# Policy 25

# POST-CONSTRUCTION WATER QUALITY CONTROL STANDARDS FOR PROPRIETARY FLOW-THROUGH BEST MANAGEMENT PRACTICES (BMPs)

## 1. Introduction

The City of Knoxville requires two types of water quality treatment in certain situations: First flush treatment and Special Pollution Abatement Permit (SPAP) treatment. This policy primarily addresses water quality treatment by means of proprietary flow-through BMPs. However, green infrastructure with supporting documentation can also be used to address the water quality standards. Proprietary BMPs that are acceptable to use for water quality treatment and their maximum treatment flow rates may be found on the list of approved stormwater manufactured treatment devices published by the New Jersey Department of Environmental Protection (NJDEP) at the following website: http://www.nj.gov/dep/stormwater/treatment.html.

## 2. First Flush Pollutant Reduction

All stormwater basins that are required under Section 22.5-23 of the Stormwater and Street Ordinance shall be built to manage first flush water quality. When the requirement for detention or retention is waived, first flush treatment is still required.

Sites requiring first flush treatment with a proprietary flow through BMP must be designed to remove 80% of the suspended solids from the post-construction runoff resulting from Knoxville's ninety-fifth percentile storm (1.5 inches of rainfall in a 24-hour period). Flows must be determined by methods approved in the Stormwater and Street Ordinance. Each of the following methodologies can be used to meet the first flush requirement:

- Green infrastructure may be used to satisfy the first flush requirement
- Green infrastructure combined with a unit certified (NJDEP) can be used to achieve 80% TSS removal rate
- The approved flow for a BMP certified (NJDEP) for 80% TSS removal rate
- The approved flow for a BMP certified (NJDEP) for 50% TSS removal rate multiplied by a factor of 0.6

## 3. Special Pollution Abatement Permit (SPAP) Pollutant Reduction

Some land uses (aka Hot Spots) are known to produce pollutants that are detrimental to water quality that would not be corrected by the standard first flush treatment. These sites will require a Special Pollution Abatement Permit and may need additional structural and management BMPs to address the pollutants of concern. See Section 22.5-37 in the Stormwater and Street Ordinance for more information regarding SPAPs.

All proprietary devices used for SPAP pollutant reduction must treat the runoff resulting from Knoxville's 1-year 24-hour storm. The BMP must remove 50% of the suspended solids from the post-

construction runoff resulting from Knoxville's 1-year 24-hour storm (2.5 inches of rainfall in a 24-hour period). Flows must be determined by methods approved in the Stormwater and Street Ordinance. Each of the following methodologies can be used to meet the SPAP requirement:

- Green infrastructure may be used to satisfy the SPAP requirement
- The approved flow for a unit certified (NJDEP) for 50% TSS removal
- The approved flow for a unit certified (NJDEP) for 80% TSS removal multiplied by a factor of 1.7

Additionally, the BMP must be able to treat all pollutants of concern for the given use (See Table 1). The pollutants of concern for special land uses that are not specifically listed in Table 1 will be determined on a case by case basis.

**Table 1. Pollutants of Concern for Specific SPAP Land Uses**

| SPAP Land Use (Hot Spot) | Pollutants of Concern | | |
|---|---|---|---|
| | Hydrocarbons | Nutrients / Bacteria | Gross Pollutants |
| Property with more than 400 parking spaces | X | | X |
| Property with more than 120,000 $ft^2$ of pavement area | X | | X |
| Food Handling and Facilities | X | | X |
| Vehicle and Equipment Facilities | X | | X |
| Vehicle Wash Facilities | X | | X |
| Recycling or Salvage Yard Facilities | X | | X |
| Facilities with Animal Housing Areas | | X | X |

### 4. Dual Treatment

When a site requires both first flush and SPAP treatment, the same BMP may be used to satisfy both criteria.

### 5. Bypass and Maximum Flow Rates

When using a proprietary device, stormwater bypass for large storms must be provided to prevent the re-suspension/discharge of captured pollutants.

There are two methods that can be used for the bypass.

- A diversion structure can be used upstream and be designed to convey the treatment flow to the water quality device.
- Stormwater diversion can occur within the proprietary device where the bypass method separates the bypass flow path from the treatment flow path, preventing mixing.

The bypass must be sized to handle the lesser of the incoming pipe capacity or the 100-year design storm.

### 6. Treatment Devices Not Approved By NJDEP

For a majority of cases, proprietary BMPs not approved by NJDEP will not be allowed. However, in situations where there is a change of use that creates the requirement for a SPAP and/or for projects that include new construction but do not meet redevelopment requirements, e.g. parking lot layout changes, certain non-NJDEP approved devises may be considered on a case-by-case basis, e.g. catch basin inserts, flume filters, trench drain filters, and snouts. The approval of such devices does not remove the possibility of a requirement to upgrade the site's water quality treatment to green infrastructure or NJDEP approved BMPs in future improvements.

Proprietary BMPs that were previously listed and accepted for use in the City of Knoxville will continue to be accepted with new permit submissions until October 1, 2019.