



**Annual Report on Financial Assurance Plans and
the Watershed Protection and Restoration
Program
-2017-**

Prepared by:
The Maryland Department of the Environment

Prepared for:
Governor Larry Hogan
**The Senate Education, Health, and Environmental Affairs
Committee**
The House Environment and Transportation Committee

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For further information concerning this document contact:

Sediment, Stormwater, and Dam Safety Program
Water and Science Administration
Maryland Department of the Environment
Baltimore, MD 21230
410-537-3543
www.mde.maryland.gov

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I. Introduction

In May 2015, revisions to Maryland’s stormwater management program, passed by the General Assembly and signed into law by Governor Larry Hogan, did away with mandatory stormwater remediation fees. These revisions resulted in new fiscal reporting requirements for Maryland’s ten largest urban jurisdictions, which are Baltimore City and Anne Arundel, Baltimore, Carroll, Charles, Frederick, Harford, Howard, Montgomery, and Prince George’s Counties.

One of the new reporting requirements, financial assurance plans (FAPs), needs to demonstrate how stormwater restoration projects are going to be paid for over the next five years. The budget information included in the FAPs provides the financial roadmap for complying with the Environmental Protection Agency’s (EPA) Chesapeake Bay total maximum daily loads (TMDLs), also known as the “pollution diet” for the Bay. These plans, submitted on July 1, 2016, and every two years thereafter, are to be completed by each National Pollutant Discharge Elimination System (NPDES) Phase I municipal separate storm sewer system (MS4) jurisdiction. The plans must include the following:

- All actions required to meet MS4 permit requirements
- Annual and projected five year costs necessary to meet the impervious surface restoration plan (ISRP) requirements
- Annual and projected five year revenues that will be used toward meeting the ISRP requirement
- Any and all sources of funds used toward meeting MS4 permit requirements
- All specific actions and expenditures undertaken in the previous fiscal years to meet the ISRP requirement

In the first submission of the FAPs each jurisdiction was required to show its financial ability to pay for restoration practices. Specifically, the FAPs were required to demonstrate sufficient funding for meeting 75% of the projected ISRP costs for the two year period immediately following the filing of the plan. Local governing bodies were required to hold public hearings and sign the plans for accuracy prior to submitting them to the Maryland Department of the Environment (MDE) for review. The law requires that MDE shall:

- Post FAPs on its website within 14 days of receipt
- Make a decision regarding the adequacy of these plans within 90 days of receipt
- Submit an annual evaluation of these plans to the Governor and the General Assembly by September 1st each year

A second reporting requirement for each MS4 jurisdiction, excluding Montgomery County, was to submit a Watershed Protection and Restoration Program (WPRP) Annual Report by July 1, 2016. Following the 2016 Annual Reports, these jurisdictions must also submit reports every year thereafter on the anniversary date of its MS4 permit. The Annual Report requires the following items:

- The number of properties, if any, subject to a stormwater remediation fee

- Any funding structure developed by the county or municipality, if any, including the amount of money collected from each classification of property assessed a fee
- The amount of money deposited into the Watershed Protection and Restoration Fund (WPRF) in the previous fiscal year by source
- The percentage and amount of funds in the local WPRF spent on each of the stormwater management purposes defined in the law
- All stormwater management projects implemented by the jurisdiction in the previous fiscal year for the ISRP requirement

This *Annual Report on Financial Assurance Plans and the Watershed Protection and Restoration Program, 2017*, (FAP Annual Report), fulfills the requirement of § 4-202.1(j)(7), Environment Article of the Annotated Code of Maryland. MDE's Executive Summary is included below, followed by statewide analyses of BMPs and funding structures. Next are summaries of each MS4's current implementation status and case studies on public-private partnerships and other innovative methods that are being employed to improve efficiencies and reduce costs. Because FAPs are only required biennially, implementation updates in this report come from the most recent MS4 annual reports submitted to MDE. For ease of comparing with last year's implementation, MDE's 2016 FAP Annual Report is included as Appendix E. Finally, MDE provides a summary of where Maryland's stormwater community stands in relation to Chesapeake Bay milestones and the challenges ahead. This report is the culmination of numerous local and State employees' hard work and the support of many elected officials. All are commended for their effort in developing and implementing these very important environmental programs for improving local water resources and restoring the Chesapeake Bay.

II. Primary Information

Table 1: Significant Dates for Financial Assurance Plans (FAPs) and Watershed Protection and Restoration Program (WPRP) Annual Reports

MS4 Jurisdiction	FAP Submission Date	WPRP Annual Report Submission Date	Date of Public Hearing for FAP	FAP Approved by Local Governing Body (Y/N)	MDE Determination of Sufficient Funding (75%)
Anne Arundel County	6/28/2016	6/28/2016	7/5/2016	Y	10/17/2016
Baltimore City	7/1/2016	7/1/2016	6/8/2016	Y	10/17/2016
Baltimore County	7/13/2016	7/1/2016	9/13/2016	Y	10/17/2016
Carroll County	6/30/2016	7/27/2016	6/9/2016	Y	10/17/2016
Charles County	6/29/2016	6/29/2016	6/7/2016	Y	10/17/2016
Frederick County	6/28/2016	6/28/2016	8/15/2016	Y	10/17/2016
Harford County	6/24/2016	6/24/2016	6/14/2016	Y	10/17/2016
Howard County	7/1/2016	7/1/2016	6/20/2016	Y	10/17/2016
Montgomery County	7/1/2016	n/a	6/14/2016	Y	10/17/2016
Prince George's County	6/30/2016	6/30/2016	10/11/2016	Y	10/17/2016

III. Executive Summary

Anne Arundel, Baltimore, Carroll, Charles, Frederick, Harford, Howard, Montgomery, and Prince George’s Counties, and Baltimore City submitted comprehensive information on local projects for meeting Impervious Surface Restoration Plan (ISRP) requirements, including:

- Upland Practices: wet ponds, swales, infiltration, dry wells, rain gardens, green roofs, permeable pavement, rainwater harvesting, submerged gravel wetlands
- In-Stream Practices: shoreline management, outfall stabilization, stream restoration
- Programmatic Practices: street sweeping, inlet cleaning, storm drain vacuuming

MDE approved each municipal separate storm sewer system’s (MS4) impervious acre baseline analysis (except for Fredrick County), which sets the 20% level of restoration required under the stormwater permits. MDE also determined that each MS4’s financial assurance plan (FAP) had sufficient revenue for funding at least 75% of the ISRP requirements during State fiscal years (FY2017 and FY2018). See Appendix A for MDE’s review of each MS4 plan and guidance for future implementation.

Current Implementation

- Statewide, the specific actions implemented by the MS4s for meeting ISRP requirements through FY 2016 are 31% completed (see Table 2).

Table 2: Specific Actions Completed Through FY2016 to Meet ISRP Permit Requirements

MS4	Impervious Acre (IA) Baseline ¹	IA Accepted by MDE (Y/P/N) ²	Acres Restored	Restoration Complete ³
Anne Arundel County	5,862	Y	912	15.6%
Baltimore City	4,291	Y	3,624	84.5%
Baltimore County	6,036	Y	983	16.3%
Carroll County	2,032	Y	1,328	65.4%
Charles County	1,480	Y	253	17.1%
Frederick County	1,013	P	161	15.8%
Harford County	2,218	Y	453	20.4%
Howard County	2,460	Y	1,028	41.8%
Montgomery County	3,778	Y	1,918	50.8%
Prince George's County	6,105	Y	225	3.7%
Totals:	35,275		10,885	30.9%

1. Updated baseline from FY2016 MS4 Annual Reports
 2. Yes/Pending/No
 3. Restoration data from FY2016 FAPs and MS4 Annual Reports

- Overall, the MS4s are projecting completion of 95% of the ISRP requirement by the end of their permits’ five-year term.

Closing the Implementation Gap

- The next FAP submittals to MDE, due between December - February FY2019, must show how each jurisdiction can fund 100% of its ISRP requirement by the end of its permit term.
- MDE's 20% restoration requirement in the MS4 permits has stretched local jurisdictions to the fullest extent of their implementation capabilities. While most have shown that they have the fiscal ability to pay for these projects, other constraints, e.g., sufficient contractor design and construction capacity, are making full restoration through traditional stormwater management practices by the end of the permit term difficult.
- Numerous MS4s are utilizing public-private partnership (P3s) for driving costs down and improving implementation efficiency. Some of the more common P3s include:
 - Creating incentives through stormwater fee reductions to leverage homeowner installation of restoration practices
 - Leveraging bonds and grants in order to provide financial assistance to private property owners for implementing stormwater restoration projects
 - Streamlining local approval procedures through design and build on call contracts
 - Reducing costs and risks through pay-for-performance with the private sector
 - Partnering with private business enterprises for increasing procurement and implementation efficiencies
- MDE anticipates proposing trading regulations this year that have the potential of lowering MS4 implementation costs through the purchase of less expensive nutrient credits from the agriculture and wastewater treatment sectors.
- MS4s that have projected trading with local wastewater treatment plants in their FAPs have shown that the cost per impervious acre treated can be reduced from \$42,092 to \$25,383 (see Tables 3 and 4 below).
- While P3s and pollutant trading show great promise in closing the MS4 permit implementation gap, there are other rising costs on the horizon. These include the long-term maintenance of BMPs and the eventual replacement of BMPs (facility life spans average 20 to 30 years). These costs will need to be accounted for in future FAPs.

Table 3: Cost per Acre for Completed and Projected Projects in Jurisdictions that Proposed Trading to meet the ISRP Five Year Permit Term Requirements*							
MS4	Impervious Acre (IA) Baseline ¹	IA Accepted by MDE (Y/P/N) ²	Acres Completed and Projected to be Restored ³	Cost ³	Cost per Acre	Restoration Completed and Projected ⁴	
Anne Arundel County	5,862	Y	4,682	\$94,117,808	\$20,102	79.9%	
Baltimore County	6,036	Y	6,061	\$148,596,014	\$24,519	100.4%	
Charles County	1,480	Y	1,500	\$34,902,646	\$23,261	101.4%	
Frederick County	1,013	P	746	\$28,837,574	\$38,680	73.6%	
Harford County	2,218	Y	2,279	\$46,388,000	\$20,354	102.8%	
Subtotal Trading	16,609		15,268	\$352,842,042	\$25,383	91.9%	

Table 4: Cost per Acre for Completed and Projected Projects in Jurisdictions that did not Propose Trading to meet the ISRP Five Year Permit Term Requirements							
MS4	Impervious Acre (IA) Baseline ¹	IA Accepted by MDE (Y/P/N) ²	Acres Completed and Projected to be Restored ³	Cost ³	Cost per Acre	Restoration Completed and Projected ⁴	
Baltimore City	4,291	Y	4,588	\$112,040,918	\$24,420	106.9%	
Carroll County	2,032	Y	1,964	\$30,386,235	\$15,468	96.7%	
Howard County	2,460	Y	1,745	\$105,838,122	\$60,661	70.9%	
Montgomery County	3,777	Y	3,629	\$230,814,187	\$63,604	96.1%	
Prince George's County	6,105	Y	6,211	\$287,603,535	\$46,309	101.7%	
Subtotal Without Trading	18,665		18,137	\$766,682,997	\$42,092	97.2%	

1 Updated baseline from FY2016 MS4 Annual Reports

2 Yes/Pending/No

3 Restoration data obtained from the 2016 FAPs

4 Percent of untreated impervious surfaces restored toward meeting the impervious surface area requirement

* Trading regulations are being promulgated to allow for this treatment option

IV. Statewide BMP and Funding Analyses

BMPs

MDE has encouraged MS4s to implement a wide range of BMPs that are effective for pollutant removal and meeting restoration requirements. Restoration may be achieved by a suite of practices that fall into one of three general categories: upland, in-stream, and programmatic. Figure 1 shows an analysis of the BMPs being implemented in the 10 Phase I MS4s during the current five-year permit term. Based on the impervious acres restored, there are similar rates of implementation for programmatic and upland practices, 39% and 38%, respectively, while 23% is being restored through in-stream practices.

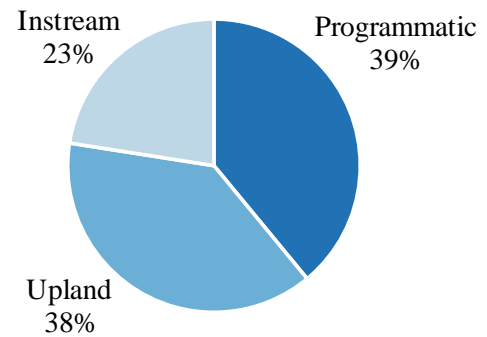


Figure 1: Completed and Projected BMP Implementation by Category during the Permit Term

The following is an analysis of the BMP diversity within each category of BMP.

Upland BMPs

- The three groups of upland BMPs with the greatest sum of impervious area treated are ponds (2,628 acres), filtering practices (1,842 acres), and wetlands (1,526 acres).
- ESD practices (i.e., micro-scale practices, nonstructural techniques, and alternative surfaces) only account for approximately 3% of the total impervious acres treated in the 10 Phase I MS4s.

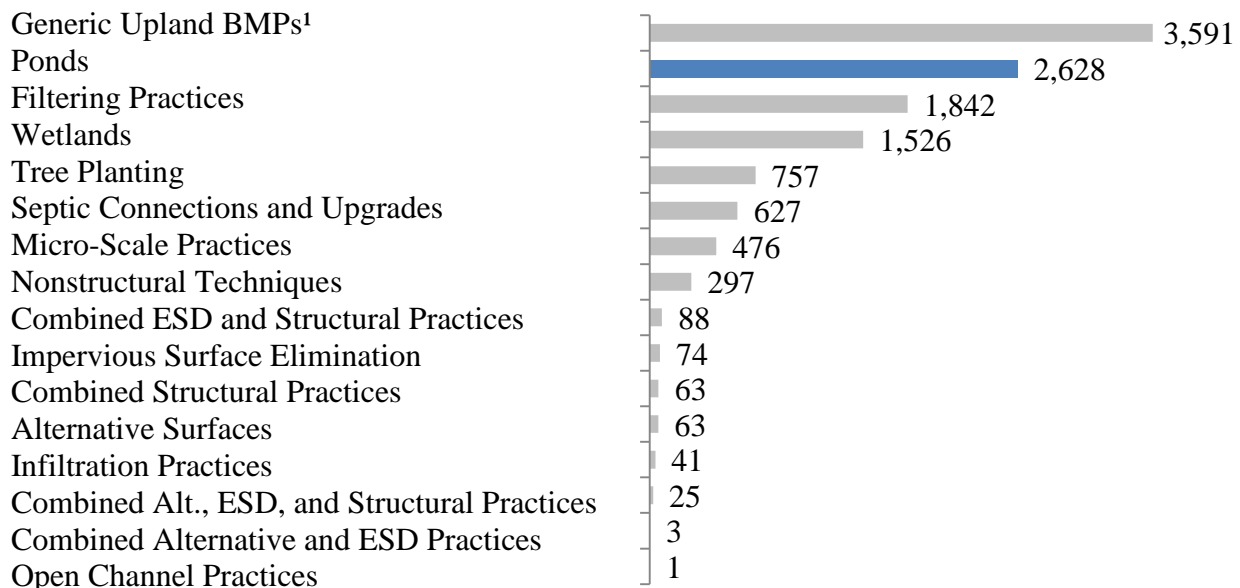


Figure 2: Impervious Acres Restored by Upland BMPs*

¹ “Generic Upland BMPs” includes unspecified upland practices that are part of volunteer, retrofit, conversion, redevelopment, and new BMP projects.

*Restoration data obtained from FY2016 FAPs. See Appendices.

In-stream BMPs

- Stream restoration is the most abundant in-stream practice and accounts for 4,725 acres of restored acres in the ten jurisdictions. This is equivalent to approximately 15% of the treated impervious acres in the 10 MS4s.

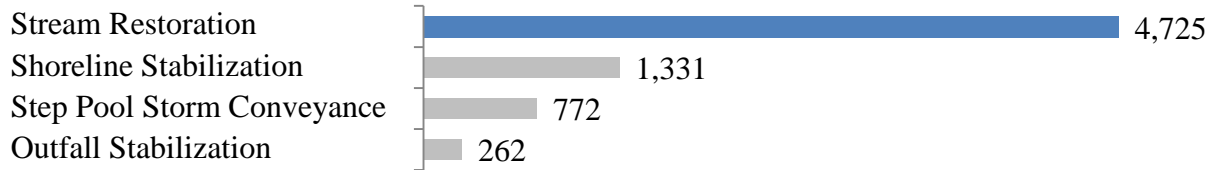


Figure 3: Impervious Acres Restored by In-stream BMPs*

*Restoration data obtained from FY2016 FAPs. See Appendices.

Programmatic BMPs

- Street sweeping is the most widely used programmatic BMP and accounts for approximately 6,024 of the impervious acres being treated throughout the 10 MS4s. This is equivalent to 19% of the treated impervious acres in the 10 MS4s.

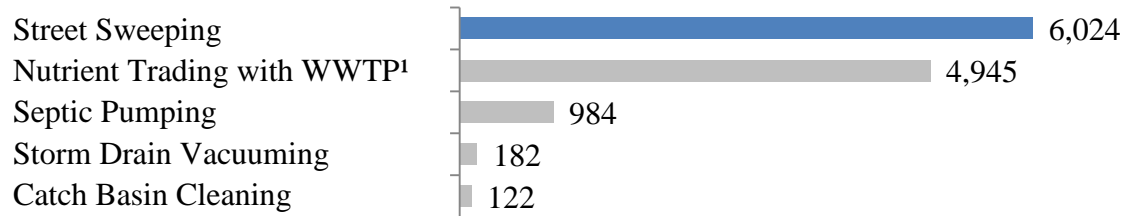


Figure 4: Impervious Acres Restored by Programmatic BMPs*

¹ While proposed by several MS4s, trading regulations are being promulgated to allow for this treatment option

*Restoration data obtained from FY2016 FAPs. See Appendices.

Funding Sources

The Watershed Protection and Restoration Program (WPRP) provides MS4 jurisdictions with the flexibility to charge a fee or dedicate funds for stormwater management restoration projects. A majority of the MS4 funding in the 10 jurisdictions is achieved through dedicated fees and bond/loans (see Figure 5).

Funding Sources (cont.)

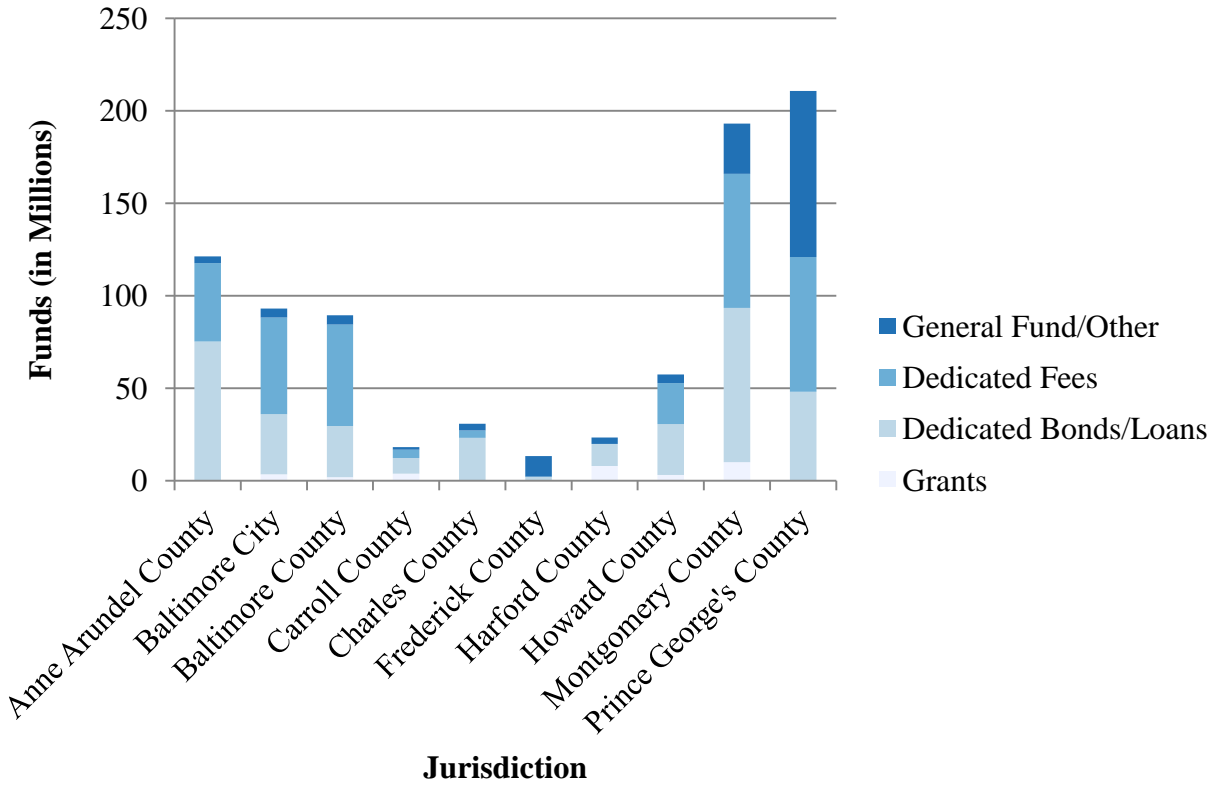


Figure 5: FY2017-2018 Funding Sources by Jurisdiction

- Dedicated bonds and loans range from 15% to 76% of funds for each MS4.
 - One option, available through MDE, is the Water Quality Revolving Loan Program, also referred to as the State Revolving Loan Fund (SRF). The SRF allows MS4s to finance water quality improvement projects through below market interest rate loans. The loans may cover up to 100% of project cost and, dependent upon the project location and benefits, interest rates in June 2017 were 0.8% or 1.6%. The FY2017 budget was \$130 million. If needed, the fund may be increased through the sale of revenue bonds.
- Phase I MS4s receive between 0% and 61% of funds through dedicated fees.
- Grants are used for between 0% to 34% of funds for each MS4.
 - The Bay Restoration Fund (BRF) is a potential source of grant funding. The BRF has an annual budget of \$60 million and once funds are allocated for upgrades to wastewater treatment facilities, MS4 jurisdictions with a system of charges may use the remaining funds to finance restoration projects beginning in FY2018.
- General funds and other sources are used for between 3% to 83% of the funds for each MS4.
- Additional MS4 funding sources may be found in Table 5.

Table 5: Additional Financing Opportunities for Maryland MS4s

State Resources		
<i>Organization</i>	<i>Program Name</i>	<i>Link</i>
Maryland Water Quality Financing Administration	Water Quality Revolving Loan Program	http://mde.maryland.gov/programs/water/WQFA/Pages/water_quality_fund.aspx
	Bay Restoration Fund Wastewater Grant Program	http://mde.maryland.gov/programs/water/BayRestorationFund/Pages/index.aspx
Maryland Department of Natural Resources	Chesapeake and Atlantic Coastal Bays Trust Fund	http://dnr.maryland.gov/ccs/Pages/funding/trust-fund.aspx
	Chesapeake & Coastal Service Funding Opportunities (Various)	http://dnr.maryland.gov/ccs/Pages/funding/fundingopp.aspx
Maryland Sea Grant College at the University of Maryland	“Green Streets, Green Jobs, Green Towns” Grant Program	http://www.cbtrust.org/grants/g3
	Maryland Watershed Restoration Assistance Directory (Various)	http://ww2.mdsg.umd.edu/wra/
Sustainable Maryland	Grants Portal (Various)	http://sustainablemaryland.com/grants-resources/grants-portal/
National Resources		
<i>Organization</i>	<i>Program Name</i>	<i>Link</i>
Environmental Protection Agency	Green Infrastructure Funding Opportunities (Various)	https://www.epa.gov/green-infrastructure/green-infrastructure-funding-opportunities
	Water Finance Clearinghouse	https://ofmpub.epa.gov/apex/wfc/f?p=165:1:.....
National Fish and Wildlife Foundation	Technical Capacity Grants Program	http://www.nfwf.org/chesapeake/Pages/technical-capacity.aspx

V. County Analyses

Anne Arundel County

Impervious Acre Baseline: 5,862 **Restored Acres:** 912 **Remaining Restoration Acres:** 4,950

- Percent of restoration requirement met to date: 16%
- Projected acres to be restored by the County by the end of permit: 4,682
- Projected restoration cost for entire permit term: \$94,117,808
- Cost per acre for completed and projected projects during the entire permit term: \$20,102
- Projected impervious acre restoration requirement met by end of permit term: 80%
- Estimated funding gap to complete MS4 restoration requirements: \$22,959,635

Current Implementation

MDE determined that Anne Arundel County's FAP demonstrated sufficient funding to meet 75% of its projected ISRP costs for FY2017 and FY2018 (see Appendix A). The County is required to submit a FAP to MDE on February 12, 2019 that shows sufficient funding for implementing 100% of its ISRP. While the County is still experiencing a significant implementation and funding gap toward meeting 100% of its ISRP, it continues to explore how P3s may help to get them across the goal line.

Closing the Implementation Gap: Pay for Performance

Anne Arundel County recently took an important step in creating more cost effective performance-based financing processes. In August 2016, the County issued a \$5,000,000 request for proposals (RFP) to solicit the most cost-effective stormwater management practices on private lands throughout the County. The goal is to maximize the amount of impervious surfaces treated at the lowest cost. The RFP's focus is on practice performance, i.e., the level of impervious



Figure 6: Anne Arundel County Step Pool Storm Conveyance

(Anne Arundel County WPRP. 2017, February 3)

acres treated, and the level of nitrogen, phosphorus, and sediment pollution reduced. The approach effectively incentivizes project performance and efficiency. In fact, recent implementation has indicated that BMPs are being constructed at 40% of their prior cost. In addition to the enhanced performance, the RFP also incentivizes long-term maintenance of the stormwater management practices and a financing strategy that transfers the implementation risk to the private sector.

Baltimore City

Impervious acre baseline: 4,291

Restored acres: 3,624

Remaining Restoration Acres: 667

- Percent of restoration requirement met to date: 84%
- Projected acres to be restored by the City by the end of permit: 4,588
- Projected restoration cost for entire permit term: \$112,040,918
- Cost per acre for completed and projected projects during the entire permit term: \$24,420
- Projected impervious acre requirement met by end of permit term: 107%
- Estimated funding gap to meet MS4 restoration requirements: None

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Current Implementation

MDE determined that Baltimore City's FAP demonstrated sufficient funding to meet 75% of its projected ISRP costs for FY2017 and FY2018 (see Appendix A). The City is required to submit a FAP to MDE on December 27, 2018 that shows sufficient funding for implementing 100% of its ISRP. While the City appears to have the wherewithal to meet 100% of its ISRP, which is attributable to an aggressive street sweeping program, it should continue to explore how P3s and other innovative strategies may increase efficiencies and further drive costs down.

Closing the Implementation Gap: Small Haulers Program

In April 2017, the City developed the Small Haulers Program at the Northwest Transfer Station to provide a more convenient and affordable location for trash haulers to dispose of refuse. Prior to this program, there was only one legal option for waste disposal: the Quarantine Road landfill, located in southern Baltimore City. Past illegal dumping of trash and larger debris on vacant lots appeared to be related to this lack of options.

Although this program is still in its early stages, the City has already seen many small haulers taking advantage of it. Over the course of only three months, 5,535 paying small haulers used the facility and approximately 3,171 tons of waste were collected. Preliminary 3-1-1 data has shown a decrease in illegal dumping service requests in the areas around the transfer station. The success of this program could be heightened with a proposed third location at a new transfer station in eastern Baltimore City. Additionally, the revenue collected from haulers can be used to increase enforcement efforts within the City. While nutrient reductions and impervious acre credits have yet to be established for this program, progress toward local trash TMDLs are being achieved.

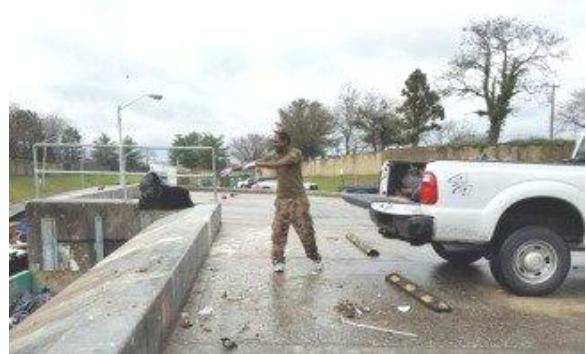


Figure 7: Small Hauler Disposing Refuse
(Baltimore City DPW)

Baltimore County

Impervious acre baseline: 6,036 **Restored acres:** 983 **Remaining Restoration Acres:** 5,053

- Percent of restoration requirement met to date: 16%
- Projected acres to be restored by the County by the end of permit: 6,061
- Projected restoration cost for entire permit term: \$148,596,014
- Cost per acre for completed and projected projects during the entire permit term: \$24,519
- Projected impervious acre requirement met by end of permit term: 100%
- Existing funding gap to meet MS4 restoration requirements: None

Current Implementation

MDE determined that Baltimore County’s FAP demonstrated sufficient funding to meet 75% of its projected ISRP costs for FY2017 and FY2018 (see Appendix A). The County is required to submit a FAP to MDE on December 23, 2018 that shows sufficient funding for implementing 100% of its ISRP. While the County appears to have the fiscal wherewithal to meet 100% of its ISRP, a significant implementation gap remains. The County continues to explore how P3s may increase efficiencies and further drive costs down.

Closing the Implementation Gap: Leveraging Homeowner Participation

Perhaps the most common and long-standing P3 mechanism is the connection between local stormwater program managers and local ratepayers. Several MS4 communities in Maryland are using a variety of funding and financing mechanisms to incentivize more effective homeowner engagement in their stormwater programs. For example, since 2010, Baltimore County has conducted annual sales of 55 gallon rain barrels. These rain barrels, valued at \$120, are delivered in bulk and sold for a discounted price of \$50. As shown in Table 6, for FYs 2014 and 2015, Baltimore County reported achieving approximately two acres of restoration credit, at no cost to the jurisdiction, through the sale of rain barrels. Baltimore County has also hosted a similar annual tree sale which, in FYs 2014 and 2015, sold enough trees to receive credit for approximately six acres of restoration.

Table 6: Restoration in Baltimore County through the Sale of Rain Barrels and Trees

Practice	Fiscal Year	Amount Sold	Acres Treated	Cost (\$)
Rain Barrels	2014	505	1.0	0
	2015	523	1.1	0
Tree Planting	2014	652	2.5	0
	2015	780	3.0	0
Total			7.6	

Carroll County

Impervious Acre Baseline: 2,032 **Restored Acres:** 1,328 **Remaining Restoration Acres:** 704

- Percent of restoration requirement met to date: 65%
- Projected acres to be restored by the County by the end of permit: 1,964
- Projected restoration cost for entire permit term: \$30,386,235
- Cost per acre for completed and projected projects during the entire permit term: \$15,468
- Projected impervious acre requirement met by end of permit term: 97%
- Existing funding gap to meet MS4 restoration requirements: \$701,923

Current Implementation

MDE determined that Carroll County's FAP demonstrated sufficient funding to meet 75% of its projected ISRP costs for FY2017 and FY2018 (see Appendix A). The County has largely met its ISRP through an aggressive stormwater management pond retrofit program. The County is required to submit a FAP to MDE on December 29, 2018 that shows sufficient funding for implementing 100% of its ISRP. The County continues to explore how P3s may help them to meet minor implementation and funding gaps toward achieving 100% of its ISRP.

Closing the Implementation Gap: Leveraging Grant Money



Figure 8: Double Pipe Creek Tree Planting

Carroll County has a long history of working with private property owners for protecting natural resources and providing restoration opportunities. The Double Pipe Creek Tree Planting #2 Project for MS4 restoration credit is a good example of how leveraging grant money can work. The project's funding was provided by a Department of Natural Resources (DNR) grant for planting 10.5 acres of trees on 12 private properties in the Double Pipe Creek watershed. The project cost was \$63,898 and generated 3.5 acres of impervious acre credit at \$18,257 per acre. The sites were planted in May 2015, and maintenance will continue until May 2018. Carroll County will assume the long-term maintenance costs.

Charles County

Impervious Acre Baseline: 1,480 **Restored Acres:** 253 **Remaining Restoration Acres:** 1,227

- Percent of restoration requirement met to date: 17%
- Projected acres to be restored by the County by the end of permit: 1,500
- Projected restoration cost for entire permit term: \$34,902,646
- Cost per acre for completed and projected projects during the entire permit term: \$23,261
- Projected impervious acre requirement met by end of permit term: 101%
- Existing funding gap to meet MS4 restoration requirements: \$3,242,200

Current Implementation

MDE determined that Charles County's FAP demonstrated sufficient funding to meet 75% of its projected ISRP costs for FY2017 and FY2018 (see Appendix A). The County is required to submit a FAP to MDE on December 26, 2018 that shows sufficient funding for implementing 100% of its ISRP. While the County is still experiencing a significant implementation and funding gap toward meeting 100% of its ISRP, it continues to explore how P3s may help to increase efficiencies and further drive costs down.

Closing the Implementation Gap: Septic System Pumping

Since FY2015, Charles County has implemented the Septic System Pump-Out Reimbursement Program to encourage households on septic systems to have their systems pumped out every three to five years. The reimbursement program is structured around an application process and, with the proper documentation, residents located within the Chesapeake Bay Critical Area of Charles County may be reimbursed 75% of the pumping cost while residents in the rest of the County may receive 50% of the pumping cost.

Pumping of septic systems is recommended to maintain the effectiveness and longevity of the system and provides a reduction of nutrient leaching over time. While an individual septic system pump-out receives a relatively low nitrogen load reduction credit (5% of the load per pump-out) and a minimal 0.03 acres of impervious surface credit per pump-out, with 17,067 septic systems the County has the potential to gain credit for a large number of pump-outs. If there was full participation in the program and one third of all septic systems were pumped-out each year, the maximum five-year impervious surface credit would be 170 acres at an annual cost of \$625,790. The five-year cost would be \$3,128,950 million, or \$18,333 per acre.

Recent implementation indicates that on average, the Septic Pump-Out program has yielded 23 acres of impervious acre credit annually (see Appendix D, Table D-1). Comparatively, the cost per acre is low given the high average cost per acre of other restoration BMPs. The cost of the program does not appear to outweigh its benefits toward restoration requirements.

Frederick County

Impervious Acre Baseline: 1,013 **Restored Acres:** 161 **Remaining Restoration Acres:** 852

- Percent of restoration requirement met to date: 16%
- Projected acres to be restored by the County by the end of permit: 746
- Projected restoration cost for entire permit term: \$28,837,574
- Cost per acre for completed and projected projects during the entire permit term: \$38,680
- Projected impervious acre requirement met by end of permit term: 74%
- Existing funding gap to meet MS4 restoration requirements: \$10,327,560

Current Implementation

MDE determined that Frederick County's FAP demonstrated sufficient funding to meet 75% of its projected ISRP costs for FY2017 and FY2018 (see Appendix A). The County is required to submit a FAP to MDE on December 30, 2018 that shows sufficient funding for implementing 100% of its ISRP. While the County is still experiencing a significant implementation and funding gap toward meeting 100% of its ISRP, it continues to explore how P3s may help to get them across the goal line.

Closing the Implementation Gap: Creek ReLeaf Program

Frederick County's Creek ReLeaf Program is a multi-year reforestation program geared towards replanting trees on both private and public lands. Through this program, the County hopes to provide stormwater control, reduce temperature impacts on streams, and assist in its efforts to meet regulatory requirements. In the program's first year, the County anticipated planting native trees on 45 acres of private property and 40 acres of public property. However, the County received 19 applications from private property owners with 158 acres available for tree planting.

On a yearly basis, proposed reforestation areas will be ranked and prioritized using criteria such as project size, forest connectivity, proximity to a stream with high or poor water quality, the presence of Brook Trout within the watershed, and nearby restoration efforts. Applicants who are selected for the program will work with County staff to develop the permanent conservation easement and will be financially compensated at a rate of \$9,000 per acre. The County will plant the trees and perform the first five years of maintenance. Following this period, the property owner will assume maintenance responsibility and the reforested area will be inspected by Frederick County staff every three years to ensure conservation easement compliance.



Figure 9: Frederick County Tree Planting

Harford County

Impervious Acre Baseline: 2,218 **Restored Acres:** 453 **Remaining Restoration Acres:** 1,765

- Percent of restoration requirement met to date: 20%
- Projected acres to be restored by the County by the end of permit: 2,279
- Projected restoration cost for entire permit term: 46,388,000
- Cost per acre for completed and projected projects during the entire permit term: \$20,354
- Projected impervious acre requirement met by end of permit term: 103%
- Existing funding gap to meet MS4 restoration requirements: \$2,920,000

Current Implementation

MDE determined that Harford County's FAP demonstrated sufficient funding to meet 75% of its projected ISRP costs for FY2017 and FY2018 (see Appendix A). The County is required to submit a FAP to MDE on December 30, 2018 that shows sufficient funding for implementing 100% of its ISRP. While the County is still experiencing a significant implementation and funding gap toward meeting 100% of its ISRP, it continues to explore how innovative procurement practices may help to increase efficiencies and further drive costs down.

Closing the Implementation Gap: Design and Build on Call Contracts

In Spring 2017, Harford County completed its largest project to-date: four water quality facilities and approximately one mile of stream restoration. In total, this project treated 65.8 impervious acres for \$2.2 million. With a below average cost per acre of \$33,680, the County believes that this reduction is a direct result of economies of scale. Through the pursuit of large restoration efforts as well as the continued use of design and build on call contracts, the County foresees accelerated implementation and lower costs.



Figure 10: Harford County Water Quality Improvement Project - Before and After
(Harford County Watershed Protection and Restoration Office)

Howard County

Impervious Acre Baseline: 2,460 **Restored Acres:** 1,028 **Remaining Restoration Acres:** 1,432

- Percent of restoration requirement met to date: 42%
- Projected acres to be restored by the County by the end of permit: 1,745
- Projected restoration cost for entire permit term: \$105,838,122
- Cost per acre for completed and projected projects during the entire permit term: \$60,661
- Projected impervious acre requirement met by end of permit term: 71%
- Existing funding gap to meet MS4 restoration requirements: \$39,471,345

Current Implementation

MDE determined that Howard County's FAP demonstrated sufficient funding to meet 75% of its projected ISRP costs for FY2017 and FY2018 (see Appendix A). The County has made significant progress toward meeting its restoration goals through the construction of wet ponds, ESD facilities, filtering practices, and swales. The County is required to submit a FAP to MDE on December 18, 2018 that shows sufficient funding for implementing 100% of its ISRP and continues to explore how P3s may help them to meet its remaining requirements.

Closing the Implementation Gap: Leveraging Homeowner Participation

Howard County utilizes an incentive-based program, called "CleanScapes", to encourage homeowners to install BMPs on their property, i.e., dry-wells, green roofs, rain barrels, rain gardens, and permeable pavements. As part of the program, the County provides instructional information on installation, where to find materials, and available contractors. The County budgets funds from the WPRF to reimburse up to 50% of a BMP's cost. Homeowners are also able to receive a credit incentive in the form of an annual percentage reduced from their Watershed Protection Fees.

After installing BMPs, homeowners are required to access an online tracking tool and input data on the practice. Upon submitting information through the online tool and completing the application forms, a certified inspector will survey the practice to ensure that it was properly installed. The County's FAP reported that through the CleanScapes program, in FY2014 - FY2015, rain gardens were installed that treated a total of 2.4 impervious acres for a reported \$72,000 in cost, or \$30,000 per impervious acre (this amount only reflects the cost to the County and did not factor in costs to the homeowners).



Figure 11: Howard County Homeowner Rain Garden

Montgomery County

Impervious Acre Baseline: 3,778 **Restored Acres:** 1,918 **Remaining Restoration Acres:** 1,860

- Percent of restoration requirement met to date: 51%
- Projected five-year acres to be restored by the County: 3,629
- Projected five-year restoration cost: \$230,814,187
- Cost per acre for completed and projected projects: \$63,604
- Projected five-year impervious acre requirement met: 96%
- Existing funding gap to meet MS4 restoration requirements: \$9,476,996

Current Implementation

MDE determined that Montgomery County's FAP demonstrated sufficient funding to meet 75% of its projected ISRP costs for FY2017 and FY2018 (see Appendix A). The County is required to submit a FAP to MDE on February 16, 2019 that shows sufficient funding for implementing 100% of its ISRP. While the County is still experiencing a significant implementation and funding gap toward meeting 100% of its ISRP, it continues to explore how P3s may help to get them across the goal line.

Closing the Implementation Gap: Pay for Performance

Montgomery County allocated \$10.2 million to have restoration projects done under a pay for performance contracting approach. The RFP solicitation requested proposals for green infrastructure projects as well as traditional BMP approaches. This approach relies on the contractor to absorb the financial risk up front where the payment for services is only provided after project completion and the County has certified that a credit will be provided.



Figure 12: Montgomery County Green Infrastructure

The selected projects will provide 174 acres of treatment, at a cost of \$29,000 per acre, through multiple pond retrofit projects and 120 acres of treatment, at a cost of \$38,000 per acre, through a stream restoration project. This is a significant decrease when compared to costs for recent projects being completed through traditional contracts (i.e., \$74,000 per acre for pond retrofits and \$85,000 per acre for stream restoration projects). The development, evaluation, and selection process provided invaluable lessons learned such as: having clear requirements concerning minority and female business participation; clearly defining eligibility areas for projects; simplifying the number of BMP types to be funded; and ensuring clear evaluation criteria concerning cost effectiveness.

Prince George's County

Impervious Acre Baseline: 6,105 **Restored Acres:** 225 **Remaining Restoration Acres:** 5,880

- Percent of restoration requirement met to date: 4%
- Projected acres to be restored by the County by the end of permit: 6,211
- Projected restoration cost for entire permit term: \$287,603,535
- Cost per acre for completed and projected projects during the entire permit term: \$46,309
- Projected impervious acre requirement met by end of permit term: 102%
- Existing funding gap to meet MS4 restoration requirements: \$40,444,420

Current Implementation

MDE determined that Prince George's County's FAP demonstrated sufficient funding to meet 75% of its projected ISRP costs for FY2017 and FY2018 (see Appendix A). The County is required to submit a FAP to MDE on January 2, 2019 that shows sufficient funding for implementing 100% of its ISRP. While the County is still experiencing a significant implementation and funding gap toward meeting 100% of its ISRP, it continues to explore how P3s may help to increase efficiencies and further drive costs down.

Closing the Implementation Gap: Contracting with Private Business Enterprises

Prince George's County entered into a significant P3 as a business enterprise, known as the Clean Water Partnership. Under the terms of the 30-year partnership, the County plans to invest \$100 million, including a \$50 million low interest loan from MDE's Water Quality Finance Administration, and the selected business enterprise will manage the design, construction and long-term maintenance of stormwater management practices for 2,000 impervious acres. The partnership was established to reduce stormwater restoration implementation costs but also as an opportunity to provide a variety of environmental and community needs. For example, by making stormwater management an integral part of the County's economy, the partnership is designed to drive local economic development, specifically through the use of small and minority-owned businesses for at least 40% of the total project scope.

Initial analysis suggests that the Clean Water Partnership has already significantly increased the rate of implementation in Prince George's County from 139 impervious acres of implementation in FY2016 to 689 impervious acres by March 31, 2017, an increase of nearly 500%. Additionally, due to increases in implementation efficiencies, the cost per impervious acre restored for all project costs, including design, construction and program administration will continue to average less than the recognized regional costs. Though the Prince George's County P3 model will not be appropriate for all jurisdictions across the State, initial analysis suggests that the Clean Water Partnership project has the potential to reduce costs and improve capacity given the right circumstances within partner communities.

VI. Summary

Maryland's MS4 permits and ISRP requirements are an integral part of the State's strategy to ensure that all pollution control measures needed to restore the Chesapeake Bay are in place by 2025. Perhaps no other environmental program in Maryland is more challenged in reaching this goal than the State's stormwater management program. Maryland's 10 largest urban jurisdictions have been tasked with reducing their stormwater pollutant loads even as their communities continue to grow. Indeed, the restoration requirements in the MS4 permits have stretched these local jurisdictions to the fullest extent of their capabilities. Even so, Maryland's MS4s in aggregate have completed 31% of their ISRP requirement and are on course for meeting 95% of the ISRP requirement by permits' end.

A critical concept that needs to be employed in order for each of these jurisdictions to meet their final restoration goal is adaptive management, which requires making an informed projection of what is required to achieve that goal. As implementation proceeds, goal achievement should be evaluated and the management plan modified in accordance with a better understanding of what is working and what is not. In this vein, numerous MS4s are experimenting with public-private partnership (P3s) and other innovative practices for driving costs down and improving BMP implementation efficiency. Some of the more common approaches include:

- Creating incentives through stormwater fee reductions to leverage homeowner installation of restoration practices
- Leveraging bonds and grants in order to provide financial assistance to private property owners for implementing stormwater restoration projects
- Streamlining local approval procedures through design and build on call contracts
- Reducing costs and risks through pay-for-performance with the private sector
- Partnering with private business enterprises for increasing procurement and implementation efficiencies

Additionally, MDE in coordination with a broad stakeholder work group, is embarking upon nutrient trading as a new mechanism for meeting the significant pollutant load reductions needed for the restoration of Chesapeake Bay. In fact, MDE anticipates promulgating trading regulations this year that will have the potential of lowering MS4 implementation costs through the purchase of less expensive nutrient credits from the agriculture and wastewater treatment sectors. While P3s and nutrient trading show great promise in closing the MS4 permit implementation gap, there are other rising costs on the horizon. These include the long-term maintenance and eventual replacement of BMPs. These costs will need to be accounted for in future FAPs and strategies for maintaining Chesapeake Bay water quality.

VII. Definitions

Annual escalation: The practice of adjusting current values to account for future increases.

Annual escalation can account for increases in value of labor and materials.

Appropriation: Authorization from the legislation to spend money from a specific funding source for the purposes allowed by law. Appropriations specify both the amount and funding source. Appropriations must be approved before a contract mechanism can be approved.

BMP: Best Management Practice; these include structural practices (e.g., filters, ponds, wetlands), ESD (e.g., grass swales, rain barrels, green roofs), and alternative practices (e.g., outfall stabilization, septic pumping, street sweeping, tree planting).

Budget: Plan or authorization for revenues and expenditures within a fixed period of time.

CIP: Capital improvement plan; A project must cost more than \$250,000 and be associated with a specific asset which will depreciate over time.

Debt service: Portion of capital expenditures which is paid using mechanisms to extend the payment over a specified period of time. Debt service mechanisms include bonds and loans, which include costs for administration and interest.

Encumbrance: Commitment of money to meet an obligation for goods and services. Once a contract or agreements is approved, the money is encumbered into the budget to secure those funds.

EPA: United States Environmental Protection Agency

ESD: Environmental site design (also referred to as 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, like micro-bioretenion.

Expenditure: The amount of money that is actually spent.

FAP: Financial Assurance Plan; state required five-year projection of funding and expenses related to the MS4 permit and impervious surface restoration requirements. These plans also require the reporting of specific actions and expenditures undertaken in previous fiscal years to meet impervious surface restoration requirements.

Fiscal year: July 1 to June 30

Grant: an amount of money given by an entity for a specific purpose, with no obligation of repayment. Grants can also be known as a gift. Grant agreements include matching commitments, either by cash or by in-kind services.

Impervious surface: a surface that does not allow stormwater to infiltrate into the ground. "Impervious surface" includes rooftops, driveways, sidewalks, or pavement.

ISRP: Impervious Surface Restoration Plan; can also mean MS4 WIP or implementation plan for qualitative controls. For the current MS4 permit, the impervious surface restoration requirement is 20% of the county or municipality's total impervious area that has not already been treated or restored to the MEP.

Loan: A debt service mechanism in which a governing body receives money from an exterior source with a commitment to repay both the principal and interest within a specific time frame.

MDE: Maryland Department of Environment

MEP: Maximum Extent Practicable

MS4: Municipal Separate Storm Sewer System

NPDES: National Pollutant Discharge Elimination System

Nutrients: Total phosphorus and total nitrogen

Paygo: Portion of capital expenditures which is paid directly when the expenditure is incurred.

Public-private partnership (P3s): An agreement between one or more public and private entities to do something better together than could be done individually. In many of these agreements, the local government provides one or a combination of tax incentives, public assets, or financing assistance. The private entity may contribute land, capital investments, a commitment to provide local jobs, or development expertise and usually, but not always, assumes most of the financial risk for the ultimate project outcomes.

Qualitative Control: A system of practices that reduces or eliminates pollutants that might otherwise be carried by surface runoff. Design parameters include water quality volume and recharge volume. Water quality volume can be converted into equivalent acreage of impervious surface restored.

Quantitative Control: A system of practices that controls the increased volume and rate of surface runoff caused by man-made changes to the land. Design parameters include channel protection volume and flood protection volumes.

Reserve: Amount of revenue held to demonstrate ability to repay a debt service mechanism or to hedge against an unforeseen economic downturn.

Revenue: Cash received from external sources to supply specific funds.

Revenue bond: An official document authorized by a governing body to complete CIP projects using a debt service, with a specific enterprise fund used as collateral.

Request for Proposal: a document used by a company or organization to procure a good or service, typically through a bidding process.

Runoff: The portion of water during a storm that runs over the land instead of evaporating or being soaked through the ground surface.

SRLF: State revolving loan fund

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

Watershed: An area of land that drains down slope to the lowest point, discharging to a river or other body of water

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

WPRP Fund: Watershed Protection and Restoration Program Fund.

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

*Some definitions obtained from Baltimore City Department of Public Works Glossary of Terms: http://dpwapps.baltimorecity.gov/cleanwaterbaltimore/wp-content/uploads/2016/06/Glossary_Regulatory-and-Fiscal.pdf

VIII. Appendices

Appendix A: MDE Reviews of Financial Assurance Plans



Maryland
Department of
the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Crumbles
Secretary

OCT 17 2016

Mr. Christopher J. Phipps, P.E.
Director, Department of Public Works
Anne Arundel County
2662 Riva Road
Annapolis, MD 21401

Dear Mr. Phipps:

This letter acknowledges the Maryland Department of the Environment's (MDE) receipt of Anne Arundel County's 2016 Financial Assurance Plan (FAP) and 2016 Watershed Protection and Restoration Program (WPRP) Annual Report as required by the Annotated Code of Maryland. MDE received an e-mail from the County that included both reports as well as additional information on June 28, 2016.

Chapter 124 of the Acts of the General Assembly of 2015 requires MDE to make a determination regarding the sufficiency of funding in each FAP filed with the Department. For any FAP filed on or before July 1, 2016, funding in the FAP is sufficient if the FAP demonstrates that the County or municipality has dedicated revenues, funds, or sources of funds to meet, for the 2-year period immediately following the filing date of the FAP, 75% of the projected costs of compliance with the impervious surface restoration plan requirements (ISRP) of the County or municipality under its National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4) permit over that 2-year period. After reviewing Anne Arundel County's 2016 FAP MDE has determined that the County has demonstrated that it has sufficient funding in its FAP.

Below are more details regarding MDE's findings:

- The County erroneously included an unapproved BMP, "Base", in the "All Actions" worksheet to achieve 1,200 acres of treatment, or 20% of the ISRP requirement. MDE has adjusted the County's FAP where appropriate to only include BMPs directly related to the implementation of the ISRP requirement during this permit term.
- The County proposes 2,044 acres of treatment, or 35% of its ISRP requirement, by improving the performance of its publicly owned treatment works (POTWs) in an amount equivalent to the impervious area pollutant reductions. As a matter of policy, MDE supports this option as a cost-effective means for achieving pollutant reductions and is committed to addressing how regulatory process requirements, including permit language and public participation, can be satisfied under this scenario. Until formal processes are in place, the County should continue to explore all currently approved BMPs for meeting the ISRP requirements.

Anne Arundel County

Mr. Christopher J. Phipps, P.E.

Page 2

- The County indicated using opportunities to restore impervious acres at little or no additional cost to the County, including septic pumping, shoreline stabilization, and septic connections to POTWs. These costs are covered by the Bay Restoration Fund (BRF) or are a homeowner's responsibility. The County should encourage more low-cost homeowner BMPs including rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation.

MDE has provided additional review comments in an attachment for the County's information and use. Please provide a response to MDE's comments in subsequent FAPs and WPRP Annual Reports. MDE requests that WPRP Annual Reports be submitted in coordination with the NPDES MS4 Annual Reports, beginning on February 12, 2018. The County's next FAP will be due in coordination with its February 12, 2019 Annual Report.

MDE recognizes the substantial effort required to create the FAP and WPRP Annual Report. Anne Arundel County is commended for its effort in developing and implementing this very important environmental program for improving local water resources and restoring the Chesapeake Bay. If you have any questions regarding this review, please contact me at 410-537-3543 or Brian Clevenger at 410-537-3554, or brian.clevenger@maryland.gov.

Sincerely,



Lynn Buhl, Director
Water Management Administration

cc: Brian Clevenger, Program Manager, Sediment, Stormwater, and Dam Safety Program

Attachment

**Maryland Department of the Environment
Anne Arundel County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Demonstration of Public Participation and Sufficient Funding	<ul style="list-style-type: none"> Anne Arundel County submitted its Financial Assurance Plan (FAP) electronically on June 28, 2016, officially dated July 1, 2016. The County forwarded the final FAP (County Resolution No. 40-16) that was certified (signed) by the County Executive on July 11, 2016. The County's signed resolution indicated that a public hearing was held. The FAP demonstrates sufficient funding (\$121,129,951) for 105% of the projected Impervious Surface Restoration Plan (ISRP) costs for the FY2017-FY2018 period (\$114,986,205), exceeding the requirement for funding of 75% of the ISRP.
ISRP Baseline	<ul style="list-style-type: none"> Anne Arundel County's impervious area analysis indicated that there are 29,311 impervious acres in the City with little or no stormwater runoff treatment. The County's current permit requires that 20% of that area, or 5,862 impervious acres, be restored during the course of its five-year permit term (i.e., 29,311 * 20% treatment requirement = 5,862 acres). The 5,862 impervious acre treatment requirement is also known as the ISRP baseline. MDE approved the County's impervious area analysis in July 2015.
Actions to Meet Permit Requirements ("All Actions" worksheet)	<ul style="list-style-type: none"> The County provided a narrative summarizing the implementation of its Municipal Separate Storm Sewer System (MS4) permit program, including impervious area information and capital budget projections. The restoration acres in the narrative are consistent with the values found in the associated Excel worksheets. However, the County incorrectly duplicated values for the total restored impervious acres from the "Spec Actions" worksheet in the "All Actions" worksheet. Moving forward the County should provide completed and projected actions in separate worksheets. The County erroneously included an unapproved best management practice (BMP), "Base", in the "All Actions" worksheet to achieve 1,200 acres of treatment, or 20% of the ISRP requirement. MDE has adjusted the County's FAP where appropriate to only include BMPs directly related to the implementation of the ISRP requirement during this permit term. Excluding the above discrepancies, the County provided specific BMP types in the "All Actions" worksheet for meeting the MS4 permit's ISRP baseline. Some BMPs are under design or construction, or have been completed. The County projects that it will attain 80% of the ISRP requirement (i.e., 4,682 vs. 5,862 impervious acres) by the end of the permit term (FY2018). The County proposes 2,044 acres of treatment, or 35% of its ISRP requirement, by improving the performance of publicly owned treatment works (POTWs) in an amount equivalent to the impervious area pollutant reductions. The County stated that the re-allocation of pollutant loads would be temporary to allow completion of restoration projects beyond the permit term. The County has projected to meet the full ISRP requirement without the aid of POTW nutrient reductions by the end of FY2020. In order to

**Maryland Department of the Environment
Anne Arundel County’s 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
<p>Actions to Meet Permit Requirements</p> <p>(“All Actions” worksheet)</p>	<p>make a determination on the acceptability of this strategy, the County should provide more detailed information, including the name(s) of the involved POTW(s) and a calculation of the pollutant load available for re-allocation.</p> <ul style="list-style-type: none"> • MDE is considering how the overachievement in nutrient reduction in the wastewater sector can be utilized by MS4 permittees in characterizing progress toward meeting total maximum daily load (TMDL) goals. As a matter of policy, MDE supports this option as a cost-effective means for achieving pollutant reductions and is committed to addressing how regulatory process requirements, including permit language and public participation, can be satisfied under this scenario. Until formal processes are in place, MS4s should explore all currently approved BMP options for meeting the ISRP requirements. • The County also included average credits of 550 acres for street sweeping (VSS) and 100 acres for septic pumping (SEPP). In FY2015, the County reported actual credits of 246 acres and 23 acres for VSS and SEPP, respectively. If the County’s projections for these fluctuating annual BMP practices fall short, additional BMPs will need to be implemented. • The County should encourage more low-cost homeowner BMPs including rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation.
<p>Annual and Projected Costs</p> <p>(“All Actions” and “ISRP Costs” worksheet)</p>	<ul style="list-style-type: none"> • In the FAP narrative, the County estimated that the required restoration will cost \$94 million through FY2018 and \$239 million through FY2020. • The restoration cost per acre for completed projects is \$10,159. Restoration cost per acre for the next two years (i.e., FY2017-FY2018) is \$18,403 per acre. The cost for restoration completed and projected through FY2020 is \$50,064 per acre. The County should re-examine cost projections and determine why they are increasing so dramatically per acre of treatment. • In the “All Actions” worksheet, there is no cost assigned to POTW credits because the County is not allocating additional stormwater funds to pay for these pollutant reductions. • The County indicated using opportunities to restore impervious acres at little or no additional cost to the County, including septic pumping and septic connections to POTWs. These costs are covered by the Bay Restoration Fund (BRF) or are a homeowner’s responsibility. There are also three shoreline stabilization projects (SHST) that are volunteer activities and have no associated cost. The County should provide outreach and promote these volunteer efforts and BMPs for additional restoration credit and cost savings. • Based on past progress, the County will need to increase the pace of implementation to fulfill the 20% restoration requirement. <ul style="list-style-type: none"> ○ The County plans to implement step pool storm conveyance systems (SPSC) for 960 acres of credit over the next five years. In previous fiscal years, the County reported 24 acres of credit through the use of SPSC. For FY2016–FY2018, the County has SPSCs either under

**Maryland Department of the Environment
Anne Arundel County’s 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Annual and Projected Costs (“All Actions” and “ISRP Costs” worksheet)	<p>construction or in planning for an additional 245 acres of credit.</p> <ul style="list-style-type: none"> ○ The County should consider the practicality of relying heavily on step pool conveyance systems and stream restoration projects within a short time period. These projects require pre-restoration monitoring for proper design. In addition, monitoring is required to estimate an erosion rate to calculate nutrient and sediment removal credits in accordance with the stream restoration expert panel protocols. Additional factors that may impact the construction process include weather and mandatory stream closure periods for fish spawning and migration. These variables indicate that any project with an anticipated credit for FY2017 should already be in the construction phase. ● The County also reported that stormwater facility retrofits were completed for 61 acres of restoration. The County plans to restore an additional 637 acres over the permit term, a more than 10-fold increase over current implementation rates.
Annual and Projected Revenues (“ISRP Revenue” worksheet)	<ul style="list-style-type: none"> ● Revenues for the ISRP have been reported for FY2015-FY2020 as required by Annotated Code of Maryland, Environment Article § 4-202.1(j)(1)(i)3. ● Entries and formulas have been entered correctly. The County reported revenues for each category as required. ● The annual revenue appropriated for the ISRP exceeds the annual costs toward the ISRP by \$6,143,746, ensuring that there is adequate funding.
Funding Sources (“Fund Sources” worksheet)	<ul style="list-style-type: none"> ● The required fields in the sources of funds worksheet are complete. The County will, however, need to indicate the percentage of funds directed toward the ISRP as directed in the FAP Guidance. ● Cell formulas have been entered and calculated correctly. ● Sources of funds for the next two years include: <ul style="list-style-type: none"> ○ Bonds = \$75M ○ Stormwater Remediation Fee = \$42M ○ General Fund/other = \$3.5M ○ State Funded Grants = \$0.3M ○ Total Funding Sources = \$121M ● The County has reported that the sum of the funding sources for the current and projected fiscal years exceed the costs for ISRP implementation.
Specific Actions and Expenditures from Previous Fiscal Years (“Spec Actions” worksheet)	<ul style="list-style-type: none"> ● The “Spec Actions” worksheet reflects completed restoration activities. The reported BMPs are site specific as required by the FAP law. ● The formulae in the worksheet are correct. ● The County used BMP codes that were approved in MDE’s MS4 geodatabase. ● According to the worksheet, there is no associated cost to the County for septic disconnection and shoreline stabilization. Moving forward, where there is no associated cost, the County should provide additional clarification on why this is the case (e.g., was it a volunteer project, etc.).

**Maryland Department of the Environment
Anne Arundel County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Future WPRP and FAP Reporting	<ul style="list-style-type: none">• Anne Arundel County's next Watershed Protection and Restoration Program (WPRP) Annual Report will be due in coordination with the County's February 12, 2018 MS4 Annual Report.• The County's next FAP will be due in coordination with its February 12, 2019 Annual Report.



Maryland
Department of
the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Grumbles
Secretary

OCT 17 2016

Mr. Rudolph S. Chow, P.E.
Director
Baltimore City Department of Public Works
600 Abel Wolman Municipal Building
Baltimore, MD 21202

Dear Mr. Chow:

This letter acknowledges the Maryland Department of the Environment's (MDE) receipt of Baltimore City's 2016 Financial Assurance Plan (FAP) and 2016 Watershed Protection and Restoration Program (WPRP) Annual Report as required by the Annotated Code of Maryland. MDE received an e-mail from the City that included both reports as well as additional information on July 1, 2016.

Chapter 124 of the Acts of the General Assembly of 2015 requires MDE to make a determination regarding the sufficiency of funding in each FAP filed with the Department. For any FAP filed on or before July 1, 2016, funding in the FAP is sufficient if the FAP demonstrates that the County or municipality has dedicated revenues, funds, or sources of funds to meet, for the 2-year period immediately following the filing date of the FAP, 75% of the projected costs of compliance with the impervious surface restoration plan (ISRP) requirements of the County or municipality under its National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4) permit over that 2-year period. After reviewing Baltimore City's 2016 FAP MDE has determined that the City has demonstrated that it has sufficient funding in its FAP.

Below are more details regarding MDE's findings:

- In FY2018, the City projected that it will attain 3,175 impervious acres of credit from street sweeping, or 74% of its ISRP requirement. The City is also relying heavily upon stream restoration projects to meet its stormwater restoration goals.
- The implementation of annual best management practices (BMPs) (e.g., street sweeping, storm drain vacuuming) can fluctuate significantly from year to year, and stream restoration projects can take several years to go from planning to implementation. If the implementation of any of these projected BMPs falls short, additional BMPs will need to be implemented.
- In FY2019, the City projected numerous opportunities to restore impervious areas at little or no additional cost to the City, including redevelopment (150 acres) and volunteer activities (129 acres). These affordable BMP options should be maximized.

Baltimore City

Mr. Rudolph S. Chow, P.E.

Page 2

MDE has provided additional review comments in an attachment for the City's information and use. Please provide a response to MDE's comments in subsequent FAPs and WPRP Annual Reports. MDE requests that WPRP Annual Reports be submitted in coordination with the NPDES MS4 Annual Reports, beginning on December 27, 2017. The City's next FAP will be due in coordination with its December 27, 2018 Annual Report.

MDE recognizes the substantial effort required to create the FAP and WPRP Annual Report. Baltimore City is commended for its effort in developing and implementing this very important environmental program for improving local water resources and restoring the Chesapeake Bay. If you have any questions regarding this review, please contact me at 410-537-3543 or Brian Clevenger at 410-537-3554, or brian.clevenger@maryland.gov.

Sincerely,



Lynn Buhl, Director
Water Management Administration

cc: Brian Clevenger, Program Manager, Sediment, Stormwater, and Dam Safety Program

Attachment

**Maryland Department of the Environment
Baltimore City's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
<p>Demonstration of Public Participation and Sufficient Funding</p>	<ul style="list-style-type: none"> • Annotated Code of Maryland ENV §4-202.1(j) requires Phase I Municipal Separate Storm Sewer System (MS4) jurisdictions to submit Financial Assurance Plans (FAPs) to Maryland Department of the Environment (MDE) by July 1, 2106. Baltimore City submitted its FAP, officially dated June 28, 2016, electronically on July 1, 2016. • A public hearing on the City's FAP was held June 8, 2016. • The FAP demonstrates sufficient funding (\$79,444,314) for 81% of the projected Impervious Surface Restoration Plan (ISRP) costs for the FY2017-FY2018 period (\$97,655,049), exceeding the requirement for funding of 75% of the ISRP. The City's next FAP submittal must show 100% funding of the ISRP permit requirement.
<p>ISRP Baseline</p>	<ul style="list-style-type: none"> • Baltimore City's impervious area analysis indicated that there are 21,455 impervious acres in the City with little or no stormwater management. The City's current permit requires that 20% of that area, or 4,291 impervious acres, be restored during the course of its five-year permit term (i.e., 21,455 * 20% treatment requirement = 4,291 acres). The 4,291 impervious acre treatment requirement is also known as the ISRP baseline. MDE approved the City's impervious area analysis in July 2015.
<p>Actions to Meet Permit Requirements ("All Actions" worksheet)</p>	<ul style="list-style-type: none"> • The City provided a narrative that summarizes the activities and major achievements for requirements found in the City's MS4 permit. • The City's narrative did not include restoration estimates. • The City provided specific best management practice (BMP) types in the "All Actions" worksheet for meeting the ISRP baseline. • Capital projects reported in the "All Actions" worksheet were not sorted by projected implementation year (e.g., 2018), resulting in subtotals that did not reflect the actual values reported in the City's FAP. Moving forward, MDE has used revised values in this evaluation. • The City projects that it will attain 106% of the ISRP by the end of the permit term (FY2018). • In FY2015, the City reported actual credits of 3,175 acres for street sweeping (VSS) for restoration. If the City's projections for this fluctuating annual BMP practice fall short, additional BMPs will need to be implemented. • The City incorrectly transferred values for total acres restored by street sweeping from the "Spec Actions" worksheet to the "All Actions" worksheet. • All data discrepancies shall be clarified or corrected in future FAP submittals.

**Maryland Department of the Environment
Baltimore City’s 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
<p>Annual and Projected Costs</p> <p>(“All Actions” and “ISRP Costs” worksheet)</p>	<ul style="list-style-type: none"> • In the FAP, the City estimated that the required restoration will cost \$28,916,682 through FY2018 and \$132,781,812 through FY2020. • The restoration cost per acre for completed projects is \$4,454. Restoration cost per acre for the next two years (i.e., FY2017-FY2018) is \$7,694 per acre. The cost for restoration completed and projected through FY2020 is \$28,243 per acre. • The City indicated using opportunities to restore acres at no cost to the City, including redevelopment and volunteer activities. These affordable BMP options should be maximized. • In the “All Actions” worksheet, the City did not include costs for the two capital projects that are shown as under construction. When possible, the City should provide the projected costs for all restoration activities. • All BMPs submitted in the City’s FAP are approved in MDE’s MS4 geodatabase. • Based on past progress, the City will need to increase the pace of implementation to fulfill the 20% restoration requirement. <ul style="list-style-type: none"> ○ The City plans to implement multiple capital project BMPs for 1,145 acres of credit in FY2018 and FY2019. This includes one stream restoration project for 771 acres of credit in FY2019. In previous fiscal years, the City reported a stream restoration project for 31 acres of credit. For FY2017, the City lists three BMPs under construction or in planning for an additional 94 acres of credit, including one stream restoration project for 80 acres of credit. ○ The City should consider the practicality of relying heavily on stream restorations projects within a short time period. These projects require pre-restoration monitoring for proper design. In addition, monitoring is required to estimate an erosion rate to calculate nutrient and sediment removal credits in accordance with the stream restoration expert panel protocols. Additional factors that may impact the construction process include weather and mandatory stream closure periods for fish spawning and migration. These variables indicate that any project with an anticipated credit for FY2017 should already be in the construction phase. • The City will need to provide additional information in its next FAP submittal on the scheduling of these projects and specifically how they will be completed before the end of its permit term. Additionally, all discrepancies noted above shall be more fully explained or corrected.

**Maryland Department of the Environment
Baltimore City’s 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Annual and Projected Revenues (“ISRP Revenue” worksheet)	<ul style="list-style-type: none"> • Revenues for the ISRP have been reported for FY2015-FY2020 as required by Annotated Code of Maryland, Environment Article § 4-202.1(j)(1)(i)3. • Values and formulae have been entered correctly. The City reported revenues for each category as required. • For FY2017-2018, the annual revenue appropriated for the ISRP exceeds the annual costs toward the ISRP by \$18,210,735, ensuring that there is adequate funding.
Funding Sources (“Fund Sources” worksheet)	<ul style="list-style-type: none"> • The required fields in the “Fund Sources” worksheet are complete. • Cell formulas have been entered and calculated correctly. • Sources of funds for the next two years include: <ul style="list-style-type: none"> ○ Stormwater Remediation Fee = \$52M ○ Bonds/State Revolving Loan Fund = \$32M ○ General Fund = \$5M ○ Grants = \$3.5M ○ Total Funding Sources = \$93M • The City has reported that the sum of the funding sources for the current and projected fiscal years exceed the costs for ISRP implementation.
Specific Actions and Expenditures from Previous Fiscal Years (“Spec Actions” worksheet)	<ul style="list-style-type: none"> • The “Spec Actions” worksheet reflects completed restoration activities. The reported BMPs are site specific as required by the law. • The formulae in the worksheet are correct. • The City used BMP codes that were approved in MDE’s MS4 geodatabase. • On the “Spec Actions” worksheet, the City only reported street sweeping, which is an annual BMP, and a stream restoration project (estimated 0.72% restoration credit).
Future WPRP and FAP Reporting	<ul style="list-style-type: none"> • Baltimore City’s next Watershed Protection and Restoration Program (WPRP) Annual Report will be due in coordination with the County’s December 27, 2017 MS4 Annual Report. • The City’s next FAP will be due in coordination with its December 27, 2018 Annual Report.



Maryland
Department of
the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Grumbles
Secretary

OCT 17 2016

Mr. Vincent J. Gardina, Director
Baltimore County Government
Department of Environmental Protection and Sustainability
111 West Chesapeake Avenue, Room 400
Towson, MD 21204

Dear Mr. Gardina:

This letter acknowledges the Maryland Department of the Environment's (MDE) receipt of Baltimore County's 2016 Financial Assurance Plan (FAP) and 2016 Watershed Protection and Restoration Program (WPRP) Annual Report as required by the Annotated Code of Maryland. MDE received an e-mail from the County that included both reports as well as additional information on July 13, 2016.

Chapter 124 of the Acts of the General Assembly of 2015 requires MDE to make a determination regarding the sufficiency of funding in each FAP filed with the Department. For any FAP filed on or before July 1, 2016, funding in the FAP is sufficient if the FAP demonstrates that the County or municipality has dedicated revenues, funds, or sources of funds to meet, for the 2-year period immediately following the filing date of the FAP, 75% of the projected costs of compliance with the impervious surface restoration plan (ISRP) requirements of the County or municipality under its National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4) permit over that 2-year period. After reviewing Baltimore County's 2016 FAP MDE has determined that the County has demonstrated that it has sufficient funding in its FAP.

Below are more details regarding MDE's findings:

- A public hearing was held on September 13, 2016 and County Council approval was received on September 19, 2016.
- The County proposed 1,000 acres of treatment, or 17% of its ISRP requirement, by improving the performance of its publicly owned treatment works (POTWs) in an amount equivalent to the impervious area pollutant reductions. As a matter of policy, MDE supports this option as a cost-effective means for achieving pollutant reductions and is committed to addressing how regulatory process requirements, including permit language and public participation, can be satisfied under this scenario. Until formal processes are in place, the County should continue to explore all currently approved best management practices (BMPs) for meeting the ISRP requirements.

Baltimore County

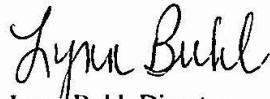
Mr. Vincent J. Gardina, Director
Page 2

- The County indicated that a number of practices will be implemented by volunteers (e.g., rain barrels, tree planting, and septic pumping). These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation, and should be maximized.

MDE has provided additional review comments in an attachment for the County's information and use. Please provide a response to MDE's comments in subsequent FAPs and WPRP Annual Reports. MDE requests that WPRP Annual Reports be submitted in coordination with the NPDES MS4 Annual Reports, beginning on December 23, 2017. The County's next FAP will be due in coordination with its December 23, 2018 Annual Report.

MDE recognizes the substantial effort required to create the FAP and WPRP Annual Report. Baltimore County is commended for its effort in developing and implementing this very important environmental program for improving local water resources and restoring the Chesapeake Bay. If you have any questions regarding this review, please contact me at 410-537-3543 or Brian Clevenger at 410-537-3554, or brian.clevenger@maryland.gov.

Sincerely,



Lynn Buhl, Director
Water Management Administration

cc: Brian Clevenger, Program Manager, Sediment, Stormwater, and Dam Safety Program

Attachment

**Maryland Department of the Environment
Baltimore County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
<p>Demonstration of Public Participation and Sufficient Funding</p>	<ul style="list-style-type: none"> • The Maryland Department of the Environment (MDE) received the County's Financial Assurance Plan (FAP) on July 13, 2016, past the due date of July 1, 2016. The submission was certified (signed) by the Administrative Officer, Fred Homan, on July 12, 2016. • The County held a public hearing on September 13, 2016 and approval by the County Council is scheduled for September 19, 2016. • In the future, the County will need to complete the public hearing and approval process by the submission deadline. • The FAP demonstrates sufficient funding (\$89,511,327) for 97% of the projected Impervious Surface Restoration Plan (ISRP) costs for the FY2017-FY2018 period (\$92,370,484), exceeding the requirement for funding of 75% of the ISRP. The County's next FAP submittal must show 100% funding of the ISRP permit requirement.
<p>ISRP Baseline</p>	<ul style="list-style-type: none"> • Baltimore County's impervious area analysis indicated that there are 30,180 impervious acres in the County with little or no stormwater runoff treatment. The County's current permit requires that 20% of that area, or 6,036 impervious acres, be restored during the course of its permit term (i.e., 30,180 untreated acres * 20% treatment requirement = 6,036 acres). The 6,036 impervious acre requirement is also known as the ISRP baseline. MDE approved the County's impervious area analysis in July, 2015.
<p>Actions to Meet Permit Requirements ("All Actions" worksheet)</p>	<ul style="list-style-type: none"> • Baltimore County included an executive summary that indicated the actions required to meet its Municipal Separate Storm Sewer System (MS4) permit. • The County has documented specific or general categories of best management practices (BMPs) for meeting the ISRP baseline. • The two-year and five-year sum totals have been correctly calculated. • The County proposed 1,000 acres of treatment, or 17% of its ISRP requirement, by improving the performance of publicly owned treatment works (POTWs) in an amount equivalent to the impervious area pollutant reductions. In order to make a determination on the acceptability of this strategy, the County should provide more detailed information, including the name(s) of the involved POTW(s) and a calculation of the pollutant load available for re-allocation. • MDE is considering how the overachievement in nutrient reduction in the wastewater sector can be utilized by MS4 permittees in characterizing progress toward meeting total maximum daily load (TMDL) goals. As a matter of policy, MDE supports this option as a cost-effective means for achieving pollutant reductions and is committed to addressing how regulatory process requirements, including permit language and public participation, can be satisfied under this scenario. Until formal processes are in place, MS4s should explore all currently approved BMP options for meeting the ISRP requirements.

**Maryland Department of the Environment
Baltimore County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
<p>Annual and Projected Costs</p> <p>("All Actions" and "ISRP Costs" worksheet)</p>	<ul style="list-style-type: none"> • The County reported capital and operating costs for the current and projected fiscal years as required. • The cell formulas appear to be correct. • Completed and projected BMPs have been reported in the appropriate worksheets. • The County has completed 1,203 acres of restoration at a cost of \$9,467 per acre. • The County projected approximately 5,128 acres of restoration over the next two years at a projected cost of \$21,686 per acre. Overall, this results in a net increase of \$12,219 per acre. • Moving forward, the County should only use BMP codes listed in MDE's MS4 geodatabase. For example, under Capital Projects, the County reported sand filters as "SF" instead of the approved code, "FSND". • The County has listed "SWM Conversions/Retrofits" as a proposed capital project in FY2018 totaling 1,200 acres at a cost of \$17,238,000. While exact BMP details are not necessary, the County will need to provide additional specificity as to which categories of BMPs the County is planning to retrofit since the proposed restoration makes up a significant portion of the County's ISRP requirement. • The County indicated that a number of practices will be implemented by volunteers (e.g., septic pumping, tree and rain barrel sales or redevelopment). The County should continue to provide outreach and promote these volunteer efforts and BMPs for additional restoration credit and cost savings. • In future FAP submittals, the County should provide a reason (e.g., volunteer, partnership project) if a listed project has no cost to the County. • The reported total two and five-year costs in the "ISRP Cost" worksheet and the reported two and five year costs under the "All Actions" worksheet are off by approximately \$19 million. The County should provide clarification as to why these numbers do not match. • Annual BMPs (i.e., mechanical street sweeping and regenerative/vacuum street sweeping) are properly accounted for under "Operational Programs". However, septic pumping, which is also an annual BMP, was reported in the "Other" section. Moving forward, please report all annual BMPs under "Operational Programs" so that they may receive the correct amount of restoration credit. Additionally, as verification of these credits, the County shall provide specific information on each septic system that is pumped according to MDE's MS4 geodatabase. • The amount of credit that the County is projecting for stream restoration over the next several years appears to be optimistic when considering the many factors involved with bringing a project from initial concept to final completion. The County should consider the extensive timeline involved in implementing stream restoration projects; for instance, all stream restoration

**Maryland Department of the Environment
Baltimore County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Annual and Projected Costs ("All Actions" and "ISRP Costs" worksheet)	<p>projects require pre-restoration monitoring for proper design. In addition, monitoring is required to estimate an erosion rate for calculating nutrient and sediment removal credits according to the stream restoration expert panel protocols. Additional factors may impact the construction process such as weather and mandatory stream closure periods for fish spawning and migration. These variables indicate that any project with an anticipated credit for FY2017 should already be in the construction phase.</p> <ul style="list-style-type: none"> • The County will need to provide additional information in its next FAP submittal on the scheduling of these projects and specifically how they will be completed before the end of its permit term. Additionally, all discrepancies noted above shall be more fully explained or corrected.
Annual and Projected Revenues ("ISRP Revenue" worksheet)	<ul style="list-style-type: none"> • Revenues for the ISRP have been reported for FY2015-FY2020 as required by Annotated Code of Maryland, Environment Article § 4-202.1(j)(1)(i)3. • Entries and formulas have been entered correctly. • The County's reported annual sources of funds equals the percentage of funds directed toward the ISRP, demonstrating that the County has sufficient funding to meet its impervious surface restoration ISRP requirement.
Funding Sources ("Fund Sources" worksheet)	<ul style="list-style-type: none"> • The required fields in the sources of funds worksheet are complete. In the future, the County must also indicate the percentage of funds directed towards the ISRP. • Cell formulas have been entered and calculated correctly. • The sum of the County's funding sources for the current fiscal year and the projected years exceed the County's costs, demonstrating sufficient funding for the permit term. • Sources of funds for the next two years include: <ul style="list-style-type: none"> ○ Stormwater Remediation Fees = \$55M ○ Bonds = \$28M ○ General Fund and Bay Restoration Fund = \$5M ○ State Funded Grants = \$2M ○ Total Funding Sources = \$90M
Specific Actions and Expenditures from Previous Fiscal Years ("Spec Actions" worksheet)	<ul style="list-style-type: none"> • There is a category of BMP listed that is not included in MDE's MS4 geodatabase. Described as "Rain Barrel Sale" ("RTD"), MDE's corresponding code is "MRWH" (rainwater harvesting). In the future, the County should remain consistent with the MDE's approved BMP codes. • The formulas for calculating the total costs have been entered correctly. • The County reported all costs of completed BMP projects in sufficient detail.

**Maryland Department of the Environment
Baltimore County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Demonstration of Sufficient Funding	<ul style="list-style-type: none">• Baltimore County's next Watershed Protection and Restoration Program (WPRP) Annual Report will be due in coordination with the County's December 23, 2017 MS4 Annual Report.• The County's next FAP will be due in coordination with its December 23, 2018 Annual Report.



Maryland
Department of
the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Grumbles
Secretary

OCT 17 2016

Mr. Tom Devilbiss, Deputy Director
Department of Land Use, Planning, and Development
Carroll County Government
225 North Center Street
Westminster MD 21157-5194

Dear Mr. Devilbiss:

This letter acknowledges the Maryland Department of the Environment's (MDE) receipt of Carroll County's 2016 Financial Assurance Plan (FAP) and 2016 Watershed Protection and Restoration Program (WPRP) Annual Report as required by the Annotated Code of Maryland. MDE received an e-mail from the County that included the FAP and additional information on June 30, 2016. The WPRP Annual Report was received on July 27, 2016.

Chapter 124 of the Acts of the General Assembly of 2015 requires MDE to make a determination regarding the sufficiency of funding in each FAP filed with the Department. For any FAP filed on or before July 1, 2016, funding in the FAP is sufficient if the FAP demonstrates that the County or municipality has dedicated revenues, funds, or sources of funds to meet, for the 2-year period immediately following the filing date of the FAP, 75% of the projected costs of compliance with the impervious surface restoration plan (ISRP) requirements of the County or municipality under its National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4) permit over that 2-year period. After reviewing Carroll County's 2016 FAP MDE has determined that the County has demonstrated that it has sufficient funding in its FAP.

Below are more details regarding MDE's findings:

- The County indicated that 79% of its impervious surface restoration plan revenue for the next two years comes from bonds, property taxes, and municipalities, while 21% comes from external grant sources. The County will need to be prepared to increase its local budget and bonds should external grant sources decrease in future years.
- The County listed "Flood Management Area" and "Sheetflow to Conservations" as best management practices (BMP) for achieving 26% of its ISRP requirement that are not currently approved by MDE for restoration credit. Until more monitoring data or clarification can be provided for the use of these BMPs, the County should explore all currently approved stormwater BMP options for meeting the ISRP requirement.
- The County should encourage more low-cost homeowner BMPs including rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation.

Carroll County

Mr. Tom Devilbiss, Deputy Director
Page 2

MDE has provided additional review comments in an attachment for the County's information and use. Please provide a response to MDE's comments in subsequent FAPs and WPRP Annual Reports. MDE requests that WPRP Annual Reports be submitted in coordination with the NPDES MS4 Annual Reports, beginning on December 29, 2017. The County's next FAP will be due in coordination with its December 29, 2018 Annual Report.

MDE recognizes the substantial effort required to create the FAP and WPRP Annual Report. Carroll County is commended for its effort in developing and implementing this very important environmental program for improving local water resources and restoring the Chesapeake Bay. If you have any questions regarding this review, please contact me at 410-537-3543 or Brian Clevenger at 410-537-3554, or brian.clevenger@maryland.gov.

Sincerely,



Lynn Buhl, Director
Water Management Administration

cc: Brian Clevenger, Program Manager, Sediment, Stormwater, and Dam Safety Program

Attachment

**Maryland Department of the Environment
Carroll County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Demonstration of Public Participation and Sufficient Funding	<ul style="list-style-type: none"> • The Financial Assurance Plan (FAP) was submitted to the Board of County Commissioners of Carroll County (County) on May 31, 2016. • The County held a public hearing on the FAP on June 9, 2016. • The Board approved the FAP on June 23, 2016. • The County submitted a FAP to Maryland Department of the Environment (MDE) on June 30, 2016 in accordance with State law. • The FAP demonstrates sufficient funding for 102% of the projected Impervious Surface Restoration Plan (ISRP) costs for the next two-year period (\$18.1 million in revenue versus \$17.7 million in cost), exceeding the requirement for funding 75% of the ISRP.
ISRP Baseline	<ul style="list-style-type: none"> • Carroll County's impervious area analysis indicated that there are 6,720 impervious acres in the County with little or no stormwater management. The County's current permit requires that 20% of that area, or 1,344 impervious acres, be restored during the course of its permit term (i.e., 6,720 untreated acres * 20% treatment requirement = 1,344 acres). The 1,344 impervious acre requirement is also known as the ISRP baseline. MDE's review of the County's impervious area analysis is pending at this time.
Actions to Meet Permit Requirements ("All Actions" worksheet)	<ul style="list-style-type: none"> • The FAP included an executive summary and detailed information on the actions required by the County to meet the ISRP requirement of the County's Municipal Separate Storm Sewer System (MS4) permit by December 29, 2019. • To meet its restoration goals, the County projected that it will require \$44,038,575 over the permit term to fund completed and planned projects. Based on the projected permit term revenue of \$47,605,712 the County is on track to meet its ISRP requirements by FY2019. • The County has listed flood management area best management practices (BMPs) for achieving 154 acres, or 4% of its ISRP requirement; however, this BMP is not approved for water quality treatment by MDE. Until more monitoring data or justification can be provided for the use of this BMP, the County should explore all currently approved stormwater BMP options for meeting the ISRP requirement. These projects should be removed from the County's "All Actions" worksheet in its next FAP submittal.
Annual and Projected Costs ("All Actions" and "ISRP Costs" worksheet)	<ul style="list-style-type: none"> • Actual costs have been reported for fiscal year (FY)2015 and FY2016 while projected costs have been reported for FY2016 through FY2020. There is some overlap in FY2016 reporting based on the status of projects at the time of the FAP submittal. • The County reported annual BMPs in the "Other" section of the "All Actions" worksheet, which aggregates their implementation over the permit term. Annual BMPs should be averaged over the permit term so that extra credit is not being calculated. To ensure that the impervious acres restored are accurately recorded, annual BMPs need to be reported under the "Operational Programs" section.

**Maryland Department of the Environment
Carroll County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Annual and Projected Costs	<ul style="list-style-type: none"> • In the “Spec Actions” worksheet, the County reported that it has achieved 1,123 acres of restoration at a cost of \$11,199 per acre. • The County reported that for the projected two years (i.e., FY2017-FY2018) it will cost \$12,090,000 to restore 458 acres at a cost per acre of \$26,411. • Comparing the cost of completed projects to the projected cost for future restoration activities, the cost per acre is increasing by \$15,198. • The reported costs in the “ISRP Costs” worksheet for FY2017-FY2018 (\$17,726,028) are greater than the costs for projected BMP implementation in the “All Actions” worksheet for FY2017-FY2018 (\$12,090,000). • The County should encourage more low-cost homeowner BMPs including rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation. • MDE requests that the County review the data discrepancies described above and provide clarifications in its next FAP submittal.
Annual and Projected Revenues (“ISRP Revenue” worksheet)	<ul style="list-style-type: none"> • Revenues have been reported for the required fiscal years. • The formulas used in the “ISRP Revenue” worksheet are correct. • The reported ISRP revenue equals 102% of the funds needed toward ISRP (\$18.1 million in revenue versus \$17.7 million in cost).
Funding Sources (“Fund Sources” worksheet)	<ul style="list-style-type: none"> • The “Fund Sources” worksheet is complete and the formulas are correct. • Sources of funds for the next two years include: <ul style="list-style-type: none"> ○ General Obligation Bonds = \$8.4 M ○ Property Taxes = \$4.5M ○ Municipalities = \$1.3M ○ State Funded Grants = \$3.8M ○ Total Funding Sources = \$18M • The County indicated that 79% of its ISRP revenue for the next two years comes from bonds, property taxes, and municipalities, while 21% comes from external grant sources. • The County will need to be prepared to increase its local budget and bonds should external grant sources decrease in future years.
Specific Actions and Expenditures from Previous Fiscal Years (“Spec Actions” worksheet)	<ul style="list-style-type: none"> • The formulas in the “Spec Actions” worksheet are correct. • The County has reported completed BMPs for site specific projects from FY2009 to FY2016 in compliance with the MDE’s instructional template. • Annual BMPs such as septic pumping have been included in the “Other” section of the worksheet. Septic pumping should be reported in the “Operational Programs” section of the table so that the impervious acres treated annually may be accurately calculated (see above, Actions to Meet Permit Requirements). • The County included flood management area and sheetflow to conservation area BMPs which are not currently approved by MDE for restoration credit.

**Maryland Department of the Environment
Carroll County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Specific Actions and Expenditures from Previous	<p>As previously mentioned, until more monitoring data or clarification can be provided for the use of these BMPs, the County should explore all currently approved stormwater BMP options for meeting the ISRP requirement.</p> <ul style="list-style-type: none"> • MDE requests that the County review the data discrepancies described above and provide clarifications in its next FAP submittal.
Future WPRP and FAP Reporting	<ul style="list-style-type: none"> • Please note that the County's next Watershed Protection and Restoration Program (WPRP) Annual Report will be due in coordination with the County's December 29, 2017 MS4 Annual Report. • The County's next FAP will be due in coordination with its December 29, 2018 MS4 Annual Report.



Maryland
Department of
the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Grumbles
Secretary

OCT 17 2016

Mr. Steven Ball, Planning Director
Charles County Department of Planning & Growth Management
P.O. Box 2150
200 Baltimore Street
La Plata, MD 20646

Dear Mr. Ball:

This letter acknowledges the Maryland Department of the Environment's (MDE) receipt of Charles County's 2016 Financial Assurance Plan (FAP) and 2016 Watershed Protection and Restoration Program (WPRP) Annual Report as required by the Annotated Code of Maryland. MDE received an e-mail from the County on June 29, 2016, that included both reports as well as additional information.

Chapter 124 of the Acts of the General Assembly of 2015 requires MDE to make a determination regarding the sufficiency of funding in each FAP filed with the Department. For any FAP filed on or before July 1, 2016, funding in the FAP is sufficient if the FAP demonstrates that the County or municipality has dedicated revenues, funds, or sources of funds to meet, for the 2-year period immediately following the filing date of the FAP, 75% of the projected costs of compliance with the impervious surface restoration plan (ISRP) requirements of the County or municipality under its National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4) permit over that 2-year period. After reviewing Charles County's 2016 FAP, MDE has determined that the County has demonstrated that it has sufficient funding in its FAP.

Below are more details regarding MDE's findings:

- In order to meet ISRP requirements, the County proposed to implement a diverse mix of stormwater management projects ranging from traditional structural practices to newer environmental site design (ESD) techniques.
- Because stream restoration projects can take several years to complete, the County may need to install back-up best management practices (BMPs) to ensure that restoration targets can be met should there be any delays in the projects currently under design and projected to be completed during this permit term.
- The County proposed 705 acres of treatment, or 47% of the total impervious acres restored, by improving the performance of its publicly owned treatment works (POTWs) in an amount equivalent to the impervious area pollutant reductions. As a matter of policy, MDE supports this option as a cost-effective means for achieving pollutant reductions and is committed to addressing how regulatory process requirements, including permit language and public

Charles County

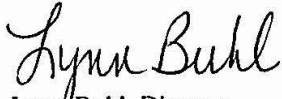
Mr. Steven Ball, Planning Director
Page 2

participation, can be satisfied under this scenario. Until formal processes are in place, the County should continue to explore all currently approved BMPs for meeting the ISRP requirements.

MDE has provided additional comments in an attachment for the County's information and use. Please provide a response to MDE's comments in subsequent FAPs and WPRP Annual Reports. MDE requests that WPRP Annual Reports be submitted in coordination with the NPDES MS4 Annual Reports, beginning on December 26, 2017. The County's next FAP will be due in coordination with its December 26, 2018 Annual Report.

MDE recognizes the substantial effort required to create the FAP and WPRP Annual Report. Charles County is commended for its effort in developing and implementing this very important environmental program for improving local water resources and restoring the Chesapeake Bay. If you have any questions regarding this review, please contact me at 410-537-3543 or Brian Clevenger at 410-537-3554, or brian.clevenger@maryland.gov.

Sincerely,



Lynn Buhl, Director
Water Management Administration

cc: Brian Clevenger, Program Manager, Sediment, Stormwater, and Dam Safety Program

Attachment

**Maryland Department of the Environment
Charles County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Demonstration of Public Participation and Sufficient Funding	<ul style="list-style-type: none"> • Annotated Code of Maryland ENV § 4-202.1(j) requires Phase I Municipal Separate Storm Sewer System (MS4) jurisdictions to submit the Financial Assurance Plan (FAP) by July 1, 2016. Charles County submitted the FAP electronically to the Maryland Department of the Environment (MDE) on June 29, 2016. • The County reported that a public hearing was held on June 7, 2016, and documentation was submitted with the FAP to show that County Commissioners voted on June 28, 2016, to approve the FAP in Resolution No. 2016-18. • The FAP demonstrated sufficient funding for 105% of the projected Impervious Surface Restoration Plan (ISRP) costs for the two-year period immediately following the filing of the FAP (\$28.7 million in revenue versus \$27.3 million in cost), greater than the minimum 75% required by the law.
ISRP Baseline	<ul style="list-style-type: none"> • Charles County's impervious area analysis indicated that there are 7,048 impervious acres in the County with little or no stormwater management. The County's current permit requires that 20% of that area, or 1,410 impervious acres, be restored during the course of its permit term (i.e., 7,048 untreated acres * 20% treatment requirement = 1,410 acres). The 1,410 impervious acre requirement is also known as the ISRP baseline. MDE's review of the County's impervious area analysis is pending at this time.
Actions to Meet Permit Requirements ("All Actions" worksheet)	<ul style="list-style-type: none"> • The FAP described Charles County's strategy to meet the requirements of its MS4 permit and ISRP within the required timeframe. • The jurisdiction documented several specific categories of BMPs and met the ISRP baseline. • Total restored impervious acres were correctly transferred from the "Spec Actions" worksheet to the "All Actions" worksheet. • All formulas, including two-year, five-year, and all-year sum totals, were used correctly within the worksheet. • All required fields were populated.
Annual and Projected Costs ("All Actions" and "ISRP Costs" worksheet)	<ul style="list-style-type: none"> • The County did not report costs from previous years and stated that this information "is beyond the requirements of the statute." The County should track this information to ensure that the cost spent per acre on restoration activities is minimized and that adequate funding is available each year. • All other costs were reported and all formulas were used correctly. • By the end of the current permit term, the County plans to accomplish 56% of its ISRP requirement through capital projects, operational best management practices (BMPs), and septic connections to wastewater treatment plants. Another 50% will be achieved by improving the performance of publicly owned treatment works (POTWs) to meet

**Maryland Department of the Environment
Charles County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
<p>Annual and Projected Costs</p> <p>("All Actions" and "ISRP Costs" worksheet)</p>	<p>impervious area restoration requirements. This will allow the County to achieve 106% of the ISRP requirement by the deadline.</p> <ul style="list-style-type: none"> • In fiscal year FY2015, 119 acres were restored through operational BMPs (e.g., street sweeping, inlet cleaning, and septic pumping). For the permit term, the County plans to achieve 119 acres of restoration annually through operational BMPs. This rate and the respective BMP cost per acre estimates are consistent with those reported in past MS4 annual reports. • Excluding annual operational BMPs, the County plans to complete in FY2017 and FY2018 an additional 414 acres in capital projects, of which 306 acres will be completed in FY2018 alone. Although this is a significant increase, MDE understands that the County is ramping up its restoration program from historic rates. • The total cost per acre for completed restoration efforts is approximately \$30,000. The cost per acre in FY2017 and FY2018, including the use of POTW credits, is approximately \$20,937 and over the current permit term approximately \$23,261. • In FY2020, the County plans to solely install wet ponds that will treat a total of 93 impervious acres. This is a shift from the diverse mixture of projects planned to be installed in earlier years, including several environmental site design (ESD) projects. The County should clarify whether it has identified specific projects or if multiple retrofit opportunities are identified for each pond BMP that has been listed. • The County's average cost per acre for wet ponds in later fiscal years is significantly less than the average cost per acre in previous fiscal years. For example, in FY2020 wet ponds cost an average of \$3,339 per acre while wet ponds installed in FY2018 were expected to cost an average of \$195,000 per acre. In the next FAP submittal, more clarification is needed on how these estimates were calculated. • When planning for the stream restoration project to be completed in FY2018 and listed as currently under design, the County should consider that the construction process may be delayed by issues such as monitoring requirements, inclement weather, or mandatory stream closure periods for fish spawning and migration. The County may need to install backup BMPs to ensure that restoration targets can be met if any delays occur. • The County should clarify two possible typos within this table: In cells A48 and A51, MDE assumed that the County meant to type "MSGW" where "MSHW" was inserted. All other reported BMPs are approved practices in MDE's MS4 geodatabase • The County should also provide clarification for the storm drain vacuuming BMP listed in cell A54. It initially appeared that this BMP should be filed under the Operational Programs. However, this BMP's cost was estimated as \$14,000 per acre, whereas the storm drain vacuuming already listed under Operational Programs was estimated to

**Maryland Department of the Environment
Charles County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
<p>Annual and Projected Costs</p> <p>(“All Actions” and “ISRP Costs” worksheet)</p>	<p>cost \$5,000 per acre. The County should ensure that the correct BMP type is used and, if necessary, list it in the appropriate location.</p> <ul style="list-style-type: none"> • All other annual BMPs were properly accounted for under Operational Programs, and all other BMPs, both completed and projected, were reported in the appropriate worksheets. • The County proposed 705 acres of treatment, or 50% of the impervious acre restoration goal, by improving the performance of locally-owned POTWs to achieve equivalent pollutant reductions. In order to make a determination on the acceptability of this strategy, the County shall provide more detailed information, including name(s) of all POTWs involved and a calculation of the pollutant load available for reallocation from each facility. • MDE is considering how the overachievement in nutrient reduction in the wastewater sector can be utilized by MS4 permittees in characterizing progress toward meeting total maximum daily load (TMDL) goals. As a matter of policy, MDE supports this option as a cost-effective means for achieving pollutant reductions and is committed to addressing how regulatory process requirements, including permit language and public participation, can be satisfied under this scenario. Until formal processes are in place, MS4s should explore all currently approved BMP options for meeting the ISRP requirements. • The County should encourage more low-cost homeowner BMPs including rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation. • All data discrepancies shall be clarified or corrected in future FAP submittals.
<p>Annual and Projected Revenues</p> <p>(“ISRP Revenue” worksheet)</p>	<ul style="list-style-type: none"> • Charles County did not report revenues from previous years and stated that this information “is beyond the requirements of the statute.” • All formulas were used correctly within the worksheet. • The reported ISRP revenue was 105% of the estimated required revenue for the next two years (\$28.7 million in revenue versus \$27.3 million in cost). • The County added \$100,000 of revenue to each year without explanation of how this funding is sourced. The County should provide clarification of where this additional revenue will come from. • Projected annual revenue exceeded annual cost in all years except FY2020, in which there was a projected deficit of \$788,000. Because legislation requires that the County demonstrate sufficient funding to meet its estimated cost for the two-year period immediately following the filing date of the FAP, there is time for the County make up this funding shortfall.

**Maryland Department of the Environment
Charles County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
<p>Funding Sources</p> <p>(“Fund Sources” worksheet)</p>	<ul style="list-style-type: none"> • The County did not report the portion of funds directed toward the ISRP, and should indicate this percentage amount in future FAPs. • All other sources of funds were reported and all formulas were used correctly within the worksheet. • Charles County’s sources of funds for the next two years include: <ul style="list-style-type: none"> ○ General Obligation Bonds = \$23M ○ Stormwater Remediation Fees = \$4M ○ General Fund/other = \$3.5M ○ Total Funding Sources = \$30.5M
<p>Specific Actions and Expenditures from Previous Fiscal Years</p> <p>(“Spec Actions” worksheet)</p>	<ul style="list-style-type: none"> • The completed actions reported in the FAP reflected the restoration activities and estimated restored acres reported in previous annual reports. • Completed site specific projects and BMPs were reported in the worksheet per MDE’s template and instructions, and all formulas were used correctly within the worksheet. • Total restored impervious acres were transferred correctly from the “Spec Actions” worksheet to the “All Actions” worksheet. • All BMPs listed in the worksheet are MDE approved BMPs.
<p>Future WPRP and FAP Reporting</p>	<ul style="list-style-type: none"> • Charles County’s next Watershed Protection and Restoration Program (WPRP) Annual Report will be due in coordination with the County’s December 26, 2017 MS4 Annual Report. • The County’s next FAP will be due in coordination with its December 26, 2018 Annual Report.



Maryland
Department of
the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Grumbles
Secretary

OCT 17 2016

Ms. Shannon Moore, Manager
Sustainability & Environmental Resources
Community Development Division
30 North Market Street
Frederick, Maryland 21701

Dear Ms. Moore:

This letter acknowledges the Maryland Department of the Environment's (MDE) receipt of Frederick County's 2016 Financial Assurance Plan (FAP) and 2016 Watershed Protection and Restoration Program (WPRP) Annual Report as required by the Annotated Code of Maryland. MDE received an e-mail from the County that included both reports as well as additional information on June 28, 2016.

Chapter 124 of the Acts of the General Assembly of 2015 requires MDE to make a determination regarding the sufficiency of funding in each FAP filed with the Department. For any FAP filed on or before July 1, 2016, funding in the FAP is sufficient if the FAP demonstrates that the County or municipality has dedicated revenues, funds, or sources of funds to meet, for the 2-year period immediately following the filing date of the FAP, 75% of the projected costs of compliance with the impervious surface restoration plan (ISRP) requirements of the County or municipality under its National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4) permit over that 2-year period. After reviewing Frederick County's 2016 FAP MDE has determined that the County has demonstrated that it has sufficient funding in its FAP.

Below are more details regarding MDE's findings:

- A public hearing was held on August 15, 2016 and the County's FAP has been approved by the local governing body.
- The County's FAP included multiple approved restoration practices that are not being claimed for impervious area credit (i.e., street sweeping, storm drain vacuuming, and catch basin cleaning). These practices can help the County meet its restoration goals, reduce program cost, and should be proposed for credit.
- The County proposed 256 acres of treatment, or 25% of the total impervious acres restored, by improving the performance of its publicly owned treatment works (POTWs) in an amount equivalent to the impervious area pollutant reductions. As a matter of policy, MDE supports this option as a cost-effective means for achieving pollutant reductions and is committed to addressing how regulatory process requirements, including permit language and public participation, can be satisfied under this scenario. Until formal processes are in place, the

Frederick County

Ms. Shannon Moore, Manager

Page 2

County should continue to explore all currently approved best management practices (BMPs) for meeting the ISRP requirements.

- The County should encourage more low-cost homeowner BMPs including rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation.

MDE has provided additional review comments in an attachment for the County's information and use. Please provide a response to MDE's comments in subsequent FAPs and WPRP Annual Reports. MDE requests that WPRP Annual Reports be submitted in coordination with the NPDES MS4 Annual Reports, beginning on December 30, 2017. The County's next FAP will be due in coordination with its December 30, 2018 Annual Report.

MDE recognizes the substantial effort required to create the FAP and WPRP Annual Report. Frederick County is commended for its effort in developing and implementing this very important environmental program for improving local water resources and restoring the Chesapeake Bay. If you have any questions regarding this review, please contact me at 410-537-3543 or Brian Clevenger at 410-537-3554, or brian.clevenger@maryland.gov.

Sincerely,



Lynn Buhl, Director
Water Management Administration

cc: Brian Clevenger, Program Manager, Sediment, Stormwater, and Dam Safety Program

Attachment

**Maryland Department of the Environment
Frederick County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Demonstration of Public Participation and Sufficient Funding	<ul style="list-style-type: none"> • Frederick County's Financial Assurance Plan (FAP) was received by the Maryland Department of the Environment (MDE) on June 28, 2016, prior to the July 1, 2016 due date. • A public hearing and approval from the County Council occurred on August 15, 2016, which is after the July 1, 2016 requirement. In the future, the County will need to complete the public hearing and approval process by the submission deadline. • The FAP demonstrates that 100% of the projected Impervious Surface Restoration Plan (ISRP) costs will be funded for the two-year period (i.e., \$11.4 million in revenue versus \$11.4 million in cost), meeting the requirement for funding of 75% of the ISRP.
ISRP Baseline	<ul style="list-style-type: none"> • Frederick County's impervious area analysis indicated that there are 5,063 impervious acres in the County with little or no stormwater management. The County's current permit requires that 20% of that area, or 1,013 impervious acres, be restored during the course of its five-year permit term (i.e., 5,063 * 20% treatment requirement = 1,013 acres). The 1,013 impervious acre treatment requirement is also known as the ISRP baseline. MDE's review of the County's impervious area analysis is pending at this time.
<p>Actions to Meet Permit Requirements</p> <p>("All Actions" worksheet)</p>	<ul style="list-style-type: none"> • The FAP includes an executive summary and outlines the necessary actions and costs required to meet the County's current Municipal Separate Storm Sewer System (MS4) permit and ISRP. • The County has documented sufficient BMPs to meet the ISRP requirement during the current permit term. • The County has listed multiple practices that are not approved BMPs for restoring impervious acres. The County should only utilize those practices recognized in MDE's MS4 geodatabase. For example, BMP codes such as EDSW, WP, and PP do not correspond to approved practices. • The County proposed 256 acres of treatment, or 25% of its ISRP requirement, to be completed by improving the performance of publicly owned treatment works (POTWs) to achieve equivalent pollutant reductions. In order to make a determination on the acceptability of this strategy, the County shall provide more detailed information, including name(s) of the POTWs involved and a calculation of the pollutant load available for reallocation. • MDE is considering how the overachievement in nutrient reduction in the wastewater sector can be utilized by MS4 permittees in characterizing progress toward meeting total maximum daily load (TMDL) goals. As a matter of policy, MDE supports this option as a cost-effective means for achieving pollutant reductions and is committed to addressing how regulatory process requirements, including permit language and public participation, can be satisfied under this scenario. Until formal processes

**Maryland Department of the Environment
Frederick County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
<p>Actions to Meet Permit Requirements ("All Actions" worksheet)</p>	<p>are in place, MS4s should explore all currently approved BMP options for meeting the ISRP requirements.</p> <ul style="list-style-type: none"> • The total restored impervious acres identified in the "Spec Actions" worksheet were transferred to the "All Actions" worksheet but included the previously mentioned practices that do not claim impervious credit. • Some of the formulas use incorrect years, resulting in misleading conclusions. Moving forward, the County should use the actual years of the permit term. The County projects that it will complete 100% of the ISRP requirement by fiscal year (FY)2020. Because the permit term includes a portion of FY2020, the County should clarify in the next FAP submittal if the ISRP requirement will be achieved by the end of the permit term, December 29, 2019. • MDE requests that the County review the data discrepancies described above and provide clarifications in its next FAP submittal.
<p>Annual and Projected Costs ("All Actions" and "ISRP Costs" worksheet)</p>	<ul style="list-style-type: none"> • Annual costs have been reported for previous years up to FY2015. Projected costs have been reported in the document for FY2016 through FY2020. • The restoration cost per acre for completed projects is \$63,491. The restoration cost per acre for completed and projected projects for the permit term, including POTW crediting, is \$38,680. • The data presented by the County indicate that restoration costs will decrease by 39%. • The "All Actions" worksheet contains projects that are either in the planning stages, under construction, or complete. • In future reports, completed projects must be reported in the "Spec Actions" worksheet. For example, the 2015 street sweeping should be reported under "Spec Actions", not "All Actions". • Septic denitrification (SEPD) as a BMP is appropriate; however, the County should consider identifying backup BMPs in the event that implementation does not meet annual targets. In future reports, the County should provide location data for SEPD credits taken per MS4 reporting requirements. • On the "ISRP Cost" worksheet, an unapproved BMP (i.e., bridge deck cleaning) has been included with no explanation of what the BMP entails. Bridge deck cleaning is neither an approved restoration practice, nor should the costs be included as part of the restoration analysis. These projects should be removed from the "ISRP Cost" worksheet in the County's next FAP submittal. • On the "All Actions" worksheet, street sweeping and storm drain vacuuming have been included but no impervious area credits were provided for these specific BMPs in the worksheet. These practices can help the County meet its restoration goals, reduce program cost, and should be proposed for credit. • The County should encourage more low-cost homeowner BMPs including rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation.

**Maryland Department of the Environment
Frederick County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
	<ul style="list-style-type: none"> • All discrepancies noted above shall be more fully explained or corrected in future FAP submittals.
Annual and Projected Revenues (“ISRP Revenue” worksheet)	<ul style="list-style-type: none"> • Based on the data supplied in the “ISRP Revenue” worksheet, the revenues meet 100% of the reported cost (i.e., \$11.4 million in revenue versus \$11.4 million in cost). • Reported ISRP revenue for FY2016 is shown on the “ISRP Revenue” worksheet as \$5,713,941. This amount conflicts with the FY2016 “Total Annual Sources of Funds” (\$7,173, 563) reported in the “Fund Sources” worksheet. • The values for revenue were obtained by using a formula that links directly to the costs field. The County should re-examine how revenues were calculated and provide clarification in its next FAP submittal.
Funding Sources (“Fund Sources” worksheet)	<ul style="list-style-type: none"> • The required fields for funding sources are complete and the formulas appear to be correct. • Sources of funds for the next two years include: <ul style="list-style-type: none"> ○ General Fund = \$9.6M ○ General Obligation Bonds = \$2M ○ Grants = \$0.26M ○ Total Funding Sources = \$12M
Specific Actions and Expenditures from Previous Fiscal Years (“Spec Actions” worksheet)	<ul style="list-style-type: none"> • As required, completed BMPs for specific projects were included in the “Spec Actions” worksheet. • The only annual BMPs accounted for on the “Spec Actions” worksheet under Operational Programs are street sweeping and inlet cleaning. • Of the activities listed, numerous examples do not provide any quantities of restored acreage and/or cost (i.e., street sweeping, inlet cleaning, and tree planting). As previously mentioned, these practices can help the County meet its restoration goals, reduce program cost, and should be proposed for credit. • The formulas used appear to be correct.
Future WPRP and FAP Reporting	<ul style="list-style-type: none"> • Frederick County’s next Watershed Protection and Restoration Program (WPRP) Annual Report will be due in coordination with the County’s December 30, 2017 MS4 Annual Report. • The County’s next FAP will be due in coordination with its December 30, 2018 Annual Report.



Maryland
Department of
the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Grumbles
Secretary

OCT 17 2016

Mr. Jeff Stratmeyer
Acting Director of Public Works
Harford County
212 South Bond Street, 1st floor
Bel Air, MD 21014

Dear Mr. Stratmeyer:

This letter acknowledges the Maryland Department of the Environment's (MDE) receipt of Harford County's 2016 Financial Assurance Plan (FAP) and 2016 Watershed Protection and Restoration Program (WPRP) Annual Report as required by the Annotated Code of Maryland. MDE received an e-mail from the County that included both reports as well as additional information on June 29, 2016.

Chapter 124 of the Acts of the General Assembly of 2015 requires MDE to make a determination regarding the sufficiency of funding in each FAP filed with the Department. For any FAP filed on or before July 1, 2016, funding in the FAP is sufficient if the FAP demonstrates that the County or municipality has dedicated revenues, funds, or sources of funds to meet, for the 2-year period immediately following the filing date of the FAP, 75% of the projected costs of compliance with the impervious surface restoration plan (ISRP) requirements of the County or municipality under its National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4) permit over that 2-year period. After reviewing Harford County's 2016 FAP MDE has determined that the County has demonstrated that it has sufficient funding in its FAP.

Below are more details regarding MDE's findings:

- The County indicated that 66% of its ISRP revenue for the next two years comes from its local budget and bonds, while 34% comes from external grant sources. The County will need to be prepared to increase its local budget and bonds should external grant sources decrease in future years.
- The County proposed 940 acres of treatment, or 41% of the total impervious acres restored, by improving the performance of its publicly owned treatment works (POTWs) in an amount equivalent to the impervious area pollutant reductions. As a matter of policy, MDE supports this option as a cost-effective means for achieving pollutant reductions and is committed to addressing how regulatory process requirements, including permit language and public participation, can be satisfied under this scenario. Until formal processes are in place, the County should continue to explore all currently approved best management practices (BMPs) for meeting the ISRP requirements.

Harford County

Mr. Jeff Stratmeyer

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- The County proposed numerous restoration options that incur little or no additional cost to its budget, including septic pumping, septic upgrades, and septic connections to POTWs. The County should also encourage more low-cost homeowner BMPs including rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation.

MDE has provided additional review comments in an attachment for the County's information and use. Please provide a response to MDE's comments in subsequent FAPs and WPRP Annual Reports. MDE requests that WPRP Annual Reports be submitted in coordination with the NPDES MS4 Annual Reports, beginning on December 30, 2017. The County's next FAP will be due in coordination with its December 30, 2018 Annual Report.

MDE recognizes the substantial effort required to create the FAP and WPRP Annual Report. Harford County is commended for its effort in developing and implementing this very important environmental program for improving local water resources and restoring the Chesapeake Bay. If you have any questions regarding this review, please contact me at 410-537-3543 or Brian Clevenger at 410-537-3554, or brian.clevenger@maryland.gov.

Sincerely,



Lynn Buhl, Director
Water Management Administration

cc: Brian Clevenger, Program Manager, Sediment, Stormwater, and Dam Safety Program

Attachment

**Maryland Department of the Environment
Harford County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Demonstration of Public Participation and Sufficient Funding	<ul style="list-style-type: none"> • Harford County held the required Financial Assurance Plan (FAP) public hearing on June 14, 2016 and submitted "Proceedings of Public Hearing" to the Maryland Department of the Environment (MDE). • The County submitted its FAP to MDE on June 29, 2016 satisfying State reporting requirements. • The County also submitted to MDE County Council Resolution NO. 014-16, providing approval of the County's FAP. • The County's FAP demonstrates sufficient funding for the projected Impervious Surface Restoration Plan (ISRP) costs for the next two-year period. The County's revenue represents 113% of the costs (i.e., \$22.9 million in revenue versus \$20.3 million in cost).
ISRP Baseline	<ul style="list-style-type: none"> • Harford County's impervious area analysis indicated that there are 9,413 impervious acres in the County with little or no stormwater management. The County's current permit requires that 20% of that area, or 1,883 impervious acres, be restored during the course of its permit term (i.e., 9,413 untreated acres * 20% treatment requirement = 1,883 acres). The 1,883 impervious acre requirement is also known as the ISRP baseline. MDE's review of the County's impervious area analysis is pending at this time.
Actions to Meet Permit Requirements ("All Actions" worksheet)	<ul style="list-style-type: none"> • Harford County provided a narrative that included capital budget projections for implementing the Municipal Separate Storm Sewer System (MS4) permit, impervious area information, and staff costs. • The County provided specific types of best management practices (BMPs) in the "All Actions" worksheet. Some BMPs were already assigned capital improvement project (CIP) numbers and were under design or construction. • The County proposed that it will reach 120% of its ISRP, assuming that 940 acres of treatment, or 41% of the total impervious acres restored is achieved by improving the performance of publicly owned treatment works (POTWs) in an amount equivalent to the impervious area pollutant reductions. Because the County projected restoration activities that would exceed the ISRP requirement by the end of its permit term, the full use of POTW credits may not need to be relied upon as significantly. • The County stated that the re-allocation of pollutant loads would be a temporary measure to allow the County to continue to build program capacity and complete projects within more "realistic timeframes". • MDE is considering how the overachievement in nutrient reduction in the wastewater sector can be utilized by MS4 permittees in characterizing progress toward meeting total maximum daily load (TMDL) goals. As a matter of policy, MDE supports this option as a cost-effective means for achieving pollutant reductions and is committed to addressing how regulatory process requirements, including permit language and public participation, can be satisfied under this scenario. • Until formal processes are in place, MS4s should explore all currently approved BMP options for meeting the ISRP requirements.

**Maryland Department of the Environment
Harford County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
<p>Actions to Meet Permit Requirements</p> <p>("All Actions" worksheet)</p>	<ul style="list-style-type: none"> • The County's discussion of its restoration activities included inconsistent impervious acres analysis in several areas that need clarification, including: <ul style="list-style-type: none"> ○ According to the table on page 5 of the Executive Summary, the County completed 73 acres of restoration from Fiscal Year (FY)2009 to FY2015 and 59 acres from January 1, 2016 through the end of FY2016, totaling 132 acres of completed restoration. ○ The last paragraph on page 5 states that the County completed 182 acres of restoration and used that to determine that it has a balance of 759 acres; correcting the completed acres to 132, the balance becomes 809 acres. ○ In the first table on page 6, the County stated that 175 acres have been restored from FY2009-FY2016. Correcting this number to 132 would leave the plan short of the 941 acres the County proposes to restore with capital projects. ○ The completed CIP table provided in the supplemental materials total 136 acres of restoration. • The County included an average credit of 300 impervious acres per year for septic pumping, or 16% of its ISRP requirement. The County calculated acres based on the average annual volume of 10 million gallons delivered to the POTW per year by septic haulers (the County assumed that 1,000 gallons are removed from each septic system). Based on MDE's MS4 guidance, 300 acres represents 10,000 individual septic systems pumped every year. • The County shall provide specific locations of the systems pumped according to MDE's MS4 geodatabase as validation of these credits. Also, the County should be prepared to provide additional BMPs should the level of septic pump-out implementation fail to meet annual projections. • CIP0027 was itemized in both the "All Actions" and "Spec Actions" worksheets, which may indicate double counting of the BMP; more clarification is needed by the County regarding this BMP. • The County applied restoration implemented beginning in FY2009, the year the previous permit expired, to the 20% requirement. Accordingly, the County revised its worksheet to include two-year totals (FY2017-FY2018) and all years (FY2009-FY2020). This change is acceptable. • MDE requests that the County review the data discrepancies described above and provide clarifications in its next FAP submittal.
<p>Annual and Projected Costs</p>	<ul style="list-style-type: none"> • In the FAP narrative, Harford County estimated a restoration cost of \$55,000 per acre, and stated the remaining required restoration will cost \$96,000,000 over the next four years.
<p>Annual and Projected Costs</p>	<ul style="list-style-type: none"> • The County indicated that it will utilize opportunities to restore acres at no cost to the County, including septic pumping, septic upgrades, septic connections to waste water treatment plants and the re-allocation of loads.

**Maryland Department of the Environment
Harford County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
<p>(“All Actions” and “ISRP Costs” worksheet)</p>	<ul style="list-style-type: none"> • Taking these cost saving options into account, the restoration cost per acre for completed projects is \$11,887. Restoration cost per acre for the next two years (i.e., FY2017-FY2018) is \$11,375 per acre. The cost for restoration for the entire term (i.e., FY2009-FY2020) is \$20,354 per acre. • As reported in the “All Actions” worksheet, the total cost of restoration over the entire term (FY2009-FY2020) is \$46,388,000. The total ISRP Cost (minus debt service) is \$48,449,000. While the total restoration cost from the “All Actions” worksheet should equal the ISRP Cost, the County is showing a difference of \$2,061,000. • Based on past progress, the County will need to increase the pace of implementation to fulfill the ISRP requirement. <ul style="list-style-type: none"> ○ The County plans to implement stream restoration for 525 acres of credit over the next 5 years. From FY2011-FY2016, the County completed 73 acres of stream restoration. Of the projected 525 acres, 340 acres are projects that have CIP numbers and an additional 185 acres of stream restorations are scheduled for completion during FY2019-FY2020 with no details provided yet. ○ The County should consider the practicality of relying heavily on stream restoration within a short time period. All stream restoration projects require pre-restoration monitoring for proper design. In addition, monitoring is required to estimate an erosion rate to calculate nutrient and sediment removal credits in accordance with the stream restoration expert panel protocols. Additional factors that may impact the construction process include weather and mandatory stream closure periods for fish spawning and migration. These variables indicate that any project with an anticipated credit for FY2017 should already be in the construction phase. ○ From FY2011-FY2016, stormwater facility retrofits were completed for 51 acres of restoration. The County plans to restore an additional 219 acres over the permit term. Thirty-six acres will be restored through stormwater facility retrofits that already have CIP numbers, expected to be completed between FY2017-FY2018. The County plans an additional 183 acres from FY2018-FY2020, but has not yet provided details. ○ The County plans to claim 15 acres per year (FY2017-FY2020) for tree plantings (1,500 trees per year). The County has taken credit for 7.6 acres through tree plantings over a two-year span (FY2013-FY2014) and did not implement tree planting projects in FY2015 nor FY2016. • The County will need to provide additional information in its next FAP submittal on the scheduling of these projects and specifically how they will be completed before the end of its permit term. Additionally, all discrepancies noted above shall be more fully explained or corrected.

**Maryland Department of the Environment
Harford County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
	<ul style="list-style-type: none"> The County should encourage more low-cost homeowner BMPs including rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation.
<p>Annual and Projected Revenues</p> <p>(“ISRP Revenue” worksheet)</p> <p>Annual and Projected Revenues</p>	<ul style="list-style-type: none"> Harford County did not report revenue, or sources of funds, under “Past up thru FY2015”, stating that this information is beyond the requirement of the statute. The County deducted the recordation tax revenue from the “Annual Revenue Appropriated for ISRP”. The County stated in the narrative that most of the redirected recordation funds will be used to pay debt services for future bonds. The recordation tax is included in the paygo category of the “Fund Sources” worksheet, indicating that this source does not change the total budget. However, the County is increasing its restoration budget with this funding source. This discrepancy will need to be resolved in the County’s next FAP submittal, specifically, more clarification is needed regarding the County’s decision to remove the recordation tax from the ISRP annual revenue. The County is appropriating 99% of its fund sources toward the ISRP revenue. The percent of funds directed toward the ISRP would be 100% if the County had not deducted the recordation tax from the “ISRP Revenue” worksheet.
<p>Funding Sources</p> <p>(“Fund Sources” worksheet)</p>	<ul style="list-style-type: none"> Harford County’s sources of funds for the next two years include: <ul style="list-style-type: none"> General Obligation Bonds = \$11.8M External Grants = \$8M General Fund = \$3.4M Total Funding Sources = \$23.2M Because 66% of its ISRP revenue for the next two years comes from its local budget and bonds, while 34% comes from external grant sources, the County will need to be prepared to increase its local budget and bonds should external grant sources decrease in future years. The County changed the numerator of the “Compare total permit term ISRP costs / total permit term annual sources of funds” percentage to include FY2020, but the denominator of the formula refers to a cell that does not include FY2020 in the sum. The County’s funding sources exceed the projected revenues by \$590,000. For FY2016-FY2019, the projected revenue is \$44,450,000 and the funding source is \$45,040,000. All of the above noted discrepancies need to be clarified in future FAP submittals.
<p>Specific Actions and Expenditures from Previous Fiscal Years</p>	<ul style="list-style-type: none"> The “Spec Actions” worksheet correctly reflects completed restoration activities. The reported BMPs are site specific as required and the formulas in this worksheet are correct.

**Maryland Department of the Environment
Harford County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
("Spec Actions" worksheet)	<ul style="list-style-type: none"> • All fields have been populated in the "All Actions" worksheet, except for the cost of a demolition of a townhome community (impervious to pervious land conversion). The County stated that this cost was unavailable. • The County shall provide the cost of all projects in future FAP submittals or a valid justification for omitting this information.
Future WPRP and FAP Reporting	<ul style="list-style-type: none"> • Harford County's next Watershed Protection and Restoration Program (WPRP) Annual Report will be due in coordination with the County's December 30, 2017 MS4 Annual Report. • The County's next FAP will be due in coordination with its December 30, 2018 Annual Report.



Maryland
Department of
the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Grumbles
Secretary

OCT 17 2016

Mr. Mark Richmond
Stormwater Management Division
Department of Public Works
Howard County Government
6751 Columbia Gateway Drive, Suite 514
Columbia, MD 21046-3145

Dear Mr. Richmond:

This letter acknowledges the Maryland Department of the Environment's (MDE) receipt of Howard County's 2016 Financial Assurance Plan (FAP) and 2016 Watershed Protection and Restoration Program (WPRP) Annual Report as required by the Annotated Code of Maryland. MDE received an e-mail from the County that included both reports as well as additional information on July 1, 2016.

Chapter 124 of the Acts of the General Assembly of 2015 requires MDE to make a determination regarding the sufficiency of funding in each FAP filed with the Department. For any FAP filed on or before July 1, 2016, funding in the FAP is sufficient if the FAP demonstrates that the County or municipality has dedicated revenues, funds, or sources of funds to meet, for the 2-year period immediately following the filing date of the FAP, 75% of the projected costs of compliance with the impervious surface restoration plan (ISRP) requirements of the County or municipality under its National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4) permit over that 2-year period. After reviewing Howard County's 2016 FAP MDE has determined that the County has demonstrated that it has sufficient funding in its FAP.

Below are more details regarding MDE's findings:

- There are a number of proposed projects that the County reported as "[best management practice] (BMP) Conversions", "Pond Conversions", "BMP Maintenance" or "New BMPs" for 6% of its ISRP requirement. The County needs to provide greater specificity regarding these proposed projects so that they can be validated.
- The County's FAP included two approved restoration practices that are not being claimed for impervious area credit (i.e., street sweeping and inlet cleaning). These practices can help the County meet its restoration goals, reduce program cost, and should be proposed for credit.
- The County is relying heavily upon volunteer activities including homeowner implementation of rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation, and should be maximized.

Howard County

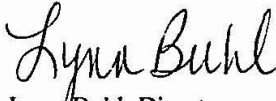
Mr. Mark Richmond

Page 2

MDE has provided additional review comments in an attachment for the County's information and use. Please provide a response to MDE's comments in subsequent FAPs and WPRP Annual Reports. MDE requests that WPRP Annual Reports be submitted in coordination with the NPDES MS4 Annual Reports, beginning on December 18, 2017. The County's next FAP will be due in coordination with its December 18, 2018 Annual Report.

MDE recognizes the substantial effort required to create the FAP and WPRP Annual Report. Howard County is commended for its effort in developing and implementing this very important environmental program for improving local water resources and restoring the Chesapeake Bay. If you have any questions regarding this review, please contact me at 410-537-3543 or Brian Clevenger at 410-537-3554, or brian.clevenger@maryland.gov.

Sincerely,



Lynn Buhl, Director
Water Management Administration

cc: Brian Clevenger, Program Manager, Sediment, Stormwater, and Dam Safety Program

Attachment

**Maryland Department of the Environment's
Howard County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Demonstration of Public Participation and Sufficient Funding	<ul style="list-style-type: none"> • Howard County submitted its Financial Assurance Plan (FAP) to the County Council on May 31, 2016. The Council held a public hearing on the FAP on June 20, 2016 and a work session on June 27, 2016. • The County submitted its FAP to the Maryland Department of the Environment (MDE) on July 1, 2016 satisfying State reporting requirements. • The FAP, adopted by the County Council on July 8, 2016, was approved and signed by the County Executive on July 11, 2016. • Howard County's FAP demonstrates sufficient funding for the projected Impervious Surface Restoration Plan (ISRP) costs for the next two-year period. The County's revenue represents 91% of the costs (i.e., \$40.8 million in revenue versus \$44.7 million in cost). The County's next FAP submittal must show 100% funding of the ISRP permit requirement.
ISRP Baseline	<ul style="list-style-type: none"> • Howard County's impervious area analysis indicated that there are 10,222 impervious acres in the County with little or no stormwater management. The County's current permit requires that 20% of that area, or 2,044 impervious acres, be restored during the course of its permit term (i.e., 10,222 untreated acres * 20% treatment requirement = 2,044 acres). The 2,044 impervious acre requirement is also known as the ISRP baseline. MDE's review of the County's impervious area analysis is pending at this time.
Actions to Meet Permit Requirements ("All Actions" worksheet)	<ul style="list-style-type: none"> • Howard County's FAP included an executive summary and detailed information on actions required to meet the ISRP requirements of the County's current permit by December 17, 2019. • There are a number of proposed projects that the County reported as "New BMPs [best management practices]", "Pond Conversions", "BMP Conversions", and "BMP Maintenance" for 6% of its ISRP requirement. The County needs to provide greater specificity regarding these proposed projects so that they can be validated. The County should only use BMP codes found in MDE's Municipal Separate Storm Sewer System (MS4) geodatabase. • The County proposed completing 64% of its ISRP requirement by restoring 1,314 impervious acres through stream restoration, including: <ul style="list-style-type: none"> ○ 21 projects for restoring 294,200 linear feet, or 294 impervious acres, that are planned for completion between fiscal year (FY)2016 and FY2018. ○ 5 projects for restoring 797,000 linear feet, or 797 impervious acres, that are planned for completion between FY2018 and FY2020. • Based on past progress, the County will need to significantly increase the pace of stream restoration implementation to fulfill its ISRP requirement. <ul style="list-style-type: none"> ○ For FY2011 through FY2016 the County completed 178 acres of impervious acre credits through stream restoration; the County is

**Maryland Department of the Environment's
Howard County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
<p>Actions to Meet Permit Requirements</p> <p>("All Actions" worksheet)</p>	<p>now projecting 1,314 impervious acres of credit through stream restoration projects.</p> <ul style="list-style-type: none"> ○ The County should consider the practicality of relying heavily on stream restoration within a short time period. All stream restoration projects require pre-restoration monitoring for proper design. In addition, monitoring is required to estimate an erosion rate to calculate nutrient and sediment removal credits in accordance with the stream restoration expert panel protocols. Additional factors that may impact the construction process include weather and mandatory stream closure periods for fish spawning and migration. These variables indicate that any project with an anticipated credit for FY2017 should already be in the construction phase. <ul style="list-style-type: none"> ● Howard County will need to provide additional information in its next FAP submittal on the scheduling of these projects and specifically how they will be completed before the end of its permit term.
<p>Annual and Projected Costs ("All Actions" and "ISRP Costs" worksheet)</p>	<ul style="list-style-type: none"> ● Annual costs have been reported for FY2015 and FY2016. Projected costs have been reported for FY2016 through FY2020. There is some overlap in FY2016 reporting based on the status of projects at the time of the FAP submittal. ● The reported costs in the "ISRP Costs" worksheet do not accurately correspond with the projected BMP implementation and costs in the "All Actions" worksheet. The County erroneously included the cost of other MS4 program activities in the "All Actions" worksheet (e.g., erosion and sediment control, illicit discharge detection and elimination, assessment of controls). MDE has adjusted the County's FAP where appropriate to include only those actions and BMPs directly related to the implementation of the ISRP requirement. ● The County projected costs of \$44,661,270 for FY2017-FY2018 to restore 750 acres at a cost per acre of \$59,509. ● The County projected costs of \$105,838,122 for the entire permit term. Based on these expenditures for restoring the projected 1,745 impervious acres, the average cost of restoring one impervious acre is \$60,661. ● Based on the projections in these worksheets, the County is on track to meet 85% of its ISRP requirement by FY2019 (i.e., 1,745 vs. 2,044 impervious acres). ● The County has listed pond maintenance and associated costs as an ISRP BMP. Pond maintenance is neither an approved restoration practice, nor should the costs be included as part of the restoration analysis. These BMPs will need to be further clarified by the County regarding what type of restoration is being implemented, or these projects should be removed from the list of proposed capital projects in future FAP submittals. ● The County's FAP included the costs associated with two approved restoration programs that are not being claimed for impervious area credit

**Maryland Department of the Environment's
Howard County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
	(i.e., street sweeping and inlet cleaning). These programs can help the County meet its restoration goals, reduce ISRP costs, and should be proposed for credit.
Annual and Projected Revenues ("ISRP Revenue" worksheet)	<ul style="list-style-type: none"> • Howard County has reported projected revenues as required. • The formulas used in the "ISRP Revenue" worksheet are correct. • The reported ISRP revenue equals 91% of the funds needed toward the ISRP requirement (\$40.8 million in revenue versus \$44.7 million in cost). • The County will need to show 100% funding of the ISRP requirement in its next FAP submittal.
Funding Sources ("Fund Sources" worksheet)	<ul style="list-style-type: none"> • Howard County's sources of funds for the next two years include: <ul style="list-style-type: none"> ○ General Obligation Bonds = \$27.6M ○ General Fund = \$4.6M ○ Stormwater Remediation Fee = \$22M ○ External Grants = \$2.9M ○ Total Funding Sources = \$57M • The "Fund Sources" worksheet is complete and the formulas are correct.
Specific Actions and Expenditures from Previous Fiscal Years ("Spec Actions" worksheet)	<ul style="list-style-type: none"> • The County has correctly reported specific actions that reflect completed restoration activities in FY2015 and for a portion of FY2016. • The County erroneously included the cost of other MS4 program activities in the "Spec Actions" worksheet. The formulas in the "Spec Actions" worksheet have been adjusted by removing all MS4 program activities that are not directly related to the ISRP (e.g., erosion and sediment control, illicit discharge detection and elimination, assessment of controls). The County should correct these worksheets in future FAP submittals to contain only the costs directly related to the ISRP permit requirement. • Based on adjustments to the "Spec Actions" worksheet, the County reported 157 acres of restoration for a total cost of \$12,838,020 and a cost per acre of \$81,771. • Comparing the County's cost of completed projects and projected cost for future implementation shows that the cost of restoration is decreasing by approximately \$20,000 per acre. • The County reported eight dry detention BMPs, which are not considered by MDE to provide water quality treatment, for eight impervious acres of credit. These practices should be deleted from the "Spec Actions" worksheet. • The County relied heavily upon volunteer activities including homeowner implementation of rain barrels, rain gardens, and tree planting in the "Spec Actions" worksheet. The County did not, however, propose any of these practices for meeting future ISRP requirements in the "All Actions" worksheet. Because these practices are implemented at little or no additional cost to the County for restoration credit, and provide great citizen outreach

**Maryland Department of the Environment's
Howard County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
	opportunities, these BMP options should be expanded in future FAP projections.
Future WPRP and FAP Reporting	<ul style="list-style-type: none"> • Howard County's next Watershed Protection and Restoration Program (WPRP) Annual Report will be due in coordination with the County's December 18, 2017 MS4 Annual Report. • The County's next FAP will be due in coordination with its December 18, 2018 Annual Report.



Maryland
Department of
the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Crumbles
Secretary

OCT 17 2016

Mr. Steven Shofar, Chief
Watershed Management Division
Montgomery County Department of Environmental Protection
255 Rockville Pike, Suite 120
Rockville, MD 20850

Dear Mr. Shofar:

This letter acknowledges the Maryland Department of the Environment's (MDE) receipt of Montgomery County's 2016 Financial Assurance Plan (FAP) and 2016 Watershed Protection and Restoration Program (WPRP) Annual Report as required by the Annotated Code of Maryland. MDE received an e-mail from the County that included both reports as well as additional information on July 1, 2016.

Chapter 124 of the Acts of the General Assembly of 2015 requires MDE to make a determination regarding the sufficiency of funding in each FAP filed with the Department. For any FAP filed on or before July 1, 2016, funding in the FAP is sufficient if the FAP demonstrates that the County or municipality has dedicated revenues, funds, or sources of funds to meet, for the 2-year period immediately following the filing date of the FAP, 75% of the projected costs of compliance with the impervious surface restoration plan (ISRP) requirements of the County or municipality under its National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4) permit over that 2-year period. After reviewing Montgomery County's 2016 FAP MDE has determined that the County has demonstrated that it has sufficient funding in its FAP.

Below are more details regarding MDE's findings:

- The County's FAP included several approved restoration practices that are not being claimed for impervious area credit (i.e., street sweeping, catch basin cleaning, and RainScapes). These practices can help the County meet its restoration goals, reduce program cost, and should be proposed for credit.
- The County has proposed dry ponds for 216 impervious acres of credit, or 6% of its ISRP requirement, yet this practice is not an approved water quality best management practice (BMP) by MDE or the Bay Program. Unless additional water quality design features can be provided for these BMPs, the County should continue to explore all currently approved stormwater BMP options for meeting the ISRP requirement.
- There are a number of completed projects that the County reported as "other", which treat a total of approximately 128 impervious acres, or 3% of its ISRP requirement. The County needs to provide greater specificity regarding these completed projects so that they can be validated.

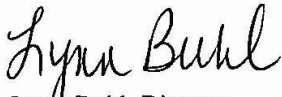
Montgomery County

Mr. Steven Shofar, Chief
Page 2

MDE has provided additional review comments in an attachment for the County's information and use. Please provide a response to MDE's comments in subsequent FAPs and WPRP Annual Reports. MDE requests that WPRP Annual Reports be submitted in coordination with the NPDES MS4 Annual Reports, beginning on February 16, 2018. The County's next FAP will be due in coordination with its February 16, 2019 Annual Report.

MDE recognizes the substantial effort required to create the FAP and WPRP Annual Report. Montgomery County is commended for its effort in developing and implementing this very important environmental program for improving local water resources and restoring the Chesapeake Bay. If you have any questions regarding this review, please contact me at 410-537-3543 or Brian Clevenger at 410-537-3554, or brian.clevenger@maryland.gov.

Sincerely,



Lynn Buhl, Director
Water Management Administration

cc: Brian Clevenger, Program Manager, Sediment, Stormwater, and Dam Safety Program

Attachment

**Maryland Department of the Environment
Montgomery County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Demonstration of Public Participation and Sufficient Funding	<ul style="list-style-type: none"> • Montgomery County held a public hearing on its Financial Assurance Plan (FAP) as required on June 14, 2016 and was approved by the County Council on June 28, 2016. A signed certification by the County Executive was provided with the FAP package. • The County submitted its FAP to Maryland Department of the Environment (MDE) on July 1, 2016 satisfying State reporting requirements. • The County's FAP demonstrates sufficient funding for 100% of the projected Impervious Surface Restoration Plan (ISRP) costs for the fiscal year (FY)2017-FY2018 period (\$116,102,260 in revenue versus \$116,102,260 in cost), meeting the requirement for funding of 75% of the ISRP. The County's next FAP submittal must show 100% funding of the ISRP.
ISRP Baseline	<ul style="list-style-type: none"> • Montgomery County's impervious area analysis indicated that there are 18,884 impervious acres in the County with little or no stormwater management. The County's current permit requires that 20% of that area, or 3,777 impervious acres, be restored during the course of its permit term (i.e., 18,885 untreated acres * 20% treatment requirement = 3,777 acres). The 3,777 impervious acre treatment requirement is also known as the ISRP baseline. MDE's review of the County's impervious area analysis is pending at this time.
Actions to Meet Permit Requirements ("All Actions" worksheet)	<ul style="list-style-type: none"> • Montgomery County included with its FAP an executive summary of its FY2015 Annual Report that indicated the actions required to meet permit conditions and the ISRP. • The total restored impervious acres from the "Spec Actions" worksheet correspond correctly with the restored impervious acres indicated on the "All Actions" worksheet. The two-year and five-year sum totals have also been calculated correctly. The County has documented general categories of best management practices (BMPs) to meet the 20% ISRP requirement. • The County incorrectly added a column to the "All Actions" worksheet and entered undefined categories (e.g., miscellaneous stream valley improvement, SM Retrofit: Countywide). The County should remove this column. • While the County did provide information on "BMP Class" in the "All Actions" worksheet (i.e., alternative, environmental site design, and structural), more specific "BMP Type" information was missing (i.e., stream restoration, stormwater wetland, septic pumping). These additional data are necessary for MDE's review of the County's projected implementation rates. • In future FAP submittals, the County shall provide more specificity on particular BMPs under construction and projected for future years. Specifically, missing "BMP Type" data in the County's FAP shall be updated with the BMPs listed in MDE's Municipal Separate Storm Sewer System (MS4) geodatabase.

**Maryland Department of the Environment
Montgomery County’s 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Annual and Projected Costs (“All Actions” and “ISRP Costs” worksheet)	<ul style="list-style-type: none"> • Montgomery County reported capital and operating costs for the current and projected fiscal years as required. • Worksheet entries and formulas have been entered correctly. • The County’s rate of BMP implementation toward the ISRP is increasing significantly. The County completed 1,780 acres of restoration between FY2010 and FY2015, an average restoration of 356 acres per year. The County is projecting that 1,571 acres will be restored from FY2017-FY2018, or 786 acres per year. • Under the “Spec Actions” worksheet, the County reported its total expenditures for FY2010-FY2015 to be \$75,031,122, and the total impervious acres restored to be 1,780 acres (a per-acre cost of \$42,152). This is consistent with what is reported in the “All Actions” worksheet. • In the “All Actions” worksheet, the County is projecting costs for FY2017-FY2018 to be \$116,102,260 and the amount of impervious acres restored to be 1,571 acres (a per-acre cost of \$73,894). This analysis shows a net increase of \$31,751 per acre of restoration. • The County’s FAP shows a projected reduction in the amount of impervious acres claimed through partnership projects, redevelopment, Rainscapes Rewards, and other low-cost restoration alternatives. • The County reported costs of mechanical street sweeping (MSS) and catch basin cleaning (CBC) under “Operational Programs” for current and future fiscal years, but did not include any projected impervious acre coverage or credit. • Partnership projects, redevelopment, and operational programs should be expanded in future ISRP and FAP projections to help engage the County’s citizens and reduce MS4 program costs.
Annual and Projected Revenues (“ISRP Revenue” worksheet)	<ul style="list-style-type: none"> • Revenues for the ISRP have been reported for FY2015-FY2020 as required. • Entries and formulas have been entered correctly. • Montgomery County’s FAP shows revenues increasing every year from a low of \$21,355,432 in FY2015 to a high of \$75,644,955 in FY2020. • The County projects revenues for the next two fiscal years to be \$116,102,260 and the total for the permit term and five-year projections to be \$381,605,657. • The amounts in the “ISRP Revenue” worksheet correspond directly with the projected costs in the “All Actions” worksheet. • The reported ISRP revenue equals 100% of the funds needed toward the ISRP permit requirement.
Funding Sources (“Fund Sources” worksheet)	<ul style="list-style-type: none"> • Montgomery County’s sources of funds for the next two years includes: <ul style="list-style-type: none"> ○ Bonds = \$84M ○ Stormwater Remediation Fee = \$72M ○ Other Paygo = \$27M ○ Grants = \$10M ○ Total Funding Sources = \$193

**Maryland Department of the Environment
Montgomery County's 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
	<ul style="list-style-type: none"> The County did not indicate the percentage of funds directed toward the ISRP requirement. These data are important for assessing the County's ability to pay for its ISRP and shall be reported in the County's next FAP submittal. All other formulas in this worksheet appear to be correct.
Specific Actions and Expenditures from Previous Fiscal Years ("Spec Actions" worksheet)	<ul style="list-style-type: none"> The reported actions and expenditures by Montgomery County correctly reflect the completed restoration activities. The formulas calculating the total costs have been entered correctly. The total restored impervious acres from the "Spec Actions" worksheet correspond with the total amount indicated in the "All Actions" worksheet. However, in the "All Actions" worksheet, the County's RainScapes Rewards are reported under "Operational Costs" while in the "Spec Actions" worksheet, these programs are reported under "Other" as volunteer projects. The County needs to report similar BMPs consistently in both worksheets in future FAP submittals. There are a number of completed projects that the County reported as a BMP type of "OTH" (other), which treat a total of approximately 128 acres. There was also a BMP reported as "OTH" that has no impervious area information reported. The County needs to provide more specificity on these BMPs in future FAP submittals. The County reported a handful of dry ponds (BMP code "XDPD") with a total of 244 impervious acres, which it counted toward its total impervious surface restoration requirement. MDE does not accept impervious acres treated by dry ponds because they provide little if any water quality treatment; these BMPs need to be removed from the County's ISRP. The County identifies "Water Quality Protection Charge Credits" as a category, with identifying code "ESD" for 23 impervious acres of restoration. The County needs to provide greater specificity on this category of BMPs in its next FAP report. The County needs to re-evaluate the spectrum of BMP implementation and credits in its current FAP, reconcile the amount of acres actually treated, and provide greater specificity in future FAP submittals.
Future WPRP and FAP Reporting	<ul style="list-style-type: none"> Montgomery County's next Watershed Protection and Restoration Program (WPRP) Annual Report will be due in coordination with the County's February 16, 2018 MS4 Annual Report. The County's next FAP will be due in coordination with its February 16, 2019 Annual Report.



Maryland
Department of
the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Grumbles
Secretary

OCT 17 2016

Mr. Adam Ortiz, Director
Department of Environment
Prince George's County Government
1801 McCormick Drive, Suite 500
Largo, MD 20774

Dear Mr. Ortiz:

This letter acknowledges the Maryland Department of the Environment's (MDE) receipt of Prince George's County's 2016 Financial Assurance Plan (FAP) and 2016 Watershed Protection and Restoration Program (WPRP) Annual Report as required by the Annotated Code of Maryland. MDE received an e-mail from the County that included both reports as well as additional information on June 30, 2016.

Chapter 124 of the Acts of the General Assembly of 2015 requires MDE to make a determination regarding the sufficiency of funding in each FAP filed with the Department. For any FAP filed on or before July 1, 2016, funding in the FAP is sufficient if the FAP demonstrates that the County or municipality has dedicated revenues, funds, or sources of funds to meet, for the 2-year period immediately following the filing date of the FAP, 75% of the projected costs of compliance with the impervious surface restoration plan (ISRP) requirements of the County or municipality under its National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4) permit over that 2-year period. After reviewing Prince George's County's 2016 FAP MDE has determined that the County has demonstrated that it has sufficient funding in its FAP.

Below are more details regarding MDE's findings:

- The County's FAP has not been approved by the local governing body, which is required by the law.
- Within three years, the County proposed to obtain 911 acres of credit through 91,100 linear feet of stream restoration. Because stream restoration projects can take several years to complete, the County may need to implement back-up best management practices (BMPs) should stream restoration projections fall short during the course of the permit.
- The County has over-estimated the amount of credit achieved through their street sweeping program. As a result, the County will need to adjust implementation strategies to ensure that restoration targets can be met.
- The County proposed several BMPs, including septic upgrades and redevelopment credits that can be implemented through the normal development process or independently by homeowners.

Prince George's County

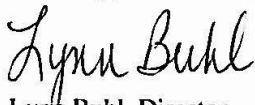
Mr. Adam Ortiz, Director
Page 2

These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation, and should be maximized.

MDE has provided additional review comments in an attachment for the County's information and use. Please provide a response to MDE's comments in subsequent FAPs and WPRP Annual Reports. MDE requests that WPRP Annual Reports be submitted in coordination with the NPDES MS4 Annual Reports, beginning on January 2, 2018. The County's next FAP will be due in coordination with its January 2, 2019 Annual Report.

MDE recognizes the substantial effort required to create the FAP and WPRP Annual Report. Prince George's County is commended for its effort in developing and implementing this very important environmental program for improving local water resources and restoring the Chesapeake Bay. If you have any questions regarding this review, please contact me at 410-537-3543 or Brian Clevenger at 410-537-3554, or brian.clevenger@maryland.gov.

Sincerely,



Lynn Buhl, Director
Water Management Administration

cc: Brian Clevenger, Program Manager, Sediment, Stormwater, and Dam Safety Program

Attachment

**Maryland Department of the Environment
Prince George’s County 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Demonstration of Public Participation and Sufficient Funding	<ul style="list-style-type: none"> • Prince George’s County submitted its Financial Assurance Plan (FAP) on June 30, 2016. • The County has yet to provide a public hearing or local approval of the FAP. A public hearing will be scheduled after the County Council reviews the draft FAP in September 2016. • The County held a public hearing on October 11, 2016. The County is required to provide approval from the local governing body prior to Maryland Department of the Environment (MDE) making a formal decision. In the interim, MDE provides the assessment and recommendations below for the County’s use. • The County’s draft FAP demonstrates sufficient funding for the projected Impervious Surface Restoration Plan (ISRP) costs for the next 2-year period. The County’s revenue represents exactly 75% of the costs (i.e., \$104 million in revenue versus \$139 million in cost). The County’s next FAP submittal must show 100% funding of the ISRP permit requirement.
ISRP Baseline	<ul style="list-style-type: none"> • MDE approved Prince George’s County’s impervious area analysis indicating that there are 30,524 impervious acres in the County with little or no stormwater management. The County’s current permit requires that 20% of that area, or 6,105 impervious acres, be restored during the course of its permit term (i.e., 30,524 untreated acres * 20% treatment requirement = 6,105 acres). The 6,105 impervious acre requirement is also known as the ISRP baseline.
Actions to Meet Permit Requirements (“All Actions” worksheet)	<ul style="list-style-type: none"> • Prince George’s County’s FAP includes an executive summary and outlines the necessary actions and costs required to meet Municipal Separate Storm Sewer System (MS4) permit conditions. • The “All Actions” worksheet has documented general categories of BMPs to show how the 20% ISRP requirement will be met during the current permit term. • The “All Actions” worksheet identifies three completed projects; however, these projects should be reported in the “Spec Actions” worksheet to avoid double counting. • There are several BMPs identified in the “All Actions” worksheet that offer an extraordinarily large credit. For example, in Fiscal Year (FY)2017 wet pond wetlands (WPWS) will treat 774 acres, bioretention practices will treat 429 acres, and another wet pond wetland proposal is identified in 2016 to treat 220 acres. • The County should provide more information regarding how these large projects have been identified. For example – clarification of whether the 774 acres for wet pond wetlands is for numerous ponds (i.e., 1 pond retrofit or hundreds). • The County did not provide projected best management practices (BMPs) for FY2020 in the “All Actions” worksheet. • Future FAP submittals shall include clarifications or additional data for the

**Maryland Department of the Environment
Prince George’s County 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
	above-noted deficiencies.
<p>Annual and Projected Costs (“All Actions” and “ISRP Costs” worksheet)</p>	<ul style="list-style-type: none"> • Annual costs have been reported for FY2014 and FY2015. • Projected costs have been reported for FY2016 through FY2020. • The formulas provided in the “ISRP Costs” worksheet are acceptable. • Prince George’s County reports that 139 acres of restoration have been completed and cost \$3,563,000. This averages out to be \$25,633 per acre of impervious area restored. • The County has used septic upgrades and redevelopment credits which allow for more cost effective treatment strategies. The County should expand the use of cost effective solutions where appropriate for meeting impervious area restoration requirements. • Based on the FAP information, the County has a realistic budget to support the projected costs for meeting the remaining ISRP permit requirement. • The reported costs budgeted in the “ISRP Costs” worksheet correspond correctly to the costs projected in the “All Actions” worksheet. • The County proposed approved BMPs according to MDE’s MS4 geodatabase. • One project proposed in FY2017 does not have a cost or impervious acre credit. The County should clarify why this information is reported. • Annual BMPs for street sweeping are properly recorded for under Operational Programs. The street sweeping implementation proposal for 2,000 acres of impervious area, however, is not consistent with MDE’s MS4 Guidance. The County provided calculations to justify the 2,000 acres of credit and MDE advised the County that an error was made in the calculation. The correct credit would be 121 acres of impervious area restored. • In one situation, a dry extended detention facility is proposed (FY2018) for treating 142 impervious acres. This type of BMP is not acceptable because it provides little if any water quality treatment. • In FY2019, an unrealistic amount of credit is anticipated for stream restoration. The credit claimed for 911 acres would require over 91,100 linear feet of stream restoration. MDE has advised the County in past annual report reviews (FY2014 and FY2015) that the County should plan to use stream restoration at a realistic rate that considers past implementation efforts. In response to this comment, the County’s 2015 Annual Report showed stream restoration implementation at 5,000 linear feet per year. Further, the County’s Annual Report specifies that, a total of 75,000 linear feet of stream will be restored by 2030. Therefore, the County’s proposal in the FAP to restore 91,100 linear feet of stream within three years is not consistent with the implementation plan specified in its 2015 annual report.

**Maryland Department of the Environment
Prince George’s County 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Annual and Projected Costs	<ul style="list-style-type: none"> • Due to the concerns identified above, the County will not receive the credit anticipated for the dry pond (142 acres), street sweeping (121 acres allowed, versus 2,000), and stream restoration (150 acres versus 911). This analysis indicates that the County may be far short of reaching its ISRP (3,429 vs. 6,105) by the end of its permit term. • The County needs to re-evaluate its BMP implementation efforts in its FAP and recent annual reports and develop a proposal that is realistic for meeting the ISRP permit requirement. • All BMP discrepancies noted above will need to be resolved in future FAP submittals.
Annual and Projected Revenues (“ISRP Revenue” worksheet)	<ul style="list-style-type: none"> • Revenues have been reported as required for the appropriate fiscal years. • The formulas used in the “ISRP Revenue” worksheet are correct. • The reported ISRP revenue equals 75% of the funds needed toward the ISRP permit requirement (\$104 million in revenue versus \$139 million in cost). This is acceptable, however, the County needs to develop more funding sources to meet the final 25% of funds needed to complete restoration requirements by the end of the permit term.
Funding Sources (“Fund Sources” worksheet)	<ul style="list-style-type: none"> • The “Fund Sources” worksheet is complete and the formulas are correct. • Sources of funds for the next two years includes: <ul style="list-style-type: none"> ○ Bonds = \$104M ○ Stormwater Remediation Fee = \$90M ○ Clean Water Act Fees = \$29M ○ Total Funding Sources = \$211M (minus debt service payment of \$12M) • The County has demonstrated that the sum of funding sources exceeds the projected revenues. This discrepancy should be resolved or explained fully in future FAP submittals.
Specific Actions and Expenditures from Previous Fiscal Years (“Spec Actions” worksheet)	<ul style="list-style-type: none"> • Prince George’s County has reported specific actions and expenditures that reflect completed restoration projects and operational programs for FY2014 and FY2015. • The formulas in the “Spec Actions” worksheet are correct. • The 139 acres of restored impervious area have been properly transferred to the “All Actions” worksheet. • The County has reported completed BMPs for site specific projects with one exception. There is one BMP on row 31 that has zero treated impervious acres that needs to be clarified. • Future FAP submittals should provide subtotals for operating expenses, capital improvement projects (CIPs), and other projects to be consistent with MDE’s FAP template.

**Maryland Department of the Environment
Prince George's County 2016 Financial Assurance Plan
September 2016**

FAP Condition	MDE Assessment and Recommendations
Future WPRP and FAP Reporting	<ul style="list-style-type: none">• Prince George's County's next Watershed Protection and Restoration Program (WPRP) Annual Report will be due in coordination with the County's January 2, 2018 MS4 Annual Report.• The County's next FAP will be due in coordination with its January 2, 2019 Annual Report.

Appendix B: Abbreviations and Classifications of BMPs

Table B-1: BMP Classes

Code	Code Description
A	Alternative BMP
E	ESD
S	Structural BMP

Table B-2: Alternative BMPs

Code	Code Description	Category
CBC	Catch Basin Cleaning	Programmatic
FPU	Planting Trees or Forestation on Previous Urban	Upland
IMPF	Impervious Surface Elimination (to forest)	Upland
IMPP	Impervious Surface Elimination (to pervious)	Upland
MSS	Mechanical Street Sweeping	Programmatic
OUT	Outfall Stabilization	In-stream
SDV	Storm Drain Vacuuming	Programmatic
SEPC	Septic Connections to WWTP	Upland
SEPD	Septic Denitrification	Upland
SEPP	Septic Pumping	Programmatic
SHST	Shoreline Stabilization	In-stream
SPSC	Step Pool Storm Conveyance	In-stream
STRE	Stream Restoration	In-stream
VSS	Regenerative/Vacuum Street Sweeping	Programmatic

Table B-3: Environmental Site Design (ESD) BMPs

Code	Code Description	Category
Alternative Surfaces		
AGRE	Green Roof – Extensive	Upland
AGRI	Green Roof – Intensive	Upland
APRP	Permeable Pavements	Upland
ARTF	Reinforced Turf	Upland
Micro-Scale Practices		
MENF	Enhanced Filters	Upland
MIBR	Infiltration Berms	Upland
MIDW	Dry Well	Upland
MILS	Landscape infiltration	Upland
MMBR	Micro-Bioretenion	Upland
MRNG	Rain Gardens	Upland
MRWH	Rainwater Harvesting	Upland
MSGW	Submerged Gravel Wetlands	Upland
MSWB	Bio-Swale	Upland
MSWG	Grass Swale	Upland
MSWW	Wet Swale	Upland
Nonstructural Techniques		
NDNR	Disconnection of Non-Rooftop Runoff	Upland
NDRR	Disconnection of Rooftop Runoff	Upland
NSCA	Sheetflow to Conservation Areas	Upland

Table B-4: Structural BMPs

Code	Code Description	Category
Filtering Systems		
FBIO	Bioretention	Upland
FORG	Organic Filter (Peat Filter)	Upland
FPER	Perimeter (Sand) Filter	Upland
FSND	Sand Filter	Upland
FUND	Underground Filter	Upland
Infiltration		
IBAS	Infiltration Basin	Upland
ITRN	Infiltration Trench	Upland
Open Channels		
ODSW	Dry Swale	Upland
OWSW	Wet Swale	Upland
Ponds		
PMED	Micropool Extended Detention Pond	Upland
PMPS	Multiple Pond System	Upland
PPKT	Pocket Pond	Upland
PWED	Extended Detention Structure, Wet	Upland
PWET	Retention Pond (Wet Pond)	Upland
Wetlands		
WEDW	Extended Detention - Wetland	Upland
WPKT	Pocket Wetland	Upland
WPWS	Wet Pond – Wetland	Upland
WSHW	Shallow Marsh	Upland
Other Practices		
XDED	Extended Detention Structure, Dry	Upland
XDPD	Detention Structure (Dry Pond)	Upland
XFLD	Flood Management Area	Upland
XOGS	Oil Grit separator	Upland
OTH	Other	Upland

Appendix C: Calculations

General

Impervious Acre Baseline = (total impervious acres not treated to the MEP jurisdiction-wide) * (20% MS4 permit restoration requirement)

Table 2: Restoration complete was determined by dividing the total acres restored (gathered from FY2016 MS4 Annual Reports) by the total updated impervious acre baseline.

Percent of project completion by the end of the five-year permit term was determined by dividing the total acres completed and projected to be restored (using the FY2016 FAP data) by the total updated impervious acre baseline.

Tables 3 and 4: Completed and Projected Cost per Acre = Total Completed and Projected Implementation Cost/Total Completed and Projected Impervious Acres Restored

Funding Gap Analysis

- Anne Arundel County
 - \$135,002,537 = FY2019 - FY2020 revenue (from FAP ISRP Revenue worksheet)
 - \$134,241,812 = FY2019 - FY2020 cost
 - \$760,725 = FY2019 - FY2020 remaining funds after cost
 - 1,180 = Remaining impervious acres to meet ISRP requirement (impervious acre baseline – projected acres to be restored)
 - \$20,102 = County restoration cost per impervious acre
 - \$23,720,360 = Funding gap for remaining acres (number of remaining acres * restoration cost/acre)
 - \$22,959,635 = Funding gap (funding gap for remaining acres - remaining funds)
- Baltimore City
 - \$64,514,600 = FY2019 - FY2020 revenue (from FAP ISRP Revenue worksheet)
 - \$43,036,901 = FY2019 - FY2020 cost
 - \$21,477,699 = FY2019 - FY2020 remaining funds after cost
- Baltimore County
 - \$37,187,525 = FY2019 - FY2020 revenue (from FAP ISRP Revenue worksheet)
 - \$37,187,525 = FY2019 - FY2020 cost
 - \$0 = FY2019 - FY2020 remaining funds after cost
- Carroll County
 - \$12,590,741 = FY2019 - FY2020 revenue (from FAP ISRP Revenue worksheet)
 - \$12,240,840 = FY2019 - FY2020 cost
 - \$349,901 = FY2019 - FY2020 remaining funds after cost
 - 68 = Remaining impervious acres to meet ISRP requirement (impervious acre baseline – projected acres to be restored)
 - \$15,468 = County restoration cost per impervious acre
 - \$1,051,824 = Funding gap for remaining acres (number of remaining acres * restoration cost/acre)
 - \$701,923 = Funding gap (funding gap for remaining acres - remaining funds)

- Charles County
 - \$29,775,400 = FY2019 - FY2020 revenue
 - \$33,017,600 = FY2019 - FY2020 cost
 - -\$3,242,200 = FY2019 - FY2020 remaining funds after cost
- Frederick County
 - \$17,696,666 = FY2019 - FY2020 revenue
 - \$17,696,666 = FY2019 - FY2020 cost
 - \$0 = FY2019 - FY2020 remaining funds after cost
 - 267 = Remaining impervious acres to meet ISRP requirement (impervious acre baseline – projected acres to be restored)
 - \$38,680 = County restoration cost per impervious acre
 - \$10,327,560 = Funding gap for remaining acres (number of remaining acres * restoration cost/acre)
 - \$10,327,560 = Funding gap (funding gap for remaining acres - remaining funds)
- Harford County
 - \$23,700,000 = FY2019 - FY2020 revenue
 - \$26,620,000 = FY2019 - FY2020 cost
 - -\$2,920,000 = FY2019 - FY2020 remaining funds after cost
- Howard County
 - \$71,523,375 = FY2019 - FY2020 revenue
 - \$67,622,105 = FY2019 - FY2020 cost
 - \$3,901,270 = FY2019 - FY2020 remaining funds after cost
 - 715 = Remaining impervious acres to meet ISRP requirement (impervious acre baseline – projected acres to be restored)
 - \$60,661 = County restoration cost per impervious acre
 - \$43,372,615 = Funding gap for remaining acres (number of remaining acres * restoration cost/acre)
 - \$39,471,345 = Funding gap (funding gap for remaining acres - remaining funds)
- Montgomery County
 - \$150,791,470 = FY2019 - FY2020 revenue
 - \$150,791,470 = FY2019 - FY2020 cost
 - \$0 = FY2019 - FY2020 remaining funds after cost
 - 149 = Remaining impervious acres to meet ISRP requirement (impervious acre baseline – projected acres to be restored)
 - \$63,604 = County restoration cost per impervious acre
 - \$9,476,996 = Funding gap for remaining acres (number of remaining acres * restoration cost/acre)
 - \$9,476,996 = Funding gap (funding gap for remaining acres - remaining funds)
- Prince George's County
 - \$139,181,119 = FY2019 - FY2020 revenue
 - \$179,625,539 = FY2019 - FY2020 cost
 - -\$40,444,420 = FY2019 - FY2020 remaining funds after cost

BMP and Funding Analyses

- The pie chart for implemented BMPs was created using the total impervious acres restored during the reported permit term. If necessary, the impervious acres used factored in corrections for formula errors and/or improperly placed BMPs.
- Permit term implementation amounts for the specific types, or groups, of BMPs were calculated by using the total impervious area treated and total cost of each BMP type/group implemented in all 10 MS4s. When a project was reported with multiple BMP types and/or classes but only a single cost and impervious acres treated, the project cost and impervious acres treated were not separated for each specific BMP. Instead, the groups were reported as “Combined Alternative and ESD”, “Combined Alternative, ESD, and Structural”, “Combined ESD and Structural”, “Combined Structural”, or “Micro-scale Practices”.
- Specific corrections for the BMP and funding analyses were:
 - Anne Arundel County
 - Removed BMP type “BASE” for FY2016 and FY2017 as this was not a valid BMP.
 - Excluded duplicate restoration projects that were reported in both the All Actions and Specific Actions worksheets.
 - Baltimore County
 - Used the average impervious acres for septic pumping instead of the sum. Septic pumping is an annual practice and may not be summed.
 - Carroll County
 - Practices that do not provide water quality treatment (i.e., XFLD) were excluded from the analysis.
 - Charles County
 - When single projects included multiple BMPs, the project was reported as “Combined ESD and Structural Practices”, “Combined Structural Practices”, or “Micro-scale Practices”.
 - One project, reported as “PWED, ODSW, FPU”, treats 26 impervious acres and was placed in the “Combined Structural Practices” category.
 - Frederick County
 - Removed BMP “Operating Support of CIP” from restoration cost since a specific BMP type was not identified.
 - Street sweeping costs were excluded from the restoration analysis since no credit was claimed.
 - Howard County
 - Excluded MS4 Program data costs not associated with the ISRP. These costs were subtracted from the County ISRP costs to bring it into alignment with the other jurisdictions and the formulas used.
 - Costs associated with practices that do not provide water quality treatment (e.g., XDED, XOTH) were excluded from the analysis.
 - Used the average implementation for Septic pumping instead of the sum. Septic pumping is an annual practice and may not be summed.

- Montgomery County
 - Practices that do not provide water quality treatment (e.g., XDED, XDPD) were not included in the analysis.
 - Costs for future street sweeping efforts were excluded from the restoration analysis since no credit was claimed.
 - Operating costs for debt service payments and the RainScapes program were excluded from the analysis since they are associated with a specific BMP and no impervious acres were claimed.
- Prince George's County
 - A BMP that does not provide water quality treatment, i.e., XDED, was not included in the analysis.
 - For the funding analysis, debt service installments were subtracted.
- Figure 12: Paygo funds are included as “Dedicated Fees” or “General Fund/Other”. Debt service funds are included as “Dedicated Bonds/Loans”. All taxes or fees that are part of the WPRP are included as “Dedicated Fees”.

Appendix D: Additional Tables from Analyses

Table D-1: Charles County Septic System Pump-Out Credits and Costs

Fiscal Year	# Pump-outs	Reimbursement ¹	Impervious Credit			Nitrogen Removal Credit ²		
			Acres	Annual Cost/Acre	Five-Year Cost/Acre	Lb. N	Annual Cost/Lb. N	Five-Year Cost/Lb. N
2015	829	\$ 98,755	24.88	\$3,971	\$19,855	370.6	\$266	\$1,330
2016	764	\$ 90,130	22.92	\$3,931	\$19,655	341.5	\$263	\$1,315

1. Reimbursement includes total amount paid to septic system owners, and does not include administrative costs.
2. Nitrogen removal credit assumes half of the systems are within 1,000' of a perennial stream (0.55 lbs. reduction/each), and half are not within 1,000' of a perennial stream (0.33 lbs. reduction/each).

Table D-2: Impervious Acres Completed and Projected to be Restored by Upland BMPs

BMP Type ¹	Total Impervious Acres Treated ¹	Total Cost ¹	Cost/Acre ²
Generic BMPs ³	3591	\$140,522,127	\$39,127
Ponds	2628	\$106,609,086	\$40,564
Filtering Practices	1842	\$128,949,150	\$70,007
Wetlands	1526	\$38,102,126	\$24,976
Tree Planting	757	\$25,554,288	\$33,764
Septic Connections and Upgrades	627	\$8,738,534	\$13,939
Micro-scale Practices	476	\$41,277,601	\$86,736
Nonstructural Techniques	297	\$357,604	\$1,203
Combined ESD and Structural Practices	88	\$11,709,476	\$132,355
Impervious Surface Elimination	74	\$789,267	\$10,630
Combined Structural Practices	63	\$1,382,217	\$21,909
Alternative Surfaces	63	\$27,442,140	\$436,479
Infiltration Practices	41	\$1,441,837	\$35,024
Combined Alt., ESD, and Structural Practices	25	\$6,367,508	\$254,741
Combined Alt. and ESD Practices	3	\$846,279	\$278,932
Open Channel Practices	1	\$119,814	\$82,172
12,103			

1. Restoration data obtained from FY2016 FAPs. BMPs were grouped based on their class, type, and function.
2. The cost/acre was calculated by dividing the total cost of the specific BMP type in the 10 MS4s by the total impervious acres treated by the specific BMP type in the 10 MS4s.
3. Generic BMPs includes unspecified Alternative, ESD, and Structural practices that are part of retrofit, conversion, redevelopment, watershed association, and new BMP projects.

Table D-3: Impervious Acres Completed and Projected to be Restored by In-stream BMPs

BMP Type ¹	Total Impervious Acres Treated ¹	Total Cost ¹	Cost/Acre ²
Stream Restoration ³	4,725	\$312,002,733	\$66,027
Shoreline Stabilization	1,331	\$15,828,261	\$11,892
Step Pool Storm Conveyance ⁴	772	\$52,556,681	\$68,116
Outfall Stabilization	262	\$11,675,083	\$44,633
	7,090		

1. Restoration data obtained from FY2016 FAPs. BMPs were grouped based on their class, type, and function.
2. The cost/acre was calculated by dividing the total cost of the specific BMP type in the 10 MS4s by the total impervious acres treated by the specific BMP type in the 10 MS4s.
3. Includes projects reported as a combination of STRE and FPU
4. Includes projects reported as a combination of SPSC and MENF, MRNG, or STRE.

Table D-4: Impervious Acres Completed and Projected to be Restored by Programmatic BMPs

BMP Type ¹	Total Impervious Acres Treated ¹	Total Cost ¹	Cost/Acre ²
Street Sweeping ³	6,024	\$32,370,189	\$5,373
Nutrient Trading with WWTP ⁴	4,945	\$0	\$0
Septic Pumping	984	\$1,048,755	\$1,066
Storm Drain Vacuuming	182	\$17,253,432	\$94,756
Catch Basin Cleaning	122	\$1,562,764	\$12,810
	12,257		

1. Restoration data obtained from FY2016 FAPs. BMPs were grouped based on their class, type, and function.
2. The cost/acre was calculated by dividing the total cost of the specific BMP type in the 10 MS4s by the total impervious acres treated by the specific BMP type in the 10 MS4s.
3. Street sweeping includes regenerative/vacuum and mechanical street sweeping as well as an unspecified type of street sweeping.
4. While proposed by several MS4s, trading regulations are being promulgated to allow for this treatment option

Appendix E: Supplemental Information from the *Annual Report on Financial Assurance Plans and the Watershed Protection and Restoration Program, 2016*



Maryland Department of the Environment

**Annual Report on Financial Assurance Plans and
the Watershed Protection and Restoration
Program
-2016-**

Prepared by:
Maryland Department of the Environment

Prepared for:
Governor Larry Hogan
**The Senate Education, Health, and Environmental Affairs
Committee**
The House Environment and Transportation Committee

October 2016

Specific Actions Completed Through FY2016 to Meet ISRP Permit Requirements

MS4	Acres Required to be Restored (Impervious Acre Baseline)	Impervious Acre Baseline Accepted by MDE (Y/P/N) ¹	Acres Restored	Cost ²	Average Cost per Acre	Restoration Complete ³
Anne Arundel County	5,862	Y	649	\$6,596,505	\$10,159	11.1%
Baltimore City	4,291	Y	2,372	10,561,649	4,454	55.3%
Baltimore County	6,036	Y	1,203	11,388,763	9,467	19.9%
Carroll County	1,344	P	1,123	12,576,575	11,199	83.6%
Charles County	1,410	P	223	6,592,038	29,508	15.8%
Frederick County	1,013	P	161	10,192,516	63,491	15.8%
Harford County	1,883	P	487	5,793,000	11,887	25.9%
Howard County	2,044	P	157	12,838,020	81,771	7.7%
Montgomery County	3,777	Y	1,780	75,031,122	42,152	47.1%
Prince George's County	6,105	Y	139	3,563,000	25,633	2.3%
Totals:	33,765		8,294	155,133,187	\$18,704	26.4%

1 Y=Yes, P=Pending, N=No

2 Cost from Specific (Spec) Actions worksheet.

3 Percent of untreated impervious surfaces restored toward meeting the impervious surface area requirement.

III. Executive Summary and Evaluation

- This evaluation of the FAPs is comprised of budget and restoration information that have been provided by each MS4 phase I permitted jurisdiction. Each locality has held public hearings and each plan has been signed by the local governing body, except for Prince George's County.
- Anne Arundel, Baltimore, Carroll, Charles, Frederick, Harford, Howard, Montgomery, and Prince George's Counties, and Baltimore City submitted comprehensive information on local projects for meeting ISRP requirements, including:
 - Annual Programs: street sweeping, inlet cleaning, storm drain vacuuming
 - Structural Practices: wet ponds, swales, infiltration, dry wells, rain gardens, green roofs, permeable pavement, rainwater harvesting, submerged gravel wetlands
 - Alternative Practices: tree planting, outfall stabilization, stream restoration
- All MS4s showed that they have the budgets necessary to fund at least 75% of the ISRP requirements over the next two State fiscal years (FY2017 and FY2018).
- Statewide, the specific actions implemented by the MS4s for meeting ISRP requirements through FY2015 are on average 26% complete, with another 62% projected for implementation over the next two fiscal years.
- The average cost per impervious acre restored through the end of FY2015 is \$18,704 and for projected projects over the next two years, \$32,126.
- Several proposed practices for meeting the ISRP requirement have yet to be approved by MDE or the Chesapeake Bay Program (e.g., dry ponds, bridge deck cleaning, and floodplain riparian buffer easements) and may only be options for impervious area credit with additional monitoring data and justification to support the practices' pollutant removal efficiencies.
- Several jurisdictions are implementing restoration practices provided in MDE's guidance document, *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits, August, 2014*, but are not taking credit for these practices. Some of these include street sweeping, inlet cleaning, tree planting, and septic system upgrades. MDE encourages jurisdictions to examine the local implementation of these practices more fully to see how they can be used for additional impervious area restoration credit.
- Anne Arundel, Baltimore, Charles, Frederick, and Harford Counties proposed improving the performance of publicly owned treatment works (POTW) in an amount equivalent to the impervious area pollutant reductions for up to 50% of the ISRP requirements. MDE is considering how the overachievement in nutrient reduction in the wastewater sector can be utilized by MS4 permittees in characterizing progress toward meeting TMDL goals. As a matter of policy, MDE supports this option as a cost-effective means for achieving pollutant

reductions and is committed to addressing how regulatory process requirements, including permit language and public participation, can be satisfied under this scenario. Until formal processes are in place, MS4s should explore all currently approved BMP options for meeting the ISRP requirements.

- MDE shall provide further detailed assessments of these plans to each jurisdiction in compliance with the revised stormwater management law requiring FAPs.

Projected ISRP Implementation for the Next Two Fiscal Years to Meet ISRP Requirements

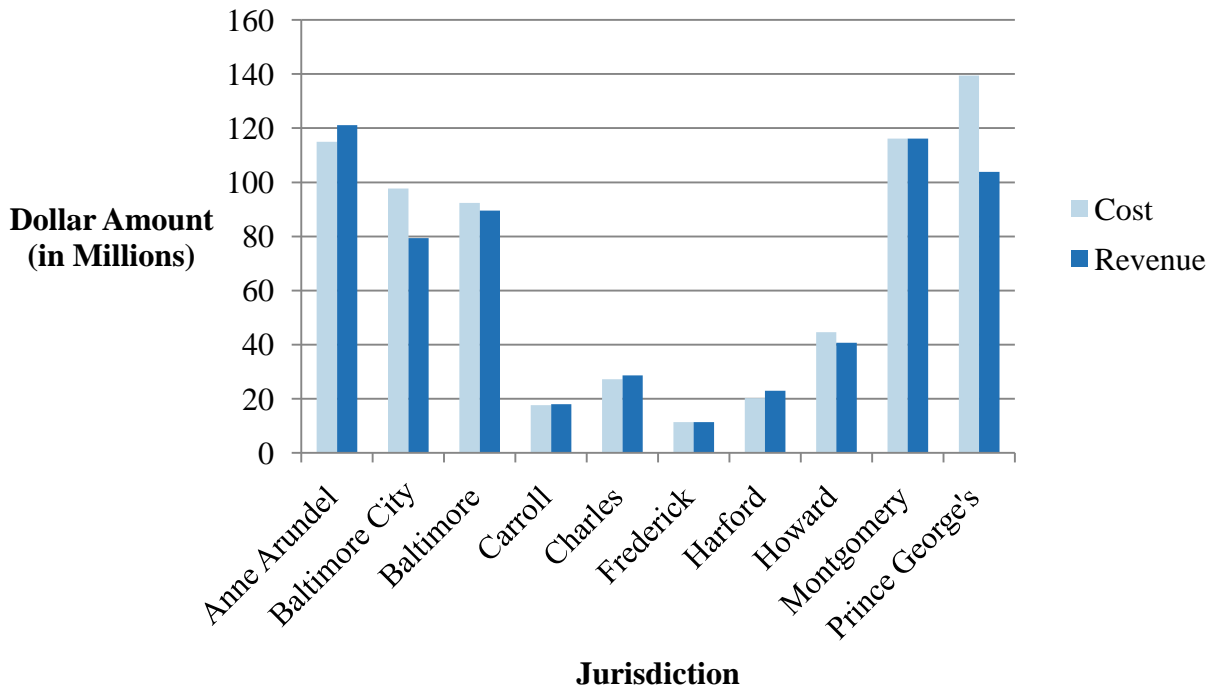
MS4	Impervious Acre (IA) Baseline	IA Accepted by MDE (Y/P/N) ¹	Acres Projected to be Restored	Cost ²	Average Cost per Acre	Restoration Projected ³
Anne Arundel County	5,862	Y	4,201	\$77,301,728	\$18,403	71.7%
Baltimore City	4,291	Y	3,758	28,916,682	7,694	87.6%
Baltimore County	6,036	Y	5,128	111,198,575	21,686	85.0%
Carroll County	1,344	P	458	12,090,000	26,411	34.1%
Charles County	1,410	P	1,238	25,921,551	20,937	87.8%
Frederick County	1,013	P	320	17,622,629	55,140	31.5%
Harford County	1,883	P	1,586	18,040,000	11,375	84.2%
Howard County	2,044	P	750	44,661,270	59,509	36.7%
Montgomery County	3,777	Y	1,571	116,102,260	73,894	41.6%
Prince George's County	6,105	Y	3,854	101,007,378	26,210	63.1%
Totals:	33,765		22,864	\$552,862,073	\$32,126	62%

1 Y=Yes, P=Pending, N=No

2 Cost from All Actions worksheet.

3 Percent of untreated impervious surfaces restored toward meeting the impervious surface area requirement.

Fulfillment of 75% Revenue Requirement for Two-Year Costs



MS4	Cost ¹	Revenue ¹	Percent of Cost Covered	Meets 75% Requirement (Y/N)
Anne Arundel County	\$115.0M	\$121.1M	105%	Y
Baltimore City	97.7M	79.4M	81%	Y
Baltimore County	92.4M	89.5M	97%	Y
Carroll County	17.7M	18.1M	102%	Y
Charles County	27.3M	28.7M	105%	Y
Frederick County	11.4M	11.4M	100%	Y
Harford County	20.3M	23.0M	113%	Y
Howard County	44.7M	40.8M	91%	Y
Montgomery County	116.1M	116.1M	100%	Y
Prince George's County	139.4M	103.9M	75%	Y
Totals:	\$681,889,942	\$631,982,429		

¹ Cost and Revenue from ISRP Revenue worksheet.

Anne Arundel County

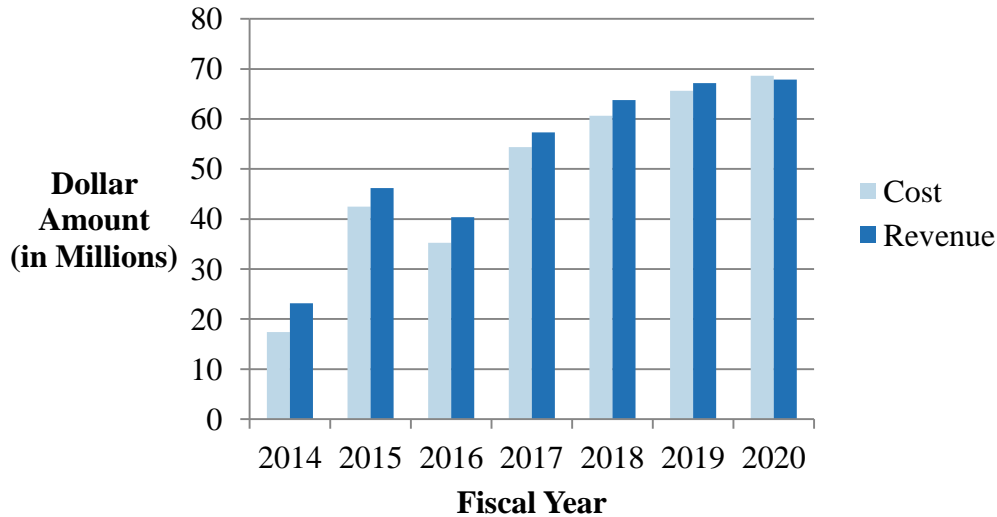
Impervious acre baseline: 5,862

Restored acres: 649

Projected restored acres: 4,682

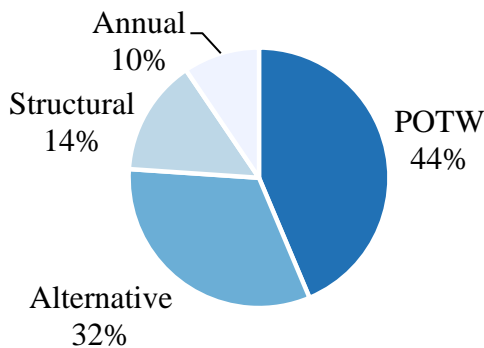
- Cost/acre for completed projects: \$10,159
- Percentage of revenue budgeted to cover next two-year costs: 105%
- Costs for funding the next two-years of the ISRP requirement: \$114,986,205
- Cost/acre for completed and projected projects during the entire permit term: \$20,102

Impervious Surface Restoration Plan Cost and Revenue

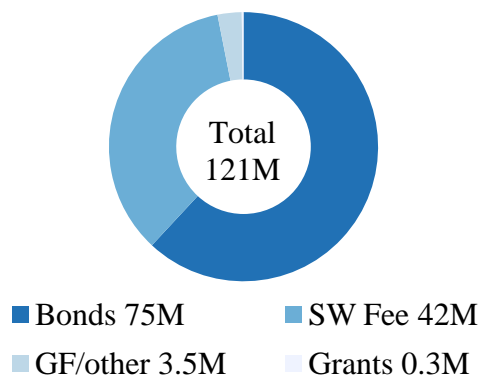


- The County erroneously included an unapproved BMP, “Base” in the “All Actions” worksheet to achieve 1,200 acres of treatment, or 20% of the ISRP requirement. MDE has adjusted the County’s FAP where appropriate to only include BMPs directly related to the implementation of the ISRP requirement during this permit term.
- The County proposes 2,044 acres of treatment, or 35% of its ISRP requirement, by improving the performance of locally-owned POTWs in an amount equivalent to the impervious area pollutant reductions. Until there is a formal, comprehensive cross-sector nutrient trading program in Maryland, the County should continue to explore all currently approved stormwater BMP options for meeting the ISRP requirement.
- The County should investigate a process for taking advantage of volunteer efforts regarding BMP implementation that are proliferating throughout the County for restoration credit and cost savings.

BMP Types Implemented During Permit Term (FY2014-2018)



Sources of Funds (FY2017-2018)



Baltimore City

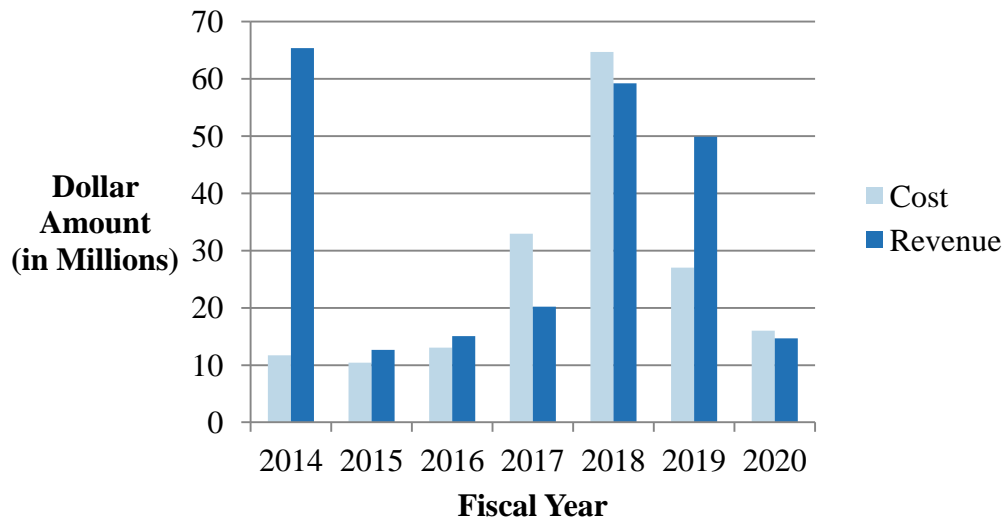
Impervious acre baseline: 4,291

Restored acres: 2,372

Projected restored acres: 4,588

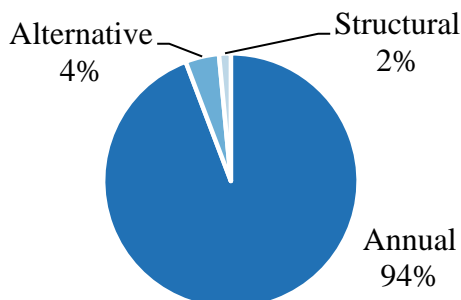
- Cost/acre for completed projects: \$4,454
- Percentage of revenue budgeted to cover next two-year costs: 81%
- Costs for funding the next two-years of the ISRP requirement: \$97,655,049
- Cost/acre for completed and projected projects during the entire permit term: \$24,420

Impervious Surface Restoration Plan Cost and Revenue

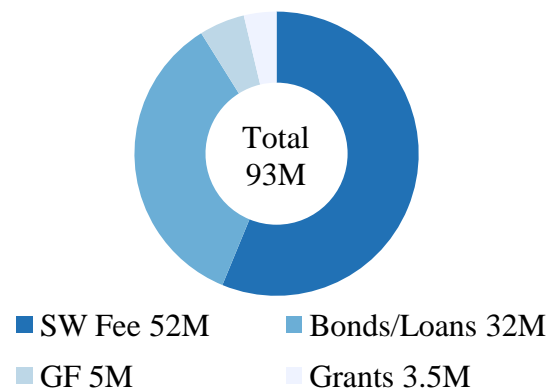


- In FY2018, the City projected that it will attain 3,175 impervious acres of credit from street sweeping, or 74% of its ISRP requirement. The City is also relying heavily upon stream restoration projects to meet its stormwater restoration goals.
- The implementation of annual BMPs (e.g., street sweeping, storm drain vacuuming) can fluctuate significantly from year to year, and stream restoration projects can take several years to go from planning to implementation. If the implementation of any of these projected BMPs falls short, additional BMPs will need to be implemented.
- In FY2019, the City projected numerous opportunities to restore impervious areas at little or no additional cost to the City, including redevelopment (150 acres) and volunteer activities (129 acres). These affordable BMP options should be maximized.

BMP Types Implemented During Permit Term (FY2014-2018)



Sources of Funds (FY2017-2018)



Baltimore County

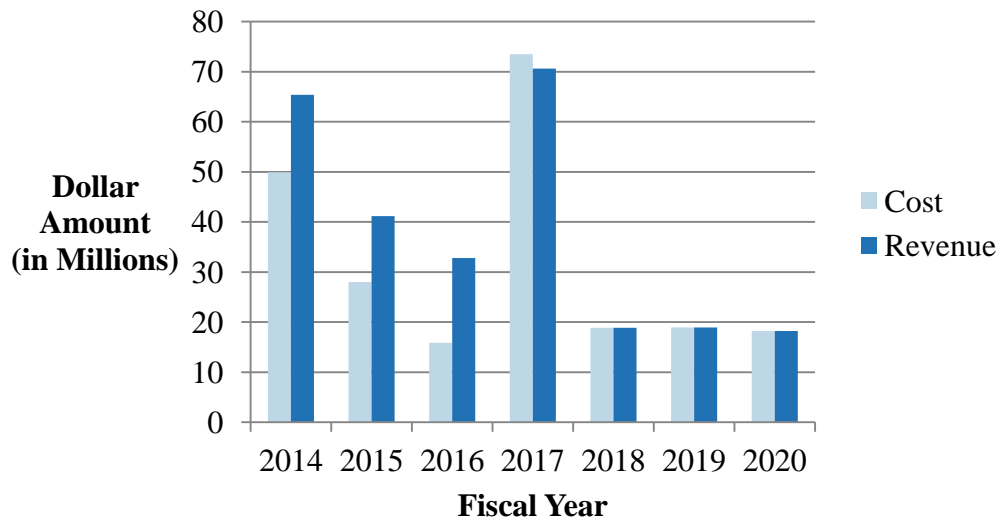
Impervious acre baseline: 6,036

Restored acres: 1,203

Projected restored acres: 6,061

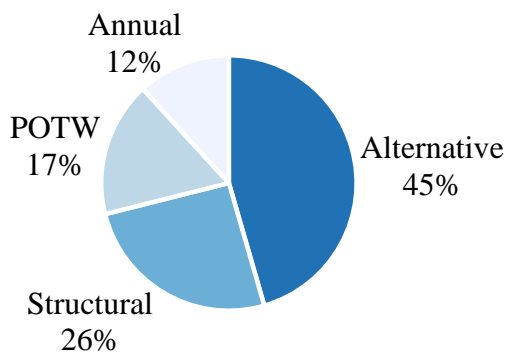
- Cost/acre for completed projects: \$9,467
- Percentage of revenue budgeted to cover next two-year costs: 97%
- Costs for funding the next two-years of the ISRP requirement: \$92,370,484
- Cost/acre for completed and projected projects during the entire permit term: \$24,519

Impervious Surface Restoration Plan Cost and Revenue

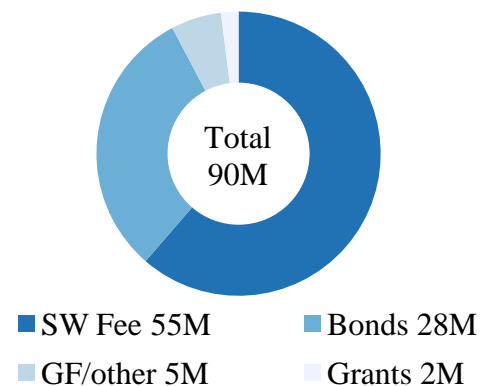


- A public hearing was held on September 13, 2016 and the Baltimore County Council approved the County’s FAP on September 19, 2016.
- The County proposed 1,000 acres of treatment, or 17% of its ISRP requirement, by improving the performance of locally-owned POTWs in an amount equivalent to the impervious area pollutant reductions. Until there is a formal, comprehensive cross-sector nutrient trading program in Maryland, the County should continue to explore all currently approved stormwater BMP options for meeting its ISRP requirement.
- The County indicated that a number of practices will be implemented by volunteers (e.g., rain barrels, tree planting, and septic pumping). Because these practices are implemented at little or no additional cost to the County for restoration credit, these affordable options should be maximized.

BMP Types Implemented During Permit Term (FY2014-2018)



Sources of Funds (FY2017-2018)



Carroll County

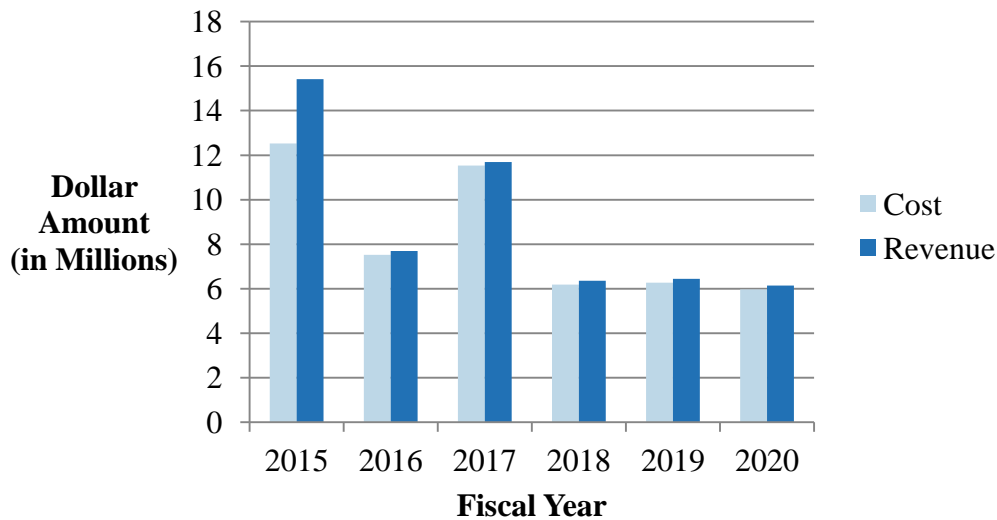
Impervious acre baseline: 1,344

Restored acres: 1,123

Projected restored acres: 1,964

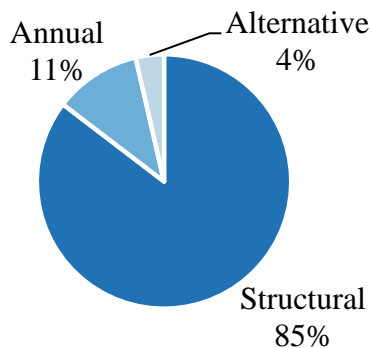
- Cost/acre for completed projects: \$11,199
- Percentage of revenue budgeted to cover next two-year costs: 102%
- Costs for funding the next two-years of the ISRP requirement: \$17,726,028
- Cost/acre for completed and projected projects during the entire permit term: \$15,468

Impervious Surface Restoration Plan Cost and Revenue

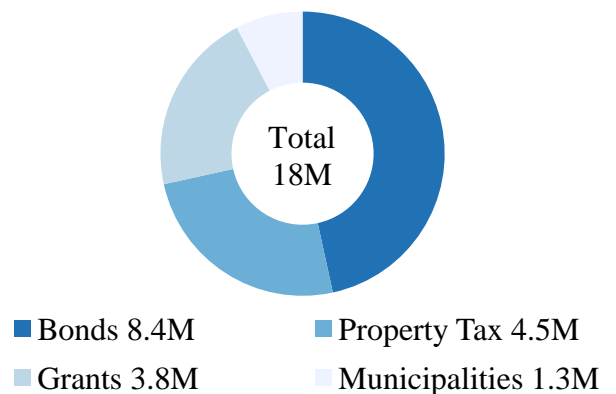


- The County indicated that 79% of its ISRP revenue for the next two years comes from bonds, property taxes, and municipalities, while 21% comes from external grant sources. The County will need to be prepared to increase its local budget and bonds should external grant sources decrease in future years.
- The County listed “Flood Management Area” and “Sheetflow to Conservation Areas” as best management practices (BMP) for achieving 26% of its ISRP requirement that are not currently approved by MDE for restoration credit. Until more monitoring data or clarification can be provided for the use of these BMPs, the County should explore all currently approved stormwater BMP options for meeting the ISRP requirement.
- The County should encourage more low cost homeowner BMPs including rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation.

BMP Types Implemented During Permit Term (FY2015-2019)



Sources of Funds (FY2017-2018)



Charles County

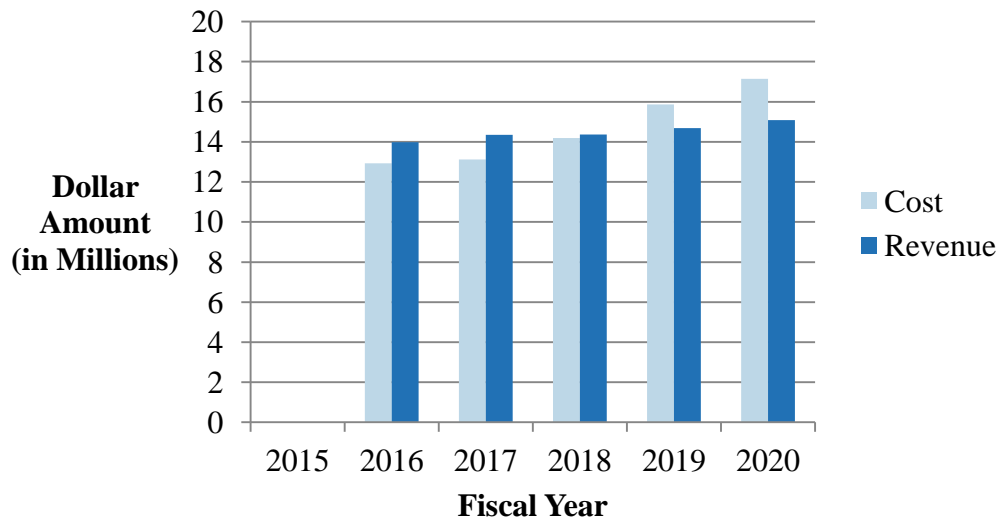
Impervious acre baseline: 1,410

Restored acres: 223

Projected restored acres: 1,500

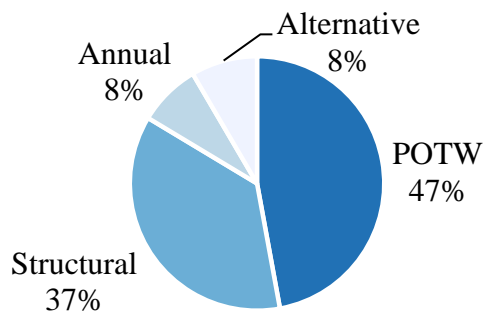
- Cost/acre for completed projects: \$29,508
- Percentage of revenue budgeted to cover next two-year costs: 105%
- Costs for funding the next two-years of the ISRP requirement: \$27,304,800
- Cost/acre for completed and projected projects during the entire permit term: \$23,261

Impervious Surface Restoration Plan Cost and Revenue

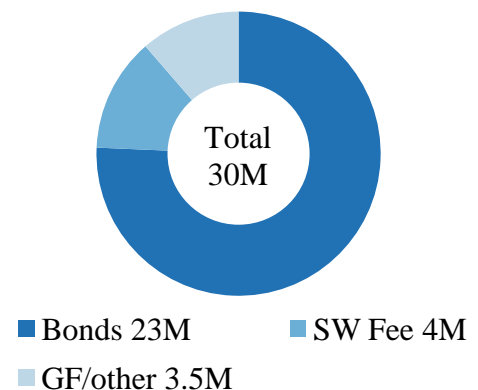


- The County proposed to implement a diverse mix of stormwater management projects for meeting ISRP requirements, ranging from traditional structural practices to newer environmental site design (ESD) techniques.
- Because stream restoration projects can take several years to complete, the County should be prepared to implement back-up BMPs to ensure that restoration targets can be met should there be any delays in the projects currently under design and projected to be completed during the permit term.
- The County proposed 705 acres of treatment, or 47% of the total impervious acres restored, by improving the performance of locally-owned POTWs in an amount equivalent to the impervious area pollutant reductions. Until there is a formal, comprehensive cross-sector nutrient trading program in Maryland, the County should continue to explore all currently approved stormwater BMP options for meeting the ISRP requirement.

BMP Types Implemented During Permit Term (FY2015-2020)



Sources of Funds (FY2017-2018)



Frederick County

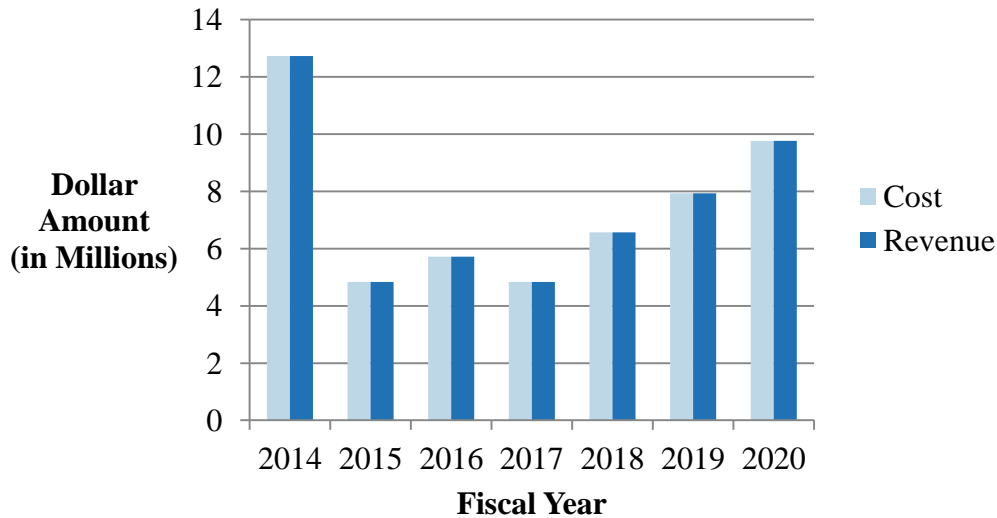
Impervious acre baseline: 1,013

Restored acres: 161

Projected restored acres: 746

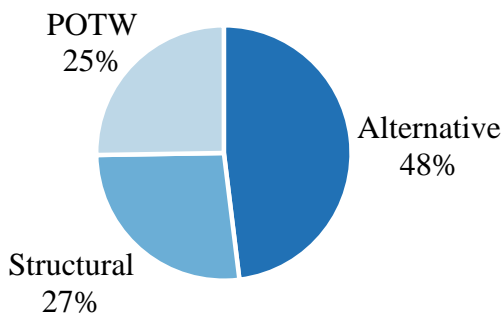
- Cost/acre for completed projects: \$63,491
- Percentage of revenue budgeted to cover next two-year costs: 100%
- Costs for funding the next two-years of the ISRP requirement: \$11,408,093
- Cost/acre for completed and projected projects during the entire permit term: \$38,680

Impervious Surface Restoration Plan Cost and Revenue

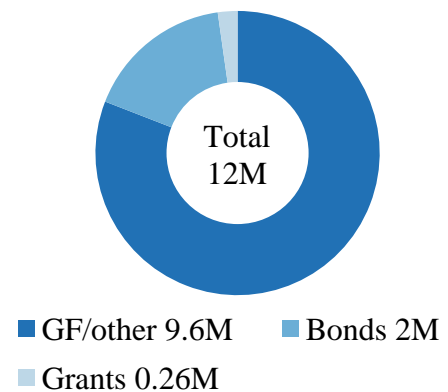


- A public hearing was held on August 15, 2016 and the County’s FAP has been approved by the local governing body.
- The County proposed 256 acres of treatment, or 25% of its ISRP requirement, by improving the performance of locally-owned POTWs in an amount equivalent to the impervious area pollutant reductions. Until there is a formal, comprehensive cross-sector nutrient trading program in Maryland, the County should continue to explore all currently approved stormwater BMP options for meeting the ISRP requirement.
- The County’s FAP included multiple approved restoration practices that are not being claimed for impervious area credit (i.e., street sweeping, storm drain vacuuming, and catch basin cleaning). These practices can help the County meet its restoration goals, reduce program cost, and should be proposed for credit. The County should encourage more low cost homeowner BMPs including rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation.

BMP Types Implemented During Permit Term (FY2015-2020)



Sources of Funds (FY2017-2018)



Harford County

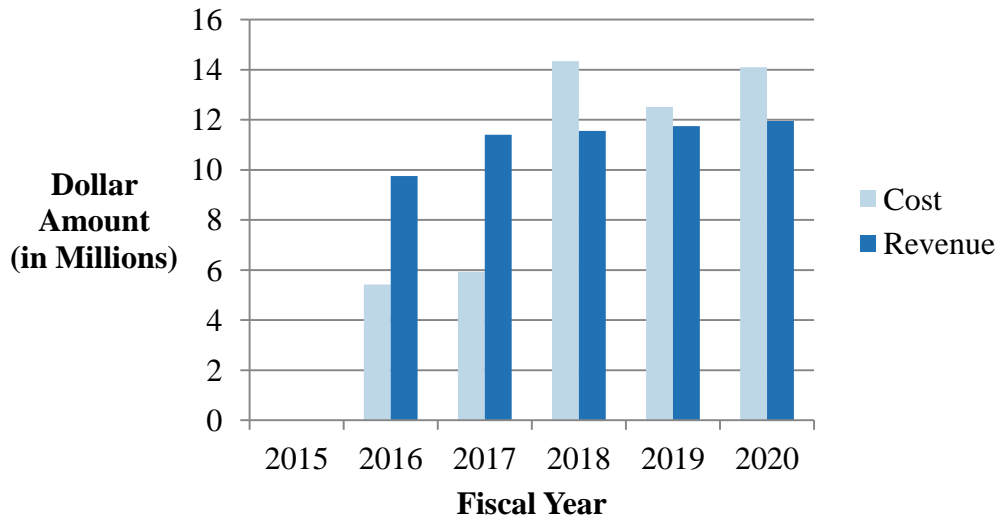
Impervious acre baseline: 1,883

Restored acres: 487

Projected restored acres: 2,279

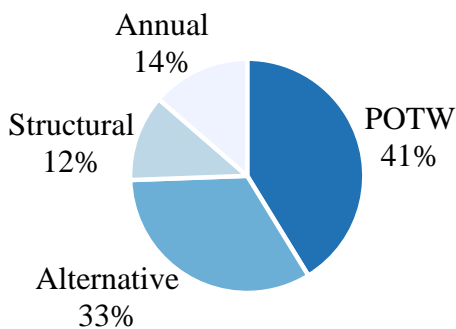
- Cost/acre for completed projects: \$11,887
- Percentage of revenue budgeted to cover next two-year costs: 88%
- Costs for funding the next two-years of the ISRP requirement: \$20,271,000
- Cost/acre for completed and projected projects during the entire permit term: \$20,354

Impervious Surface Restoration Plan Cost and Revenue

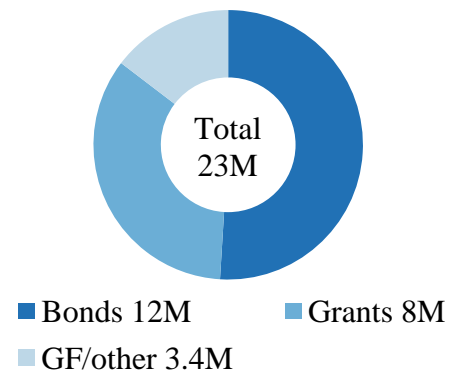


- The County indicated that 66% of its ISRP revenue for the next two years comes from its local budget and bonds, while 34% comes from external grant sources. The County will need to be prepared to increase its local budget and bonds should external grant sources decrease in future years.
- The County proposed numerous restoration options that incur little or no additional cost to its budget, including septic pumping, septic upgrades, and septic connections to POTWs. The County should also encourage other low cost homeowner BMPs including rain barrels, rain gardens, and tree planting. These affordable BMP options should be maximized.
- The County proposed 940 acres of treatment, or 41% of the total impervious acres restored, by improving the performance of locally-owned POTWs in an amount equivalent to the impervious area pollutant reductions. Because the County’s FAP showed that it can exceed the ISRP requirement through numerous BMP options, the full use of the POTW credits may not be needed. Additionally, until there is a formal, comprehensive cross-sector nutrient trading program in Maryland, the County should continue to explore all currently approved stormwater BMP options for meeting the ISRP requirement.

BMP Types Implemented During Permit Term (FY2015-2020)



Sources of Funds (FY2017-2018)



Howard County

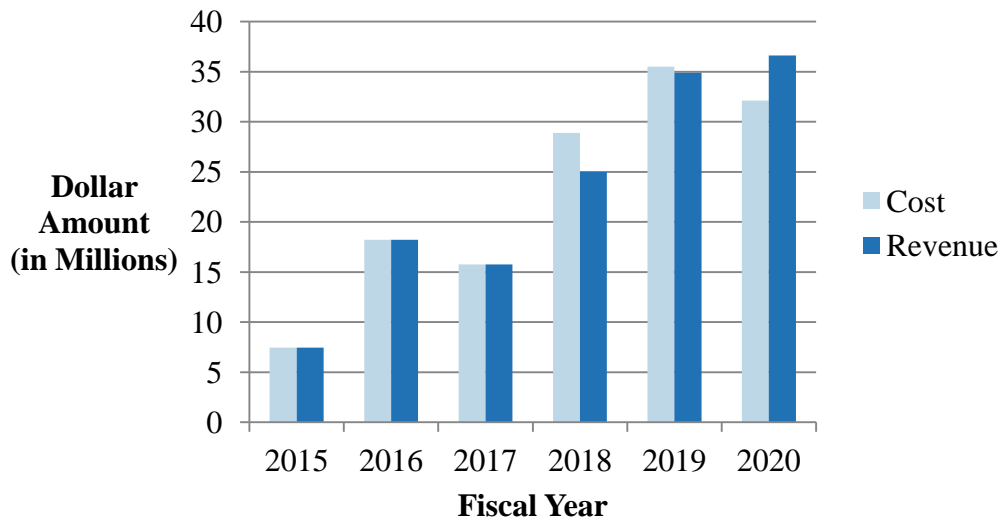
Impervious acre baseline: 2,044

Restored acres: 157

Projected restored acres: 1,745

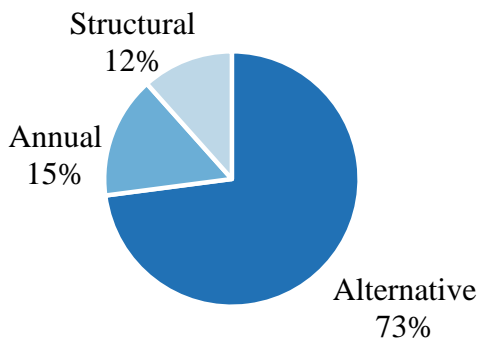
- Cost/acre for completed projects: \$81,771
- Percentage of revenue budgeted to cover next two-year costs: 91%
- Costs for funding the next two-years of the ISRP requirement: \$44,661,270
- Cost/acre for completed and projected projects during the entire permit term: \$60,661

Impervious Surface Restoration Plan Cost and Revenue

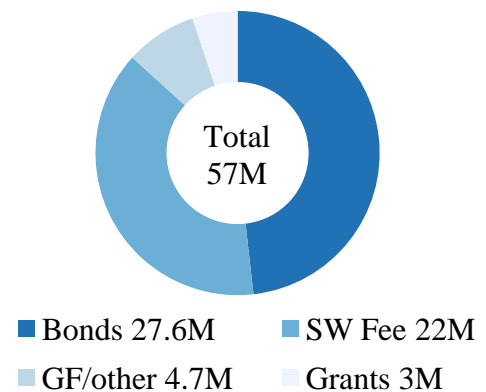


- There are a number of proposed projects that the County reported as “BMP Conversions”, “Pond Conversions”, “BMP Maintenance” or “New BMPs” for 6% of ISRP requirement. The County needs to provide greater specificity regarding these proposed projects so that they can be validated.
- The County’s FAP included two approved restoration practices that are not being claimed for impervious area credit (i.e., street sweeping and inlet cleaning). These practices can help the County meet its restoration goals, reduce program cost, and should be proposed for credit.
- The County is relying heavily upon volunteer activities including homeowner implementation of rain barrels, rain gardens, and tree planting. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation, and should be maximized.

BMP Types Implemented During Permit Term (FY2015-2019)



Sources of Funds (FY2017-2018)



Montgomery County

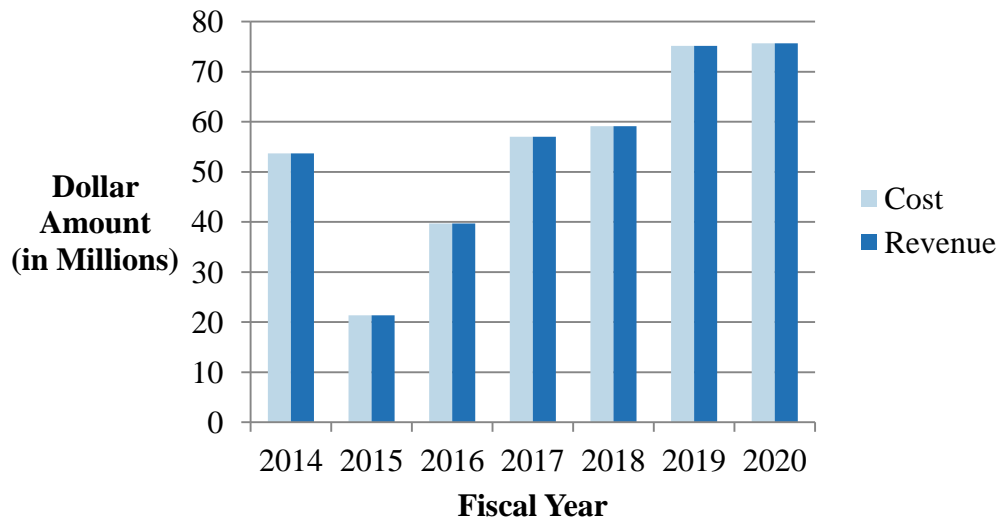
Impervious acre baseline: 3,777

Restored acres: 1,780

Projected restored acres: 3,629

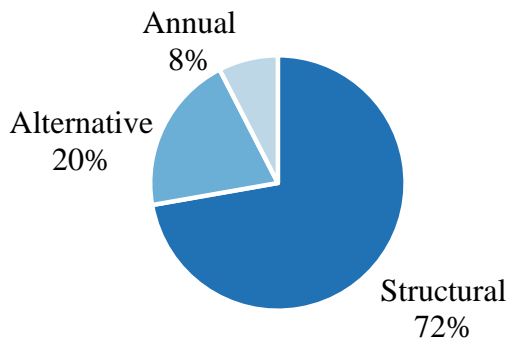
- Cost/acre for completed projects: \$42,152
- Percentage of revenue budgeted to cover next two-year costs: 100%
- Costs for funding the next two-years of the ISRP requirement: \$116,102,260
- Cost/acre for completed and projected projects during the entire permit term: \$63,604

Impervious Surface Restoration Plan Cost and Revenue

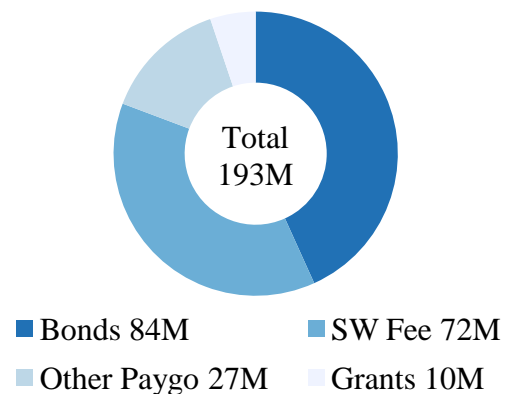


- The County’s FAP included multiple approved restoration practices that are not being claimed for impervious area credit (i.e., street sweeping, catch basin cleaning, and RainScapes). These practices can help the County meet its restoration goals, reduce program cost, and should be proposed for credit.
- The County has proposed dry ponds for 216 impervious acres of credit, or 6% of its ISRP requirement, yet this practice is not an approved water quality BMP by MDE or the Bay Program. Unless additional water quality design features can be provided for these BMPs, the County should continue to explore all currently approved stormwater BMP options for meeting the ISRP requirement.
- There are a number of completed projects that the County reported as “other”, which treat a total of approximately 128 impervious acres, or 3% of its ISRP requirement. The County needs to provide greater specificity regarding these completed projects so that they can be validated.

BMP Types Implemented During Permit Term (FY2014-2018)



Sources of Funds (FY2017-2018)



Prince George's County

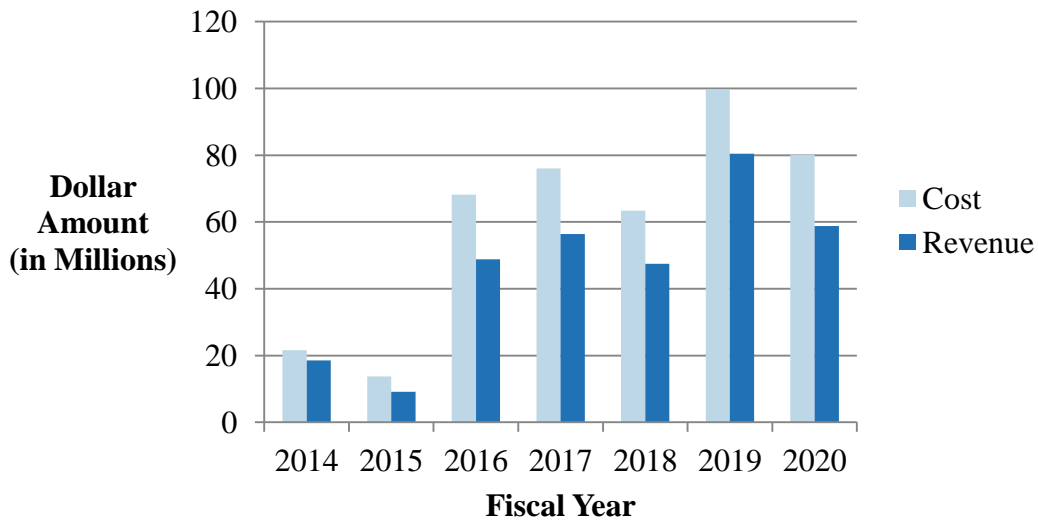
Impervious acre baseline: 6,105

Restored acres: 139

Projected restored acres: 6,211

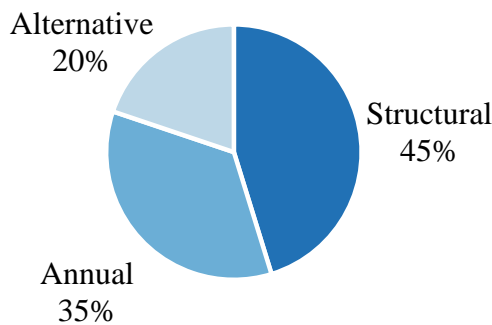
- Cost/acre for completed projects: \$25,633
- Percentage of revenue budgeted to cover next two-year costs: 75%
- Costs for funding the next two-years of the ISRP requirement: \$139,404,753
- Cost/acre for completed and projected projects during the entire permit term: \$46,309

Impervious Surface Restoration Plan Cost and Revenue

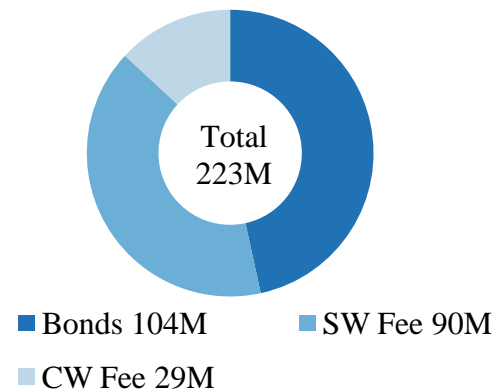


- The County's FAP has not been approved by the local governing body, which is required by the law.
- Within three years, the County proposed to obtain 911 acres of credit through 91,100 linear feet of stream restoration. Because stream restoration projects can take several years to complete, the County may need to implement back-up BMPs to ensure that restoration targets can be met should stream restoration projections fall short.
- The County has over-estimated the amount of credit achieved through their street sweeping program. As a result, the County may need to adjust implementation strategies to ensure that restoration targets can be met.
- The County proposed several BMPs, including septic upgrades and redevelopment credits that can be implemented through the normal development process or independently by homeowners. These affordable BMP options provide great opportunities for citizen outreach and ISRP implementation, and should be maximized.

BMP Types Implemented During Permit Term (FY2014-2019)



Sources of Funds Before Debt Service Installment (FY2017-2018)



V. Watershed Protection and Restoration Program Annual Reports

- Stormwater remediation fees are now optional for MS4 jurisdictions.
- Eight MS4 jurisdictions have fees; two jurisdictions obtain funds through taxes.
- Residential fees range from \$0.01 to \$170.
- For the jurisdictions that have a fee, the number of properties subject to fees range from 49,394 to 260,553.

Sources of Funds for the WPRF

Jurisdiction	Number of Properties Subject to a Stormwater Remediation Fee	Total Stormwater Remediation Fees	Total Additional Sources of Funds	Total
Anne Arundel County	171,046	\$16,168,584	\$1,308,209	\$17,476,794
Baltimore City	223,623	28,302,000	86,130	28,388,130
Baltimore County ¹	256,060	24,444,149	10,032,061	34,476,210
Carroll County	0	0	1,066,890	1,066,890
Charles County	49,742	2,124,017	68,509	2,192,526
Frederick County	49,394	494	0	494
Harford County	0	0	0	0
Howard County	93,163	11,105,687	0	11,105,687
Montgomery County ²	n/a	n/a	n/a	
Prince George's County	260,553	14,669,145	0	14,669,145
Total	1,103,581	\$96,814,076	\$12,561,799	\$109,375,876

*For further details on the WPRP, refer to the WPRP Annual Reports in the appendices.

1. Baltimore County provided estimates of fees collected.
2. Montgomery County was not required to report this data.

VI. Summary and Conclusions

1. All Phase I MS4s in Maryland, including Anne Arundel, Baltimore, Carroll, Charles, Frederick, Harford, Howard, Montgomery, and Prince George's Counties, and Baltimore City, submitted comprehensive lists of projects for meeting ISRP requirements. Typical practices included:
 - a. Annual Programs: street sweeping, inlet cleaning, storm drain vacuuming
 - b. Structural Practices: wet ponds, swales, infiltration, dry wells, rain gardens, green roofs, permeable pavement, rainwater harvesting, submerged gravel wetlands
 - c. Alternative Practices: tree planting, outfall stabilization, stream restoration
2. All MS4s showed that they have the budgets necessary to fund at least 75% of the ISRP requirements over the next two State fiscal years (FY2017 and FY2018).
3. Statewide, projects completed and projected for ISRP implementation over the course of the five year permit term achieve 102% of the restoration requirement at the cost of \$33,738 per acre.
4. Several proposed practices for meeting the ISRP requirement have not been approved by MDE or the Chesapeake Bay Program (e.g., dry ponds, bridge deck cleaning, and floodplain riparian buffer easements) and may only be options for impervious area credit with additional monitoring data and justification to support the practice's pollutant removal efficiencies.
5. Several jurisdictions are implementing restoration practices provided in MDE's guidance document, *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits, August, 2014*, but are not taking credit for these practices. Some of these include street sweeping, inlet cleaning, tree planting, and septic system upgrades. MDE encourages jurisdictions to examine the local implementation of these practices more fully to see how they can be used for additional impervious area restoration credit.
6. MDE's 90 day review of the FAPs will provide further technical details on each MS4 submission. In instances where BMP implementation or budgetary information is unclear, MDE will assist each MS4 in providing the clarification in subsequent submittals.
7. Anne Arundel, Baltimore, Charles, Frederick, and Harford Counties proposed improving the performance of publicly owned treatment works (POTW) in an amount equivalent to the impervious area pollutant reductions for up to 50% of the ISRP requirements. MDE is considering how the overachievement in nutrient reduction in the wastewater sector can be utilized by MS4 permittees in characterizing progress toward meeting TMDL goals. As a matter of policy, MDE supports this option as a cost-effective means for achieving pollutant reductions and is committed to addressing how regulatory process requirements, including permit language and public participation, can be satisfied under this scenario. Until formal processes are in place, MS4s should explore all currently approved BMP options for meeting the ISRP requirements.

Completed and Projected Projects to Meet the ISRP Five Year Permit Term Requirements

MS4	Impervious Acre (IA) Baseline	IA Accepted by MDE (Y/P/N) ¹	Acres Completed and Projected to be Restored	Restoration Cost ²	Average Cost per Acre	Restoration Completed and Projected ³
Anne Arundel County	5,862	Y	4,682	\$94,117,808	\$20,102	79.9%
Baltimore City	4,291	Y	4,588	112,040,918	24,420	106.9%
Baltimore County	6,036	Y	6,061	148,596,014	24,519	100.4%
Carroll County	1,344	P	1,964	30,386,235	15,468	146.2%
Charles County	1,410	P	1,500	34,902,646	23,261	106.4%
Frederick County	1,013	P	746	28,837,574	38,680	73.6%
Harford County	1,883	P	2,279	46,388,000	20,354	121.0%
Howard County	2,044	P	1,745	105,838,122	60,661	85.4%
Montgomery County	3,777	Y	3,629	230,814,187	63,604	96.1%
Prince George's County	6,105	Y	6,211	287,603,535	46,309	101.7%
Totals:	33,765		33,404	\$1,119,525,039	\$33,738	102%

1 Y=Yes, P=Pending, N=No

2 Cost from All Actions worksheet.

3 Percent of untreated impervious surfaces restored toward meeting the impervious surface area requirement.

8. Several jurisdictions have proposed implementation plans that fall short of meeting their ISRP requirements during the five year permit term. For example, Anne Arundel County's projected implementation plan can meet 79.9% of its ISRP requirement, Frederick County's projected implementation plan can meet 73.6% of its ISRP requirement and Howard County's projected implementation plan can meet 85.4% of its ISRP requirement. MDE will meet with these jurisdictions and assist them in developing adaptive management strategies for achieving permit requirements during the current permit term.

9. During its five year permit term that ended February 16, 2015, Montgomery County was able to meet 47% of its ISRP requirement. When FAP and ISRP requirements are not met within the five year permit term, MDE will pursue enforcement action according to § 9-334(a)(3), § 9-335(a), § 9-338, § 9-342, Environment Article, Annotated Code of Maryland, to bring a jurisdiction into compliance.

10. MDE will require the submittal of future FAPs and WPRP Annual Reports to be synchronized with the existing MS4 annual report schedules for easing reporting burdens on local governments and thereby increasing restoration implementation.

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