



## **DWR – NR – G – 12 – Municipal Stormwater – 08012022 NPDES Municipal Separate Storm Sewer Systems (MS4) Permit Uncontaminated Roof Runoff Exclusion Guidance**

DISCLAIMER: This document is guidance only and does not create legal rights or obligations. Agency decisions in any particular case will be made by applying applicable laws and regulations to the specific facts.

**EFFECTIVE DATE:** MARCH 19, 2024, RESCINDED

### **SIGNATURES:**

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### **PURPOSE**

This guidance is developed for the Municipal Separate Storm Sewer System Permit and describes the implementation of the uncontaminated roof runoff exclusion. This guidance does not remove or modify any standard established in the rule or in the permit and does not grant access to private property.

Tennessee Code Annotated section 69-3-108(s) and (t) codifies the discretion of local governmental entities in selecting measures to meet post-construction effluent limitations. For the general permit, the effluent limitations are adopted as Rule 0400-40-10-.04 and for the individual permit as Rule 0400-40-05-.15. The Rule requires specific effluent limitations to manage post-construction stormwater at all new development and redevelopment projects that discharge into the permittee's MS4. Rule 0400-40-10-.04(2) and 0400-05-.15(2) sets Permanent Stormwater Standards and Subparagraph (c) establishes the Water Quality Treatment Volume (WQTV) as follows: "The water quality treatment volume is a portion of the runoff generated from impervious surfaces at a new development or redevelopment project by the design storm. Uncontaminated roof runoff may be excluded from the WQTV.<sup>5</sup>

<sup>5</sup> Roof runoff should be presumed to be contaminated. Roof runoff that has been demonstrated to be uncontaminated may be excluded from the WQTV, however permittees are not required to provide an exclusion to the WQTV for roof runoff."

### **GUIDANCE**

In Tennessee, local jurisdictions have the authority to provide stormwater and flood control facilities and to establish standards to regulate water quantity per Tennessee Code Annotated section 68-221-1105. The standards established by municipalities regulating water quantity are beyond the scope of the MS4 permit. The permit provision for uncontaminated roof runoff is applicable to water quality



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only. For purposes of calculating WQTV, the roof runoff must be physically separated (uncontaminated) from other sources of runoff. For projects where the municipality requires stormwater quantity control, the roof runoff cannot be excluded from local water quantity requirements.

It is recognized that not all impervious surfaces contribute the same amount of pollutants to stormwater runoff. Stormwater pollutant concentrations may be found in various published literature. See Table 1 below excerpted from Schueler, T. 1987 and Center for Watershed Protection Article 141.

| <b>Table 1 Pollutant Concentrations from Source Areas</b>  |                        |                       |                       |                            |                       |                       |                       |
|--|------------------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|-----------------------|
| <b>Constituent</b>   | <b>TSS<sup>1</sup></b> | <b>TP<sup>2</sup></b> | <b>TN<sup>3</sup></b> | <b>F. Coli<sup>1</sup></b> | <b>Cu<sup>1</sup></b> | <b>Pb<sup>1</sup></b> | <b>Zn<sup>1</sup></b> |
|  | mg/l                   | mg/l                  | mg/l                  | 1000col/ml                 | ug/l                  | ug/l                  | mg/l                  |
| Residential Roof   | 19                     | 0.11                  | 1.5                   | 0.26                       | 20                    | 21                    | 0.312                 |
| Commercial Roof  | 9                      | 0.14                  | 2.1                   | 1.1                        | 7                     | 17                    | 0.256                 |
| Industrial Roof  | 17                     | 0.13*                 | -                     | 5.8                        | 62                    | 43                    | 1.390                 |
| Commercial/Residential Parking   | 27                     | 0.15                  | 1.9                   | 1.8                        | 51                    | 28                    | 0.139                 |
| Industrial Parking   | 228                    | 0.48*                 | -                     | 2.7                        | 34                    | 85                    | 0.224                 |
| Residential Street   | 172                    | 0.55                  | 1.4                   | 37                         | 25                    | 51                    | 0.173                 |
| Commercial Street  | 468                    | -                     | -                     | 12                         | 73                    | 170                   | 0.450                 |
| Rural Highway  | 51                     | -                     | 22                    | -                          | 22                    | 80                    | 0.080                 |
| Urban Highway  | 142                    | 0.32                  | 3.0                   | -                          | 54                    | 400                   | 0.329                 |
| Lawns  | 602                    | 2.1                   | 9.1                   | 24                         | 17                    | 17                    | 0.050                 |
| Landscaping  | 37                     | -                     | -                     | 94                         | 94                    | 29                    | 0.263                 |
| Driveway   | 173                    | 0.56                  | 2.1                   | 17                         | 17                    | 20*                   | 0.107                 |
| Gas station  | 31                     | -                     | -                     | -                          | 88                    | 80                    | 0.290                 |
| Auto recycler  | 335                    | -                     | -                     | -                          | 103                   | 182                   | 0.520                 |
| Heavy Industrial   | 124                    | -                     | -                     | -                          | 148                   | 290                   | 1.600                 |
| 1: Claytor and Schueler (1996)<br>2: Average of Steuer et al. (1997), Bannerman (1993) and Waschbusch (2000)<br>3: Steuer et al. (1997)<br>*Center for Watershed Protection; Watershed Protection Techniques (Article 141) |                        |                       |                       |                            |                       |                       |                       |

Roof runoff should be presumed to be contaminated unless an applicant demonstrates otherwise. See Van Metre and Mahler. The municipality is not required to provide the roof runoff exclusion.

In circumstances where a municipality provides the roof runoff water quality exclusion for a specific project, analytical characterization of the atmospheric deposition in the project area and of the roofing materials planned for the project shall be provided to the municipality. This could be accomplished,



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for example, through characterization of roof runoff from an existing building in the same vicinity with similar roofing materials. Some roofing materials are more likely to carry pollutants: for example, a copper roof is likely to be a source of copper in runoff. Or, runoff from a large roof in an industrial zone may carry pollutants deposited from the air. The municipality will then be able to compare the analytical results to the effluent concentrations from the International Stormwater BMP Database to determine if further treatment would be practicable. Local policies, processes, and other resources necessary to implement an exclusion should be identified as part of the Permanent Stormwater Management Implementation Plan due within 90 days after the effective date of the first new or revised permit issued after the effective date of Tennessee Rule 0400-40-10-.04.

When evaluating BMP performance, it is important to consider influent concentrations. In cases where influent concentrations are already very low, additional reductions of pollutant concentrations may not be feasible. The [International Stormwater BMP Database](#) is an evidence-based resource for characterizing Best Management Practice (BMP) performance and provides effluent concentrations as a reference for feasibility of pollutant removal.

### **REFERENCES**

Schueler T. R., Holland H.K., edited anthology *The Practice of Watershed Protection*, The Center for Watershed Protection, Ellicott City, MD, 2000.

Schueler, T. 1987. *Controlling urban runoff: a practical manual for planning and designing urban BMPs*. Metropolitan Washington Council of Governments. Washington, DC, as presented in Appendix A of the *New York State Stormwater Management Design Manual of 2001*.

Claytor, R. and T. Schueler. 1996. *Design of Stormwater Filtering Systems*. Center for Watershed Protection. Ellicott City, MD.

Steuer, J., W. Selbig, N. Hornewer, and J. Prey. 1997. "Sources of Contamination in an Urban Basin in Marquette, Michigan and an Analysis of Concentrations, Loads, and Data Quality." U.S. Geological Survey, *Water-Resources Investigations Report 97-4242*.

Bannerman, R., D. Owens, R. Dodds and N. Hornewer. 1993. "Sources of Pollutants in Wisconsin Stormwater." *Water Science and Technology*. 28(3-5): 241-259.

Waschbusch. 2000. Sources of phosphorus in stormwater and street dirt from two urban residential basins in Madison, Wisconsin, 1994-1995. In: *National Conference on Tools for Urban Water Resource Management and Protection*. US EPA February 2000: pp. 15-55.



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Van Metre P.C., Mahler B.J., The contribution of particles washed from rooftops to contaminant loading to urban streams. Chemosphere. 2003 Sep;52(10):1727-41.

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The Water Research Foundation, International Stormwater BMP Database: 2020 Summary Statistics, November 6, 2020. ([https://www.waterrf.org/system/files/resource/2020-11/DRPT-4968\\_0.pdf](https://www.waterrf.org/system/files/resource/2020-11/DRPT-4968_0.pdf))

### **REVISION HISTORY TABLE**

| <b>Revision Number</b> | <b>Date</b> | <b>Brief Summary of Change</b> |
|------------------------|-------------|--------------------------------|
| 0                      | 08/01/22    | New Guidance                   |
| 1                      | 03/19/2024  | Rescinded                      |