Maryland Port Administration
Water Quality Master Plan Summary

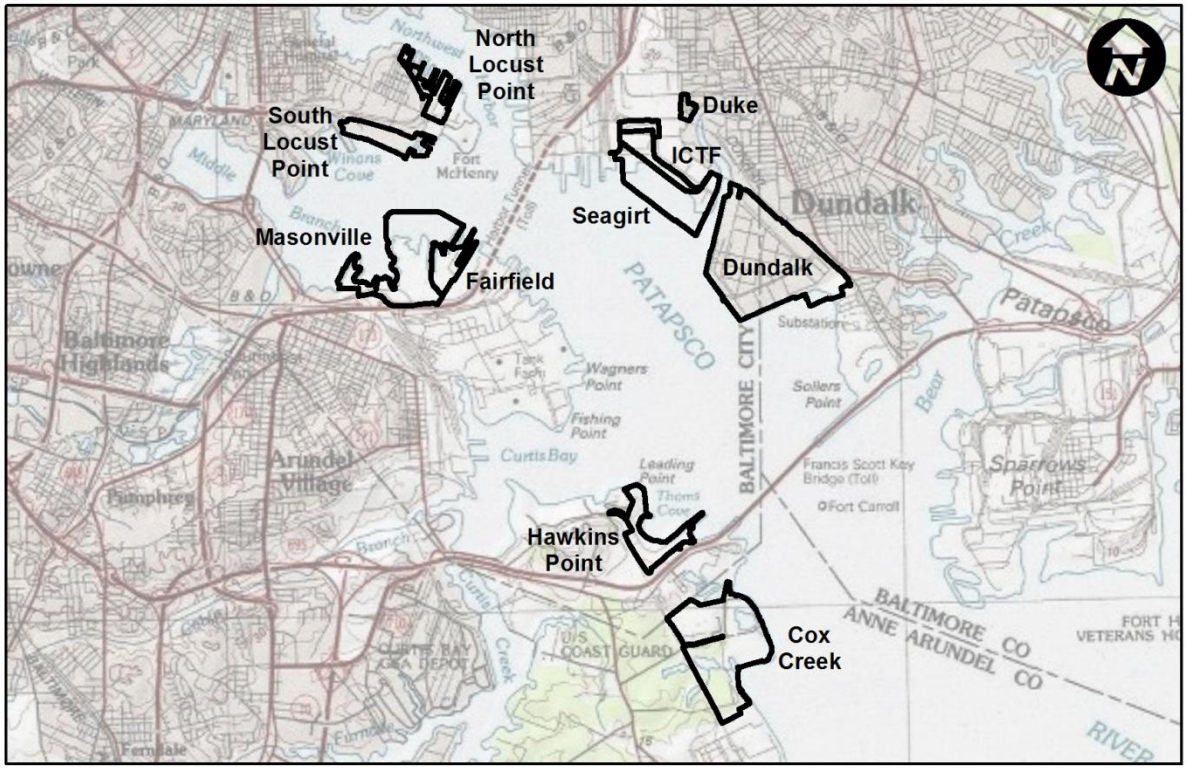
INTRODUCTION

The MPA is committed to the stewardship of the Chesapeake Bay, including the wildlife that depends on aquatic and shoreline habitat. As part of that effort, MPA is working to reduce the impact of stormwater runoff from its facilities, which was the genesis for this project and the Water Quality Management Plan (WQMP). The goal of the plan is to help the MPA meet National Pollutant Discharge Elimination System (NPDES) Municipal Separate Stormwater System (MS4) permit requirements and the need for pollutant load reductions from the Chesapeake Bay nutrient and sediment Total Maximum Daily Load (TMDL).

The plan was developed to provide a description of existing conditions, potential pollutant sources, existing stormwater controls, recommendations for improvements, and an implementation plan.
To support MPA's reporting requirements, the plan provides:

- Inventory of existing stormwater controls, delineation of drainage areas, and calculations of both impervious and pervious treated and untreated area.
- Modeling of existing nutrient and sediment loads and an estimate of pollutant reductions from existing controls using methods compatible with the Chesapeake Bay TMDL.
- Analysis of potential for stormwater retrofits and non-structural measures and recommendations for those that are appropriate for MPA facilities.
- Concepts and cost estimates for specific stormwater retrofits and estimates of pollutant load reductions from recommended treatment measures.

Plans were included for ten marine terminals and properties owned by the MPA: Cox Creek, Duke, Dundalk, Fairfield, Hawkins Point, the Intermodal Container Transfer Facility, Masonville, North and South Locust Point, and Seagirt.



LAND COVER

The land use analysis found, that pavement is the primary land cover. Because of the nature of port operations, particularly for containers and automobile and construction equipment, a great deal of open, paved space is required. Scrub/shrub was the second most prevalent land cover, made up of open areas near the shoreline at Masonville, Cox Creek, and Hawkins Point

terminals. Buildings were also a significant part of the land cover, primarily from cargo sheds at Dundalk and South Locust Point.

Land Cover by Terminal or Property

	Abandoned Pier	Building	Construction	Gravel	Landfill	Pavement	Railroad	Riprap	Scrub/Shrub	Tank	Turf	Water	Total
Cox Creek		15.1	25.5	4.5		21.4	0.9	0.8	128.7		7.3	47.8	252.0
Duke						13.6			0.2		0.4		14.2
Dundalk		42.0				528.7	2.3		2.2		1.9		577.1
Fairfield	2.2	1.4				57.5		1.2	0.6	0.0	3.7		66.6
Hawkins Point		0.6		3.1	7.6	7.9	3.3	1.1	41.7	1.4	37.2	7.4	111.3
ICTF		0.1		1.6		54.4	5.6		0.6		1.5		63.8
Masonville		2.4		0.8		93.2		0.2	62.7		21.9	3.2	184.4
North Locust Point	0.4	11.5		3.6		46.6	2.2	0.2	0.6	2.0	0.4	0.3	67.8
Seagirt		2.0		6.7		199.2	1.3	1.5			3.8	0.7	215.2
South Locust Point		23.8				59.4	0.1	0.8	0.1		0.8		85.0
Total	2.6	98.9	25.5	20.3	7.6	1,081.9	15.7	5.8	237.4	3.4	78.9	59.4	1,637.4
Percent of Total	0.2%	6.0%	1.6%	1.2%	0.5%	66.1%	1.0%	0.4%	14.5%	0.2%	4.8%	3.6%	100.0%

Land Cover, Dundalk, Seagirt, and ICTF

STORMWATER MANAGEMENT

Most of the development of MPA's terminals took place before stormwater management was required in the 1980s. Even so, there is a fairly large amount of stormwater treatment already in place.

All of the terminals and properties had at least some level of water quality

Masonville Surface Sand Filter

treatment. FMT and MMT, which were constructed or renovated after stormwater management regulations were in place, had the largest amount of existing treatment, at 81 and 84 percent respectively. The two largest, most active sites, DMT and SMT, have only small areas with stormwater treatment; by small conventional systems, hydrodynamic separators and inlet filters in the case of DMT, and inlet filters and wet storage at SMT.

Overall, the MPA is currently treating 16 percent of its impervious area with structural controls. The controls range in pollutant removal effectiveness from sand filters, wet ponds, and a shallow marsh in MMT, to hydrodynamic structures and inlet filters at several of the terminals, to underground dry detention storage at FMT, which only provides sedimentation.

Existing Treatment, Dundalk, Seagirt and ICTF

STORMWATER RETROFITS

Proposed Improvements – On-site Conventional BMPs

The assessment of potential retrofit sites conducted for each terminal and property resulted in seven recommended projects. They provide treatment for an additional 28 impervious acres. All of the proposed BMPs provide relatively high removal rates for all of the pollutants of concern.

Proposed Improvements – Area-Wide Alternative BMPs

Following the assessment for conventional stormwater management practices, alternative techniques were analyzed and are anticipated to be more feasible to implement given the constraints of Port facilities and operations. These area-wide alternatives were assessed and sized based on treating a unit impervious area, without siting them at specific locations. Two were conventional BMPs: underground wet vaults and permeable pavers. Two were alternative BMPs: hydrodynamic separators, catch basin filters, and a proprietary underground filter. Two were pollution prevention methods: street sweeping and catch basin cleaning, and one was a mitigation approach: floating treatment wetlands.

TMDL ISSUES

In the Phase II Watershed Improvement Plan (WIP), the Bay Program and MDE have allocated pollutant removal targets for larger NPDES MS4 permittees. They have not yet been allocated to smaller MS4 permittees; as a result, the reductions MPA will have to meet were not established as of the publication of this plan. However, using the loads and reductions from the WIP, MPA's targets were estimated to be a 32% reduction in nitrogen and 46% reduction in phosphorus.

Of the on-site conventional BMPs, the bioswales at MMT and FMT, the underground sand filter at NLP, and the bioretention retrofit at SLP all meet or exceed the target removal rates. Depending on the removal rate approved by the Bay Program, the NLP wet vault may meet the phosphorus target as well. However, while these BMPs have rates that could achieve the targeted goals, the area that can feasibly be treated with them is so limited that the overall load reduction targets cannot be met with this approach.

Of the area-wide alternatives, all but four, the hydrodynamic separators, catch basin filters, street sweeping, and catch basin cleaning, meet the targeted removal rates. This again depends on Bay Program acceptance of proposed rates for wet vaults, proprietary filters, and floating treatment wetlands. With the exception of the floating treatment wetlands, however, the area-wide approaches with the highest removal rates and a large area of coverage are the least cost-effective.

The challenge in meeting the WIP targets is two-fold: MPA can only address improvements in one source sector for pollutant loads to the Bay: urban stormwater. Most other NPDES MS4 permittees addressing the issue have the option of meeting the targets through reductions of loads in agriculture, stormwater, septic systems and wastewater. For these permittees, loads that can't be removed with stormwater retrofits may be achievable through other sectors.

Second, the MPA's options for retrofitting stormwater loads are limited because of site constraints. For example, some of the other options open to counties are to expand urban tree canopies; reduce lawn fertilizer; restore wetlands and plant streamside buffers. None of these improvements to natural features are applicable to the MPA's facilities.

In short, there are not a lot of options for the MPA to meet the ultimate phosphorus targets. There are three possible approaches moving forward:

- Work with MDE and the Bay Program to set target expectations more applicable to the urban stormwater sector for highly impervious sites.
- Work with MDE and the Bay Program to update removal efficiencies for area-wide alternatives such as street sweeping, where monitoring studies show better results than are currently credited.
- Work offsite to offset MPA stormwater loads in other areas within the Baltimore Harbor watersheds, which has the potential for allowing the MPA to meet its permit and TMDL goals.