

Fairfax County 2023 MS4 Program Plan and Annual Report

# Appendix R10

Wet Weather Screening Report

VSMP Permit Number VA0088587  
9-29-2023

|                         |                |                 | Water Quality Analyte |                      |                     |                    |                     |                 |     |           |             |            |            |           |           |           |           |           |           |           |           |           |           |           |           |                        |            |                        |                |           |           |                 |                        |
|-------------------------|----------------|-----------------|-----------------------|----------------------|---------------------|--------------------|---------------------|-----------------|-----|-----------|-------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------|------------|------------------------|----------------|-----------|-----------|-----------------|------------------------|
| Monitoring Site         | STMN           | Sample Type     | Rainfall Start Date   | Rainfall Amount (in) | Rainfall Length (h) | Last Rainfall Date | Physical Parameters |                 |     |           |             |            | Metals     |           |           |           |           |           |           |           |           |           | Nutrients |           |           |                        |            | Anions                 |                |           |           |                 |                        |
|                         |                |                 |                       |                      |                     |                    | COD (mg/L)          | Hardness (mg/L) | pH  | Si (mg/L) | SPC (µS/cm) | TDS (mg/L) | TSS (mg/L) | Cd (ug/L) | Ca (mg/L) | Cr (ug/L) | Cu (ug/L) | Fe (ug/L) | Pb (ug/L) | Mg (ug/L) | Mn (ug/L) | Ni (ug/L) | K (mg/L)  | Na (mg/L) | Zn (ug/L) | NH <sub>3</sub> (mg/L) | TKN (mg/L) | NO <sub>3</sub> (mg/L) | Ortho-P (mg/L) | TP (mg/L) | Cl (mg/L) | Fluoride (mg/L) | SO <sub>4</sub> (mg/L) |
| Bren Marr               | STMN0811453764 | First Flush     | 8/10/2022             | 0.37                 | 8.5                 | 8/4/2022           | 40.70               | 10000.00        | 6.8 | 1850      | 48.9        | 40.00      | 12.7       | ND        | 3150      | 1.9       | 12.2      | 662.00    | 1.0       | 520       | 20.6      | 2.3       | 1210      | 4510      | 57.5      | 0.22                   | 0.99       | 0.41                   | 0.07           | 0.11      | 4.3       | ND              | 2.1                    |
| Bren Marr               | STMN0811453764 | Storm Composite | 8/10/2022             | 0.37                 | 8.5                 | 8/4/2022           | ND                  | 30200.00        | 6.8 | 3540      | 183.0       | 103.00     | 8.3        | ND        | 8670      | 1.3       | 7.3       | 422.00    | ND        | 2060      | 21.8      | 2.2       | 2010      | 21200     | 36.4      | ND                     | ND         | 0.54                   | ND             | ND        | 35.4      | ND              | 5.0                    |
| Fairfax Water Authority | STMN0442033318 | First Flush     | 9/30/2022             | 1.39                 | 53.3                | 9/23/2022          | 199.00              | 133000.00       | 6.8 | 29200     | 360.0       | 285.00     | 129.0      | 0.26      | 40300     | 7.4       | 36.0      | 4200.00   | 6.5       | 7940      | 1720.0    | 9.8       | 3260      | 21200     | 251.0     | 0.85                   | 5.10       | 1.90                   | ND             | 0.57      | 48.3      | 0.13            | 18.6                   |
| Fairfax Water Authority | STMN0442033318 | Storm Composite | 9/30/2022             | 1.39                 | 53.3                | 9/23/2022          | 53.10               | 27900.00        | 6.6 | 5020      | 107.0       | 76.00      | 21.4       | ND        | 8750      | 1.5       | 10.5      | 431.00    | 2.3       | 1470      | 51.8      | 1.9       | 1210      | 10200     | 46.0      | 0.12                   | 0.82       | 0.37                   | ND             | 0.17      | 14.5      | ND              | 4.7                    |
| Bren Marr               | STMN0811453764 | First Flush     | 10/13/2022            | 0.7                  | 19                  | 10/5/2022          | 168                 | 33600           | 6.2 | 4490      | 142         | 97         | 131.0      | 0.21      | 10600     | 3.4       | 26.0      | 2920      | 7.5       | 1760      | 296       | 6.0       | 2210      | 13700     | 285.0     | 0.73                   | 4.10       | 0.68                   | ND             | 0.33      | 19.8      | ND              | 7.1                    |
| Bren Marr               | STMN0811453764 | Storm Composite | 10/13/2022            | 0.7                  | 19                  | 10/5/2022          | 40.8                | 42300           | 6.9 | 4330      | 237         | 127        | 22.0       | ND        | 12400     | 1.4       | 8.1       | 533       | 1.9       | 2770      | 36.0      | 2.5       | 3330      | 28800     | 53.5      | 0.13                   | 1.1        | 0.61                   | ND             | 0.077     | 41.2      | ND              | 9.2                    |
| Fairfax Water Authority | STMN0442033318 | First Flush     | 11/11/2022            | 0.75                 | 6.1                 | 11/6/2022          | 56.90               | 230000          | 7.9 | 24200     | 690         | 399        | 57.2       | ND        | 71600     | 1.8       | 13.2      | 885       | 2.1       | 12400     | 122       | 2.2       | 4070      | 51400     | 44.40     | 0.15                   | 1.60       | 2.00                   | 0.08           | 0.28      | 96.4      | 0.22            | 29.1                   |
| Fairfax Water Authority | STMN0442033318 | Storm Composite | 11/11/2022            | 0.75                 | 6.1                 | 11/6/2022          | 160                 | 24400           | 6.4 | 19700     | 81.50       | 72         | 45.5       | ND        | 6820      | 2.4       | 20.8      | 1190      | 5.6       | 1790      | 215       | 3.1       | 3540      | 5290      | 111.0     | ND                     | 2.10       | 0.12                   | 0.19           | 0.51      | 8.6       | ND              | 3.2                    |
| Bren Marr               | STMN0811453764 | First Flush     | 2/12/2023             | 1.18                 | 19.3                | 2/1/2023           | 36                  | 20100           | 6.9 | 2670      | 274         | 138        | 32.4       | ND        | 6240      | 2.1       | 9.5       | 1520      | 5.2       | 1090      | 34        | 2.1       | 1040      | 46400     | 90.9      | 0.22                   | 0.94       | 0.24                   | ND             | 0.10      | 67.8      | ND              | ND                     |
| Bren Marr               | STMN0811453764 | Storm Composite | 2/12/2023             | 1.18                 | 19.3                | 2/1/2023           | 54.80               | 27100           | 7.1 | 5210      | 203         | 112        | 50.30      | ND        | 8070      | 3.6       | 11.1      | 1990      | 8.1       | 1680      | 48.9      | 3.2       | 1960      | 29000     | 105.0     | 0.10                   | 0.78       | 0.35                   | ND             | 0.980     | 43.4      | ND              | 4.3                    |
| Fairfax Water Authority | STMN0442033318 | Storm Composite | 2/12/2023             | 1.01                 | 15.2                | 2/1/2023           | 50.10               | 39300           | 7.3 | 3450      | 133         | 79         | 91.70      | ND        | 11500     | 4.5       | 18.8      | 2740      | 5.7       | 2600      | 148       | 3.9       | 967       | 13000     | 89.5      | ND                     | 0.63       | 0.21                   | ND             | 0.14      | 18.2      | 0.15            | 3.40                   |
| Bren Marr               | STMN0811453764 | First Flush     | 4/28/2023             | 3.47                 | 22.75               | 4/23/2023          | 86.8                | 140000          | 6.7 | 14500     | 615         | 400        | 9.6        | ND        | 54000     | 71.5      | 12        | 275       | 1.3       | 1260      | 30.5      | 2.3       | 38400     | 42400     | 51.9      | 0.61                   | 2.7        | 3.2                    | ND             | 0.094     | 52.1      | 0.15            | 150                    |
| Bren Marr               | STMN0811453764 | Storm Composite | 4/28/2023             | 3.47                 | 22.75               | 4/23/2023          | 32.80               | 36400           | 6.9 | 4420      | 190         | 108        | 13.4       | ND        | 13500     | 15.8      | 6.5       | 356       | 1.4       | 672       | 11.7      | 1.0       | 8390      | 13600     | 30.9      | 0.11                   | 0.73       | 0.80                   | ND             | ND        | 17.6      | ND              | 34.8                   |

In Q3 (Jan-Mar, 2023) the first flush sample was not collected at the Fairfax Water Authority location due to an automated sampler error.

In Q4 (Apr-June, 2023) staff discovered a diesel fuel leak at the Fairfax Water Authority location. The leak was reported to the Stormwater Pollution Inspection group, Fairfax Fire Marshal, and DEQ. Mitigation has been ongoing, and we expect to start sampling again in Q2 (Oct-Dec, 2023). See Appendix R4 Spills Response for event on 4/4/2023.

**Analyte value was greater than exceedance criterion**

Follow-up actions : All storm event reports with exceedances are sent to our Stormwater Pollution Inspections (SPI) Group for analysis. Zinc and copper are common urban pollutants, originating from roofs and vehicles. Copper can also come from cooling towers, washing activity, or from water flowing through soil such as groundwater seeps into the storm drainage system joints. Elevated copper and zinc concentrations are common in urban and suburban runoff (Davis, Shokouhian and Ni, 2001), (Pitt, Field, Lalor, & Brown, 1995). The SPI group performed a desktop analysis and found that observed values were similar to levels commonly found in drinking water, which is an allowable discharge under the permit.

References:

Pitt, R., R. Field, M. Lalor, and M. Brown. 1995. Urban stormwater toxic pollutants: assessment, sources, and treatability. Water Environment Research, 67(3), 260-275.

Davis, A., M. Shokouhian, and S. Ni. 2001. Loading estimates of lead, copper, cadmium, and zinc in urban runoff from specific sources. Chemosphere, 44(5), 997-1009.