

# RUNOFF REDUCTION METHOD & VIRGINIA STORMWATER SPREADSHEET: INSTRUCTIONS & DOCUMENTATION

## INTRODUCTION

Virginia's proposed Stormwater Regulations (4 VAC 50-60) include water quality and quantity requirements based, in part, on the "Runoff Reduction Method." This method is supported by recent stormwater research findings concerning the runoff reduction and pollutant removal capabilities of various stormwater best management practices (BMPs). More information and documentation concerning the Runoff Reduction Method can be found in a Technical Memorandum prepared by the Center for Watershed Protection and the Chesapeake Stormwater Network. The memorandum can be downloaded at: [www.cwp.org](http://www.cwp.org) > Resources > Controlling Runoff & Discharges > Stormwater Management.

The method is accompanied by a site planning and compliance spreadsheet. The spreadsheet is designed to help users plan combinations of stormwater BMPs for a particular site in order to meet the standards in the proposed regulations. There is one spreadsheet for new development and a separate one for redevelopment (prior developed lands).

As a general overview, the following characteristics apply to the Runoff Reduction Method and associated spreadsheet:

- **Total Phosphorus (TP)** is used as the target pollutant for compliance with proposed **Water Quality** criteria (4 VAC50-60-63 through 65). Total Nitrogen (TN) is also calculated and BMP designs address TN removal, as well as the removal of other stormwater pollutants.
- Compliance is based on the overall site; however, stormwater BMP planning can be done on a drainage area basis. The spreadsheet has tabs for multiple drainage areas.
- Each site also has a **Treatment Volume (Tv)**. The method uses post-development land covers (forest and open space, managed turf, impervious cover) to compute the Tv.
- Stormwater BMPs are assigned **Runoff Reduction (RR)** and **Pollutant Removal (PR)** rates. These rates vary based on the "level of design" used. Level 1 designs represent good, current design standards with regard to sizing and BMP features. Level 2 BMPs have design enhancements to boost runoff reduction and pollutant removal performance. Each Level 1 and 2 design has associated design standards and specifications that should be followed to achieve the assigned RR and PR rates.
- There is a tab in the spreadsheet for **Channel and Flood Protection**. This tab is designed to assist users with compliance with the **Water Quantity** part of the proposed regulations (4 VAC50-60-66). The spreadsheet assists users with computing runoff volumes and Curve Numbers (CN). The user must then use available hydrologic and hydraulic models and programs to calculate peak discharges for various design storms and verify compliance with the various

conditions of the Water Quantity section. If Runoff Reduction practices are used for Water Quality compliance, then these are given credit for Channel Protection and Flood Control, chiefly by allowing the user to compute an Adjusted CN. The designer, with concurrence from the local program authority, may also take other hydrologic “credits” for RR practices, such as increasing the time of concentration (Tc).

- In the spreadsheet, blue boxes require user input; gray boxes are calculation cells, and yellow boxes are constant values. The user should only add values to the blue boxes.

The following documents are included in this documentation package:

New Development	Redevelopment (Prior Developed Lands)
<b>DOCUMENT A:</b> A general flowchart showing the steps for water quality and quantity compliance	Same
<b>DOCUMENT B:</b> Step-by-step instructions for using the site planning and compliance spreadsheet	<b>DOCUMENT B-R:</b> Supplemental instructions for using the redevelopment version of the spreadsheet
<b>DOCUMENT C:</b> Documentation for the Runoff Reduction Method, outlining the procedures and calculations. This is for those who want to look in more detail at the method.	<b>DOCUMENT C-R:</b> Supplemental documentation for the redevelopment method