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

Decision Rationale
Total Maximum Daily Loads
Potomac River Watershed
For Fecal Coliform Bacteria

Approved

____
Jon M. Capacasa, Director
Water Protection Division

Date:__________________

Decision Rationale
Total Maximum Daily Loads
Potomac River Watershed
For Fecal Coliform Bacteria
Executive Summary

I. Introduction

The Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for those water bodies that will not attain water quality standards after application of technology-based and other required controls. A TMDL sets the quantity of a pollutant that may be introduced into a waterbody without exceeding the applicable water quality standard. EPA's regulations define a TMDL as the sum of the wasteload allocations (WLAs) assigned to point sources, the load allocations (LAs) assigned to nonpoint sources and natural background, and a margin of safety. The TMDL is commonly expressed as:

$$TMDL = WLAs + LAs + MOS$$

where

WLA = wasteload allocation
LA = load allocation
MOS = margin of safety

II. Summary

This document sets forth the United States Environmental Protection Agency's (EPA) rationale for approving the TMDLs for fecal coliform bacteria in the tidal Potomac River and its tributaries. The following TMDL Summary table is discussed in Section V.2. of this Decision Rationale. Virginia and Maryland's allocations are based on meeting water quality standards. A TMDL summary is presented below, Table 8 contains the detailed TMDLs.

Average Annual Loads - MPN[1]						
Segment	TMDL	WLA[2]	LA[3]	Upstream	Allocations	MOS[4]
Upper Potomac	1.455 E+16	6.296 E+14	1.764 E+13	1.353 E+16	2.293 E+14	1.451 E+14
Middle Potomac	1.843 E+16	2.466 E+15	6.926 E+13	1.440 +16	1.338 E+15	1.600 E+14
Lower Potomac	4.525 E+16	1.031 E+16	4.036 E+13	1.825 E+16	1.629 E+16	3.560 E+14

[1]Most Probable Number is a statistical estimation of bacteria count based on a specific analytical method
[2]Wasteload Allocation
[3]Load Allocation
[4]Margin of Safety

The following table contains the tributary TMDLs.

Average Annual Loads - MPN				
Tributary name	TMDL	Storm Water		MOS
		WLA	LA	
Battery Kemblel Creek	8.91 E+11	5.38 E+11	1.91 E+10	3.34 E+11
Foundary Branch	8.50 E+11	5.22 E+11	4.44 E+10	2.83 E+11
Dalecarlia Tributary DC	4.76 E+12	3.40 E+12	0	1.36 E+12
Dalecarlia Tributary Maryland	1.33 E+11	9.47 E+10		3.79 E+10

III. Background

The Potomac River watershed covers 14,679 square miles in four states and the District of Columbia. The river is more than 380 miles long from its start in West Virginia to Point Lookout on the Chesapeake Bay.

The Potomac River provides 75 percent of the metropolitan Washington drinking water and all of the District's drinking water. The river also received discharges from wastewater treatment plants, including the District's Blue Plains Plant and treatment plants for Arlington and Alexandria located just upstream of the DC/MD line. There are no drinking water intakes downstream of the District.

Combined sewer overflows (CSOs), are a contributor to high fecal bacteria counts in the tidal portion of the river. CSOs drain approximately 11 square miles of the District of Columbia with 10 active and two abandoned CSOs discharging to the Potomac River. The Blue Plains Wastewater Treatment Plant also has two outfalls discharging to the Potomac River.

The management of CSOs is the responsibility of the Washington Water and Sewer Authority (WASA), an independent agency of the District of Columbia which is responsible for the District's combined sanitary and storm sewers, sanitary sewers, storm water sewers, and the waste water treatment plant at Blue Plains. WASA developed a Long-Term Control Plan (LTCP) for the District's CSOs, final report dated July 2002, and submitted it to EPA for review. WASA has chosen a "demonstration approach" for the design of the LTCP, meaning that it is designed to achieve applicable water quality standards.[1] WASA's recommended LTCP consolidates CSOs and limits discharges to the Potomac River an annual average of four discharges per year during the representative three years (1988-1990) of modeling described in the LTCP, page 11-36.

[1] EPA's 1994 CSO Policy, 59 FR 18688

Virginia's existing and TMDL loads for storm water and wastewater treatment plants are summed into one allocation. Although assumptions regarding Virginia loads are referred to in the Decision Rationale and TMDL Report, more details are contained in WASA's LTCP and files submitted by the District, Virginia will determine their allocation will be divided.

This TMDL Report also covers three small tributaries in the District which discharge to the Potomac, either directly or via a tributary: Battery Kemble Creek, Dalecarlia Tributary, and Foundry Branch. Kemble Creek and Foundry Branch are completely within the District while Dalecarlia Tributary originates in the District and crosses into Maryland.

These fecal coliform bacteria TMDLs were completed by the District to partially meet the eighth-year TMDL milestone commitments due September 2007 under the requirements of the 2000 TMDL lawsuit settlement of *Kingman Park Civic Association et al. v. EPA*, Civil Action No. 98-758 (D.D.C.), effective June 13, 2000, as modified March 25, 2003. Eighth-year milestones include the development of fecal coliform bacteria TMDLs for the Upper, Middle, and Lower[2] Potomac River and its tributaries. Eighth-year requirements also include TMDLs for various combinations of the Potomac River and tributaries for metals, organics, and pH.

IV. Technical Methods

The Potomac River fecal coliform TMDLs rely on the technical data and models used by WASA in developing the LTCP. WASA used a proprietary program, MOUSE, to investigate the combined sewer and storm sewer systems. The impacts of the various sources of bacteria on the instream Potomac River quality were evaluated by EPA's Dynamic Estuary Model. Less data was available for the Potomac River tributaries, therefore, a simpler model was used. ICPRB[3] constructed a simple mass balance model to estimate tributary fecal coliform loads. As described in the decision rationale, the model treats each tributary as a "bathtub" where the daily base flow and storm water loads are reduced until instream water quality standards are met.

V. Discussions of Regulatory Requirements

EPA has determined that these TMDLs are consistent with statutory and regulatory requirements and EPA policy and guidance. Based on this review, EPA determined that the following eight regulatory requirements have been met:

1. The TMDLs are designed to implement the applicable water quality standards,
2. The TMDLs include a total allowable load as well as individual waste load allocations and load allocations,
3. The TMDLs consider the impacts of background pollutant contributions,
4. The TMDLs consider critical environmental conditions,
5. The TMDLs consider seasonal environmental variations,

---

[2]Upper, middle, and lower Potomac as defined by the District's Section 303(d) list of impaired waters.

[3]Interstate Commission on the Potomac River Basin

6. The TMDLs include a margin of safety,
7. There is reasonable assurance that the proposed TMDLs can be met, and
8. The TMDLs have been subject to public participation.

Decision Rationale
District of Columbia
Total Maximum Daily Loads
Potomac River Watershed
For Fecal Coliform Bacteria

I. Introduction

The Clean Water Act (CWA) requires that Total Maximum Daily Loads (TMDLs) be developed for those water bodies that will not attain water quality standards after application of technology-based and other required controls. A TMDL expresses the quantity of a pollutant that may be introduced into a waterbody and still achieve the applicable water quality standards. EPA's regulations define a TMDL as the sum of the wasteload allocations (WLAs) assigned to point sources, the load allocations (LAs) assigned to nonpoint sources and natural background, and a margin of safety.

This document sets forth the United States Environmental Protection Agency's (EPA) rationale for approving the TMDLs for fecal coliform bacteria in the tidal mainstem Potomac River and three tributaries. These TMDLs were established to address impairment of water quality as identified in the District of Columbia's (DC) 1998 Section 303(d) list of impaired waters. The DC Department of Health, Environmental Health Administration, Bureau of Environmental Quality, Water Quality Division, submitted the *Total Maximum Daily Loads, for Fecal Coliform Bacteria Upper Potomac River, Middle Potomac River, Lower Potomac River, Battery Kemble Branch, Foundry Branch, and Dalecarlia Tributary,* dated July 2004 (TMDL Report), to EPA for final review which was received by EPA on August 2, 2004. The TMDL Report uses as its technical basis the WASA's[4] *Combined Sewer System Long Term Control Plan, Final Report* (LTCP), dated July 2002, various Study Memorandums, and *District of Columbia Small Tributaries Total Maximum Daily Load Model*[5] Final Report. The District also provided the computer files necessary to run the receiving water model.

Based on this review, EPA determined that the following eight regulatory requirements have been met:

1. The TMDLs are designed to implement the applicable water quality standards,
2. The TMDLs include a total allowable load as well as individual waste load allocations and load allocations,
3. The TMDLs consider the impacts of background pollutant contributions,
4. The TMDLs consider critical environmental conditions,
5. The TMDLs consider seasonal environmental variations,

[4]Water and Sewer Authority

[5]*District of Columbia Small Tributaries Total Maximum Daily Load Model* Final Report, Interstate Commission on the Potomac River Basin (ICPRB), July 2003.

6. The TMDLs include a margin of safety,
7. There is reasonable assurance that the proposed TMDLs can be met, and
8. The TMDLs have been subject to public participation.

II. Summary

Table 1 presents the1998 Section 303(d) listing information for the water quality-limited waters of the Potomac River and tributaries in effect at the time the consent decree was filed.

Table 1 - Section 303(d) Listing Information

1998 Section 303(d) list					
Year Listed	Waterbody	Pollutants of Concern	Priority	Ranking	Action Needed
1998	Upper Potomac (Northwest Maryland/DC line to Key Bridge)	Organics, bacteria	Low	34	Control CSO and Nonpoint Source (NPS) pollution
1998	Middle Potomac (Key Bridge to Hains Point)	Organics, bacteria	Low	35	Control CSO and NPS pollution
1998	Lower Potomac (Hains Point to Woodrow Wilson Bridge)	Organics, bacteria	Low	36	Control CSO and NPS pollution
1998	Battery Kemble Creek	Metals and bacteria	Low	19	Control NPS pollution
1998	Foundry Branch	Metals and bacteria	Low	20	Control NPS pollution
1998	Dalecarlia Tributary	Bacteria and organics	Low	31	Control NPS pollution

CSO - combined sewer outfall

Maryland's 1998 Section 303(d) list of impaired waters included their portion of the Potomac River for nutrients, as included in the Chesapeake Bay Tributary Strategies, and suspended sediment attributed to nonpoint sources and natural conditions. Maryland's 2002 Section 303(d) list of impaired waters added bacteria, biological, polychlorinated biphenyls, and heptachlor epoxide as impairing substances to the Potomac River.

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 which considers current and foreseeable conditions, the best available data, and accounts for uncertainty with the inclusion of a margin of safety value. TMDLs may be revised in order to address new water quality data, better understanding of natural processes, refined modeling assumptions or analysis and/or reallocation.

The following TMDL Summary table is discussed below in Section V.2. Maryland's allocations are based on meeting the District's applicable water quality standards at the Maryland/DC border and Virginia's allocations are based on meeting the District's applicable water quality standards at the Virginia/DC border, basically the Virginia shoreline:

Table 2 - TMDL Summary

Average Annual Loads - MPN[1]						
Segment	TMDL	WLA[2]	LA[3]	Upstream	Allocations	MOS[4]
Upper Potomac	1.455 E+16	6.296 E+14	1.764 E+13	1.353 E+16	2.293 E+14	1.451 E+14
Middle Potomac	1.843 E+16	2.466 E+15	6.926 E+13	1.440 +16	1.338 E+15	1.600 E+14
Lower Potomac	4.525 E+16	1.031 E+16	4.036 E+13	1.825 E+16	1.629 E+16	3.560 E+14

Average Annual Loads - MPN				
Tributary name	TMDL	Storm Water		MOS
		WLA	LA	
Battery Kemblel Creek	8.91 E+11	5.38 E+11	1.91 E+10	3.34 E+11
Foundary Branch	8.50 E+11	5.22 E+11	4.44 E+10	2.83 E+11
Dalecarlia Tributary DC	4.76 E+12	3.40 E+12	0	1.36 E+12
Dalecarlia Tributary Maryland	1.33 E+11	9.47 E+10		3.79 E+10

[1]Most Probable Number is a statistical estimation of bacteria count based on a specific analytical method
[2]Wasteload Allocation
[3]Load Allocation
[4]Margin of Safety

III. Background

Potomac River Watershed

The Potomac River watershed covers 14,679 square miles in four states and the District of Columbia. The river is more than 380 miles long from its start in West Virginia to Point

Lookout on the Chesapeake Bay. The watershed lies within two physiographic provinces, the Atlantic Coastal Plain and the Piedmont.

The Potomac River provides 75 percent of the metropolitan Washington drinking water and all of the District's drinking water. The river also received discharges from wastewater treatment plants, including the District's Blue Plains Plant and treatment plants for Arlington and Alexandria, Virginia, located just upstream of the DC/MD line. There are no drinking water intakes downstream of the District.

The District's portion of the Potomac River Watershed is heavily urbanized and can be expected to have the water quality problems associated with urban streams. The District has several programs in place to control the effects of storm water runoff and promote nonpoint source pollution prevention and control. The District is also a signatory to the Chesapeake Bay Agreement, pledging to reduce nutrient loads to the Bay by 40 percent by the year 2010. While not specifically addressing bacteria, the agreement's *Priority Urban Waters* section does call for reducing pollution loads to the Potomac River in order to eliminate public health concerns.

Table 3 - Land Use in the Potomac River Basin (square miles)

Watershed	Developed	Agriculture	Forested	Open Water	Wetland	Barren	Total
Potomac (entire watershed)*	701	4,663	8,451	579	165	120	14,679
Middle Potomac (DC, MD, VA)*	437	913	1,037	63	39	29	2,518
Battery Kemble Creek	96		143				239
Foundry Branch	134		34				168
Dalecarlia Tributary	834		277				1,111

* *Chesapeake Bay Program* web site

Combined sewer overflows (CSOs), are a contributor to high fecal bacteria counts in the tidal portion of the river. CSOs drain approximately 11 square miles of the District of Columbia with 10 active and two abandoned CSOs discharging to the Potomac River. The Blue Plains Wastewater Treatment Plant also has two outfalls discharging to the Potomac River. In addition, 17 CSO outfalls discharge to the tidal Anacostia River. The two largest CSO outfalls are the Northeast Boundary CSO, which drains into the Anacostia River near RFK Stadium (East Capital Street), and the "O" Street Pump Station, just below the Navy Yard are addressed in the Anacostia River Fecal Coliform TMDL Report dated June 2003 and approved by EPA August 28, 2003. EPA amended the Decision Rationale on October 16, 2003.

The management of CSOs is the responsibility of the Washington Water and Sewer Authority (WASA), an independent agency of the District of Columbia which is responsible for the District's combined sanitary and storm sewers, sanitary sewers, storm sewers, and the waste water treatment plant at Blue Plains. WASA developed a Long-Term Control Plan (LTCP) for the District's CSOs, final report dated July 2002, and submitted it to EPA for review. WASA has chosen a "demonstration approach" for the design of the LTCP, meaning that it is designed to achieve applicable water quality standards.[6] As part of the LTCP, computer simulation models of the District's combined sewer and storm water system were constructed. Those models were used to simulate current conditions and alternative management plans. As part of WASA's assessment of alternative control plans, EPA's Dynamic Estuary Model (DEM) was used to assess the impact of CSOs on water quality in the Potomac River and to demonstrate that the recommended LTCP adequately protects water quality standards. WASA's recommended LTCP consolidates CSOs and limits discharges to the Potomac River to an annual average of four discharges per year during the representative three years (1988-1990) of modeling described in the LTCP, page 11-36.

Potomac River Tributaries

There are three small tributaries in the District which discharge to the Potomac, either directly or via a tributary: Battery Kemble Creek, Dalecarlia Tributary, and Foundry Branch. Kemble Creek and Foundry Branch are completely with the District while Dalecarlia Tributary originates in the District and crosses into Maryland as shown in the Appendix, Figure 1.

Battery Kemble Creek

The total watershed area is 239 acres of which 60 percent is parkland and wooded. The entire western bank is parkland and about one-third of the eastern side is parkland.

Foundry Branch

The total watershed is 168 acres of which about 80 percent is developed and sewered. The remaining 20 percent is forested parkland operated by the National Park Service. The stream's 2,050 feet of open channel is buffered by parkland on both sides.

Dalecarlia Tributary

Most of the 1,111-acre watershed lies within the District and is sewered. Dalecarlia discharges to a stream discharging Little Falls Run in Maryland and then to the Potomac River. About 25 percent of the lower stream flows through parkland. The stream crosses into Maryland, skirting the Dalecarlia Reservoir and discharges to Little Falls Run which passes under the C & O Canal to the Potomac River just upstream of the District.

---

[6] EPA's 1994 CSO Policy, 59 FR 18688

Consent Decree

These fecal coliform bacteria TMDLs were completed by the District to partially meet the eighth-year TMDL milestone commitments due September 2007 under the requirements of the 2000 TMDL lawsuit settlement of *Kingman Park Civic Association et al. v. EPA*, Civil Action No. 98-758 (D.D.C.), effective June 13, 2000, as modified March 25, 2003. Eighth-year milestones include the development of fecal coliform bacteria TMDLs for the Upper, Middle, and Lower[7] Potomac River and its tributaries. Eighth-year requirements also include TMDLs for various combinations of the Potomac River and tributaries for metals, organics, and pH.

IV. Technical Approach

When models are used to develop TMDLs, the model selection depends on many factors, including but not limited to, the complexity of the system being modeled, available data, and impact/importance/significance of the pollutant loading. For example, the District used EPA's Dynamic Estuary Model[8] for the tidal Potomac River to develop bacteria TMDLs for the Potomac River mainstem because of the significant impact of the loading from those segments on water quality and because of the availability of LTCP modeling[9] and information. The District chose to use a less complex model to develop the bacteria TMDLs for the Potomac River tributaries partly because of the relative lack of data, and because the overall impact of pollutant loadings from the individual tributaries on mainstem water quality is relatively less significant than the impact of the mainstem loadings on water quality. Complex models such as the DEM model require large amounts of water quality data. Overall EPA finds that the District's selection of models for the two types of waterbodies is reasonable and appropriate as described in the following sections.

LTCP

The LTCP, Study Memorandum LTCP-6-3, Receiving Water Model Selection, discusses the selection of the computer model used to model the Potomac River. Study Memorandum LTCP-6-5, Potomac River Model Documentation, discusses the model and sources of inputs to the model. The selected model is capable of assessing and comparing the relative impacts of CSOs, storm water, and upstream loads under a range of storm events and environmental conditions and to forecast the improvements from proposed CSO control alternatives and assess the LTCP's compliance with water quality standards.

DEM is a one-dimensional model that consists of a hydrodynamic model (DYNHYD) that simulates water movement, and a water quality model (DYNQUAL) that simulates mass transport and water quality of various constituents. DEM has been used for previous studies of the Potomac River including the 1983 DC CSO abatement study, the Blue Plains feasibility

---

[7]Upper, middle, and lower Potomac as defined by the District's Section 303(d) list of impaired waters.

[8]*User's Manual for the Dynamic (Potomac) Estuary Model, Technical Report 63*, January 1979

[9]*LTCP*, page 5-11

study, and a Potomac River dissolved oxygen study. DEM was set up to predict bacteria and dissolved oxygen concentrations at a daily time step for WASA's LTCP and DOH's Potomac River fecal coliform TMDL.[10]

As developed, DEM has 133 segments within the model, a portion of which is shown in the Appendix, Figure 2. As WASA is only interested in the impact of CSOs on the Potomac River in the vicinity of the District, inputs were prepared and results were analyzed only for the DEM segments between Chain Bridge and the Woodrow Wilson Bridge. Model segments within this area are approximately 2,000 to 7,000 feet long and the width of each segment varies from 300 feet near Chain Bridge to 3,500 feet near the Blue Plains WWTP. Average segment depths range from 10 to 30 feet. Although model segmentation includes the lower portion of the Anacostia River, the DEM results were not used to determine the Anacostia River CSOs impacts on instream water quality.[11]

The rate at which water enters a model segment from outside the model boundary is needed as input to the hydrodynamic model. For the LTCP and this TMDL, the sources of inflow include:

Upstream flows/loads from Maryland based on the USGS gage records at the Little Falls pumping station which were slightly increased for the additional drainage area to match the model segment boundary near Chain,
Storm water from the District's storm sewers,
Lateral flow from overland runoff from DC, Maryland, and Virginia to the Potomac River,
Combined Sewer Outfall discharges,
Potomac River tributaries, and
The District's Blue Plains and Virginia's waste water treatment plants.

Five watersheds with drainage areas greater than 10 square miles were included in the model. Cameron Run and Four Mile Run flows were taken from USGS gaging stations and increased to represent flow to the Potomac River. Flow in Pimmit Creek was estimated from the Rock Creek flow record and flows for Henson Creek and Oxon Run were estimated using USGS flow data from Piscataway Creek.

Calibration flows for Virginia's Alexandria WWTP and Arlington WWTP were taken from their discharge monitoring reports and projected future discharges were calculated by MWCOG using the Regional Wastewater Flow Forecast Model.

The CSO flows used for this TMDL are based on the extensive studies, flow and water quality monitoring, and modeling performed for the District's LTCP and documented in Study

---

[10] *Study Memorandum LTCP-6-5, Draft,* August 2001.

[11] Ibid.

Memorandums and summarized in the final LTCP Report dated July 2002. The District of Columbia WASA has the responsibility for developing the LTCP.

Because of the complex nature of the hydrology and hydraulics governing the combined sewer system (CSS), a comprehensive model was required to relate the occurrence of CSO outfall events to a system-wide precipitation event. The model needed to be sufficiently detailed to allow prediction of overflow events observed during the monitoring period and flexible enough to allow modification that accurately characterize the implementation of future long-term control options (Study Memorandum LTCP-5-4). The selected model is the propriety program MOUSE by the Danish Hydraulic Institute.

The MOUSE hydrology characterization consists of 969 separate catchment areas, each with its own associated hydrologic parameters. The MOUSE network is comprised of six element types: (1) manholes, (2) basins, (3) outlets, (4) weirs, (5) pumps, and (6) pipes or (7) custom cross-sections. MOUSE input data includes several separate time series databases. Types of data include rainfall, water level (tide), and discharge. The systems diversion structures, inflatable dams and dynamic gates, and pumping stations were also modeled.

The combined sewer system has evolved over the years. In 1960 the District adopted a policy to separate the system over time. Separation projects were undertaken in several smaller drainage areas on the west side of Rock Creek but construction difficulty brought the project to a halt. In 1970 and 1973 feasibility studies were performed regarding off-line storage. However, both studies were rejected by the District because of the costs involved.

In the early 1980s, another attempt at CSO discharge abatement was made. A two-phase program was developed that focused primarily on overflows to the Potomac River. Phase I was completed in 1991. Phase I consisted of a 400 million gallons per day (mgd) CSO treatment facility, the Northeast boundary Swirl Facility, and installation of inflatable dams at eight of the largest CSOs. Phase II, consisting of two additional swirl concentrator facilities, a sewer separation project, and a screening facility for the Piney Branch drainage area, was never implemented because of lack of funding (LTCP). A 1998 evaluation of WASA’s pumping stations and conveyance system recommended rehabilitation of restore capacity.

Being able to say that 92 percent reduction in CSO pollution loads is required in order to achieve water quality standards requires a baseline, or starting point. The above discussion indicates that any of the following three potential baseline scenarios could be used: [12]

	Scenario	CSO discharge to the Potomac River
B1	Prior to CSO Phase I controls	1,063 million gallons per year
C2	Phase I CSO controls	953 million gallons per year
C3	Phase I CSO controls and pump station rehabilitation	639 million gallons per year

[12]LTCP, Table 6-1

The Potomac River Bacteria TMDL Report selected C2 as the baseline as most representative of the existing load scenario for the CSO discharges. The baseline scenario provides a basis from which to evaluate alternate control scenarios and establish required reductions, *i.e.,* a 91.7 percent reduction is required from the C2 scenario. It should be noted that the TMDL values to be implemented are the loads, expressed as average annual loads, and not the percent reduction. Should the actual existing loads differ from the C2 assumed loads, a greater or lesser percent reduction may be required to meet instream water quality standards.

MOUSE was also used to develop storm sewer volumes during the representative three-year period of analysis, 1988 to 1990. The year 1988 was a dry year with a total rainfall of 31.74 inches, 1989 was a wet year with 50.32 inches of rain, and 1990 was an average year with 40.94 inches of rain. This TMDL and the previous Anacostia River and Rock Creek TMDLs also used the same period of analysis. EPA finds that the use of these representative years is appropriate.

WASA also conducted monitoring programs to establish pollutant concentrations in both the CSO discharge and storm water described in various study memorandums. *Study Memorandum LTCP-5-8*[13] describes the "event mean concentration" (EMC). As the pollutant concentration varies over the course of storm runoff, the EMC is the runoff volume averaged concentration.

From August 1999 to July 2000, approximately 19 CSS and separate storm water system (SSWS) locations were monitored for some or all of the following:

- Flow
- Conventional parameters including fecal coliform and *e.-coli* [14]
- Total metals
- Dissolved metals

The LTCP and the Potomac River Bacteria TMDLs used the following Event Meam Concentrations:

Table 4. CSO Event Mean Concentrations

Parameter	Potomac CSOs	SSWS
Fecal Coliform MPN/100 ml	939,270	28,265
E. Coli MPN/100 ml	686,429	16,238
Dissolved Oxygen mg/l	6	6

[13]*Long Term Control Plan Study Memorandum LTCP-5-8, CSS and SSWS Event Mean Concentrations*, Draft, September 2000.

[14]Samples taken from March 2000 to September 2000.

The LTCP describes the combined sewer system, separate storm water sewer system, "lateral flow," and upstream flows.

The other source of storm water is rainfall runoff that flows overland directly to the Potomac River, or through storm sewers not under the control of the District. A variation of the rational equation was used:

$$Q = 0.042(Rv * I * Pj * A)$$

where

Rv = runoff coefficient
I = rainfall intensity in inches / day
Pj = fraction of rainfall events that produce runoff - 0.9 (to account for initial abstraction)
A = direct drainage area in acres
Q = flow in cubic feet / second

The above describes how the EMC and flow to each WASP segment was determined.

The upstream Potomac River and storm water concentrations are shown in Table 5.

Table 5 - Storm Water Constituent Concentrations.

Water Body	Flow Type	Constituent	Concentration
Upstream Potomac	Base	Fecal Coliform	60 MPN/100 ml
Upstream Potomac	Storm	Fecal Coliform	350 MPN/100 ml
Upstream Potomac	Base	*E. coli*	30 MPN/100 ml
Upstream Potomac	Storm	*E. coli*	190 MPN/100 ml
MS4[1]	Storm	Fecal Coliform	28,265 MPN/100 ml
MS4	Storm	*E. coli*	16,238 MPN/100 ml
MS4	Storm	Dissolved Oxygen	6 mg/l

[1]Municipal Separate Storm Water System (LTCP-6-4, August 2001 and LTCP-5-8, September 2000)

Potomac River Tributary Modeling

In order to assist the District in developing TMDLs for the Potomac River Tributaries, ICPRB constructed a simple mass balance model composed of three sub-models, one of which is for fecal coliform. The fecal coliform sub-model simulates concentrations of fecal coliform which is used as an indicator of human and non-human fecal matter and is associated with pathogens in natural waterbodies.[15]

The mass balance model treats each tributary as a "bathtub" which, on each day of the simulation period, receives a volume of water representing storm water runoff and a volume of water representing base flow from groundwater infiltration. Base flow and storm water are assumed to contain a fecal coliform load based on average concentrations measured in available storm water and base flow monitoring data. No additional instream processes, such as sediment resuspension or fecal coliform decay, are simulated. EPA concurs that this is appropriate based on the amount of data available and because each tributary's impact on the Potomac River instream water quality is extremely small.

Based on the District's MS4 monitoring data, the storm water fecal coliform count used is 17,300 counts/100 ml and the baseflow count is 280 counts/100 ml.

Daily estimates of base flow and storm water volume for each tributary is based on ICPRB's Watts Branch HSPF model[16] and landuse information. The Watts Branch HSPF model was calibrated using stream discharge data from the USGS gage 01658000 on Watts Branch near Minnesota Avenue which has been in operation since June 1992. The HSPF model provided daily runoff for the period January 1, 1988, to December 31, 1990, by landuse. Each tributary's drainage area was divided into three representative landuses: (1) impervious,(2) urban pervious, and (3) forested pervious. Based on the assumption that tributaries have hydrologic properties similar to those of the Watts Branch drainage area, the flow for each day from each tributary was determined and the instream bacteria count was compared to the District's water quality criteria. EPA finds this modeling approach reasonable.

Because each tributary receives water discharged from the District's separate sewer system, tributaries' watershed boundaries were not delineated based on topography alone but based on a combination of topographic information and information on the sewer outfalls discharging into the tributary or its watershed. A certain amount of "engineering judgement" was also used. EPA finds the District's judgment reasonable and consistent with supporting information.

Dalecarlia Tributary has a significant portion of its topographic watershed in Maryland. The TMDL Report allocates a portion of that TMDL load to Maryland. In addition, the District's tributary TMDLs are allocated between WLA, and LAs.

---

[15]ICPRB 2003.

[16]Appendix B, ICPRB 2000.

V. Discussions of Regulatory Requirements

EPA has determined that these TMDLs are consistent with statutory and regulatory requirements and EPA policy and guidance. EPA's rationale for approval is set forth according to the regulatory requirements listed below.

The TMDL is the sum of the individual waste load allocations (WLAs) for point sources and the load allocations (LAs) for nonpoint sources and natural background and must include a margin of safety (MOS). The TMDL is commonly expressed as:

$$TMDL = \sum WLAs + \sum LAs + MOS$$

where

WLA = waste load allocation
LA = load allocation
MOS = margin of safety

1. The TMDLs are designed to implement the applicable water quality standards.

The TMDL Report states that the Potomac River and tributaries are on the District's 1998 Section 303(d) list of impaired waters because of "excessive counts of fecal coliform bacteria." In the TMDL Report the District recites the Potomac's beneficial water uses as well as the general and specific water quality criteria designed to protect those uses. The District identifies the designated uses for the Potomac River which are:

A. Primary contact recreation
B. Secondary contact recreation and aesthetic enjoyment
C. Protection and propagation of fish, shellfish and wildlife
D. Protection of human health related to consumption of fish and shellfish
E. Navigation

The designated uses for Battery Kemble Creek, Foundry Branch, and Dalecarlia Tributary are A, B, C, and D.

For purposes of the bacteria impairment identified on the District's 1998 Section 303(d) list, the TMDL Report notes that these bacteria TMDLs are designed to "achieve or exceed water quality standard[s] as measured by fecal coliform as indicator organism" for two of those uses: Class A (primary contact recreation) and B (secondary recreation and aesthetic enjoyment).[17] The District's definition of primary contact recreation is "those water contact sports or activities that result in frequent whole body immersion or involve significant risks of ingestion of the water."

The TMDL Report discusses in detail some of the underlying assumptions of the District's bacteriological water quality criteria consistent with EPA's Bacteria criteria and guidance for fecal coliform (EPA Red Book, 1976). All water quality criteria are based on

---

[17]The numeric standards for fecal coliform only apply to Class A and B uses since exposure to bacteria is normally express through illnesses related to human contact, *i.e.*, primary and secondary contact recreation.

protection of beneficial uses and a reasonable reduction of risk from the effects of that pollutant whether that risk is to human health or aquatic life. As the District articulates in their TMDL report, there is a risk level associated with each class of beneficial use (*e.g*., Class A, Primary Contact Recreation, and Class B, Secondary Contact Recreation), and within each use, there are further levels of risk associated with each of the many and varied activities covered by that use. For instance, the Class A Primary Contact Recreation use includes such higher risk activities as swimming but also the lower risk activity such as wading. A Class A water achieving its water quality criterion may still be expected to produce approximately eight illnesses for every 1,000 swimmers, as swimming is a high risk activity, *Ambient Water Quality Criteria for Bacteria,* 1986. The District's numeric water quality criteria for bacteria is a monthly geometric mean consistent with EPA's criteria number for monthly average protection, and as such implies that there may some days where that monthly numeric limit may not be achieved.

Even when the water quality criteria is met, the District recognizes that certain activities may still carry a certain amount of risk, and that the District's criteria is not designed nor intended to protect all activities under all circumstances. For example, EPA agrees that is not reasonable that the Distirict's bacteria criteria (or TMDL) ensure risk-free swimming or boating during thunder storms or significant rain events. The TMDL Report specifically states that "(t)he District of Columbia Water quality standards do not guarantee risk free primary contact recreation nor do they guarantee that it can occur everywhere all of the time." This is consistent with the EPA bacteria criteria guidance insofar as EPA's criteria was designed to protect most recreational activities for most people but recognized higher risk for some people (some small number of people still get sick even when criteria is achieved), and for some activities (*e.g*., wading is lower risk for sickness vs. the higher risk swimming or diving).

The Potomac River Watershed upstream of the District lies in Maryland. Therefore, consistent with the Clean Water Act, the Potomac River waters crossing the DC/Maryland border must meet the District's water quality standards at the border.

Table 6 - Water Quality Standards

Fecal Coliform - No./100 ml		
District of Columbia*		
Class of Use	A	B
Bacteriological		
Fecal coliform - maximum 30-day geometric mean for 5 samples	200	1,000
Maryland**		
Bacteriological	Public health	
Fecal coliform - maximum log mean (geomean) based on not less than 5 samples over any 30-day period, or	200	

Fecal Coliform - No./100 ml	
Fecal coliform - maximum value which may exceeded during any 30-day period by less than 10% of total number of samples taken	400
Virginia***	
Fecal coliform - maximum geometric mean for two or more samples over a calendar month	200
Fecal coliform - not more than 10% of the total samples taken during any calendar month can exceed this number	400

*49 D.C. REG. 3012; and 49 D.C. REG.4854
**COMAR 26.08.02.03-3
***9 VAC 25-260-170

Maryland's and the District's jurisdiction over the Potomac River extends to Virginia's shore line, therefore, the District must ensure that the Potomac River water quality leaving the District's jurisdiction meets Maryland's water quality standards.

Table 7 - Comparison of Average Annual Fecal Coliform MPN/Geometric Means Between Existing and TMDL Scenarios (days per 1988 - 1990)

Criteria	Model Segment					
	114	3	6	10	129	16
Existing Conditions						
Number of Months Geomean > 200 MPN/ 100 ml	8	1	2	0	0	0
Number of Days MPN > 400 MPN/100 ml	11	4	51	36	26	13
Number of Months Geomean > 1000 MPN/ 100 ml	0	0	0	0	0	0
TMDL Allocation Run						
Number of Months Geomean > 200 MPN/100 ml	0	0	0	0	0	0
Number of Days MPN > 400 MPN/100 ml	0	0	4	3	4	2
Number of Months Geomean > 1000 MPN/ 100 ml	0	0	0	0	0	0

In addition to the water quality criteria shown in Table 7 above, the District's water quality standards include Section 1104.3:

> Class A waters shall be free of discharges of untreated sewage, litter and unmarked, submerged or partially submerged, man-made structures that would constitute a hazard to the users.

The term, untreated sewage, is not defined in the District's water quality standards, Section 1199. Furthermore, EPA does not define untreated sewage in its regulations or guidance. After reviewing the Long Term Control Plan submitted by WASA to EPA including the CSO control measures (capture and storage of the "first flush" 460 million gallons[18] and screening for each CSO discharge thereafter) the District interpreted the above narrative criteria and reasonably found that the LTCP CSO controls will provide "partially treated sewage."

Among other things, the LTCP addresses controls on solids and floatables. Sources of those pollutants to the Potomac include the CSO discharges, storm water discharges, littering and dumping directly into or along the river and its tributaries, and upstream sources. The LTCP states that implementation of the recommended control plan will virtually eliminate solids and floatables from the CSO discharges because there is a total capture of the first flush[19] loads containing the most concentrated combined sewage. When CSOs do discharge,[20] the first flush which contains most of the solids and floatables will be captured and treated. For the CSO discharges that are not captured, the design of new CSO diversions structures/facilities to provide some degree of screening will provide additional controls. EPA approval of this TMDL and the District's interpretation of its unique narrative criteria do not and are not intended to represent EPA's determination of whether the level of CSO controls provide "minimal treatment" as described in EPA's CSO Policy, page 18693.

The District's discussion and allocation to the WASA CSOs in this TMDL is based on the assumption that any outfall discharging to model segments 4, 5, and 12 will include floatables control.[21] The outfalls predicted to discharge to these segments include 003, 020, 021,022, and 029. Based on EPA's review of the LTCP, the TMDL report and deference due to the State regarding reasonable interpretation of its narrative water quality criteria, EPA finds that this TMDL is consistent with will adequately achieve and maintain the applicable District's water quality standards.

2. The TMDLs include a total allowable load as well as individual waste load allocations and load allocations.

The TMDL Report identifies the Blue Plains Treatment Plant and CSOs and, in addition, WASA's permitted storm water sewer system as permitted point sources consistent with an EPA

---

[18]LTCP recommended storage tunnel capacity of 460 mgal, Table13-1.

[19]The "first flush" is often considered to be the first one-half inch of rain.

[20]The Blue Plains treatment plant and tunnel system are designed to capture the one-year, 24-hour storm.

[21]LTCP, page 13-23, states floatables control "will be constructed as part of the recommended plan, where practical."

guidance memorandum which clarifies existing EPA regulatory requirements for establishing wasteload allocations (WLAs) for storm water discharges in TMDLs approved or established by EPA.[22]

The key points established in the memorandum are:

- NPDES-regulated storm water discharges must be addressed by the wasteload allocation component of a TMDL,
- NPDES-regulated storm water discharges may <u>not</u> be addressed by the load allocation (LA) component of a TMDL,
- Storm water discharges from sources that are not currently subject to NPDES regulation <u>may</u> be addressed by the load allocation component of a TMDL,
- It may be reasonable to express allocations for NPDES-regulated storm water discharges from multiple point sources as a single categorical wasteload allocation when data and information are insufficient to assign each source or outfall individual WLAS, and,
- The wasteload allocations for NPDES-regulated municipal storm water discharge effluent limits should be expressed as best management practices.

The Potomac River tributaries' drainage area determined by ICPRB includes the sewershed areas as estimated from sewer maps. The tributaries' TMDLs were divided into WLAs and LAs based on an estimated ratio of sewered to unsewered areas.

Battery Kemble Creek and Dalecarlia Tributary discharge via surface water to the Potomac River while Foundry Branch discharges to the Potomac River via storm sewers. The tributary TMDL was developed at the point the open channel flow enters the last storm sewer prior to discharging to the Potomac River or leaving the District. The TMDL Report presents the TMDL and the associated required percent reduction from existing loads in order to meet water quality standards. The required percent reduction ranges from 84 to 87 percent. In the MOS section the District states "(a)s a margin of safety the loads to all tributaries (hence the load to the Potomac) will be reduced by 90%," therefore, the MOS is increased to three to six percent.

The TMDL Report calculates TMDLs for each Section 303(d) list of impaired waterbody, *i.e.*, TMDLs are presented for the Upper, Middle, and Lower Potomac River.

The TMDL Report requires the following reductions in fecal coliform loads:

---

[22]Memorandum *Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs*, from Robert H. Wayland, III, Director, Office of Wetlands, Oceans and Watersheds, and James A. Hanlon, Director, Office of Wastewater Management, to Water Division Directors, Regions 1 - 10, dated November 22, 2002.

- 91.7 percent reduction in CSO loads
- 50 percent reduction is upstream loads from Maryland
- 50 percent reduction in storm water loads discharging directly to the Potomac River from the District, Maryland, and Virginia (overland flow)
- 50 percent reduction in loads from storm sewers
- 50 percent reduction in tributary storm water loads
- No reduction is Blue Plains' or Virginia's WWTP loads

The percent reductions are from the C2 scenario discussed on page 8 of this decision rationale.

The following tables contain the allocations and identify allocations as taken from the TMDL Report. The existing loads are from the table on page 13 of the TMDL Report and the TMDL, or allocated, loads are from the table on page 18. These tables are rearranged and the line identification is expanded but the loads are identical.

Table 8 - Potomac River Existing Load and TMDLs

Average Annual Loads - MPN[1]		
	Existing Loads	TMDL Loads
Upper Potomac River		
Upstream - Maryland	2.731 E+16	1.353 E+16
Combined Sewer Outfalls - WLA	1.009 E+15	3.688 E+13
Separate Storm Water (MS4) - WLA	1.197 E+15	5.927 E+14
Direct Storm Runoff - LA	3.563 E+14	1.764 E+13
Virginia Allocation	4.631 E+14	2.293 E+14
1% MOS - not applied to CSO load	NA	1.451 E+14
Upper Potomac River Existing/TMDL	3.002 E+16	1.455 E+16
Middle Potomac River		
Upstream - Upper Potomac River	3.002 E+16	1.440 E+16
Combined Sewer Outfalls - WLA	3.312 E+16	2.435 E+15
Separate Storm Water (MS4) - WLA	6.316 E+13	3.126 E+13
Direct Storm Runoff - LA	1.399 E+14	6.926 E+13
Virginia Allocation	5.597 E+14	2.770 E+14
Rock Creek Allocation	3.230 E+15	1.061 E+15
1% MOS - not applied to CSO load	NA	1.600 E+14
Middle Potomac River Existing/TMDL	6.713 E+16	1.843 E+16
Lower Potomac River		
Upstream - Middle Potomac River	6.716 E+16	1.825 E+16
Combined Sewer Outfalls - WLA	0	3.487 E+14
Separate Storm Water (MS4) - WLA	1.350 E+15	6.685 E+14
Direct Storm Runoff - LA	8.153 E+13	4.036 E+13
Virginia Allocation	2.006 E+14	9.938 E+14
Blue Plains WWTP - WLA	6.420 E+15	9.294 E+15
Anacostia River Allocation	5.858 E+16	1.497 E+16
Maryland Allocation Downstream of District	6.616 E+15	3.275 E+14
1% MOS - not applied to CSO Load *(see page 19)*	NA	3.514 E+14
Lower Potomac River Existing/TMDL	1.362 E+17	4.525 E+16

[1]Most Probable Number

Table 8 - Tributary TMDL Summary

Average Annual Loads - MPN[1]					
Tributary name	Existing Loads	TMDL	MOS	Storm Water (MS4) WLA	Direct Runoff - LA
Battery Kemble Creek	5.57 E+12	8.91 E+11	3.34 E+11	5.38 E+11	1.91 E+10
Foundry Branch	5.67 E+12	8.50 E+11	2.83 E+11	5.22 E+11	4.44 E+10
Dalecarlia Tributary - DC	3.40 E+13	4.76 E+12	1.36 E+12	3.40 E+12	0
Dalecarlia Tributary - MD	9.47 E+11	1.33 E+11	3.79 E+10	9.47 E+10	

[1]Most Probable Number

Because most of the loading to the Potomac River and its tributaries is precipitation induced, *i.e.*, the CSOs do not discharge unless it has rained, the above loads are shown as average annual loads which is the total of daily loads for 1988 to 1990 divided by three.[23] EPA believes that this representation is appropriate in spite of comments received by the District asserting that average annual loads violate the law. The commentor's technical reviewer[24] suggests that the "maximum daily loads only need to be extracted from the calculations already performed." EPA views a "maximum daily load" to mean that the permittee is allowed to discharge that load each and every day, which is suitable for steady state conditions, *e.g.*, constant flow in the river and constant pollutant loads. Neither the District nor EPA would contend that the maximum one-day load during the three-year forecast[25] period could be discharged every day and still meet the instream water quality standards. Instead, EPA believes the "average annual load" is an appropriate and reasonable expression of the TMDLs.

Further, the commentor's memorandum suggests that there is nothing in the TMDL Report to prevent the entire "average annual load" from being discharged in one month, or even one day. What prevents the entire average annual load from being discharged in one month or one day is that the discharge is precipitation driven. The long-term average annual rainfall for the District is approximately 39 inches, and maximum monthly rainfall during the three-year

[23]The three-year, daily computer simulation shows that water quality standards will be met at all times throughout the Potomac River (TMDL Report, Scenario 3, page 16).

[24]Jack Smith, Omicron Associates, March 30, 2003, memorandum attached to Earthjustice's March 31, 2003, comment letter to Jerusalem Bekele, Program Manager, Water Quality Division, Environmental Health Administration, D.C. Department of Health.

[25]Although the term, "three-year forecast period," covering a wide range of wet and dry years, is used, it should be noted that precise, future precipitation which drives Potomac River loadings cannot be forecast.

forecast period is approximately 7.8 inches making it impossible for the entire annual load to be discharge in one months. In addition, Federal regulations at 40 CFR § 122.44(d)(vii)(B) require that any permitted effluent limits be consistent with the assumptions and requirements of any EPA-approved TMDL. Although the LTCP shows that CSO discharges are expected three times per year over the three-year forecast period,[26] the TMDL Report clearly shows that water quality standards will be achieved throughout the Potomac River.

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

All of Maryland's pollutant loads are "background" to the District's portion of the Potomac River. Maryland's contribution to the pollutant loads has been estimated based on available information. It should be noted that Maryland currently lists the Potomac River as impaired by bacteria and will develop specific TMDLs for their portion of the Potomac River.

4. The TMDLs consider critical environmental conditions.

The TMDL Report considers critical environmental conditions by modeling the watershed using daily simulations for three years. The three years represent average flow in the Potomac River, a wetter than average year, and a drier than average year.

At the Ronald Reagan National Airport, the average annual rainfall for the period of record, 1949 to 1998, is 38.95 inches.[27] Yearly totals vary, from 26.94 inches in 1965 to 51.97 inches in 1972. Individual events, often hurricanes, can be significant. Hurricane Agnes in 1972 delivered approximately 10 inches of rain in the Washington, DC area. The District selected 1988 to 1990 as their representative rainfall years as shown:

Table 9 - Rainfall

Year	Annual Rainfall (inches)	Representing
1988	31.74	10 percentile, dry year
1989	50.32	90 percentile, wet year
1990	40.84	median, approx. 38 percentile

(LTCP-3-2, September 1999)

[26]*LTCP*, page 11-37

[27]*Study Memorandum LTCP-3-2: Rainfall Conditions*, Draft, September 1999.

5. The TMDLs consider seasonal environmental variations.

The TMDL Report considers seasonal variations by modeling the watershed using daily simulations for three years with seasonal data as appropriate.

6. The TMDLs include a margin of safety.

The CWA and Federal regulations require TMDLs to include a MOS to take into account any lack of knowledge concerning the relationship between effluent limitations and water quality. EPA guidance suggest two approaches to satisfy the MOS requirement. First, it can be met implicitly by using conservative model assumptions to develop the allocations. Alternately, it can be met explicitly by allocating a portion of the allowable load to the MOS.

DC has chosen to use a one percent explicit MOS for the mainstem Potomac River for all loads except the CSO loads. The District has invested a great deal of resources into defining CSO loads to the river and use of an implicit margin of safety only is reasonable.

With respect to CSO loads, there is an implicit margin of safety, the recognized "first flush" effect. If the CSO concentrations were constant over time, capturing 95 percent of the volume captures 95 percent of the load; however, as concentrations are generally higher for the first one-half inch of storm water runoff, capturing 95 percent of the volume captures more than 95 percent of the storm water part of the load. The relative proportion of storm water to sanitary flow determines the size of the MOS.

The tributaries' TMDLs were developed with less precise information. Therefore, a margin of safety equal to the difference between a 90 percent reduction in bacteria loading and the estimated TMDL load required to meet water quality standards is presented in this document. To meet the fecal coliform criterion, reductions of 84 to 86 percent are required.

7. There is reasonable assurance that the proposed TMDLs can be met.

Based on the WLA in the TMDL Report, the largest reduction in permitted loads to the Potomac River will be to the CSOs at a 91.7 percent reduction based on the existing average annual volume scenario C2, after CSO Phase I controls, of 953 million gallons per year. The WASA-recommended final LTCP will meet this requirement.

The MS4 (municipal separate storm sewer system) permit and the NPDES storm water permits both provide regulatory authority to require effluent limits (numeric, narrative and/or BMPs) to achieve storm water pollutant load reductions, providing reasonable assurance that the TMDLs will be implemented. A 50 percent reduction in storm water bacteria loads is required by this TMDL.

Previously the District provided a report on the Mill Creek Investigation, dated March 21, 2003, and documentation[28] that WASA has selected a contractor to perform an evaluation of the D.C. sewer system. The estimated cost is approximately $12 million and will take about five years. This effort includes an evaluation of capacity and condition of the collection system, identifying rehabilitation needs, and developing capital improvement program elements and schedules for rehabilitation.

The Potomac River upstream of the District is on Maryland's Section 303(d) list of impaired waters for fecal coliform bacteria. Therefore, Maryland will develop their own Potomac River TMDLs.

Virginia's Four Mile Run, Alexandria, Virginia, and Pimmit Run, Arlington, Virginia, are also listed for fecal coliform bacteria and are scheduled for TMDLs in 2010 and 2014, respectively.

The re-affirmed Chesapeake Bay Agreement signed June 28, 2000, does not specifically address bacteria, but the *Priority Urban Waters* section does call for reducing pollution loads to the Potomac River in order to eliminate public health concerns. In addition, the agreement does address bacteria reductions directly by establishing "no discharge zones" for human waste from boats. The Chesapeake Bay 2000 Agreement provides that there shall be no discharge of human waste from boats by 2003. The District intends to comply with that provision and has funded pump-out stations at every marina on the Potomac River.

Based on the above, EPA expects that the bacteria loads can be reduced to achieve and maintain water quality standards.

8. The TMDLs have been subject to public participation.

DC public noticed a October 2003 version of these TMDLs October 31, 2003, with comments due November 31, 2003. The TMDLs were placed in the Martin Luther King Jr. Library. In addition, the District used their e-mail list for the TMDL meetings to notify the interested parties of the public comment period. EPA believes all interested parties have had adequate time to comment on these TMDLs.

The District and WASA held monthly technical (modeling) meetings where interested parties were briefed on the technical progress toward the District's TMDLs and WASA's LTCP.

As part of DC's TMDL submittal, a response to comments document was submitted to EPA via e-mail. In addition to EPA's comments, comments were received from Earth Justice Legal Defense Fund and the District of Columbia Water and Sewer Authority. EPA considered those comments and the District's response to them in its evaluation of the TMDL submission.

---

[28]WASA's August 15, 2002, letter from Cuthbert Braveboy, Director of Sewer Services, to Jerusalem Bekele, Program Manager, Water Quality Division, Department of Health.

APPENDIX

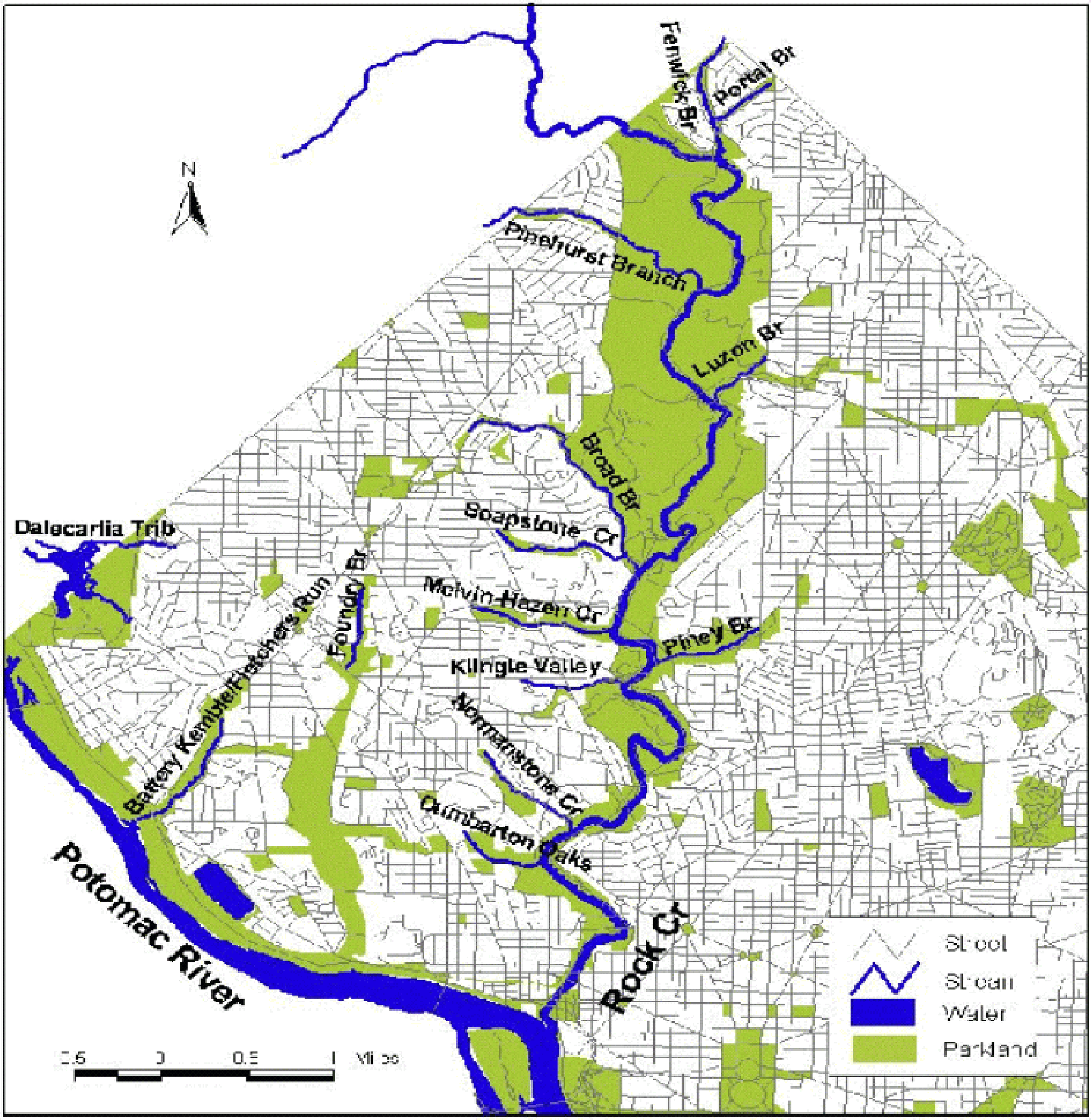

Figure 1 - Potomac River Tributaries

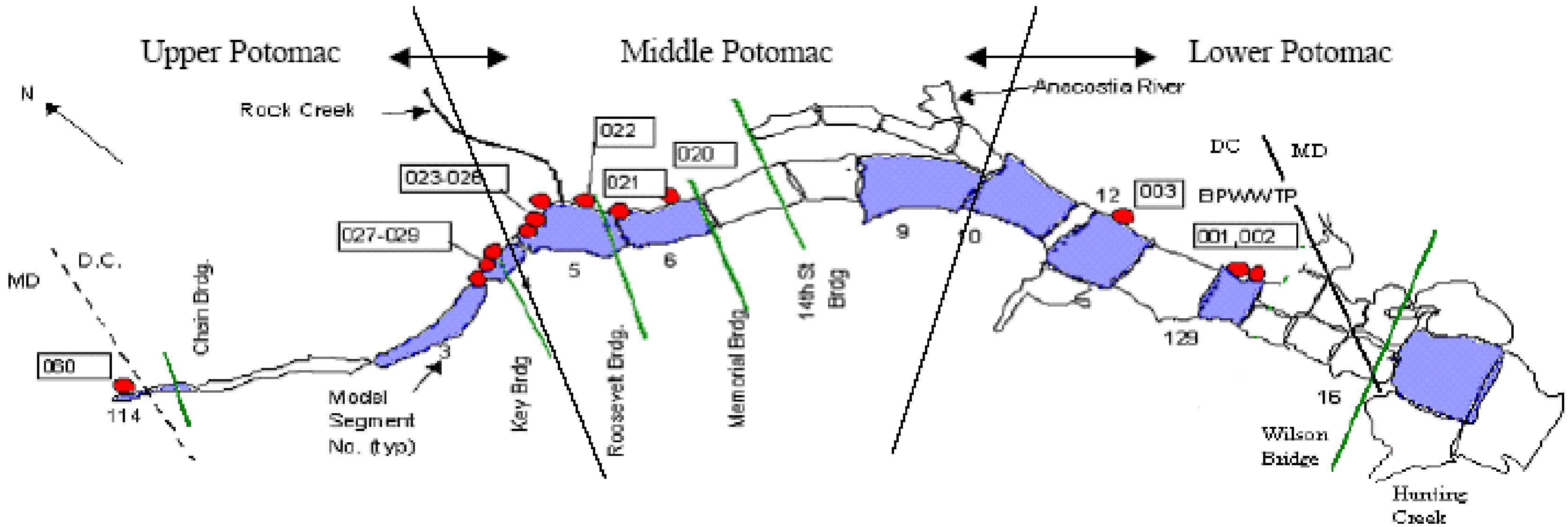

Figure 2 - Potomac River Model Segment Numbers