UA01
Department of the Environment – Capital

Capital Budget Summary

Grant and Loan *Capital Improvement Program*
($ in Millions)

Program	2016 Approp.	2017 Approp.	2018 Request	2019 Est.	2020 Est.	2021 Est.	2022 Est.
Maryland Water Quality Revolving Loan Fund	$130.000	$123.208	$336.792	$250.000	$150.000	$150.000	$150.000
Maryland Drinking Water Revolving Loan Fund	24.000	20.997	129.003	30.000	30.000	32.000	32.000
Bay Restoration Fund – Wastewater Projects	80.000	80.000	60.000	65.000	65.000	65.000	65.000
Septic System Upgrade Program	14.000	14.000	15.000	15.000	15.000	15.000	15.000
Biological Nutrient Removal Program	26.500	25.000	49.089	0.000	0.000	0.000	0.000
Supplemental Assistance Program	4.157	0.000	0.000	0.000	0.000	0.000	0.000
Water Supply Financial Assistance Program	2.661	2.480	1.944	2.500	2.500	2.500	2.500
Hazardous Substance Clean-Up Program	0.400	0.200	0.500	1.000	1.000	1.000	1.000
Mining Remediation Program	0.500	0.500	0.500	0.500	0.500	0.500	0.500
Energy-Water Infrastructure Program	0.000	16.200	8.000	8.000	0.000	0.000	0.000
Total	**$282.218**	**$282.585**	**$600.828**	**$372.000**	**$264.000**	**$266.000**	**$266.000**

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Fund Source	2016 Approp.	2017 Approp.	2018 Request	2019 Est.	2020 Est.	2021 Est.	2021 Est.
PAYGO GF	$0.400	$0.200	$0.500	$1.000	$1.000	$1.000	$1.000
PAYGO SF	193.346	210.086	187.101	217.140	208.580	211.140	210.580
PAYGO FF	44.869	44.319	42.614	41.660	42.220	41.660	42.220
GO Bonds	43.603	27.980	21.524	12.200	12.200	12.200	12.200
Revenue Bonds	0.000	0.000	349.089	100.000	0.000	0.000	0.000
Total	**$282.218**	**$282.585**	**$600.828**	**$372.000**	**$264.000**	**$266.000**	**$266.000**

FF: federal funds
GF: general funds
GO: general obligation
PAYGO: pay-as-you-go
SF: special funds

Note: The fiscal 2018 spending plan includes the reversion of $6.8 million in Water Quality Revolving Loan Fund general funds and $3.0 million in Drinking Water Revolving Loan Fund general funds in fiscal 2017 and thus the general funds are not reflected for fiscal 2017. The fiscal 2018 capital budget includes the de-authorization of $11.0 million in fiscal 2017 GO bond authorization for the Biological Nutrient Removal Program, but the funding is still reflected here because the de-authorization has not been approved yet. The 2017 *Capital Improvement Program* reflects an additional $10.0 million in special funds in each of fiscal 2019 to 2022 for the Biological Nutrient Removal Program. However, this funding is actually proposed to be a subcomponent of the Bay Restoration Fund – Wastewater Projects funding and thus is not shown in this exhibit in order to avoid double-counting.

Summary of Issues

Bay Restoration Fund Expanded Uses: Chapter 428 of 2004 established the Bay Restoration Fund (BRF) to provide grants to owners of wastewater treatment plants (WWTP) to reduce nutrient pollution to the Chesapeake Bay by upgrading the systems with enhanced nutrient removal (ENR) technology. The fund is also used to support septic system upgrades, and the planting of cover crops and through fiscal 2009 was authorized to provide funding for stormwater management. In recent years, legislation has expanded the use of the BRF, and in the 2017 legislative session, additional legislation is being proposed to allow the BRF to be used to purchase nutrient credits and fund Biological Nutrient Removal (BNR) projects. Although, amendments may modify the proposal to purchase nutrient credits and instead provide authority to implement a competitive grant process. **The Department of Legislative Services (DLS) recommends that the Maryland Department of the Environment (MDE) comment on the proposed fiscal 2018 and future year allocation plan for the BRF and whether it will continue to be an effective source of funding even though spread across so many diverse uses.**

Energy-Water Infrastructure Program Reported: The fiscal 2017 operating budget bill restricted $100,000 of MDE's special fund appropriation for the new Energy-Water Infrastructure Program pay-as-you-go (PAYGO) capital program. The funding was restricted pending submission of reports on July 1, 2016, concerning the criteria for the allocation of the Energy-Water Infrastructure Program funding, and on January 1, 2017, concerning the actual allocation of funding including energy efficiency benchmarks and expected outcomes, including any user rate modifications. MDE has submitted the required reports. **DLS recommends that the $50,000 in special funds restricted pending submission of the report on the actual allocation of the Energy-Water Infrastructure Program project funding be released.**

Summary of Updates

Integrated Project Priority System Revised: Water Quality Revolving Loan Fund (WQRLF) projects are prioritized based on an Environmental Protection Agency (EPA) approved Integrated Project Priority System. The priority system for WQRLF projects consists of a system for evaluating, rating, and ranking of both point source and nonpoint source water quality projects. The Integrated Project Priority System originally was revised by MDE and approved by EPA in 2010 to target financial assistance to projects that help meet Maryland's Phase I Watershed Implementation Plan (WIP) to address the Chesapeake Bay Total Maximum Daily Load (TMDL). The most recent revision was approved by EPA on November 10, 2016, and reflects the weighting of cost efficiency more heavily than it was previously weighted, among other changes.

Cash Accounting and Revenue Bonds for the Drinking Water Revolving Loan Fund and the Water Quality Revolving Loan Fund: The fiscal 2018 spending plan includes a shift to cash accounting for the WQRLF and the Drinking Water Revolving Loan Fund (DWRLF) as well as the authorization of revenue bond issuances. In combination, the switch to cash accounting and planned revenue bond issuances allow the WQRLF and the DWRLF to fund several large projects that are ready to proceed: the Back River Headworks Improvement project, which is budgeted $160.0 million for fiscal 2018 in the WQRLF; and the Ashburton Reservoir Improvements Project and Druid Lake Tanks project, which are budgeted $50.0 million and $49.0 million in fiscal 2018, respectively, in the DWRLF. These three large projects are ready to proceed and have some urgency behind them given the connected consent decrees and administrative orders.

Summary of Recommended PAYGO Actions

1. Concur with Governor's allowance for the Water Quality Revolving Loan Fund.

2. Concur with Governor's allowance for the Hazardous Substance Clean-Up Program.

3. Concur with Governor's allowance for the Drinking Water Revolving Loan Fund.

4. Concur with Governor's allowance for the Bay Restoration Fund – Wastewater Projects.

5. Concur with Governor's allowance for the Bay Restoration Fund – Septic Systems.

6. Concur with Governor's allowance for the Energy-Water Infrastructure Program.

Summary of Recommended Bond Actions

1. Biological Nutrient Removal Program

   Approve the Biological Nutrient Removal Program authorization.

2. Maryland Drinking Water Revolving Loan Fund

   Approve the Drinking Water Revolving Loan Fund authorization.

3. Maryland Water Quality Revolving Loan Fund

   Approve the Water Quality Revolving Loan Fund authorization.

4. Mining Remediation Program

   Approve the Mining Remediation Program authorization.

5. Water Supply Financial Assistance Program

   Approve the Water Supply Financial Assistance Program authorization.

6. SECTION 2 – Maryland Department of the Environment – Biological Nutrient Removal Program

   Approve the de-authorization for the Biological Nutrient Removal Program.

Program Description

The MDE capital program is comprised of the WQRLF, the DWRLF, the BRF – Wastewater Projects, the BRF – Septic System Projects, the BNR Program, the Water Supply Financial Assistance Program, the Hazardous Substance Clean-Up Program, the Mining Remediation Program, and the continuation of a new program for fiscal 2017 – the Energy-Water Infrastructure Program. The programs in MDE's fiscal 2018 allowance address MDE's goals of protecting water resources and ensuring safe and adequate supplies of drinking water, managing air quality and emissions for maximum protection of human health and the environment, and reducing Maryland citizens' exposure to hazards. Descriptions of MDE's nine current programs follow.

- ***WQRLF:*** The WQRLF was created to provide low-interest loans to counties and municipalities to finance water quality improvement projects. The fund was established by the federal government in the Clean Water Act of 1987 and by the State of Maryland in Sections 9-204 and 9-1604 of the Environment Article to replace the federal construction grants program that was phased out. Projects eligible for funding include WWTPs; failing septic systems; and nonpoint source projects, such as urban stormwater control projects. The federal Act requires a 20% State match. For fiscal 2018, at least 10% of the federal funding must be used for Green Reserve projects – water efficiency, energy efficiency, and stormwater projects – and no more than $12.926 million may be used for loan forgiveness/grants. WQRLF projects are prioritized based on an EPA-approved Integrated Project Priority System. The priority system for WQRLF projects consists of a system for evaluating, rating, and ranking of both point source and nonpoint source water quality projects. The Integrated Project Priority System originally was revised by MDE and approved by EPA in 2010 to target financial assistance to projects that help meet Maryland's Phase I WIP to address the Chesapeake Bay TMDL. The most recent revision was approved by EPA on November 10, 2016. The Integrated Project Priority System focuses on water quality or public health benefits, compliance, cost efficiency, and sustainability; the most recent revision weights cost efficiency more heavily than it was previously weighted, among other changes. In accordance with this system, the projects are rated and ranked by MDE's Water Quality Financing Administration and are listed in ascending ranking order on the Project Priority List. Through January 1, 2017, the program has executed $2.296 billion in loans, loan forgiveness, and grants, including the American Recovery and Reinvestment Act of 2009 (ARRA) funding.

- ***DWRLF:*** The DWRLF was established in accordance with a federal capitalization grant approved by the U.S. Congress in 1996 in anticipation of future federal capitalization grants. This program was authorized by the General Assembly in 1993 to provide loans to counties and municipalities to finance water supply improvements and upgrades. In accordance with the federal legislation, these funds may also be loaned to private parties. The federal Act requires that a minimum of 20% of State matching funds for each year's federal capitalization grant be deposited into the fund. For fiscal 2018, at least 20% and no more than 50% of the federal funding must be used for loan forgiveness or grants. Similar to the WQRLF, DWRLF projects are prioritized based on an EPA-approved Drinking Water Project Priority System that focuses on many criteria, the most important being the public health benefit. Through January 1, 2017,

the program has executed approximately $301.8 million in loans, loan forgiveness, and grants including ARRA funding.

- ***BRF – Wastewater Projects:*** The BRF (Chapter 428 of 2004) was created to address the significant decline in Chesapeake Bay water quality due to overenrichment of nutrients, such as phosphorus and nitrogen. This dedicated fund, financed in large part by WWTP users, initially was used to provide grants to local governments to upgrade Maryland's 67 major WWTPs with ENR technology as part of reducing an additional 7.5 million pounds of nitrogen per year in order to reach Maryland's commitment under the TMDL as implemented by the WIP. Chapter 150 of 2012 increased the BRF fee beginning July 1, 2012, in order to address a funding shortfall that would have made it very difficult to complete the upgrades to the 67 major publicly owned WWTPs by calendar 2017, as required by the WIP. Chapter 150 also made several other changes such as establishing additional uses for the fund beginning in fiscal 2018. Chapter 153 of 2015 (Environment – BRF – Use of Funds) added to the authorized uses of the BRF, beginning in fiscal 2016, by providing funding for up to 87.5% of the cost of projects relating to combined sewer overflows (CSO) abatement, rehabilitation of existing sewers, and upgrading conveyance systems, including pumping stations; this funding authority previously existed between fiscal 2005 and 2009, capped at $5 million annually. The bill also altered the priority of BRF funding beginning in fiscal 2018 by making grants for septic system upgrades, stormwater management, and CSO and sewer abatement projects of equal priority, with funding decisions made on a project-specific basis. The funding allocation is up to 100% for eligible capital costs related to planning, design, and construction of ENR technology at targeted WWTPS; up to 85% for combined sewer overflow abatement, rehabilitation of existing sewers and upgrading conveyance systems, including pumping stations; and up to 50% for stormwater project costs. ENR takes water that has gone through the BNR process and further refines the effluent physically, biochemically, or chemically to an average level of 3.0 milligrams per liter (mg/L) nitrogen and 0.3 mg/L phosphorus. Revenue from this fund also supports upgrades to septic systems. A portion of the funding ($7 million in the fiscal 2018 allowance) is budgeted in the MDE operating budget for operations and maintenance of WWTPs upgraded to ENR status.

- ***BRF – Septic System Projects*:** The BRF includes a separate program to fund replacement of failing septic systems. This program is funded as part of the BRF legislation by a fee on users of septic systems and sewage holding tanks, of which 60% of the revenue is allocated to MDE for the septic system upgrade program and 40% to the Maryland Department of Agriculture for the Cover Crop Program. While Chapter 280 of 2009 (Chesapeake Bay Nitrogen Reduction Act of 2009) already required best available technology for new and replacement systems in the Chesapeake Bay Critical Area or the Atlantic Coastal Bays Critical Area, new regulations finalized in September 2012 expand septic system upgrade requirements to include the best available technology for all septic systems serving new construction in the Chesapeake and Atlantic Coastal Bays watersheds and in the watershed of any nitrogen impaired water body. MDE provides grants to upgrade failing systems and holding tanks with the best available technology for nitrogen removal. Overall, the program gives priority to projects that involve failing systems in environmentally sensitive areas that are ready to proceed. The program is administered by county governments or other parties; contractors conducting the septic system

upgrades are directly reimbursed for their work. Applications are prioritized as follows: (1) failing septic systems or holding tanks in the Critical Areas; (2) failing septic systems or holding tanks outside the Critical Areas; (3) nonconforming septic systems in the Critical Areas; (4) nonconforming septic systems outside of the Critical Areas; (5) other septic systems in the Critical Areas, including new construction; and (6) other septic systems outside the Critical Areas, including new construction. Homeowners with household income less than or equal to $300,000 per year are eligible for 100% grants of the best available technology cost, and all other homeowners are eligible for grants covering 50% of the cost. Nonprofit entities are eligible for 100% grants. For-profit businesses are eligible for 50% grants. Chapter 379 of 2014 (BRF – Authorized Uses – Local Entities) required that up to 10% of the funds in the Septics Account of the BRF be distributed to a local public entity delegated by MDE – local health departments – to cover reasonable costs associated with implementation of MDE regulations pertaining to septic systems that use the best available technology (BAT) for nitrogen removal. MDE adopted a new septic system regulation that became effective on November 24, 2016, which removes the universal requirement that BAT for removal of nitrogen systems be installed outside the Chesapeake and Atlantic Coastal Bays Critical Area (Critical Area) for all new construction or replacement septic systems.

- ***BNR Program:*** This program provides cost-share grant funds to local governments to retrofit or upgrade WWTPs to remove a greater portion of nutrients (nitrogen and phosphorus) from discharges. The goal of the program is to support the WIP implementation of the Chesapeake Bay TMDL point source nutrient reduction strategy. The State provides up to 50% of the total eligible project cost, with the ability to provide 100% of the project cost, as provided under Title 9, Sections 9-348 of the Environment Article. BNR biologically removes the total nitrogen to an average level of 8 mg/L and the total phosphorus to an average level of 2 mg/L prior to discharging the water into the receiving waters. The next level of treatment is provided by an upgrade to ENR technology. All WWTPs upgraded to BNR by MDE will have the capacity to accommodate ENR upgrades in the future. The fiscal 2018 allowance reflects a shift in funding source from general obligation (GO) bonds to BRF revenue bonds for the program. For fiscal 2019 and beyond, the 2017 *Capital Improvement Program* (CIP) programs special funds for the program, which reflects that the program is assumed to be funded by the BRF.

- ***Water Supply Financial Assistance Program:*** The General Assembly created the Water Supply Financial Assistance Program in 1982 to address the deteriorating condition of the State's water supply infrastructure and the lack of adequate financing available to local governments to upgrade water supply systems. This program provides grants to assist small communities in the acquisition, construction, equipping, rehabilitation, and improvement of publicly owned water supply facilities. The State may provide up to 87.5% of total eligible project costs (not to exceed $1.5 million per project), and a minimum 12.5% local match is required. In recent years, all assistance has been in the form of grants rather than loans. This program is often used in conjunction with other sources of federal and State financial assistance (such as the DWRLF) to achieve project affordability.

- ***Hazardous Substance Clean-Up Program:*** The Hazardous Substance Clean-Up program provides funds for cleaning up uncontrolled waste sites listed on the federal National Priorities

List (Superfund) and other uncontrolled waste sites within the State that do not qualify for federal funding through the Superfund program. The State provides up to 100% of the costs of cleanup for the projects not included on the National Priorities List. At orphan sites, sites lacking a financially viable responsible party to pay for the cleanup, the State provides 100% of the cost of the preliminary site assessment. In all cases, the program seeks cost recovery when possible from responsible parties. The program also provides the State's share (10%) of remediation costs for federal Superfund orphan sites with the remainder provided through the federal share (90%).

- ***Mining Remediation Program:*** The Mining Remediation Program was a new addition to MDE's capital program for fiscal 2015. Where there is no financially viable responsible party, the program provides funding for remediation of abandoned lands and waters impacted by inadequate coal mining reclamation practices prior to the passage of the federal Surface Mine Control and Reclamation Act of 1977. The program works through the Maryland Abandoned Mine Land Division. Projects include reclamation of surface mine high walls and pits, stabilization of landslides, restoration of stream banks to address flooding, extinguishing underground coal mine and coal refuse fires, stabilization of coal refuse piles, water supply replacement, stabilizing buildings and roads that are impacted by underground mine subsidence, and acid mine drainage treatment projects.

- ***Energy-Water Infrastructure Program:*** The Energy-Water Infrastructure Program was a new addition to MDE's capital program for fiscal 2017. The program is funded with money from the agreement by which, under Public Service Commission (PSC) Order 86372, Dominion Cove Point is allowed to construct a 130-megawatt nameplate capacity electric generating station at the existing liquefied natural gas terminal site in Calvert County near Cove Point. A total of $40.0 million was made available as a result of PSC Order 86372, of which the Energy-Water Infrastructure Program's current and projected authorizations represent $32.2 million of the $40.0 million. As part of the agreement, funding is being used – per the right to fund cost-effective energy efficiency and conservation programs, projects, or activities – to provide grants to water and wastewater treatment plant owners to develop energy-efficient and resilient projects in order to reduce operating costs and ultimately pass savings on to consumers by lowering the rate of future user fee increases. Project selection is based on ready-to-construct project applications received. Funding is provided as 100% grants not to exceed $1.0 million per project for energy-efficient equipment (such as replacement of aging pumps with new energy-efficient ones) and $3.0 million per project for combined heat and power projects (such as using methane from digesters to generate heat/power or by developing wind power to generate power). The goal is to achieve energy efficiency/reduction levels of 20% relative to the old equipment being replaced as tracked through an energy audit.

Performance Measures and Outputs

In January of each year, MDE solicits interest for funding from the WQRLF and the DWRLF. The solicitation of interest is available to local governments and private drinking water providers. MDE's funding solicitation in January 2016 for fiscal 2018 funding is reflected in **Exhibit 1.** MDE's solicitation distinguishes between clean water and drinking water type projects with the majority of funding solicited for clean water projects. As reflected in the exhibit, the funding demand of $1.3 billion exceeds the $144.2 million in the fiscal 2018 allowance.

Exhibit 1
MDE Capital Program Funding Solicitation for Revolving Loan Funds
Fiscal 2018

Project Type	Applications	Total Project Cost	Funding Requested from MDE
Clean Water			
Secondary Treatment	4	$412,362,119	$377,677,463
Advanced Treatment	16	202,958,304	186,514,360
Sewerage (inc. I/I and CSO)	62	315,950,986	251,346,320
Stormwater	22	134,091,309	110,337,079
Hydromodification	3	8,191,022	7,818,022
Landfills	0	0	0
Other	3	17,101,000	16,501,000
Subtotal	***110***	***$1,090,654,740***	***$950,194,244***
Drinking Water			
Source Water Development	3	$23,500,000	$20,467,500
Water Treatment Plant	4	10,995,397	10,990,397
Transmission/Distribution Mains	21	182,524,604	166,608,934
Water Storage	5	155,259,800	120,396,400
Other	0	0	0
Subtotal	***33***	***$372,279,801***	***$318,463,231***
Total	**143**	**$1,462,934,541**	**$1,268,657,475**

CSO: combined sewer overflow
I/I: infiltration or inflow
MDE: Maryland Department of the Environment

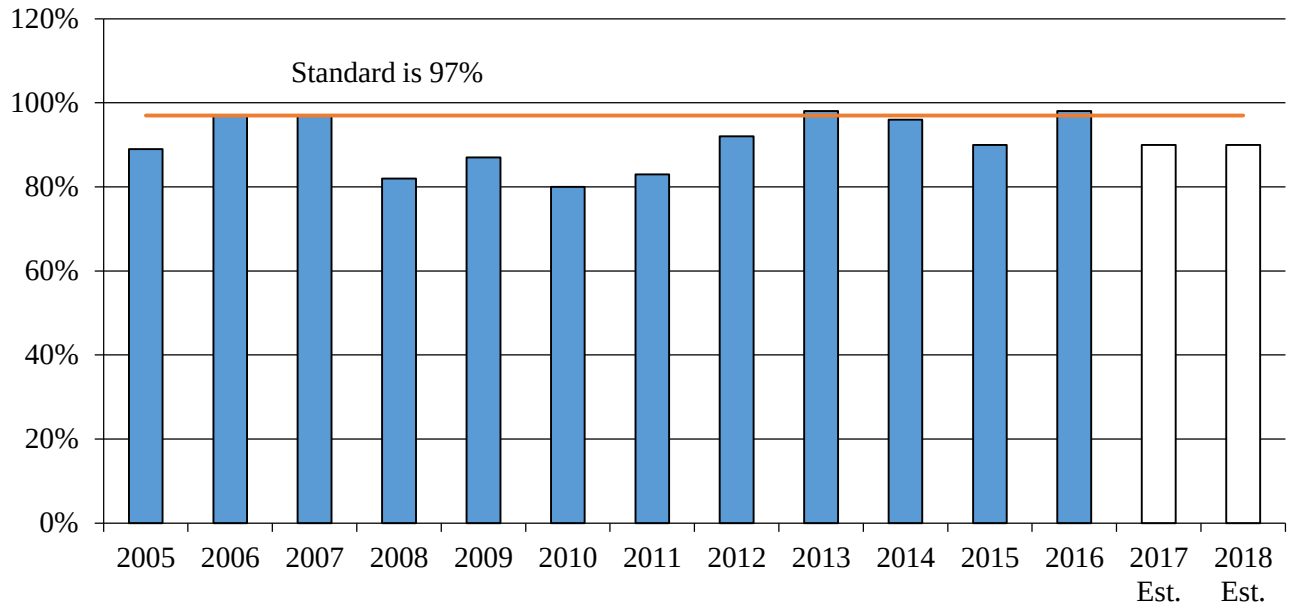
Source: Maryland Department of the Environment

DWRLF

Exhibit 2 shows that due to the changing nature of the underlying standards to which MDE applies a 97% significant compliance goal, it is difficult to see long-term trends in public water system compliance with rules. Instead, there appears to be a trend toward increasing compliance with a standard for a couple of years after the standard is created until a new standard is developed and the process starts over. For instance, Maryland met the standard for complying with the 2002 rules in fiscal 2006, but then new rules were developed, and the compliance dropped to 82% in fiscal 2008. Five new federal regulations required new State rules in fiscal 2010. As of October 2013, MDE noted that monitoring requirements for two new contaminant levels have reduced the fiscal 2015 and 2016 compliance levels. These two new contaminant levels are the Long Term Enhanced Surface Water Treatment Rule, which became effective on September 30, 2014, for targeted systems serving less than 10,000 people; and the Stage 2 Disinfections By-Products Rule (total trihalomethanes or haloacetic acids), which required a second round of monitoring in October 2013 and reporting by October 2014. However, as noted previously, the overall trend is toward a cleaner public water system in Maryland.

However, the data only reflects compliance with rules for which MDE has delegated primary enforcement responsibility, or primacy. Due to a legal disagreement between EPA and the Maryland Attorney General's Office about whether to use "quarterly" or "every 90 days" for the definition of the required frequency for monitoring in Maryland's adopted regulations, MDE did not have primacy for the Stage 2 Disinfections By-Products Rule in fiscal 2016. As a result, MDE's measure does not include the Stage 2 Disinfections By-Products Rule in fiscal 2016. If MDE did have primacy, then the Marylanders served by public water systems in significant compliance would have decreased to 70% since four of Maryland's largest public water systems (*i.e.*, Baltimore City) exceeded the drinking water standard for Stage 2 Disinfections By-Products Rule. The population impacted by these violations is as follows (total is 1,743,169): Baltimore City (includes portions of Baltimore County) – 1.6 million; Freedom District (Carroll County) – 24,867; Springfield Hospital Distribution (Carroll County) – 1,500; Town of North East (Cecil County) – 5,190; Town of Perryville (Cecil County) – 3,672; Perry Point VA Medical Center (Cecil County) – 2,000; City of Havre de Grace (Harford County) – 14,000; City of Hagerstown (Washington County) – 88,000; Town of Sharpsburg (Washington County) – 1,360; Town of Smithsburg Distribution (Washington County) – 2,500; and Princess Royale Distribution (Worcester County) – 80.

Exhibit 2
Marylanders Served by Public Water Systems in Significant Compliance
Fiscal 2005-2018 Est.



Note: Up to fiscal 2008, the basis for significant compliance with public water systems rules was 97% of the rules adopted in 2002. For fiscal 2008, the basis for significant compliance is 97% of the rules adopted since fiscal 2002. For fiscal 2009 and onward, significant compliance is measured as 97% of the rules adopted as of fiscal 2009. In fiscal 2010, State regulations were adopted to reflect five new federal regulations: arsenic, radionuclide, Stage 2 Disinfection Byproduct, Long Term Enhanced Surface Water Treatment, and revised lead and copper. The Maryland Department of the Environment has noted that fiscal 2015 and 2016 estimates have been adjusted to reflect short-term compliance issues from more than 500 water systems implementing new monitoring requirements, as of October 2013, for two new maximum contaminant levels.

Source: Governor's Budget Books, Fiscal 2008-2016; Department of Budget and Management

BRF – Wastewater Projects

Exhibit 3 shows the status of efforts to install BNR and ENR technology at the 67 major WWTPs. BNR technology allows WWTPs to achieve wastewater effluent quality of 8 mg/L total nitrogen and 3 mg/L total phosphorus. As of January 2017, of the 67 major WWTPs, 93% are operating at the BNR level (equal to 93% as of January 2016), and 75% are operating at the ENR level (up from 61% as of January 2016).

Exhibit 3
Status of BNR and ENR Construction
Through January 2017

	BNR	ENR
Pre-planning	0	0
Planning	0	1
Design	1	2
Construction	4	14
Under Operation	62	50
Total	**67**	**67**

BNR: biological nutrient removal
ENR: enhanced nutrient removal

Note: The Bay Restoration Fund Advisory Committee added the Hampstead wastewater treatment plant, increasing the major plants to 67.

Source: Maryland Department of the Environment

EPA issued its *Interim Evaluation of Maryland's 2014-2015 and 2016-2017 Milestones* on June 17, 2016, which reflects the progress on best management practices (BMP) implementation. The modeled results reflect that Maryland met its statewide phosphorus and sediment targets for the 2014-2015 milestone period but missed its nitrogen target – only the wastewater sector is on target. For the 2016-2017 milestone period, Maryland is on track to meet nitrogen, phosphorus, and sediment targets and is on track to meet phosphorus and sediment targets for 2025. However, Maryland is not on track to meet any targets in the urban sector in 2017, and EPA noted that it may increase its oversight of Maryland's stormwater sector if Maryland does not make substantial improvements.

MDE indicates that there are now 15 WWTPs, up from 6 as of last year's analysis, which may not meet the deadline to fully complete the upgrade of the 67 major WWTPs to ENR technology by June 30, 2017. The status of the 15 WWTPs is as follows:

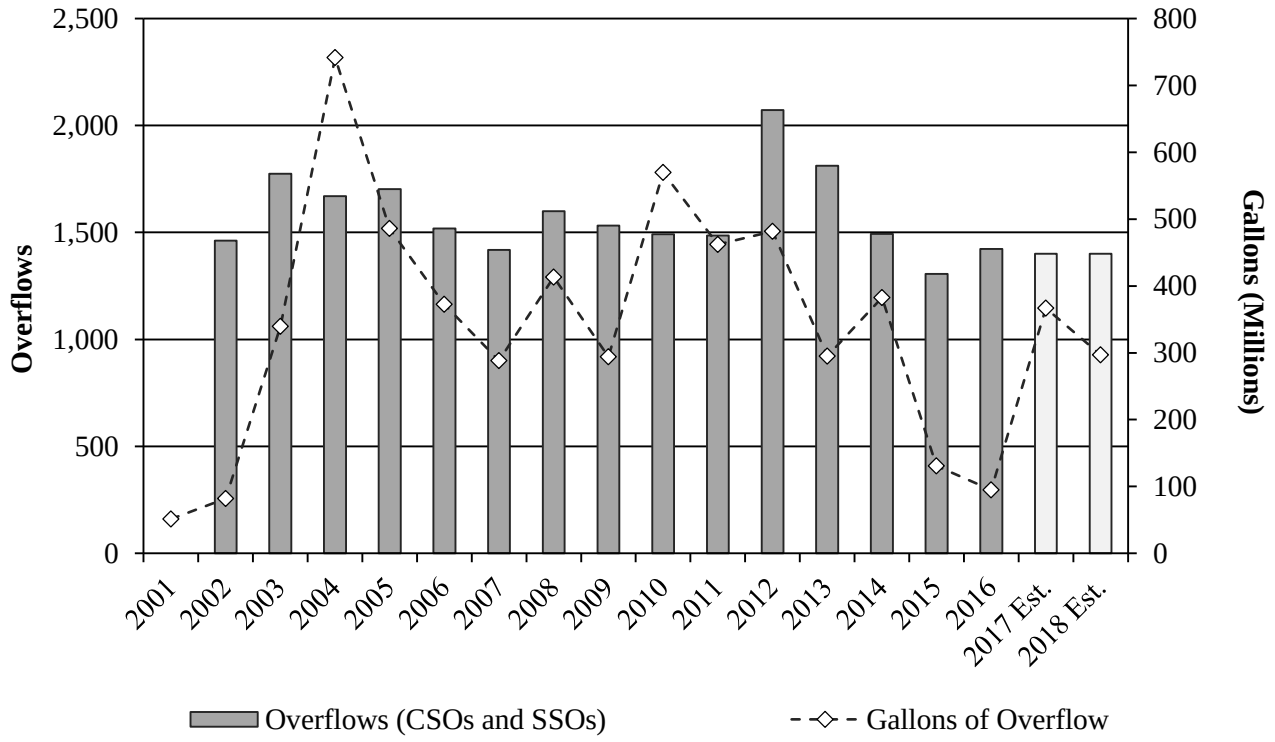
- ***Patapsco:*** under construction;
- ***Northeast River:*** under construction;
- ***Cox Creek:*** under construction;
- ***Winebrenner:*** under construction;
- ***Back River:*** under construction;

- ***Freedom District:*** under construction;
- ***Salisbury:*** under construction;
- ***Mayo:*** under construction;
- ***Leonardtown:*** under construction;
- ***Maryland Correctional Institution:*** under construction;
- ***Frederick:*** under construction;
- ***Conococheague:*** under construction;
- ***Westminster:*** in design;
- ***Hampstead:*** in design; and
- ***Princess Anne:*** in planning.

A number of Maryland's jurisdictions have signed consent decrees, requiring the upgrade of their sewer systems due to the release of untreated sewage from facilities with National Pollutant Discharge Elimination System permits. These releases are called CSOs if a jurisdiction has a single system carrying both storm and sanitary sewer water, and it is called a sanitary sewer overflow if the two systems are separated.

As illustrated in **Exhibit 4,** the number of gallons of overflow has shown a decreasing trend between fiscal 2010 and 2016. However, over the fiscal 2001 through 2016 period, it appears very little progress has been made to reduce the number of overflows. Large overflows in a particular year may be attributable to a few extreme events, such as in Cumberland and LaVale, in Allegany County in recent years. MDE has noted previously that funding for sewer rehabilitation and the amount of rainfall will determine future sewer overflow reductions and that it has very little control over either the number of overflows or the associated gallons. For instance, while not necessarily reflected in Exhibit 4, MDE has noted in the past that predictions about more substantial storms due to global warming have led to higher overflow estimates for future years. MDE also has noted that it can ensure that the systems have long-term control plans and/or consent decrees or other enforcement actions to control overflows, but that remedying these shortcomings can be expensive, long-term projects; therefore, only slow progress toward the objective of a 50% reduction from the baseline amount of overflow gallons can be made.

Exhibit 4
CSO and SSO Overflows
Fiscal 2001-2018 Est.



CSO: combined sewer overflow
SSO: sanitary sewer overflow

Note: The number of gallons of overflow is calculated by the annual net change in number of gallons of overflows from the 2003 to 2005 average.

Source: Governor's Budget Books, Fiscal 2005 and 2016; Department of Budget and Management, Fiscal 2015 to 2018

BRF – Septic System Projects

The septic system data provided in **Exhibit 5** reflects the large numbers of septic systems to be upgraded by the program. The greatest number of both the State's septic systems in the Critical Area and upgrades funded by the BRF are in Anne Arundel County. Between February 2016 and February 2017, 955 septic systems in total have been upgraded with BRF funding, which includes 810 in the Critical Area. Since the program's inception, a total of 3,297 systems have been upgraded using non-BRF funding with the greatest number of upgrades in Anne Arundel County.

Exhibit 5
Septic System Data
January 2017

County	Systems	Systems in Critical Area	Systems Not in Critical Area	BRF Upgraded Septic Systems	Critical Area BRF Upgraded Septic Systems	Septic Systems Upgraded without BRF Funding	Total BAT Systems
Allegany	4,169	0	4,169	16	n/a	31	47
Anne Arundel	40,538	12,911	27,627	1,392	1,073	576	1,968
Baltimore City	0	0	0	0	n/a	0	0
Baltimore County	28,000	2,130	25,870	287	57	233	520
Calvert	25,341	4,832	20,509	692	524	332	1,024
Caroline	8,463	1,135	7,328	254	135	33	287
Carroll	33,441	0	33,441	164	n/a	293	457
Cecil	20,209	3,503	16,706	450	267	104	554
Charles	22,067	1,132	20,935	242	107	46	288
Dorchester	6,883	3,321	3,562	480	440	10	490
Frederick	31,031	0	31,031	218	n/a	336	554
Garrett	11,897	0	11,897	67	n/a	21	88
Harford	33,568	182	33,386	255	47	235	490
Howard	17,131	0	17,131	100	n/a	346	446
Kent	4,850	1,914	2,936	341	224	41	382
Montgomery	32,800	0	32,800	179	n/a	138	317
Prince George's	10,348	209	10,139	25	1	49	74
Queen Anne's	9,074	4,525	4,549	684	457	33	717
Somerset	6,058	2,529	3,529	719	454	35	754
St. Mary's	21,882	5,994	15,888	741	548	109	850
Talbot	7,732	4,045	3,687	445	397	65	510
Washington	18,626	0	18,626	196	n/a	124	320
Wicomico	20,619	1,589	19,030	487	207	49	536
Worcester	7,039	1,520	5,519	250	195	58	308
Total	**421,766**	**51,471**	**370,295**	**8,684**	**5,133**	**3,297**	**11,981**

BAT: best available technology
BRF: Bay Restoration Fund

Note: The information on the total number of septic systems is based on 2009 Maryland Department of Planning (MDP) data, while the number of systems in the Critical Area is based on 2004 MDP data. Certain counties have no septic systems in the Critical Area. In the column "Critical Area BRF Upgraded Septic Systems," the information for these counties is designated as not applicable, or "n/a." The Critical Area BRF upgraded septic figures are a subset of the BRF upgraded system figures.

Source: Maryland Department of the Environment

The Phase II WIP strategy for septic system upgrades is 43,181 additional septic systems not planned for connection to WWTPs. This figure is comprised of 15,141 systems in the Critical Area, 15,498 systems outside the Critical Area but within 1,000 feet of a perennial stream, and 12,542 additional systems outside the Critical Area and beyond 1,000 feet of a perennial stream. MDE has noted in the past that along with the approximately 1,200 septic systems upgraded per year with BRF funding, the regulations requiring BAT for new construction and repairs to existing homes in the Chesapeake Bay watershed, paid for by homeowners, will help convert most septic systems to BAT over the septic systems 30-year life cycle.

However, MDE adopted a new septic system regulation that became effective on November 24, 2016. The purpose of the regulation is to remove the universal requirement that BAT systems be installed outside the Critical Area for all new construction or replacement septic systems. Under the regulation, BAT systems are still required outside of the Critical Area if the system has a design flow of 5,000 gallons per day or greater, or if the local jurisdiction enacts code to require BAT systems outside of the Critical Area in order to protect public health or the waters of the State. MDE estimates that approximately 703 fewer BAT systems may be installed annually in the State as a result of the regulation. In addition, the Administration notes that there may be an increase of approximately 50,000 pounds of nitrogen over the next 10 years.

In addition, it was noted in the report *Historical and Projected Chesapeake Bay Restoration Spending*, submitted by the Administration in response to budget bill language in the fiscal 2017 operating budget bill, that current nutrient reductions due to septic system upgrades and connections to WWTPs will not meet the septic reductions specified in the WIP by 2025.

Hazardous Substance Clean-Up Program

The previous performance measure for the Hazardous Substance Clean-Up Program was the number of properties on the State Master and Non-Master Lists that are given a "No Further Action" determination and moved to the formerly investigated sites category or archived. The State Master List identified potential hazardous waste sites in Maryland and included sites identified under the EPA's Superfund Program. The Non-Master List was comprised of sites under investigation or that had previously been investigated but were not on the State Master List. However, beginning in 2014, MDE noted that it combined all the sites into a single list called the Brownfield Master Inventory (BMI), which was an amalgamation of the State Master List, the Non-Master List, a Federal Facilities list, a Voluntary Cleanup Program list, a Formerly Used Defense Site list, and a Brownfield list.

As shown in **Exhibit 6**, the number of active BMI and archived BMI sites increased in between fiscal 2015 and 2016. However, MDE notes that sites can move between the "active" and "archived" list based on whether a prospective property purchaser enrolls the property in the Voluntary Cleanup Program or new environmental data suggests inclusion. Furthermore, MDE notes that the BMI overstates the need for the Hazardous Substance Clean-Up Program because Voluntary Cleanup Program and other sites for which the Hazardous Substance Clean-Up Program are not eligible are constantly being added to the BMI. MDE notes that it only uses State funds to conduct site assessment or remediation activities in situations where there is no financially viable responsible party. Therefore,

a more accurate measure for the program would be a measure of orphan sites – sites that do not have a financially responsible party – and thus are eligible for the Hazardous Substance Clean-Up Program. In addition to time series data on how many orphan sites there are, it would be helpful to know the value of the land improvements generated by the Hazardous Substance Clean-Up Program in terms of increased taxes, new development, jobs, and the saving of valuable undeveloped land, but this information is not currently collected. **DLS recommends that MDE comment on the number of orphan sites for fiscal 2014 to 2016 relative to the Hazardous Substance Clean-Up Program activity levels.**

Exhibit 6
Brownfield Master Inventory Sites
Fiscal 2014-2016

	2014	2015	2016
Active BMI	748	727	1,033
Archived BMI	687	734	986
Total Sites	**1,435**	**1,461**	**2,019**

BMI: Brownfield Master Inventory

Source: Maryland Department of the Environment

Budget Overview

Fiscal 2017 Budget Cost Containment

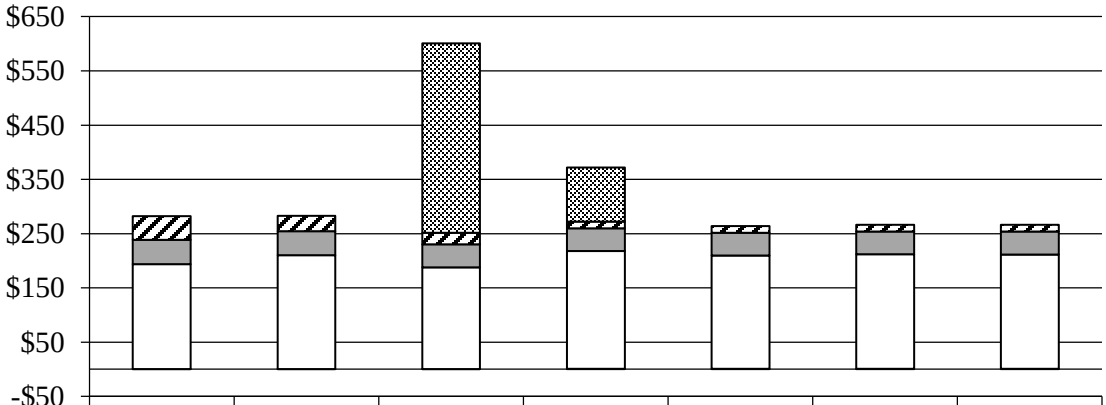
The fiscal 2018 spending plan includes the reversion of $6,792,000 in WQRLF general funds and $3,003,000 in DWRLF general funds in fiscal 2017. This funding reflects the 20% match to federal funding that was budgeted for fiscal 2017. The funding was budgeted as general funds, in turn, to alleviate the need to issue taxable debt due to the possibility of private activity. The reversion of the general funds assists in offsetting general fund revenue shortfalls but requires the doubling of the match to federal funding in fiscal 2018.

Fiscal 2018 Budget

MDE's fiscal 2018 capital program includes $0.5 million in general funds, $187.1 million in special funds, $42.6 million in federal funds, $21.5 million in GO bonds, and $349.1 million in revenue bonds for a total of $600.8 million. The overall change between fiscal 2017 and 2018 is a $318.2 million increase, as shown in **Exhibit 7**. The increase in funding between fiscal 2017 and 2018 is attributable to the $200.0 million in revenue bond authorization for the WQRLF, $100.0 million in revenue bond

authorization for the DWRLF, and an increase of $24.1 million in revenue bond authorization for the BNR program, which are offset partially by a decrease of $20.0 million for the BRF – Wastewater Projects, and a decrease of $8.2 million for the Energy-Water Infrastructure Program. For the out-years, once the $100.0 million WQRLF revenue bond issuance in fiscal 2019 is accounted for, there is anticipated to be slightly lower funding available due to BRF – Wastewater Projects absorbing the BNR program and also decreasing in appropriations and the end of the Energy-Water Infrastructure Program. MDE notes that the change in federal administration may mean there is the potential for additional federal funding for infrastructure, including the drinking water and water quality sectors. For instance, the federal administration has proposed an infrastructure improvement plan, although the details have yet to be released. In addition, U.S. Senate democrats have released a plan called "A Blueprint to Rebuild America's Infrastructure," which includes a $1 trillion federal investment component, of which $110 billion would be invested in rehabilitating water and sewer infrastructure.

Exhibit 7
MDE Capital Programs Funding
Fiscal 2016-2022 Est.
($ in Millions)



	2016 Approp.	2017 Approp.	2018 Request	2019 Est.	2020 Est.	2021 Est.	2022 Est.
Total	$282.2	$282.6	$600.8	$372.0	$264.0	$266.0	$266.0
Revenue Bonds	0.0	0.0	349.1	100.0	0.0	0.0	0.0
GO Bonds	43.6	28.0	21.5	12.2	12.2	12.2	12.2
PAYGO FF	44.9	44.3	42.6	41.7	42.2	41.7	42.2
PAYGO SF	193.3	210.1	187.1	217.1	208.6	211.1	210.6
PAYGO GF	0.4	0.2	0.5	1.0	1.0	1.0	1.0

FF: federal funds
GF: general funds
GO: general obligation
MDE: Maryland Department of the Environment
PAYGO: pay-as-you-go
SF: special funds

Source: Governor's Capital Budget, Fiscal 2018; Department of Budget and Management, Capital Budget Worksheets

Multiple Uses of Funding

Exhibit 8 shows the funding breakdown by project type for the projects funded in fiscal 2018. As can be seen, the majority of water quality funding is provided for sewer projects in fiscal 2018, and the majority of this funding is provided by the WQRLF.

Exhibit 8
Multiple Uses of Funding
Fiscal 2018

	WQRLF	BNR	BRF –Wastewater Projects	Total
WWTP Major	$0	$47,339,000	$0	$47,339,000
WWTP Minor	4,000,000	1,750,000	8,643,000	14,393,000
Stormwater	74,037,100	$0	0	74,037,100
Sewer	251,962,900	0	50,776,367	302,739,267
Total	**$330,000,000**	**$49,089,000**	**$59,419,367**	**$438,508,367**

BNR: Biological Nutrient Removal Program
BRF: Bay Restoration Fund
WWTP: wastewater treatment plant
WQRLF: Water Quality Revolving Loan Fund

Source: Maryland Department of the Environment

Multiple Sources of Funding

Exhibit 9 shows water quality-related project funding across programs. There are 14 projects receiving multiple sources of funding (WQRLF, BNR, or BRF) in fiscal 2018, of which 2 projects are receiving all three sources of funding: Preston WWTP ENR Upgrade and Smith Island WWTP BNR/ENR Upgrade. **Exhibit 10** shows drinking water-related project funding across programs, for which there are 5 projects receiving both DWRLF and Water Supply Financial Assistance Program funding in fiscal 2018: Willowbrook Road 12" Waterline Replacement, Bonnie Brook Water Facilities Improvement, Oakland Water Plant Improvements, Smithsburg Stagnant Water Elimination (Mixers and Auto Flushers), and Funkstown Water Meters Replacement Leak Repairs to Distribution. For both exhibits, bolded text reflects projects for which there are consent decrees.

Exhibit 9

Water Quality-related Project Funding Across Programs

Fiscal 2018

($ in Thousands)

Subdivision	LD	Project Title	Estimated Cost	WQRLF	BNR	BRF	Total
Baltimore City	6	Back River WWTP BNR/ENR Upgrade	$657,701	$0	$45,956	$0	$45,956
Harford	34B	Barrington Stormwater Management and Stream Restoration	2,194	1,900	0	0	1,900
Allegany	**1B**	**Bedford Road Sanitary Sewer Rehab – Phase V**	**1,000**	**1,000**	**0**	**0**	**1,000**
Allegany	**1B**	**Braddock Run Sanitary Sewer – Phase VI**	**1,000**	**1,000**	**0**	**0**	**1,000**
Charles	28	College of Southern Maryland WWTP BNR/ENR Upgrade and Expansion	5,588	0	250	200	450
Garrett	1A	Deep Creek Lake WWTP BNR/ENR Upgrade	10,070	0	250	200	450
Cecil	35A	Elk Neck State Park WWTP BNR/ENR Upgrade	4,500	0	250	200	450
Baltimore City	43	Chinquapin Run – Environmental Restoration Project 6 (Part of SC-910)	10,440	7,776	0	0	7,776
Baltimore City	Reg	ER-4121 Environmental Restoration Project 1 (Seamon Ave)	1,948	1,530	0	0	1,530
Baltimore City	46	North Point Road – Environmental Restoration Project 5	5,004	3,694	0	0	3,694
Baltimore City	Reg	Hampden – Environmental Restoration Project 11	3,690	2,527	0	0	2,527
Baltimore City	Reg	Mt. Washington – Environmental Restoration Project 13	3,632	2,333	0	0	2,333
Baltimore City	Reg	Belair Edison – Environmental Restoration Project 14	4,540	2,916	0	0	2,916
Harford	7	Heavenly Stream and Wetland Restoration	957	710	0	0	710
Montgomery	19	Kemp Mill Shallow Marsh Wetland Retrofit	613	452	0	0	452
Allegany	**1B**	**LaVale Basin 6 Sewer Improvements**	**3,400**	**3,000**	**0**	**0**	**3,000**
Allegany	**1B**	**LaVale Sanitary Commission Manhole Rehab, Phase 2**	**1,142**	**21**	**0**	**0**	**21**
Anne Arundel	30B	Mayo WRF BNR/ENR Upgrade through Annapolis WRF	36,381	0	1,383	0	1,383
Harford	34A	Northwest Branch Declaration Run Stormwater Management Retrofit and Stream Restoration	1,380	1,100	0	0	1,100

Subdivision	LD	Project Title	Estimated Cost	WQRLF	BNR	BRF	Total
Caroline	37B	Preston WWTP ENR Upgrade	6,500	2,000	250	1,943	4,193
Prince George's	Reg	Sanitary Sewer Reconstruction – Beaverdam Basin	2,662	317	0	2,219	2,536
Prince George's	Reg	Sanitary Sewer Reconstruction – Broad Creek Basin	4,580	4,356	0	0	4,356
Montgomery	Reg	Sanitary Sewer Reconstruction – Cabin John Basin	4,628	550	0	3,848	4,398
Montgomery	Reg	Sanitary Sewer Reconstruction – Little Falls Basin	2,959	2,797	0	0	2,797
Prince George's	Reg	Sanitary Sewer Reconstruction – Lower Anacostia Basin	4,537	542	0	3,791	4,333
Prince George's	Reg	Sanitary Sewer Reconstruction – Northeast Branch	6,426	766	0	5,363	6,129
Montgomery	Reg	Sanitary Sewer Reconstruction – Northwest Branch	3,251	385	0	2,698	3,083
Prince George's	Reg	Sanitary Sewer Reconstruction – Northwest Branch	3,781	448	0	3,134	3,582
Montgomery	Reg	Sanitary Sewer Reconstruction – Paint Branch Basin	3,186	3,015	0	0	3,015
Montgomery	Reg	Sanitary Sewer Reconstruction – Rock Creek Basin	3,730	3,534	0	0	3,534
Montgomery	Reg	Sanitary Sewer Reconstruction – Seneca Creek Basin	1,997	1,896	0	0	1,896
Montgomery	Reg	Sanitary Sewer Reconstruction – Sligo Creek Basin	4,407	4,180	0	0	4,180
Prince George's	Reg	Sanitary Sewer Reconstruction – Sligo Creek Basin	2,303	2,183	0	0	2,183
Baltimore City	46	Patapsco Sewershed Sewer Improvements, Phase 1	30,766	0	0	10,026	10,026
Baltimore City	43	Herring Run Sewershed Sewer Improvements – Chinquapin Run	24,480	0	0	7,875	7,875
Baltimore City	46	Low Level Sewershed Sewer Improvements, Phase 1	20,035	0	0	5,086	5,086
Baltimore	6	Back River Headworks Improvement	409,285	80,000	0	0	80,000
Baltimore City	6	Back River Headworks Improvement	409,285	80,000	0	0	80,000
Baltimore	41	Gwynns Falls Sewershed Collection System Area B	29,040	18,493	0	0	18,493
Baltimore City	45	Herring Run Sewershed Sewer Improvements – Basin	8,786	0	0	1,888	1,888
Baltimore City	Reg	High Level Sewershed Sewer Improvements	18,850	4,343	0	4,849	9,191
Baltimore	Reg	Jones Fall Sewershed Sewer Improvements	18,578	2,536	0	0	2,536
Baltimore City	Reg	Jones Fall Sewershed Sewer Improvements	18,578	12,590	0	0	12,590
Baltimore City	Reg	High Level Sewershed Sewer Improvements	17,850	14,580	0	0	14,580
Baltimore City	41	Gwynns Falls Sewershed Collection System Hydraulic Improvements	11,737	3,530	0	0	3,530
Baltimore City	43	Herring Run Sewershed Collection System Improvements, Part 1 Sanitary Sewer	10,658	4,549	0	0	4,549

Subdivision	LD	Project Title	Estimated Cost	WQRLF	BNR	BRF	Total
Somerset	**38A**	**Smith Island WWTP BNR/ENR Upgrade**	**9,941**	**2,000**	**250**	**1,900**	**4,150**
Calvert	29C	Solomon WWTP ENR Upgrade and Expansion	9,390	0	250	4,000	4,250
Statewide	99	To Be Determined	Not available	0	0	581	581
Garrett	**1A**	**Town of Accident Sewer I and I Rehabilitation, Phase 2**	**4,628**	**1,353**	**0**	**0**	**1,353**
Garrett	1A	Trout Run WWTP ENR Upgrade	14,245	0	250	200	450
Prince George's	Reg	Urban Stormwater Retrofit Program Public-private Partnership	48,000	48,000	0	0	48,000
Harford	34A	Willoughby Beach Extended Stormwater Management Retrofit and Stream Restoration	1,386	1,100	0	0	1,100
Statewide	99	Fiscal 2017 Projects – General Funds Replacement	6,792	6,792	0	0	6,792
Total			**$1,932,436**	**$336,792**	**$49,089**	**$60,000**	**$445,881**

BNR: Biological Nutrient Removal Program
BRF: Bay Restoration Fund
ENR: enhanced nutrient removal
LD: legislative district
WRF: water reclamation facility
WWTP: wastewater treatment plants

Note: Bolded text refers to projects under consent orders.

Source: Maryland Department of the Environment

Exhibit 10

Drinking Water Quality-related Project Funding Across Programs

Fiscal 2018

($ in Thousands)

Subdivision	LD	Project Title	Estimated Cost	DWRLF	WSFA	Total
Allegany	1B	LaVale Zone 6 Water Improvements	$3,350	$3,000	$0	$3,000
Allegany	1C	Willowbrook Road 12" Waterline Replacement	755	563	188	751
Baltimore	**40**	**Druid Lake Tanks**	**162,714**	**23,952**	**0**	**23,952**
Baltimore	**41**	**Ashburton Reservoir Improvements**	**150,200**	**25,000**	**0**	**25,000**
Baltimore City	**40**	**Druid Lake Tanks**	**162,714**	**25,000**	**0**	**25,000**
Baltimore City	**41**	**Ashburton Reservoir Improvements**	**150,200**	**25,000**	**0**	**25,000**
Calvert	27B	Chesapeake Heights/Dares Beach Arsenic Treatment	1,800	1,618	0	1,618
Cecil	35A	Rising Sun Water Extension	500	0	500	500
Dorchester	37B	Bonnie Brook Water Facilities Improvement	395	165	165	330
Dorchester	37B	Bonnie Brook Water Meter Replacement	184	0	92	92
Frederick	4	Walkersville Water Treatment Plant	8,400	8,400	0	8,400
Garrett	1A	Keysers Ridge Water System Water Storage Tank	689	0	344	344
Garrett	1A	Oakland Water Plant Improvements	475	238	238	476
Garrett	1A	Oakland Water Distribution System Improvements	1,050	1,050	0	1,050
Harford	**34B**	**Maryland American Water Winters Run Water Treatment Plant Intake Improvements**	**3,000**	**2,650**	**0**	**2,650**
Kent	36	Galena Water Meter Replacement	200	0	100	100
Kent	36	Galena Water System Generator	40	0	20	20
Somerset	38A	Deal Island Road Watermain Loop	351	313	0	313
St. Mary's	29B	Patuxent Park Water Main Replacement Phase 4	2,232	2,232	0	2,232
St. Mary's	29C	Town Creek Water System Phase 1	3,345	3,345	0	3,345
Washington	2A	Smithsburg Stagnant Water Elimination (Mixers and Auto Flushers)	281	211	70	281

Subdivision	LD	Project Title	Estimated Cost	DWRLF	WSFA	Total
Washington	2A	Funkstown Water Meters Replacement Leak Repairs to Distribution	455	228	227	455
Washington	2A	Smithsburg New 16" Transmission Water Line	969	959	0	959
Wicomico	38B	Fruitland Water System Upgrades	2,080	2,080	0	2,080
Statewide	99	Fiscal 2017 Projects – General Funds Replacement	3,003	3,003	0	3,003
Total			**$659,380**	**$129,003**	**$1,944**	**$130,947**

DWRLF: Drinking Water Revolving Loan Fund
LD: legislative district
WSFA: Water Supply Financial Assistance Program

Note: Bolded text refers to projects under consent orders.

Source: Maryland Department of the Environment

Highlights

The changes in funding between fiscal 2017 and 2018 are reflected in terms of the program overall difference in **Exhibit 11.**

Exhibit 11
MDE Capital Funding Changes
Fiscal 2017-2018
($ in Millions)

Program	2017 Approp.	2018 Request	Difference
Maryland Water Quality Revolving Loan Fund	$123.208	$336.792	$213.584
Maryland Drinking Water Revolving Loan Fund	20.997	129.003	108.006
Biological Nutrient Removal Program	25.000	49.089	24.089
Septic System Upgrade Program	14.000	15.000	1.000
Hazardous Substance Clean-Up Program	0.200	0.500	0.300
Mining Remediation Program	0.500	0.500	0.000
Water Supply Financial Assistance Program	2.480	1.944	-0.536
Energy-Water Infrastructure Program	16.200	8.000	-8.200
Bay Restoration Fund – Wastewater Projects	80.000	60.000	-20.000
Total	**$282.585**	**$600.828**	**$318.243**

MDE: Maryland Department of the Environment

Source: Department of Budget and Management; Department of Legislative Services

The highlighted changes in funding for fiscal 2018 are as follows.

- ***Maryland WQRLF:*** MDE's fiscal 2018 allowance of $336.8 million for the WQRLF is $213.6 million more than the fiscal 2017 appropriation and is $206.8 million greater than the 2016 CIP amount for fiscal 2018. The funding increase is due to $200.0 million in revenue bond authorization in fiscal 2018. In addition, there is $13.3 million more in GO bond authorization for the 20% federal capitalization match since the $6.8 million fiscal 2017 matching amount was provided in general funds that are now proposed to be reverted to the General Fund. Thus, additional GO bond funding is provided in fiscal 2018 in order to provide for both the fiscal 2017 and 2018 capitalization amounts. The fiscal 2018 allowance includes $91.2 million in special funds, $32.3 million in federal funds, $13.3 million in GO bonds used for the 20% match to the federal funds for fiscal 2017 and 2018, and $200.0 million in revenue bonds. This funding would provide for 41 projects in nine jurisdictions. The federal fund appropriation programmed in the 2017 CIP for fiscal 2019 to 2022 has increased from

$24.5 million to $32.0 million annually, because MDE estimates that the U.S. Congress's recent funding levels will continue into the future. The largest projects in the fiscal 2018 allowance are as follows: Back River Headworks Improvement project is budgeted $160.0 million for complying with the Wet Weather Consent Decree by constructing improvements that are estimated to eliminate 82% of Baltimore City's Sanitary Sewer Overflows by volume and allow Baltimore City to manage all the wet weather flows at the Back River WWTP; Gwynns Falls Sewershed Collection System Area B project is budgeted $18.5 million to rehabilitate, repair, and replace the wastewater collection/conveyance system in the Gwynns Falls Sewershed in order to comply with an EPA/MDE consent decree; and Urban Stormwater Retrofit Program public-private partnership is budgeted $48.0 million for the Prince George's County Stormwater BMP program to undertake capital improvements to comply with the county's stormwater permit with debt service on the loan coming from Prince George's County's Clean Water fund/stormwater fee.

- ***Maryland DWRLF:*** The DWRLF allowance for fiscal 2018 is $129.0 million, which is $108.0 million more than the fiscal 2017 working appropriation and $103.0 million more than the 2016 CIP amount programmed for fiscal 2018. The funding increase is due to $100.0 million in revenue bond authorization and the inclusion of $5.8 million in GO bonds since the $3.0 million provided in general funds to match the federal funds in fiscal 2017 are being reverted to the General Fund and, thus, both fiscal 2017 and 2018 federal funding is being matched with GO bonds in fiscal 2018. The fiscal 2018 allowance includes $12.9 million in special funds, $10.3 million in federal funds, $5.8 million in GO bond authorizations used as matching funding, and $100.0 million in revenue bond authorization. The funding provides for 19 projects serving 767,567 homes in 12 subdivisions throughout the State. The largest projects in the fiscal 2018 allowance are as follows: the Ashburton Reservoir Improvements Project is budgeted $50.0 million and would replace the existing open surface finished water reservoir at Ashburton Reservoir as part of the administrative order to comply with the Long Term 2 Enhanced Surface Water Treatment Rule and the Druid Lake Tanks project is budgeted $49.0 million and would also replace an existing open surface finished water reservoir at Druid Lake Reservoir in order to comply with the same administrative order and rule.

- ***BNR:*** The BNR Program funding is $49.1 million in BRF revenue bonds in the fiscal 2018 allowance, which reflects an increase of $24.1 million relative to the fiscal 2017 appropriation and an increase of $8.1 million relative to what was programmed in the 2016 CIP for fiscal 2018. However, there have been some fund source changes. The fiscal 2018 capital budget reflects the de-authorization of $11.0 million in fiscal 2017 GO bond funding while the Budget Reconciliation and Financing Act (BRFA) of 2017 authorizes the use of the BRF for BNR upgrades to WWTPs in fiscal 2017 and 2018 using $60.0 million in BRF revenue bonds and special funds. The Back River WWTP upgrade receives $46.0 million in fiscal 2018, which is the final year of programmed funding. As noted elsewhere in this analysis, the 2017 CIP reflects BRF special funds for the BNR program from fiscal 2019 through 2022. Of note, the Elk Neck State Park WWTP – BNR project receives 56% of total eligible project costs in fiscal 2018 instead of the typical cap of 50%. MDE notes that it has adopted a policy of providing up to 75% grants to minor WWTPs in order to reduce the local share and to help mitigate future sewer user rate

impacts that would otherwise occur due to the smaller number of customers and thus higher cost per customer.

- ***Septic System Upgrade Program:*** The fiscal 2018 appropriation of $15.0 million in special funds for the Septic System Upgrade Program is $1.0 more than both the fiscal 2017 appropriation and the fiscal 2018 amount programmed in the 2016 CIP. This reflects higher annual fee collections and is expected to carry through fiscal 2022 in the 2017 CIP. There is also $1.0 million in MDE's operating budget that is programmed by Chapter 379 of 2014 (BRF – Authorized Uses – Local Entities), which requires that up to 10% of the funds in the septic account of the BRF be distributed to a local public entity delegated by MDE – local health departments – to cover reasonable costs associated with implementation of MDE regulations pertaining to septic systems that use the BAT for nitrogen removal. The program anticipates upgrading 1,100 systems in fiscal 2018. MDE adopted a new septic system regulation that became effective on November 24, 2016, which removes the universal requirement that BAT systems be installed outside the Critical Area for all new construction or replacement septic systems. MDE notes that counties that do not have Chesapeake Bay Critical Areas may provide grants where there is need for a pretreatment BAT unit to correct an existing septic problem, for sewer connections, to upgrade shared/community septic system for nitrogen reduction, and for BAT installation in an area to protect drinking source groundwater. As an additional consideration, there is the possibility that MDE will adopt some version of a trading policy allowing for developers outside of the Critical Area to install BAT systems, pay a fee in lieu, or purchase nitrogen credits available in the nutrient trading market upon finalization of a nutrient trading policy.

- ***Hazardous Substance Clean-Up Program:*** The fiscal 2018 allowance includes $0.5 million in general funds for the Hazardous Substance Clean-Up Program, which is an increase of $0.3 million relative to the fiscal 2017 appropriation and reduction of $0.5 million relative to the 2016 CIP amount programmed for fiscal 2018. The $0.5 million in fiscal 2018 will allow for the planning of two projects in Baltimore City – 1600 Harford Avenue (former Stop, Shop and Save) and Chemical Metals, Site #1 – and investigation of contamination via site assessments across the State.

- ***Mining Remediation Program:*** The Mining Remediation Program receives its fourth year of funding in fiscal 2018 – $500,000 in GO bonds – which is equal to both the fiscal 2017 authorization and the 2016 CIP amount programmed for fiscal 2018. The money provides for third-year funding of the Matthew Run Acid Mine Drainage Remediation Project. Overall, MDE has estimated a total Mining Remediation Program need of approximately $60 million – split evenly between the federal government and the State. However, MDE notes that the federal funding is scheduled to end in fiscal 2022. In terms of fiscal 2017 projects, $201,116 of the Matthew Run Acid Mine Doser project funding is being used for the Kempton Doser project instead due to downstream inaccessibility concerns. These concerns have required MDE to look at ways to improve treatment efficiency at the Kempton Doser. The proposed method is to inject highly alkaline sludge from the downstream collection pond into the underground mine

pool through several injection holes in order to ensure protection of the North Branch of the Potomac River.

- ***Water Supply Financial Assistance Program:*** The Water Supply Financial Assistance Program funding of $1.94 million in GO bonds reflects a $536,000 reduction relative to the fiscal 2017 appropriation and a $0.6 million decrease relative to the 2016 CIP programmed amount for fiscal 2018. MDE notes that the reduction in funding in fiscal 2018 reflects that the federal fiscal 2016 DWRLF funding required that at least 20.0% of the federal grant amount be used as loan principal forgiveness, which reduced the need for the fiscal 2018 funding. However, the program is still necessary because it can provide up to 87.5% of the project cost as a grant, while the DWRLF may provide only up to 50.0%. The Rising Sun Water Extension project in Cecil County is the largest project in the fiscal 2018 allowance and receives $0.5 million. The project is singled out for funding in the fiscal 2018 capital budget bill, since it was not on MDE's Project Priority List and receives 100.0% of the project cost but will still need to comply with the other provisions of Environment Article sections 9-420 through 9-426.

- ***Energy-Water Infrastructure Program:*** The fiscal 2018 allowance includes $8.0 million for the second year of funding for the Energy-Water Infrastructure Program. This funding is $8.2 million less than was provided in fiscal 2017 but is $8.0 million more than was programmed for fiscal 2018 in the 2016 CIP since the program at that time appeared to be one-time funding. The program is funded from the agreement by which, under PSC Order 86372, Dominion Cove Point is allowed to construct a 130-megawatt nameplate capacity electric generating station at the existing liquefied natural gas terminal site in Calvert County near Cove Point. The Energy-Water Infrastructure Program is discussed as an issue in this analysis.

- ***BRF – Wastewater Projects:*** Funding for the BRF – Wastewater Projects is $60.0 million in special funds, which is $20.0 million less than was budgeted in fiscal 2017 but $20.0 million more than was programmed in the 2016 CIP for fiscal 2018. The funding provides for 17 projects in nine jurisdictions and will reduce 52,460 pounds of nitrogen per year from flowing to the Chesapeake Bay and sewer rehabilitation projects that serve 933,653 homes throughout Maryland. MDE notes that the breakdown of funding by use (WWTP majors, WWTP minors, sewers, stormwater, and possibly nutrient trading) for fiscal 2019 to 2022 cannot be predetermined, as the final project list will be based on the project rating and ranking and applications received in any fiscal year. In addition, MDE notes that the fiscal 2019 to 2022 amounts reflected in the 2017 CIP may be understated given the delay in the sale of revenue bonds and, thus, lower debt service costs; a reduction in the total amount of revenue bonds to be sold from $530.0 million to $390.0 million due to updated cash flow projections; and the continuation of operating the BRF as a cash flow program. MDE notes that the revision to the revenue bond authorization will be made after the effect of funding BNR projects has been evaluated. Finally, MDE notes that there was a one-time $13.6 million audit settlement with the Comptroller that resolved a cumulative past year fee deposit error to the credit of the BRF, which is the reason that the BRF revenue increased from $110.0 million in fiscal 2015 to $124.3 million in fiscal 2016.

Issues

1. Bay Restoration Fund Expanded Uses

Chapter 428 of 2004 established the BRF to provide grants to owners of WWTPs to reduce nutrient pollution to the Chesapeake Bay by upgrading the systems with ENR technology. The fund is also used to support septic system upgrades and the planting of cover crops; and through fiscal 2009, was authorized to provide funding for stormwater management, which was phased out and instead provided to local jurisdictions for operations and maintenance of upgraded WWTPs that met permit limits. In recent years, legislation has expanded the use of the BRF, and in the 2017 legislative session, additional legislation is being proposed to allow the BRF to be used for purchasing nutrient credits and funding BNR projects. All of these changes raise the question of whether the BRF is being stretched too thin to be effective.

The recent legislation impacting the BRF is as follows.

- ***Chapter 150 of 2012 (Environment – BRF – Fees and Uses):*** Chapter 150 increased the BRF fee beginning July 1, 2012, in order to address a funding shortfall that would have made it very difficult to complete the upgrades to the 67 major publicly owned WWTPs by calendar 2017, as required by the WIP. Chapter 150 also established additional uses for the fund beginning in fiscal 2018 as follows, in order of priority: (1) funding an upgrade of a wastewater facility with a design capacity of 500,000 gallons or more per day to ENR technology; (2) funding for the most cost-effective ENR upgrades at wastewater facilities with a design capacity of less than 500,000 gallons per day; (3) costs associated with upgrading septic systems and sewage holding tanks; and (4) grants for local government stormwater control measures for jurisdictions that have implemented a specified system of charges under current authority.

- ***Chapter 153 of 2015 (Environment – BRF – Use of Funds):*** Beginning in fiscal 2016, Chapter 153 added to the authorized uses of the BRF by providing funding for up to 87.5% of the cost of projects relating to CSO abatement, rehabilitation of existing sewers, and upgrading conveyance systems, including pumping stations. This effectively ended the need for the Supplemental Assistance Program and, thus, reduced the need for the $5 million of GO bonds programmed each year between fiscal 2017 and 2020 in the 2015 CIP. The bill also altered the priority of BRF funding beginning in fiscal 2018 by making grants for septic system upgrades, stormwater management, and CSO and sewer abatement projects of equal priority, with funding decisions made on a project-specific basis.

- ***HB 417 and SB 314 (Clean Water Commerce Act of 2017):*** HB 417 and SB 314 have been introduced in the 2017 legislative session to authorize MDE to purchase cost-effective nitrogen and phosphorus nutrient credits in support of State efforts to restore the Chesapeake Bay using the BRF. MDE notes that the bill is intended to have a positive long-term impact on State and local governments by reducing the costs of meeting TMDL nutrient reduction targets. MDE also notes that Maryland's WIP envisions nutrient trading as an efficient and less expensive way for high-cost sectors, such as septic systems and urban stormwater, to achieve the required

reductions. However, a final nutrient trading policy, which would inform the use of the BRF for this purpose, has not been developed. In addition, it appears that amendments have been submitted for HB 417 and SB 314 that change the purpose of the BRF from purchasing nutrient credits to implementing a competitive grant process for nutrient and sediment load reductions.

- ***HB 152 and SB 172 (BRFA of 2017)/HB 384 and SB 343 (BRF – Eligible Costs – Expansion):*** HB 152 and SB 172 have been introduced in the 2017 session to authorize MDE to use up to $60,000,000 of revenue bond proceeds and the funds in the BRF for BNR upgrades of WWTPs, for fiscal 2017 and 2018 combined. Similarly, HB 384 and SB 343 have been introduced in the 2017 session to authorize permanently the use of BRF for BNR upgrades.

While it is acknowledged that the original goal of the BRF to upgrade the 67 major WWTPs to ENR technology almost has been met, the uses of the BRF have been expanded to include septic system upgrades, stormwater management, CSO and sewer abatement projects, and possibly nutrient credit purchases and BNR upgrades. **DLS recommends that MDE comment on the proposed fiscal 2018 and future year allocation plan for the BRF and whether it will continue to be an effective source of funding even though spread across so many diverse uses.**

2. Energy-Water Infrastructure Program Reported

The fiscal 2017 operating budget bill restricted $100,000 of MDE's special fund appropriation for the new Energy-Water Infrastructure Program PAYGO capital program. The funding was restricted pending submission of reports on July 1, 2016, concerning the criteria for the allocation of the Energy-Water Infrastructure Program funding, and on January 1, 2017, concerning the actual allocation of funding including energy efficiency benchmarks and expected outcomes, including any user rate modifications. MDE submitted the required reports.

Background

The fiscal 2017 operating budget bill language is as follows:

, provided that $100,000 of this appropriation made for the purpose of providing grants to water and wastewater treatment plant owners to develop energy efficient and resilient projects shall be restricted pending the submission of two reports. The first report shall be submitted by July 1, 2016, and specify the qualitative and quantitative criteria that will be used to evaluate and select projects to be funded by the Energy-Water Infrastructure Program under both the $1,000,000 per project allocation for energy efficient equipment and the $3,000,000 per project allocation for combined heat and power projects. The second report shall be submitted by January 1, 2017, and provide the following for each project selected for funding:

(1) an energy use baseline;

(2) a 20% energy reduction target;

(3) the expected payback period for the energy efficient equipment or combined heat and power project as if the project were to be funded as an energy performance contract; and

(4) the expected amount and timing of the modification of any user rates associated with the entity receiving funding as a result of the energy efficient equipment or combined heat and power project funded.

The budget committees shall have 45 days to review and comment. Funding shall be released in $50,000 increments pending submission of each report. Funds restricted pending the receipt of the reports may not be transferred by budget amendment or otherwise to any other purpose and shall be canceled if the reports are not submitted to the budget committees.

First Required Report – Criteria

As shown in **Exhibit 12**, MDE's criteria report for the July 1, 2016 deadline, reflects the division of projects into two categories: energy-efficient equipment (up to $1 million per project) and alternative energy/combined heat and power (up to $3 million per project). The main criteria for each category of project appears to be the payback period in years, which is typically calculated as initial cost divided by annual savings. Shorter payback periods are rewarded with more points, which is consistent with efficient use of resources. Of note, the energy-efficient equipment projects appear to have much longer payback periods than the alternative energy/combined heat and power projects. In addition, there appears to be a priority placed on waste to energy given the additional points granted to alternative energy/combined heat and power projects for this purpose. The budget committees released to MDE the first $50,000 in special funds since the required report on funding criteria was submitted.

Exhibit 12
Energy-Water Infrastructure Program Project Ratings

		Points Awarded			
Type of Project	**Criteria**	**5**	**10**	**15**	**20**
Energy-efficient Equipment (Up to $1 Million per Project)	Energy Savings (Percent)	Less than 10.	Greater than or equal to 10 and less than 20.	Greater than or equal to 20 and less than 50.	Greater than or equal to 50.
	Payback Period (Years)	Greater than 100.	Greater than or equal to 50 and less than 100.	Greater than or equal to 20 and less than 50.	Less than 20.
Alternative Energy/Combined Heat and Power (Up to $3 Million per Project)	Energy Production Percent of Need	Less than 10.	Greater than or equal to 10 and less than 20.	Greater than or equal to 20 and less than 50.	Greater than 50.
	Payback Period (Years)	Greater than or equal to 20.	Greater than or equal to 10 and less than 20.	Greater than or equal to 5 and less than 10.	Less than 5.
	Waste to Energy – Bonus 5 Points	If applicable.			

Source: Maryland Department of the Environment

Second Required Report – Allocation

The second required report on the actual allocation of funding requested energy-efficiency benchmarks and expected outcomes, including any user rate modifications. The project data from the second required report is shown in **Appendix 1**. MDE notes that the energy savings from the projects are a fraction of the overall operations and maintenance costs and, therefore, are not expected to result in reduction of existing user rates. In terms of the award schedule, MDE notes that the first Board of Public Works action is anticipated in April 2017, but that the Memorandum of Understanding between MDE and the Maryland Energy Administration is not final yet.

The projects are divided into energy-efficient equipment and alternative energy/combined heat and power. The expected payback time – dollar value of annual energy savings divided by the total

capital cost – ranges from 5 to 180 years for the energy-efficient equipment projects and from 4 to 64 years for the alternative energy/combined heat and power projects. **Exhibit 13** shows the range of measures for the submitted project information.

Exhibit 13
Energy-Water Infrastructure Program Statistics
Fiscal 2017

Measure	Energy-efficient Equipment (Energy Savings)	Alternative Energy/ Combined Heat and Power (Energy Production)
Total Capital Cost	$16,500 to $3,600,000	$128,400 to $5,500,000
Annual Energy Savings/Energy Production (kWh)	5,368 to 4,263,722	53,000 to 16,500,000
Annual Energy Savings/Production (Percent)	8% to 63%	6% to 100%
Dollar Value of Annual Energy Savings/Production	$539 to $426,372	$5,300 to $1,650,000
Expected Payback Time (Years)	5 to 180	3 to 64
Fiscal 2017 Grant	$16,500 to $1,000,000	$128,400 to $3,000,000
Total Fiscal 2017 Grants	$7,090,195	$8,739,400

kWh: kilowatt hour

Source: Maryland Department of the Environment; Department of Legislative Services

Several of the larger projects are as follows.

- **Energy-efficient Equipment**
  - ***Piscataway WWTP Aeration/Mixer ($1,000,000 Grant for $3,600,000 Total Project Cost):*** Replace existing blowers with new blowers to better meet aeration demands during normal plant flows, thereby decreasing energy consumption and replace existing mixers with newer, more energy-efficient models to achieve 4,263,733 kWh in annual energy savings worth $426,372 (61% of all savings for energy-efficient equipment projects) with an expected eight-year payback period.

- ***Annapolis, Broadneck, Maryland City, and Patuxent WWTPs Belt Filter Press Upgrades ($1,000,000 Grant for a $2,591,781 Total Project Cost):*** Replace belt filter presses at four Water Reclamation Facilities to achieve 153,900 kWh in annual energy savings worth $15,390 (2% of all savings for energy-efficient equipment projects) with an expected 168-year payback period.

- ***Clarke Avenue Pump Station Energy Improvements ($1,000,000 Grant for a $1,369,899 Total Project Cost):*** Replace existing pumps and controls to reduce energy consumption at the Clarke Avenue Pump Station to achieve 76,164 kWh in annual energy savings worth $7,616 (1% of all savings for energy-efficient equipment projects) with an expected 180-year payback period.

- **Alternative Energy/Combined Heat and Power**

  - ***Back River WWTP Combined Heat and Power ($3,000,000 Grant for a $5,500,000 Total Project Cost):*** Build a 2 megawatt combined heat and power facility fueled by digester gas to generate electricity and heat at the facility to achieve 16,500,000 kWh in annual energy production worth $1,650,000 (75% of all production for alternative energy/combined heat and power projects) with an expected 3-year payback period.

  - ***Easton WWTP Photo-voltaic Array ($3,000,000 Grant for a $4,326,000 Total Project Cost):*** Construct a photo-voltaic array (solar cells) on the grounds of Easton WWTP to generate renewable electricity and associated renewable energy credits to achieve 2,896,000 kWh in annual energy production worth $289,600 (13% of all production for alternative energy/combined heat and power projects) with an expected 15-year payback period.

  - ***Westminster WWTP Geothermal System ($1,166,000 Grant for $1,166,000 Total Project Cost):*** Install a system by which treated effluent is reused as plant service water throughout the facility for needs that do not require potable water (*e.g.*, heating and cooling) to achieve 182,500 kWh in annual energy production worth $18,250 (1% of all production for alternative energy/combined heat and power projects) with an expected 64-year payback period.

DLS recommends that the $50,000 in special funds restricted pending submission of the report on the actual allocation of Energy-Water Infrastructure Program project funding be released.

Updates

1. Integrated Project Priority System Revised

WQRLF projects are prioritized based on an EPA-approved Integrated Project Priority System. The priority system for WQRLF projects consists of a system for evaluating, rating, and ranking of both point source and nonpoint source water quality projects. The Integrated Project Priority System originally was revised by MDE and approved by EPA in 2010 to target financial assistance to projects that help meet Maryland's Phase I WIP to address the Chesapeake Bay TMDL. The most recent revision was approved by EPA on November 10, 2016. The Integrated Project Priority System focuses on water quality or public health benefits, compliance, cost efficiency, and sustainability. The most recent revision weights cost efficiency more heavily than it was previously weighted, among other changes. In accordance with this system, the projects are rated and ranked by MDE's Water Quality Financing Administration and are listed in ascending ranking order on the Project Priority List.

Exhibit 14 shows the changes between the former rating system points and the current rating system points. This illustrates that the cost efficiency category is increased by 20 points, while the sustainability rating category is reduced by 15 points, the compliance category by 10 points, and the water quality or public health benefits category by 5 points. MDE notes that until fiscal 2016, the BRF – Wastewater Projects was basically only funding ENR upgrades at major WWTPS but with the expanded uses now allowed for under the BRF, it made sense to provide more points for cost efficiency for nutrient-reduction projects. MDE also notes that the projects likely to rank high in the revised Integrated Project Priority System will include ENR upgrades at WWTPs and septic to sewer connections for larger communities.

Exhibit 14
Water Quality and Public Health Integrated Project Priority System
November 10, 2016

Rating Category	Former Rating System Points	Current Rating System Points	Difference
Water Quality or Public Health Benefits	35	40	-5
Compliance	30	20	-10
Cost Efficiency	10	30	20
Sustainability	25	10	-15
Total	**100**	**100**	**0**

Source: Maryland Department of the Environment

2. Cash Accounting and Revenue Bonds for the Drinking Water Revolving Loan Fund and the Water Quality Revolving Loan Fund

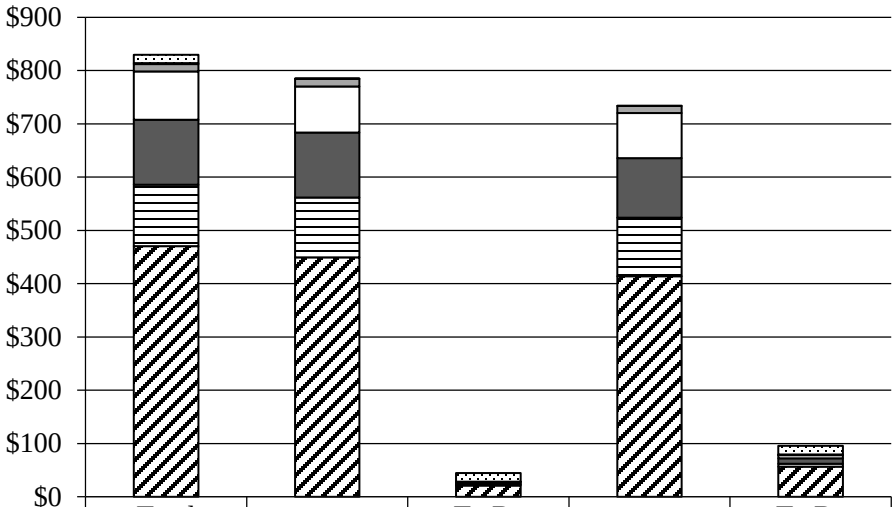
The fiscal 2018 spending plan includes a shift to cash accounting for the WQRLF and DWRLF as well as the authorization of revenue bond issuances. In combination, the switch to cash accounting and planned revenue bond issuances allow the WQRLF and DWRLF to fund several large projects that are ready to proceed. These projects include the Back River Headworks Improvement project, which is budgeted $160 million for fiscal 2018 in the WQRLF; and the Ashburton Reservoir Improvements Project and Druid Lake Tanks project, which are budgeted $50 million and $49 million in fiscal 2018, respectively, in the DWRLF. These three large projects are read to proceed and have some urgency behind them given the connected consent decrees and administrative orders.

As a result of the concentrated funding need, MDE has sought and gained approval to switch from an encumbrance to a cash accounting system. The effect of this shift is to make more realistic assumptions about the expenditure of encumbered funds – over four years – and, thus, allow for projects to be funded on a cash flow basis instead of locking up all funding for a project when it is encumbered. Once this one-time funding boost is spent, MDE will issue revenue bonds for the two programs in order to return to the historical average encumbrance schedule. For WQRLF, this means issuing $50 million in revenue bonds in fiscal 2021 with the first debt service payment of $5 million in fiscal 2022, and for DWRLF $50 million in fiscal 2020 with the first debt service payment in fiscal 2021.

Encumbrances and Expenditures

Exhibit 15 reflects the encumbrance and expenditure levels for the BNR, Supplemental Assistance, Septic System Upgrade, Water Supply Financial Assistance, Hazardous Substance Clean-Up, Mining Remediation programs, and Energy-Water Infrastructure Program. In general, the exhibit reflects expenditure levels being proportionate to the total authorization for the program, with the exception of the Mining Remediation Program. The largest authorization reflected is for the BNR Program, which has $470.4 million authorized. Of this amount, $21.0 million remains to be encumbered, although the department's project list for the current fiscal year reflects full utilization and encumbrance of these funds in fiscal 2017. The $56.7 million that remains to be expended typically reflects the delays in reimbursement requests from local governments that are responsible for project procurement and implementation.

Exhibit 15
Non-BRF Programs – Encumbrances and Expenditures
Program Inception through February 2017
($ in Millions)



	Total Authorized	Encumbered	To Be Encumbered	Expended	To Be Expended
Total	$813.7	$785.3	$28.5	$734.2	$79.5
Energy-Water Infrastructure Program	16.2	0.0	16.2	0.0	16.2
Mining Remediation Program	1.5	0.9	0.6	0.5	1.0
Hazardous Substance Clean-Up Program	14.0	13.9	0.1	13.4	0.6
Water Supply Financial Assistance	90.3	86.5	3.8	84.4	5.9
Septic System Upgrade	122.3	122.3	0.0	112.2	10.2
Supplemental Assistance	115.2	112.3	2.9	110.0	5.2
Biological Nutrient Removal	470.4	449.4	21.0	413.7	56.7

BRF: Bay Restoration Fund

Source: Maryland Department of the Environment

Exhibit 16 reflects the encumbrances and expenditures for the BRF – Wastewater Projects. The overall authorization is $1.5 billion, of which $127.1 million remains to be encumbered, and $310.6 million still remains to be expended. However, the majority of the amount to be encumbered and to be expended reflects MDE's authorization of $530.0 million in revenue bonds. MDE's plan is to hold the revenue bond issuances until the effect of funding BNR projects is evaluated. To date, $330.0 million in revenue bonds have been issued – $50.0 million in fiscal 2008, $100.0 million in

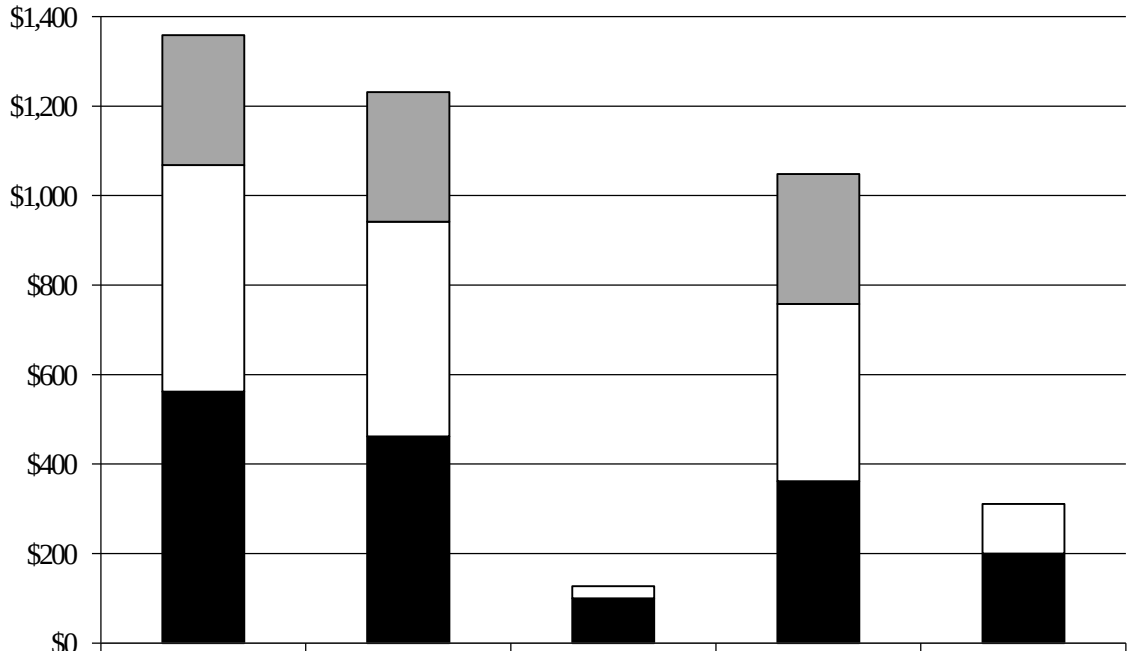
fiscal 2014, and $180.0 million in fiscal 2016 – based on cash flow needs for project reimbursements in order to fund the approximately $1.25 billion cost of upgrading the 67 major WWTPs to ENR technology. In addition, MDE plans on issuing $60.0 million in fiscal 2018 for BNR projects in fiscal 2017 and 2018. Although only $330.0 million of the revenue bond authorization has been issued, MDE reflects the encumbrance or obligation of $461.8 million in authorization for projects in anticipation that the revenue bonds will be issued within the next couple of years but will most likely need to be adjusted based on the new revenue bond issuance schedule.

Exhibit 16

Bay Restoration Fund – Wastewater Projects – Encumbrances and Expenditures

Program Inception through February 2017

($ in Millions)



	Total Authorization	Encumbered	To Be Encumbered	Expended	To Be Expended
Total	$1,358.5	$1,231.4	$127.1	$1,047.9	$310.6
GO Bonds	290.0	290.0	0.0	290.0	0.0
Special Funds	506.7	479.6	27.1	396.1	110.6
Revenue Bonds	561.8	461.8	100.0	361.8	200.0

GO: general obligation

Source: Maryland Department of the Environment

Pre-authorizations and De-authorizations

The fiscal 2018 capital budget bill reflects the de-authorization of $11,000,000 in fiscal 2017 GO bond authorization for the BNR Program as shown in **Exhibit 17**. The BRFA of 2017 authorizes the use of $60,000,000 in BRF revenue bonds and special funds for the purposes of the BNR Program. **DLS recommends approval of the de-authorization of $11,000,000 of GO bond authorization for the BNR Program in fiscal 2017.**

Exhibit 17
De-authorizations

Project	De-authorized Amount	Reason
Biological Nutrient Removal	$11,000,000	Budget Reconciliation and Financing Act of 2017 provision authorizes the use of Bay Restoration Fund revenue bonds for the same purpose.

Source: Department of Budget and Management, 2017 *Capital Improvement Program*

PAYGO Recommended Actions

1. Concur with Governor's allowance of $91,222,000 in special funds and $32,315,000 in federal funds for the Water Quality Revolving Loan Fund.

2. Concur with Governor's allowance of $500,000 in general funds for the Hazardous Substance Clean-Up Program.

3. Concur with Governor's allowance of $12,879,000 in special funds and $10,299,000 in federal funds for the Drinking Water Revolving Loan Fund.

4. Concur with Governor's allowance of $60,000,000 in special funds for the Bay Restoration Fund – Wastewater Projects.

5. Concur with Governor's allowance of $15,000,000 in special funds for the Bay Restoration Fund – Septic Systems.

6. Concur with Governor's allowance of $8,000,000 in special funds for the Energy-Water Infrastructure Program.

GO Bond Recommended Actions

1. Approve the Biological Nutrient Removal Program authorization of $49,089,000 in revenue bonds from the Bay Restoration Fund – Wastewater Projects to provide funds to the Water Pollution Control Fund for projects to remove nutrients from discharges at publicly owned sewage treatment works.

2. Approve the Drinking Water Revolving Loan Fund authorization of $5,825,000 in general obligation bonds to finance drinking water projects. The authorization reflects the 20% match to federal funding for fiscal 2017 and 2018 since the fiscal 2017 general fund match funding is targeted for reversion to the General Fund.

3. Approve the Water Quality Revolving Loan Fund authorization of $13,255,000 in general obligation bonds to finance water quality improvements. The authorization reflects the 20% match to federal funding for fiscal 2017 and 2018 since the fiscal 2017 general fund match funding is targeted for reversion to the General Fund.

4. Approve the Mining Remediation Program authorization of $500,000 in general obligation bonds to design, construct, and equip active and passive measures to remediate damage to water quality related to abandoned mining operations.

5. Approve the Water Supply Financial Assistance Program authorization of $1,944,000 in general obligation bonds for assistance to State and local government entities to acquire, design, construct, rehabilitate, equip, and improve water supply facilities. Of these funds, $500,000 is programmed to be used to provide a grant to the town of Rising Sun for the design and construction of a new water supply to the town of Rising Sun.

6. Approve the de-authorization of $11,000,000 in general obligation bonds from fiscal 2017 for the Biological Nutrient Removal Program given that Bay Restoration Fund – Wastewater Projects revenue bond authorization will be used instead.

Appendix 1
Energy-Water Infrastructure Program Funding
Fiscal 2017

Applicant	Project Name	Project Description	Total Capital Cost	Current Annual Energy Usage (kWh)	Projected Annual Energy Usage (kWh)	Annual Energy Savings (kWh)	Annual Energy Savings (%)	Dollar Value of Annual Energy Savings at $0.10 per kWh	Expected Payback Time (Number of Years)	Fiscal 2017 Grant
Existing Pumps/Unit Process Energy Reduction Projects										
Kent County	Water and WWTP Lighting Efficiency Upgrade	Replace light bulbs at county WWTPs and water treatment plants with light emitting diodes.	$130,500	137,000	59,000	78,000	57%	$7,800	17	$130,500
Washington Suburban Sanitary Commission	Energy Performance Project Phase F – Piscataway WWTP Aeration System Upgrade	Improvements of aeration system at Piscataway WWTP.	3,600,000	6,752,873	2,489,151	4,263,722	63%	426,372	8	1,000,000
Allegany County	Locust Grove Pump Station Upgrade	Upgrade pumps/controls/ HVAC at pump station.	364,000	1,800,000	1,100,000	700,000	39%	70,000	5	364,000

Applicant	Project Name	Project Description	Total Capital Cost	Current Annual Energy Usage (kWh)	Projected Annual Energy Usage (kWh)	Annual Energy Savings (kWh)	Annual Energy Savings (%)	Dollar Value of Annual Energy Savings at $0.10 per kWh	Expected Payback Time (Number of Years)	Fiscal 2017 Grant
City of Cambridge	Nathans Avenue, Stone Boundary, and Washington Street Pump Stations Pump Replacement	Replace five pumps total at three pump stations.	392,955	474,187	273,553	200,634	42%	20,063	20	392,955
City of Hagerstown	Hagerstown Water Pumping Improvements	Replace pumps at R.C. Willson Water Treatment Plant and Water Pump Station #4.	842,940	2,668,442	1,918,453	749,989	28%	74,999	11	842,940
City of Salisbury	Salisbury Park Water Treatment Plant High Service Pumps Replacement	Replace pumps at Salisbury Park Water Treatment Plant.	132,000	614,778	382,200	232,578	38%	23,258	6	132,000
Calvert County	Chesapeake Heights/Dares Beach Arsenic Treatment Pump Installation	Replace well pump/take second out of service.	83,000	97,670	74,448	23,222	24%	2,322	36	83,000
Town of Delmar	Pine Street Pump Station Energy Reduction	Replace pumps at Pine Street Pump Station and install SCADA.	100,000	109,190	82,000	27,190	25%	2,719	37	100,000

Applicant	Project Name	Project Description	Total Capital Cost	Current Annual Energy Usage (kWh)	Projected Annual Energy Usage (kWh)	Annual Energy Savings (kWh)	Annual Energy Savings (%)	Dollar Value of Annual Energy Savings at $0.10 per kWh	Expected Payback Time (Number of Years)	Fiscal 2017 Grant
Town of Indian Head	Indian Head Wastewater Treatment Plant Blower Replacement	Replace blowers at WWTP.	200,000	324,120	243,090	81,030	25%	8,103	25	200,000
Town of Snow Hill	Ironshire Pump Station Energy Reduction	Replace pumps at Ironshire Pump Station.	16,500	13,350	7,964	5,386	40%	539	31	16,500
Somerset County	Princess Anne Wastewater Treatment Plant Energy Reduction	Replace pumps/blowers and add variable-frequency drives at Princess Anne WWTP.	652,800	891,685	599,617	292,068	33%	29,207	22	652,800
Anne Arundel County	Annapolis, Broadneck, Maryland City, Patuxent WWTPs Belt Filter Press Upgrades	Replace belt filter presses at four water reclamation facilities.	2,591,781	304,061	150,161	153,900	51%	15,390	168	1,000,000
Howard County	Little Patuxent Water Reclamation Plant Influent Pump Station Replacement	Replace four pumps at Little Patuxent Water Reclamation Plant.	384,000	489,868	441,008	48,860	10%	4,886	79	384,000

Applicant	Project Name	Project Description	Total Capital Cost	Current Annual Energy Usage (kWh)	Projected Annual Energy Usage (kWh)	Annual Energy Savings (kWh)	Annual Energy Savings (%)	Dollar Value of Annual Energy Savings at $0.10 per kWh	Expected Payback Time (Number of Years)	Fiscal 2017 Grant
LaVale Sanitary Commission	LaVale Sanitary Commission Pump Station Energy Improvements	Improvements at LaVale Sanitary Commission Pump Station.	640,000	171,909	132,267	39,642	23%	3,964	161	640,000
Town of Pittsville	Pittsville Systemwide Water Pressure Reduction	Install pressure-reducing valve on water distribution main.	151,500	644,376	591,658	52,718	8%	5,272	29	151,500
Pocomoke City	Clarke Avenue Pump Station Energy Saving Improvements	Replace pumps/controls at Clarke Avenue Pump Station.	1,369,899	158,837	82,673	76,164	48%	7,616	180	1,000,000
Subtotal			***$11,651,875***	***15,652,346***	***8,627,243***	***7,025,103***	***45%***	***$702,510***	***834***	***$7,090,195***

Applicant	Project Name	Project Description	Total Capital Cost	Current Annual Energy Usage (kWh)	Projected Annual Energy Usage (kWh)	Annual Energy Savings (kWh)	Annual Energy Savings (%)	Dollar Value of Annual Energy Savings at $0.10 per kWh	Expected Payback Time (Number of Years)	Fiscal 2017 Grant
New Unit Process Generating Alternate Source of Energy										
St. Mary's Metropolitan Commission	Marlay-Taylor Wastewater Treatment Plant Methane Co-Generator Upgrade	Upgrade existing methane co-generator at Marlay-Taylor WWTP.	$945,000	2,764,000	2,168,100		78%	$216,810	4	$945,000
Baltimore City	Back River Wastewater Treatment Plant Combined Heat and Power	Install CHP system at Back River WWTP.	5,500,000	69,200,000	16,500,000		24%	1,650,000	3	3,000,000
Easton Utilities	Easton Wastewater Treatment Plant Photovoltaic Array	Install photovoltaic system at Easton WWTP.	4,326,000	2,896,000	2,896,000		100%	289,600	15	3,000,000
Town of Sharptown	Sharptown Water Treatment Plant Solar Modification	Install solar power at Sharptown WWTP.	500,000	180,000	180,000		100%	18,000	28	500,000

Applicant	Project Name	Project Description	Total Capital Cost	Current Annual Energy Usage (kWh)	Projected Annual Energy Usage (kWh)	Annual Energy Savings (kWh)	Annual Energy Savings (%)	Dollar Value of Annual Energy Savings at $0.10 per kWh	Expected Payback Time (Number of Years)	Fiscal 2017 Grant
Cecil County	Northeast Advanced Wastewater Treatment Plant PhotoVoltaic Array	Install photovoltaic system at Northeast Advanced WWTP.	128,400	125,000	53,000		42%	5,300	24	128,400
City of Westminster	Westminster Wastewater Treatment Plant Geothermal System	Utilize effluent for geothermal source in processing.	1,166,000	2,979,000	182,500		6%	18,250	64	1,166,000
Subtotal			***$12,565,400***	***78,144,000***	***21,979,600***		***28%***	***$2,197,960***	***139***	***$8,739,400***
Total										**$15,829,595**

CHP: combined heat and power
HVAC: heating, ventilation, and air conditioning
kWh: kilowatt
SCADA: Supervisory control and data acquisition
WWTP: wastewater treatment plant

Source: Maryland Department of the Environment