**GOVERNMENT OF THE DISTRICT OF COLUMBIA**
**WASHINGTON, DC**

**Municipal Separate Storm Sewer System**
**NPDES Permit No. DC0000221**

# DISCHARGE MONITORING REPORT

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DISTRICT OF COLUMBIA
WATER AND SEWER AUTHORITY
Washington, D.C.

***Municipal Separate Storm Sewer System***
***NPDES Permit No. DC 0000221***
***2002 Discharge Monitoring Report***

## INTRODUCTION

National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) – Permit No. DC 0000221 (the Permit) also requires monitoring of storm event discharges to characterize the quality of storm water discharges, monitoring of dry weather flows to detect illicit connections and improper discharges, and wet weather screening to further investigate excessive levels of pollutants. Efforts are underway to develop these Permit requirements into a program that will provide confirmation of the District of Columbia's overall progress in effectively managing storm water.

This report describes the monitoring sites, sample collection, record keeping, monitoring results, and estimates of loadings that have occurred since April 2001.

## MONITORING SITES

The sites monitored for this period of the permit are not the sites listed in Table 5 of the Permit. As allowed by Part IV.A.1.1, a request for approval of alternate monitoring locations was made to the U.S EPA Region 3 Director in November 2000. (Copy of request in Appendix A) The Director approved the alternate sites in January 2001 (Copy of approval in Appendix B). A listing of the sites and the acreage monitored at those sites is found in Table 1. The acreage for each location was calculated by tracing the tributaries to the sampling location on a WASA

sewer map, creating a grid based on the scale from the sewer map, and converting grid units to the desired unit of measurement. A street level map of the sites is found in Appendix C. The land uses associated with the monitoring sites are found in Appendix D.

**Table 1 – Monitoring Sites**

| Site Number | Sampling Location | Acres |
|---|---|---|
| 1 | Stickfoot Sewer - 2400 block of Martin Luther King Jr. Ave., S.E. | 367.31 |
| 2 | O Street Storm Water Pump Station - 125 O St., S.E. | 252.52 |
| 3 | Anacostia High School - Corner of 17th St. and Minnesota Ave., S.E. | 413.22 |
| 4 | Gallatin St. & 14th Street, N.E. | 619.83 |
| 5 | Varnum St. & 19th Place, N.E. | 1216.71 |
| 6 | Nash Run - Intersection of Anacostia Dr. & Polk St., N.E. | 344.35 |
| 7 | East Capitol Street - 200 Block of Oklahoma Ave. at intersection with D St., N.E. | 91.83 |
| 8 | Ft. Lincoln-Newtown BMP - wooded area before South Dakota St. Exit off of New York Ave., NE | 229.56 |
| 9 | Hickey Run - 33rd and V Street, N.E. | 149.22 |

Each of the sites is to be monitored for three (3) wet weather events per year. At sites with dry weather flows, samples are collected two (2) times per year. Dry weather samples were collected at sites 4 through 9. Samples are collected, in accordance with the Permit, by Maryland Environmental Services (MES), a contractor. The dates that samples were collected are given in Appendix E.

After several failed attempts by the contractor to collect wet weather samples at the Ft. Lincoln-Newtown BMP, Maryland Environmental Services (MES) requested that DOH investigate the BMP. A January 2002 site visit by the Watershed Protection Division (WPD) staff that designed and monitored construction of the BMP found that the BMP isn't functioning as designed. Consequently there are no sampling events to report for site 9 (Ft. Lincoln-Newtown BMP).

Ambient samples are collected monthly by DOH Bureau of Environmental Quality Water Quality Division (WQD) staff at 2 sites on Hickey Run. (See Appendix F.) These samples are only analyzed for nutrients, turbidity, alkalinity, hardness, pH, temperature, dissolved oxygen, oil and grease, fecal coliforms, and metals (quarterly). One site is located in the National Arboretum and the second is located in the headwaters of the stream. These samples are collected and analyzed according to the WQD's Quality Assurance Project Plan that is on file with U.S. EPA Region 3.

**WEATHER INFORMATION**

Table 2 shows the actual, predicted normal, and average precipitation for the Washington, D.C. area for the period of January 2001 through February 2002. During that period the amount of precipitation was below the predicted normal. The ongoing decrease in precipitation has resulted in one of the driest periods on record. Therefore, a delay in wet weather event sampling has occurred. Wet weather monitoring was not completed as required (i.e.- three times per year) due to the near drought conditions during this period.

**Table 2 – Precipitation Record for Washington, D.C.**

| Precipitation | | | |
|---|---|---|---|
| MONTH | ACTUAL (in.) | NORMAL (in.) | AVERAGE (in.) |
| January 2001 | 2.22 | 3.21 | 2.8 |
| February | 1.83 | 2.63 | 2.6 |
| March | 3.91 | 3.60 | 3.4 |
| April | 1.68 | 2.77 | 2.8 |
| May | 3.71 | 3.82 | 3.9 |
| June | 4.69 | 3.13 | 3.3 |
| July | 4.77 | 3.66 | 4.0 |
| August | 3.00 | 3.44 | 4.1 |
| September | 1.41 | 3.79 | 3.3 |
| October | 0.70 | 3.22 | 3.0 |
| November | 0.55 | 3.03 | 3.0 |
| December | 1.53 | 3.05 | 3.2 |
| January 2002 | 1.53 | 3.21 | -- |
| February | 0.35 | 2.63 | -- |
| Washington Times – AccuWeather, Inc. ; USA Today, Data is from Ronald Reagan National Airport, Source: U.S. Climatic Data Center, Ashville, N.C. | | | |

## SAMPLE COLLECTION

The list of sampled parameters, the detection limits, and EPA-approved methods utilized for monitoring activities are included in Appendix G. A Quality Assurance Project Plan for the wet and dry weather monitoring is on file with U.S. EPA Region 3.

## RECORDKEEPING

DOH maintains the records of monitoring information which include the following:

- Description of Sampling
    - Location/Collection Time
    - Sampling Collection
    - Field Test
    - Maryland Environmental Services (MES) Personnel who collected samples

- Storm Event Data
    - Date and duration of the storm events samples
    - Rainfall measurements
    - Duration between storm event sampled and the end of the previous measurable storm event
    - Estimate of the total volume of the discharge sampled
- Sampling Difficulties/Field Notes
- QA/QC Review and Clarification
    - Field Test Results
    - Laboratory Results Tables
    - Atlantic Coast Laboratories Data
    - Lancaster Laboratories Data
    - Triangle Laboratories Data
    - Martel Laboratories Data

**MONITORING RESULTS**

Monitoring results for the wet and dry weather sampling events are reported on discharge monitoring report (DMR) forms. The completed DMR forms for the available monitoring results are found in Appendix H.

**ESTIMATES OF CUMULATIVE LOADINGS**

Due to the limited amount of data available, Appendix I is an evaluation of the data utilizing various statistical equations such as median and average. The median is a central tendency number in the middle of an ordered set of data. The average is a numerical central tendency.

$$\text{Average} = X = \frac{\sum x}{N}$$

The variance and standard deviation is the measure of the spread of data about the mean.

$$\text{Variance} = \frac{\sum (x-X)^2}{N-1} = s^2$$

$$\text{Standard Deviation} = \sqrt{s^2}$$

Coefficient of the Variance = Standard Deviation / Average

Mean Runoff Event Concentration (M) = $T*SQRT(1+CV^2)$

Where M = Mean
T = Median
CV = Coefficient of the Variance
The mean event concentration will be 25% greater than the median value.

Mean Storm Event Mass Load (lbs/acre) =
Runoff Volume (inches) * Pollutant concentrations (mg/L) * 0.227

0.227= conversion factor

Annual Mass Load (ANMASS) = M(Mass) * NST

Where ANMASS = Annual Mass Load (mass/yr)
M(MASS) = Mass Load for the Mean Event
NST = Number of Events per Year

A cursory review of the incomplete storm event data reveals little or no loads of volatile organic compounds, acid extractable compounds, base/neutral extractable compounds, pesticides, PCBs or Dioxin. In the metals, cyanide, and phenols category, minor amounts of copper and zinc are contributed. Moderate loads of nutrients were contributed. While significant loads of suspended and dissolved solids, fecal coliform, and fecal streptococcus should be noted. Oil and grease,

even at the Hickey Run storm water monitoring site, is not a major pollutant of concern based on the limited available data. Appendix I includes the preliminary load calculations.