

# BALTIMORE CITY MS4 AND TMDL WATERSHED IMPLEMENTATION PLAN

## EXECUTIVE SUMMARY

The Baltimore City Municipal Separate Storm Sewer System (MS4) and Total Maximum Daily Load (TMDL) Watershed Implementation Plan (WIP) is a requirement of the City's MS4 Permit, which was issued on December 27, 2013. The WIP is a plan for achieving the 20% restoration requirement set out in the permit, in addition to attaining applicable waste load allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body.

The WIP presents the strategies to meet the restoration and TMDL goals as specified in the current MS4 permit. Specifically, the WIP will provide the basis for the City to:

1. Provide Best Management Practices (BMPs) to restore an equivalent of 20% of the existing impervious area which stormwater runoff is not currently 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 coverage area includes the land within the legal City boundary, plus the properties owned by the City associated with Back River Wastewater Treatment Plant and the drinking water reservoirs at Loch Raven, Pretty Boy and Liberty. For the purposes of the restoration and TMDL compliance conditions of the MS4 permit, the WIP will concentration on the area within the City limits, 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)

Each of the above watersheds is listed as impaired and has a TMDL associated with nutrients, sediment, bacteria, chlordane and PCBs. The City is also part of the Chesapeake Bay watershed, and therefore subject to the Chesapeake Bay TMDL (Bay TMDL) for nutrients and sediments. The Bay TMDL has been a major regulatory driver, therefore available guidance documents were focused on the pollutant loadings based on impervious area and the correlation of BMPs to quantified reductions of nutrients and sediment, as associated with equivalent impervious area reduction. Illicit discharge detection and elimination (IDDE) programs will be used to reduce the loadings of the other pollutants.

The City is characterized as an ultra-urban environment that is characterized by high densities of paved surfaces and buildings which result in a high degree of stormwater runoff. Not only is 45% of the city impervious, but much of its storm drain infrastructure is 100 years or older. This means that there is limited space for installing stormwater management facilities, with increased installation costs due to demolition and removal of existing pavement, relocation of existing utilities and structures and the installation of off-site soils. Additionally, the City

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contains approximately 14,000 vacant lots, with 19% of households in Baltimore live below the poverty line. This impacts the City's ability to manage and fund infrastructure improvements.

However, the City is slowly growing in population, and new development occurring in many neighborhoods. The Baltimore Harbor is an asset for tourism, economic development, and industry, with efforts like the Healthy Harbor Plan focusing renewed attention and resources on its health and the health of its tributaries. Finally, there are several initiatives, including 21<sup>st</sup> Century Schools, Growing Green, and TreeBaltimore, that are bringing together environmental non-profits and other partners to work collaboratively on improving the City. These factors have all guided the development of the WIP.

### Six Pillars of Practical Watershed Planning

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

1. Plan for more projects than you need: contingency projects were identified.
2. Plan for resources that will affect funding needs: public lands, local and re-purposed materials, and local labor forces were emphasized.
3. Plan to maintain: long-term maintenance resources and costs were evaluated.
4. Plan to be a part of a bigger picture: existing environmental, social, and economic development initiatives in the City were considered.
5. Plan for effective public participation: various stakeholders were engaged to develop The WIP and will continue to be engaged during the implementation and maintenance phases.
6. Plan to adapt: methods for tracking and reporting were identified, in addition to a plan for annual evaluation and adaptive management to reflect changes in regulatory guidance documents, legal mandates, and technologies.

### Meeting our Goals

To meet the 20% restoration goal, the City will restore an equivalent of 4,041 acres of impervious area. Given the ultra-urban nature of Baltimore, a diverse and comprehensive approach for meeting our restoration and TMDL requirements is needed. This includes:

- Installing stormwater management projects, including traditional Best Management Practices (BMPs), Environmental Site Design (ESD) practices, and Alternative BMPs (1,191 equivalent impervious acres);
- Employing a variety of programs to improve water quality, including mechanical street sweeping, preventive inlet cleaning, and IDDE (2,766 equivalent impervious acres); and
- Fostering partnerships to encourage private development of stormwater management (279 equivalent impervious acres).

Installing projects by far will restore the greatest amount of equivalent impervious acres (see Appendix A)<sup>1</sup>. A goal of identifying and prioritizing projects is to build on existing capital projects and 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;

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<sup>1</sup> The projected impervious acres restored identified in the WIP is 4,822. A higher than needed goal is proposed in order to accommodate project feasibility, accepted credits, and other factors that may arise during the coverage period of the WIP.

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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.

Finally, Baltimore City believes that by meeting, or exceeding, our MS4 restoration requirements, we will be on track to meet our TMDL goals. Restoring 20% of our currently untreated impervious surfaces will result in a reduction on the order of 40,000 lbs nitrogen, 15,000 lbs of phosphorus, and 2,400 tons of sediments by the end of the permit period. Education and enforcement programs focused on illicit discharges, in concert with water and sanitary sewer infrastructure improvements, will also result a reduction of bacteria. Monitoring program focused on illicit discharges will address the TMDL for chlordane and PCB.

### **Public Outreach**

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. DPW 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.

### **Maintenance**

Having a successful restoration program does not stop with the installation of the facilities. Currently, each City agency is responsible for the stormwater BMPs that it installs. It has been agreed 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. This team will maintain all city-owned BMPs, regardless of the agency that installed or is responsible for the facility.