Appendix D
Technical Approach Used to Generate Maximum Daily Loads

Summary

This appendix documents the technical approach used to define maximum daily loads of total suspended solids (TSS) consistent with the average annual and growing season TMDLs which, when met, are protective of water quality standards in the Anacostia River. The approach builds upon the modeling analysis that was conducted to determine the loadings of TSS that comply with the applicable water quality standards, and can be summarized as follows.

- The approach defines maximum daily loads for each of the source categories.
- The approach builds upon the TMDL modeling analysis that was conducted to ensure that compliance with average annual/seasonal loading targets will result in compliance with the applicable water quality standards. These average annual/seasonal loading targets were converted into allowable *daily* values by using the daily time-series loadings developed from the TMDL modeling analysis.
- The approach converts the daily time-series loadings into TMDL values in a manner that is consistent with available EPA guidance on generating daily loads for TMDLs.
- The approach uses policy input related to the expected level of resolution and probability level provided by an advisory group led by EPA Region 3.

Introduction

The Anacostia River was listed on the 1998 District of Columbia Section 303(d) list as impaired by total suspended solids (TSS) and biochemical oxygen demand (BOD). The EPA established a TMDL for total suspended solids for the DC portion of the tidal Anacostia River in March 2002. The TMDL identified annual loads over the course of a growing season for the critical year. Friends of the Earth, Inc., challenged EPA's approval of this TMDL in federal court on grounds that the load was not expressed on a daily basis. On April 25, 2006, the Court of Appeals for the DC Circuit ruled in favor of the challengers and directed the district court to vacate EPA's approval of the subject TMDL. The decision of the DC Circuit is not strictly binding on the State of Maryland. However, understanding EPA's need for uniformity within the region and in the spirit of cooperation on this joint TMDL, Maryland has collaborated with DC and EPA to develop a technical approach to represent the average annual and seasonal TMDLs in "daily" terms for both the non-tidal and tidal portions of the Anacostia River that are designated as impaired for sediment and TSS on the Maryland and DC 303(d) lists, respectively. The purpose of the discussion in this Appendix is to document that approach.

This appendix documents the development and application of the approach used to define total maximum daily loads on a daily basis. It is divided into sections discussing:

- Basis for Approach
- Options Considered
- Selected Approach
- Application of Approach

Basis for Approach

The overall approach for development of daily loads was based upon the following factors:

- **Original DC TSS TMDL:** The 2002 TMDL protected the aquatic life use, SAV, through interpretation of the narrative standard expressed as annual/seasonal loads.
- **Daily time-series loadings developed for this TSS TMDL:** Although the original DC TMDL specified maximum allowable loads on a seasonal/annual basis, those loads were based upon a continuous simulation analysis that generated daily loading values for each contributing source category. This TSS TMDL also employed continuous simulation modeling to determine compliance with the applicable water quality standard(s), producing a time series of daily loads for each contributing source category for the 3-year period (i.e., 1995-97) that was simulated.
- **Draft EPA guidance on "Developing Daily Loads for Load-based TMDLs"**: This guidance provides options for defining maximum daily loads when using TMDL approaches that generate daily output.

The prior DC TSS TMDL analyses defined allowable loadings that would result in compliance with applicable standards, but failed to express the TMDL in daily terms. The rationale for developing TMDLs with *daily* load expressions was to accept the existing TMDL development methodology, but to then develop a method for converting the resulting daily time series of loadings into maximum *daily* values – in a manner consistent with EPA guidance.

Options Considered

The available guidance for developing daily loads does not specify a single allowable approach; it contains a range of options. Selection of a specific method for translating a time-series of allowable loads into expression of a TMDL requires decisions regarding both the level of resolution (e.g., single daily load for all conditions vs. loads that vary with environmental conditions) and level of probability associated with the TMDL.

This section describes the range of candidate options that were considered for use in developing maximum daily TSS loads for the Anacostia River. It is divided into discussions corresponding to the two primary decisions required in selecting an approach:

1) Level of Resolution, and 2) Probability Level. It concludes with a discussion of how various options were applied via the calculation of "sample" maximum daily loads.

Level of Resolution

The level of resolution pertains to the amount of detail used in specifying the maximum daily load. The draft EPA guidance on daily loads provides three categories of options for level of resolution, all of which are potentially applicable for the Anacostia River:

1. **Representative daily load:** In this option, a single daily load (or multiple representative daily loads) is specified that covers all time periods and environmental conditions.
2. **Flow-variable daily load:** This option allows the maximum daily load to vary based upon the observed flow condition.
3. **Temporally-variable daily load:** This option allows the maximum daily load to vary based upon seasons or times of varying source or waterbody behavior.

Probability Level

Essentially all TMDLs have some probability of being exceeded, with the specific probability being either explicitly specified or implicitly assumed. This level of probability reflects, directly or indirectly, two separate phenomena:

1. Water quality criteria consist of components describing acceptable magnitude, duration, and frequency. The frequency component addresses how often conditions can allowably surpass the combined magnitude and duration components.

2. Pollutant loads, especially from wet weather sources, typically exhibit a large degree of variability over time. It is rarely practical to specify a "never to be exceeded value" for a daily load, as essentially any loading value has some finite probability of being exceeded.

The draft daily load guidance states that the probability component of the maximum daily load should be "based on a representative statistical measure" that is dependent upon the specific TMDL and best professional judgment of the developers. This statistical measure represents how often the maximum daily load is expected/allowed to be exceeded. The primary options for selecting this level of protection would be:

1. **The maximum daily load reflects some central tendency:** In this option, the maximum daily load is based upon the mean or median value of the range of loads expected to occur. The variability in the actual loads is not addressed.
2. **The maximum daily load reflects a level of protection implicitly provided by the selection of some "critical" period**: In this option, the maximum daily load is based upon the allowable load that is predicted to occur during some critical period examined during the analysis. The developer does not explicitly specify the probability of occurrence.
3. **The maximum daily load is a value that will be exceeded with a pre-defined probability:** In this option, a "reasonable" upper bound percentile is selected for the maximum daily load based upon a characterization of the variability of daily

loads. For example, selection of the 95th percentile value would result in a maximum daily load that would be exceeded 5% of the time.

Sample Daily Load Calculations

The process for selecting a specific approach to develop maximum daily loads for the Anacostia River was guided by an advisory group led by EPA Region 3, and including participation from EPA Headquarters, the Maryland Department of the Environment and the District of Columbia Department of the Environment. Prior to selecting a single specific approach, the group requested evaluation of "sample" calculations of maximum daily loads generated using four candidate approaches. The candidate approaches consisted of two options each for level of resolution and probability level; namely: 1) Representative load/central tendency, 2) Representative load/critical period, 3) Flow-variable load/central tendency, and 4) Flow-variable load/ critical period.

Calculation of the sample flow-variable daily loads highlighted the difficulties of applying these approaches in tidally-influenced areas. The flow used in a flow-variable daily load generally represents the available dilution flow, and is typically represented by gauged stream flow. This approach is applicable for free-flowing streams, where stream flow can be directly measured and is a direct measurement of available dilution. The flow-variable approach is not readily applicable in tidally-influenced areas because stream flow cannot be directly measured nor is it necessarily an accurate indicator of available dilution. For this reason, the flow-variable expression of the maximum daily load was conducted only for the non-tidal portions of the Anacostia River.

Selected Approach

The selected approach for defining a daily maximum load for the Anacostia River was based upon the consensus decision of the EPA Region 3/EPA Headquarters/Maryland Department of the Environment/District of Columbia Department of the Environment advisory group. The approach consists of unique methods for each of the following categories of sources:

- Approach for MS4 and Nonpoint Sources
- Approach for CSOs
- Approach for Other Point Sources

Maryland and the District of Columbia chose different options regarding probability level for certain sources. The details of the respective approaches for Maryland and the District of Columbia sources are provided below.

Maryland Approach:

Approach for MS4 and Nonpoint Sources

The level of resolution selected for defining a daily maximum load for the Anacostia River is for a flow-variable daily load for each loading source in the non-tidal Anacostia River, and a single representative load for each loading source in the tidal portions of the Anacostia River. This approach was selected to provide the maximum detail possible, given the nature of the system.

The probability level is based upon the use of a critical condition. This approach was selected because it is directly analogous to the approach used in setting the original TMDL and will maintain the policy decisions made during development of that TMDL. The probability level for the annual/seasonal TMDL determination was based on the use of a critical period approach. For the annual/seasonal TMDL, the period 1995-1997 was selected as representing a range of wet, average and dry rainfall conditions and the TMDL was based upon the most critical loading from that three-year period. The most direct analogy for developing maximum daily loads is to use the same critical period approach, with the critical period being defined as the highest single daily loading predicted during the same three-year simulation period used in this TMDL. The maximum "daily" load for each contributing source is therefore defined as the highest observed (or predicted) daily load for each loading source over the course of the critical period. These maximum daily loads are calculated for each of the flow strata considered.

Approach for Other Point Sources

The TMDL also considers contributions from other point sources (i.e., not MS4) in the watershed that have NPDES permits with sediment limits. These sources are generally minor contributors to the overall sediment load. The calculation approach for point sources in Maryland is as follows:

Annual TMDL Loads

- Municipal – Loads were calculated based on the permitted flow and monthly average TSS values. Both permits contain values for two seasons, which were incorporated into the calculations based on the permit-defined season.
- Industrial – Loads were calculated from the average reported flow and the monthly average permitted TSS value.

Growing Season Loads

- Municipal – Loads were calculated based on the permitted flow and monthly average TSS values The permits contain values for two seasons, which are incorporated into the calculations based on the defined growing season.
- Industrial – Loads were calculated by multiplying the average annual load by the ratio of the growing season to a full year (7/12).

Daily Maximum Loads

- Municipal – Loads were calculated based on the USEPA (1991) guidance. The annual TMDL value was converted to a daily load and then multiplied by a conversion factor. The conversion factor was based on USEPA guidance (1991). A default coefficient of variation of 0.6 was used based on USEPA (1991) recommendations and the 99^{th} percentile was selected based on input from the MDE Water Management Administration. This resulted in a long-term average load to maximum daily load conversion factor of 3.11.
- Industrial – Loads were calculated from the average reported flow and the daily maximum permitted TSS value.

Daily Maximum Growing Season Loads

- Municipal – Loads were calculated based on the USEPA (1991) guidance. The growing season TMDL value was converted to a daily load and then multiplied by a conversion factor. The conversion factor was based on USEPA guidance (1991). A default coefficient of variation of 0.6 was used based on USEPA (1991) recommendations and the 99th percentile was selected based on input from the MDE Water Management Administration (Stone, 2007, personal communication). This resulted in a long-term average load to maximum daily load conversion factor of 3.11.
- Industrial – Loads are equivalent to the daily maximum load.

District of Columbia Approach:

Approach for MS4 and Nonpoint Sources

The level of resolution selected for defining a daily maximum load for the Anacostia River is to provide representative maximum and daily average loads for each loading source, including Lower Beaverdam Creek and Watts Branch, which flow into the tidal reaches of the Anacostia River. This approach was selected to provide the maximum detail possible, given the nature of the system and the methodology used to determine the loads.

The probability level is based upon both the representative load/central tendency and representative load/critical period options. This approach was selected because it is directly analogous to the approach used in setting the original TMDL and will maintain the policy decisions made during development of that TMDL. The probability level for the annual/seasonal TMDL determination was based on the use of a critical period approach. For the annual/seasonal TMDL, the period 1995-1997 was selected as representing a range of wet, average and dry rainfall conditions, and the TMDL was based upon the most critical loading from that three year period. The most direct analogy for developing maximum daily loads is to use the same critical period approach, with the critical period being defined as the highest single daily loading predicted during the same three-year simulation period originally used in the TMDL. The maximum "daily" load for each contributing source is therefore defined as the highest observed (or predicted) daily load for each loading source over the course of the critical period, expressed. These maximum and daily average loads are calculated and provided for each source category.

Approach for CSOs

Similar to the method used for MS4 and nonpoint sources, the CSO TMDL loads for the District of Columbia are also expressed using the representative load/central tendency and representative load/critical period options. The allowable CSO loads were developed in a manner consistent with the Long Term Control Plan (LTCP) for controlling combined sewer overflows (CSOs) in the District of Columbia (DC WASA, 2002).

Approach for Other Point Sources

The TMDL also considers contributions from other point sources (i.e., not MS4 or CSO) in the watershed that have NPDES permits with sediment limits. These sources are generally minor contributors to the overall sediment load. The TMDL analysis that defined maximum allowable seasonal/average loads held each of these sources constant at their existing technology-based NPDES permit limit for every day of the three-year simulation period. The approach used to convert these loads to maximum daily values was based upon maximum daily permit calculations provided in the Technical Support Document (TSD) for Water Quality-based Toxics Control (USEPA, 1991), per the instructions of the advisory group. The constant loads used for the three-year simulation in the TMDL analysis were taken to represent the long-term average concentrations required for TSD calculations. These long-term averages were then converted to maximum daily limits using Table 5-2 of the TSD assuming a coefficient of variation of 0.6 and a 99th percentile probability. This results in a multiplication factor of 3.11.

Application of Approach

This section documents the application of the selected approach to define maximum daily loads for the Anacostia River. It is divided into sub-sections for Maryland and the District of Columbia sources discussing:

- Data Used for Analysis
- Calculation Approach for Non-Tidal Anacostia River MS4 and Nonpoint Sources
- Calculation Approach for Tidal Anacostia River MS4 and Nonpoint Sources
- Calculation Approach for Combined Sewer Overflows *(applicable to DC only)*
- Calculation Approach Other Point Sources

The final results for the daily loads are then presented together for both Maryland and the District of Columbia reaches of the Anacostia River.

Application for Maryland Sources

Data Used for Analysis

Predicted daily TSS loads that comply with the applicable water quality standards, and that were generated for the determination of the annual/seasonal TMDL loads, were provided for the period 1995-1997 for the following sources:

- Non-Tidal Anacostia River
    - Non-Tidal Upstream Sources
    - MD Non-Tidal MS4
    - MD Non-Tidal Other Point Sources
    - MD Non-Tidal Nonpoint Sources

- Tidal Anacostia River
  - MD Tidal MS4
  - MD Tidal Nonpoint Sources

In addition to the above daily loads for Maryland sources, time-series of information provided from the TMDL modeling effort also contained corresponding District of Columbia loads (as applicable) and observed flow data for the Anacostia River for each day. These data consisted of the sum of the observed daily flows at the USGS gages on the Northeast Branch and Northwest Branch of the Anacostia River.

Calculation Approach for Non-Tidal Anacostia River MS4 and Nonpoint Sources

The specific approach used for application to the non-tidal Anacostia River TMDL was implemented as follows:

1. Obtained the predicted daily loading time series over the simulation period 1995-1997 from each contributing source for the recommended TMDL scenario that demonstrates compliance with water quality standards.
2. Conducted a flow duration analysis for the Anacostia River flow, dividing flows into five strata corresponding to the commonly used flow duration intervals (i.e. <10%, 10-40%, 40-60%, 60-90%, and >90%).
3. Determined the maximum daily TSS load over the annual and growing season periods of simulation for each source and for each flow duration interval.
4. Used the maximum daily load obtained in Step 3 as the basis of the maximum daily load for each source.

Calculation Approach for Tidal Anacostia River MS4 and Nonpoint Sources

The specific approach used for application to the tidal Anacostia River TMDL was implemented as follows:

1. Obtained the predicted daily loading time series over the simulation period 1995-1997 from each contributing source for the recommended TMDL scenario that demonstrates compliance with water quality standards.
2. Determined the maximum daily TSS load over the annual and growing season periods of simulation for each source.
3. Use the maximum daily load obtained in Step 2 as the basis of the maximum daily load for each source.
4. Defined the upstream load as the sum of loads from the maximum daily loads in the upstream sections.

Calculation Approach for Other Point Sources

1. Obtained the predicted daily loading time series over the simulation period 1995-1997 for the other point source discharges for the recommended TMDL scenario that demonstrates compliance with water quality standards.

2. Converted these values, where necessary, from long-term averages to maximum daily loads by multiplying them by a factor of 3.11 (from TSD Table 5-2). Note that for the WLA to be met, compliance with the long-term average loads would also be necessary.
3. Developed the loads in accordance with the description of the Selected Approach section of this document for Maryland's Other Point Sources.

Application for District of Columbia Sources

Data Used for Analysis

Predicted daily TSS loads that comply with the applicable water quality standards, and that were generated for the determination of the annual/seasonal TMDL loads, were provided for the period 1995-1997 for the following sources:

- Tidal Anacostia River
  - Lower Beaverdam Creek Upstream Sources
  - Lower Beaverdam Creek MS4
  - Lower Beaverdam Creek Nonpoint Sources
  - Watts Branch Upstream Sources
  - Watts Branch MS4
  - Watts Branch Nonpoint Sources
  - DC Upper Anacostia River MS4
  - DC Upper Anacostia River CSO
  - DC Upper Anacostia River Nonpoint Sources
  - DC Lower Anacostia River MS4
  - DC Lower Anacostia River Other Point Sources
  - DC Lower Anacostia River CSO
  - DC Lower Anacostia River Nonpoint Sources

In addition to the above daily loads, the time-series of information provided from the TMDL modeling effort also contained corresponding Maryland loads (as applicable) and observed flow data for the Anacostia River for each day. These data consisted of the sum of the observed daily flows at the USGS gages on the Northeast Branch and Northwest Branch of the Anacostia River.

Calculation Approach for Tidal Anacostia River MS4 and Nonpoint Sources

The specific approach used for application to the tidal Anacostia River TMDL was implemented as follows:

1. Obtained the predicted daily loading time series over the simulation period 1995-1997 from each contributing source for the recommended TMDL scenario that demonstrates compliance with water quality standards.
2. Determined the maximum daily and average daily (for non-zero loading days) TSS load over the annual and growing season periods of simulation for each source.

3. Used the maximum and average daily load obtained in Step 2 as the basis of the maximum and average daily load for each source.
4. Defined the upstream load as the sum of loads from the maximum and average daily loads in the upstream sections.

Calculation Approach for Combined Sewer Overflows (CSOs)

1. Obtained the predicted daily loading time series over the simulation period 1995-1997 from each of the contributing CSO discharges for the recommended TMDL scenario that demonstrates compliance with water quality standards.
2. Separated the contributing CSO discharges into two categories: DC Tidal Upper Anacostia River and DC Tidal Lower Anacostia River.
3. Summed the contributing CSO daily loading time series within these two categories - DC Tidal Upper Anacostia River and DC Tidal Lower Anacostia River.
4. Determined the maximum and average daily TSS loads over the annual and growing season periods of simulation for the DC Tidal Upper Anacostia River and DC Tidal Lower Anacostia River.
5. Used the maximum and average daily load obtained in Step 4 as the basis for the maximum and average daily load for CSOs.

Calculation Approach for Other Point Sources

1. Obtained the predicted daily loading time series over the simulation period 1995-1997 for the other point source discharges for the recommended TMDL scenario that demonstrates compliance with water quality standards.
2. Converted these values, where necessary, from long-term averages to maximum daily loads by multiplying them by a factor of 3.11 (from TSD Table 5-2). Note that for the WLA to be met, compliance with the long-term average loads would also be necessary.

Final Results

Tables 1 and 2 contain the final maximum daily load results generated using the approaches described above. Table 1 presents the results for the analysis conducted on an annual basis. Table 2 presents the results for the analysis conducted on the growing season (April – October). The margin of safety for these maximum daily loads is implicit – consistent with the approach used for the original TMDLs.

References

DC WASA, 2002. Combined Sewer System Long Term Control Plan. Submitted by the Distict of Columbia Water and Sewer Authority. Prepared by Greeley and Hansen, LLC. Washington, DC.

USEPA, 1991. Technical Support Document (TSD) for Water Quality-based Toxics Control. EPA/505/2-90-001. Office of Water, Washington, DC.

Table 1. Summary of Annually-Based Maximum Daily Loads of Sediment/TSS for the Anacostia River Watershed (tons/day)

Non-Tidal Anacostia River

Flow Range (m^3/s)	Upstream (max, avg)	MD Non-Tidal MS4-WLA	MD Non-Tidal Other PS-WLA	MD Non-Tidal LA	MOS	Non-Tidal TMDL (max, avg)
< 0.89	0.003, 0.002	0.505	0.349	0.0007	Implicit	0.858, 0.199
0.89 - 2.34	0.009, 0.003	2.581	0.349	0.016	Implicit	2.955, 0.381
2.34 - 3.48	0.020, 0.005	20.870	0.349	0.041	Implicit	21.28, 0.800
3.48 - 10.75	0.279, 0.013	44.617	0.349	0.459	Implicit	45.70, 3.016
> 10.75	19.23, 0.676	3828.51	0.349	244.45	Implicit	4092.54, 168.86

MD Tidal Anacostia River

Flow Range (m^3/s)	Upstream (max, avg)	MD Tidal MS4-WLA	MD Tidal LA	MOS	TMDL to MD/DC Border (max, avg)
All	4092.54, 18.15	18.85	0.11	Implicit	4111.50, 18.95

Table 1 (cont'd). Summary of Annually-Based Maximum Daily Loads of Sediment/TSS for the Anacostia River Watershed (tons/day)

DC Tidal Upper Anacostia River

Non-Tidal Lower Beaverdam Creek					
Flow Range (m^3/s)	Upstream (max, avg)	DC LBC MS4-WLA (max, avg)	DC LBC LA (max, avg)	MOS	Total TMDL (max, avg)
All	106.01, 1.324	0.0954, 0.0016	-, -	Implicit	106.105, 1.326

Non-Tidal Watts Branch					
Flow Range (m^3/s)	Upstream (max, avg)	DC WB MS4-WLA (max, avg)	DC WB LA (max, avg)	MOS	Total TMDL (max, avg)
All	4.338, 0.1314	3.425, 0.1114	-, -	Implicit	7.763, 0.2428

DC Tidal Upper Anacostia						
Flow Range (m^3/s)	Upstream (max, avg)	DC Upper Anacostia MS4-WLA (max, avg)	DC Upper Anacostia CSO-WLA (max, avg)	DC Upper Anacostia LA (max, avg)	MOS	TMDL to Upper / Lower Boundary (max, avg)
All	4111.50, 18.95	18.35, 0.78	84.61, 24.37	6.33, 0.28	Implicit	4220.79, 44.38

DC Tidal Lower Anacostia River

Flow Range (m^3/s)	Upstream (max, avg)	DC Lower Anacostia MS4-WLA (max, avg)	DC Lower Anacostia Other PS-WLA	DC Lower Anacostia CSO-WLA (max, avg)	DC Lower Anacostia LA (max, avg)	MOS	TOTAL TMDL (max, avg)
All	4220.79, 44.38	10.24, 0.43	0.0043	67.10, 25.85	4.52, 0.19	Implicit	4302.65, 70.85

Table 2. Summary of Seasonally-Based Maximum Daily Loads of Sediment/TSS for the Anacostia River Watershed (tons/day during growing season)

Non-Tidal Anacostia River

Flow Range (m^3/s)	Upstream (max, avg)	MD Non-Tidal MS4-WLA	MD Non-Tidal Other PS-WLA	MD Non-Tidal LA	MOS	Non-Tidal TMDL (max, avg)
< 0.89	0.003, 0.0023	0.500	0.302	0.0007	Implicit	0.806, 0.156
0.89 - 2.34	0.009, 0.0037	2.580	0.302	0.006	Implicit	2.897, 0.369
2.34 - 3.48	0.020, 0.0071	20.870	0.302	0.022	Implicit	21.21, 1.016
3.48 - 10.75	0.279, 0.236	44.620	0.302	0.168	Implicit	45.37, 4.854
> 10.75	19.23, 1.0981	1393.24	0.302	9.500	Implicit	1422.27, 158.69

MD Tidal Anacostia River

Flow Range (m^3/s)	Upstream (max, avg)	MD Tidal MS4-WLA	MD Tidal LA	MOS	TMDL to MD/DC Border (max, avg)
All	1422.27, 14.23	18.85	0.0005	Implicit	1441.12, 15.44

Table 2 (cont'd). Summary of Seasonally-Based Maximum Daily Loads of Sediment/TSS for the Anacostia River Watershed (tons/day during growing season)

DC Tidal Upper Anacostia River

Non-Tidal Lower Beaverdam Creek					
Flow Range (m^3/s)	Upstream (max, avg)	DC LBC MS4-WLA (max, avg)	DC LBC LA (max, avg)	MOS	Total TMDL (max, avg)
All	66.01, 1.403	0.0930, 0.0020	-, -	Implicit	66.10, 1.405

Non-Tidal Watts Branch					
Flow Range (m^3/s)	Upstream (max, avg)	DC WB MS4-WLA (max, avg)	DC WB LA (max, avg)	MOS	Total TMDL (max, avg)
All	3.65, 0.1406	3.425, 0.1318	-, -	Implicit	7.075, 0.2724

DC Tidal Upper Anacostia						
Flow Range (m^3/s)	Upstream (max, avg)	DC Upper Anacostia MS4-WLA (max, avg)	DC Upper Anacostia CSO-WLA (max, avg)	DC Upper Anacostia LA (max, avg)	MOS	TMDL to Upper / Lower Boundary (max, avg)
All	1441.12, 15.44	18.35, 1.18	84.61, 21.94	6.33, 0.41	Implicit	1550.41, 38.97

DC Tidal Lower Anacostia River

Flow Range (m^3/s)	Upstream (max, avg)	DC Lower Anacostia MS4-WLA (max, avg)	DC Lower Anacostia Other PS-WLA	DC Lower Anacostia CSO-WLA (max, avg)	DC Lower Anacostia LA (max, avg)	MOS	TOTAL TMDL (max, avg)
All	1550.41, 38.97	10.24, 0.66	0.0043	67.10, 25.85	4.52, 0.291	Implicit	1632.27, 65.77