	401 E 25TH ST	24,765
2442D002	2442D	2	FED-PUBHOUS	1000-46 ELLAMONT AVE	22,082
505021	505	21	FED-PUBHOUS	25-27 W CHASE ST	19,550
2179023	2179	23	FED-PUBHOUS	2550 MCHENRY ST	18,673
306026	306	26	FED-PUBHOUS	1431 N CAREY ST	15,727
475001	475	1	FED-PUBHOUS	708 N M.L. KING JR BLVD	15,341
5028009	5028	9	FED-PUBHOUS	5216 CROWSON AVE	15,240
1324001	1324	1	FED-PUBHOUS	131 AISQUITH ST	14,940
2408065	2408	65	FED-PUBHOUS	1501 SLINGLUFF AVE	14,807
1188040	1188	40	FED-PUBHOUS	1001 AISQUITH ST	10,301
4109001	4109	1	FED-PUBHOUS	2601 HOMEWOOD AVE	9,474
4110002	4110	2	FED-PUBHOUS	1406-08 MONTPELIER ST	7,642
165050	165	50	FED-PUBHOUS	1608 W LEXINGTON ST	6,705
185021	185	21	FED-PUBHOUS	1044 W FAYETTE ST	4,554
197016	197	16	FED-PUBHOUS	21 N STRICKER ST	2,352
1177021	1177	21	FED-PUBHOUS	1105 N CAROLINE ST	2,335
164028	164	28	FED-PUBHOUS	1722-26 W LEXINGTON ST	2,071
540001	540	1	FED-PUBHOUS	851 GEORGE ST	1,840
932010	932	10	FED-PUBHOUS	1020 S HANOVER ST	1,813

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
1183024	1183	24	FED-PUBHOUS	823 E CHASE ST	1,809
948037	948	37	FED-PUBHOUS	36 W WEST ST	1,609
3417061	3417	61	FED-PUBHOUS	2574 MCCULLOH ST	1,602
1925A009	1925A	9	FED-PUBHOUS	1255 RIVERSIDE AVE	1,599
1183031	1183	31	FED-PUBHOUS	837 E CHASE ST	1,588
32010	32	10	FED-PUBHOUS	1320 N MOUNT ST	1,561
1102046	1102	46	FED-PUBHOUS	1818 N BROADWAY	1,525
4021C085	4021C	85	FED-PUBHOUS	2218 KIRK AVE	1,508
308043	308	43	FED-PUBHOUS	2126 DRUID HILL AVE	1,450
308051	308	51	FED-PUBHOUS	2110 DRUID HILL AVE	1,442
16005	16	5	FED-PUBHOUS	1608 N GILMOR ST	1,439
389040	389	40	FED-PUBHOUS	1804 ST PAUL ST	1,436
149071	149	71	FED-PUBHOUS	313 N FULTON AVE	1,426
146029	146	29	FED-PUBHOUS	2020 W SARATOGA ST	1,425
145054	145	54	FED-PUBHOUS	2133 W MULBERRY ST	1,404
308050	308	50	FED-PUBHOUS	2112 DRUID HILL AVE	1,403
3935033	3935	33	FED-PUBHOUS	2737 THE ALAMEDA	1,389
114006	114	6	FED-PUBHOUS	1111 HARLEM AVE	1,374
315011	315	11	FED-PUBHOUS	2020 MCCULLOH ST	1,315
1135012	1135	12	FED-PUBHOUS	1426 N EDEN ST	1,313
4001034	4001	34	FED-PUBHOUS	719 E 20TH ST	1,302
84012	84	12	FED-PUBHOUS	822 N FULTON AVE	1,297
1143031	1143	31	FED-PUBHOUS	832 E PRESTON ST	1,296
87004	87	4	FED-PUBHOUS	1506 W LANVALE ST	1,292
3806017	3806	17	FED-PUBHOUS	310 E 20TH ST	1,279
314004	314	4	FED-PUBHOUS	2006 DRUID HILL AVE	1,266
244054	244	54	FED-PUBHOUS	100 S MOUNT ST	1,265
1737051	1737	51	FED-PUBHOUS	29 S WASHINGTON ST	1,262
3806008	3806	8	FED-PUBHOUS	328 E 20TH ST	1,254
4059B010	4059B	10	FED-PUBHOUS	618 E 37TH ST	1,249
1706016	1706	16	FED-PUBHOUS	2207 E FAYETTE ST	1,247
1721026	1721	26	FED-PUBHOUS	2033 E FAIRMOUNT AVE	1,231
1164A073	1164A	73	FED-PUBHOUS	1222 N BROADWAY	1,227
4057022	4057	22	FED-PUBHOUS	615 E 36TH ST	1,227
87006	87	6	FED-PUBHOUS	1510 W LANVALE ST	1,225
2323029E	2323	029E	FED-PUBHOUS	2211 PRESBURY ST	1,225
4001036	4001	36	FED-PUBHOUS	715 E 20TH ST	1,223
163068	163	68	FED-PUBHOUS	236 N FULTON AVE	1,216
1721016	1721	16	FED-PUBHOUS	2013 E FAIRMOUNT AVE	1,212
1739005	1739	5	FED-PUBHOUS	2209 E BALTIMORE ST	1,212
4156A001	4156A	1	FED-PUBHOUS	1738 E NORTH AVE	1,212
1721035	1721	35	FED-PUBHOUS	28 N CHESTER ST	1,211
4533021	4533	21	FED-PUBHOUS	3342 AVONDALE AVE	1,208
429009	429	9	FED-PUBHOUS	1619 N CALVERT ST	1,205
1180031	1180	31	FED-PUBHOUS	1009 BRENTWOOD AVE	1,203
1095041	1095	41	FED-PUBHOUS	1806 BARCLAY ST	1,200
1095042	1095	42	FED-PUBHOUS	1804 BARCLAY ST	1,200
120073	120	73	FED-PUBHOUS	1806 W FRANKLIN ST	1,198
1706013	1706	13	FED-PUBHOUS	2201 E FAYETTE ST	1,198
4002008	4002	8	FED-PUBHOUS	814 E NORTH AVE	1,191

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
3803013	3803	13	FED-PUBHOUS	1913 GUILFORD AVE	1,189
3972D038	3972D	38	FED-PUBHOUS	924 NORTH HILL RD	1,185
77048	77	48	FED-PUBHOUS	1310 W LAFAYETTE AVE	1,184
4167002	4167	2	FED-PUBHOUS	2004 E NORTH AVE	1,183
391027	391	27	FED-PUBHOUS	1827 N CALVERT ST	1,181
16006	16	6	FED-PUBHOUS	1610 N GILMOR ST	1,179
1114015	1114	15	FED-PUBHOUS	1601 AISQUITH ST	1,170
3036	3	36	FED-PUBHOUS	1843 W NORTH AVE	1,169
1095049	1095	49	FED-PUBHOUS	326 E LAFAYETTE AVE	1,169
1531001	1531	1	FED-PUBHOUS	1800 E BIDDLE ST	1,169
315003	315	3	FED-PUBHOUS	2004 MCCULLOH ST	1,167
1744065	1744	65	FED-PUBHOUS	1735 E LOMBARD ST	1,165
2475C064	2475C	64	FED-PUBHOUS	901 N ROSEDALE ST	1,165
4071048	4071	48	FED-PUBHOUS	518 E 27TH ST	1,164
613016	613	16	FED-PUBHOUS	730 W FAYETTE ST	1,162
1670066	1670	66	FED-PUBHOUS	2220 ORLEANS ST	1,162
1671020	1671	20	FED-PUBHOUS	441 N PATTERSON PK AVE	1,162
108024	108	24	FED-PUBHOUS	646 N FULTON AVE	1,161
414041	414	41	FED-PUBHOUS	1328 DIVISION ST	1,161
2475C040	2475C	40	FED-PUBHOUS	948 N FRANKLINTOWN RD	1,159
4062019	4062	19	FED-PUBHOUS	510 E 26TH ST	1,157
3004049	3004	49	FED-PUBHOUS	2927 WALBROOK AVE	1,156
315001	315	1	FED-PUBHOUS	2000 MCCULLOH ST	1,153
1549048	1549	48	FED-PUBHOUS	1831 E BIDDLE ST	1,152
4123A056	4123A	56	FED-PUBHOUS	1716 MONTPELIER ST	1,149
429008	429	8	FED-PUBHOUS	1617 N CALVERT ST	1,147
2205077	2205	77	FED-PUBHOUS	2402 W FRANKLIN ST	1,144
3806061	3806	61	FED-PUBHOUS	2006 BARCLAY ST	1,143
1142B039	1142B	39	FED-PUBHOUS	1308 HOMEWOOD AVE	1,134
1191006	1191	6	FED-PUBHOUS	1015 N CAROLINE ST	1,132
1149A012	1149A	12	FED-PUBHOUS	1323 N EDEN ST	1,127
1149A011	1149A	11	FED-PUBHOUS	1321 N EDEN ST	1,126
1494019	1494	19	FED-PUBHOUS	1435 N BROADWAY	1,125
4163018	4163	18	FED-PUBHOUS	1425 DARLEY AVE	1,123
176054	176	54	FED-PUBHOUS	110 N PAYSON ST	1,122
1155010	1155	10	FED-PUBHOUS	1225 GREENMOUNT AVE	1,118
164047	164	47	FED-PUBHOUS	212 N MOUNT ST	1,116
0300B004	0300B	4	FED-PUBHOUS	1412 PRESSTMAN ST	1,116
3837070	3837	70	FED-PUBHOUS	307 E LORRAINE AVE	1,116
53067	53	67	FED-PUBHOUS	1526 RIGGS AVE	1,113
3818031	3818	31	FED-PUBHOUS	2210 N CALVERT ST	1,110
1145004	1145	4	FED-PUBHOUS	1006 E PRESTON ST	1,109
1155101	1155	101	FED-PUBHOUS	702 MURA ST	1,108
179001	179	1	FED-PUBHOUS	1701 W LEXINGTON ST	1,107
3836A022	3836A	22	FED-PUBHOUS	405 E 27TH ST	1,106
79020	79	20	FED-PUBHOUS	1113 MOSHER ST	1,101
67014	67	14	FED-PUBHOUS	1015 N ARLINGTON AVE	1,100
53042	53	42	FED-PUBHOUS	1132 N STRICKER ST	1,098
315004	315	4	FED-PUBHOUS	2006 MCCULLOH ST	1,094
4071051	4071	51	FED-PUBHOUS	512 E 27TH ST	1,092



**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
1459022	1459	22	FED-PUBHOUS	1724 N CHESTER ST	1,088
3424053	3424	53	FED-PUBHOUS	1013 WHITELOCK ST	1,087
4005070	4005	70	FED-PUBHOUS	1903 KENNEDY AVE	1,086
314001	314	1	FED-PUBHOUS	2000 DRUID HILL AVE	1,081
314003	314	3	FED-PUBHOUS	2004 DRUID HILL AVE	1,079
3845007H	3845	007H	FED-PUBHOUS	419 E 28TH ST	1,076
27024	27	24	FED-PUBHOUS	1446 N MOUNT ST	1,074
778002	778	2	FED-PUBHOUS	1303 WASHINGTON BLVD	1,074
166061	166	61	FED-PUBHOUS	1520 W LEXINGTON ST	1,072
1188064	1188	64	FED-PUBHOUS	1216 E EAGER ST	1,072
359031	359	31	FED-PUBHOUS	625 PITCHER ST	1,071
2171078	2171	78	FED-PUBHOUS	8 S CATHERINE ST	1,070
3845025	3845	25	FED-PUBHOUS	432 WHITRIDGE AVE	1,065
2205044	2205	44	FED-PUBHOUS	2440 LAURETTA AVE	1,064
3209022	3209	22	FED-PUBHOUS	1805 CLIFTON AVE	1,064
4024016	4024	16	FED-PUBHOUS	737 E 23RD ST	1,063
2199C025	2199C	25	FED-PUBHOUS	229 S HILTON ST	1,062
3815033	3815	33	FED-PUBHOUS	445 E 23RD ST	1,062
1669055	1669	55	FED-PUBHOUS	2120 ORLEANS ST	1,061
916090	916	90	FED-PUBHOUS	927-29 BEVAN ST	1,060
2205039	2205	39	FED-PUBHOUS	2430 LAURETTA AVE	1,059
3913092	3913	92	FED-PUBHOUS	4012 WILSBY AVE	1,055
2213B021	2213B	21	FED-PUBHOUS	2629 EDMONDSON AVE	1,054
3818029	3818	29	FED-PUBHOUS	2214 N CALVERT ST	1,054
77025	77	25	FED-PUBHOUS	913 N CALHOUN ST	1,050
32019	32	19	FED-PUBHOUS	1338 N MOUNT ST	1,048
4011A025	4011A	25	FED-PUBHOUS	1126 E 20TH ST	1,048
1215025	1215	25	FED-PUBHOUS	1612 ASHLAND AVE	1,047
1450072	1450	72	FED-PUBHOUS	2104 E LAFAYETTE AVE	1,046
1506064	1506	64	FED-PUBHOUS	1401 N LUZERNE AVE	1,045
1104062	1104	62	FED-PUBHOUS	402 E LANVALE ST	1,043
3814039	3814	39	FED-PUBHOUS	2122 GREENMOUNT AVE	1,038
43033	43	33	FED-PUBHOUS	1212 N STRICKER ST	1,036
1483011	1483	11	FED-PUBHOUS	2232 E OLIVER ST	1,036
2205070	2205	70	FED-PUBHOUS	2441 LAURETTA AVE	1,035
54022	54	22	FED-PUBHOUS	1143 N STRICKER ST	1,034
2377B033	2377B	33	FED-PUBHOUS	2801 HARLEM AVE	1,033
1667015	1667	15	FED-PUBHOUS	431 N WASHINGTON ST	1,031
2213A007	2213A	7	FED-PUBHOUS	2743 EDMONDSON AVE	1,029
121009	121	9	FED-PUBHOUS	526 N MOUNT ST	1,027
2377B029	2377B	29	FED-PUBHOUS	610 N DUKELAND ST	1,027
1157017	1157	17	FED-PUBHOUS	932 E BIDDLE ST	1,026
1460034	1460	34	FED-PUBHOUS	1728 N COLLINGTON AVE	1,025
2377B004	2377B	4	FED-PUBHOUS	2806 EDMONDSON AVE	1,025
2205032	2205	32	FED-PUBHOUS	2416 LAURETTA AVE	1,024
2475F002	2475F	2	FED-PUBHOUS	3003 W LANVALE ST	1,024
779079	779	79	FED-PUBHOUS	1200 CARROLL ST	1,023
2475C020	2475C	20	FED-PUBHOUS	910 N FRANKLINTOWN RD	1,023
4002011	4002	11	FED-PUBHOUS	820 E NORTH AVE	1,023
2401A040	2401A	40	FED-PUBHOUS	1814 BRADDISH AVE	1,017

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
32012	32	12	FED-PUBHOUS	1324 N MOUNT ST	1,014
53047	53	47	FED-PUBHOUS	1122 N STRICKER ST	1,014
179008	179	8	FED-PUBHOUS	1715 W LEXINGTON ST	1,014
1574024	1574	24	FED-PUBHOUS	2643 E CHASE ST	1,014
1183001	1183	1	FED-PUBHOUS	801 E CHASE ST	1,012
2205043	2205	43	FED-PUBHOUS	2438 LAURETTA AVE	1,011
2205050	2205	50	FED-PUBHOUS	2401 LAURETTA AVE	1,011
16013	16	13	FED-PUBHOUS	1624 N GILMOR ST	1,010
1114019	1114	19	FED-PUBHOUS	1611 AISQUITH ST	1,009
1738038	1738	38	FED-PUBHOUS	2108 E LOMBARD ST	1,009
1095048	1095	48	FED-PUBHOUS	328 E LAFAYETTE AVE	1,007
315002	315	2	FED-PUBHOUS	2002 MCCULLOH ST	1,006
1477011	1477	11	FED-PUBHOUS	1521 N BROADWAY	1,003
2248007	2248	7	FED-PUBHOUS	125 S LOUDON AVE	1,002
3312025	3312	25	FED-PUBHOUS	2705 OSWEGO AVE	1,002
2205060	2205	60	FED-PUBHOUS	2421 LAURETTA AVE	997
1188060	1188	60	FED-PUBHOUS	1208 E EAGER ST	995
1157015	1157	15	FED-PUBHOUS	928 E BIDDLE ST	993
1157049	1157	49	FED-PUBHOUS	1231 VALLEY ST	991
224017	224	17	FED-PUBHOUS	1939 HOLLINS ST	989
3228A029	3228A	29	FED-PUBHOUS	2862 WOODBROOK AVE	988
123015	123	15	FED-PUBHOUS	528 N STRICKER ST	986
1099A033	1099A	33	FED-PUBHOUS	1221 E NORTH AVE	986
1722013	1722	13	FED-PUBHOUS	2109 E FAIRMOUNT AVE	985
75041	75	41	FED-PUBHOUS	902 N STRICKER ST	983
1227057	1227	57	FED-PUBHOUS	811 N CAROLINE ST	983
4001043	4001	43	FED-PUBHOUS	701 E 20TH ST	983
2205038	2205	38	FED-PUBHOUS	2428 LAURETTA AVE	982
3952027	3952	27	FED-PUBHOUS	1804 E 28TH ST	982
916086	916	86	FED-PUBHOUS	921 BEVAN ST	980
3815018	3815	18	FED-PUBHOUS	415 E 23RD ST	980
1460022	1460	22	FED-PUBHOUS	1704 N COLLINGTON AVE	978
2205028	2205	28	FED-PUBHOUS	2408 LAURETTA AVE	976
2205078	2205	78	FED-PUBHOUS	2404 W FRANKLIN ST	976
1737052	1737	52	FED-PUBHOUS	27 S WASHINGTON ST	975
2205059	2205	59	FED-PUBHOUS	2419 LAURETTA AVE	975
1155020	1155	20	FED-PUBHOUS	711 E PRESTON ST	974
2205089	2205	89	FED-PUBHOUS	2426 W FRANKLIN ST	971
150030	150	30	FED-PUBHOUS	1629 W MULBERRY ST	970
2206B073	2206B	73	FED-PUBHOUS	2545 LAURETTA AVE	966
2205068	2205	68	FED-PUBHOUS	2437 LAURETTA AVE	965
54007	54	7	FED-PUBHOUS	1113 N STRICKER ST	964
1096036	1096	36	FED-PUBHOUS	411 E NORTH AVE	959
2205090	2205	90	FED-PUBHOUS	2428 W FRANKLIN ST	959
4002014	4002	14	FED-PUBHOUS	826 E NORTH AVE	956
1164A064	1164A	64	FED-PUBHOUS	1240 N BROADWAY	955
1152034	1152	34	FED-PUBHOUS	1216 BRENTWOOD AVE	950
2205079	2205	79	FED-PUBHOUS	2406 W FRANKLIN ST	947
3836A023	3836A	23	FED-PUBHOUS	403 E 27TH ST	944
152004	152	4	FED-PUBHOUS	307 N STRICKER ST	943

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**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
2205080	2205	80	FED-PUBHOUS	2408 W FRANKLIN ST	942
1152021	1152	21	FED-PUBHOUS	430 E BIDDLE ST	941
1184070	1184	70	FED-PUBHOUS	1009 VALLEY ST	938
1721029	1721	29	FED-PUBHOUS	2039 E FAIRMOUNT AVE	936
34051	34	51	FED-PUBHOUS	1507 PRESSTMAN ST	935
1158020	1158	20	FED-PUBHOUS	1013 E PRESTON ST	935
1737048	1737	48	FED-PUBHOUS	35 S WASHINGTON ST	935
1706026	1706	26	FED-PUBHOUS	2227 E FAYETTE ST	933
3844073	3844	73	FED-PUBHOUS	310 WHITRIDGE AVE	933
2205046	2205	46	FED-PUBHOUS	2444 LAURETTA AVE	929
3815046	3815	46	FED-PUBHOUS	2200 GREENMOUNT AVE	927
4021C081	4021C	81	FED-PUBHOUS	2210 KIRK AVE	926
4004016	4004	16	FED-PUBHOUS	1900 KENNEDY AVE	925
1122032	1122	32	FED-PUBHOUS	1535 HOLBROOK ST	912
309002	309	2	FED-PUBHOUS	2100-1/2 MCCULLOH ST	911
54017	54	17	FED-PUBHOUS	1133 N STRICKER ST	909
179033	179	33	FED-PUBHOUS	1724 W FAYETTE ST	907
1705049	1705	49	FED-PUBHOUS	2104 E FAIRMOUNT AVE	904
1172053	1172	53	FED-PUBHOUS	1027 E BIDDLE ST	899
150011	150	11	FED-PUBHOUS	320 N GILMOR ST	898
4019001	4019	1	FED-PUBHOUS	500 E 21ST ST	898
1194077	1194	77	FED-PUBHOUS	1012 N BROADWAY	897
150031	150	31	FED-PUBHOUS	1631 W MULBERRY ST	896
3816053	3816	53	FED-PUBHOUS	2238 BARCLAY ST	895
2205052	2205	52	FED-PUBHOUS	2405 LAURETTA AVE	891
53044	53	44	FED-PUBHOUS	1128 N STRICKER ST	889
2205053	2205	53	FED-PUBHOUS	2407 LAURETTA AVE	889
2475H041	2475H	41	FED-PUBHOUS	913 ELLICOTT DR	888
2385061	2385	61	FED-PUBHOUS	2845 W LAFAYETTE AVE	887
1183042	1183	42	FED-PUBHOUS	1030 VALLEY ST	884
2424B016	2424B	16	FED-PUBHOUS	3030 BAKER ST	884
1157009	1157	9	FED-PUBHOUS	916 E BIDDLE ST	881
1721050	1721	50	FED-PUBHOUS	2040 E BALTIMORE ST	881
75013	75	13	FED-PUBHOUS	923 N GILMOR ST	880
1534038	1534	38	FED-PUBHOUS	1213 N CHESTER ST	880
1945022	1945	22	FED-PUBHOUS	1843 COVINGTON ST	880
108047	108	47	FED-PUBHOUS	1814 EDMONDSON AVE	878
2377C039	2377C	39	FED-PUBHOUS	610 GLENOLDEN AVE	875
3806060	3806	60	FED-PUBHOUS	2008 BARCLAY ST	870
1143018	1143	18	FED-PUBHOUS	804 E PRESTON ST	869
3815025	3815	25	FED-PUBHOUS	429 E 23RD ST	869
1227059	1227	59	FED-PUBHOUS	807 N CAROLINE ST	868
0055B029	0055B	29	FED-PUBHOUS	1156 N CAREY ST	867
2206B081	2206B	81	FED-PUBHOUS	2510 W FRANKLIN ST	861
1188066	1188	66	FED-PUBHOUS	1220 E EAGER ST	860
948015	948	15	FED-PUBHOUS	1121 RACE ST	859
4005006	4005	6	FED-PUBHOUS	1110 E NORTH AVE	858
26001	26	1	FED-PUBHOUS	1400 N FULTON AVE	857
152013	152	13	FED-PUBHOUS	325 N STRICKER ST	856
5216017	5216	17	FED-PUBHOUS	4735 ALHAMBRA AVE	856

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**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
1161029	1161	29	FED-PUBHOUS	1226 N EDEN ST	851
1162040	1162	40	FED-PUBHOUS	1208 N CAROLINE ST	851
180012	180	12	FED-PUBHOUS	1623 W LEXINGTON ST	850
1451077	1451	77	FED-PUBHOUS	1709 N COLLINGTON AVE	850
58006	58	6	FED-PUBHOUS	1910 MOSHER ST	847
4114H032	4114H	32	FED-PUBHOUS	1519 MONTPELIER ST	846
431035	431	35	FED-PUBHOUS	1150 ARGYLE AVE	842
1191010	1191	10	FED-PUBHOUS	1023 N CAROLINE ST	842
3826049	3826	49	FED-PUBHOUS	2446 BRENTWOOD AVE	842
3846067	3846	67	FED-PUBHOUS	420 ILCHESTER AVE	841
74017	74	17	FED-PUBHOUS	1621 MOSHER ST	838
62012	62	12	FED-PUBHOUS	1022 N STRICKER ST	837
124056	124	56	FED-PUBHOUS	1418 W FRANKLIN ST	837
4019007	4019	7	FED-PUBHOUS	512 E 21ST ST	837
1191011	1191	11	FED-PUBHOUS	1025 N CAROLINE ST	836
124062	124	62	FED-PUBHOUS	1406 W FRANKLIN ST	834
4004007	4004	7	FED-PUBHOUS	1012 E NORTH AVE	830
74031	74	31	FED-PUBHOUS	926 N GILMOR ST	822
3312027	3312	27	FED-PUBHOUS	2709 OSWEGO AVE	822
3416027	3416	27	FED-PUBHOUS	2362 MCCULLOH ST	821
196063	196	63	FED-PUBHOUS	1520 W FAIRMOUNT AVE	820
3312A029	3312A	29	FED-PUBHOUS	2700 OSWEGO AVE	819
4010I015	4010I	15	FED-PUBHOUS	2304 AISQUITH ST	819
4629017	4629	17	FED-PUBHOUS	3132 OAKFORD AVE	818
3806010	3806	10	FED-PUBHOUS	324 E 20TH ST	816
4114I010	4114I	10	FED-PUBHOUS	2528 GARRETT AVE	812
1188057	1188	57	FED-PUBHOUS	1202 E EAGER ST	810
1227058	1227	58	FED-PUBHOUS	809 N CAROLINE ST	809
1184017	1184	17	FED-PUBHOUS	932 E EAGER ST	808
127045	127	45	FED-PUBHOUS	536 N ARLINGTON AVE	807
2205040	2205	40	FED-PUBHOUS	2432 LAURETTA AVE	807
586085	586	85	FED-PUBHOUS	213 N FREMONT AVE	805
32013	32	13	FED-PUBHOUS	1326 N MOUNT ST	802
179030	179	30	FED-PUBHOUS	1730 W FAYETTE ST	802
1227053	1227	53	FED-PUBHOUS	819 N CAROLINE ST	798
16011	16	11	FED-PUBHOUS	1620 N GILMOR ST	797
1498037	1498	37	FED-PUBHOUS	1417 N WASHINGTON ST	795
2205084	2205	84	FED-PUBHOUS	2416 W FRANKLIN ST	793
4114G044	4114G	44	FED-PUBHOUS	2618 GARRETT AVE	792
1529057	1529	57	FED-PUBHOUS	1257 N BROADWAY	787
3311013	3311	13	FED-PUBHOUS	4226 PARK HTS AVE	787
129020	129	20	FED-PUBHOUS	940 W FRANKLIN ST	786
3307A025B	3307A	025B	FED-PUBHOUS	2650 PARK HTS TER	785
3413046	3413	46	FED-PUBHOUS	2431 FRANCIS ST	785
53032	53	32	FED-PUBHOUS	1152 N STRICKER ST	781
110053	110	53	FED-PUBHOUS	1606 EDMONDSON AVE	780
1227005	1227	5	FED-PUBHOUS	1508 E MADISON ST	779
3824009	3824	9	FED-PUBHOUS	2317 BARCLAY ST	779
1145017	1145	17	FED-PUBHOUS	1302 AISQUITH ST	776
4011B029	4011B	29	FED-PUBHOUS	2034 ROBB ST	774

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
2205093	2205	93	FED-PUBHOUS	2434 W FRANKLIN ST	770
4127054	4127	54	FED-PUBHOUS	1739 CARSWELL ST	768
4132018	4132	18	FED-PUBHOUS	1550 CARSWELL ST	766
152014	152	14	FED-PUBHOUS	327 N STRICKER ST	765
3341051	3341	51	FED-PUBHOUS	2600 SPRINGHILL AVE	763
3257B003	3257B	3	FED-PUBHOUS	3522 OVERVIEW RD	760
1114020	1114	20	FED-PUBHOUS	1613 AISQUITH ST	759
4129005	4129	5	FED-PUBHOUS	1618 GORSUCH AVE	757
3408059	3408	59	FED-PUBHOUS	1520 RETREAT ST	755
1548035	1548	35	FED-PUBHOUS	1719 E BIDDLE ST	753
118046	118	46	FED-PUBHOUS	548 N PAYSON ST	752
124052	124	52	FED-PUBHOUS	503 N STRICKER ST	750
317001	317	1	FED-PUBHOUS	2001 MADISON AVE	748
193090	193	90	FED-PUBHOUS	1824 W FAIRMOUNT AVE	740
0023B005	0023B	5	FED-PUBHOUS	1508 PRESSTMAN ST	737
32052	32	52	FED-PUBHOUS	1716 LAURENS ST	737
1737050	1737	50	FED-PUBHOUS	31 S WASHINGTON ST	734
4051A006	4051A	6	FED-PUBHOUS	3211 WESTERWALD AVE	733
78023	78	23	FED-PUBHOUS	927 N CAREY ST	727
187010	187	10	FED-PUBHOUS	120 N POPPLETON ST	724
1155004	1155	4	FED-PUBHOUS	1209 GREENMOUNT AVE	724
1549051	1549	51	FED-PUBHOUS	1837 E BIDDLE ST	714
1671033	1671	33	FED-PUBHOUS	2331 JEFFERSON ST	714
1456081	1456	81	FED-PUBHOUS	1702 N REGISTER ST	713
2205085	2205	85	FED-PUBHOUS	2418 W FRANKLIN ST	712
2206B036	2206B	36	FED-PUBHOUS	2524 LAURETTA AVE	712
67016	67	16	FED-PUBHOUS	1019 N ARLINGTON AVE	698
586035	586	35	FED-PUBHOUS	728 DR BENJAMIN QUARLS PL	696
61040	61	40	FED-PUBHOUS	1025 N MOUNT ST	695
77047	77	47	FED-PUBHOUS	1312 W LAFAYETTE AVE	693
119005	119	5	FED-PUBHOUS	520 N MONROE ST	692
1549050	1549	50	FED-PUBHOUS	1835 E BIDDLE ST	687
242052	242	52	FED-PUBHOUS	1925 W LOMBARD ST	685
2205034	2205	34	FED-PUBHOUS	2420 LAURETTA AVE	685
74035	74	35	FED-PUBHOUS	918 N GILMOR ST	683
2177064	2177	64	FED-PUBHOUS	301 S FRANKLINTOWN RD	673
121007	121	7	FED-PUBHOUS	522 N MOUNT ST	672
113024	113	24	FED-PUBHOUS	1207 HARLEM AVE	670
2301043	2301	43	FED-PUBHOUS	2116 PRESBURY ST	669
77049	77	49	FED-PUBHOUS	1308 W LAFAYETTE AVE	664
164057	164	57	FED-PUBHOUS	232 N MOUNT ST	659
152005	152	5	FED-PUBHOUS	309 N STRICKER ST	658
1157056	1157	56	FED-PUBHOUS	1217 VALLEY ST	658
1686036	1686	36	FED-PUBHOUS	2038 E FAYETTE ST	657
3413013	3413	13	FED-PUBHOUS	2424 DRUID HILL AVE	656
1721046	1721	46	FED-PUBHOUS	6 N CHESTER ST	655
117016	117	16	FED-PUBHOUS	530 N PULASKI ST	654
4070A034	4070A	34	FED-PUBHOUS	511 E 27TH ST	650
1686040	1686	40	FED-PUBHOUS	2030 E FAYETTE ST	646
6272023	6272	23	FED-PUBHOUS	3524 E FAIRMOUNT AVE	641

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**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
1450016	1450	16	FED-PUBHOUS	1831 N CHESTER ST	640
5216020	5216	20	FED-PUBHOUS	4741 ALHAMBRA AVE	638
3815024	3815	24	FED-PUBHOUS	427 E 23RD ST	637
1531002	1531	2	FED-PUBHOUS	1802 E BIDDLE ST	634
2213B086	2213B	86	FED-PUBHOUS	2614 W FRANKLIN ST	633
54006	54	6	FED-PUBHOUS	1111 N STRICKER ST	632
2165058	2165	58	FED-PUBHOUS	2404 W BALTIMORE ST	627
34052	34	52	FED-PUBHOUS	1505 PRESSTMAN ST	618
0055D051	0055D	51	FED-PUBHOUS	1113 N CARROLLTON AVE	616
2377C040	2377C	40	FED-PUBHOUS	612 GLENOLDEN AVE	615
0055C068	0055C	68	FED-PUBHOUS	1204 RIGGS AVE	614
77021	77	21	FED-PUBHOUS	921 N CALHOUN ST	611
61049	61	49	FED-PUBHOUS	1007 N MOUNT ST	606
1143028	1143	28	FED-PUBHOUS	824 E PRESTON ST	606
1142B044	1142B	44	FED-PUBHOUS	1318 HOMEWOOD AVE	600
3205068	3205	68	FED-PUBHOUS	2133 HERBERT ST	598
74015	74	15	FED-PUBHOUS	1625 MOSHER ST	581
279067	279	67	FED-PUBHOUS	302 S STRICKER ST	578
1169052	1169	52	FED-PUBHOUS	1115 GREENMOUNT AVE	578
16015	16	15	FED-PUBHOUS	1628 N GILMOR ST	576
1483057	1483	57	FED-PUBHOUS	1501 N COLLINGTON AVE	575
3187024	3187	24	FED-PUBHOUS	3018 GRANTLEY AVE	572
359010	359	10	FED-PUBHOUS	1520 ARGYLE AVE	571
27015	27	15	FED-PUBHOUS	1428 N MOUNT ST	564
1548034	1548	34	FED-PUBHOUS	1717 E BIDDLE ST	564
2372035	2372	35	FED-PUBHOUS	910 WHITMORE AVE	556
74004	74	4	FED-PUBHOUS	933 N MOUNT ST	553
293061	293	61	FED-PUBHOUS	726 CUMBERLAND ST	552
274055	274	55	FED-PUBHOUS	303 S PAYSON ST	545
4533018	4533	18	FED-PUBHOUS	3336 AVONDALE AVE	544
1590040	1590	40	FED-PUBHOUS	2340 E EAGER ST	534
1668032	1668	32	FED-PUBHOUS	414 N CHESTER ST	531
3650C027	3650C	27	FED-PUBHOUS	2841 REMINGTON AVE	516
8043	8	43	FED-PUBHOUS	1702 MCKEAN AVE	511
7437014	7437	14	FED-PUBHOUS	2208 SIDNEY AVE	510
2475H001B	2475H	001B	FED-PUBHOUS	804 N ROSEDALE ST	508
1668031	1668	31	FED-PUBHOUS	416 N CHESTER ST	491
222003	222	3	FED-PUBHOUS	2105 HOLLINS ST	450
7647003	7647	3	FED-PUBHOUS	917-19 VERONICA AVE	48
1104005	1104	5	FED-PUBHOUS	1707 BARCLAY ST	45
1364054	1364	54	FED-PUBHOUS	1014 E LOMBARD ST	38
126047	126	47	FED-PUBHOUS	509 N CAREY ST	1
0023A024	0023A	24	FED-PUBHOUS	1548 N STRICKER ST	0
26003	26	3	FED-PUBHOUS	1404 N FULTON AVE	0
26005	26	5	FED-PUBHOUS	1408 N FULTON AVE	0
26007	26	7	FED-PUBHOUS	1412 N FULTON AVE	0
27040	27	40	FED-PUBHOUS	1409 N FULTON AVE	0
34029	34	29	FED-PUBHOUS	1355 N GILMOR ST	0
34031	34	31	FED-PUBHOUS	1359 N GILMOR ST	0
0036A012	0036A	12	FED-PUBHOUS	1320 N CAREY ST	0

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
0037A016	0037A	16	FED-PUBHOUS	1332 N FREMONT AVE	0
0037A022	0037A	22	FED-PUBHOUS	1344 N FREMONT AVE	0
53007	53	7	FED-PUBHOUS	1113 N GILMOR ST	0
53010	53	10	FED-PUBHOUS	1119 N GILMOR ST	0
62033	62	33	FED-PUBHOUS	1033 N GILMOR ST	0
62034	62	34	FED-PUBHOUS	1031 N GILMOR ST	0
64015	64	15	FED-PUBHOUS	1328 MOSHER ST	0
64016	64	16	FED-PUBHOUS	1330 MOSHER ST	0
64056	64	56	FED-PUBHOUS	1004 N CAREY ST	0
66001	66	1	FED-PUBHOUS	1102 MOSHER ST	0
76011	76	11	FED-PUBHOUS	921 N STRICKER ST	0
76014	76	14	FED-PUBHOUS	927 N STRICKER ST	0
76015	76	15	FED-PUBHOUS	929 N STRICKER ST	0
76017	76	17	FED-PUBHOUS	933 N STRICKER ST	0
76018	76	18	FED-PUBHOUS	935 N STRICKER ST	0
76020	76	20	FED-PUBHOUS	939 N STRICKER ST	0
77009	77	9	FED-PUBHOUS	1323 MOSHER ST	0
78031	78	31	FED-PUBHOUS	1213 MOSHER ST	0
79024	79	24	FED-PUBHOUS	1105 MOSHER ST	0
87045	87	45	FED-PUBHOUS	836 N STRICKER ST	0
87047	87	47	FED-PUBHOUS	832 N STRICKER ST	0
87050	87	50	FED-PUBHOUS	826 N STRICKER ST	0
87053	87	53	FED-PUBHOUS	820 N STRICKER ST	0
87054	87	54	FED-PUBHOUS	818 N STRICKER ST	0
87055	87	55	FED-PUBHOUS	816 N STRICKER ST	0
113019	113	19	FED-PUBHOUS	636 N CARROLLTON AVE	0
121026	121	26	FED-PUBHOUS	1721 EDMONDSON AVE	0
122007	122	7	FED-PUBHOUS	514 N GILMOR ST	0
122008	122	8	FED-PUBHOUS	516 N GILMOR ST	0
122020	122	20	FED-PUBHOUS	1603 EDMONDSON AVE	0
122023	122	23	FED-PUBHOUS	1609 EDMONDSON AVE	0
122027	122	27	FED-PUBHOUS	1617 EDMONDSON AVE	0
122028	122	28	FED-PUBHOUS	1619 EDMONDSON AVE	0
122030	122	30	FED-PUBHOUS	1623 EDMONDSON AVE	0
122031	122	31	FED-PUBHOUS	1625 EDMONDSON AVE	0
122033	122	33	FED-PUBHOUS	1629 EDMONDSON AVE	0
122066	122	66	FED-PUBHOUS	1612 W FRANKLIN ST	0
123023	123	23	FED-PUBHOUS	1511 EDMONDSON AVE	0
123026	123	26	FED-PUBHOUS	1517 EDMONDSON AVE	0
128018	128	18	FED-PUBHOUS	1035 EDMONDSON AVE	0
128059	128	59	FED-PUBHOUS	510 N SCHROEDER ST	0
129001	129	1	FED-PUBHOUS	902 W FRANKLIN ST	0
151026	151	26	FED-PUBHOUS	1503 W MULBERRY ST	0
154001	154	1	FED-PUBHOUS	329 N CAREY ST	0
155034	155	34	FED-PUBHOUS	331 N CARROLLTON AVE	0
155038	155	38	FED-PUBHOUS	1125 W MULBERRY ST	0
155039	155	39	FED-PUBHOUS	1123 W MULBERRY ST	0
155040	155	40	FED-PUBHOUS	1121 W MULBERRY ST	0
155041	155	41	FED-PUBHOUS	1119 W MULBERRY ST	0
155043	155	43	FED-PUBHOUS	1115 W MULBERRY ST	0

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**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
158008	158	8	FED-PUBHOUS	802 W SARATOGA ST	0
158010	158	10	FED-PUBHOUS	806 W SARATOGA ST	0
158024	158	24	FED-PUBHOUS	311 N POPPLETON ST	0
158025	158	25	FED-PUBHOUS	313 N POPPLETON ST	0
158027	158	27	FED-PUBHOUS	317 N POPPLETON ST	0
158028	158	28	FED-PUBHOUS	319 N POPPLETON ST	0
158031	158	31	FED-PUBHOUS	325 N POPPLETON ST	0
158032	158	32	FED-PUBHOUS	327 N POPPLETON ST	0
158034	158	34	FED-PUBHOUS	331 N POPPLETON ST	0
164024	164	24	FED-PUBHOUS	1734 W LEXINGTON ST	0
178006	178	6	FED-PUBHOUS	1811 W LEXINGTON ST	0
178048	178	48	FED-PUBHOUS	1818 W FAYETTE ST	0
179011	179	11	FED-PUBHOUS	1721 W LEXINGTON ST	0
179052	179	52	FED-PUBHOUS	118 N MOUNT ST	0
179055	179	55	FED-PUBHOUS	124 N MOUNT ST	0
180003	180	3	FED-PUBHOUS	1605 W LEXINGTON ST	0
180042	180	42	FED-PUBHOUS	1610 W FAYETTE ST	0
185058	185	58	FED-PUBHOUS	121 N CARROLLTON AVE	0
185059	185	59	FED-PUBHOUS	123 N CARROLLTON AVE	0
185060	185	60	FED-PUBHOUS	125 N CARROLLTON AVE	0
193052	193	52	FED-PUBHOUS	1832 W BALTIMORE ST	0
194042	194	42	FED-PUBHOUS	4 N MOUNT ST	0
194053	194	53	FED-PUBHOUS	26 N MOUNT ST	0
194054	194	54	FED-PUBHOUS	28 N MOUNT ST	0
194068	194	68	FED-PUBHOUS	17 N BRUCE ST	0
195016	195	16	FED-PUBHOUS	1631 W FAYETTE ST	0
195017	195	17	FED-PUBHOUS	1633 W FAYETTE ST	0
196048	196	48	FED-PUBHOUS	8 N STRICKER ST	0
209008	209	8	FED-PUBHOUS	1719 W BALTIMORE ST	0
214019	214	19	FED-PUBHOUS	5 S STRICKER ST	0
215026	215	26	FED-PUBHOUS	1334 HOLLINS ST	0
222071	222	71	FED-PUBHOUS	2119 BOYD ST	0
224025	224	25	FED-PUBHOUS	1921 HOLLINS ST	0
228002	228	2	FED-PUBHOUS	1703 HOLLINS ST	0
228016	228	16	FED-PUBHOUS	1731 HOLLINS ST	0
228037	228	37	FED-PUBHOUS	1710 W LOMBARD ST	0
232042	232	42	FED-PUBHOUS	1304 W LOMBARD ST	0
260071	260	71	FED-PUBHOUS	216 S FULTON AVE	0
260072	260	72	FED-PUBHOUS	214 S FULTON AVE	0
272073	272	73	FED-PUBHOUS	300 S PULASKI ST	0
275102	275	102	FED-PUBHOUS	1816 WILHELM ST	0
276034	276	34	FED-PUBHOUS	347 S FULTON AVE	0
285093	285	93	FED-PUBHOUS	749 RYAN ST	0
293051	293	51	FED-PUBHOUS	706 CUMBERLAND ST	0
293054	293	54	FED-PUBHOUS	712 CUMBERLAND ST	0
0300B020	0300B	20	FED-PUBHOUS	1503 N STRICKER ST	0
0300B027	0300B	27	FED-PUBHOUS	1517 N STRICKER ST	0
0300C058	0300C	58	FED-PUBHOUS	1520 N CAREY ST	0
306053	306	53	FED-PUBHOUS	1461 N CAREY ST	0
314027	314	27	FED-PUBHOUS	513 BLOOM ST	0



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<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
314032	314	32	FED-PUBHOUS	523 BLOOM ST	0
315034	315	34	FED-PUBHOUS	2013 DRUID HILL AVE	0
323020	323	20	FED-PUBHOUS	1927 MCCULLOH ST	0
323021	323	21	FED-PUBHOUS	1925 MCCULLOH ST	0
323028	323	28	FED-PUBHOUS	1911 MCCULLOH ST	0
323030	323	30	FED-PUBHOUS	1907 MCCULLOH ST	0
339031	339	31	FED-PUBHOUS	517 LAURENS ST	0
362005	362	5	FED-PUBHOUS	1518 DRUID HILL AVE	0
364003	364	3	FED-PUBHOUS	1504 MADISON AVE	0
372003	372	3	FED-PUBHOUS	1408 MYRTLE AVE	0
390001	390	1	FED-PUBHOUS	1801 ST PAUL ST	0
390002	390	2	FED-PUBHOUS	1803 ST PAUL ST	0
391053	391	53	FED-PUBHOUS	1800 GUILFORD AVE	0
392040	392	40	FED-PUBHOUS	823 N FREMONT AVE	0
409033	409	33	FED-PUBHOUS	1717 ST PAUL ST	0
428030	428	30	FED-PUBHOUS	1614 N CALVERT ST	0
452040	452	40	FED-PUBHOUS	851 HARLEM AVE	0
454003	454	3	FED-PUBHOUS	904 ARGYLE AVE	0
454004	454	4	FED-PUBHOUS	906 ARGYLE AVE	0
454005	454	5	FED-PUBHOUS	908 ARGYLE AVE	0
454006	454	6	FED-PUBHOUS	910 ARGYLE AVE	0
454022	454	22	FED-PUBHOUS	1022 ARGYLE AVE	0
454023	454	23	FED-PUBHOUS	641 W HOFFMAN ST	0
454028	454	28	FED-PUBHOUS	651 W HOFFMAN ST	0
454029	454	29	FED-PUBHOUS	1017 MYRTLE AVE	0
454045	454	45	FED-PUBHOUS	905 MYRTLE AVE	0
454046	454	46	FED-PUBHOUS	903 MYRTLE AVE	0
454056	454	56	FED-PUBHOUS	627 PERKINS ST	0
454057	454	57	FED-PUBHOUS	629 PERKINS ST	0
454058	454	58	FED-PUBHOUS	631 PERKINS ST	0
454062	454	62	FED-PUBHOUS	630 PERKINS ST	0
454069	454	69	FED-PUBHOUS	635 MCCULLOUGH CIR	0
454072	454	72	FED-PUBHOUS	632 MCCULLOUGH CIR	0
454073	454	73	FED-PUBHOUS	634 MCCULLOUGH CIR	0
454074	454	74	FED-PUBHOUS	636 MCCULLOUGH CIR	0
455024	455	24	FED-PUBHOUS	1009 ARGYLE AVE	0
455025	455	25	FED-PUBHOUS	1007 ARGYLE AVE	0
455030	455	30	FED-PUBHOUS	614 MCCULLOUGH CIR	0
455031	455	31	FED-PUBHOUS	612 MCCULLOUGH CIR	0
469031	469	31	FED-PUBHOUS	600 BRUNE ST	0
469032	469	32	FED-PUBHOUS	800 GEORGE ST	0
469041	469	41	FED-PUBHOUS	818 GEORGE ST	0
469042	469	42	FED-PUBHOUS	820 GEORGE ST	0
469043	469	43	FED-PUBHOUS	822 GEORGE ST	0
469044	469	44	FED-PUBHOUS	824 GEORGE ST	0
469045	469	45	FED-PUBHOUS	826 GEORGE ST	0
469046	469	46	FED-PUBHOUS	525 N FREMONT AVE	0
470006	470	6	FED-PUBHOUS	611 BRUNE ST	0
470009	470	9	FED-PUBHOUS	705 BRUNE ST	0
470010	470	10	FED-PUBHOUS	707 BRUNE ST	0

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<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
470011	470	11	FED-PUBHOUS	709 BRUNE ST	0
470012	470	12	FED-PUBHOUS	711 BRUNE ST	0
470013	470	13	FED-PUBHOUS	713 BRUNE ST	0
470014	470	14	FED-PUBHOUS	715 BRUNE ST	0
470015	470	15	FED-PUBHOUS	717 BRUNE ST	0
470016	470	16	FED-PUBHOUS	1018 MYRTLE AVE	0
470040	470	40	FED-PUBHOUS	709 EDMONDSON AVE	0
470041	470	41	FED-PUBHOUS	707 EDMONDSON AVE	0
470042	470	42	FED-PUBHOUS	705 EDMONDSON AVE	0
470043	470	43	FED-PUBHOUS	703 EDMONDSON AVE	0
0473004B	473	004B	FED-PUBHOUS	903 ARGYLE AVE	0
0473004C	473	004C	FED-PUBHOUS	905 ARGYLE AVE	0
473033	473	33	FED-PUBHOUS	612 MURPHY LN	0
473034	473	34	FED-PUBHOUS	614 MURPHY LN	0
473035	473	35	FED-PUBHOUS	616 MURPHY LN	0
540022	540	22	FED-PUBHOUS	501 N FREMONT AVE	0
540023	540	23	FED-PUBHOUS	816 MURPHY LN	0
540033	540	33	FED-PUBHOUS	508 BRUNE ST	0
540034	540	34	FED-PUBHOUS	801 GEORGE ST	0
540041	540	41	FED-PUBHOUS	815 GEORGE ST	0
540042	540	42	FED-PUBHOUS	817 GEORGE ST	0
540071	540	71	FED-PUBHOUS	507 BRUNE ST	0
540072	540	72	FED-PUBHOUS	505 BRUNE ST	0
540089	540	89	FED-PUBHOUS	704 MURPHY LN	0
540090	540	90	FED-PUBHOUS	702 MURPHY LN	0
586003	586	3	FED-PUBHOUS	763 DR BENJAMIN QUARLS PL	0
711029	711	29	FED-PUBHOUS	1848 EAGLE ST	0
720030	720	30	FED-PUBHOUS	1825 EAGLE ST	0
852034	852	34	FED-PUBHOUS	774 CARROLL ST	0
855020	855	20	FED-PUBHOUS	841 CARROLL ST	0
0856A056	0856A	56	FED-PUBHOUS	601 ARCHER ST	0
857004	857	4	FED-PUBHOUS	833 W BARRE ST	0
857028	857	28	FED-PUBHOUS	787 CARROLL ST	0
857030	857	30	FED-PUBHOUS	791 CARROLL ST	0
858093	858	93	FED-PUBHOUS	811 WOODWARD ST	0
916104	916	104	FED-PUBHOUS	914 BEVAN ST	0
932121	932	121	FED-PUBHOUS	1009 CREEK ST	0
946054	946	54	FED-PUBHOUS	1124 LEADENHALL ST	0
1096021	1096	21	FED-PUBHOUS	1803 BARCLAY ST	0
1096022	1096	22	FED-PUBHOUS	1805 BARCLAY ST	0
1096027	1096	27	FED-PUBHOUS	1815 BARCLAY ST	0
1103026	1103	26	FED-PUBHOUS	317 E LAFAYETTE AVE	0
1104047	1104	47	FED-PUBHOUS	432 E LANVALE ST	0
1111097	1111	97	FED-PUBHOUS	441 E LANVALE ST	0
1111104	1111	104	FED-PUBHOUS	427 E LANVALE ST	0
1116077	1116	77	FED-PUBHOUS	1617 N SPRING ST	0
1121014	1121	14	FED-PUBHOUS	1526 HOLBROOK ST	0
1132001	1132	1	FED-PUBHOUS	1100 E HOFFMAN ST	0
1144011	1144	11	FED-PUBHOUS	1321 VALLEY ST	0
1145014	1145	14	FED-PUBHOUS	1106 E PRESTON ST	0

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
1148001	1148	1	FED-PUBHOUS	1301 N CENTRAL AVE	0
1155072	1155	72	FED-PUBHOUS	705 MURA ST	0
1155083	1155	83	FED-PUBHOUS	727 MURA ST	0
1155086	1155	86	FED-PUBHOUS	732 MURA ST	0
1157029	1157	29	FED-PUBHOUS	1214 ENSOR ST	0
1158067	1158	67	FED-PUBHOUS	1002 E BIDDLE ST	0
1172050	1172	50	FED-PUBHOUS	1021 E BIDDLE ST	0
1172051	1172	51	FED-PUBHOUS	1023 E BIDDLE ST	0
1182025	1182	25	FED-PUBHOUS	703 E CHASE ST	0
1184036	1184	36	FED-PUBHOUS	947 E CHASE ST	0
1188074	1188	74	FED-PUBHOUS	1236 E EAGER ST	0
1191021	1191	21	FED-PUBHOUS	1505 E CHASE ST	0
1215010	1215	10	FED-PUBHOUS	918 N BROADWAY	0
1215011	1215	11	FED-PUBHOUS	920 N BROADWAY	0
1215012	1215	12	FED-PUBHOUS	922 N BROADWAY	0
1215014	1215	14	FED-PUBHOUS	926 N BROADWAY	0
1454045	1454	45	FED-PUBHOUS	1841 N MONTFORD AVE	0
1454051	1454	51	FED-PUBHOUS	1819 N MONTFORD AVE	0
1454086	1454	86	FED-PUBHOUS	1821 N PORT ST	0
1499024	1499	24	FED-PUBHOUS	2046 E HOFFMAN ST	0
1499032	1499	32	FED-PUBHOUS	1402 N CHESTER ST	0
1505010	1505	10	FED-PUBHOUS	2518 E HOFFMAN ST	0
1506074	1506	74	FED-PUBHOUS	2619 LLEWELYN AVE	0
1516007	1516	7	FED-PUBHOUS	1915 E HOFFMAN ST	0
1516009	1516	9	FED-PUBHOUS	1919 E HOFFMAN ST	0
1553068	1553	68	FED-PUBHOUS	1105 N COLLINGTON AVE	0
1603042	1603	42	FED-PUBHOUS	806 N WASHINGTON ST	0
1610069	1610	69	FED-PUBHOUS	823 N GLOVER ST	0
1652004	1652	4	FED-PUBHOUS	2108 JEFFERSON ST	0
1656024	1656	24	FED-PUBHOUS	2509 MCELDERRY ST	0
1656056	1656	56	FED-PUBHOUS	2500 JEFFERSON ST	0
1668020	1668	20	FED-PUBHOUS	2025 JEFFERSON ST	0
1706006	1706	6	FED-PUBHOUS	111 N COLLINGTON AVE	0
1706051	1706	51	FED-PUBHOUS	2240 E FAIRMOUNT AVE	0
1706052	1706	52	FED-PUBHOUS	2238 E FAIRMOUNT AVE	0
1707068	1707	68	FED-PUBHOUS	2312 E FAIRMOUNT AVE	0
1721053	1721	53	FED-PUBHOUS	2034 E BALTIMORE ST	0
1721057	1721	57	FED-PUBHOUS	2026 E BALTIMORE ST	0
1721061	1721	61	FED-PUBHOUS	2018 E BALTIMORE ST	0
1721068	1721	68	FED-PUBHOUS	2004 E BALTIMORE ST	0
1724080	1724	80	FED-PUBHOUS	11 N BRADFORD ST	0
1737021	1737	21	FED-PUBHOUS	10 S CHESTER ST	0
1737022	1737	22	FED-PUBHOUS	12 S CHESTER ST	0
1834048	1834	48	FED-PUBHOUS	701 VAN LILL ST	0
2175086	2175	86	FED-PUBHOUS	2522 BOYD ST	0
2205007	2205	7	FED-PUBHOUS	2413 EDMONDSON AVE	0
2284029	2284	29	FED-PUBHOUS	3506 W FRANKLIN ST	0
2377A061	2377A	61	FED-PUBHOUS	2862 HARLEM AVE	0
2382038	2382	38	FED-PUBHOUS	2712 PROSPECT ST	0
2385072	2385	72	FED-PUBHOUS	808 N DUKELAND ST	0

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
2387010	2387	10	FED-PUBHOUS	2746 W LAFAYETTE AVE	0
2406022	2406	22	FED-PUBHOUS	2843 W NORTH AVE	0
2447052	2447	52	FED-PUBHOUS	1006 ELLICOTT DR	0
2475H024	2475H	24	FED-PUBHOUS	946 N ROSEDALE ST	0
2484033D	2484	033D	FED-PUBHOUS	632 DENISON ST	0
2504017	2504	17	FED-PUBHOUS	732 LINNARD ST	0
2544014	2544	14	FED-PUBHOUS	4221 MASSACHUSETTS AVE	0
2808005	2808	5	FED-PUBHOUS	2103 CHELSEA TER	0
2808008	2808	8	FED-PUBHOUS	2109 CHELSEA TER	0
2901002	2901	2	FED-PUBHOUS	3703A W FOREST PK AVE	0
2956003	2956	3	FED-PUBHOUS	4105 GARRISON BLVD	0
3003002	3003	2	FED-PUBHOUS	3002 W NORTH AVE	0
3013051	3013	51	FED-PUBHOUS	2912 WALBROOK AVE	0
3172009	3172	9	FED-PUBHOUS	2801 ROCKROSE AVE	0
3175A031	3175A	31	FED-PUBHOUS	3901 TOWANDA AVE	0
3175A032	3175A	32	FED-PUBHOUS	3903 TOWANDA AVE	0
3185A019	3185A	19	FED-PUBHOUS	2812 GRANTLEY AVE	0
3196F014	3196F	14	FED-PUBHOUS	2817 WALDORF AVE	0
3196F027	3196F	27	FED-PUBHOUS	3523 VIRGINIA AVE	0
3207074	3207	74	FED-PUBHOUS	1915 HERBERT ST	0
3236029	3236	29	FED-PUBHOUS	3425 HOLMES AVE	0
3303006	3303	6	FED-PUBHOUS	2620 W COLD SPRING LN	0
3307B004	3307B	4	FED-PUBHOUS	4307 PARK HTS AVE	0
3307B005	3307B	5	FED-PUBHOUS	4309 PARK HTS AVE	0
3311003	3311	3	FED-PUBHOUS	4206 PARK HTS AVE	0
3321008	3321	8	FED-PUBHOUS	3914 PARK HTS AVE	0
3322016	3322	16	FED-PUBHOUS	3830 PARK HTS AVE	0
3324005	3324	5	FED-PUBHOUS	3608 PARK HTS AVE	0
3324016	3324	16	FED-PUBHOUS	3630 PARK HTS AVE	0
3326037	3326	37	FED-PUBHOUS	3439 REISTERSTOWN RD	0
3342009	3342	9	FED-PUBHOUS	3911 PARK HTS AVE	0
3342011	3342	11	FED-PUBHOUS	3907 PARK HTS AVE	0
3803023	3803	23	FED-PUBHOUS	325 E 20TH ST	0
3803030	3803	30	FED-PUBHOUS	339 E 20TH ST	0
3806004	3806	4	FED-PUBHOUS	336 E 20TH ST	0
3806012	3806	12	FED-PUBHOUS	320 E 20TH ST	0
3806013	3806	13	FED-PUBHOUS	318 E 20TH ST	0
3806063	3806	63	FED-PUBHOUS	2002 BARCLAY ST	0
3806092	3806	92	FED-PUBHOUS	324 E 20-1/2 ST	0
3811002	3811	2	FED-PUBHOUS	2130 N CALVERT ST	0
3811003	3811	3	FED-PUBHOUS	2128 N CALVERT ST	0
3811010	3811	10	FED-PUBHOUS	2114 N CALVERT ST	0
3811011	3811	11	FED-PUBHOUS	2112 N CALVERT ST	0
3829036	3829	36	FED-PUBHOUS	2414 N CALVERT ST	0
3837020	3837	20	FED-PUBHOUS	2639 GUILFORD AVE	0
3903020	3903	20	FED-PUBHOUS	3953 GREENMOUNT AVE	0
3912014	3912	14	FED-PUBHOUS	625 E 41ST ST	0
3913039	3913	39	FED-PUBHOUS	715 CATOR AVE	0
3913057	3913	57	FED-PUBHOUS	755 CATOR AVE	0
3941003	3941	3	FED-PUBHOUS	1905 E 31ST ST	0

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
3941025	3941	25	FED-PUBHOUS	1912 E 30TH ST	0
3941026	3941	26	FED-PUBHOUS	1914 E 30TH ST	0
3941029	3941	29	FED-PUBHOUS	1920 E 30TH ST	0
3941A023	3941A	23	FED-PUBHOUS	1910 E 31ST ST	0
3941B045	3941B	45	FED-PUBHOUS	2013 E 32ND ST	0
3941C023	3941C	23	FED-PUBHOUS	2012 E 30TH ST	0
3942A005	3942A	5	FED-PUBHOUS	1909 E 30TH ST	0
3972L012	3972L	12	FED-PUBHOUS	3822 KIMBLE RD	0
3973C087	3973C	87	FED-PUBHOUS	616 E 41ST ST	0
4008015	4008	15	FED-PUBHOUS	1258 E NORTH AVE	0
4018001	4018	1	FED-PUBHOUS	500 E 20TH ST	0
4062027	4062	27	FED-PUBHOUS	505 E 26TH ST	0
4133028	4133	28	FED-PUBHOUS	1425 CARSWELL ST	0
4149G063	4149G	63	FED-PUBHOUS	3403 TERESA CT	0
4149G064	4149G	64	FED-PUBHOUS	3405 TERESA CT	0
4149G065	4149G	65	FED-PUBHOUS	3407 TERESA CT	0
4149G068	4149G	68	FED-PUBHOUS	3413 TERESA CT	0
4149G070	4149G	70	FED-PUBHOUS	3417 TERESA CT	0
4175021	4175	21	FED-PUBHOUS	1931 N PATTERSON PK AVE	0
4179D072	4179D	72	FED-PUBHOUS	3445 CLIFTMONT AVE	0
4511008	4511	8	FED-PUBHOUS	5332 BEAUFORT AVE	0
4511009	4511	9	FED-PUBHOUS	5330 BEAUFORT AVE	0
4511011	4511	11	FED-PUBHOUS	5326 BEAUFORT AVE	0
4511014	4511	14	FED-PUBHOUS	5318 BEAUFORT AVE	0
4511B006	4511B	6	FED-PUBHOUS	5358 CORDELIA AVE	0
4511D030	4511D	30	FED-PUBHOUS	4010 HAYWARD AVE	0
4511G038	4511G	38	FED-PUBHOUS	5436 PRICE AVE	0
4526002	4526	2	FED-PUBHOUS	5321 BEAUFORT AVE	0
4533029	4533	29	FED-PUBHOUS	3333 INGLESIDE AVE	0
4534009	4534	9	FED-PUBHOUS	3220 AVONDALE AVE	0
4534013	4534	13	FED-PUBHOUS	3228 AVONDALE AVE	0
4552006	4552	6	FED-PUBHOUS	3212 W BELVEDERE AVE	0
4573004	4573	4	FED-PUBHOUS	5101 ARBUTUS AVE	0
4575023	4575	23	FED-PUBHOUS	5102 LITCHFIELD AVE	0
4577B020	4577B	20	FED-PUBHOUS	5107 LITCHFIELD AVE	0
4577B022	4577B	22	FED-PUBHOUS	5103 LITCHFIELD AVE	0
4578027	4578	27	FED-PUBHOUS	3508 SPAULDING AVE	0
4586022	4586	22	FED-PUBHOUS	3019 W BELVEDERE AVE	0
4587057	4587	57	FED-PUBHOUS	3011 SPAULDING AVE	0
4609045	4609	45	FED-PUBHOUS	3613 MANCHESTER AVE	0
4609054	4609	54	FED-PUBHOUS	3631 MANCHESTER AVE	0
4612021B	4612	021B	FED-PUBHOUS	4918 PALMER AVE	0
4613003	4613	3	FED-PUBHOUS	3012 OAKLEY AVE	0
4614001	4614	1	FED-PUBHOUS	2916 OAKLEY AVE	0
4614009	4614	9	FED-PUBHOUS	4901 QUEENSBERRY AVE	0
4616013	4616	13	FED-PUBHOUS	3024 WOODLAND AVE	0
4616025	4616	25	FED-PUBHOUS	3114 WOODLAND AVE	0
4616101	4616	101	FED-PUBHOUS	4823 PALMER AVE	0
4616108	4616	108	FED-PUBHOUS	4806 PALMER AVE	0
4620039	4620	39	FED-PUBHOUS	3426 VIRGINIA AVE	0

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Summary of Properties Exempt from Impervious Baseline

PIN	Block	Lot	Type	Address	Imp. Area (sf)
4623057	4623	57	FED-PUBHOUS	4718 PIMLICO RD	0
4810028	4810	28	FED-PUBHOUS	3004 DUPONT AVE	0
5136034	5136	34	FED-PUBHOUS	5805 HALWYN AVE	0
5138A723	5138A	723	FED-PUBHOUS	934 LENTON AVE	0
5165060	5165	60	FED-PUBHOUS	725 MCCABE AVE	0
5165076	5165	76	FED-PUBHOUS	625 MCCABE AVE	0
5165077	5165	77	FED-PUBHOUS	623 MCCABE AVE	0
5165B016A	5165B	016A	FED-PUBHOUS	5214 CRAIG AVE	0
5165B032	5165B	32	FED-PUBHOUS	5217 READY AVE	0
5165C011	5165C	11	FED-PUBHOUS	720 MCCABE AVE	0
5165C014	5165C	14	FED-PUBHOUS	726 MCCABE AVE	0
5165D025	5165D	25	FED-PUBHOUS	5213 IVANHOE AVE	0
5267J210	5267J	210	FED-PUBHOUS	1315 SILVERTHORNE RD	0
5460044	5460	44	FED-PUBHOUS	6909 CHAMBERS RD	0
5783021A	5783	021A	FED-PUBHOUS	5502 REMMELL AVE	0
6019P004A	6019P	004A	FED-PUBHOUS	5103 HAMILTON AVE	0
6043040	6043	40	FED-PUBHOUS	5403 DAYWALT AVE	0
6987001	6987	1	FED-PUBHOUS	6600 ST HELENA AVE	0
7476011	7476	11	FED-PUBHOUS	2624 RIDGELY ST	0
7477050	7477	50	FED-PUBHOUS	2629 RIDGELY ST	0
7623013	7623	13	FED-PUBHOUS	3201-23 CHERRYLAND RD	0
7647005	7647	5	FED-PUBHOUS	944-46 VERONICA AVE	0
7958034	7958	34	FED-PUBHOUS	4403 COLBORNE RD	0
7983004	7983	4	FED-PUBHOUS	1107 WALNUT AVE	0
7987017	7987	17	FED-PUBHOUS	903 WALNUT AVE	0
8219016	8219	16	FED-PUBHOUS	4409 GROVELAND AVE	0
8234022	8234	22	FED-PUBHOUS	4203 RIDGEWOOD AVE	0
8298008	8298	8	FED-PUBHOUS	4400 MAINE AVE	0
8491012	8491	12	FED-PUBHOUS	4510 WAKEFIELD RD	0
2024007	2024	7	IND-NPDES-GEN	1075 Hull St	2,240,569
7001010	7001	10	IND-NPDES-GEN	2801 Hawkins Point Rd	1,292,033
6607K002	6607K	2	IND-NPDES-GEN	2021 S Clinton St	1,260,398
6607K001	6607K	1	IND-NPDES-GEN	2021 S Clinton St	1,174,741
7418B001	7418B	1	IND-NPDES-GEN	4501 Curtis Ave	1,080,039
1053001	1053	1	IND-NPDES-GEN	300 E Cromwell St	794,712
4284008	4284	8	IND-NPDES-GEN	4401 Mount Hope Dr	712,232
7335G004	7335G	4	IND-NPDES-GEN	2155-C Northbridge Ave	652,800
7386G001	7386G	1	IND-NPDES-GEN	1501 E Patapsco Ave	638,786
7335D004	7335D	4	IND-NPDES-GEN	3400 Fairfield Rd	627,444
6607P001	6607P	1	IND-NPDES-GEN	2301 S Newkirk St	619,530
828010	828	10	IND-NPDES-GEN	1700 Ridgely St	591,955
6235001	6235	1	IND-NPDES-GEN	6600 Landay Ave	584,368
2040001	2040	1	IND-NPDES-GEN	1525 Andre St	543,186
3572027	3572	27	IND-NPDES-GEN	1650 Union Ave	489,596
7335G001E	7335G	001E	IND-NPDES-GEN	3545 Fairfield Rd	389,711
2101002	2101	2	IND-NPDES-GEN	909 Millington Ave	367,551
7702001	7702	1	IND-NPDES-GEN	1448 Desoto Rd	363,075
345DCO6345D			IND-NPDES-GEN	201 Kane St	353,339
1903D001	1903D	1	IND-NPDES-GEN	2021 S Clinton St	351,178
7006005A	7006	005A	IND-NPDES-GEN	3925 Fort Armistead Rd	335,237

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**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
7173A006	7173A	6	IND-NPDES-GEN	6101 Pennington Ave	328,098
1903D002	1903D	2	IND-NPDES-GEN	2021 S Clinton St	316,613
2024004	2024	4	IND-NPDES-GEN	1201 Wallace St, Pier 1, Fort McHenry	304,890
1903C002	1903C	2	IND-NPDES-GEN	2021 S Clinton St	301,359
7323D001	7323D	1	IND-NPDES-GEN	2100 Frankfurst Ave	300,226
1903B002	1903B	2	IND-NPDES-GEN	2021 S Clinton St	289,180
1055010	1055	10	IND-NPDES-GEN	260 W Dickman St	281,648
1576005	1576	5	IND-NPDES-GEN	1030 Edison Hwy	280,090
7654005	7654	5	IND-NPDES-GEN	3701 Southwestern Blvd	261,437
7418A001	7418A	1	IND-NPDES-GEN	4101 Curtis Ave	250,673
4086011	4086	11	IND-NPDES-GEN	2700 Loch Raven Rd	245,896
6607K012	6607K	12	IND-NPDES-GEN	2021 S Clinton St	241,464
7698003	7698	3	IND-NPDES-GEN	3639 Benson Ave	230,929
6333020	6333	20	IND-NPDES-GEN	6311 E Lombard St	220,923
828014	828	14	IND-NPDES-GEN	1910 Russell St	216,827
7300001	7300	1	IND-NPDES-GEN	1200 Chesapeake Ave	204,994
6332005	6332	5	IND-NPDES-GEN	201 S Oldham St	203,377
5460A002	5460A	2	IND-NPDES-GEN	7000 Hamlet Ave	198,817
6140006	6140	6	IND-NPDES-GEN	1100 N. Macon St	191,074
6140006	6140	6	IND-NPDES-GEN	1100 N. Macon St	191,074
6254B002A	6254B	002A	IND-NPDES-GEN	4203 Pulaski Hwy	189,974
7386H005	7386H	5	IND-NPDES-GEN	2001 Benhill Ave	188,593
6607N003	6607N	3	IND-NPDES-GEN	4601 Newgate Ave; Pier 13	188,468
6587B001	6587B	1	IND-NPDES-GEN	1500 S Ponca St	184,048
6167002	6167	2	IND-NPDES-GEN	4300 Pulaski Hwy	183,927
7000004	7000	4	IND-NPDES-GEN	2301 Hawkins Point Rd	182,969
807008	807	8	IND-NPDES-GEN	1425 Wicomico St	176,716
3575C076	3575C	76	IND-NPDES-GEN	1600 Roland Heights Ave	167,388
6242C001C	6242C	001C	IND-NPDES-GEN	5011 Pulaski Hwy	167,044
7274016	7274	16	IND-NPDES-GEN	915 Baltic Ave	165,913
6.24E+04	6242E	1	IND-NPDES-GEN	6201 Erdman Ave	162,671
841001	841	1	IND-NPDES-GEN	1551 Russell St	154,826
7300006	7300	6	IND-NPDES-GEN	3000 Vera St	149,455
814001	814	1	IND-NPDES-GEN	1620 Bush St	148,701
6918004	6918	4	IND-NPDES-GEN	1810 Portal St	145,616
6999B002L	6999B	002L	IND-NPDES-GEN	2300 Edgewater Ave	142,876
7628070	7628	70	IND-NPDES-GEN	3101 Viona Ave	142,302
7335A011	7335A	11	IND-NPDES-GEN	1440 Chesapeake Ave	140,824
7274017A	7274	017A	IND-NPDES-GEN	1026 E Patapsco Ave	134,412
2958016	2958	16	IND-NPDES-GEN	5030 Reisterstown Rd	132,814
6169009	6169	9	IND-NPDES-GEN	701 N Kresson St	132,751
2034A001	2034A	1	IND-NPDES-GEN	1301 E Fort Ave	131,193
7.34E+04	7335E	1	IND-NPDES-GEN	1443 CHESAPEAKE AVE	129,524
7335A017	7335A	17	IND-NPDES-GEN	3300-3305 Childs St	127,490
7386H003A	7386H	003A	IND-NPDES-GEN	1920 Benhill Ave	124,941
7470N001	7470N	1	IND-NPDES-GEN	3230 Annapolis Rd	123,390
7177009	7177	9	IND-NPDES-GEN	5501 Pennington Ave	117,866
7005001	7005	1	IND-NPDES-GEN	3200 Hawkins Point Rd	105,884
7001009	7001	9	IND-NPDES-GEN	2749 Hawkins Point Rd	104,245
3642D001	3642D	1	IND-NPDES-GEN	2600 Sisson St	101,455

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
3600B002	3600B	2	IND-NPDES-GEN	2100 Huntingdon Ave	101,451
6242032	6242	32	IND-NPDES-GEN	4500 E Fayette St	98,670
6169008	6169	8	IND-NPDES-GEN	901 N Newkirk St	96,658
6526002	6526	2	IND-NPDES-GEN	1700 S Haven St	93,041
2024004A	2024	004A	IND-NPDES-GEN	1201 Wallace St, Pier 1, Fort McHenry	92,807
6.24E+09	6242E	6	IND-NPDES-GEN	6501 Quad Ave	92,262
3642D008A	3642D	008A	IND-NPDES-GEN	2701 Falls Rd	92,072
6607K005	6607K	5	IND-NPDES-GEN	2021 S Clinton St	90,535
7.61E+18	7612E	15	IND-NPDES-GEN	1400 Cherry Hill Rd	90,208
7335A015	7335A	15	IND-NPDES-GEN	3310 Childs Street	85,190
7880008	7880	8	IND-NPDES-GEN	2036 Hollins Ferry Rd	82,317
6242C001B	6242C	001B	IND-NPDES-GEN	5001 Pulaski Hwy	81,109
0788005B	788	005B	IND-NPDES-GEN	1411 Bush St	80,907
6607F001	6607F	1	IND-NPDES-GEN	2021 S Clinton St	76,351
6333019	6333	19	IND-NPDES-GEN	6000 E. Lombard St	74,281
7335A009	7335A	9	IND-NPDES-GEN	3300-3305 Childs St	73,050
6607N001	6607N	1	IND-NPDES-GEN	4401 Newgate Ave	72,299
6607G001	6607G	1	IND-NPDES-GEN	2021 S Clinton St	70,904
4179H061	4179H	61	IND-NPDES-GEN	1915 Edison Hwy	70,586
3504B001	3504B	1	IND-NPDES-GEN	3100 Falls Cliff Rd	68,945
6333019D	6333	019D	IND-NPDES-GEN	6305 E Lombard St	67,608
6242D052	6242D	52	IND-NPDES-GEN	6301 Quad Ave	63,646
7335A006A	7335A	006A	IND-NPDES-GEN	3230 Sun St	63,287
6063008	6063	8	IND-NPDES-GEN	6465 Frankford Ave	62,593
1903C001	1903C	1	IND-NPDES-GEN	2021 S Clinton St	59,860
7880010	7880	10	IND-NPDES-GEN	2100 Hollins Ferry Rd	59,589
6607K005B	6607K	005B	IND-NPDES-GEN	2021 S Clinton St	53,676
6242034	6242	34	IND-NPDES-GEN	4401 E Fairmount Ave	53,261
7841G004	7841G	4	IND-NPDES-GEN	2905 Whittington Ave	49,431
7470019	7470	19	IND-NPDES-GEN	2720 Annapolis Rd	48,689
6140001B	6140	001B	IND-NPDES-GEN	4725 Erdman Ave	47,348
3193A071	3193A	71	IND-NPDES-GEN	3310 Ridgewood Ave	43,750
7695007	7695	7	IND-NPDES-GEN	3305 Benson Ave	38,669
3642D009	3642D	9	IND-NPDES-GEN	2500 Sisson St	37,141
807001	807	1	IND-NPDES-GEN	1401 West Hamburg St	36,814
7418001A	7418	001A	IND-NPDES-GEN	3811 Curtis Ave	35,834
2215007	2215	7	IND-NPDES-GEN	222 N Calverton Rd	34,208
0828013B	828	013B	IND-NPDES-GEN	1701 Ridgely St	33,242
1903C003	1903C	3	IND-NPDES-GEN	2021 S Clinton St	30,022
6607F004	6607F	4	IND-NPDES-GEN	2021 S Clinton St	29,997
6242C002	6242C	2	IND-NPDES-GEN	5101 Pulaski Hwy	29,522
6254002	6254	2	IND-NPDES-GEN	155 N Haven St	28,404
1903A004	1903A	4	IND-NPDES-GEN	2021 S Clinton St	28,342
3438B003	3438B	3	IND-NPDES-GEN	2800 Falls Rd	26,612
6309002	6309	2	IND-NPDES-GEN	311 S Haven St	24,959
7004015	7004	15	IND-NPDES-GEN	3601 Fort Armstead Rd	24,546
1903D003	1903D	3	IND-NPDES-GEN	2021 S Clinton St	24,315
233003	233	3	IND-NPDES-GEN	1300 Moreland Ave	23,989
6195007	6195	7	IND-NPDES-GEN	4300 Shannon Dr	23,620
962024	962	24	IND-NPDES-GEN	1215 Leadenhall St	22,505



**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
3193A017	3193A	17	IND-NPDES-GEN	3010 Ridgewood Ave	21,884
1903C002B	1903C	002B	IND-NPDES-GEN	2021 S Clinton St	21,203
6871001	6871	1	IND-NPDES-GEN	4900 Holabird Ave	20,414
7335A006B	7335A	006B	IND-NPDES-GEN	3230 Sun St	19,614
7335A010	7335A	10	IND-NPDES-GEN	3300-3305 Childs St	16,224
4021B041	4021B	41	IND-NPDES-GEN	2226 Kirk Ave	16,169
6169002C	6169	002C	IND-NPDES-GEN	4726 Pulaski Hwy	15,892
4281051	4281	51	IND-NPDES-GEN	4119 Fordleigh Rd	15,661
6607F003A	6607F	003A	IND-NPDES-GEN	2021 S Clinton St	14,228
7005039	7005	39	IND-NPDES-GEN	4000 Ft. Armistead Road	13,149
6543002	6543	2	IND-NPDES-GEN	901 S Kresson St	13,070
0036A002	0036A	2	IND-NPDES-GEN	1304 Laurens St	11,806
6242D028	6242D	28	IND-NPDES-GEN	5819 Erdman Ave	11,542
3404047	3404	47	IND-NPDES-GEN	2639 Pennsylvania Ave	11,322
6607F003	6607F	3	IND-NPDES-GEN	2021 S Clinton St	11,239
7628001	7628	1	IND-NPDES-GEN	2825 Annapolis Rd	9,596
7882012	7882	12	IND-NPDES-GEN	2200 Berlin St	9,377
6512008	6512	8	IND-NPDES-GEN	1401 S Haven St	7,913
2222004	2222	4	IND-NPDES-GEN	2900 - 2902 W. Baltimore St	7,566
2019B023	2019B	23	IND-NPDES-GEN	1219 Hull St	4,796
7892C012	7892C	12	IND-NPDES-GEN	2330 Severn St	1,500
7335D002	7335D	2	IND-NPDES-GEN	1550 E Patapsco Ave	597
7173012	7173	12	IND-NPDES-GEN	1515 Open St	407
6607K008	6607K	8	IND-NPDES-IND	3800 Newgate Ave	3,803,242
7000011	7000	11	IND-NPDES-IND	5500 Chemical Rd	1,887,711
7006005	7006	5	IND-NPDES-IND	3901 Fort Armistead Rd	1,801,329
7335B001	7335B	1	IND-NPDES-IND	3441 Fairfield Rd	1,251,994
7005030	7005	30	IND-NPDES-IND	5500 Quarantine Rd	970,076
795001	795	1	IND-NPDES-IND	1600 Wicomico St	910,782
1079001	1079	1	IND-NPDES-IND	2525 Insulator Dr	890,244
1987B010	1987B	10	IND-NPDES-IND	1100 E Key Hwy	787,783
7451007	7451	7	IND-NPDES-IND	2325 Hollins Ferry Rd	759,595
7323C002	7323C	2	IND-NPDES-IND	1800 Frankfurst Ave	630,980
682001	682	1	IND-NPDES-IND	1 W Pratt St	574,907
7335B003	7335B	3	IND-NPDES-IND	1955 Chesapeake Ave	563,511
828026	828	26	IND-NPDES-IND	1801 Annapolis Rd	416,099
7002004	7002	4	IND-NPDES-IND	5500 Chemical Rd	329,503
7386G002	7386G	2	IND-NPDES-IND	1910 Benhill Ave	281,416
1053004	1053	4	IND-NPDES-IND	2105 Gould St	207,017
7335G007	7335G	7	IND-NPDES-IND	3450 Asiatic Ave	180,367
7003004	7003	4	IND-NPDES-IND	5500 Chemical Rd	172,229
890010	890	10	IND-NPDES-IND	501 E Pratt St; Pier 3	146,833
2017003	2017	3	IND-NPDES-IND	1100 E Key Hwy	68,661
1999B001A	1999B	001A	IND-NPDES-IND	1100 E Key Hwy	62,603
7841G003	7841G	3	IND-NPDES-IND	2915 Whittington Ave	59,606
1999B001	1999B	1	IND-NPDES-IND	1100 E Key Hwy	58,508
4756005	4756	5	IND-NPDES-IND	1900 Brand Ave	44,518
7335G001A	7335G	001A	IND-NPDES-IND	3450 Asiatic Ave	43,213
1998B001	1998B	1	IND-NPDES-IND	1100 E Key Hwy	42,817
7177011	7177	11	IND-NPDES-IND	5218 Curtis Ave	29,734

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
7335G008	7335G	8	IND-NPDES-IND	3450 Asiatic Ave	29,112
1998B001A	1998B	001A	IND-NPDES-IND	1100 E Key Hwy	25,529
589029	589	29	IND-NPDES-IND	641 W Saratoga St	20,626
7335G012	7335G	12	IND-NPDES-IND	3450 Asiatic Ave	20,567
516007	516	7	IND-NPDES-IND	814, 816 N Charles St &	13,379
516009	516	9	IND-NPDES-IND	814, 816 N Charles St &	11,515
516010	516	10	IND-NPDES-IND	814, 816 N Charles St &	8,865
516011	516	11	IND-NPDES-IND	814, 816 N Charles St &	3,119
1987B009	1987B	9	IND-NPDES-IND	1100 E Key Hwy	2,289
6150A005	6150A	5	IND-NPDES-NE	3501 E Biddle St, Bldg D	1,523,488
7.39E+04	7386E	1	IND-NPDES-NE	2000 Chesapeake Ave	1,031,089
2108C003	2108C	3	IND-NPDES-NE	1100-1110 Wilso Dr	935,065
6916013	6916	13	IND-NPDES-NE	2500 Broening Hwy; Ste B	872,602
7.61E+11	7612E	8	IND-NPDES-NE	3030 Waterview Ave	586,074
7386B004	7386B	4	IND-NPDES-NE	3901 Asiatic Ave	545,812
1958001	1958	1	IND-NPDES-NE	1001 E McComas St	467,069
4106011	4106	11	IND-NPDES-NE	2701 Loch Raven Rd	402,173
7000009	7000	9	IND-NPDES-NE	5800 Chemical Rd	356,534
2219056	2219	56	IND-NPDES-NE	230 N Franklinton Rd	323,086
6874A005	6874A	5	IND-NPDES-NE	4851 Holabird Ave	313,206
6587A006	6587A	6	IND-NPDES-NE	1401 Newkirk St	290,006
6694124	6694	124	IND-NPDES-NE	600 - 608 Folcroft St	284,734
7335D003	7335D	3	IND-NPDES-NE	3440 Fairfield Rd	280,428
7774A002	7774A	2	IND-NPDES-NE	2701 Wilmarco Ave	262,848
6918012	6918	12	IND-NPDES-NE	1820 Portal St	223,803
7274011Z	7274	011Z	IND-NPDES-NE	1030 E Patapsco Ave	209,283
7774A003	7774A	3	IND-NPDES-NE	1211 Bernard Dr	205,355
6.24E+08	6242E	5	IND-NPDES-NE	6401 Quad Ave	192,884
7492C479	7492C	479	IND-NPDES-NE	3010 Nieman Ave	186,921
6921008	6921	8	IND-NPDES-NE	6611 Tributary St	182,970
0688C001	0688C	1	IND-NPDES-NE	1104-C Russell St	181,167
3257A003	3257A	3	IND-NPDES-NE	3310 Carlins Park Dr	179,210
7628037	7628	37	IND-NPDES-NE	3100 Viona Ave	177,630
1038001	1038	1	IND-NPDES-NE	1901 Light St	156,237
7755159	7755	159	IND-NPDES-NE	3200 James St	145,836
1847019	1847	19	IND-NPDES-NE	727 S Wolfe St	131,832
6923011	6923	11	IND-NPDES-NE	2301 Chesapeake Ave	130,243
6703007	6703	7	IND-NPDES-NE	3900 Claremont Ave	129,409
0688C021A	0688C	021A	IND-NPDES-NE	1111 S Paca St	120,445
6320A001	6320A	1	IND-NPDES-NE	329 S Kresson St	118,212
7772055	7772	55	IND-NPDES-NE	2915 Wilmarco Ave	116,199
6333013	6333	13	IND-NPDES-NE	5901 E Lombard St	110,089
6920012	6920	12	IND-NPDES-NE	1900 Portal St	104,097
6202024	6202	24	IND-NPDES-NE	6750 Moravia Park Dr	103,156
974001	974	1	IND-NPDES-NE	175 W Ostend St	102,853
7470J007B	7470J	007B	IND-NPDES-NE	2640 Merchant Dr	92,875
6543C004	6543C	4	IND-NPDES-NE	4301 Eastern Ave	91,385
7335A016	7335A	16	IND-NPDES-NE	3311 Childs St	85,204
6264A005	6264A	5	IND-NPDES-NE	1 North Haven St	81,980
6202028B	6202	028B	IND-NPDES-NE	7111 Commercial Ave	79,230

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
1038005	1038	5	IND-NPDES-NE	1921 Light St	73,713
7000016	7000	16	IND-NPDES-NE	5901 Chemical Rd	58,197
2219067	2219	67	IND-NPDES-NE	2810 W Saratoga St	57,062
7774A012	7774A	12	IND-NPDES-NE	1207 Bernard Dr	55,469
7805D012	7805D	12	IND-NPDES-NE	1601 S Ponca St	49,706
7772049E	7772	049E	IND-NPDES-NE	3001 Cowan Ave	46,914
1808001	1808	1	IND-NPDES-NE	603 S Bond St	43,069
4276C001	4276C	1	IND-NPDES-NE	6320 Oakleaf Ave	40,181
6254001	6254	1	IND-NPDES-NE	101 N Haven St	39,269
2131B001	2131B	1	IND-NPDES-NE	2955 Frederick Ave	38,483
1898018	1898	18	IND-NPDES-NE	1202 S East Ave	32,408
7755004B	7755	004B	IND-NPDES-NE	2940 Washington Blvd	31,434
839004	839	4	IND-NPDES-NE	1421 Ridgely St	29,623
6254003	6254	3	IND-NPDES-NE	157 N Haven St	23,815
962031	962	31	IND-NPDES-NE	150 W Ostend St	17,427
789001	789	1	IND-NPDES-NE	1303 Carroll St	14,596
2152002A	2152	002A	IND-NPDES-NE	2409 W. Baltimore St	13,395
778039	778	39	IND-NPDES-NE	1300 Carroll St	13,280
7.61E+34	7612E	31	IND-NPDES-NE	1800 Cherry Hill Rd	13,116
6278007	6278	7	IND-NPDES-NE	3705 E. Baltimore St	12,570
6607P001A	6607P	001A	IND-NPDES-NE	2207 S. Newkirk St	11,638
1433051	1433	51	IND-NPDES-NE	409 S Spring St	10,212
5482B026	5482B	26	IND-NPDES-NE	6836 Harford Rd	10,079
1416021	1416	21	IND-NPDES-NE	227 S. Central Ave	9,655
7165001	7165	1	IND-NPDES-NE	5100 Pennington Ave	8,649
1825006	1825	6	IND-NPDES-NE	1000 S Caroline St	7,446
2150031A	2150	031A	IND-NPDES-NE	100 Mcphail St	6,422
319036	319	36	IND-NPDES-NE	1423 N Fremont Ave	6,365
3829016	3829	16	IND-NPDES-NE	107 E 25th St	5,995
0688C015	0688C	15	IND-NPDES-NE	1230 Ridgely St	5,853
1037001	1037	1	IND-NPDES-NE	1900 Light St	5,613
0719A095	0719A	95	IND-NPDES-NE	601 S. Brice St	5,585
6305045	6305	45	IND-NPDES-NE	201-211 Rear South Fagley St	4,675
686030	686	30	IND-NPDES-NE	641 Washington Blvd	3,286
1710037	1710	37	IND-NPDES-NE	2617 E Fayette St	2,949
7083009	7083	9	IND-NPDES-NE	417 E Patapsco Ave	2,883
1782011	1782	11	IND-NPDES-NE	524 S Washington St	1,239
1433044	1433	44	IND-NPDES-NE	1423 Bank St	103
7043001	7043	1	MS4-MPA	3100 CHILDS ST	3,885,757
2024007	2024	7	MS4-MPA	2300 E FORT AVE	2,240,569
7323001	7323	1	MS4-MPA	2900 CHILDS ST	1,991,262
6920001	6920	1	MS4-MPA	2001 BROENING HWY	579,273
7323002	7323	2	MS4-MPA	3000 CHILDS ST	392,495
1903B001	1903B	1	MS4-MPA	1900 S CLINTON ST	262,354
2024003	2024	3	MS4-MPA	2310 E FORT AVE	6,281
1903A005	1903A	5	MS4-MPA	1824 S CLINTON ST	864
0688A001	0688A	1	MS4-STADIUM	301 W CAMDEN ST	929,047
688001	688	1	MS4-STADIUM	555 RUSSELL ST	746,030
0688B001	0688B	1	MS4-STADIUM	1101 RUSSELL ST	718,324
958001	958	1	MS4-STADIUM	250 W OSTEND ST	202,526

Appendix A

Summary of Properties Exempt from Impervious Baseline

PIN	Block	Lot	Type	Address	Imp. Area (sf)
0631CO0631a			MS4-STADIUM	401 FAYETTE ST	56,172
631001	631	1	MS4-STADIUM	12 N EUTAW ST	28,166
0631003A	631	003A	MS4-STADIUM		6,560
6917A001	6917A	1	STATE		5,891,541
PSC0020	PSC0	20	STATE		2,420,771
2040011	2040	11	STATE	2025 MCCOMAS ST	1,794,526
1958002	1958	2	STATE	1101 E MCCOMAS ST	1,756,741
6874001	6874	1	STATE	2200 VAIL ST	1,295,561
5387011	5387	11	STATE	1911 E COLD SPRING LANE	1,263,260
6916017	6916	17	STATE	2600 BROENING HWY	1,050,308
773001	773	1	STATE	1501 WASHINGTON BLVD	1,008,703
6917A006	6917A	6	STATE	4801 NEWGATE AVE	963,134
5387007	5387	7	STATE	4601 HILLEN ROAD	833,042
3200006	3200	6	STATE	2500 W NORTH AVE	809,033
5570006	5570	6	STATE	3501 TAYLOR AVE	772,049
6874003A	6874	003A	STATE	5001 KEITH AVE	726,456
4284008	4284	8	STATE	4401 MOUNT HOPE DR	712,232
6916016	6916	16	STATE	2520 BROENING HWY	654,433
3438B002B	3438B	002B	STATE	400 W NORTH AVE	547,720
3948003	3948	3	STATE	2201 ARGONNE DR	515,921
2024009	2024	9	STATE	2200 E FORT AVE	417,817
6997001A	6997	001A	STATE	2800 BROENING HWY	387,836
4416A001	4416A	1	STATE	5801 WABASH AVE	367,890
4285010	4285	10	STATE	6300 WABASH AVE	358,802
1197001	1197	1	STATE	300 E MADISON ST	344,200
3969047	3969	47	STATE	1600 HAVENWOOD ROAD	340,106
PSC0085	PSC0	85	STATE		328,394
6916009	6916	9	STATE	2330 BROENING HWY	304,662
1197003	1197	3	STATE	521 E EAGER ST	300,500
3948002A	3948	002A	STATE	2301 ARGONNE DR	298,737
630025	630	25	STATE	22 S GREENE ST	298,312
3257001	3257	1	STATE	3100 TOWANDA AVE	280,797
5267O001	5267O	1	STATE	4501 LOCH RAVEN BLVD	270,954
7005038	7005	38	STATE	4000 FORT ARMISTEAD ROAD	270,523
6265A056	6265A	56	STATE	3800 E BALTIMORE ST	260,910
8139C006	8139C	6	STATE	605 N CHAPELGATE LANE	254,440
4021B040	4021B	40	STATE	2300 KIRK AVE	251,858
6607K007B	6607K	007B	STATE	4000 LELAND AVE	246,288
4286A026	4286A	26	STATE	4600 N ROGERS AVE	238,915
4502A001	4502A	1	STATE	4300 HAYWARD AVE	228,305
6332005	6332	5	STATE	201 OLDHAM ST	203,377
7005035	7005	35	STATE	5501 QUARANTINE ROAD	198,694
3200CO3200			STATE		196,044
6916007	6916	7	STATE	2310 BROENING HWY	189,756
6916004	6916	4	STATE	2220 BROENING HWY	176,327
1266001	1266	1	STATE	300 N GAY ST	169,680
7059018	7059	18	STATE	700 E PATAPSCO AVE	159,418
4010Q033	4010Q	33	STATE	2301 KIRK AVE	144,416
2335A001	2335A	1	STATE	2620 WINCHESTER ST	142,782
3262F004	3262F	4	STATE	2307 LIBERTY HEIGHTS AVE	132,717

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
4284007	4284	7	STATE	5800 WABASH AVE	128,245
478002	478	2	STATE	201 W PRESTON ST	127,659
630034	630	34	STATE	650 W BALTIMORE ST	127,509
6265A057	6265A	57	STATE	4000 E BALTIMORE ST	120,079
460003	460	3	STATE	231 29TH DIVISION ST	117,520
630017	630	17	STATE	501 W BALTIMORE ST	113,413
448001	448	1	STATE	1420 N CHARLES ST	108,490
630027	630	27	STATE	646 W PRATT ST	108,452
459003	459	3	STATE		104,215
459001	459	1	STATE	1100 N EUTAW ST	100,917
2375001	2375	1	STATE	731 ASHBURTON ST	99,583
812001	812	1	STATE	1430 S MONROE ST	97,965
6874004	6874	4	STATE		94,411
1201012	1201	12	STATE	901 GREENMOUNT AVE	91,785
460001	460	1	STATE	300 W PRESTON ST	90,765
630037	630	37	STATE	633 W BALTIMORE ST	90,632
478001	478	1	STATE	301 W PRESTON ST	90,391
773006	773	6	STATE	1331 S MONROE ST	89,357
630005	630	5	STATE	111 S GREENE ST	88,724
0773006A	773	006A	STATE	1211 S MONROE ST	87,409
1232001	1232	1	STATE	401 E MADISON ST	83,675
5267046	5267	46	STATE	4530 PORTAGE AVE	83,632
4736014	4736	14	STATE	2101 W ROGERS AVE	80,133
459002	459	2	STATE		74,226
0480002B	480	002B	STATE	1030 PARK AVE	72,890
6917A002	6917A	2	STATE		70,369
630033	630	33	STATE	500 W BALTIMORE ST	68,912
460002	460	2	STATE		67,215
1197006	1197	6	STATE	920 GREENMOUNT AVE	66,685
0480002C	480	002C	STATE	1040 PARK AVE	66,378
1028007	1028	7	STATE	2001 RACE ST	66,227
529001	529	1	STATE	211 E MADISON ST	65,398
2040016	2040	16	STATE		64,760
616008	616	8	STATE	630 W FAYETTE ST	62,579
5387004	5387	4	STATE	4141 HILLEN ROAD	62,346
663004	663	4	STATE	725 W LOMBARD ST	61,273
6916002	6916	2	STATE		57,438
3438B005	3438B	5	STATE	340 W NORTH AVE	56,733
7704041A	7704	041A	STATE	1411 S EDGEWOOD ST	56,471
3812017	3812	17	STATE	2100 GUILFORD AVE	55,354
616011	616	11	STATE	651 W LEXINGTON ST	55,024
1197004	1197	4	STATE	FOREST ST	54,793
3200001	3200	1	STATE	2501 GWYNNNS FALLS PKWY	54,734
1233001	1233	1	STATE	501 E MADISON ST	53,587
5387003	5387	3	STATE	4101 HILLEN ROAD	52,774
6242D001	6242D	1	STATE	5900 ERDMAN AVE	52,698
3100A001A	3100A	001A	STATE		51,989
616001	616	1	STATE	622 W FAYETTE ST	51,217
2209003	2209	3	STATE	301 N CALVERTON ROAD	49,262
1197005	1197	5	STATE	550 E MADISON ST	45,771

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Summary of Properties Exempt from Impervious Baseline

PIN	Block	Lot	Type	Address	Imp. Area (sf)
480002	480	2	STATE		45,688
626001	626	1	STATE	20 N PINE ST	45,659
812004	812	4	STATE	1500 S MONROE ST	42,996
890004	890	4	STATE	401 E PRATT ST	42,695
638001	638	1	STATE	10 S PINE ST	42,463
1235001	1235	1	STATE	717 FORREST ST	40,989
553001	553	1	STATE	500 N CALVERT ST	40,553
7567A002A	7567A	002A	STATE	698 W PATAPSCO AVE	37,848
3200008	3200	8	STATE	2330 N WARWICK AVE	36,260
5158A014	5158A	14	STATE	801 WOODBOURNE AVE	35,855
663020	663	20	STATE	700 W PRATT ST	34,942
3257B016	3257B	16	STATE		33,907
1267015	1267	15	STATE	412 N EXETER ST	33,653
427001	427	1	STATE	1401 N CHARLES ST	33,243
590021	590	21	STATE	680 W LEXINGTON ST	32,930
528001	528	1	STATE	707 N CALVERT ST	32,682
3948002	3948	2	STATE	2311 ARGONNE DR	32,335
5387006	5387	6	STATE	4307 HILLEN ROAD	32,295
985002	985	2	STATE	215 STOCKHOLM ST	32,245
202001	202	1	STATE	900 W BALTIMORE ST	32,134
3254030	3254	30	STATE	3101 TOWANDA AVE	31,423
590001	590	1	STATE	636 W LEXINGTON ST	31,380
2312001	2312	1	STATE	2601 W NORTH AVE	31,085
494001	494	1	STATE	1111 CATHEDRAL ST	30,576
7511A016	7511A	16	STATE	2800 W PATAPSCO AVE	30,138
0203001A	203	001A	STATE	1 N POPPLETON ST	29,891
6202029	6202	29	STATE	7120 COMMERCIAL AVE	28,740
3200007	3200	7	STATE		28,455
3820014	3820	14	STATE	2300 SAINT PAUL ST	28,230
630001	630	1	STATE	110 S PACA ST	27,312
4656B001	4656B	1	STATE	5701 SMITH AVE	26,146
480001	480	1	STATE		25,669
501004	501	4	STATE	800 LINDEN AVE	24,390
591043	591	43	STATE	620 W LEXINGTON ST	23,990
501002	501	2	STATE	300 ARMORY PL	23,695
465024	465	24	STATE	11 W MOUNT ROYAL AVE	23,081
6607K016	6607K	16	STATE	3400 MERTENS AVE	22,815
1179B001	1179B	1	STATE		21,819
7772051B	7772	051B	STATE	2500 GEORGETOWN ROAD	21,815
7612D003A	7612D	003A	STATE	1515 CHERRY HILL ROAD	21,588
0812001A	812	001A	STATE	1650 S MONROE ST	21,507
2381002	2381	2	STATE	2700 RAYNER AVE	21,202
651021	651	21	STATE	701 W REDWOOD ST	21,055
590020	590	20	STATE	650 W LEXINGTON ST	21,043
3948002B	3948	002B	STATE	2322 ARGONNE DR	20,903
651001	651	1	STATE	20 PENN ST	20,757
577026	577	26	STATE	301 N EUTAW ST	20,607
1233017	1233	17	STATE	512 E MONUMENT ST	20,356
0613A001	0613A	1	STATE	100 N PINE ST	20,091
633012	633	12	STATE	200 W BALTIMORE ST	19,615

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
7772049F	7772	049F	STATE	2610 OTTAWA AVE	19,165
630030	630	30	STATE	111 PENN ST	18,975
3200009	3200	9	STATE	2340 N WARWICK AVE	18,796
501005	501	5	STATE	803 N EUTAW ST	18,385
447019	447	19	STATE	1420 MARYLAND AVE	18,010
3100A002	3100A	2	STATE	3105 W COLD SPRING LANE	17,475
635009	635	9	STATE	6 SAINT PAUL ST	17,359
630028	630	28	STATE	120 S GREENE ST	16,873
589033	589	33	STATE	619 W SARATOGA ST	16,463
617007	617	7	STATE	518 W FAYETTE ST	16,201
588001	588	1	STATE	210 N PINE ST	16,028
465030	465	30	STATE	10 W PRESTON ST	15,853
630035	630	35	STATE	509 W FAYETTE ST	14,150
480005	480	5	STATE	1150 CATHEDRAL ST	13,995
674040	674	40	STATE	701 W PRATT ST	13,591
7612011A	7612	011A	STATE	2200 KLOMAN ST	13,585
7567A050A	7567A	050A	STATE		13,162
7612D003B	7612D	003B	STATE	1501 CHERRY HILL ROAD	13,109
3812010	3812	10	STATE	2119 N CALVERT ST	12,712
616029	616	29	STATE	104 N GREENE ST	12,503
663001	663	1	STATE	737 W LOMBARD ST	12,406
0731001B	731	001B	STATE	1520 WASHINGTON BLVD	12,368
1234005	1234	5	STATE	540 E MONUMENT ST	12,301
3812001	3812	1	STATE	2101 N CALVERT ST	12,208
203110	203	110	STATE	801 W FAYETTE ST	12,106
2951B024A	2951B	024A	STATE	3100 W COLD SPRING LANE	11,664
3406001	3406	1	STATE	2501 PENNSYLVANIA AVE	11,457
589001	589	1	STATE	220 ARCH ST	11,370
465014	465	14	STATE	21 W MOUNT ROYAL AVE	11,312
7027C002	7027C	2	STATE	3700 POTEET ST	10,788
654010	654	10	STATE	16 S EUTAW ST	10,657
7419C023	7419C	23	STATE	2103 ANNAPOLIS ROAD	10,135
617001	617	1	STATE	500 W FAYETTE ST	10,059
1201007	1201	7	STATE	701 E EAGER ST	9,755
3200003	3200	3	STATE	2525 GWYNNS FALLS PKWY	9,626
618033	618	33	STATE	100 N EUTAW ST	9,530
501008	501	8	STATE	819 N EUTAW ST	9,372
592039	592	39	STATE	206 N GREENE ST	9,154
675030	675	30	STATE	649 W PRATT ST	9,056
3463D010	3463D	10	STATE	907 DRUID PARK LAKE DR	9,006
591042	591	42	STATE	237 ARCH ST	8,968
0425003A	425	003A	STATE	1211 W MOUNT ROYAL AVE	8,886
617010	617	10	STATE	520 W FAYETTE ST	8,801
530025	530	25	STATE	319 W MONUMENT ST	7,774
636006	636	6	STATE	110 E BALTIMORE ST	7,773
596001	596	1	STATE	201 N EUTAW ST	7,441
667012	667	12	STATE	201 N EUTAW ST	7,441
972001	972	1	STATE	201 N EUTAW ST	7,441
618003	618	3	STATE	414 W FAYETTE ST	7,265
1234002	1234	2	STATE	526 E MONUMENT ST	7,194

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**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
618001	618	1	STATE	410 W FAYETTE ST	7,069
1234013	1234	13	STATE	736 FORREST ST	6,987
651007	651	7	STATE	714 W LOMBARD ST	6,912
1234006	1234	6	STATE	730 FORREST ST	6,888
589027	589	27	STATE	663 W SARATOGA ST	6,806
7772049B	7772	049B	STATE		6,742
901022	901	22	STATE		6,475
2380072	2380	72	STATE		6,344
5387005	5387	5	STATE	4211 HILLEN ROAD	6,265
5334024	5334	24	STATE	2412 COLLEGE AVE	6,154
3463D009	3463D	9	STATE	909 DRUID PARK LAKE DR	5,871
3200004	3200	4	STATE	2601 GWYNNS FALLS PKWY	5,800
2312008A	2312	008A	STATE		5,712
495028	495	28	STATE	1130 N CHARLES ST	5,522
6167002B	6167	002B	STATE	4211 E MONUMENT ST	5,459
294015	294	15	STATE	1601 W NORTH AVE	5,423
466009	466	9	STATE	1319 N CHARLES ST	5,157
3820015	3820	15	STATE	16 E 23RD ST	5,109
501031	501	31	STATE	857 N EUTAW ST	5,087
616034	616	34	STATE	100 N GREENE ST	4,833
674037	674	37	STATE	715 W PRATT ST	4,746
618034	618	34	STATE	405 MARION ST	4,699
592041	592	41	STATE	204 N GREENE ST	4,480
610015	610	15	STATE	201 SAINT PAUL PL	4,322
592042	592	42	STATE	202 N GREENE ST	4,315
1246008	1246	8	STATE	708 N BROADWAY	4,313
1234014	1234	14	STATE	729 GRAVES ST	4,310
618005	618	5	STATE	418 W FAYETTE ST	4,277
1246007	1246	7	STATE	702 N BROADWAY	4,200
6917A005	6917A	5	STATE		4,142
592034	592	34	STATE	218 N GREENE ST	4,035
7772049A	7772	049A	STATE		3,852
651017	651	17	STATE	723 W REDWOOD ST	3,805
616023	616	23	STATE	601 W LEXINGTON ST	3,753
589014	589	14	STATE	683 BORN CT	3,746
447017	447	17	STATE	51 W OLIVER ST	3,573
589018	589	18	STATE	219 N PINE ST	3,520
501030	501	30	STATE	855 N EUTAW ST	3,504
617015	617	15	STATE	121 N GREENE ST	3,503
674035	674	35	STATE	723 W PRATT ST	3,370
447016	447	16	STATE	53 W OLIVER ST	3,305
521054	521	54	STATE	304 W MONUMENT ST	3,293
616016	616	16	STATE	615 W LEXINGTON ST	3,231
2311044A	2311	044A	STATE		3,202
2951B025	2951B	25	STATE	3102 W COLD SPRING LANE	3,185
447015	447	15	STATE	55 W OLIVER ST	3,125
505013	505	13	STATE	5 W CHASE ST	3,079
203199	203	199	STATE	802 W FAIRMOUNT AVE	3,044
6607K015	6607K	15	STATE		2,952
674036	674	36	STATE	719 W PRATT ST	2,920



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Summary of Properties Exempt from Impervious Baseline

PIN	Block	Lot	Type	Address	Imp. Area (sf)
3257A011	3257A	11	STATE		2,834
530023	530	23	STATE	639 N EUTAW ST	2,797
0501040A	501	040A	STATE	829 N EUTAW ST	2,740
494010	494	10	STATE	1101 CATHEDRAL ST	2,734
651006	651	6	STATE	712 W LOMBARD ST	2,729
616027	616	27	STATE	114 N GREENE ST	2,652
3262F005A	3262F	005A	STATE		2,652
253088	253	88	STATE	116 CALLENDAR ST	2,610
616026	616	26	STATE	118 N GREENE ST	2,594
592018	592	18	STATE	223 PEARL ST	2,592
501033	501	33	STATE	905 N MARTIN LUTHER KING JR BLVD	2,530
530029	530	29	STATE	315 W MONUMENT ST	2,502
442007	442	7	STATE		2,435
592038	592	38	STATE	212 N GREENE ST	2,411
494009	494	9	STATE	1105 CATHEDRAL ST	2,397
7419B003A	7419B	003A	STATE	2250 KLOMAN ST	2,284
3200005	3200	5	STATE	2607 GWYNNNS FALLS PKWY	2,247
674033	674	33	STATE	727 W PRATT ST	2,201
592008	592	8	STATE	616 W LEXINGTON ST	2,086
1341031	1341	31	STATE	18 N EDEN ST	1,986
447012	447	12	STATE	150 W MOUNT ROYAL AVE	1,984
591033	591	33	STATE	240 PEARL ST	1,971
3812008	3812	8	STATE	2115 N CALVERT ST	1,947
2311028	2311	28	STATE	2551 W NORTH AVE	1,946
3812009	3812	9	STATE	2117 N CALVERT ST	1,906
2308001	2308	1	STATE	2501 W NORTH AVE	1,847
592036	592	36	STATE	216 N GREENE ST	1,830
6042J001	6042J	1	STATE	4900 FRANKFORD AVE	1,825
651016	651	16	STATE	727 W REDWOOD ST	1,807
592037	592	37	STATE	214 N GREENE ST	1,762
447018	447	18	STATE	47 W OLIVER ST	1,742
2314021	2314	21	STATE	1600 THOMAS AVE	1,717
591001	591	1	STATE	247 ARCH ST	1,662
616022	616	22	STATE	603 W LEXINGTON ST	1,661
591037	591	37	STATE	234 PEARL ST	1,623
2315031	2315	31	STATE	1600 N WARWICK AVE	1,616
616018	616	18	STATE	611 W LEXINGTON ST	1,592
0685A047	0685A	47	STATE	300 RUSSELL ST	1,458
1028005B	1028	005B	STATE		1,418
2311032	2311	32	STATE	1825 WHITMORE AVE	1,400
2308015	2308	15	STATE	1817 THOMAS AVE	1,369
2311041	2311	41	STATE	1807 WHITMORE AVE	1,367
2311034	2311	34	STATE	1821 WHITMORE AVE	1,348
2311016	2311	16	STATE	2527 W NORTH AVE	1,346
2311036	2311	36	STATE	1817 WHITMORE AVE	1,345
2315001	2315	1	STATE	1601 THOMAS AVE	1,340
2308017	2308	17	STATE	1813 THOMAS AVE	1,339
2311027	2311	27	STATE	2549 W NORTH AVE	1,338
2311039	2311	39	STATE	1811 WHITMORE AVE	1,335
399010	399	10	STATE	1320 EUTAW PL	1,334

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Summary of Properties Exempt from Impervious Baseline

PIN	Block	Lot	Type	Address	Imp. Area (sf)
675042	675	42	STATE	637 W PRATT ST	1,325
675039	675	39	STATE	643 W PRATT ST	1,320
675041	675	41	STATE	639 W PRATT ST	1,319
675040	675	40	STATE	641 W PRATT ST	1,311
2310006	2310	6	STATE	1710 THOMAS AVE	1,307
2308012	2308	12	STATE	2523 W NORTH AVE	1,303
2310007	2310	7	STATE	1712 THOMAS AVE	1,299
2310008	2310	8	STATE	1714 THOMAS AVE	1,283
2308013	2308	13	STATE	2525 W NORTH AVE	1,279
2311042	2311	42	STATE	1805 WHITMORE AVE	1,276
2311035	2311	35	STATE	1819 WHITMORE AVE	1,274
2308011	2308	11	STATE	2521 W NORTH AVE	1,272
599030	599	30	STATE	108 CLAY ST	1,269
2311043	2311	43	STATE	1803 WHITMORE AVE	1,266
592019	592	19	STATE	227 PEARL ST	1,261
2311033	2311	33	STATE	1823 WHITMORE AVE	1,256
2315002	2315	2	STATE	1603 THOMAS AVE	1,255
2310019	2310	19	STATE	1736 THOMAS AVE	1,253
2311026	2311	26	STATE	2547 W NORTH AVE	1,240
2309003	2309	3	STATE	1705 THOMAS AVE	1,237
2309006	2309	6	STATE	1711 THOMAS AVE	1,203
2311040	2311	40	STATE	1809 WHITMORE AVE	1,198
5326001	5326	1	STATE		1,184
2315038	2315	38	STATE	1614 N WARWICK AVE	1,182
2311037	2311	37	STATE	1815 WHITMORE AVE	1,177
2311008	2311	8	STATE	1814 THOMAS AVE	1,144
2309007	2309	7	STATE	1713 THOMAS AVE	1,140
617016	617	16	STATE	123 N GREENE ST	1,123
2311031	2311	31	STATE	1827 WHITMORE AVE	1,107
501035	501	35	STATE	909 N MARTIN LUTHER KING JR BLVD	1,100
592002	592	2	STATE	602 W LEXINGTON ST	1,097
592001	592	1	STATE	600 W LEXINGTON ST	1,094
2310018	2310	18	STATE	1734 THOMAS AVE	1,090
2308008	2308	8	STATE	2515 W NORTH AVE	1,073
592006	592	6	STATE	610 W LEXINGTON ST	1,062
2309002	2309	2	STATE	1703 THOMAS AVE	1,060
2315060	2315	60	STATE	1660 N WARWICK AVE	1,056
2315026	2315	26	STATE	1653 THOMAS AVE	1,051
592003	592	3	STATE	604 W LEXINGTON ST	1,049
2309017	2309	17	STATE	1733 THOMAS AVE	1,043
591020	591	20	STATE		1,038
2315028	2315	28	STATE	1657 THOMAS AVE	1,038
592007	592	7	STATE	612 W LEXINGTON ST	1,034
7005037	7005	37	STATE	5400 QUARANTINE ROAD	1,033
2315019	2315	19	STATE	1639 THOMAS AVE	1,031
2951D002	2951D	2	STATE		1,026
2308019	2308	19	STATE	1809 THOMAS AVE	1,025
2315035	2315	35	STATE	1608 N WARWICK AVE	1,025
2314012	2314	12	STATE	1624 THOMAS AVE	1,012
2310020	2310	20	STATE	1738 THOMAS AVE	1,007

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Summary of Properties Exempt from Impervious Baseline

PIN	Block	Lot	Type	Address	Imp. Area (sf)
2310010	2310	10	STATE	1718 THOMAS AVE	1,004
2310016	2310	16	STATE	1730 THOMAS AVE	983
2309011	2309	11	STATE	1721 THOMAS AVE	978
2310005	2310	5	STATE	1708 THOMAS AVE	974
2315020	2315	20	STATE	1641 THOMAS AVE	974
2308005	2308	5	STATE	2509 W NORTH AVE	972
2315021	2315	21	STATE	1643 THOMAS AVE	968
2315023	2315	23	STATE	1647 THOMAS AVE	964
2309012	2309	12	STATE	1723 THOMAS AVE	960
2310004	2310	4	STATE	1706 THOMAS AVE	956
2315011	2315	11	STATE	1623 THOMAS AVE	951
2315017	2315	17	STATE	1635 THOMAS AVE	950
2315029	2315	29	STATE	1659 THOMAS AVE	950
2315018	2315	18	STATE	1637 THOMAS AVE	946
2310013	2310	13	STATE	1724 THOMAS AVE	944
2308007	2308	7	STATE	2513 W NORTH AVE	941
2309016	2309	16	STATE	1731 THOMAS AVE	941
2315025	2315	25	STATE	1651 THOMAS AVE	941
2315034	2315	34	STATE	1606 N WARWICK AVE	939
2308016	2308	16	STATE	1815 THOMAS AVE	938
2315024	2315	24	STATE	1649 THOMAS AVE	938
2315014	2315	14	STATE	1629 THOMAS AVE	935
592010	592	10	STATE	211 PEARL ST	932
2311009	2311	9	STATE	1816 THOMAS AVE	930
2310014	2310	14	STATE	1726 THOMAS AVE	927
2309008	2309	8	STATE	1715 THOMAS AVE	926
2315016	2315	16	STATE	1633 THOMAS AVE	926
2309013	2309	13	STATE	1725 THOMAS AVE	925
2315022	2315	22	STATE	1645 THOMAS AVE	925
2315015	2315	15	STATE	1631 THOMAS AVE	922
501036	501	36	STATE	911 N MARTIN LUTHER KING JR BLVD	919
2309014	2309	14	STATE	1727 THOMAS AVE	919
2310017	2310	17	STATE	1732 THOMAS AVE	919
2315013	2315	13	STATE	1627 THOMAS AVE	918
2315027	2315	27	STATE	1655 THOMAS AVE	918
2315009	2315	9	STATE	1619 THOMAS AVE	912
2308006	2308	6	STATE	2511 W NORTH AVE	910
2315046	2315	46	STATE	1632 N WARWICK AVE	902
442006	442	6	STATE		899
2308003	2308	3	STATE	2505 W NORTH AVE	898
2309005	2309	5	STATE	1709 THOMAS AVE	895
2315012	2315	12	STATE	1625 THOMAS AVE	895
2311019	2311	19	STATE	2533 W NORTH AVE	888
2309010	2309	10	STATE	1719 THOMAS AVE	887
2308004	2308	4	STATE	2507 W NORTH AVE	884
2315049	2315	49	STATE	1638 N WARWICK AVE	882
2309015	2309	15	STATE	1729 THOMAS AVE	876
2315010	2315	10	STATE	1621 THOMAS AVE	875
2308009	2308	9	STATE	2517 W NORTH AVE	874
2310003	2310	3	STATE	1704 THOMAS AVE	872

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
2311014	2311	14	STATE	1826 THOMAS AVE	871
2308014	2308	14	STATE	1819 THOMAS AVE	870
2314011	2314	11	STATE	1626 THOMAS AVE	865
2314001	2314	1	STATE	1646 THOMAS AVE	858
599031	599	31	STATE	110 CLAY ST	853
2310001	2310	1	STATE	1700 THOMAS AVE	850
2315048	2315	48	STATE	1636 N WARWICK AVE	847
2315050	2315	50	STATE	1640 N WARWICK AVE	847
2314008	2314	8	STATE	1632 THOMAS AVE	843
591036	591	36	STATE	236 PEARL ST	841
2311010	2311	10	STATE	1818 THOMAS AVE	839
2315047	2315	47	STATE	1634 N WARWICK AVE	834
2315036	2315	36	STATE	1610 N WARWICK AVE	829
2311023	2311	23	STATE	2541 W NORTH AVE	825
2315039	2315	39	STATE	1616 N WARWICK AVE	823
2310015	2310	15	STATE	1728 THOMAS AVE	815
5326004	5326	4	STATE		813
2309040	2309	40	STATE	1744 N WARWICK AVE	790
2309022	2309	22	STATE	1708 N WARWICK AVE	789
2311015	2311	15	STATE	1828 THOMAS AVE	786
2311017	2311	17	STATE	2529 W NORTH AVE	786
2309001	2309	1	STATE	1701 THOMAS AVE	782
2311018	2311	18	STATE	2531 W NORTH AVE	781
2310009	2310	9	STATE	1716 THOMAS AVE	779
2311022	2311	22	STATE	2539 W NORTH AVE	777
2313002	2313	2	STATE		773
2311021	2311	21	STATE	2537 W NORTH AVE	770
2310011	2310	11	STATE	1720 THOMAS AVE	769
2311012	2311	12	STATE	1822 THOMAS AVE	768
2311024	2311	24	STATE	2543 W NORTH AVE	767
2311025	2311	25	STATE	2545 W NORTH AVE	766
2310012	2310	12	STATE	1722 THOMAS AVE	756
2309009	2309	9	STATE	1717 THOMAS AVE	748
2309024	2309	24	STATE	1712 N WARWICK AVE	747
2311006	2311	6	STATE	1810 THOMAS AVE	744
2315030	2315	30	STATE	1661 THOMAS AVE	743
2309028	2309	28	STATE	1720 N WARWICK AVE	738
2311001	2311	1	STATE	1800 THOMAS AVE	736
2311020	2311	20	STATE	2535 W NORTH AVE	733
2309027	2309	27	STATE	1718 N WARWICK AVE	732
7612C011A	7612C	011A	STATE		731
2310002	2310	2	STATE	1702 THOMAS AVE	728
2315008	2315	8	STATE	1615 THOMAS AVE	727
2309026	2309	26	STATE	1716 N WARWICK AVE	715
0674045A	674	045A	STATE	728 DOVER ST	710
2309004	2309	4	STATE	1707 THOMAS AVE	704
2311011	2311	11	STATE	1820 THOMAS AVE	698
3703009A	3703	009A	STATE	4320 SAINT PAUL ST	697
7772049	7772	49	STATE		696
2311004	2311	4	STATE	1806 THOMAS AVE	693

Appendix A

Summary of Properties Exempt from Impervious Baseline

PIN	Block	Lot	Type	Address	Imp. Area (sf)
2309023	2309	23	STATE	1710 N WARWICK AVE	692
2315004	2315	4	STATE	1607 THOMAS AVE	691
2315003	2315	3	STATE	1605 THOMAS AVE	678
2309029	2309	29	STATE	1722 N WARWICK AVE	672
2311005	2311	5	STATE	1808 THOMAS AVE	671
2311013	2311	13	STATE	1824 THOMAS AVE	671
2311003	2311	3	STATE	1804 THOMAS AVE	662
2311007	2311	7	STATE	1812 THOMAS AVE	662
7772049G	7772	049G	STATE		654
2309030	2309	30	STATE	1724 N WARWICK AVE	651
2314020	2314	20	STATE	1604 THOMAS AVE	651
2309032	2309	32	STATE	1728 N WARWICK AVE	644
2315005	2315	5	STATE	1609 THOMAS AVE	644
2315007	2315	7	STATE	1613 THOMAS AVE	640
2308031	2308	31	STATE	1814 N WARWICK AVE	635
2311002	2311	2	STATE	1802 THOMAS AVE	633
2315006	2315	6	STATE	1611 THOMAS AVE	631
2309031	2309	31	STATE	1726 N WARWICK AVE	629
2308032	2308	32	STATE	1816 N WARWICK AVE	623
1028005C	1028	005C	STATE		618
2309025	2309	25	STATE	1714 N WARWICK AVE	614
2309033	2309	33	STATE	1730 N WARWICK AVE	611
2312008B	2312	008B	STATE		570
2314005	2314	5	STATE	1638 THOMAS AVE	547
2314007	2314	7	STATE	1634 THOMAS AVE	541
6587A015	6587A	15	STATE		525
501039	501	39	STATE	872 LINDEN AVE	445
492022	492	22	STATE		376
6871005C	6871	005C	STATE		349
6587A012	6587A	12	STATE		315
6587A013	6587A	13	STATE		304
2311030	2311	30	STATE	1829 WHITMORE AVE	265
6587A014	6587A	14	STATE		258
6587A011	6587A	11	STATE		256
7612D002D	7612D	002D	STATE	1701 CHERRY HILL ROAD	249
253087	253	87	STATE	114 CALLENDAR ST	222
3265C011	3265C	11	STATE		209
589024	589	24	STATE	667 W SARATOGA ST	99
3100A003	3100A	3	STATE		71
2308010	2308	10	STATE	2519 W NORTH AVE	68
1028005A	1028	005A	STATE		54
6235A010	6235A	10	STATE		39
7774003A	7774	003A	STATE	2208 GEORGETOWN ROAD	23
7804011A	7804	011A	STATE	2415 GEORGETOWN ROAD	7
203116	203	116	STATE	12 N FREMONT AVE	1
202014	202	14	STATE	926 W BALTIMORE ST	0
202016	202	16	STATE	930 W BALTIMORE ST	0
202017	202	17	STATE	934 W BALTIMORE ST	0
202019	202	19	STATE	938 W BALTIMORE ST	0
202020	202	20	STATE	940 W BALTIMORE ST	0

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
202021	202	21	STATE	942 W BALTIMORE ST	0
202022	202	22	STATE	944 W BALTIMORE ST	0
202023	202	23	STATE	946 W BALTIMORE ST	0
202024	202	24	STATE	3 N SCHROEDER ST	0
202025	202	25	STATE	5 N SCHROEDER ST	0
202026	202	26	STATE	7 N SCHROEDER ST	0
202027	202	27	STATE	9 N SCHROEDER ST	0
202028	202	28	STATE	11 N SCHROEDER ST	0
0202076B	202	076B	STATE	925 W FAIRMOUNT AVE	0
203117	203	117	STATE	10 N FREMONT AVE	0
589022	589	22	STATE	227 N PINE ST	0
1234001	1234	1	STATE	524 E MONUMENT ST	0
1267001	1267	1	STATE	408 N EXETER ST	0
1551008	1551	8	STATE	2009 E BIDDLE ST	0
2308018	2308	18	STATE	1811 THOMAS AVE	0
2308020	2308	20	STATE	1807 THOMAS AVE	0
2308021	2308	21	STATE	1805 THOMAS AVE	0
2308022	2308	22	STATE	1803 THOMAS AVE	0
2308023	2308	23	STATE	1801 THOMAS AVE	0
2308024	2308	24	STATE	1800 N WARWICK AVE	0
2308025	2308	25	STATE	1802 N WARWICK AVE	0
2308026	2308	26	STATE	1804 N WARWICK AVE	0
2308027	2308	27	STATE	1806 N WARWICK AVE	0
2308028	2308	28	STATE	1808 N WARWICK AVE	0
2308029	2308	29	STATE	1810 N WARWICK AVE	0
2308030	2308	30	STATE	1812 N WARWICK AVE	0
2309018	2309	18	STATE	1700 N WARWICK AVE	0
2309019	2309	19	STATE	1702 N WARWICK AVE	0
2309020	2309	20	STATE	1704 N WARWICK AVE	0
2309021	2309	21	STATE	1706 N WARWICK AVE	0
2309034	2309	34	STATE	1732 N WARWICK AVE	0
2309035	2309	35	STATE	1734 N WARWICK AVE	0
2309036	2309	36	STATE	1736 N WARWICK AVE	0
2309037	2309	37	STATE	1738 N WARWICK AVE	0
2309038	2309	38	STATE	1740 N WARWICK AVE	0
2309039	2309	39	STATE	1742 N WARWICK AVE	0
2309041	2309	41	STATE	2500 PRESBURY ST	0
2309042	2309	42	STATE	2502 PRESBURY ST	0
2314002	2314	2	STATE	1644 THOMAS AVE	0
2314003	2314	3	STATE	1642 THOMAS AVE	0
2314004	2314	4	STATE	1640 THOMAS AVE	0
2314006	2314	6	STATE	1636 THOMAS AVE	0
2314009	2314	9	STATE	1630 THOMAS AVE	0
2314010	2314	10	STATE	1628 THOMAS AVE	0
2314013	2314	13	STATE	1622 THOMAS AVE	0
2314014	2314	14	STATE	1620 THOMAS AVE	0
2314015	2314	15	STATE	1618 THOMAS AVE	0
2314016	2314	16	STATE	1616 THOMAS AVE	0
2314017	2314	17	STATE	1614 THOMAS AVE	0
2314018	2314	18	STATE	1612 THOMAS AVE	0

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
2314019	2314	19	STATE	1610 THOMAS AVE	0
2314019A	2314	019A	STATE	1608 THOMAS AVE	0
2314019B	2314	019B	STATE	1606 THOMAS AVE	0
2314020A	2314	020A	STATE	1602 THOMAS AVE	0
2315032	2315	32	STATE	1602 N WARWICK AVE	0
2315033	2315	33	STATE	1604 N WARWICK AVE	0
2315037	2315	37	STATE	1612 N WARWICK AVE	0
2315040	2315	40	STATE	1618 N WARWICK AVE	0
2315041	2315	41	STATE	1620 N WARWICK AVE	0
2315042	2315	42	STATE	1622 N WARWICK AVE	0
2315043	2315	43	STATE	1626 N WARWICK AVE	0
2315044	2315	44	STATE	1628 N WARWICK AVE	0
2315045	2315	45	STATE	1630 N WARWICK AVE	0
2315051	2315	51	STATE	1642 N WARWICK AVE	0
2315052	2315	52	STATE	1644 N WARWICK AVE	0
2315053	2315	53	STATE	1646 N WARWICK AVE	0
2315054	2315	54	STATE	1648 N WARWICK AVE	0
2315055	2315	55	STATE	1650 N WARWICK AVE	0
2315056	2315	56	STATE	1652 N WARWICK AVE	0
2315057	2315	57	STATE	1654 N WARWICK AVE	0
2315058	2315	58	STATE	1656 N WARWICK AVE	0
2315059	2315	59	STATE	1658 N WARWICK AVE	0
2320024	2320	24	STATE	1648 RUXTON AVE	0
2380001	2380	1	STATE	2800 RAYNER AVE	0
2380003	2380	3	STATE	2804 RAYNER AVE	0
2401A011	2401A	11	STATE	2721 W NORTH AVE	0
2402002	2402	2	STATE	2783 W NORTH AVE	0
4265017	4265	17	STATE	4400 SPRING AVE	0
4349005	4349	5	STATE	6209 PARK HEIGHTS AVE	0
4539028B	4539	028B	STATE	5299 WABASH AVE	0
4539028C	4539	028C	STATE	5297 WABASH AVE	0
4539029B	4539	029B	STATE	5295 WABASH AVE	0
4539029C	4539	029C	STATE	5293 WABASH AVE	0
4539029D	4539	029D	STATE	5291 WABASH AVE	0
4539029E	4539	029E	STATE	5289 WABASH AVE	0
4539029F	4539	029F	STATE	5287 WABASH AVE	0
4539029G	4539	029G	STATE	5285 WABASH AVE	0
4539030A	4539	030A	STATE	5283 WABASH AVE	0
4539030B	4539	030B	STATE	5281 WABASH AVE	0
4539030C	4539	030C	STATE	5279 WABASH AVE	0
4539030D	4539	030D	STATE	5277 WABASH AVE	0
4539030E	4539	030E	STATE	5275 WABASH AVE	0
4539030F	4539	030F	STATE	5273 WABASH AVE	0
4539030G	4539	030G	STATE	5271 WABASH AVE	0
4539030H	4539	030H	STATE	5269 WABASH AVE	0
4570015A	4570	015A	STATE	5199 WABASH AVE	0
4570015B	4570	015B	STATE	5197 WABASH AVE	0
4570015C	4570	015C	STATE	5195 WABASH AVE	0
4570015D	4570	015D	STATE	5193 WABASH AVE	0
6135A016	6135A	16	STATE	4225 SHANNON DR	0

**Appendix A**

**Summary of Properties Exempt from Impervious Baseline**

<b>PIN</b>	<b>Block</b>	<b>Lot</b>	<b>Type</b>	<b>Address</b>	<b>Imp. Area (sf)</b>
6587A001	6587A	1	STATE	4700 HOLABIRD AVE	0
6607K010	6607K	10	STATE	1802 S NEWKIRK ST	0
7804001A	7804	001A	STATE	2401 GEORGETOWN ROAD	0
7804003A	7804	003A	STATE	2403 GEORGETOWN ROAD	0
7804005A	7804	005A	STATE	2405 GEORGETOWN ROAD	0
7804007A	7804	007A	STATE	2411 GEORGETOWN ROAD	0
7805009	7805	9	STATE	2228 WASHINGTON BLVD	0
7805010	7805	10	STATE	2234 WASHINGTON BLVD	0
7805011	7805	11	STATE	2236 WASHINGTON BLVD	0
7805012	7805	12	STATE	2238 WASHINGTON BLVD	0
7805013	7805	13	STATE	2240 WASHINGTON BLVD	0
7874001A	7874	001A	STATE	2201 WASHINGTON BLVD	0
7874002A	7874	002A	STATE	2203 WASHINGTON BLVD	0
7874003A	7874	003A	STATE	2205 WASHINGTON BLVD	0
7874004A	7874	004A	STATE	2207 WASHINGTON BLVD	0
7874005A	7874	005A	STATE	2209 WASHINGTON BLVD	0
7874006A	7874	006A	STATE	2201 WASHINGTON BLVD	0
7874A001A	7874A	001A	STATE	2225 WASHINGTON BLVD	0
7874A002A	7874A	002A	STATE	2223 WASHINGTON BLVD	0
7874A003A	7874A	003A	STATE	2219 WASHINGTON BLVD	0
8348012	8348	12	STATE	3119 FERNDALE AVE	0

**NOTE:** FED-NONPUBHOUS: Federal properties excluding public housing  
 FED-PUBHOUS: Federal properties used for public housing  
 MS4-MPA: Phase II MS4 permit area for MD Port Administration  
 MS4-STADIUM: Phase II MS4 permit area for the MD Stadium Authority  
 STATE: Other State owned properties  
 IND-NPDES-GEN: NPDES Industrial Discharge General permit  
 IND-NPDES-IND: NPDES Industrial Discharge Individual permit  
 IND-NPDES-NE: Properties with NPDES No Exposure Certification



**Appendix B:**

**BMPs Constructed Prior to 2010**

Appendix B: Summary of Existing BMPs

**Table B-1: Summary of Stream Restoration Projects completed by DPW prior to 2010 (listed in Table 4 of WIP)**

Project Name	Structure Type	BMP Type Code	Land Use	Watershed	Construction Purpose	Construction Completion	Length	Impervious Area
Maidens Choice Stream #1	Stream Restoration	STRE	14	2130905	REST	2008	2,700	41
Biddison Run Phase I	Stream Restoration	STRE	14	2130901	REST	2006	1,500	23
Upper Stony Run	Stream Restoration	STRE	14	2130904	REST	2006	2,325	35
Middle Stony Run	Stream Restoration	STRE	14	2130904	REST	2006	2,750	41
Lower Stony Run	Stream Restoration	STRE	14	2130904	REST	2008	1,850	28
<b>Total:</b>							<b>11,125</b>	<b>167</b>

**Table B-2: Summary of Other Restoration Projects completed by DPW prior to 2010 (listed in Table 4 of WIP)**

Project Name	Structure Type	BMP Type	Land Use	Watershed	Construction Purpose	Construction Completion	Drainage Area	Imp Area	Water Quality Volume			Equ. Imp. Area
									(acre-ft)	(cf)	(in)	
Brooklyn Park	Wet Retention Pond	WP	16	2130903	REST	2004	306.00	138.0	7.50	326,700	0.65	89.0
Gwynns Run	Wet retention Pond / Wetland	WP	16	2130905	REST	2003	1373.00	693.0	5.80	252,648	0.10	69.7
WS 263 B-1	Bioretention	BR	14	2130905	REST	2009	0.87	0.9	0.06	2,400	0.8	0.7
WS 263 B-10	Microbioretention / Afforestation	ESDMB	14	2130905	REST	2009	1.30	0.7	0.03	1,229	0.5	0.3
WS 263 B-13	Microbioretention / Afforestation	ESDMB	14	2130905	REST	2009	0.60	0.3	0.02	958	1.0	0.3
WS 263 B-15	Microbioretention / Afforestation	ESDMB	14	2130905	REST	2009	1.63	1.5	0.05	2,105	0.4	0.6
WS 263 C-1	Filtera Unit	SF	14	2130905	REST	2009	0.20	0.2	0.01	552	0.8	0.2
Yorkwood Elementary	IA Removal/ Afforestation/ Bioretention		15	2130901	REST	2010	0.75	0.8				0.8
<b>Total:</b>											<b>161.5</b>	

**Appendix C:**

**Projects, Programs, and Partnerships for 20% Restoration**

APPENDIX C: Projects, Programs, and Partnerships for 20% Restoration

Table C-1: Summary of Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		NOTES
						TN	TP	TSS		Design	Construction	
<b>Structural / Traditional BMPs</b>												
S01	SW Pond Retrofit	Gwynns Falls	Gwynns Run, Carrolton Park	38	25	132	17	15,525	\$505,000	2016	2018	Expansion and retrofit to increase pollutant removal efficiency
S02	SW Pond Retrofit	Gwynns Falls	SetonBusiness Park Park	62	41	214	27	25,169	\$795,000	2016	2018	Expansion and retrofit to increase pollutant removal efficiency
S03	Pond Retrofit and New Pond	Back River	North Point Road @ Kane and Quad	92	60	317	40	37,260	\$3,290,000	2015	2016	Ref: Drainage Study Report 2012. Includes infrastructure improvement for flooding.
S04	Wetland / Pond	Back River	Perring Parkway at Cloville (HR-R28B)	23	15	63	13	8,484	\$344,000	2016	2018	Ref:Back River SWAP
S05	Wetland / Pond	Back River	Herring Run Park below Shannon at Lyndale (HR-R15C)	31	20	84	17	11,465	\$550,000	2016	2018	Ref:Back River SWAP
S06	Wetland	Back River	Herring Run Park below Shannon at Kavon Ave (HR-R39)	31	20	84	17	11,465	\$550,000	2016	2018	Ref:Back River SWAP
S07	Wetland	Back River	Herring Run Park below Parkside at Sinclair (HR-R15A)	100	65	275	56	37,260	\$1,600,000	2016	2018	Ref:Back River SWAP
S08	Wetland	Back River	Chinquapin Run Park between Belvedere and Alameda (CH-R6A)	69	45	190	39	25,795	\$1,840,000	2016	2018	Ref:Back River SWAP
S09	Bioretention Area	Baltimore Harbor	Faring Baybrook Park Rec Center (MC-18a)	5	3	17	3	1,702	\$160,000	2016	2018	Ref: Masonville Cove SWAP 2014
S10	Bioretention Area	Gwynns Falls	Park Hts Virginia + Homer	3	2	11	2	1,135	\$60,000	2016	2018	Ref: UPWP / Sabra Wang Study
S11	Shallow extended detention wetland	Jones Falls	West Colspring and Brand Ave (LJ-R9)	14	9	46	8	4,624	\$212,000	2016	2018	Ref: Lower Jones Falls SWAP
S12	Shallow wetland	Jones Falls	Woodheights and La Plata (LJ-R38)	6	4	21	3	2,102	\$96,000	2016	2018	Ref: Lower Jones Falls SWAP
			<b>Subtotal Structural / Traditional:</b>	<b>475</b>	<b>309</b>	<b>1,455</b>	<b>243</b>	<b>181,986</b>	<b>\$10,002,000</b>			
<b>ESD Practices</b>												
E01	Micro-bioretention	Baltimore Harbor	Cloverleaf - northwest of I-895 and Frankfurst Ave (MC-30)	0.5	0.4	2.1	0.34	217	\$50,000	2016	2019	Ref: Masonville Cove SWAP 2014
E02	Micro-bioretention	Baltimore Harbor	Bush St. Curb bump-out	0.3	0.2	1.2	0.20	127	\$80,000	2011	2016	Ref: WS 263
E03	Micro-bioretention	Baltimore Harbor	Lafayette inner block retrofit.	0.9	0.7	4.0	0.64	411	\$240,000	2011	2016	Ref: WS 263
E14	Micro-bioretention	Baltimore Harbor	Bay Brook MS (MC-18b)	0.3	0.3	1.5	0.2	157	\$54,000	2015	2016	Ref: Masonville Cove SWAP 2014
E15	Micro-bioretention	Baltimore Harbor	Bay Brook MS (MC-18c)	0.2	0.2	1.1	0.2	115	\$46,800	2015	2016	Ref: Masonville Cove SWAP 2014
E16	Micro-bioretention	Baltimore Harbor	Bay Brook MS - parking lot (MC-18d)	0.2	0.2	1.1	0.2	115	\$34,800	2015	2016	Ref: Masonville Cove SWAP 2014
E18	Micro-bioretention	Baltimore Harbor	Brooklyn / Curtis Bay	1.1	0.9	5.0	0.8	513	\$19,800	2015	2016	
E19	Micro-bioretention	Baltimore Harbor	Patterson Park (HA-R5A)	0.3	0.2	1.4	0.2	139	\$40,000	2016	2018	Ref: WS 246 SWAP
E20	Micro-bioretention	Baltimore Harbor	Ellwood Park (HA-R8)	0.2	0.1	0.7	0.1	72	\$21,000	2016	2018	Ref: WS 246 SWAP

APPENDIX C: Projects, Programs, and Partnerships for 20% Restoration

Table C-1: Summary of Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		NOTES
						TN	TP	TSS		Design	Construction	
E21	Micro-bioretenion	Baltimore Harbor	Patterson Park Adjunct (HA-R6)	0.8	0.6	3.6	0.6	362	\$105,000	2016	2018	Ref: WS 246 SWAP
E22	Micro-bioretenion	Baltimore Harbor	Patterson Park / Highlandtown / Baltimore Highlands	5.1	4.1	24.1	3.79	2,446	\$710,000	2016	2018	GGI / Green Streets
E23	Micro-bioretenion	Back River	Frankford / Greater Lauraville / Belair-Edison / Cedonia	4.6	3.6	21.6	3.40	2,198	\$671,000	2016	2018	GGI / Green Streets
E24	Micro-bioretenion	Back River	Erdman Avenue	1.4	1.2	6.8	1.07	694	\$128,000	2016	2018	BENI Green Streets projects / CWP
E25	Micro-bioretenion	Back River	Belair Road	0.3	0.2	1.2	0.20	127	\$77,000	2016	2018	BENI Green Streets projects / CWP
E26	Micro-bioretenion	Jones Falls	Hampden / Remington / Wyman Park	6.3	5.0	29.7	4.67	3,020	\$850,000	2016	2018	GGI / Green Streets
E27	Micro-bioretenion	Gwynns Falls	Howard Park / Grove Park / West Arlington / Fairmount	3.1	2.5	14.9	2.34	1,510	\$420,000	2016	2018	GGI / Green Streets
E28	Micro-bioretenion	Gwynns Falls	Hunting Ridge / Rognel Hts / Edmondson Village / Edgewood	3.1	2.5	14.9	2.34	1,510	\$420,000	2016	2018	GGI / Green Streets
E29	Micro-bioretenion	Baltimore Harbor	Sharp-Leadenhall / Federal Hill / Otterbein / S. Baltimore	1.6	1.3	7.4	1.17	755	\$215,000	2016	2018	GGI / Green Streets
E30	Micro-bioretenion	L. N. Branch Patapsco	Cherry Hill	3.1	2.5	14.9	2.34	1,510	\$500,000	2016	2018	GGI / Green Streets
E31	Micro-bioretenion	Baltimore Harbor	Lakeland / Mt. Winans / Westport	1.6	1.3	7.4	1.17	755	\$420,000	2016	2018	GGI / Green Streets
E32	Micro-bioretenion	Baltimore Harbor	McElderry Park / CARE / Milton-Montford / Patterson Place	3.1	2.5	14.9	2.34	1,510	\$438,000	2016	2018	GGI / Green Streets
E33	Micro-bioretenion	Gwynns Falls	Greater Mondawmin / Walbrook / Rosemont / NW Community Action /	3.1	2.5	14.9	2.34	1,510	\$438,000	2016	2018	GGI / Green Streets
E34	Micro-bioretenion	Jones Falls	Mt. Washington / Glen / Cheswolde / Cross Country	6.3	5.0	29.7	4.67	3,020	\$1,350,000	2016	2018	GGI / Green Streets
E35	Micro-bioretenion	Back River	Cameron Village / Chinquapin Park (upstream to Chinquapin Run)	5.0	4.0	23.8	3.74	2,416	\$680,000	2017	2019	GGI / Green Streets
E36	Micro-bioretenion	Back River	De Wees Park	1.3	1.0	5.9	0.93	604	\$180,000	2017	2019	GGI / Green Streets
E37	Micro-bioretenion	Back River	Orchard Ridge / Armistead Gardens / Orangeville	6.3	5.0	29.7	4.67	3,020	\$630,000	2017	2019	GGI / Green Streets
E38	Micro-bioretenion	Jones Falls	Central Park Heights / Towanda Grantley / Lucille Park	3.1	4.0	14.9	2.34	1,510	\$513,000	2017	2019	GGI / Green Streets
E39	Micro-bioretenion	Gwynns Falls	MorrellPark / Wilhelm Park / Gwynns Falls / Carroll-South Hilton	3.1	6.0	14.9	2.34	1,510	\$625,000	2017	2019	GGI / Green Streets
E41	Micro-bioretenion	Back River	Clifton Park	0.3	0.2	1.2	0.19	121	\$35,000	2017	2019	Ref: Back River SWAP
E42	Micro-bioretenion	Back River	Clifton Park	2.9	2.3	13.7	2.15	1,389	\$400,000	2017	2019	Ref: Back River SWAP
			<b>Subtotal ESD Practices:</b>	<b>69</b>	<b>60</b>	<b>328</b>	<b>52</b>	<b>33,359</b>	<b>\$10,391,400</b>			

APPENDIX C: Projects, Programs, and Partnerships for 20% Restoration

Table C-1: Summary of Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		NOTES
						TN	TP	TSS		Design	Construction	
<b>Alternative BMPs (Stream Restoration)-- Drainage Area = Stream Restoration Length (LF)</b>												
A01	Stream Restoration	Gwynns Falls	Leakin Park Stream Restoration at Fairmount Storm Drain	2,080 LF	31	156	141	62,400	\$700,000	Completed	Complete	
A02	Stream Restoration	Jone Falls	Lower Lower Stony Run	4,500 LF	68	338	306	135,000	\$4,030,000	2015	2016	Ref: Lower Jones Falls SWAP
A03	Stream Restoration	Gwynns Falls	Powder Mill Phase 1	3,900 LF	59	293	265	117,000	\$3,420,000	2009	2017	MTA Red Line / portion above mitigation needs credited to the City
A04	Stream Restoration	Jone Falls	East Stony Run Project 1	800 LF	12	60	54	24,000	\$839,000	2014	2017	Ref: Lower Jones Falls SWAP
A05	Stream Restoration	Back River	Chinquapin Run Project 1	2,200 LF	33	165	150	66,000	\$3,670,000	2014	2017	
A06	Stream Restoration	Back River	Chinquapin Run Project 2	2,600 LF	39	195	177	78,000	\$1,772,000	2015	2017	
A07	Stream Restoration	Gwynns Falls	Franklinton Culvert	2,400 LF	36	180	163	72,000	\$1,700,000	2015	2018	
A08	Stream Restoration	Back River	Lower Moore's Run Project 2	2,500 LF	38	188	170	75,000	\$1,960,000	2015	2018	
A09	Stream Restoration	Back River	Biddison Run Project 2	3,030 LF	45	227	206	90,900	\$3,590,000	2014	2018	
A10	Stream Restoration	Jones Falls	Western Run at Kelly Avenue	800 LF	12	60	54	24,000	\$1,324,600	2015	2018	
A11	Stream Restoration	Jone Falls	East Stony Run Project 2	1,340 LF	20	101	91	40,200	\$2,040,000	2015	2018	
A12	Stream Restoration	Back River	Biddison Run Projects 3	3,850 LF	58	289	262	115,500	\$1,800,000	Complete	2018	
A13	Stream Restoration	Back River	Moore's Run Restoration Project 1	2,500 LF	38	188	170	75,000	\$1,822,000	2015	2018	
A14	Stream Restoration	Back River	Moore's Run Restoration Project 2	2,800 LF	42	210	190	84,000	\$1,822,000	2015	2018	
A15	Stream Restoration	Back River	Herring Run stream	2,665 LF	40	200	181	79,950	\$2,702,000	2015	2018	Back River SWAP
A16	Stream Restoration	Jones Falls	Druid Hill Park Stream Project	1,875 LF	28	141	128	56,250	\$2,702,000	2015	2018	Lower Jones Falls SWAP
A17	Stream Restoration	Gwynns Falls	Lower Gwynns Falls	2,600 LF	39	195	177	78,000	\$2,702,000	2015	2018	Gwynns Falls Watershed Assessment
A18	Stream Restoration	Gwynns Falls	Lower Gwynns Falls	2,600 LF	39	195	177	78,000	\$2,702,000	2015	2018	Gwynns Falls Watershed Assessment
A19	Stream Restoration	Gwynns Falls	Lower Gwynns Falls	2,300 LF	35	173	156	69,000	\$2,702,000	2015	2018	Gwynns Falls Watershed Assessment
A20	Stream Restoration	Gwynns Falls	Dead Run	2,200 LF	33	165	150	66,000	\$2,702,000	2016	2019	Gwynns Falls Watershed Assessment
A21	Stream Restoration	Back River	Herring Run Western Branch	2,675 LF	40	201	182	80,250	\$2,702,000	2016	2019	Herring Run Stream Assessment
			<b>Subtotal Alternative BMPs (Stream Restoration):</b>	<b>52,215 LF</b>	<b>783</b>	<b>3,916</b>	<b>3,551</b>	<b>1,566,450</b>	<b>\$49,403,600</b>			

APPENDIX C: Projects, Programs, and Partnerships for 20% Restoration

Table C-1: Summary of Projects

MS4 WIP Project ID	BMP Type	Watershed	Location	Drainage Area (ac)	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	Schedule to Start (FY)		NOTES
						TN	TP	TSS		Design	Construction	
<b>Alternative BMPs (Other)</b>												
A22	Regenerative Step Pool Storm Conveyance	Gwynns Falls	Seamon Avenue	20	9	146	13	6,622	\$1,168,000	2015	2017	Infrastructure improvement
A23	IA Removal, afforestation, bioretention	Baltimore Harbor	CARE Communities / McElderry Park / Milton-Montford	3.1	3.75	19.2	4.34	2,852	\$496,000	2016	2018	Ref: Direct Harbor Characterization
A24	IA Removal, afforestation	Baltimore Harbor	Harford Hts ES (HA-R19)	0.9	0.60	3.3	0.92	523	\$110,000	2016	2018	GGI / Green Streets
A25	IA Removal, afforestation, bioretention	Back River	Northwood ES and Rec Center (CH-R2A)	2.4	2.85	14.6	3.30	2,167	\$565,000	2016	2018	Ref:Back River SWAP
A26	IA Removal, afforestation	Back River	Sinclair Lane ES (HR-R18)	1.9	1.31	7.3	2.03	1,154	\$260,400	2016	2018	Ref:Back River SWAP
A27	IA Removal, afforestation	Back River	WEB DuBois (HR-R29A)	0.8	0.53	2.9	0.81	461	\$104,200	2016	2018	Ref:Back River SWAP
A28	IA Removal, afforestation, bioretention	Back River	Various Schools	0.5	0.6	3.1	0.70	456	\$120,000	2016	2018	Location to be determined based on final school construction schedule.
A29	IA Removal, afforestation, bioretention	Gwynns Falls	Mt. Winans	3.1	3.75	19.2	4.34	2,852	\$496,000	2016	2018	GGI / Green Streets
A30	IA Removal, afforestation, bioretention	Back River	Montebello ES (HR-R41A)	0.9	1.05	5.4	1.22	799	\$208,000	2016	2018	Ref: Back River SWAP
A31	IA Removal, afforestation, bioretention	City-wide	Various Schools	1.5	1.76	9.0	2.03	1,335	\$350,000	2016	2018	GGI / Green Streets
A32	IA Removal, afforestation, bioretention	Jones Falls	Pimlico ES (LJ-R6)	1.1	1.35	6.9	1.56	1,027	\$268,000	2016	2018	Ref: Lower Jones Falls SWAP
A33	IA Removal, afforestation, bioretention	Jones Falls	Poly Western HS (LJ-R8C)	1.4	1.65	8.5	1.91	1,255	\$328,000	2016	2018	Ref: Lower Jones Falls SWAP
A34	IA Removal, afforestation, bioretention	Baltimore Harbor	Duane Avenue Park - parking lot (MC-21)	0.3	0.35	1.8	0.40	262	\$42,000	2016	2018	Ref:Masonville Cove SWAP 2014
A35	IA Removal, afforestation	Baltimore Harbor	Oliver / Broadway East	4.0	2.8	15.6	4.32	2,461	\$496,000	2017	2019	GGI / Green Streets
A36	IA Removal, afforestation	Gwynns Falls	Carrollton Ridge / Shipley Hill / Mill Hill / Pigtown / New Southwest / Union Square	4.0	2.8	15.6	4.32	2,461	\$496,000	2017	2019	GGI / Green Streets
A37	IA Removal, afforestation	Direct Harbor	Harlem Park / Sandtown-Winchester / Uplands	2.0	1.40	7.8	2.16	1,230	\$248,000	2017	2019	GGI / Green Streets
A38	IA Removal, afforestation	Direct Harbor	Various Schools	2.0	1.40	7.8	2.16	1,230	\$248,000	2017	2019	GGI / Green Streets
A39	Aforestation of IA	Gwynns Falls	Central Park Heights	2.0	1.40	19.3	2.29	1,121	\$496,000	2017	2019	GGI / Green Streets
A40	Aforestation of IA	Gwynns Falls	City-wide	8.3	5.81	90.2	13.19	6,793	\$496,000	NA	2017	GGI / Green Streets
A41	Aforestation of IA	Jones Falls	City-wide	8.3	5.81	90.2	13.19	6,793	\$496,000	NA	2018	GGI / Green Streets
A42	Aforestation of IA	City-wide	City-wide	4.2	2.91	45.1	6.59	3,396	\$248,000	NA	2019	GGI / Green Streets
<b>Subtotal Alternative BMPs (Other):</b>				<b>72</b>	<b>52.86</b>	<b>538.93</b>	<b>84.93</b>	<b>47,250</b>	<b>\$7,739,600</b>			
<b>Total Projects:</b>					<b>1,205</b>	<b>6,238</b>	<b>3,930</b>	<b>1,829,045</b>	<b>\$77,536,600</b>			

APPENDIX C: Projects, Programs, and Partnerships for 20% Restoration

Table C-2: Summary of Programs

Project No. / Type	Debris Collected	Equivalent Impervious Area Restoration (ac)	Estimated Pollutant Removal (lbs / yr)			NOTES
			TN	TP	TSS	
<b>Street Sweeping*</b>						
Collection within CY 2012	9,988 tons	2,797	24,471	9,788	2,936,472	Ref: Baltimore's New and Improved Mechanical Street Sweeping Program (October 2013)
Anticipated Increase after City-wide expansion (Peak):	9,109 tons	2,551	22,317	8,927	2,678,046	Ref :Baltimore's New and Improved Mechanical Street Sweeping Program (October 2013)
<b>Sub-total Street Sweeping at full expansion:</b>	<b>19,097 tons</b>	<b>5,347</b>	<b>46,788</b>	<b>18,715</b>	<b>5,614,518</b>	
<b>Preventive Inlet Cleaning &amp; Debris Collection</b>						
Anticipated Increase after Asset Management (4% Inlets cleaned quarterly):	990 tons	215	2,425	970	291,052	Ref: Preliminary Asset Management Program and CIP Schedule for Inlet Screens
<b>Sub-total Preventive Inlet Cleaning:</b>		<b>215</b>	<b>2,425</b>	<b>970</b>	<b>291,052</b>	
<b>Illicit Discharge Detection and Elimination Program</b>						
Sanitary Direct**		NA	100	18	NA	Pending asset management inventory for direct illicit connections.
Sewage Exfiltration**		NA	5,000	909	NA	Lining as part of DPW's capital program for sanitary sewers.
Drinking Water Transmission**		NA	1,500	273	NA	Estimated water line lining / replacement by 2018.
Dry Weather SSO**		NA	350	64	NA	Asset management / FOG program, education, enforcement, and enhanced IDDE
<b>Sub-total IDDE:</b>			<b>6,950</b>	<b>1,264</b>	<b>0</b>	
<b>TOTAL Programs:</b>		<b>5,562</b>	<b>56,163</b>	<b>20,949</b>	<b>5,905,570</b>	

\* Assuming bi-weekly frequency.

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



APPENDIX C: Projects, Programs, and Partnerships for 20% Restoration

Table C-3: Summary of Partnerships

Project No. / Type	Source ID	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)		
					TN	TP	TSS
<b>Development</b>							
Impervious area to pervious	DPW Plans Review	City-wide	City-wide	73.8	351	35	29,426
Treatment by ESD	DPW Plans Review	City-wide	City-wide	21.4	102	10	8,539
Treatment by Traditional	DPW Plans Review	City-wide	City-wide	54.7	260	26	21,805
			<b>Sub-total Development:</b>	<b>150</b>	<b>713</b>	<b>70</b>	<b>59,770</b>
<b>Voluntary</b>							
Impervious Removal	BWB	Jones Falls	Guilford ES/MS	0.28	0.4	0.1	33
Impervious Removal	BWB	Gwynns Falls	Calvin Rodwell ES	0.13	0.2	0.04	15
Micro-bioretenion	BWB	Baltimore Harbor	Library Square	1.1	5.3	0.5	261
IA Removal, Rain Garden	DOT	Baltimore Harbor	200 N. Duncan Street	0.45	2.3	0.5	342
IA Removal, afforestation	DOT	Baltimore Harbor	2300-2400 Eager St	1.5	7.7	1.7	1141
IA Removal, afforestation, bioretention	GGI Design Comp	Gwynns Falls	2306-8 Riggs Street	0.81	4.2	0.9	616
IA Removal, afforestation, bioretention	GGI Design Comp	Back River	CHM Gateway 32nd & Harford	0.18	0.9	0.2	137
IA Removal, afforestation, bioretention	GGI Design Comp	Baltimore Harbor	Day Spring Green Parking 1100 block N. Bradford	0.36	1.8	0.4	274
IA Removal, afforestation	GGI Design Comp	Baltimore Harbor	Druid Heights Peace Park Bloom & Druid Hill Ave	0.15	0.8	0.2	114
IA Removal, afforestation	GGI Design Comp	Baltimore Harbor	Hollins Roundhouse Lots of Art1218-20 W. Lombard	0.06	0.3	0.1	46
IA Removal, afforestation, and rainwater harvesting	GGI Design Comp	Baltimore Harbor	Janes House of Inspiration A-maze-N Lot728 North Avenue	0.20	1.0	0.2	148
IA Removal, afforestation	GGI Design Comp	Baltimore Harbor	Flower Farm1400 block Gay Street	0.75	3.8	0.9	570
Aforestation of IA	Tree Baltimore	Baltimore Harbor	TBD	25.2	10.9	1.6	818
Aforestation of IA	Tree Baltimore	Gwynns Falls	TBD	23.1	10.9	1.6	818

APPENDIX C: Projects, Programs, and Partnerships for 20% Restoration

Table C-3: Summary of Partnerships

Project No. / Type	Source ID	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)		
					TN	TP	TSS
Aforestation of IA	Tree Baltimore	Jones Falls	TBD	19.6	10.9	1.6	818
Aforestation of IA	Tree Baltimore	Back River	TBD	21.0	10.9	1.6	818
			<b>Sub-total Volunteer:</b>	<b>95</b>	<b>72.2</b>	<b>12.1</b>	<b>6,971</b>
SW Fee Credit program							
Treatment BMPs	SAIS	City-wide	City-wide	24.0	206.7	26.5	16,157
Private tree planting (Reforestation on pervious)	SAIS	City-wide	City-wide	7.6	142.6	6.6	1596
Rain gardens	SAIS	City-wide	City-wide	2.0	17.2	2.2	1,346
Rainwater harvesting	SAIS	City-wide	City-wide	0.5	12.4	1.0	485
			<b>Subtotal SW Fee Credit:</b>	<b>34.1</b>	<b>378.9</b>	<b>36.3</b>	<b>19,584</b>
			<b>Total for Partnerships:</b>	<b>279</b>	<b>1,164</b>	<b>119</b>	<b>86,325</b>

**Appendix D:**

**Chesapeake Bay TMDL Compliance**

## APPENDIX D: Chesapeake Bay TMDL Compliance

Location	Imp. Area (ac)	Estimated Pollutant Removal (lbs / yr)			Reference
		TN	TP	TSS	
Chesapeake Bay Loading for Baltimore City		374,772	28,594	32,970,117	Bay TMSDL MAST Scenario 2010 Loadings for Baltimore City MS4 Area
<i>Reduction Goal for Stormwater</i>		20.3%	30.3%	1.9%	Maryland's Phase II WIP for the Chesapeake Bay, Oct. 2012, Executive Summary
<b>Completed within current MS4 permit</b>					
Structural/ Traditional BMPs	309	1,455	243	181,986	Table C-1 of WIP
ESD Practices	60	328	52	33,359	Table C-1 of WIP
Alternative BMPs (Stream Restoration)	783	3,916	3,551	1,566,450	Table C-1 of WIP
Alternative BMPs (Other)	53	539	85	47,250	Table C-1 of WIP
Street Sweeping at full expansion	5,347	46,788	18,715	5,614,518	Table C-2 of WIP
Inlet Cleaning	215	2,425	970	291,052	Table C-2 of WIP
IDDE*	0	6,950	1,264	0	Table C-2 of WIP
Partnerships	279	3,928	282	130,175	Table C-3 of WIP
<b>Total Reduction by end of MS4 permit:</b>	<b>7,046</b>	<b>66,329</b>	<b>25,161</b>	<b>7,864,790</b>	
<i>% Reduction by end of MS4 Permit:</i>		18%	88%	24%	

## APPENDIX D: Chesapeake Bay TMDL Compliance

Location	Imp. Area (ac)	Estimated Pollutant Removal (lbs / yr)			Reference
		TN	TP	TSS	
<b>Projected between FY 2019 and 2025:</b>					
Structural/ Traditional BMPs	75	354	59	44,239	
ESD Practices	60	327	51	33,227	
Alternative BMPs	150	1,529	241	134,086	
Street Sweeping	267	2,339	936	280,726	Assume avg. annual debris collection increase by 5%.
Inlet Cleaning	215	2,425	970	291,052	Increase to 8% of inlets (double the effort completed by end of MS4 permit).
IDDE*	0	1,700	309	0	Est. similar to MS4, without sewage exfiltration attributed to CD CIP.
Partnerships (Development)	210	5,499	395	182,246	
<b>Total Reduction by FY 2025:</b>	<b>8,023</b>	<b>80,503</b>	<b>28,122</b>	<b>8,830,364</b>	
<b>% Reduction by end of MS4 Permit:</b>		<b>21.5%</b>	<b>98.3%</b>	<b>26.8%</b>	
<b>Anticipated Chesapeake Bay Loading at 2025:</b>		<b>294,269</b>	<b>0</b>	<b>24,139,753</b>	

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

**Appendix E:**

**Local Nutrient TMDL Compliance**

**APPENDIX E: Local Nutrient TMDL Compliance**

**Table E-1: Back River**

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal		Estimated Capital Cost	Schedule to Start (FY)		NOTES
					TN	TP		Design	Construction	
<b>MS4 Baseline Load:</b>						<b>73,429</b>	<b>8,315</b>			
<b>Reduction Goal:</b>						15%	15%			
<b>BMPs installed between 2005 and 2010:</b>										
	Stream Restoration	Back River	Biddison Run Phase I		113	102	\$1,318,129	2003	2006	Previous MS4 Annual Reports. 1,500 LF restored.
	Private / Other City BMPs	Back River	12 BMPs	4	24	3				Appendix B of WIP.
<b>Total removal between 2005 and 2010:</b>						<b>136</b>	<b>105</b>			
<b>Projects proposed within current MS4 permit:</b>										
S03	Pond Retrofit and New Pond	Back River	North Point Road @ Kane and Quad	60	317	40	\$3,290,000	2015	2016	Ref: Drainage Study Report 2012. Includes infrastructure improvement for flooding.
S04	Wetland / Pond	Back River	Perring Parkway at Cloville (HR-R28B)	15	63	13	\$344,000	2016	2018	Ref:Back River SWAP
S05	Wetland / Pond	Back River	Herring Run Park below Shannon at Lyndale (HR-R15C)	20	84	17	\$550,000	2016	2018	Ref:Back River SWAP
S06	Wetland	Back River	Herring Run Park below Shannon at Kavon Ave (HR-R39)	20	84	17	\$550,000	2016	2018	Ref:Back River SWAP
S07	Wetland	Back River	Herring Run Park below Parkside at Sinclair (HR-R15A)	65	275	56	\$1,600,000	2016	2018	Ref:Back River SWAP
S08	Wetland	Back River	Chinquapin Run Park between Belvedere and Alameda (CH-R6A)	45	190	39	\$1,840,000	2016	2018	Ref:Back River SWAP
<b>Subtotal Structural / Traditional:</b>					<b>225</b>	<b>1,013</b>	<b>183</b>	<b>\$8,174,000</b>		
E23	Micro-bioretenion	Back River	Frankford / Greater Lauraville / Belair-Edison / Cedonia	3.6	21.6	3.40	\$671,000	2016	2018	GGI / Green Streets
E24	Micro-bioretenion	Back River	Erdman Avenue	1.2	6.8	1.07	\$128,000	2016	2018	BENI Green Streets projects / CWP
E25	Micro-bioretenion	Back River	Belair Road	0.2	1.2	0.20	\$77,000	2016	2018	BENI Green Streets projects / CWP
E35	Micro-bioretenion	Back River	Cameron Village / Chinquapin Park (upstream to Chinquapin Run)	4.0	23.8	3.74	\$680,000	2017	2019	GGI / Green Streets
E36	Micro-bioretenion	Back River	De Wees Park	1.0	5.9	0.93	\$180,000	2017	2019	GGI / Green Streets
E37	Micro-bioretenion	Back River	Orchard Ridge / Armistead Gardens / Orangeville	5.0	29.7	4.67	\$630,000	2017	2019	GGI / Green Streets
E41	Micro-bioretenion	Back River	Clifton Park	0.2	1.2	0.19	\$35,000	2017	2019	Ref: Back River SWAP

**APPENDIX E: Local Nutrient TMDL Compliance**

**Table E-1: Back River**

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal		Estimated Capital Cost	Schedule to Start (FY)		NOTES
					TN	TP		Design	Construction	
E42	Micro-bioretenion	Back River	Clifton Park	2.3	13.7	2.15	\$400,000	2017	2019	Ref: Back River SWAP
			<b>Subtotal ESD Practices:</b>	<b>18</b>	<b>104</b>	<b>16</b>	<b>\$2,801,000</b>			
A05	Stream Restoration	Back River	Chinquapin Run Project 1	33	165	150	\$3,670,000	2014	2017	
A06	Stream Restoration	Back River	Chinquapin Run Project 2	39	195	177	\$1,772,000	2015	2017	
A08	Stream Restoration	Back River	Lower Moore's Run Project 2	38	188	170	\$1,960,000	2015	2018	
A09	Stream Restoration	Back River	Biddison Run Project 2	45	227	206	\$3,590,000	2014	2018	
A12	Stream Restoration	Back River	Biddison Run Projects 3	58	289	262	\$1,800,000	Complete	2018	
A13	Stream Restoration	Back River	Moore's Run Restoration Project 1	38	188	170	\$1,822,000	2015	2018	
A14	Stream Restoration	Back River	Moore's Run Restoration Project 2	42	210	190	\$1,822,000	2015	2018	
A15	Stream Restoration	Back River	Herring Run stream	40	200	181	\$2,702,000	2015	2018	Back River SWAP
A21	Stream Restoration	Back River	Herring Run Western Branch	40	201	182	\$2,702,000	2016	2019	Herring Run Stream Assessment
			<b>Subtotal Alternative BMPs (Stream Restoration):</b>							
A25	IA Removal, afforestation, bioretention	Back River	Northwood ES and Rec Center (CH-R2A)	2.85	14.6	3.30	\$565,000	2016	2018	Ref:Back River SWAP
A26	IA Removal, afforestation	Back River	Sinclair Lane ES (HR-R18)	1.31	7.3	2.03	\$260,400	2016	2018	Ref:Back River SWAP
A27	IA Removal, afforestation	Back River	WEB DuBois (HR-R29A)	0.53	2.9	0.81	\$104,200	2016	2018	Ref:Back River SWAP
A28	IA Removal, afforestation, bioretention	Back River	Various Schools	0.6	3.1	0.70	\$120,000	2016	2018	Location to be determined based on final school construction schedule.
A30	IA Removal, afforestation, bioretention	Back River	Montebello ES (HR-R41A)	1.05	5.4	1.22	\$208,000	2016	2018	Ref: Back River SWAP
			<b>Subtotal Alternative BMPs (Other):</b>	<b>379</b>	<b>1,895</b>	<b>1,696</b>	<b>\$23,097,600</b>			
			<b>Total Projects:</b>	<b>621</b>	<b>3,011</b>	<b>1,895</b>	<b>\$34,072,600</b>			
<b>Programs</b>										
	Street Sweeping				10,761	4,304				Estimated distribution based on Table 1.



**APPENDIX E: Local Nutrient TMDL Compliance**

**Table E-1: Back River**

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal		Estimated Capital Cost	Schedule to Start (FY)		NOTES
					TN	TP		Design	Construction	
	Inlet Cleaning				558	223				Estimated distribution based on Table 1.
	IDDE				1,599	291				Estimated distribution based on Table 1.
			<b>Total Programs:</b>		<b>12,918</b>	<b>4,818</b>				
<b>Partnerships</b>										
	Development				164	16				Estimated distribution based on Table 1.
	Voluntary				12	2				
	Stormwater Fee Program				87	8				Estimated distribution based on Table 1.
			<b>Total Partnerships:</b>		<b>263</b>	<b>26</b>				
<b>Total Reduction by end of MS4 Permit:</b>					16,328	6,844				
<b>% Reduction by end of MS4 Permit:</b>					22%	82%				

APPENDIX E: Local Nutrient TMDL Compliance

Table E-2: Baltimore Harbor

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)		Estimated Capital Cost	Schedule to Start (FY)		NOTES
					TN	TP		Design	Construction	
<b>MS4 Baseline Load</b>					<b>260,323</b>	<b>28,177</b>				
<b>Reduction Goal</b>					15%	15%				
<b>BMPs installed between 2007 and 2010:</b>										
	ESD Practices	Gwynns Falls	Watershed 263 (5 locations)	3.5	20.4	3.26	\$647,400	2007	2009	Previous MS4 Annual Reports.
	Stream Restoration	Jones Falls	Lower Stony Run		139	126	\$1,676,000	2006	2009	Previous MS4 Annual Reports. 1,850 LF restored.
	Stream Restoration	Gwynns Falls	Maiden's Choice		203	184	\$1,800,000	2008	2008	Previous MS4 Annual Reports. 2,700 LF restored.
	Private / Other City BMPs	Gwynns Falls	4 BMPs	1	4	1				Appendix B of WIP.
	Private / Other City BMPs	Jones Falls	13 BMPs	13	84	10				Appendix B of WIP.
	Private / Other City BMPs	Baltimore Harbor	21 BMPs	8	34	5				Appendix B of WIP.
			<b>Total removal between 2007 and 2010:</b>		484	328				
<b>Structural / Traditional BMPs</b>										
S01	SW Pond Retrofit	Gwynns Falls	Gwynns Run, Carrolton Park	25	132	17	\$505,000	2016	2018	Expansion and retrofit to increase pollutant removal efficiency
S02	SW Pond Retrofit	Gwynns Falls	SetonBusiness Park Park	41	214	27	\$795,000	2016	2018	Expansion and retrofit to increase pollutant removal efficiency
S09	Bioretention Area	Baltimore Harbor	Faring Baybrook Park Rec Center (MC-18a)	3	17	3	\$160,000	2016	2018	Ref: Masonville Cove SWAP 2014
S10	Bioretention Area	Gwynns Falls	Park Hts Virginia + Homer	2	11	2	\$60,000	2016	2018	Ref: UPWP / Sabra Wang Study
S11	Shallow extended detention wetland	Jones Falls	West Colspring and Brand Ave (LJ-R9)	9	46	8	\$212,000	2016	2018	Ref: Lower Jones Falls SWAP
S12	Shallow wetland	Jones Falls	Woodheights and La Plata (LJ-R38)	4	21	3	\$96,000	2016	2018	Ref: Lower Jones Falls SWAP
			<b>Subtotal Structural / Traditional:</b>	<b>84</b>	<b>442</b>	<b>60</b>	<b>\$1,828,000</b>			
E01	Micro-bioretention	Baltimore Harbor	Cloverleaf - northwest of I-895 and Frankfurst Ave (MC-30)	0.4	2.1	0.34	\$50,000	2016	2019	Ref: Masonville Cove SWAP 2014
E02	Micro-bioretention	Baltimore Harbor	Bush St. Curb bump-out	0.2	1.2	0.20	\$80,000	2011	2015	Ref: WS 263
E03	Micro-bioretention	Baltimore Harbor	Lafayette inner block retrofit.	0.7	4.0	0.64	\$240,000	2011	2015	Ref: WS 263
E04	Micro-bioretention	Baltimore Harbor	Ben Franklin HS (MC-3a)	0.1	0.3	0.05	\$15,000	2015	2016	Ref: Masonville Cove SWAP 2014

**APPENDIX E: Local Nutrient TMDL Compliance**

**Table E-2: Baltimore Harbor**

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)		Estimated Capital Cost	Schedule to Start (FY)		NOTES
					TN	TP		Design	Construction	
E05	Micro-bioretenion	Baltimore Harbor	Ben Franklin HS (MC-3b)	0.0	0.2	0.03	\$42,000	2015	2016	Ref: Masonville Cove SWAP 2014
E06	Micro-bioretenion	Baltimore Harbor	Ben Franklin HS (MC-3c)	0.0	0.2	0.03	\$15,000	2015	2016	Ref: Masonville Cove SWAP 2014
E07	Micro-bioretenion	Baltimore Harbor	Faring Baybrook Park (MC-11a)	0.2	1.0	0.15	\$54,000	2015	2016	Ref: Masonville Cove SWAP 2014
E08	Micro-bioretenion	Baltimore Harbor	Faring Baybrook Park (MC-11b)	0.1	0.7	0.10	\$30,000	2015	2016	Ref: Masonville Cove SWAP 2014
E09	Micro-bioretenion	Baltimore Harbor	Faring Baybrook Park (MC-12a)	0.2	0.9	0.14	\$54,000	2015	2016	Ref: Masonville Cove SWAP 2014
E10	Micro-bioretenion	Baltimore Harbor	Faring Baybrook Park (MC-12b)	0.2	1.1	0.17	\$60,000	2015	2016	Ref: Masonville Cove SWAP 2014
E11	Micro-bioretenion	Baltimore Harbor	Faring Baybrook Park (MC-13a)	0.1	0.5	0.08	\$27,600	2015	2016	Ref: Masonville Cove SWAP 2014
E12	Micro-bioretenion	Baltimore Harbor	Faring Baybrook Park (MC-13b)	0.2	1.0	0.16	\$50,400	2015	2016	Ref: Masonville Cove SWAP 2014
E13	Micro-bioretenion	Baltimore Harbor	Curtis Bay ES/MS (MC-17b)	0.2	1.1	0.18	\$66,000	2015	2016	Ref: Masonville Cove SWAP 2014
E14	Micro-bioretenion	Baltimore Harbor	Bay Brook MS (MC-18b)	0.3	1.5	0.2	\$54,000	2015	2016	Ref: Masonville Cove SWAP 2014
E15	Micro-bioretenion	Baltimore Harbor	Bay Brook MS (MC-18c)	0.2	1.1	0.2	\$46,800	2015	2016	Ref: Masonville Cove SWAP 2014
E16	Micro-bioretenion	Baltimore Harbor	Bay Brook MS - parking lot (MC-18d)	0.2	1.1	0.2	\$34,800	2015	2016	Ref: Masonville Cove SWAP 2014
E17	Micro-bioretenion	Baltimore Harbor	Duane Ave Park (MC-23)	0.2	1.2	0.2	\$38,400	2015	2016	Ref: Masonville Cove SWAP 2014
E18	Micro-bioretenion	Baltimore Harbor	Brooklyn / Curtis Bay	0.9	5.0	0.8	\$19,800	2015	2016	Each project = 10 locations = 5 ac treated
E19	Micro-bioretenion	Baltimore Harbor	Patterson Park (HA-R5A)	0.2	1.4	0.2	\$40,000	2016	2018	Ref: WS 246 SWAP
E20	Micro-bioretenion	Baltimore Harbor	Ellwood Park (HA-R8)	0.1	0.7	0.1	\$21,000	2016	2018	Ref: WS 246 SWAP
E21	Micro-bioretenion	Baltimore Harbor	Patterson Park Adjunct (HA-R6)	0.6	3.6	0.6	\$105,000	2016	2018	Ref: WS 246 SWAP
E22	Micro-bioretenion	Baltimore Harbor	Patterson Park / Highlandtown / Baltimore Highlands	4.1	24.1	3.79	\$710,000	2016	2018	GGI / Green Streets
E26	Micro-bioretenion	Jones Falls	Hampden / Remington / Wyman Park	5.0	29.7	4.67	\$850,000	2016	2018	GGI / Green Streets
E27	Micro-bioretenion	Gwynns Falls	Howard Park / Grove Park / West Arlington / Fairmount	2.5	14.9	2.34	\$420,000	2016	2018	GGI / Green Streets
E28	Micro-bioretenion	Gwynns Falls	Hunting Ridge / Rognel Hts / Edmondson Village / Edgewood	2.5	14.9	2.34	\$420,000	2016	2018	GGI / Green Streets

APPENDIX E: Local Nutrient TMDL Compliance

Table E-2: Baltimore Harbor

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)		Estimated Capital Cost	Schedule to Start (FY)		NOTES
					TN	TP		Design	Construction	
E29	Micro-bioretenion	Baltimore Harbor	Sharp-Leadenhall / Federal Hill / Otterbein / S. Baltimore	1.3	7.4	1.17	\$215,000	2016	2018	GGI / Green Streets
E31	Micro-bioretenion	Baltimore Harbor	Lakeland / Mt. Winans / Westport	1.3	7.4	1.17	\$420,000	2016	2018	GGI / Green Streets
E32	Micro-bioretenion	Baltimore Harbor	McElderry Park / CARE / Milton-Montford / Patterson Place	2.5	14.9	2.34	\$438,000	2016	2018	GGI / Green Streets
E33	Micro-bioretenion	Gwynns Falls	Greater Mondawmin / Walbrook / Rosemont / NW Community Action /	2.5	14.9	2.34	\$438,000	2016	2018	GGI / Green Streets
E34	Micro-bioretenion	Jones Falls	Mt. Washington / Glen / Cheswolde / Cross Country	5.0	29.7	4.67	\$1,350,000	2016	2018	GGI / Green Streets
E38	Micro-bioretenion	Jones Falls	Central Park Heights / Towanda Grantley / Lucille Park	4.0	14.9	2.34	\$513,000	2017	2019	GGI / Green Streets
E39	Micro-bioretenion	Gwynns Falls	MorrellPark / Wilhelm Park / Gwynns Falls / Carroll-South Hilton	6.0	14.9	2.34	\$625,000	2017	2019	GGI / Green Streets
			<b>Subtotal ESD Practices:</b>	<b>42</b>	<b>217</b>	<b>34</b>	<b>\$7,542,800</b>			
A01	Stream Restoration	Gwynns Falls	Leaking Park Stream Restoration at Fairmount Storm Drain	31	156	141	\$700,000	Completed	Complete	
A02	Stream Restoration	Jone Falls	Lower Lower Stony Run	68	338	306	\$4,030,000	2015	2016	Ref: Lower Jones Falls SWAP
A03	Stream Restoration	Gwynns Falls	Powder Mill Phase 1	59	293	265	\$3,420,000	2009	2017	MTA Red Line / portion above mitigation needs credited to the City
A04	Stream Restoration	Jone Falls	East Stony Run Project 1	12	60	54	\$839,000	2014	2017	Ref: Lower Jones Falls SWAP
A07	Stream Restoration	Gwynns Falls	Franklintown Culvert	36	180	163	\$1,700,000	2015	2018	
A08	Stream Restoration	Back River	Lower Moore's Run Project 2	38	188	170	\$1,960,000	2015	2018	
A09	Stream Restoration	Back River	Biddison Run Project 2	45	227	206	\$3,590,000	2014	2018	
A10	Stream Restoration	Jones Falls	Western Run at Kelly Avenue	12	60	54	\$1,324,600	2015	2018	
A11	Stream Restoration	Jone Falls	East Stony Run Project 2	20	101	91	\$2,040,000	2015	2018	
A16	Stream Restoration	Jones Falls	Druid Hill Park Stream Project	28	141	128	\$2,702,000	2015	2018	Lower Jones Falls SWAP
A17	Stream Restoration	Gwynns Falls	Lower Gwynns Falls	39	195	177	\$2,702,000	2015	2018	Gwynns Falls Watershed Assessment
A18	Stream Restoration	Gwynns Falls	Lower Gwynns Falls	39	195	177	\$2,702,000	2015	2018	Gwynns Falls Watershed Assessment
A19	Stream Restoration	Gwynns Falls	Lower Gwynns Falls	35	173	156	\$2,702,000	2015	2018	Gwynns Falls Watershed Assessment

**APPENDIX E: Local Nutrient TMDL Compliance**

**Table E-2: Baltimore Harbor**

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)		Estimated Capital Cost	Schedule to Start (FY)		NOTES
					TN	TP		Design	Construction	
A20	Stream Restoration	Gwynns Falls	Dead Run	33	165	150	\$2,702,000	2016	2019	Gwynns Falls Watershed Assessment
A22	Regenerative Step Pool Storm Conveyance	Gwynns Falls	Seamon Avenue	9	146	13	\$1,168,000	2015	2017	Infrastructure improvement
A23	IA Removal, afforestation, bioretention	Baltimore Harbor	CARE Communities / McElderry Park / Milton-Montford	3.75	19.2	4.34	\$496,000	2016	2018	Ref: Direct Harbor Characterization
A24	IA Removal, afforestation	Baltimore Harbor	Harford Hts ES (HA-R19)	0.60	3.3	0.92	\$110,000	2016	2018	GGI / Green Streets
A29	IA Removal, afforestation, bioretention	Gwynns Falls	Mt. Winans	3.75	19.2	4.34	\$496,000	2016	2018	GGI / Green Streets
A30	IA Removal, afforestation, bioretention	Back River	Montebello ES (HR-R41A)	1.05	5.4	1.22	\$208,000	2016	2018	Ref: Back River SWAP
A32	IA Removal, afforestation, bioretention	Jones Falls	Pimlico ES (LJ-R6)	1.35	6.9	1.56	\$268,000	2016	2018	Ref: Lower Jones Falls SWAP
A33	IA Removal, afforestation, bioretention	Jones Falls	Poly Western HS (LJ-R8C)	1.65	8.5	1.91	\$328,000	2016	2018	Ref: Lower Jones Falls SWAP
A34	IA Removal, afforestation, bioretention	Baltimore Harbor	Duane Avenue Park - parking lot (MC-21)	0.35	1.8	0.40	\$42,000	2016	2018	Ref:Masonville Cove SWAP 2014
A35	IA Removal, afforestation	Baltimore Harbor	Oliver / Broadway East	1.75	10.9	1.59	\$496,000	2017	2019	GGI / Green Streets
A36	IA Removal, afforestation	Gwynns Falls	Carrollton Ridge / Shipley Hill / Mill Hill / Pigtown / New Southwest / Union	1.75	10.9	1.59	\$496,000	2017	2019	GGI / Green Streets
A37	IA Removal, afforestation	Baltimore Harbor	Harlem Park / Sandtown-Winchester / Uplands	0.88	10.9	1.59	\$248,000	2017	2019	GGI / Green Streets
A38	IA Removal, afforestation	Baltimore Harbor	Various Schools	0.88	10.9	1.59	\$248,000	2017	2019	GGI / Green Streets
A39	Aforestation of IA	Gwynns Falls	Central Park Heights	0.88	10.9	1.59	\$248,000	2017	2019	GGI / Green Streets
A40	Aforestation of IA	Gwynns Falls	City-wide	5.81	10.9	1.59	\$496,000	NA	2017	GGI / Green Streets
A41	Aforestation of IA	Jones Falls	City-wide	5.81	10.9	1.59	\$496,000	NA	2018	GGI / Green Streets
			<b>Subtotal Alternative BMPs:</b>	<b>533</b>	<b>2,756</b>	<b>2,278</b>	<b>\$38,957,600</b>			
			<b>Total Projects:</b>	<b>658</b>	<b>3,415</b>	<b>2,372</b>	<b>\$48,328,400</b>			
<b>Programs</b>										
	Street Sweeping				34,623	13,849				Estimated distribution based on Table 1.
	Inlet Cleaning				1,795	718				Estimated distribution based on Table 1.

**APPENDIX E: Local Nutrient TMDL Compliance**

**Table E-2: Baltimore Harbor**

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)		Estimated Capital Cost	Schedule to Start (FY)		NOTES
					TN	TP		Design	Construction	
	IDDE				5,143	935				Estimated distribution based on Table 1.
			<b>Total Programs:</b>		<b>41,561</b>	<b>15,502</b>				
<b>Partnerships</b>										
	Development				528	52				Estimated distribution based on Table 1.
	Voluntary				60	10				
	Stormwater Fee Program				280	27				Estimated distribution based on Table 1.
			<b>Total Partnerships:</b>		<b>868</b>	<b>89</b>				
<b>Total Reduction by end of MS4 Permit:</b>					<b>45,859</b>	<b>17,966</b>				
<b>% Reduction by end of MS4 Permit:</b>					18%	64%				

**Appendix F:**

**Local Sediment TMDL Compliance**

**APPENDIX F: Local Sediment TMDL Compliance**

**Table F-1: Gwynns Falls**

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant TSS (lb)	Estimated Capital Cost	Schedule to Start (FY)		NOTES
							Design	Construction	
<b>MS4 Baseline Load</b>					<b>14,410,000</b>				Listed as 7,205 tons (Table 2 of WIP)
<b>Reduction Goal</b>					<i>49%</i>				
<b>Projects</b>									
S01	SW Pond Retrofit	Gwynns Falls	Gwynns Run, Carrolton Park	25	15,525	\$505,000	2016	2018	Expansion and retrofit to increase pollutant removal efficiency
S02	SW Pond Retrofit	Gwynns Falls	SetonBusiness Park Park	41	25,169	\$795,000	2016	2018	Expansion and retrofit to increase pollutant removal efficiency
S10	Bioretention Area	Gwynns Falls	Park Hts Virginia + Homer	2	1,135	\$60,000	2016	2018	Ref: UPWP / Sabra Wang Study
<b>Subtotal Structural / Traditional:</b>				<b>68</b>	<b>41,829</b>	<b>\$1,360,000</b>			
E27	Micro-bioretention	Gwynns Falls	Howard Park / Grove Park / West Arlington / Fairmount	2.5	1,510	\$420,000	2016	2018	GGI / Green Streets
E28	Micro-bioretention	Gwynns Falls	Hunting Ridge / Rognel Hts / Edmondson Village / Edgewood	2.5	1,510	\$420,000	2016	2018	GGI / Green Streets
E33	Micro-bioretention	Gwynns Falls	Greater Mondawmin / Walbrook / Rosemont / NW Community Action /	2.5	1,510	\$438,000	2016	2018	GGI / Green Streets
E39	Micro-bioretention	Gwynns Falls	MorrellPark / Wilhelm Park / Gwynns Falls / Carroll-South Hilton	6.0	1,510	\$625,000	2017	2019	GGI / Green Streets
<b>Subtotal ESD Practices:</b>				<b>14</b>	<b>6,039</b>	<b>\$1,903,000</b>			
A01	Stream Restoration	Gwynns Falls	Leaking Park Stream Restoration at Fairmount Storm Drain	31	62,400	\$700,000	Completed	Complete	
A07	Stream Restoration	Gwynns Falls	Franklintown Culvert	36	72,000	\$1,700,000	2015	2018	
A17	Stream Restoration	Gwynns Falls	Lower Gwynns Falls	39	78,000	\$2,702,000	2015	2018	Gwynns Falls Watershed Assessment
A18	Stream Restoration	Gwynns Falls	Lower Gwynns Falls	39	78,000	\$2,702,000	2015	2018	Gwynns Falls Watershed Assessment
A19	Stream Restoration	Gwynns Falls	Lower Gwynns Falls	35	69,000	\$2,702,000	2015	2018	Gwynns Falls Watershed Assessment
A20	Stream Restoration	Gwynns Falls	Dead Run	33	66,000	\$2,702,000	2016	2019	Gwynns Falls Watershed Assessment
A22	Regenerative Step Pool Storm Conveyance	Gwynns Falls	Seamon Avenue	9	6,622	\$1,168,000	2015	2017	Infrastructure improvement
A29	IA Removal, afforestation, bioretention	Gwynns Falls	Mt. Winans	3.75	2852	\$496,000	2016	2018	GGI / Green Streets
A36	IA Removal, afforestation	Gwynns Falls	Carrollton Ridge / Shipley Hill / Mill Hill / Pigtown / New Southwest / Union	1.75	818	\$496,000	2017	2019	GGI / Green Streets



APPENDIX F: Local Sediment TMDL Compliance

Table F-1: Gwynns Falls

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant TSS (lb)	Estimated Capital Cost	Schedule to Start (FY)		NOTES
							Design	Construction	
A39	Aforestation of IA	Gwynns Falls	Central Park Heights	0.88	818	\$248,000	2017	2019	GGI / Green Streets
A40	Aforestation of IA	Gwynns Falls	City-wide	5.81	818	\$496,000	NA	2017	GGI / Green Streets
			<b>Subtotal Alternative BMPs:</b>	<b>444</b>	<b>857,329</b>	<b>\$29,843,000</b>			
			<b>Total Projects:</b>	<b>525</b>	<b>905,197</b>	<b>\$33,106,000</b>			
<b>Programs</b>									
	Street Sweeping				1,403,630				Estimated distribution based on Table 1.
	Inlet Cleaning				72,763				Estimated distribution based on Table 1.
			<b>Total Programs:</b>		<b>1,476,392</b>				
<b>Partnerships</b>									
	Development				14,943				Estimated distribution based on Table 1.
	Voluntary				1,450				
	Stormwater Fee Program				4,896				Estimated distribution based on Table 1.
			<b>Total Partnerships:</b>		<b>21,288</b>				
<b>Total Reduction by end of MS4 Permit:</b>					<b>2,402,878</b>				
<b>% Reduction by end of MS4 Permit:</b>					<b>17%</b>				

**APPENDIX F: Local Sediment TMDL Compliance**

**Table F-2: Jones Falls**

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant TSS (lb)	Estimated Capital Cost	Schedule to Start (FY)		NOTES
							Design	Construction	
<b>MS4 Baseline Load</b>					<b>9,466,000</b>				Listed as 4,733 tons (Table 2 of WIP)
<b>Reduction Goal</b>					26.3%				
<b>Projects</b>									
S11	Shallow extended detention wetland	Jones Falls	West Colspring and Brand Ave (LJ-R9)	9	4,624	\$212,000	2016	2018	Ref: Lower Jones Falls SWAP
S12	Shallow wetland	Jones Falls	Woodheights and La Plata (LJ-R38)	4	2,102	\$96,000	2016	2018	Ref: Lower Jones Falls SWAP
			<b>Subtotal Structural / Traditional:</b>	<b>13</b>	<b>6,726</b>	<b>\$308,000</b>			
E26	Micro-bioretenion	Jones Falls	Hampden / Remington / Wyman Park	5.0	3,020	\$850,000	2016	2018	GGI / Green Streets
E34	Micro-bioretenion	Jones Falls	Mt. Washington / Glen / Cheswolde / Cross Country	5.0	3,020	\$1,350,000	2016	2018	GGI / Green Streets
E38	Micro-bioretenion	Jones Falls	Central Park Heights / Towanda Grantley / Lucille Park	4.0	1,510	\$513,000	2017	2019	GGI / Green Streets
			<b>Subtotal ESD Practices:</b>	<b>14</b>	<b>7,549</b>	<b>\$2,713,000</b>			
A02	Stream Restoration	Jone Falls	Lower Lower Stony Run	68	135,000	\$4,030,000	2015	2016	Ref: Lower Jones Falls SWAP
A04	Stream Restoration	Jone Falls	East Stony Run Project 1	12	24,000	\$839,000	2014	2017	Ref: Lower Jones Falls SWAP
A10	Stream Restoration	Jones Falls	Western Run at Kelly Avenue	12	24,000	\$1,324,600	2015	2018	
A11	Stream Restoration	Jone Falls	East Stony Run Project 2	20	40,200	\$2,040,000	2015	2018	
A16	Stream Restoration	Jones Falls	Druid Hill Park Stream Project	28	56,250	\$2,702,000	2015	2018	Lower Jones Falls SWAP
A32	IA Removal, afforestation, bioretention	Jones Falls	Pimlico ES (LJ-R6)	1.35	1027	\$268,000	2016	2018	Ref: Lower Jones Falls SWAP
A33	IA Removal, afforestation, bioretention	Jones Falls	Poly Western HS (LJ-R8C)	1.65	1255	\$328,000	2016	2018	Ref: Lower Jones Falls SWAP
A41	Aforestation of IA	Jones Falls	City-wide	5.81	818	\$496,000	NA	2018	GGI / Green Streets
			<b>Subtotal Alternative BMPs:</b>	<b>149</b>	<b>282,550</b>	<b>\$12,027,600</b>			
			<b>Total Projects:</b>	<b>175</b>	<b>296,825</b>	<b>\$15,048,600</b>			

**APPENDIX F: Local Sediment TMDL Compliance**

**Table F-2: Jones Falls**

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant TSS (lb)	Estimated Capital Cost	Schedule to Start (FY)		NOTES
							Design	Construction	
<b>Programs</b>									
	Street Sweeping				1,179,049				Estimated distribution based on Table 1.
	Inlet Cleaning				61,121				Estimated distribution based on Table 1.
			<b>Total Programs:</b>		<b>1,240,170</b>				
<b>Partnerships</b>									
	Development				12,552				Estimated distribution based on Table 1.
	Voluntary				851				
	Stormwater Fee Program				4,113				Estimated distribution based on Table 1.
			<b>Total Partnerships:</b>		<b>17,516</b>				
<b>Total Reduction by end of MS4 Permit:</b>					<b>1,594,710</b>				
<b>% Reduction by end of MS4 Permit:</b>					17%				

**APPENDIX F: Local Sediment TMDL Compliance**

**Table F-3: Lower North Branch Patapsco**

MS4 WIP Project ID	BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant TSS (lb)	Estimated Capital Cost	Schedule to Start (FY)		NOTES
							Design	Construction	
<b>MS4 Baseline Load</b>					<b>1,220,000</b>				Listed as 610 tons (Table 2 of WIP)
<b>Reduction Goal</b>					<b>25.1%</b>				
<b>Structural / Traditional BMPs</b>									
E30	Micro-bioretenion	L. N. Branch Patapsco	Cherry Hill	2.5	1,510	\$500,000	2016	2018	GGI / Green Streets
A31	IA Removal, afforestation, bioretention	L. N. Branch Patapsco	Various Schools	1.76	1335	\$350,000	2016	2018	GGI / Green Streets
A42	Aforestation of IA	L. N. Branch Patapsco	City-wide	2.91	818	\$248,000	NA	2019	GGI / Green Streets
<b>Subtotal Alternative BMPs:</b>				<b>5</b>	<b>2,153</b>	<b>\$598,000</b>			
<b>Total Projects:</b>				<b>7</b>	<b>3,663</b>	<b>\$1,098,000</b>			
<b>Programs</b>									
	Street Sweeping				112,290				Estimated distribution based on Table 1.
	Inlet Cleaning				5,821				Estimated distribution based on Table 1.
<b>Total Programs:</b>					<b>118,111</b>				
<b>Partnerships</b>									
	Development				1,315				Estimated distribution based on Table 1.
	Voluntary				0				
	Stormwater Fee Program				431				Estimated distribution based on Table 1.
<b>Total Partnerships:</b>					<b>1,746</b>				
<b>Total Reduction by end of MS4 Permit:</b>					<b>123,520</b>				
<b>% Reduction by end of MS4 Permit:</b>					<b>10%</b>				

## Appendix F: Local Sediment TMDL Compliance

### Worksheet F-1: Evaluation of Sediment Loading: Gwynns Falls

Conditions:	% City	Total Area		Imp Area
		(sq. mi.)	(ac)	(ac)
Gwynns Falls	25%	20.7	13,248	6,210
Total Area		81.6	52,224	24,479

<b>TMDL Base Line</b>	<b>7,205</b>	<b>tons</b>
<b>WLA</b>	<b>3,712</b>	<b>tons</b>

#### Method 1: TSS loading listed in MAST

Baseline for City:	32,970,117	lb
% City for Gwynns Falls (area):	8,363,743	lb
	4,182	tons
Comparison to TMDL baseline loading:	58%	of TMDL baseline.

#### Method 2: Loadings by MDE Guidance

High Density	Imp	Pervious	All (avg)
TSS (tons)	0.46	0.07	0.18

Incremental loading (tons):	2,856	493	
Total Loading per Method (tons):		3,349	2,385
		tons	tons
Comparison to TMDL baseline loading:	46%	33%	of TMDL baseline.

High Density	Imp	Pervious	All (avg)
TSS (tons)	0.46	0.07	0.18

	6,133	1,058	
Area needed for TMDL baseline :	28,445	40,028	ac
Compared to actual impervious area:	215%	302%	
Compared to City area:	54%	77%	

#### Method 3: Feasibility of removal via BMP

Removal efficiency	66%	average for filtration BMPs	
TSS Removal Goal	3,493	tons	
Loading to BMP	5,292	tons	
Drainage Area	20,894	ac by inc	158% of the watershed
	29,402	ac by avg	222% of the watershed

Removal efficiency	93%	average for IA removal/ reforestation	
TSS Removal Goal	3,493	tons	
Loading to BMP	3,756	tons	
Drainage Area	14,828	ac by inc	112% of the watershed
	20,866	ac by avg	158% of the watershed



## Appendix F: Local Sediment TMDL Compliance

### Worksheet F-3: Evaluation of Sediment Loading: LNB Patapsco

Conditions:	% City	Total Area		Imp Area
		(sq. mi.)	(ac)	(ac)
Lower Patapsco	2.2%	1.8	1,152	540
Total Area		81.6	52,224	24,479

<b>TMDL Base Line</b>	<b>610</b>	<b>tons</b>
<b>WLA</b>	<b>457</b>	<b>tons</b>

#### Method 1: TSS loading listed in MAST

Baseline for City	32,970,117	lb
% City for Jones Falls (area):	727,282	lb
	364	tons
Comparison to TMDL baseline loading:	60%	of TMDL baseline.

#### Method 2: Loadings by MDE Guidance

High Density	Imp	Pervious	All (avg)
TSS (tons)	0.46	0.07	0.18

Incremental loading (tons):	248	43	
Total Loading per Method (tons):		291	207
		tons	tons
Comparison to baseline loading:		48%	34%

High Density	Imp	Pervious	All (avg)
TSS (tons)	0.46	0.07	0.18

	519	90	
Area needed for TMDL baseline :	2,408	3,389	ac
Compared to actual impervious area:	209%	294%	
Compared to City area:	5%	6%	

#### Method 3: Feasibility of removal via BMP

Removal efficiency	66%	average for filtration BMPs	
TSS Removal Goal	153	tons	
Loading to BMP	232	tons	
Drainage Area	915	ac by inc	79% of the watershed
	1,288	ac by avg	112% of the watershed

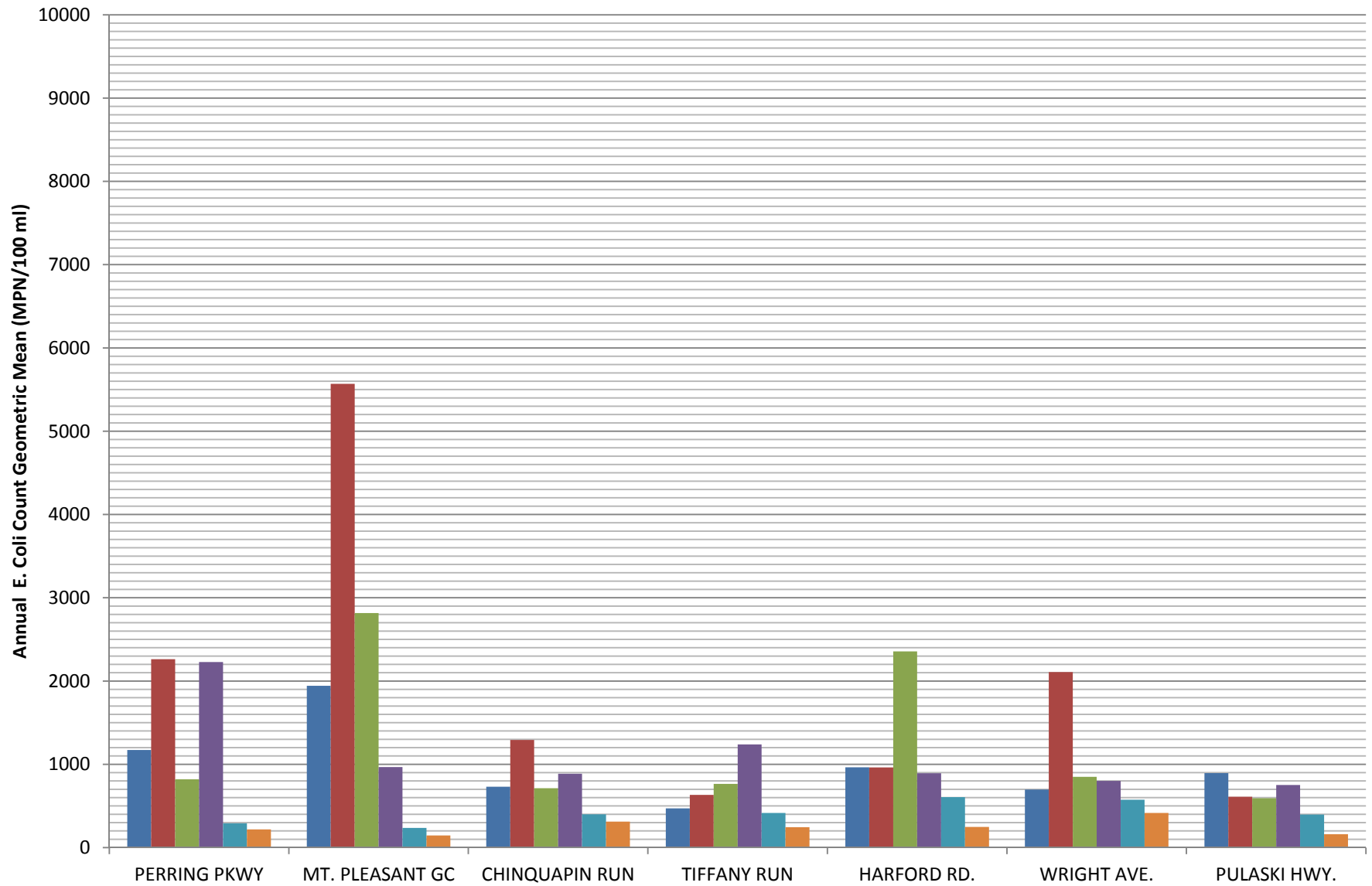
Removal efficiency	93%	average for IA removal/ reforestation	
TSS Removal Goal	153	tons	
Loading to BMP	165	tons	
Drainage Area	649	ac by inc	56% of the watershed
	914	ac by avg	79% of the watershed

**Appendix G:**  
**Bacteria Monitoring Data**



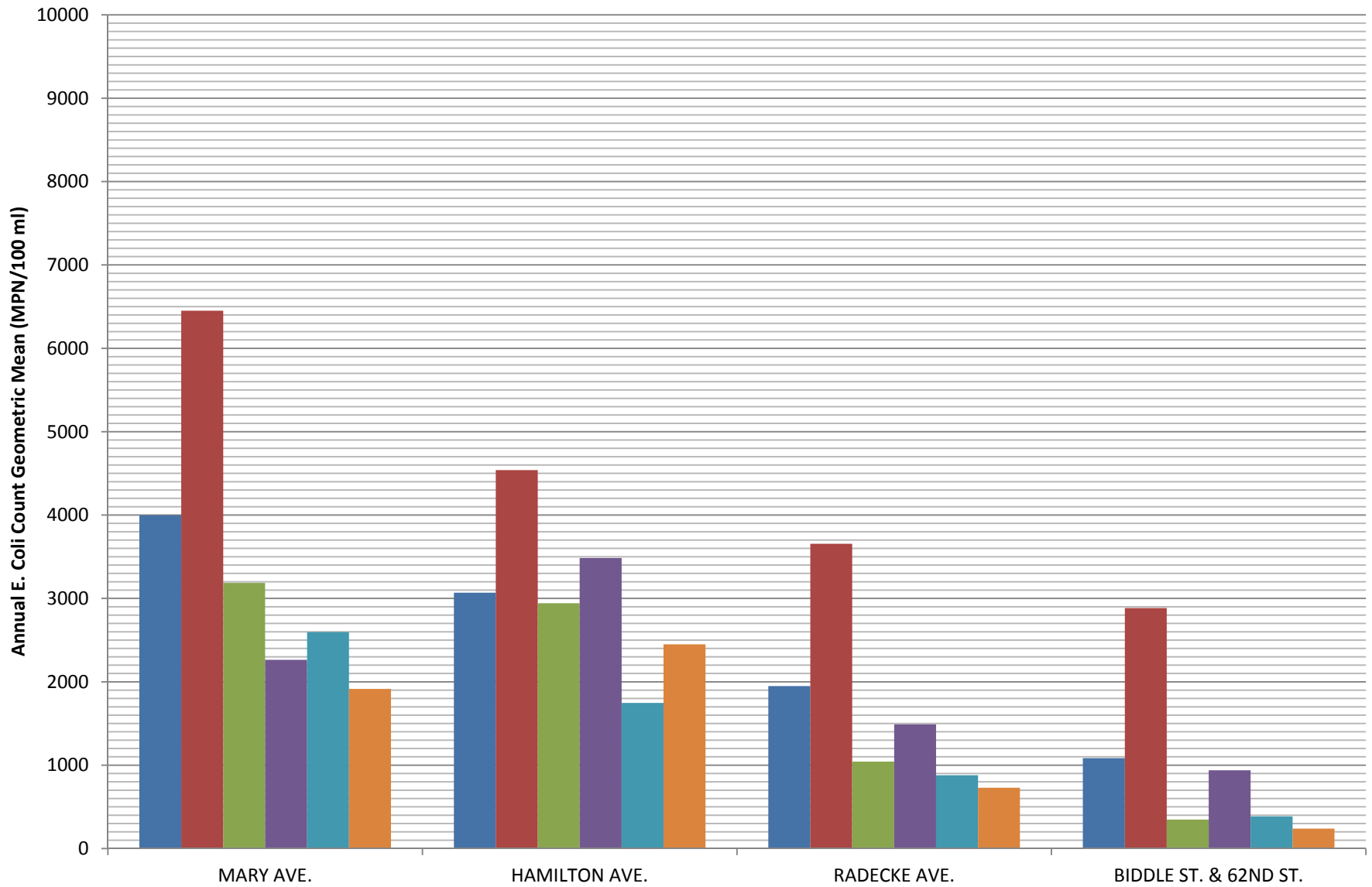
# Herring Run SIS E. Coli MPN Count Geometric Means by Year by Station

2009 2010 2011 2012 2013 2014



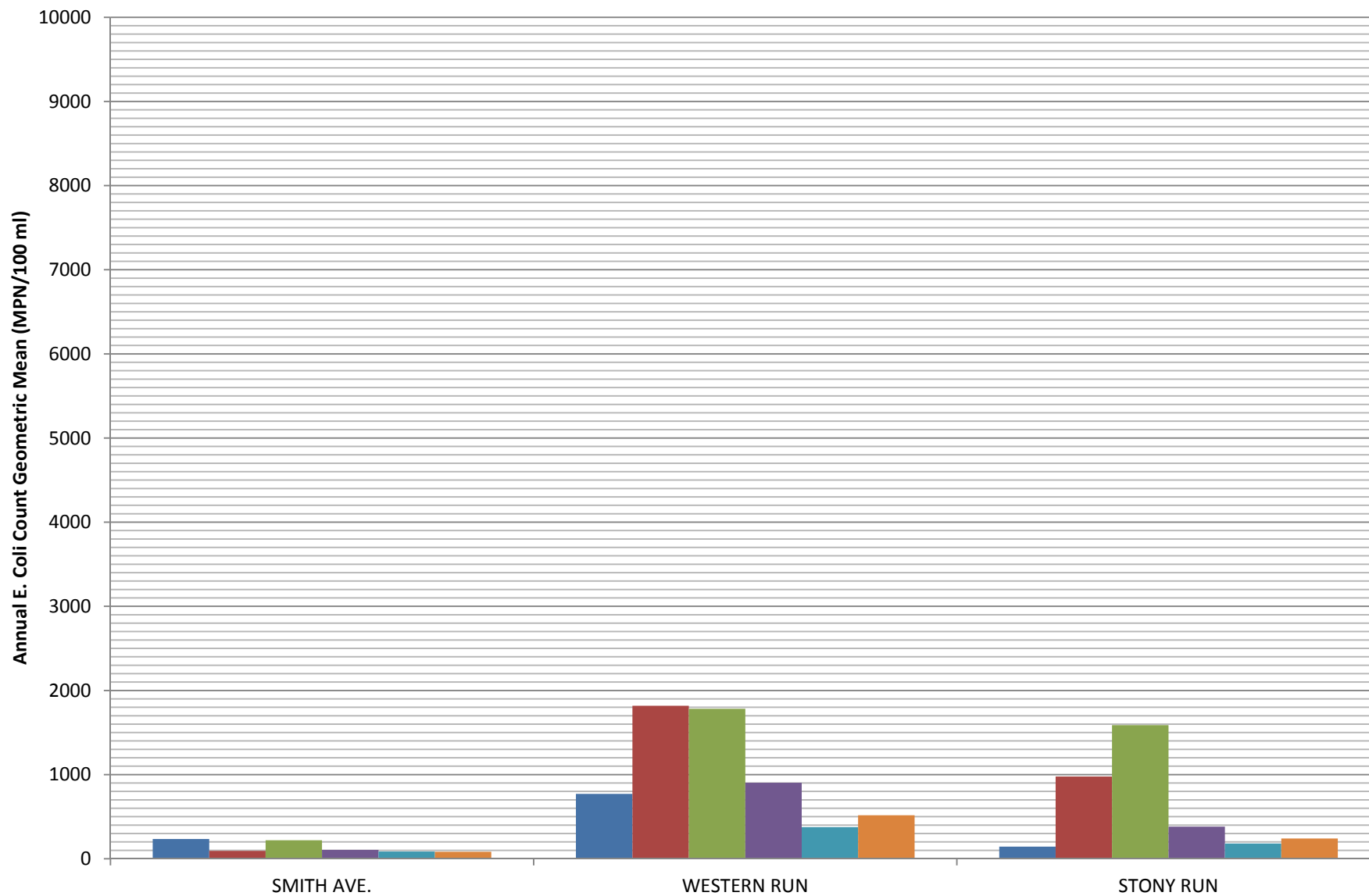
# Moores Run SIS E. Coli MPN Count Geometric Means by Year by Station

2009 2010 2011 2012 2013 2014



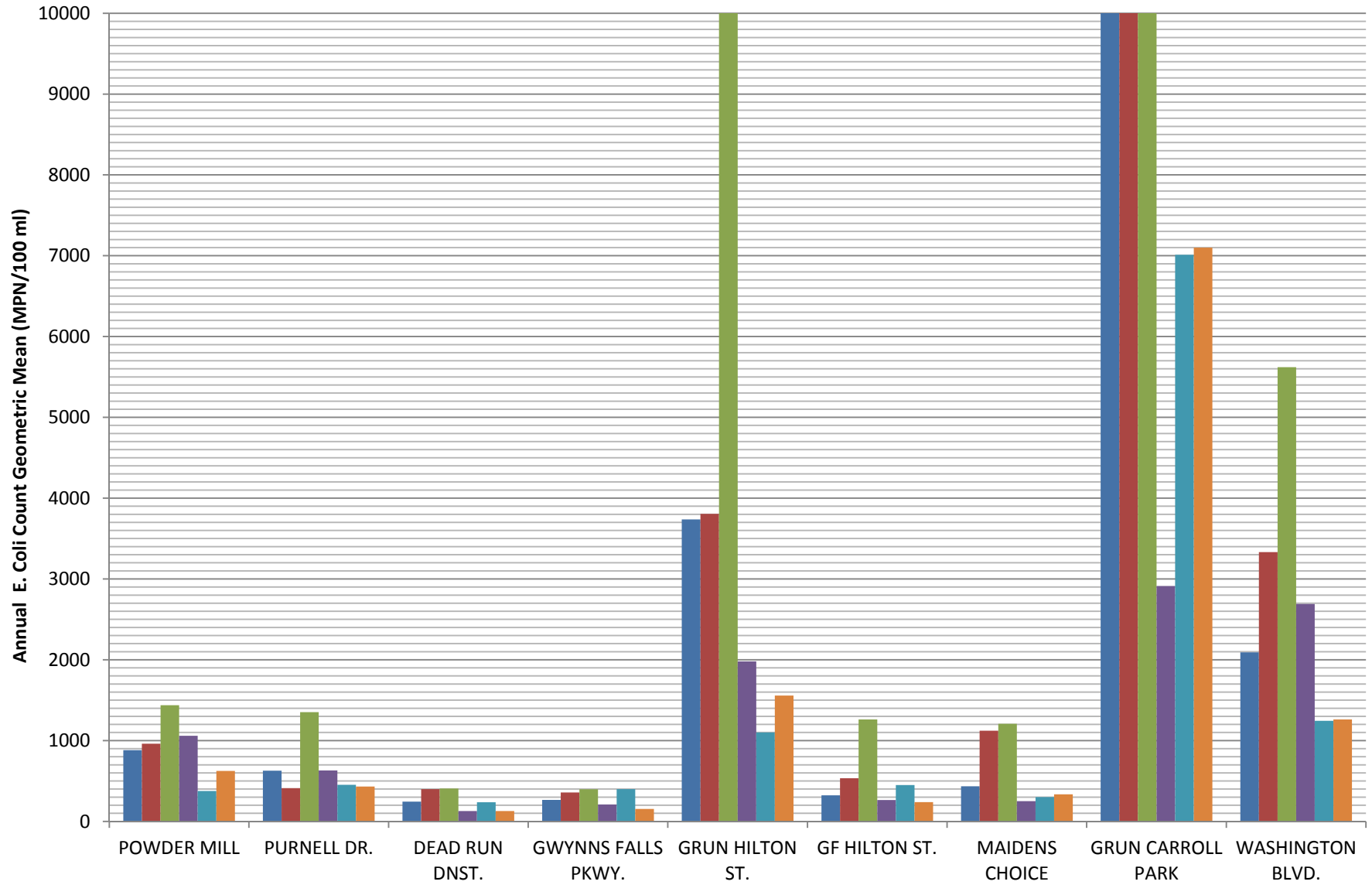
# Jones Falls SIS E. Coli MPN Count Geometric Means by Year by Station

■ 2009 ■ 2010 ■ 2011 ■ 2012 ■ 2013 ■ 2014



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

2009 2010 2011 2012 2013 2014



**Appendix H:**  
**Contingency Projects**

**APPENDIX H: Summary of Contingency Projects**

BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	NOTES
				TN	TP	TSS		
SW pond/wetland	Back River	Perring Parkway at Westfield (HR-R28A)	35.00	185	30.3	18,391	\$842,800	Back River SWAP
SW pond/wetland	Baltimore Harbor	Clifton Park Adjunct (HA-R20)	5.20	27	4.5	2,732	\$125,216	WS 246 SWAP
SW pond/wetland	Back River	Northwood ES (CH-R2B)	26.50	140	22.9	13,925	\$638,120	Back River SWAP
SW pond/wetland	Back River	Walter P. Carter ES (TI-R2)	36.00	190	31.1	18,917	\$866,880	Back River SWAP
Bioretention	Back River	Clifton Park (HR-R38B)	2.30	12	2.0	1,209	\$422,625	Back River SWAP
Bioretention	Baltimore Harbor	Faring Baybrook Park (MC-11C)	2.36	12	2.0	1,240	\$470,876	Ref: Masonville Cove SWAP 2014
Streambank Stabilization	Gwynns Falls	Westport	4.00	8	7	3,000	\$258,000	NFWF grant proposal 2014
Warner Street living shoreline and wetlands	Baltimore Harbor	Middle Branch- Warner Street	2.00	4	3	1,500	\$48,230	NFWF grant proposal 2014
Stream Restoration	Back River	Herring Run East Branch: Reach A, E	9.90	12.4	11.2	4,950	\$178,329	Herring Run Stream Assessment
Stream Restoration	Back River	Herring Run: Reach J, K	9.90	12.4	11.2	4,950	\$178,329	Herring Run Stream Assessment
Stream Restoration	Back River	Armistead Run	4.95	6.2	5.6	2,475	\$89,164	Herring Run Stream Assessment
Stream Restoration	Back River	Herring Run: Reach Reach R, S, W	4.95	6.2	5.6	2,475	\$89,164	Herring Run Stream Assessment
Micro-bioretention	Baltimore Harbor	Curtis Bay ES/MS parking lot (MC-17a)	0.93	0.1	0.1	28	\$47,777	Masonville Cove SWAP 2014
Micro-bioretention	Back River	North Harford Rec Center Parking Lot (HR-R3)	1.00	0.1	0.1	30	\$183,750	Back River SWAP
Micro-bioretention	Back River	Mt. Pleasant Park at Perring Parkway (HR-R10)	0.80	0.1	0.1	24	\$147,000	Back River SWAP
Micro-bioretention	Baltimore Harbor	Fayette and Caroline streets (HA-R16)	1.20	0.1	0.1	36	\$220,500	WS 246 SWAP
Micro-bioretention	Jones Falls	Tamarind and Springarden (LJ-R3)	0.80	0.1	0.1	24	\$147,000	Lower Jones Falls SWAP
Wet Swale	Direct Harbor	Empty lot southwest of Shell Road and I-895 (MC-31)	0.77	0.1	0.1	23	\$2,564	Masonville Cove SWAP 2014
Micro-bioretention	Baltimore Harbor	Ben Franklin HS (MC-3a)	0.1	0.3	0.05	30	\$15,000	Ref: Masonville Cove SWAP 2014
Micro-bioretention	Baltimore Harbor	Ben Franklin HS (MC-3b)	0.0	0.2	0.03	18	\$42,000	Ref: Masonville Cove SWAP 2014
Micro-bioretention	Baltimore Harbor	Ben Franklin HS (MC-3c)	0.0	0.2	0.03	18	\$15,000	Ref: Masonville Cove SWAP 2014

**APPENDIX H: Summary of Contingency Projects**

BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	NOTES
				TN	TP	TSS		
Micro-bioretenion	Baltimore Harbor	Faring Baybrook Park (MC-11a)	0.2	1.0	0.15	97	\$54,000	Ref: Masonville Cove SWAP 2014
Micro-bioretenion	Baltimore Harbor	Faring Baybrook Park (MC-11b)	0.1	0.7	0.10	66	\$30,000	Ref: Masonville Cove SWAP 2014
Micro-bioretenion	Baltimore Harbor	Faring Baybrook Park (MC-12a)	0.2	0.9	0.14	91	\$54,000	Ref: Masonville Cove SWAP 2014
Micro-bioretenion	Baltimore Harbor	Faring Baybrook Park (MC-12b)	0.2	1.1	0.17	109	\$60,000	Ref: Masonville Cove SWAP 2014
Micro-bioretenion	Baltimore Harbor	Faring Baybrook Park (MC-13a)	0.1	0.5	0.08	54	\$27,600	Ref: Masonville Cove SWAP 2014
Micro-bioretenion	Baltimore Harbor	Faring Baybrook Park (MC-13b)	0.2	1.0	0.16	103	\$50,400	Ref: Masonville Cove SWAP 2014
Micro-bioretenion	Baltimore Harbor	Curtis Bay ES/MS (MC-17b)	0.2	1.1	0.18	115	\$66,000	Ref: Masonville Cove SWAP 2014
Micro-bioretenion	Baltimore Harbor	Duane Ave Park (MC-23)	0.2	1.2	0.2	121	\$38,400	Ref: Masonville Cove SWAP 2014
Dry swale	Back River	Woodhome ES (RE-R1A)	0.20	0.0	0.0	6	\$4,800	Back River SWAP
Micro-bioretenion	Back River	Erdman Ave and Edison Hwy	0.22	0.0	0.0	7	\$38,808	BENI Green Streets projects / CWP
Rain Garden	Back River	Woodhome ES (RE-R1C)	0.35	0.0	0.0	11	\$61,740	Back River SWAP
Micro-bioretenion	Back River	Brehms Lane ES (HR-R14)	0.40	0.0	0.0	12	\$70,560	Back River SWAP
Micro-bioretenion	Back River	WEB DuBois HS (HR-R29C)	0.30	0.0	0.0	9	\$52,920	Back River SWAP
Permeable Paving	Back River	WEB DuBois (HR-R29B)	1.80	0.1	0.1	54	\$317,520	Back River SWAP
Permeable Paving	Back River	WEB DuBois (HR-R29D)	0.10	0.0	0.0	3	\$17,640	Back River SWAP
Permeable Paving	Back River	Woodhome ES/MS (RE-R1B)	0.50	0.0	0.0	15	\$88,200	Back River SWAP
Micro-bioretenion	Baltimore Harbor	Casino Area Master Plan	5.00	0.4	0.3	150	\$882,000	Casino Area Master Plan
Permeable Paving	Jones Falls	Poly Western HS parking (LJ-R8D)	1.67	0.1	0.1	50	\$294,588	Lower Jones Falls SWAP
Permeable Paving	Jones Falls	Cross Country ES parking (WE-R4)	0.50	0.0	0.0	15	\$88,200	Lower Jones Falls SWAP
Roof Downspout Disconnect	Jones Falls	Fallstaff MS (WE-R6B)	1.25	0.1	0.1	38	\$220,500	Lower Jones Falls SWAP
Green Roofs	Baltimore Harbor	Public Roof Space	2.0	1.9	1.7	750	\$1,980,000	Estimated available public roof space for green roof

**APPENDIX H: Summary of Contingency Projects**

BMP Type	Watershed	Location	Eq. Imp Area Restored (ac)	Estimated Pollutant Removal (lbs / yr)			Estimated Capital Cost	NOTES
				TN	TP	TSS		
Outfall Stabilization	Jones Falls	30 outfalls	60.0	0.0	0.0	0	\$2,250,000	Stormwater Asset Management
Outfall Stabilization	Gwynns Falls	20 outfalls	40.0	0.0	0.0	0	\$1,500,000	
Outfall Stabilization	Back river	50 outfalls	100.0	0.0	0.0	0	\$3,750,000	
<b>Total Contingency Identified:</b>			<b>164.21</b>	<b>626.39</b>	<b>140.87</b>	<b>77,867.95</b>	<b>\$9,526,200</b>	