



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
1650 Arch Street  
Philadelphia, Pennsylvania 19103-2029  
10/8/2009

Richard Eskin, Ph.D., Director  
Technical and Regulatory Service Administration  
Maryland Department of the Environment  
1800 Washington Blvd., Suite 540  
Baltimore, Maryland 21230-1718

Dear Dr. Eskin:

The U.S. Environmental Protection Agency (EPA), Region III, is pleased to approve the *Total Maximum Daily Loads (TMDLs) for fecal bacteria in the Antietam Creek Basin in Washington County, Maryland*. The TMDL report was submitted via the Maryland Department of the Environment's letter dated June 18, 2008, and was received by EPA for review and approval on June 23, 2008. Based on EPA's comments, MDE sent a final revised TMDL report to EPA for review and approval on September 15, 2009. The TMDL was established and submitted in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act to address impairments of water quality as identified in Maryland's Section 303(d) List. The Antietam Creek Basin (MD02140502) was included on Maryland's Section 303(d) List as impaired by fecal bacteria (2002), impacts to biological communities (2002), and low dissolved oxygen, nutrients and sediments (1996). This TMDL addresses the fecal bacteria impairment only.

In accordance with Federal regulations at 40 CFR §130.7, a TMDL must comply with the following requirements: (1) be designed to attain and maintain the applicable water quality standards; (2) include a total allowable loading and, as appropriate, wasteload allocations for point sources and load allocations for nonpoint sources; (3) consider the impacts of background pollutant contributions; (4) take critical stream conditions into account (the conditions when water quality is most likely to be violated); (5) consider seasonal variations; (6) include a margin of safety (which accounts for uncertainties in the relationship between pollutant loads and instream water quality); and (7) be subject to public participation. In addition, these TMDLs considered reasonable assurance that the TMDL allocations assigned to the nonpoint sources can be reasonably met. The enclosure to this letter describes how the fecal bacteria TMDLs for the Antietam Creek watershed satisfy each of these requirements.

As you know, all new or revised National Pollutant Discharge Elimination System permits must be consistent with the TMDL wasteload allocation pursuant to 40 CFR §122.44 (d)(1)(vii)(B). Please submit all such permits to EPA for review as per EPA's letter dated October 1, 1998.

If you have any questions or comments concerning this letter, please do not hesitate to

contact María García, at 215-814-3199.

Sincerely,

/S/

Jon M. Capacasa, Director  
Water Protection Division

Enclosure

cc: Nauth Panday, MDE-TARSA  
Melissa Chatham, MDE-TARSA



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**Decision Rationale**  
**Total Maximum Daily Loads**  
**Fecal Bacteria in Antietam Creek Basin**  
**Washington County, Maryland**

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**Jon M. Capacasa, Director**  
**Water Protection Division**

**Date: 10/8/2009**

**Decision Rationale**  
**Total Maximum Daily Loads**  
**Fecal Bacteria in Antietam Creek Basin**  
**Washington County, Maryland**

**I. Introduction**

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed for those waterbodies identified as impaired by the State where technology based and other controls will not provide for attainment of water quality standards. A TMDL is a determination of the amount of a pollutant from point, nonpoint, and natural background sources, including a Margin of Safety (MOS), that may be discharged to a waterbody without exceeding water quality standards.

This document sets forth the U.S. Environmental Protection Agency's (EPA) rationale for approving the TMDLs for fecal bacteria in the Antietam Creek Basin. The TMDL was established to address impairments of water quality, caused by fecal bacteria, as identified in Maryland's 2002 Section 303(d) List for water quality limited segments. The Maryland Department of the Environment (MDE) submitted the report, *Total Maximum Daily Loads of Fecal Bacteria for the Antietam Creek Basin in Washington County, Maryland*, dated June 18, 2008, to EPA for final review on June 23, 2008. Based on EPA's comments, MDE sent a final revised TMDL report to EPA for review and approval on August 26, 2009. The TMDL in this report addresses the fecal bacteria impairment in the Antietam Creek Basin as identified on Maryland's Section 303(d) List. The basin identification for the Antietam Creek Watershed is MD02140502.

EPA's rationale is based on the TMDL Report and information contained in the computer files provided to EPA by MDE. EPA's review determined that the TMDLs meet the following seven regulatory requirements pursuant to 40 CFR Part 130.

1. The TMDL is designed to implement applicable water quality standards.
2. The TMDL includes a total allowable load as well as individual wasteload allocations (WLAs) and load allocations (LAs).
3. The TMDL considers the impacts of background pollutant contributions.
4. The TMDL considers critical environmental conditions.
5. The TMDL considers seasonal environmental variations.
6. The TMDL includes a MOS.
7. The TMDL has been subject to public participation.

In addition, these TMDLs considered reasonable assurance that the TMDL allocations assigned to nonpoint sources can be reasonably met.

## II. Summary

The TMDL specifically allocates the allowable fecal bacteria loading to the Antietam Creek watershed. There are fifteen permitted point sources of fecal bacteria which are included in the WLA. The fact that the TMDL does not assign WLAs to any other sources in the watershed should not be construed as a determination by either EPA or MDE that there are no additional sources in the watershed that are subject to the National Pollutant Discharge Elimination System (NPDES) program. In addition, the fact that EPA is approving this TMDL does not mean that EPA has determined whether some of the sources discussed in the TMDL, under appropriate conditions, might be subject to the NPDES program. The annual average TMDL and Maximum Daily Load for fecal bacteria are presented in Tables 1 and 2, respectively. Individual annual and daily WLAs for permitted point sources are provided in Table 3. The TMDLs include an upstream load generated from Pennsylvania.

**Table 1. Antietam Creek Watershed Annual Average TMDL**

<b>Antietam Creek Watershed Fecal Bacterial TMDL (Billion MPN <i>E. coli</i>/year)</b>										
TMDL	=	LA			+	WLA			+	MOS
		LA PA <sup>(1)</sup>	+	LA <sub>ANT</sub>		+	NPDES Stormwater WLA <sub>ANT</sub>	+		
382,109	=	121,716	+	189,808	+	47,810	+	22,775	+	Incorporated
		Upstream Load Allocation		MD-8 digit Antietam Creek Basin TMDL Contribution (260,393)						

(1) Although the upstream load is reported here as a single value, it could include point and nonpoint sources.

**Table 2. Antietam Creek Watershed Maximum Daily Load**

<b>Antietam Creek Watershed Fecal Bacteria TMDL Summary (Billion MPN <i>E. coli</i>/day)</b>										
TMDL	=	LA			+	WLA			+	MOS
		LA PA <sup>(1)</sup>	+	LA <sub>ANT</sub>		+	NPDES Stormwater WLA <sub>ANT</sub>	+		
11,192	=	3,742	+	5,381	+	1,874	+	194	+	Incorporated
		Upstream MDL		MD-8 digit Antietam Creek MDL Contribution (7,449)						

**Table 3. Wasteload Allocations for Permitted Point Sources in the Antietam Creek Watershed**

Facility	NPDES Permit Number	County/ Subwatershed	Annual Average TMDL (Billion MPN <i>E. coli</i> /year)	Maximum Daily Load (Billion MPN <i>E. coli</i> /day)
Funkstown WWTP	MD0020362	Washington/ ANT0132	348	3.0
Highland View Academy WWTP	MD0024627	Washington/ BEC0001	52	0.4
Brook Lane Psychiatric Center WWTP	MD0053198	Washington/ ANT0277	17	0.1

Facility	NPDES Permit Number	County/ Subwatershed	Annual Average TMDL (Billion MPN <i>E. coli</i> /year)	Maximum Daily Load (Billion MPN <i>E. coli</i> /day)
Smithsburg WRF	MD0024317	Washington/ ANT0277	580	4.9
Hagerstown WPCP	MD0021776	Washington/ ANT0223	13,927	118.7
Boonsboro WTF	MD0020231	Washington/ LAS0004	923	7.9
Hunter Hill Apartments WWTP	MD0022926	Washington/ MRS0000	24	0.2
Antietam WRF	MD0062308	Washington/ ANT0002	284	2.4
Winebrenner WRF	MD0003221	Washington/ ANT0366	1,045	8.9
MD Correctional Institute WWTP	MD0023957	Washington/ ANT0132	2,785	23.7
Fahrney-Keedy Memorial Home WWTP	MD0053066	Washington/ BEC0001	87	0.7
Greenbrier State Park WWTP	MD0023868	Washington/ BEC0001	87	0.7
Albert Powell Fish Hatchery	MD0054054	Washington/ BEC0001	2,611	22.3
St. Lawrence Cement Co.	MD0002151	Washington/ ANT0277	3	0.03
Washington County Phase II NPDES MS4	MDR055500	Washington/ Antietam Creek watershed	47,810	1,874

The TMDL is a written plan and analysis established to ensure that a waterbody will attain and maintain water quality standards. The TMDL is a scientifically based strategy that considers current and foreseeable conditions, the best available data, and accounts for uncertainty with the inclusion of a MOS value. The option is always available to refine the TMDL for resubmittal to EPA for approval if environmental conditions, new data, or the understanding of the natural processes change more than what was anticipated by the MOS.

### III. Background

The Antietam Creek watershed is located in both Maryland (MD) and Pennsylvania (PA) with a drainage area of 291 square miles (186,166 acres). The majority of the watershed (64%) is in MD (Washington County), with portions in Franklin and Adams Counties in PA. The headwaters begin in PA, south of Waynesboro with confluence of East and West Branch Antietam Creek. It continues flowing southwest past Hagerstown, Maryland, then through Antietam National Battlefield in Sharpsburg, and empties into the Potomac River near the town of Antietam. The tributaries of Antietam Creek include, West Branch Antietam Creek, East Branch Antietam Creek, Little Antietam Creek (north), Marsh Run, Hamilton Run, Landis Spring Branch, Beaver Creek, Little Antietam Creek (south), and Sharmans Branch. The East and West Branches of Antietam Creek are located almost entirely in PA. Marsh Run flows through both PA and MD. The other tributaries are located entirely in MD.

Maryland's portion of the watershed is primarily agricultural (39.1%), with significant forest (29%), and urban (22.6%) lands. The PA portion of the watershed is largely forest (46.6%) and agricultural (38.3%). The total population in the Antietam Creek watershed is estimated to be 113,162 people. The human population and the number of households were estimated based on a weighted average from the 2000 Census Geographical Information Systems (GIS) Block Groups, the 2002 Maximum Design Pressure (MDP) Land Use Land Cover, and the Regional Earth Science Applications Center (RESAC) for PA.

The Antietam Creek watershed was included on Maryland's Section 303(d) List as impaired by fecal bacteria (2002), impacts to biological communities (2002), and low dissolved oxygen, nutrients and sediments (1996). This TMDL addresses the fecal bacteria impairment only.

The Surface Water Use Designation for Beaver Creek, Marsh Run, Little Antietam Creek, and their tributaries have been designated as Use III-P *Nontidal Cold Water and Public Water Supply* (COMAR 26.08.02.08Q). The Antietam Creek and its other tributaries is Use IV-P: *Recreational Trout Waters and Public Water Supply*. The Antietam Creek watershed was listed on Maryland's Section 303(d) List as impaired by fecal bacteria in 2002 due to elevated fecal coliform concentrations detected at a Department of Natural Resources (DNR) Core monitoring station (ANT0044) which showed a geometric mean of 296 MPN/100 ml.

CWA Section 303(d) and its implementing regulations require that TMDLs be developed for waterbodies identified as impaired by the State where technology based and other required controls do not provide for attainment of water quality standards. The fecal bacteria TMDL submitted by MDE is designed to allow for the attainment of the Antietam Creek watershed's designated uses and to ensure that there will be no bacteria impacts affecting aquatic health in the Antietam Creek watershed. Refer to Tables 1 and 2 above for a summary of allowable loads.

For this TMDL analysis, the Antietam Creek watershed has been divided into nine subwatersheds. To establish baseline and allowable pollutant loads for this TMDL, a flow duration curve approach was employed, using bacteria data from MDE and flow strata estimated from United States Geological Survey (USGS) daily flow monitoring. The sources of fecal bacteria were estimated at nine representative stations in the Antietam Creek watershed where samples were collected for one year. Multiple antibiotic resistance analysis (ARA) source tracking was used to determine the relative proportion of domestic (pets and human associated animals), human (human waste), livestock (agricultural related animals), and wildlife (mammals and waterfowl) source categories.

The baseline load was estimated from current monitoring data using a long-term geometric mean and weighting factors from the flow duration curve. The TMDL for fecal bacteria entering the Antietam Creek watershed was established after considering three different hydrological conditions: high flow and low flow annual conditions, and an average seasonal condition (the period between May 1 and September 30) when water contact recreation is more prevalent). The allowable load quantified by the TMDL is reported in units of Most Probable Number (MPN)/day and represents a long-term load estimated over a variety of hydrological conditions.

Two scenarios were developed, with the first assessing if attainment of current water quality standards could be achieved by applying maximum practicable reductions (MPRs) and the second applying higher reductions than MPRs. Scenario solutions were based on an optimization method where the objective was to minimize the overall risk to human health, assuming that the risk varies over the four bacteria source categories. In all nine subwatersheds, it was estimated that the water quality standards could not be attained with MPRs; thus, higher reductions were applied.

The fecal bacteria long-term annual average TMDL for the Antietam Creek watershed is 382,109 billion MPN *E. coli*/year, which includes a load allocation for subwatersheds located in Pennsylvania (LAPA). The LAPA (121,716 billion MPN *E. coli*/year) represents a 95 percent reduction from the PA baseline load (2,324,273 billion MPN *E. coli*/year). The Maryland TMDL contribution (260,393 billion MPN *E. coli*/year) represents a 92 percent reduction from the baseline load (3,469,308 billion MPN *E. coli*/year). Maryland's TMDL contribution represents the sum of individual TMDLs for the four subwatersheds, or portions thereof, within MD, and is distributed between a LA for nonpoint sources and a WLA for point sources. Point sources include NPDES wastewater treatment plants (WWTPs) and NPDES regulated stormwater (SW) discharges, including County and Municipal Separate Storm Sewer systems (MS4s).

#### **IV. Discussion of Regulatory Conditions**

EPA finds that MDE has provided sufficient information to meet all seven of the basic requirements for establishing a fecal bacteria TMDL for the Antietam Creek watershed. EPA, therefore, approves this fecal bacteria TMDL for the Antietam Creek watershed. This approval is outlined below according to the seven regulatory requirements.

##### ***1) The TMDLs are designed to implement applicable water quality standards.***

Water Quality Standards consist of three components: designated and existing uses; narrative and/or numerical water quality criteria necessary to support those uses; and an anti-degradation Statement. The Surface Water Use Designation for the Beaver Creek, Marsh Run, Little Antietam Creek and their tributaries have been designated as Use III-P *Nontidal Cold Water and Public Water Supply* (COMAR 26.08.02.08Q). The Antietam Creek and its other tributaries is Use IV-P: *Recreational Trout Waters and Public Water Supply*. Maryland's water quality criteria for bacteria is based on water column limits for either *E. coli* or *enterococci*. The indicator organism used in the Antietam Creek watershed TMDL analysis was *E. coli* and the State water quality standard used in this study was 126 MPN/100 ml (COMAR 26.08.02.03-3 *Water Quality Criteria Specific to Designated Uses; Table1*). EPA believes this is a reasonable and appropriate water quality goal.



- 2) *The TMDLs include a total allowable load as well as individual wasteload allocations and load allocations.*

### **Total Allowable Load**

As described above, the allowable load was determined by first estimating a baseline load from current monitoring data. The baseline load was estimated using a long-term geometric mean and weighting factors from the flow duration curve. The TMDL for fecal bacteria was established after considering four different hydrological conditions: high flow and low flow annual conditions; and average seasonal conditions (the period between May 1 and September 30, when water contact recreation is more prevalent). This load is considered the maximum allowable load the watershed can assimilate and still attain water quality standards. The fecal bacteria TMDL was developed for the Antietam Creek watershed based on this endpoint. The allowable load was reported in units of MPN/year for the average annual load and in MPN/day for the long term daily load. Expressing TMDLs using these units is consistent with Federal regulations at 40 CFR §130.2(i), which states that *TMDLs can be expressed in terms of either mass per time, or other appropriate measure*. The average annual and long term daily fecal bacteria TMDLs are presented in Tables 1 and 2, respectively.

EPA regulations at 40 CFR §130.2(i) state *that the total allowable load shall be the sum of individual WLAs for point sources, LAs for nonpoint sources, and natural background concentrations*. The TMDL for fecal bacteria for the Antietam Creek watershed is consistent with 40 CFR §130.2(i) because the total loads provided by MDE equal the sum of the individual WLAs for point sources and the land based LAs for nonpoint sources. Pursuant to 40 CFR §130.6 and §130.7(d)(2), this TMDL and the supporting documentation should be incorporated into Maryland's current water quality management plan.

### **Wasteload Allocations**

As indicated in the TMDL Report, there are fifteen permitted point sources regulating the discharge of fecal bacteria in this watershed. These point sources include twelve active municipal NPDES permitted facilities (WWTPs), which treat approximately 9.8 million gallons per day (MGD). There are also two industrial facilities in the Antietam Creek watershed with NPDES permits regulating the discharge of fecal bacteria. These two industrial facilities, combined, discharge approximately 0.5 MGD. Additionally, the Antietam Creek watershed is covered by a Phase II NPDES MS4 permit which accounts for Washington County's entire stormwater WLA for fecal bacteria. See Table 3 above for the WLAs for these facilities.

### **Load Allocations**

The TMDL summary in Table 1 contains the LA for the Antietam Creek watershed. According to Federal regulations at 40 CFR §130.2(g), LAs are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and nonpoint source loadings should be distinguished. As described above, Maryland conducted a source assessment in order to estimate the contributions from domestic animals (pets

and human associated animals), human (human waste), livestock (agriculture-related animals), and wildlife (mammals and waterfowl) to the overall nonpoint source loadings. Table 4.6.1, of the TMDL Report, provides a breakdown of the existing average annual fecal bacteria from these four source categories. A similar breakdown was developed for the allocations, which are shown in Table 4.7.2, of the TMDL Report. In this analysis, the upstream load ( $LA_{PA}$ ) was reported as a single value, but it could include point and nonpoint sources. Also, the livestock loads are all assigned to the  $LA_{ANT}$ . Since the entire Antietam Creek watershed is covered by NPDES MS4 permit (MDR055500), bacteria loads from domestic animal sources are assigned to the  $SW-WLA_{ANT}$  in all the nine subwatersheds of Antietam Creek. However, wildlife sources were distributed between the  $LA_{ANT}$  and the  $SW-WLA_{ANT}$  based on a ratio of the amount of pervious area in non-urban land to pervious area in urban land.

Federal regulations at 40 CFR §122.44(d)(1)(vii)(B) require that, for an NPDES permit for an individual point source, the effluent limitations must be consistent with the assumptions and requirements of any available WLA for the discharge prepared by the State and approved by EPA. EPA has authority to object to the issuance of an NPDES permit that is inconsistent with WLAs established for that point source. To ensure consistency with this TMDL, if an NPDES permit is issued for a point source that discharges one or more of the pollutants of concern in the Antietam Creek watershed, any deviation from the WLAs set forth in the TMDL Report and described herein for a point source, must be documented in the permit Fact Sheet and made available for public review along with the proposed draft permit and the Notice of Tentative Decision. The documentation should: (1) demonstrate that the loading change is consistent with the goals of the TMDL and will implement the applicable water quality standards; (2) demonstrate that the changes embrace the assumptions and methodology of the TMDL; and (3) describe that portion of the total allowable loading determined in the State's approved TMDL Report that remains for any other point sources (and future growth where included in the original TMDL) not yet issued a permit under the TMDL. It is also expected that Maryland will provide this Fact Sheet for review and comment to each point source included in the TMDL analysis, as well as, any local and State agency with jurisdiction over land uses for which LA changes may be impacted. It is also expected that MDE will require periodic monitoring of the point source(s) for fecal bacteria, through the NPDES permit process, in order to monitor and determine compliance with the TMDL's WLAs.

In addition, EPA regulations and program guidance provides for effluent trading. Federal regulations at 40 CFR §130.2(i) state: "if Best Management Practices (BMP) or other nonpoint source pollution controls make more stringent LAs practicable, then WLAs may be made less stringent. Thus, the TMDL process provides for nonpoint source control tradeoffs." The State may trade between point sources and nonpoint sources identified in the TMDL as long as three general conditions are met: (1) the total allowable load to the waterbody is not exceeded; (2) the trading of loads from one source to another continues to properly implement the applicable water quality standards and embraces the assumptions and methodology of the TMDL; and (3) the trading results in enforceable controls for each source.

Based on the foregoing, EPA has determined that the TMDLs are consistent with the regulations and requirements of 40 CFR Part 130.

**3) *The TMDLs consider the impacts of background pollutant contributions.***

The TMDLs consider the impact of background pollutants by considering the bacterial loads from natural sources such as wildlife.

**4) *The TMDLs consider critical environmental conditions.***

EPA regulations at 40 CFR §130.7(c)(1) require TMDLs to account for critical conditions for stream flow, loading, and water quality parameters. The intent of the regulations is to ensure that (1) the TMDLs are protective of human health, and (2) the water quality of the waterbodies is protected during the times when they are most vulnerable.

Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards<sup>1</sup>. Critical conditions are a combination of environmental factors (e.g., flow, temperature, etc.), which have an acceptably low frequency of occurrence. In specifying critical conditions in the waterbody, an attempt is made to use a reasonable worst-case scenario condition. For this TMDL, the critical condition was determined by assessing annual and seasonal hydrological conditions for high flow and low flow periods. The critical condition requirement is met by determining the maximum reduction per bacteria source that satisfies all hydrological conditions and meets the water quality standard, thereby minimizing the risk to water contact recreation.

**5) *The TMDLs consider seasonal environmental variations.***

Seasonality was determined using various hydrological conditions and it was assessed as the time period when water contact recreation was expected, specifically May 1 through September 30.

**6) *The TMDLs include a Margin of Safety.***

The requirement for a MOS is intended to add a level of conservatism to the modeling process in order to account for uncertainty. Based on EPA guidance, the MOS can be achieved through two approaches. One approach is to reserve a portion of the loading capacity as a separate term, and the other approach is to incorporate the MOS as part of the design conditions. MDE adopted an explicit MOS for this TMDL. The MOS was determined by estimating the loading capacity of the stream based on a reduced (more stringent) water quality criterion concentration. The *E. coli* water quality criterion concentration was reduced by 5 percent, from 126 *E. coli* MN/100 ml to 119.7 *E. coli* MPN/100 ml.

**7) *The TMDLs have been subject to public participation.***

MDE provided an opportunity for public review and comment on the fecal bacteria

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<sup>1</sup> EPA memorandum regarding EPA Actions to Support High Quality TMDLs from Robert H. Wayland III, Director, Office of Wetlands, Oceans, and Watersheds to the Regional Management Division Directors, August 9, 1999.

TMDL for the Antietam Creek watershed. A public notice of intent to establish the Antietam Creek fecal bacteria TMDLs, announcing the opening and closing dates of the formal 30-day Public Comment Period, was published in the *Washington County Herald-Mail*. The public notice announced the availability of the draft TMDL document, copies of which were placed in the Hagerstown, Boonsboro, and Smithsburg Branches of the Washington County Free Library. No written comments were received by the close of the comment period.

A letter was sent to the U.S. Fish and Wildlife Service pursuant to Section 7(c) of the Endangered Species Act, requesting the Service's concurrence with EPA's findings that approval of this TMDL does not adversely affect any listed endangered and threatened species, and their critical habitats.

## **V. Discussion of Reasonable Assurance**

EPA requires that there be a reasonable assurance that the TMDLs can be implemented. WLAs will be implemented through the NPDES permit process. According to 40 CFR §122.44(d)(1)(vii)(B), the effluent limitations for an NPDES permit must be consistent with the assumptions and requirements of any available WLA for the discharge prepared by the State and approved by EPA. Furthermore, EPA has the authority to object to issuance of an NPDES permit that is inconsistent with WLAs established for the point source.

MDE intends for the required reductions to be implemented in an iterative process that first addresses those sources with the largest impact on water quality and human health risk, with consideration given to ease of implementation and cost. Reductions will be achieved through the implementation of BMPs and through outreach programs such as the pet waste education program.

Potential funding sources for implementation include Maryland's Agricultural Cost Share Program (MACS), which provides grants to farmers to help protect natural resources, the Environmental Quality and Incentives Program, which focuses on implementing conservation practices and BMPs on land involved with livestock and production, and the 319 Nonpoint Source Management Program, which can provide grant money for states to support nonpoint source implementation projects.

While a portion of the fecal bacteria loads that contribute to the Antietam Creek watershed impairment originate in the Pennsylvania portion of the watershed, implementation actions in this area of the watershed are beyond the jurisdictional and regulatory authority of the Maryland Department of the Environment. MDE has stated that it will work with the Commonwealth of Pennsylvania and EPA to ensure that the Upstream Load Allocations presented in this document are achieved to meet Maryland's downstream water quality standards.