



# **Bay Restoration Fund Advisory Committee**

**Gregory B. Murray, Chairman**

## **Annual Status Report January 2018 (13<sup>th</sup> Report)**

**Report to:**

**Governor Larry Hogan**

**President of the Senate**

**Speaker of the House**

**Senate Education, Health, and Environmental Affairs Committee**

**Senate Budget and Taxation Committee**

**House Environment and Transportation Committee**

**House Appropriations Committee**

## **Bay Restoration Fund Advisory Committee Members**

<b>Committee Members</b>	<b>Affiliation</b>
Gregory B. Murray	Washington County
Ben Grumbles	Maryland Department of the Environment
Barbara A. Frush	Maryland House of Delegates
James L. Hearn	Washington Suburban Sanitary Commission
Beth Lynn McGee, Ph.D.	Chesapeake Bay Foundation
Christopher P. Murphy	Anne Arundel County Department of Public Works
Kevin Barnaba	Harford County Health Department
William P. Ball, Ph.D.	Johns Hopkins University
Cheryl A. Lewis	Town of Oxford
Mark J. Belton	Maryland Department of Natural Resources
Robert S. McCord	Maryland Department of Planning
David R. Brinkley	Maryland Department of Budget & Management
Joseph Bartenfelder	Maryland Department of Agriculture

## PURPOSE OF THIS REPORT

Section 1605.2 of Chapter 9 of the Environment Article requires that, beginning January 2006 and every year thereafter, the Bay Restoration Fund (BRF) Advisory Committee (BRFAC) provide an update to the Governor and the General Assembly on the implementation of the BRF program, and report on its findings and recommendations.

## EXECUTIVE SUMMARY

The BRFAC is pleased to present to Governor Larry Hogan and the Maryland Legislature, its thirteenth annual Legislative Update Report. Great strides have been made in implementing this historic BRF, but many challenges remain as we continue with the multi-year task of upgrading the state's wastewater treatment plants (WWTPs) and OSDS, and planting cover crops to reduce nitrogen and phosphorus pollution in the Chesapeake Bay.

### **Accomplishments**

- As of June 30, 2017, the Comptroller of Maryland has deposited approximately \$970 million in the Maryland Department of the Environment (MDE) Wastewater Treatment Plant fund, \$135 million in the Maryland Department of Environment Septic Systems Upgrade fund, and \$99 million in the Maryland Department of Agriculture (MDA) Cover Crop Program fund, for a total of \$1.204 billion in BRF fees from wastewater and septic users.
- Enhanced Nutrient Removal (ENR) upgrades of the state's major sewage treatment plants are currently underway. Upgrades to 53 major facilities have been completed and are in operation. Upgrades to 11 other facilities are under construction, two are in design, and one is in planning.
- Upgrades are underway for some minor sewage treatment plants (less than 0.5 million gallons per day). The goal to complete the upgrade of at least five minor plants by 2017 has already been achieved. This goal was set by the Maryland Watershed Implementation Plan (WIP) for the Chesapeake Bay Total Maximum Daily Loading (TMDL). Six minor facilities have completed the ENR upgrade and are in operation and four more are under construction, allowing Maryland to exceed its goal for minor facilities.
- In addition to the 10 minor sewage plants that have been upgraded or under construction, MDE is encouraging other minor plants to apply for funding and initiate the planning for ENR. To date, seven additional plants have signed the funding agreement and have progressed into planning or design.
- MDE is using BRF funds to upgrade septic systems with the Best Available Technology (BAT) for nitrogen removal. As of June 2017, BRF has funded 8,944 BAT upgrades throughout Maryland, of which 5,490 BAT upgrades were completed within Maryland's Critical Areas. In addition, 310 homes have been connected to public sewer using BRF.
- The Maryland Department of Agriculture (MDA) dedicates its portion of BRF for the implementation of the statewide Cover Crop Program. In FY17, farmers planted 561,344 acres

attaining an estimated nutrient reduction of 3 million pounds of nitrogen and 100,000 pounds of phosphorus. Cover crops are one of the Best Management Practices (BMPs) comprising Maryland's WIP to meet nutrient reductions for TMDL. Goals are established in 2-year increments known as milestones. Cover crop implementation in FY17 represents 135% of Maryland's 2017 Milestone goal.

- In FY17, Maryland farmers applied to plant 691,787 acres of cover crops, which is a record signup, although farmers typically enroll more acreage than they plant. Weather conditions in the spring 2017 delayed planting of crops which in turn may contribute to a delay in harvest and a potential reduction in fall planted cover crop acres.
- MDA is projected to receive \$11.2 million in BRF support in FY18. It is projected that BRF will provide financial assistance for approximately 228,000 acres of cover crops.
- Over the past six years, funding gaps for the Cover Crop Program have been addressed with funding from the Chesapeake and Atlantic Coastal Bays Trust Fund (Trust Fund) to support the increased level of participation helpful in meeting the TMDL goals.
- Cover crops are planted in the fall to prevent excess nitrogen runoff from the soil after crop harvest. They are recognized as one of the State's most cost effective BMP available to prevent nitrogen movement to groundwater and subsequently the Bay. Cover crops also prevent soil erosion and improve soil quality.
- MDE and the Maryland Department of Planning (MDP) are continuing their efforts to implement the requirements of Chapter 257 of the 2007 Acts, which requires MDE and MDP, in concert with BRAC, and in consultation with local governments, to report on the growth influences that ENR upgraded wastewater treatment plants may be having in the jurisdiction served. As part of this report, MDP is continuing its analyses and is reporting on all qualifying wastewater treatment plants, grouped by region, found in Tables 1 Page 30 of this report.

## **Challenges**

The U.S. Environmental Protection Agency (EPA), in coordination with the Bay watershed jurisdictions of Maryland, Virginia, Pennsylvania, Delaware, West Virginia, New York, and Washington, DC, developed and established the TMDL and a nutrient and sediment pollution diet for the Chesapeake Bay, consistent with Clean Water Act requirements. The Maryland WIP calls for specific strategies to achieve 60% of the Final Target by 2017, as an interim target reduction, and ultimately achieving 100% of the Final Target by 2025. MDE will continue to use its Water Quality Integrated Project Priority System (IPPS) to prioritize/allocate future funding to the different sectors. BRAC will monitor the project selections under this process and recommend changes to the process as needed. All the following sectors, except Agriculture, are funded through MDE:

- Point Source: Point Sources include major and minor municipal sewage treatment plants. Most major plants (close to 80%) and six additional minor plants have been upgraded to ENR in order to achieve the interim target reduction of 60% by 2017. The ENR upgrades to date have been successful in exceeding the interim target for the wastewater sector as

nitrogen load reduction is approximately at 70% of the final target, and phosphorus reduction has already exceeded the final target. However, construction delays at some of the largest plants prevented further reductions originally planned to be used to offset the shortfall of other sectors.

- Septic Systems: BRF will continue to be provided before and after 2017 for BAT septic systems to support local TMDL and MDE strategies.
- Stormwater: BRF can be provided starting July 2017 for stormwater BMPs to support local initiatives, MS4 permit compliance, and MDE strategies.
- Agriculture: Annual agricultural BMPs are set at about the same level in the interim as in the Final Target. Cover Crop activities being funded by BRF are essential to the success of the agricultural strategy.

### **Conclusions**

- MDE will continue to use the Bay Cabinet process to improve its benchmarks, and tracking of implementation efforts to ensure that BRF projects remain on schedule to assist the state in meeting both the interim 2017, and final 2025 nutrient reduction targets.
- MDE and MDP, in consultation with BRFAC have developed a priority system for the selection of minor WWTPs for ENR upgrades. In addition to funding ENR at minor WWTPs, MDE is using its updated (November 2016) water quality IPPS for the selection of BRF expanded use projects.

## **Programs and Administrative Functions**

### **Comptroller's Office:**

The role of the Comptroller of Maryland (CoM) is to act as the collection agent for BRF and make distributions to the Maryland Department of the Environment and the Maryland Department of Agriculture as required.

In the third year of administering BRF, the CoM began the compliance phase of the fee administration. The law specifies that BRF shall be administered under the same provisions allocable to administering the sales and use tax. Granted that authority, the CoM began the audit process for both filers and non-filers of BRF quarterly reports.

For non-filers, CoM began contacting the billing authorities and users who have failed to file or pay BRF, and is obtaining sufficient documentation to make an assessment and begin collection activity. Federal government billing authorities and users have, to date, refused to participate in the BRF process. MDE secured an agreement with several defense organizations having WWTPs to upgrade their systems over a defined period of time and they were then exempted from BRF by MDE. A copy of the agreement was provided by MDE to CoM, and those BRF accounts were subsequently placed on inactive status.

The CoM is continuing its audits of billing authorities to ensure fees are calculated correctly and are being collected.

### **Maryland Department of the Environment:**

Three units within MDE are involved in the implementation of BRF:

1. *Maryland Water Quality Financing Administration:*

The Maryland Water Quality Financing Administration (MWQFA) was established under Title 9, Subtitle 16 of the Maryland Code. MWQFA has primary responsibility for the capital budget development, financial management, and fund accounting of the Water Quality Revolving Loan Fund, the Drinking Water Revolving Loan Fund and BRF. Specifically for BRF, MWQFA is responsible for the issuance of revenue bonds, payment disbursements, and the overall financial accounting, including audited financial statements.

2. *Engineering and Capital Projects Program:*

The Engineering and Capital Projects Program (ECPP) manages the engineering and project management of federal capital funds consisting of special federal appropriation grants and state revolving loan funds for water quality and drinking water projects. ECPP also manages projects funded by state grant programs, including BRF, Special Water Quality/Health, Small Creeks and Estuaries Restoration, Stormwater, Biological Nutrient Removal, and Water Supply Financial Assistance. There may be as many as 250 active capital projects ranging in levels of complexity at any given time. Individual projects range in value from \$10,000 to \$500 million. A single project may involve as many as eight different funding sources and multiple construction and engineering contracts over a period of three to 10 years. ECPP is responsible for assuring compliance with the requirements for each funding

source while achieving the maximum benefit of funds to the recipient and timely completion of the individual projects. ECPP consists of two regional project management divisions.

3. Wastewater Permits Program:

The Wastewater Permits Program (WWPP) issues permits for surface and groundwater discharges from municipal and industrial sources, and oversees onsite sewage disposal and well construction programs delegated to local approving authorities. Large municipal and industrial discharges to the groundwater are regulated through individual groundwater discharge permits. All surface water discharges are regulated through combined state and federal permits under the National Pollutant Discharge Elimination System. These permits are issued for sewage treatment plants, some water treatment plants and industrial facilities that discharge to state surface waters. These permits are designed to protect the quality of the body of water receiving the discharge.

Anyone who discharges wastewater to surface waters needs a surface water discharge permit. Applicants include industrial facilities, municipalities, counties, federal facilities, schools, and commercial water and wastewater treatment plants, as well as treatment systems for private residences that discharge to surface waters.

WWPP will ensure that the ENR goals and/or limits are included in the discharge permits of facilities upgraded under BRF. To accommodate the implementation of the Onsite Sewage Disposal System portion of BRF, the WWPP deputy program manager has been designated as the lead for the onsite sewage disposal system upgrade program.

**Maryland Department of Agriculture:**

The Maryland Department of Agriculture (MDA) delivers soil conservation and water quality programs to agricultural landowners and operators using a number of mechanisms to promote and support the implementation of BMPs. Programs include information, outreach, technical assistance, financial assistance, and regulatory programs such as Nutrient Management. Soil Conservation Districts are the local delivery system for many of these programs.

BRF provides a dedicated fund source for the Cover Crop Program. In prior years, funding fluctuated and program guidelines were modified accordingly to try to get the best return on public investment. Results from past surveys of farm operators conducted by the Schaeffer Center of Public Policy at the University of Baltimore indicated that changing Cover Crop Program eligibility guidelines and funding uncertainty discouraged participation.

For FY17 incentive payments were adjusted. A maximum payment could have reached \$85/acre for those meeting all of the incentive criteria.

Expenditures for FY17 utilized appropriations of \$11.4 million from BRF, and \$11.25 million from the Trust Fund.

For FY17, 637,000 acres were enrolled in the Cover Crop program. Changes to this year's program included removing the commodity acres therefore making the program a totally traditional Cover Crop Program. The traditional acres along with commodity acres reported by U.S. Department of

Agriculture Farm Service Agency should allow Maryland farmers to again exceed the 417,014-acre 2017 goal for cover crops.

MDA's outreach for the program included news releases, print ads, direct mail, posters, 25' outdoor banners at commercial grain facilities and equipment dealer facilities, cover crop field signs, seed testing bags, bumper stickers, and educational displays targeted toward farmers. Additionally inclement weather, which impacts crop productivity, influenced farmers' decisions to enroll additional acres because a projected early harvest allows additional time for cover crop planting.

MDA administers the Cover Crop Program through the Maryland Agricultural Water Quality Cost Share (MACS) Program. The program offers several incentive programs and provides financial assistance to farm operators to help them implement over 30 BMPs. Cover crops are one of the most cost effective methods for tying up excess nitrogen from the soil following the fall harvest of crops. They minimize nitrogen leaching, prevent soil erosion, and improve soil quality.

### **Maryland Department of Planning:**

The Maryland Department of Planning (MDP) is a statutory member of BRFA. Chapter 80 of the Acts of 2014 allows for the use of BRFA for the remediation of failing septic systems, outside of the Priority Funding Area (PFA), connecting to qualified wastewater treatment plants. Such cases must meet certain conditions and gain approval from the Smart Growth Coordinating Committee prior to using BRFA. MDP works with local governments to ensure that land use plans maintain consistency with both local development goals and state growth policies, in light of these external PFA sewer extensions to remediate failing septic systems.

Specific functions that MDP carries out that relate directly or indirectly to BRFA programs are summarized below. HB 893 enacted by the 2007 legislative session, added an additional BRFA reporting responsibility, which is discussed later in this report.

#### **1. State Clearinghouse Review**

All State and federal financial assistance applications, including those for BRFA are required to be submitted for review through the State Clearinghouse, which is part of MDP. The Clearinghouse solicits comments on these applications from all relevant state agencies and local jurisdictions. The applicant and funding agency are subsequently notified of any comments received. This review ensures that the interests of all reviewing parties are considered before a project is sent forward for final federal or state approval.

#### **2. County Water and Sewerage Plans and Amendments**

MDP assists local governments in the preparation of amendments and revisions to the water and sewer planning document; when requested by the local governments.

MDP is directed by law to advise MDE regarding the consistency of County Water and Sewerage Plans and amendments with regard to the "local master plan and other appropriate matters" (Environment Article § 9-507 (b)(2)).

The law requires that County Water and Sewerage Plans and amendments be consistent with the local comprehensive plans. If a plan or amendment is not consistent, it is subject to disapproval, in whole or in part, by MDE.

### 3. Priority Funding Areas

Priority Funding Areas are delineated by local governments in accordance with statutory criteria that focus on concentrating high density growth in and near existing communities. If the local PFA designations do not meet the legal requirements in the law, MDP indicates those portions as “comment areas” to indicate that not all requirements of the §5-7B-02 and 03 State Finance and Procurement Article (SFPA) are met. In these areas “growth-related projects” are not eligible for certain state funding until SFPA requirements are met or unless an exception is granted by the Maryland Smart Growth Coordinating Committee. The PFA statute lists the specific state financial assistance programs that are required to focus their funding on projects inside the PFA, with certain specified exceptions.

BRF was enacted after the PFA law, and is not included in the list of state financial programs subject to the PFA funding restrictions, but is monitored so as not to negatively affect the efforts of Smart Growth policies, namely support to new development at lower densities, especially outside of designated growth areas. Even though the PFA law is not directly applicable to this capacity, as highlighted in Table 1 on Page 26 of this report, it appears that treatment capacity has been consistently used for service connections within the PFA. MDP will continue to monitor this activity, especially in areas where major failing septic systems are increasing in numbers or where the remediation of failing septic systems for public health and safety reasons is on the rise. Where BRF septic funds are provided for these types of connections, local governments are guided and advised by MDE and MDP.

### 4. Local Comprehensive Plan Review and Comment

Local Comprehensive Plans must be prepared by every county and municipality in Maryland, pursuant to the Land Use Article of the Annotated Code. MDP provides comments on draft local comprehensive plans and amendments. Through the Clearinghouse process, MDP coordinates other state agency comments prior to being adopted by local governing bodies. While these plans are not subject to state approval and comments provided are advisory only, local governing bodies provide full consideration to the state advisory comments since state funds may later be needed to implement specific recommendations of the local plan.

MDP works closely with, and provides technical assistance to local governments in the processes leading to the adoption of local comprehensive plans. MDP ensures coordination with state policies, including the plans, policies, and programs of the Governor’s Smart Growth Subcabinet.

## Bay Restoration Fund Status

BRF fees collected from WWTP users are identified as “Wastewater” fees, and those collected from users on individual onsite septic systems are identified as “Septic” fees. These fees are collected by the State Comptroller’s Office and deposited as follows:

- Wastewater fees (net of local administrative expenses) are deposited into MDE’s “Wastewater Fund.”
- Sixty percent (60%) of the Septic fees (net of local administrative expenses) are deposited into MDE’s “Septic Fund.”
- Forty percent (40%) of the Septic fees (net of local administrative expenses) are deposited into MDA’s “Septic Fund.”

The status of the deposits from the State Comptroller’s Office to MDE and MDA for each of the sub-funds identified above, as of June 30, 2016, is as follows:

### Wastewater Fund (MDE 100% - cumulative since inception 2004):

<u>Sources:</u>	<u>\$ Million</u>	<u>Uses:</u>	<u>\$ Million</u>
Cash Deposits	\$ 970	Grant Awards	\$1,295*
Cash Interest Earnings	\$ 29	Admin. Expense Allowance	\$ 14
Net Bond Proceeds	<u>\$ 362</u>	Bond DS Payments	<u>\$ 74</u>
Total	\$1,361	Total	\$1,383

*\* Funds are awarded after construction bids have opened (except for planning/design) and payment disbursements are made as expenses are incurred; \$100M in additional revenue bonds issuance is projected for FY20.*

As of June 30, 2017, the grants under the Wastewater Fund were awarded as follows:

<b>ENR MAJOR WWTP PROJECTS</b>
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Aberdeen ENR	\$14,581,773.00
Allegany Co/ Georges Creek ENR	9,875,136.00
Allegany Co/ Celanese ENR	2,333,382.00
Anne Arundel Co/ Annapolis WRF ENR	14,700,000.00
Anne Arundel Co/ Broadneck WRF	7,851,000.00
Anne Arundel Co/ BroadWater ENR	6,050,000.00
Anne Arundel Co/ Cox Creek WRF ENR Up	88,600,000.00
Anne Arundel Co/ MD City Facility ENR	3,473,000.00

Anne Arundel Co/ Mayo WRF BNR ENR	6,000,000.00
Anne Arundel Co/ Patuxent WRF ENR	3,713,000.00
Baltimore City/Back River WWTP ENR	300,885,432.00
Baltimore City/Patapsco ENR	158,922,000.00
Bowie ENR	8,668,492.00
Brunswick, City of/ WWTP ENR	8,263,000.00
Cambridge ENR	8,618,255.00
Cecil Co./Northeast River Adv WWTP ENR	10,977,120.00
Chesapeake Beach WWTP ENR Up	7,080,000.00
Chestertown ENR	1,490,854.14
Crisfield WWTP ENR	4,230,766.00
Cumberland WWTP ENR	25,654,866.00
Delmar WWTP ENR	2,369,464.00
Denton WWTP ENR	4,405,615.00
Easton WWTP ENR	7,788,021.00
Elkton ENR	7,403,154.00
Emmitsburg WWTP ENR	5,517,848.00
Federalburg ENR	2,900,000.00
Frederick, City of /Frederick Gas House	16,060,521.00
Fred. Co./ Ballenger McKinney WWTP	31,000,000.00
Fruitland WWTP ENR Up	4,809,000.00
Hagerstown, City of /WWTP ENR II	10,191,836.00
Harford Co./ Joppatowne ENR	3,399,778.00
Harford Co./ Sod Run ENR	36,640,567.00
Havre de Grace WWTP ENR	10,474,820.00
Howard County/Little Patuxent ENR	35,493,172.00
Hurlock WWTP ENR	941,147.75

Indian Head ENR	5,822,098.00
La Plata ENR Upgrade	9,367,610.00
Leonardtown WWTP ENR	8,996,527.00
MES/Freedom District WWTP ENR	7,716,359.00
MES/Correctional Instit. WWTP ENR	6,504,691.00
MES/Dorsey Run WWTP ENR	47,986.00
Mt Airy WWTP/ENR	3,354,144.00
Perryville ENR	3,888,168.00
Pocomoke WWTP ENR	3,214,878.00
Poolesville WWTP ENR	223,132.00
Queen Anne's/ Kent Island ENR	6,380,645.09
Salisbury WWTP ENR	2,553,876.86
Salisbury WWTP BNR ENR (corrective)	11,435,411.00
Snow Hill/BNR ENR	3,275,455.00
St. Mary's Co./Marlay Taylor ENR	9,896,000.00
Talbot Co/St Michaels ENR	1,978,698.78
Taneytown/WWTP ENR Up Planning & Des	5,381,998.00
Thurmont WWTP ENR	6,680,679.00
Washington Co./Winebrenner	3,059,028.00
Washington Co./Conococheague	19,271,609.00
Westminster WWTP ENR	1,020,000.00
WSSC/Blue Plains WWTP ENR	138,036,769.00
WSSC/Damascus WWTP ENR	5,053,399.00
WSSC/Parkway WWTP ENR	14,271,803.00
WSSC/Piscataway WWTP ENR	6,324,000.00
WSSC/Seneca WWTP ENR Upgrade & Exp	6,221,000.00

WSSC/Western Branch WWTP ENR 39,109,000.00

**ENR MAJOR WWTP SUBTOTAL** \$1,200,447,984.62

**BRF EXPANDED USES (POST FY16)**

Galena WWTP ENR (Minor)	\$1,847,832.00
Greensboro WWTP ENR (Minor)	2,660,819.00
Oxford WWTP/ ENR (Minor)	2,989,477.00
Preston WWTP ENR (Minor)	360,762.00
Queenstown WWTP BNR ENR (Minor)	880,929.00
Rising Sun, Town of/ENR WWTP (Minor)	1,099,268.00
Secretary ,Town of/Twin Cities ENR (Minor)	317,185.00
Somerset Co/Smith Island (Minor)	375,000.00
<u>Sudlersville, Town of/ BNR ENR Up (Minor)</u>	<u>2,364,420.00</u>

**Sewer Projects**

Balto. City/Patapsco SSI (SC-903)	9,843,750.00
Balto. City/Herring Run SSI (SC-937)	3,257,734.00
Balto. City/Low-level SSI (SC-914)	7,481,250.00
Cumberland CSO Storage Facility Ph I	27,241,372.00
LaVale Manhole Rehab Ph II	749,831.00

**TOTAL EXPANDED USE PROJECTS** \$61,469,629.00

**SEWER PROJECTS (PRE FY10)**

Allegany Co/ Braddock Run Interceptor	\$499,748.00
Balto City Gwynns Run Sewer	1,575,000.00
Balto. City Greenmount Br Sewer Interc.	2,300,000.00

Balto. City Greenmount Br Sewer Interc. II	1,000,000.00
Cumberland / CSO Elimination-Evitts Creek	1,319,889.00
Denton - Lockerman St. Lift Station	100,000.00
Emmitsburg/South Seton Ave Sewer Line	600,000.00
Federalsburg/Maple Ave Sewer	600,000.00
Frostburg Combined Sewer Overflow Ph-IV	1,000,000.00
Frostburg CSO - Phase V	800,000.00
Frostburg CSO - Phase VI Elimination	1,100,000.00
Fruitland, City of Infiltration & Inflow Sewer	800,000.00
Hagerstown/ Collection System Rehab	800,000.00
Havre de Grace/ I&I Sewer Reduction	166,500.00
Mountain Lake Park - Sewer Rehab III	731,884.00
Port Deposit Inflow & Infiltration Reduction	178,199.00
Secretary/Gordon Street Lift Station	150,000.00
Secretary Infiltration/Inflow Reduction	172,068.00
St. Mary's METCOM/Evergreen Park Sewer	203,714.00
St. Mary's METCOM/Piney Pt. Sewers	465,559.00
Talbot/St Michaels Sewer & Upgrade	1,000,000.00
Talbot/St Michaels Reg. II Sewer & Upgrade	450,000.00
Taneytown, City of /Balt St Water Main	200,000.00
Thurmont / Sewer Line Rehab	947,000.00
Washington Co. Halfway Inflow/Infiltration	200,000.00
Westernport CSO	936,000.00
Westernport CSO/ Elim Philos Ave Area	1,032,519.00
Williamsport, Town of /Inflow & Infiltration.	383,226.00

<b>SEWER SUBTOTAL (PRE FY10)</b>	<b>\$19,711,306.00</b>
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**O&M PROJECTS**

Allegany Co./ North Celanese	\$312,000.00
Allegany Co./ George's Creek	40,800.00
AA Co./Annapolis	300,000.00
AA Co./ Broadneck	315,000.00
AA Co./Broadwater	20,000.00
AA Co./ MD City	125,000.00
AA Co./ Patuxent	450,000.00
Boonsboro, Town of	69,540.00
Bowie, City of	59,400.00
Brunswick, City of	201,600.00
Cambridge, City of	303,750.00
Charles Co./ Mattawoman	816,000.00
Chestertown, Town of	115,650.00
Crisfield, City of	18,000.00
Cumberland, City of	1,398,000.00
Delmar, Town of	40,000.00
Denton, Town of	80,000.00
Easton, Easton Utilities	624,000.00
Elkton, Town of	420,900.00
Federalsburg, Town of	133,500.00
Frederick Co./Ballenger	250,000.00
Hagerstown, City of	1,104,000.00
Harford Co./ Aberdeen	240,000.00
Harford Co./Joppatowne	77,500.00

Harford Co./ Sod Run	525,000.00
Havre de Grace, City of	336,600.00
Howard Co./Little Patuxent	1,000,000.00
Hurlock, Town of	257,400.00
Indian Head, Town of	99,000.00
La Plata, Town of	82,500.00
MD Environmental Service/ Dorsey Run	180,000.00
MD Environmental Service/ ECI	60,000.00
Mt. Airy, Town of	129,600.00
Perryville, Town of	29,700.00
Pocomoke City, City of	52,920.00
Poolesville, Town of	13,500.00
Queen Anne Co./Kent Island	378,000.00
Rising Sun, Town of	12,500.00
Snow Hill, Town of	70,000.00
Talbot Co. / Region II	134,850.00
Thurmont, Town of	90,000.00
WSSC, Blue Plains	300,000.00
WSSC, Damascus	135,000.00
WSSC, Parkway	581,250.00
WSSC, Piscataway	900,000.00
WSSC, Seneca	300,000.00
WSSC, Western Branch	300,000.00

<b>O&amp;M PROJECT SUBTOTAL</b>	<b>\$13,482,460.00</b>
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<b>TOTAL (ENR, SEWER and O&amp;M)</b>	<b>\$1,295,111,379.62</b>
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**Septic Fund (MDE 60% for Onsite Disposal System upgrades except 22.4% in FY10):**

Sources:	\$ Million	Uses:	\$ Million
Cash Deposits	\$135	Capital Grant Awards	\$ 122*
Cash Interest Earnings	\$ 3	Admin. Expense Allowance	\$ 11
		HB12 Local Admin Grant	\$ 4 **
<b>Total</b>	<b>\$138</b>	<b>Total</b>	<b>\$120.4</b>

*\* Does not include \$15 million of FY18 grant awarded in June 2017. Payment disbursements are made as BATs are installed and expenses are incurred.*

*\*\* HB12 passed during the 2014 legislative session allows for up to 10% of the MDE septic fee allocation to be used for grants to local health departments to implement and enforce the septic regulations requiring BAT for nitrogen reduction from septic systems.*

As of June 30, 2017, the grants under the Wastewater Fund were awarded as follows:

<b>BRF: SEPTIC GRANTS</b>
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Allegany Co. - Canaan Val Instit. (GY11-16)	\$241,116.85
Allegany Co. - Canaan Val Instit. <b>(GY17)</b>	95,000.00
Anne Arundel Co. (GY10-16)	17,488,298.20
Anne Arundel Co. <b>(GY17)</b>	2,913,000.00
Baltimore Co. (GY11-16)	2,413,579.31
Baltimore Co. <b>(GY17)</b>	651,000.00
Calvert Co. (GY08-16)	9,036,724.94
Calvert Co. <b>(GY17)</b>	1,240,000.00
Caroline Co. (GY08-16)	2,632,589.90
Caroline Co. <b>(GY17)</b>	359,000.00
Carroll Co. (GY11-16)	1,304,459.66
Carroll Co. <b>(GY17)</b>	417,000.00
Cecil Co. (GY09-16)	4,927,845.09
Cecil Co. <b>(GY17)</b>	885,000.00
Charles Co. (GY08-16)	2,688,835.10

Charles Co. <b>(GY17)</b>	493,000.00
Dorchester Co. (GY09-16)	5,022,069.05
Dorchester Co. <b>(GY17)</b>	670,000.00
Frederick Co (Canaan Valley Inst.) (GY08-16)	2,853,290.55
Frederick Co (Canaan Valley Inst.) <b>(GY17)</b>	414,000.00
Garrett Co. (GY11-16)	727,046.12
Garrett Co. <b>(GY17)</b>	164,000.00
Harford Co. (GY09-16)	2,447,716.08
Harford Co. <b>(GY17)</b>	429,000.00
Howard Co (Canaan Valley Inst.) (GY11-16)	842,799.75
Howard Co (Canaan Valley Inst.) <b>(GY17)</b>	226,000.00
Kent Co. (GY08-16)	4,278,184.89
Kent Co. <b>(GY17)</b>	460,000.00
Montgomery Co (Canaan Valley Inst.) (GY11-16)	1,217,387.50
Montgomery Co (Canaan Valley Inst.) <b>(GY17)</b>	384,000.00
Prince George's Co.(GY11-12&14-16)	172,292.50
Prince George's Co. <b>(GY17)</b>	135,000.00
Queen Anne's Co. (GY11-16)	5,991,801.89
Queen Anne's Co. <b>(GY17)</b>	943,000.00
Somerset Co. (GY11-16)	2,013,014.58
Somerset Co. <b>(GY17)</b>	353,000.00
St. Mary's Co. (GY11-16)	7,718,913.20
St. Mary's Co. <b>(GY17)</b>	1,365,000.00
Talbot Co. (GY15-16)	5,365,129.75
Talbot Co. <b>(GY17)</b>	862,000.00
Washington Co (Canaan Valley Inst.) <b>(GY15-16)</b>	2,677,345.55

Washington Co (Canaan Valley Inst.) (GY17)	268,000.00
Wicomico Co. (GY08-16)	5,377,515.75
Wicomico Co. (GY17)	585,000.00
Worcester Co. (GY08-16)	2,470,997.46
Worcester Co. (GY17)	364,000.00

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<b>SEPTIC County Grants Total</b>	<b>\$104,583,953.67</b>
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<b><u>DIRECT SEPTIC GRANTS:</u></b>	
<b>Ind Septic Grants: Inception through GY'11</b>	
<b>Total</b>	<b>\$17,725,266.58</b>

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<b>SEPTIC Total Capital Grants</b>	<b>\$122,309,220.25</b>
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**HB 12 GRANT AWARDS:**

Allegany Co. (FY15/17)	\$55,000.00
Anne Arundel Co. (FY15-17)	115,000.00
Baltimore Co. (FY15-17)	225,000.00
Calvert Co. (FY15-17)	320,000.00
Caroline Co. (FY15-17)	320,000.00
Carroll Co. (FY15-17)	85,000.00
Cecil Co. (FY15-17)	115,000.00
Charles Co. (FY15-17)	225,000.00
Dorchester Co. (FY15-17)	320,000.00
Frederick Co. (FY15-17)	190,000.00
Garrett Co. (FY15-17)	120,000.00
Harford Co. (FY15-17)	190,000.00
Howard Co. (FY15-17)	85,000.00
Kent Co. (FY15-17)	320,000.00
Montgomery Co. (FY15-17)	60,000.00
Prince George's Co.(FY15-17)	15,000.00
Queen Anne's Co. (FY15-17)	115,000.00

St. Mary's Co. (FY15-17)	320,000.00
Somerset Co. (FY15-17)	115,000.00
Talbot Co. (FY15-17)	320,000.00
Washington Co. (FY15-17)	105,000.00
Wicomico Co. (FY15-17)	115,000.00
Worcester Co. (FY15-17)	85,000.00

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<b>HB 12 Grant Total</b>	<b>\$3,935,000.00</b>
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**TOTAL SEPTIC GRANTS** **\$126,244,220.25**

**Septic Fund (MDA 40% for Cover Crops)**

Sources:

Cash Deposits\* \$98,888,429.72

Uses:

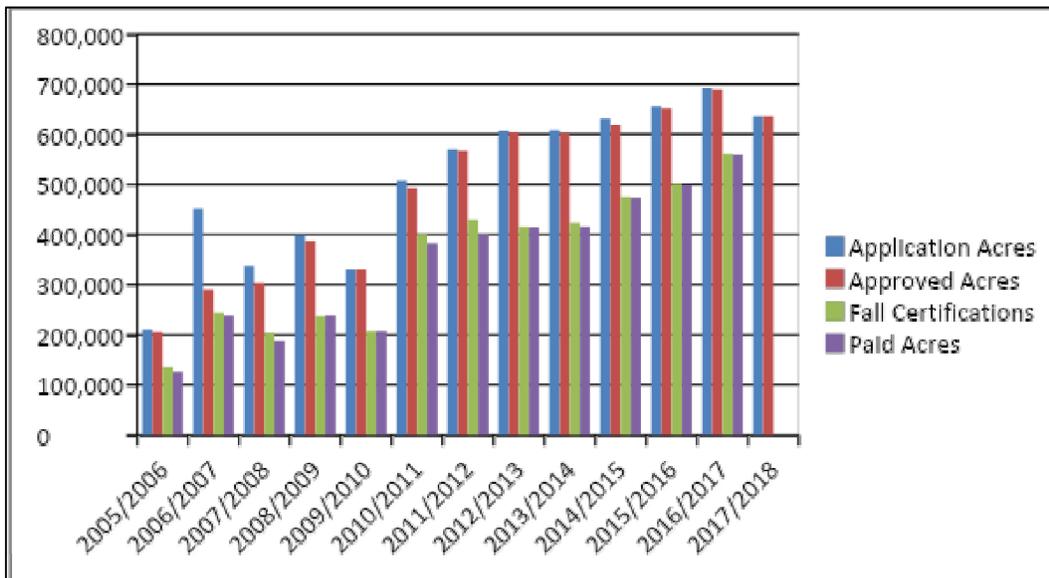
Grant Awards \$91,796,246

Admin. Expense \$ 2,296,397

Total \$94,092,643

\*Cumulative revenue and expenditures as of June 30, 2017

Historically there is attrition between acres enrolled and actual payments for cover crops planted under the MACS Program. The main cause of reduced acreage is one of time and labor availability in the fall planting of cover crops after harvest. Other causes include delays due to weather and other uncontrolled factors. There is also a smaller reduction in acres planted and those paid due to conversions from traditional to commodity cover crops or removal of acres from the program. The chart below illustrates the “typical” program attrition profile.



## **ENR Funding Status:**

Consistent with BRFAC recommendation from prior years, the Maryland General Assembly during the 2012 session, doubled BRF fee from \$2.50 per month (\$30/year) per household or Equivalent Dwelling Unit (EDU) to \$5.00 (\$60/year) for most Marylanders. The fee remained unchanged for users that do not discharge sewage into the Chesapeake Bay or the Atlantic Bays watershed, which covers a portion of Garrett County, Cecil County and Ocean City area. The new increased fee will remain in place until FY30, and revert back to the lower level of \$2.50 per month starting in FY31. The increased fee generated approximately \$110 million per year in gross revenue. Statutory changes during the 2017 legislative session (HB384 effective July 1, 2018) will allow BRF to also provide grant for BNR costs at WWTPs. The webpage below (under Financial Reports/August 2017 Cash Flow Projections) shows the estimated future awards and cash flow needs, while fully funding the ENR upgrades to the 67 major WWTPs by FY18.

[mde.maryland.gov/programs/Water/BayRestorationFund/Pages/annualreports.aspx](http://mde.maryland.gov/programs/Water/BayRestorationFund/Pages/annualreports.aspx)

Starting FY18, after payment of bond debt service, the WWTP fund is projected to have \$70+ million per year in fee revenue available for capital projects. Based on the statutory changes during the 2015 session (Chapter 153 & Chapter 124), the prioritization of project funds will be as follows:

1. Funding an upgrade of a wastewater facility to enhance nutrient removal at wastewater facilities with a design capacity of 500,000 gallons or more per day;
2. Funding for the most cost-effective enhanced nutrient removal upgrades at wastewater facilities with a design capacity of less than 500,000 gallons per day;
3. Funding any of the following types of projects selected based on water quality and public health benefits, as determined by MDE:
  - (i) Combined sewer overflow abatement, rehabilitation of existing sewers, and upgrading conveyance systems, including pumping stations (starting FY16);
  - (ii) Nitrogen reduction from onsite sewage disposal systems/septic systems;
  - (iii) Stormwater projects being undertaken by local governments who have implemented a system of charges;
  - (iv) Stormwater alternative compliance plan, undertaken by an organization exempt from taxation under IRS regulations, if required by the local government because the organization has substantial financial hardship as a result of a local government stormwater remediation fee.

## Wastewater Treatment Plant Upgrades With Enhanced Nutrient Removal

### Status of Upgrades:

MDE has implemented a strategy known as ENR and is providing financial assistance to upgrade wastewater treatment facilities in order to achieve ENR. The ENR Strategy and BRF set forth annual average nutrient goals of WWTP effluent quality of Total Nitrogen (TN) at 3 mg/l and Total Phosphorus (TP) at 0.3 mg/l, where feasible, for all major WWTPs with a design capacity of 0.5 million gallons per day (MGD) or greater. Other smaller WWTPs are currently being selected by MDE for upgrade on a case-by-case basis, based on the cost effectiveness of the upgrade, environmental benefits, and land use factors. Primarily, the Maryland's 67 major sewage treatment facilities are targeted for the initial upgrades.

### Major WWTPs:

ENR upgrades are underway at many plants, and to date, upgrades to 53 major facilities have been completed and are successfully in operation. Eleven other facilities are under construction, two are in the design stage, and one is in the planning stage.

### Minor WWTPs:

ENR upgrades are also underway at some minor WWTPs in order to meet Maryland's WIP requirement to upgrade at least five minor WWTPs before FY18. MDE and MDP have been assisting local governments in applying for BRF grants. Currently, six minor plants are ENR operational, four are under construction and seven are in design and planning phases.

As an estimate of the total benefit of the completed projects, the following load reductions were determined based on the difference between what would be the facility's load without the upgrade versus the load with the upgrade at the ultimate design capacity. These load reductions would allow the upgraded facilities to maintain their loading caps of nitrogen and phosphorus even after reaching their design capacity with the 20-year projected growth.

The following are the major facilities that have completed the upgrade and are in operation:

#	Major Facility	Design Flow In Million Gallons Per Day (MGD)	Date Completed	Nitrogen Load Reduction At Design Flow (Lbs/year)	Phosphorus Load Reduction At Design Flow (Lbs/year)
1	Hurlock	1.65	May 2006	70,000	8,500
2	Celanese (North Branch)	2.00	Nov 2006	85,000	10,300
3	Easton	4.00	June 2007	170,000	20,700
4	Kent Narrows	3.00	Aug 2007	128,000	15,500

#	Major Facility	Design Flow In Million Gallons Per Day (MGD)	Date Completed	Nitrogen Load Reduction At Design Flow (Lbs/year)	Phosphorus Load Reduction At Design Flow (Lbs/year)
5	APG-Aberdeen (Federal) <sup>1</sup>	2.80	Mar. 2006	119,000	14,500
6	Swan Point <sup>1</sup>	0.60	May 2007	25,000	3,100
8	Mattawoman <sup>1</sup>	20.00	Nov 2007	853,000	0
7	Chestertown	0.90	June 2008	64,000	7,800
9	Brunswick	1.40	Sept 2008	60,000	7,200
10	St. Michaels	0.66	Oct 2008	28,000	3,400
11	Indian Head	0.50	Jan 2009	21,000	2,600
12	Elkton	3.05	Dec 2009	130,000	15,800
13	Havre De Grace	2.275	May 2010	28,000	11,800
14	Poolesville	0.75	Jul 2010	9,000	3,900
15	Federalsburg	0.75	Aug 2010	32,000	3,900
16	Crisfield	1.00	Aug 2010	43,000	5,200
17	George's Creek	0.60	Nov 2010	25,000	3,100
18	Mount Airy	1.20	Nov 2010	15,000	6,200
19	Perryville	1.65	Dec 2010	70,000	8,500
20	Hagerstown	8.00	Dec 2010	97,000	41,400
21	Cumberland	15.0	Feb 2011	183,000	77,700
22	Bowie	3.30	Feb 2011	40,000	7,000
23	Delmar	0.85	Sept 2011	36,000	4,400
24	Pocomoke City	1.47	Oct 2011	18,000	7,600
25	Denton	0.80	May 2012	10,000	4,100
26	Little Patuxent	25.00	Sept 2012	304,000	53,200
27	Damascus	1.50	Feb 2013	18,000	7,700
28	Thurmont	1.00	April 2013	12,000	5,100
29	Piscataway	30.00	May 2013	365,000	0
30	Centreville	0.50	July 2013	6,000	2,500
31	Parkway	7.50	July 2013	91,000	15,900
32	Dorsey Run <sup>1</sup>	2.00	Oct 2013	24,000	4,200
33	Joppatowne	0.95	Nov 2013	11,000	4,900
34	Cambridge	8.1	Dec 2013	98,000	41,900
35	Snow Hill	0.5	June 2014	21,000	2,500
36	La Plata	1.5	Dec 2014	18,000	7,700
37	Sod Run	20.0	Feb 2015	243,000	103,500
38	Aberdeen	4.0	March 2015	48,000	20,700
39	Patuxent	7.5	March 2015	91,000	15,900
40	Maryland City	2.5	March 2015	30,000	5,300
41	Broadneck	6.0	May 2015	73,000	31,000
42	Emmitsburg	0.75	March 2016	31,000	3,800
43	Annapolis	13.0	April 2016	158,000	67,300
44	Seneca	20.0	April 2016	243,000	0

#	Major Facility	Design Flow In Million Gallons Per Day (MGD)	Date Completed	Nitrogen Load Reduction At Design Flow (Lbs/year)	Phosphorus Load Reduction At Design Flow (Lbs/year)
45	Broadwater	2.0	April 2016	24,000	10,300
46	Western Branch	30.0	April 2016	365,000	63,900
47	Blue Plains (MD Portion)	169.6	April 2016	7,230,000	0
48	Ballenger Creek	6.0	April 2016	73,000	31,000
49	Taneytown	1.1	July 2016	13,000	5,600
50	Marlay Taylor	6.0	August 2016	73,000	31,000
51	North East River	2.0	October 2016	24,000	0
52	Fruitland	0.8	November 2016	9,700	4,100
53	Westminster	1.0	February 2017	42,600	5,100

The following are the minor facilities that have completed the upgrade and are in operation:

No.	Minor Facility	Design Flow In Million Gallons Per Day (MGD)	Date Completed	Nitrogen Load Reduction At Design Flow (Lbs/year)	Phosphorus Load Reduction At Design Flow (Lbs/year)
1	Boonsboro <sup>1</sup>	0.53	Oct 2009	22,000	2,700
2	Worton <sup>1</sup>	0.25	Dec 2012	10,000	1,200
3	Eastern Correctional Facility <sup>1</sup>	0.50	May 2015	21,000	2,500
4	Rising Sun	0.50	April 2016	21,000	2,500
5	Queenstown	0.085	October 2016	3,800	400
6	Greensboro	0.28	June 2017	12,700	1,400

<sup>1</sup> No BRF funding was provided

### Chesapeake Bay TMDL Implications:

In early November, 2009, the EPA officially transmitted the WIP guidance. EPA, in coordination with the Bay watershed jurisdictions of Maryland, Virginia, Pennsylvania, Delaware, West Virginia, New York, and Washington, DC, developed and, on Dec. 29, 2010, established the TMDL, and a nutrient and sediment pollution diet for the Chesapeake Bay, consistent with Clean Water Act requirements. Current model estimates are that the states' Bay water quality standards can be met at basin-wide loading levels of 200 million pounds of nitrogen per year, and 15 million pounds of phosphorus per year. Maryland's current target loads are 41 million pounds of nitrogen per year, and 3 million pounds of phosphorus per year by 2025.

To meet the established Chesapeake Bay TMDL, Maryland developed its WIP (dated Oct. 26, 2012). The WIP provides detailed proposed strategies that could help Maryland meet and exceed our 2017 target (60% of the needed total implementation). Significant local input was part of the plan, thereby providing additional detail at the local level and increased reasonable assurance of successful implementation.

### **Annual Operation and Maintenance Grants for the Upgraded Facilities:**

Starting in FY10, BRF legislation allows up to 10% of the annual fee generated from users of wastewater treatment facilities to be earmarked for grants for the operation and maintenance (O&M) costs of ENR technology. To ensure that each upgraded facility receives a reasonable and fair amount of grant, MDE, in consultation with the BRFAC, is allocating the grants at the following rates:

- Minimum annual allocation per facility (for design capacity  $\leq$  1 MGD) = \$30,000
- For facility with design capacity between 1 and 10 MGD = \$30,000 per MGD
- Maximum allocation per facility (for design capacity  $\geq$  10 MGD) = \$300,000

On July 5, 2017, the Maryland Board of Public Works approved \$4,776,900 (under FY18 authorization) for facilities that achieved ENR level of treatment during CY16.

MDE is requesting authorization for \$7 million in FY19. The upgraded facilities listed above that achieved ENR level of treatment in calendar year 2017 will be receiving O&M grants based above rates.

## Update on Department of Defense Facilities

On July 19, 2006, the State of Maryland and the Department of Defense (DoD) signed a Memorandum of Understanding (MOU) to resolve a dispute regarding the applicability of the BRF to DoD. The state’s legal position is that the federal government is not exempt from paying the BRF fee; however, the DoD asserts that BRF fee is a tax, and that the state may not tax the federal government. With the advice of counsel, the state chose to settle the matter with DoD rather than to litigate. In the MOU, neither party concedes any legal position with respect to BRF fee. MDE has agreed to accept DoD’s proposal to undertake nutrient removal upgrades at certain DoD-owned WWTPs at its own expense in lieu of paying BRF fee. No other federal agency is exempt from paying BRF fee under this MOU.

MDE continues to work with DoD to upgrade the targeted DoD facilities as specified in the MOU. Specifically, the following are the targeted DoD facilities with their current ENR upgrade status:

<b>DoD Facility</b>	<b>Status</b>	<b>Remark</b>
Aberdeen Proving Ground – Aberdeen	Operation	Construction was completed in March 2006. ENR upgrade is fully operational.
Aberdeen Proving Ground – Edgewood	Operation	Construction was completed in March 2016. ENR upgrade is fully operational.
Fort Detrick	Operation	Construction was completed in June 2012. ENR upgrade is fully operational.
Naval Station – Indian Head	Operation	Construction was completed in September 2011. ENR upgrade is fully operational.
Fort Meade	Under Construction	American Water Group has assumed ownership of the plant. ENR upgrade is underway using the design-build project delivery process.
Naval Support Activity – Annapolis	Design Complete with No Construction	MDE approved the design for Phase I of the project (Denitrification Filter) on Sept. 9, 2013. The project did not proceed to construction and is on hold due to federal budgetary issues.

## Chapter 257 Implementation

Chapter 257 (HB 893) of 2007 - *Bay Restoration Fund - Wastewater Treatment Facilities Upgrades - Reporting Requirements* requires that “Beginning January 1, 2009, and every year thereafter, MDE and MDP shall jointly report on the impact that a wastewater treatment facility that was upgraded to enhanced nutrient removal during the calendar year before the previous calendar year with funds from the Bay Restoration Fund had on growth within the municipality or county in which the wastewater treatment facility is located.”

As required by this law, MDP and MDE have advised the BRFAC with the best available information and data analysis to address this mandate.

### Available Capacity

This report addresses the following BRF financed facilities that were upgraded to ENR with BRF, that were completed prior to Jan. 1, 2017 and operational for one calendar year:

Facility	Design Capacity (MGD)		Flow in CY 2016 (MGD)
	Original	At Upgrade	
North Branch, Allegany County	2.0	2.0	1.366
Town of Easton, Talbot County	2.35	4.0	2.542
Town of Hurlock, Dorchester County	2.0	1.65	1.232
Kent Island (KNSG), Queen Anne's County	2.0	3.0	1.808
City of Brunswick, Frederick County	0.7	1.4	0.538
Town of Chestertown, Kent County	0.9	0.9	0.651
Talbot Region II, Talbot County	0.5	0.66	0.355
Town of Indian Head, Charles County	0.5	0.5	0.357
Town of Elkton, Cecil County	2.7	3.05	1.753
City of Havre De Grace, Harford County	1.89	3.3	1.856
Town of Poolesville, Montgomery County	0.75	0.75	0.490
Town of Federalsburg, Caroline County	0.75	0.75	0.289
City of Crisfield, Somerset County	1.0	1.0	0.587
Town of Mount Airy, Carroll County	1.2	1.2	0.719
George’s Creek, Allegany County	0.6	0.6	0.827
Hagerstown, Washington County	8.0	8.0	6.698
City of Cumberland, Allegany County	15.0	15.0	10.060
City of Bowie, Prince George's County	3.3	3.3	1.498
Town of Perryville, Cecil County	1.65	2.0	0.646
City of Pocomoke City, Worcester County	1.47	1.47	1.011

Facility	Design Capacity (MGD)		Flow in CY 2016 (MGD)
	Original	At Upgrade	
Town of Delmar, Wicomico County	0.65	0.85	0.721
Town of Denton, Caroline County	0.8	0.8	0.425
Little Patuxent, Howard County	25.0	29.0	19.416
Damascus (WSSC), Montgomery County	1.5	1.5	0.781
Town of Thurmont, Frederick County	1.0	1.0	0.595
Piscataway (WSSC), Prince George's County	30.0	30.0	25.144
Parkway (WSSC), Prince George's County	7.5	7.5	6.096
Joppatowne, Harford County	0.95	0.95	0.910
City of Cambridge, Dorchester County	8.1	8.1	2.458
Town of Snow Hill, Worcester County	0.5	0.5	0.313
Town of La Plata, Charles County	1.5	1.5	1.080
Sod Run, Harford County	20.0	20.0	11.171
City of Aberdeen, Harford County	4.0	4.0	1.600
Patuxent, Anne Arundel County	7.5	7.5	5.147
Maryland City, Anne Arundel County	2.5	2.5	1.201
Broadneck, Anne Arundel County	6.0	6.0	4.800
Western Branch (WSSC), Prince George's County	30.0	30.0	19.887
Annapolis, Anne Arundel County	13.0	13.0	7.787
Seneca (WSSC), Montgomery County	26.0	26.0	14.525
Blue Plains, Prince George's and Montgomery Counties	169.6	169.6	118.560
Ballenger Creek, Frederick County	15.0	6.821	6.821
Rising Sun, Cecil County	0.275	0.50	0.221
Broadwater, Anne Arundel County	2.0	2.0	0.919

ENR upgrades may create the possibility of capacity expansion beyond the original design capacity by significantly reducing nitrogen loads. However, given the limitations of the WWTP nutrient discharge caps, only a few of the plants could actually expand. Of the 36 facilities listed above, only three exceeded their original design capacity. At least one (George's Creek) was due to excessive infiltration and inflow (I/I) into the sewer system.

## 2017 BRF Analysis Findings

### Methodology

MDP conducts a BRF Analysis for each calendar year as directed by Chapter 257 (House Bill 893) of 2007 - *Bay Restoration Fund - Wastewater Treatment Facilities Upgrades - Reporting Requirements*. The purpose is to provide BRFAC and Maryland's legislature with information on the impact that an ENR upgraded wastewater treatment facility may have on growth in the municipalities and counties in which the facility is located. Growth is measured before and after ENR upgrades within existing and planned sewer service area boundaries and PFAs, using Geographical Information System (GIS) mapping software. These findings help assess changes in growth patterns, the capacity of the upgraded facility to meet the demands of current and future users, and possible changes in development patterns that could be influenced by upgrades.

MDP works with every county and many municipalities to maintain and annually update the Statewide Sewer Service Data layer to ensure as accurate a representation as possible. Planning has successfully conducted BRF Analysis each year since 2009 by utilizing the most recently published data from Maryland Property View, and our sewer service data layers. It should be noted that data vintage for each of these datasets affects the annual BRF Analysis findings.

Last year, MDP updated BRF Analysis methodology to confirm data boundary discrepancies within the existing sewer service areas both before and after ENR technology implementation, resulting in improved data outputs. Planning is committed to continuous improvement to its processes, contributing to the overarching goal of restoring water quality in the Chesapeake Bay.

### Available Capacity

An ENR upgrade can create the possibility for capacity expansion beyond the original design capacity. However, the limitations of the WWTP nutrient discharge caps established by Maryland's Point Source Policy for the Bay<sup>1</sup> heavily influence whether that possibility can become reality, notwithstanding new treatment technologies or the use of multiple discharge means or wastewater reuse. As required by state regulations that guide county water and sewer plans, to date, all ENR upgrades and plant expansions have been found to be consistent with locally adopted and approved comprehensive plans. Also, MDP's analysis shows that the imposed nutrient discharge caps following the ENR upgrades have not had any noted compromising effects on development.

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<sup>1</sup> Annual nutrient load caps for major WWTPs were based on an annual average concentration of 3 mg/l total nitrogen and 0.3 mg/l total phosphorus, at the approved design capacity of the plant. Design capacity for major WWTPs met both of the following two conditions: (1) A discharge permit was issued based on the plant capacity, or MDE issued a letter to the jurisdiction with design effluent limits based on the new capacity as of April 30, 2003; (2) Planned capacity was either consistent with the MDE-approved County Water and Sewer Plan as of April 30, 2003, or shown in the locally-adopted Water and Sewer Plan Update or Amendment to the County Water and Sewer Plan, which was under review by MDE as of April 30, 2003 and subsequently approved by MDE.

## Planning's Findings

For the 2017 reporting period, MDP reviewed development served by 43 WWTPs with ENR upgrades completed within the timeframe specified in Chapter 257 (House Bill 893) of 2007 - *Bay Restoration Fund - Wastewater Treatment Facilities Upgrades - Reporting Requirements*. The selection of ENR upgrades to be analyzed in the annual report is based on the following criteria: (1) ENR upgrades completed before Jan. 1, 2016 and (2) operational for one calendar year. Seven new ENR upgrades are included in this year's report. They include several wastewater treatment facilities within the Washington Region: Western Branch, Blue Plains, Seneca Creek, and Ballenger Creek. The Baltimore Region saw upgrades to the Annapolis and Broadwater facilities while the Upper Eastern Shore had an upgrade to the Rising Sun Wastewater Treatment Plant.

Table 1 summarizes all the ENR upgrades that MDP is advised to report on by MDE (see list on page 28). These ENR upgrades are completed, operational and meet the criteria above. Table 1 also distinguishes new ENR upgrades since the last reporting period. The table depicts growth activity by the number of connections before and after an ENR upgrade within a particular municipality or county. The starting point for each plant's reporting is the calendar year prior to the start of ENR funding; the table also shows the year in which the upgrade was completed and became operational. It then summarizes information on a) number of connections before ENR Funding, and b) the current number of total connections, which includes connections to new development on sewer as well as connections of existing septic systems to sewer.

The table compares development in and outside PFAs, as well as the use of plant capacity for new growth versus septic hookups. PFAs are designated by local governments and recognized by the state as areas in which to concentrate growth and development due to the presence of existing or planned infrastructure. BRF funding is not restricted to PFAs, but PFAs provide a useful geographic frame of reference for reviewing possible effects of BRF upgrades on growth.

The table also shows that for each WWTP, the percentages of connections of improved parcels inside PFAs before and after ENR upgrades are very similar, within a few percentage points in every case.



Figure 1 - Little Patuxent Water Reclamation Plant - 25 MGD, ENR Upgrade

**Table 1. Connections to Wastewater Treatment Facilities Upgraded to ENR**

ENR WWTF	County	ENR Upgrade Completed and Operational (Month-Year)	Connections Before ENR Funding					Current Number of Total Connections			
			Column A: Reporting Year before ENR Funding	Column B: Number of Improved Parcels in the Sewershed	Column C: Number of Improved Parcels in Existing Service Area ("S")	Column D: Number of Improved Parcels in "S" within PFA	Column E: % of Connections Located in "S" & PFA (Column D ÷ C)	Column F: Total Improved Parcels in S1	Column G: Total Improved Parcels in S1 & PFA	Column H: % Total Improved Parcels Located in "S1" within PFA (Column G ÷ F)	Column I: Total Increase Improved Parcels in S1 (Total Number New Connections)
<b>Western Region</b>											
North Branch	ALLE	Nov-06	2005	1,913	1,801	1,794	99.6%	1,858	1,840	99.0%	57
George's Creek	ALLE	Nov-10	2009	2,069	1,938	1,876	96.8%	1,997	1,938	97.0%	59
City of Cumberland	ALLE	Feb-11	2010	17,656	16,412	16,243	99.0%	16,797	16,643	99.1%	385
City of Hagerstown	WASH	Dec-10	2009	21,975	18,825	17,769	94.4%	19,991	19,717	98.6%	1,166
<b>Western Region Total</b>				<b>43,613</b>	<b>38,976</b>	<b>37,682</b>	<b>97%</b>	<b>40,643</b>	<b>40,138</b>	<b>99%</b>	<b>1,667</b>
<b>Washington Region</b>											
City of Brunswick	FRED	Sep-08	2007	2,446	1,957	1,957	100.0%	2,267	2,267	100.0%	310
Town of Thurmont	FRED	Apr-13	2012	2,385	2,345	2,204	94.0%	2,350	2,217	94.3%	5
Town of Polesville	MONT	Jul-10	2009	1,742	1,719	1,651	96.0%	1,723	1,652	96.0%	4
Damascus	MONT	Feb-13	2012	3,997	3,793	3,437	90.6%	3,793	3,437	90.6%	0
City of Bowie	PRIN	Feb-11	2010	20,712	20,559	20,269	98.6%	20,949	20,478	97.8%	390
Parloway	PRIN	Jul-13	2012	15,470	15,394	15,388	99.9%	15,501	15,439	99.6%	107
Piscataway	PRIN	May-13	2012	56,296	55,007	51,954	94.4%	56,600	52,481	93.6%	1,053
Western Branch (WSSC) (new)	PRIN	Apr-16	2015	45,533	43,438	38,554	89%	43,440	38,554	89%	2
Blue Plains (new)	PRIN/MONT	Apr-16	2015	330,121	327,437	319,529	98%	327,544	319,639	98%	107
Saweca (WSSC) (new)	MONT	Apr-16	2015	60,161	57,387	56,911	99%	57,419	56,943	99%	32
Ballegger Creek (new)	FRED	Apr-16	2015	21,554	17,110	17,105	100%	17,110	17,105	100%	0
Facilities Upgraded During Reporting Period				457,369	445,272	432,099	97.0%	445,513	432,241	97.0%	141
<b>Washington Region Total</b>				<b>560,417</b>	<b>546,146</b>	<b>528,954</b>	<b>97%</b>	<b>548,156</b>	<b>530,212</b>	<b>97%</b>	<b>2,010</b>
<b>Upper Eastern Shore Region</b>											
Town of Elkton	CECI	Dec-09	2008	6,000	4,926	4,925	100.0%	5,092	5,090	100.0%	166
Town of Perryville	CECI	Dec-10	2009	1,704	1,508	1,508	100.0%	1,547	1,544	99.8%	39
Rising Sun (new)	CECI	Apr-16	2015	1,052	856	846	99%	856	846	99%	0
Town of Chestertown	KENT	Jun-08	2007	1,772	1,742	1,562	89.7%	1,885	1,695	89.9%	143
Kent Island (KNS6)	QUEE	Aug-07	2006	6,590	6,401	5,974	93.3%	7,134	6,757	94.7%	733
Town of Denton	CARO	May-12	2011	1,508	1,097	1,095	99.8%	1,502	1,486	98.9%	405
Town of Federalburg	CARO	Aug-10	2009	881	827	817	98.8%	860	849	98.7%	33
Town of Easton	TALB	Jun-07	2006	5,810	5,831	5,822	99.8%	6,429	6,423	99.9%	598
Talbot Region II	TALB	Oct-08	2007	2,269	2,214	1,981	89.5%	2,413	2,145	88.9%	199
Facilities Upgraded During Reporting Period				1,052	856	846	98.8%	856	846	98.8%	0
<b>Upper Eastern Shore Total</b>				<b>27,606</b>	<b>25,402</b>	<b>24,530</b>	<b>97%</b>	<b>27,718</b>	<b>26,835</b>	<b>97%</b>	<b>2,316</b>
<b>Lower Eastern Shore Region</b>											
City of Cambridge	DORC	Dec-13	2012	5,861	5,418	5,293	97.7%	5,433	5,308	97.7%	15
Town of Hurlock	DORC	May-06	2005	769	703	703	100.0%	798	798	100.0%	95
Town of Delmar	WICO	Sep-11	2010	1,107	932	824	88.4%	951	841	88.4%	19
City of Pocomoke	WORC	Oct-11	2010	1,893	1,607	1,585	98.6%	1,613	1,592	98.7%	6
City of Crisfield	SOME	Aug-10	2009	3,495	2,044	1,735	84.9%	2,108	1,828	86.7%	64
Town of Snow Hill	WORC	Jun-14	2013	900	930	882	94.8%	930	882	94.8%	0
<b>Lower Eastern Shore Total</b>				<b>13,025</b>	<b>11,624</b>	<b>11,022</b>	<b>95%</b>	<b>11,823</b>	<b>11,249</b>	<b>95%</b>	<b>199</b>
<b>Baltimore Region</b>											
Town of Mount Airy	CARR/FRED	Nov-10	2009	3,336	3,145	3,145	100.0%	3,410	3,338	97.9%	265
Joppatowns/Sod Run	HARI	Nov-13	2012	51,174	48,459	48,195	99.5%	48,665	48,401	99.5%	206
City of Havre de Grace	HARI	May-10	2009	5,098	4,898	4,782	97.6%	5,262	5,259	99.9%	364
Little Patuxent	HOWA	Sep-12	2011	56,997	50,848	50,833	100.0%	57,475	57,406	99.9%	6,627
City of Aberdeen	HARI	Mar-15	2014	5,098	4,524	4,443	98.2%	4,524	4,443	98.2%	0
Broadneck	ANNE	May-15	2014	30,847	21,172	20,454	96.6%	21,638	20,885	96.5%	466
Maryland City	ANNE	Mar-15	2014	4,522	4,394	4,376	99.6%	4,494	4,376	97.6%	90
Patuxent	ANNE	Mar-15	2014	24,037	22,886	22,440	98.1%	23,644	22,440	94.9%	758
City of Annapolis (new)	ANNE	Apr-16	2015	31,823	28,394	27,466	97%	28,461	27,542	97%	77
Broadwater (new)	ANNE	Apr-16	2015	4,919	4,694	3,902	83%	4,717	3,921	83%	23
Facilities Upgraded During Reporting Period				36,742	33,078	31,268	95%	33,178	31,463	95%	100
<b>Baltimore Region Total</b>				<b>217,851</b>	<b>193,404</b>	<b>190,036</b>	<b>98%</b>	<b>202,280</b>	<b>198,011</b>	<b>98%</b>	<b>8,876</b>
<b>Southern Maryland Region</b>											
Town of Indian Head	CHAR	Jan-09	2008	1,409	1,317	1,317	100.0%	1,400	1,400	100.0%	83
Town of La Plata	CHAR	Dec-14	2013	3,164	3,213	3,132	97.5%	3,335	3,254	97.6%	122
<b>Southern Maryland Total</b>				<b>4,573</b>	<b>4,530</b>	<b>4,449</b>	<b>98%</b>	<b>4,735</b>	<b>4,654</b>	<b>98%</b>	<b>205</b>
<b>Statewide</b>											
Facilities Upgraded During Reporting Period				495,163	479,206	464,213	97%	479,547	464,550	97%	241
<b>Statewide Totals</b>				<b>867,085</b>	<b>820,092</b>	<b>796,678</b>	<b>97%</b>	<b>835,365</b>	<b>811,099</b>	<b>97%</b>	<b>15,273</b>

**Notes:**

(new) = Facilities upgraded to ENR during the 2018 reporting period.

There are a few instances since reporting began in 2009, where the total number of improved parcels in Column C varied slightly due to service boundary discrepancies. Planning has worked diligently to resolve this issue.

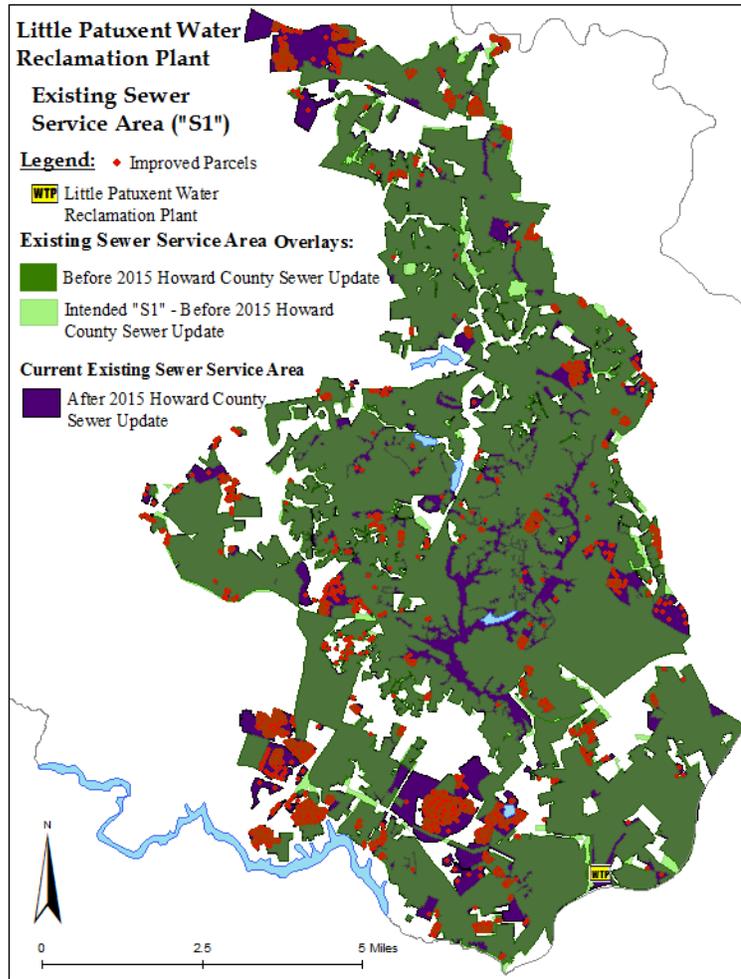
This year MDP BRF Analysis indicates that the largest annual increase in connections occurred in Howard County via the Little Patuxent Water Reclamation Plant, with 99% of new connections in the PFA. The facility was upgraded in 2012 to ENR technology and the Howard County Master Plan Sewer Map underwent a major comprehensive update in November of 2015, expanding the sewer service area significantly.

MDP requested and received the latest GIS data from Howard County in November of 2017. This Figure depicts the changing landscape of the Little Patuxent Water Reclamation Plant existing service area, and improved parcels, which now reside within the updated sewer service area.

When BRF Analysis results reveal significant increases in development, as in the phenomenon within the Little Patuxent existing service area, the department investigates. We re-evaluate the many factors that play a part in our findings as reported in the table, including MDProperty View’s data production schedule, vintage of source data and the accuracy of GIS data from local governments. If need be, we correct the data through parcel point alignment and boundary corrections.

Among the regions with major WWTPs that were upgraded to ENR in 2016, the Washington Region had the greatest number of upgrades. The number of connections that now have ENR treatment rose dramatically.

Last year’s BRF Analysis determined that the number of total connections with ENR within the existing service area for the Washington Region (i.e., Cities of Brunswick and Bowie, Towns of Thurmont and Poolesville, Damascus, Parkway, and Piscataway) was 102,590. Now, with the addition of the Western Branch, Blue Plains, Seneca, and Ballenger Creek facility upgrades, the current total stands at 548,156 connections. It is anticipated that this large increase in ENR upgrades will translate to significant nutrient reduction within the Potomac and Patuxent rivers, and ultimately the Chesapeake Bay.



## **Onsite Sewage Disposal System Upgrade Program**

### **Program Implementation**

Starting July 1, 2010, the BRF Septic BAT upgrade program was implemented locally at the county level, and MDE no longer took direct applications from homeowners.

The Bay Restoration (Septic) Fund statute (Annotated Code of Maryland under 9-1605.2) requires that funding priority for BAT installations be “first given to failing septic systems and holding tanks in the Chesapeake and Atlantic Coastal Bays Critical Areas and then to failing septic systems that the Department (MDE) determines are a threat to public health or water quality”. Chapter 280 (SB 554) acts of 2009, requires new and replacement septic systems serving property in the Critical Areas to include the BAT for removing nitrogen. In addition Code of Maryland Regulation (COMAR) 26.04.02.07 effective Jan. 1, 2013, requires all Onsite Sewage Disposal Systems (OSDS) installed in the Chesapeake Bay and Coastal Bays watersheds for new construction to include BAT. All BAT must be inspected, and have the necessary operation and maintenance performed by a certified service provider at a minimum of once per year for the life of the system. The regulation also requires that both individuals that install BAT and individuals that perform operation and maintenance complete a course of study approved by MDE. As of May of 2016, approximately 1,240 installers and 220 service providers have been certified by MDE.

On Nov. 14, 2016, MDE finalized a regulatory change to the Code of Maryland Regulations 26.04.02.07. This change will reform the universal requirement that BAT units be installed outside of the Critical Area for all new construction, unless the local jurisdiction enacts a code in order to protect public health or waters of the state, or the system design is 5,000 gallons per day or greater.

Consistent with the above, MDE is requiring all new grant recipients to prioritize applications for financial assistance based on the following:

1. Failing OSDS or holding tanks in the Critical Areas
2. Failing OSDS or holding tanks not in the Critical Areas
3. Non-Conforming OSDS in the Critical Areas
4. Non-conforming OSDS outside the Critical Areas
5. Other OSDS in the Critical Areas, including new construction
6. Other OSDS outside the Critical Areas, including new construction

The program guidance for FY18 is available on the web site at:

[mde.maryland.gov/programs/Water/WQFA/Documents/FINAL%20FY%202018%20Program%20Guidance-Appendix%20C\\_1.pdf](http://mde.maryland.gov/programs/Water/WQFA/Documents/FINAL%20FY%202018%20Program%20Guidance-Appendix%20C_1.pdf)

The webpage below (under Financial Reports) shows BRF funded BAT installations and sewer connections for SFY17.

[mde.maryland.gov/programs/Water/BayRestorationFund/Pages/annualreports.aspx](http://mde.maryland.gov/programs/Water/BayRestorationFund/Pages/annualreports.aspx)

During this fiscal year, 960 BAT installations were completed, and 96 septic systems were eliminated by connecting the dwellings to public sewer.

MDE-Approved BAT for Nitrogen Removal: MDE has currently approved 19 technologies for BAT nitrogen removal of which nine are field verified. Consistent with HB 347 (2011 Session), effective June 1, 2011, and every 2 years thereafter, MDE is required to provide an evaluation and ranking of all best available nitrogen removal technologies for OSDS. The evaluation will include for each BAT technology:

1. Total Nitrogen Reduction
2. Total cost including Operation, Maintenance and Electricity
3. Cost per pound of Nitrogen Reduction

The following are the currently nine field-verified BAT technologies in Maryland:

Model	Manufacturer	Effluent TN Concentration	% TN Removal	Cost of Purchase, Installation and 5 Years Operation & Maintenance	Operation and Maintenance Cost per year*	Electricity cost and Usage**
Hoot® BNR	Hoot Aerobic Systems, Inc. <a href="http://hootsystems.com">hootsystems.com</a>	21 mg/L	64%	\$12,677	\$175	\$92/year or 766 kWh/year
Advantex® - AX20	Orenco Systems®, Inc. <a href="http://orenco.com">orenco.com</a>	17 mg/L	71%	\$13,235	\$200	\$40/year or 336 kWh/year
Advantex® - RT	Orenco Systems®, Inc. <a href="http://orenco.com">orenco.com</a>	14 mg/L	76%	\$15,054	\$300	\$40/year or 336 kWh/year
Singulair TNT	Norweco, Inc. <a href="http://norweco.com">norweco.com</a>	27 mg/L	55%	\$10,895	\$175	\$118/year or 980 kWh/year
Singulair Green	Norweco, Inc. <a href="http://norweco.com">norweco.com</a>	27 mg/L	55%	\$10,926	\$175	\$118/year or 980 kWh/year
SeptiTech®	SeptiTech, Inc. <a href="http://septitech.com">septitech.com</a>	20 mg/L	67%	\$13,272	\$300	\$209/year or 1741 kWh/year
RetroFast	Bio-Microbics, Inc. <a href="http://biomicrobics.com">biomicrobics.com</a>	25 mg/L	57%	\$10,092	\$175	\$168/year or 1402 kWh/year
AquaKlear AK6S245	AquaKlear, Inc. <a href="http://aquaklear.net">aquaklear.net</a>	27 mg/L	54%	\$10,616	\$100	\$36/year or 299 kWh/year
Hydro Action AN	Hydro-Action Industries <a href="http://hydro-action.com">hydro-action.com</a>	20 mg/L	66%	\$12,910	\$300	\$188/year or 1565 kWh/year

\* Does not include cost of pumping septage.

\*\* Based on a rate of \$0.12 per kWh and unit size for 3 to 4 bedrooms.

The following BAT technologies have been approved to enter a field verification period:

1. MicroFast
2. Fuji Clean CEN
3. Nitrex
4. Norweco Hydro-Kinetic
5. Ecoflo Coco Filter ECDn

### **Chesapeake Bay States - Data Sharing**

On April 16, 2015, the states of Delaware, Maryland, Pennsylvania, Virginia and West Virginia signed a Memorandum of Cooperation (MOC) to share data on the performance of advanced onsite pretreatment units for nitrogen reduction in order to simplify and expedite the approval processes for these technologies in each individual state, as well as reduce costs to residents and manufacturers. Prior to this MOC, all states nationwide approved systems on an individual basis, and many did not take into account data collected by other state programs. To learn more about data sharing, please visit the [Chesapeake Bay Program website](#).

### **BEST AVAILABLE TECHNOLOGY CLASSIFICATION DEFINITIONS**

Effective on July 1, 2015, there are five different classifications of BAT. Each of these classifications works in conjunction with Regulation 26.04.02 for the reduction of nitrogen through OSDs. This classification is intended only to classify the use of BAT systems on domestic wastewater usage. Domestic wastewater is defined by the BAT Technical Review Committee (BAT TRC) as having a TN influent concentration of 60mg/L. Supporting documents that clearly and concisely define the methods in which each of these classifications can be used are on MDE's webpage for reference.

**BAT Class I** systems are standalone units that are approved through MDE protocols as BAT units capable of reducing TN to 30 mg/L or less. These units are currently on the approved BAT list, and have successfully completed the Maryland field verification process. The flow chart for approval of BAT Class I units is available on MDE's website.

**BAT Class II** systems are standalone units that are undergoing field verification for BAT Class I. Upon successful completion of the field verification, they will become BAT Class I. All requirements and guidance for BAT Class I apply to BAT Class II technologies. Technologies that do not reduce the effluent nitrogen to 30 mg/l or less will be either removed from the BAT listing, enter a modified field verification process (contingent on prior approval from BAT TRC), or be classified as BAT Class III at the discretion of the BAT TRC and working with the manufacturer's representative.

**BAT Class III** systems are pretreatment technologies approved by MDE as capable of reducing nitrogen to 48 mg/L effluent. These technologies may only be installed as BAT when paired with a BAT Class IV soil disposal system. BAT Class III technologies must have one of the following certifications: NSF 245, NSF 40 Class I, CAN/BNQ 3680-600, CEN Standard 12566-3 or equivalent. Technologies proposed as BAT Class III, must first apply to MDE for BAT classification using the technology application found within the MDE website. The application needs to be accompanied by the final report of the verification organization. Once submitted to the BAT TRC, analysis of the data and the application will begin. The BAT TRC will analyze for the TN reduction capabilities of the unit. If the

analysis of data concludes the unit will not reduce TN to 48 mg/L, the technology will be denied entry into the BAT program.

**BAT Class IV** systems are OSDS that are installed above, at, or just below (12-inch maximum depth) grade and are thus capable of reducing effluent TN by 30%. For inclusion as a BAT in Maryland, these units are to be paired with a BAT Class III, Class II or Class I system. No modification of this is authorized unless applied for and approved by MDE on a case-by-case basis.

**BAT Class IV** systems, installed under the BAT classification, must be maintained on the same frequency as any BAT in accordance with COMAR Regulation 26.04.02.07. Since no specific manufacturer is tied to this type of system, the operation and maintenance provider of the BAT Class III, II, or I unit must successfully complete the MDE-approved course for the Installation and Operation and Maintenance of the specific system.

Sand Mound, At Grade Systems, and Low Pressure Dosing are addressed in Code of Maryland Regulation 26.04.02.05. All practices and criteria listed in this regulation must be applied when installing these as BAT. All installation contractors of sand mounds must be certified by MDE. The MDE Design and Construction Manual for Sand Mound Systems and the Construction Manual for At Grade systems is to be utilized for the latest and best installation practices for these systems. Information sheets are available for each system type.

**SAND MOUNDS** – An elevated sand mound system is an OSDS that is elevated above the natural soil surface in a suitable sand fill material. Gravel-filled absorption trenches or beds are constructed in the sand fill, and the effluent is pumped into the absorption area through a pressure distribution network. Pretreatment of sewage occurs either in a septic tank or advanced pretreatment unit, and additional treatment occurs as the effluent moves downward through the sand fill and into the underlying natural soil. The sand mound must be installed over a natural surface, A or B horizon. No BAT credit is given to sand mounds installed over sand or loamy sand soils. Please refer to, “BAT Class IV: Sand Mound,” for exact details as to what is needed to qualify for BAT Classification.

**AT-GRADE SYSTEMS** – The at-grade system is an onsite sewage disposal system that utilizes a raised bed of gravel or stone over the natural soil surface with a pressure distribution system constructed to equally distribute the pretreated effluent along the length of the gravel bed. The purpose of the design is to overcome site limitations that prohibit the use of conventional trench or seepage pit OSDS. Please refer to, “BAT Class IV: At-Grade Mound Systems,” for exact details as to what is needed to qualify for BAT Classification.

**SHALLOW PLACED LOW PRESSURE DISTRIBUTION** – Shallow-placed pressure dosing allows for uniform distribution of effluent at a depth not to exceed 12 inches across the entire dispersal field. Dosing allows for the creation of fluctuating aerobic/anoxic environments, which sets up the conditions for nitrification and denitrification to occur. Please refer to, “BAT Class IV: Shallow-Placed Pressure-Dosed Dispersal,” for exact details as to what is needed to qualify for BAT Classification.

**BAT Class V** systems are technologies that mitigate the impact of TN on groundwater, but do not fit into any of the above BAT classifications. As systems are identified that will apply for classification as BAT Class V, the BAT TRC will develop a concise plan for the unit to enter the BAT classification. Examples include, but are not limited to, waterless toilets, and individually engineered peat systems.

## Cover Crop Activities

### Recent Program Streamlining and Targeting to Achieve Maximum Nutrient Reduction:

In FY17, MDA continued to implement a targeting strategy to maximize nutrient reduction effectiveness of cover crops. MDA eliminated aerial seeding for non-irrigated, double-crop soybeans due to lesser than desired crop performance. The 2017 program included incentives to:

1. Plant cover crops as early as possible in the fall,
2. Plant after crops that need higher fertilizer rates, such as corn, vegetables and tobacco,
3. Use cover crops on fields that were fertilized using manure,
4. Use planting methods that maximize seed to soil contact to assure germination and early growth, and
5. Use small grains such as rye to maximize nutrient uptake.

MDA has applied these criteria for the last 8 fiscal years by structuring the incentive payments to reward farmers who adhered to one or more of these priorities. They are based both on four separate surveys (Schaeffer Center of Public Policy at the University of Baltimore) of farm operators' opinions to streamline and adapt the program to be responsive to participants while maximizing water quality benefits.

### Status of Implementation of BRF for Cover Crop Activities:

MDA cumulative portion of BRF is \$98,888,429 as of June 30, 2017. In FY17, \$11.4 million from BRF was supplemented by an additional \$11.3 million from the Trust Fund to fund the Cover Crops Program.

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*It is with great pleasure that BRFAC acknowledges the steadfast, commitment, and unwavering service of the professionals who have contributed their time, energy, and efforts toward the production of this report, annually for over 10 years. Thank you!*

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