# City of Staunton, Virginia
# Chesapeake Bay Action Plan
# 2023 – 2028

**Revised December 18, 2024**

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G. Keith Thompson Jr., PE, LEED AP BD+C, ENV SP
Wiley|Wilson Project Manager

*This report was prepared solely for the use of the City of Staunton for this project. It is a statement of professional opinion based on information available at the time of preparation. It represents conditions at a specific time which is identified in the report and these conditions may change. To develop this report, the standard of care applicable to professional services was used.*

## 1.0 - Introduction

The City of Staunton is an independent city located in Augusta County, Virginia. The City was designated as regulated Small Municipal Separate Storm Sewer System (MS4) in August 2013. Staunton developed a stormwater management program that addressed the six minimum control measures established by the United States Environmental Protection Agency to comply with the General Permit. The Development of a Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan is an additional requirement of the Small MS4 general permit. A TMDL is a "pollution diet" for an impaired water body. The "pollution diet" establishes discharge limits for pollutants of concern (POC) that impact the water body in question. The Chesapeake Bay TMDL has set limits on the amount of nitrogen (TN) and phosphorus (TP) that MS4 communities can discharge from the point source (i.e. – treatment plants) and non-point sources (i.e. – stormwater). These limits correspond to levels that will allow the Chesapeake Bay to meet water quality standards.

As a 2013 MS4 community, Staunton is required to update its Draft TMDL action plan for compliance with the Level 2 (L2) scoping run, Phase III (100% POC reduction) water quality standards by October 1, 2023. The TMDL Action Plan is a critical planning tool used to provide permit compliance in a fiscally responsible manner. The plan is not intended to be a rigid guide to compliance. As new technologies and opportunities are developed, Staunton reserves the right to implement alternative strategies that are more beneficial to the achievement of the program goal of fiscally responsible compliance.

## 2.0 - Current Program and Legal Authority

The City of Staunton implemented a MS4 stormwater management program in February of 2014. The program was developed to address the six minimum controls and the special conditions for the Chesapeake Bay TMDL. The MS4 program has been established with the appropriate legal authority to administer the requirements of the TMDL action plan. No additional authorities are required at this time.

## 3.0 - Means and Methods to Address Discharges from New Sources

The City of Staunton is required to provide means and methods to address discharges from new sources after July 1, 2009. Land disturbing activities greater than one acre with an average impervious land cover greater than 16% are required to provide additional offsets. The City employed an average land cover condition of 16% for all land disturbing activities between July 1, 2009 and June 30, 2014.

Staunton developed and adopted a stormwater management ordinance that became effective July 1, 2014. The ordinance meets or exceeds the minimum requirements set forth by the Virginia Stormwater Management Act (62.1-44.15:24 et seq, Code of Virginia) and the Erosion and Sediment Control Act (62.1-44.15:67 et seq, Code of Virginia). All new land-disturbing activities that exceed 10,000 square feet of disturbance will be required to adhere to the stormwater management ordinance. No projects were construction after June 30, 2014 that resulted in a land

cover condition of 16% or greater. Thus, no additional reduction will be required to offset new sources constructed after July 1, 2014 to October 31, 2023.

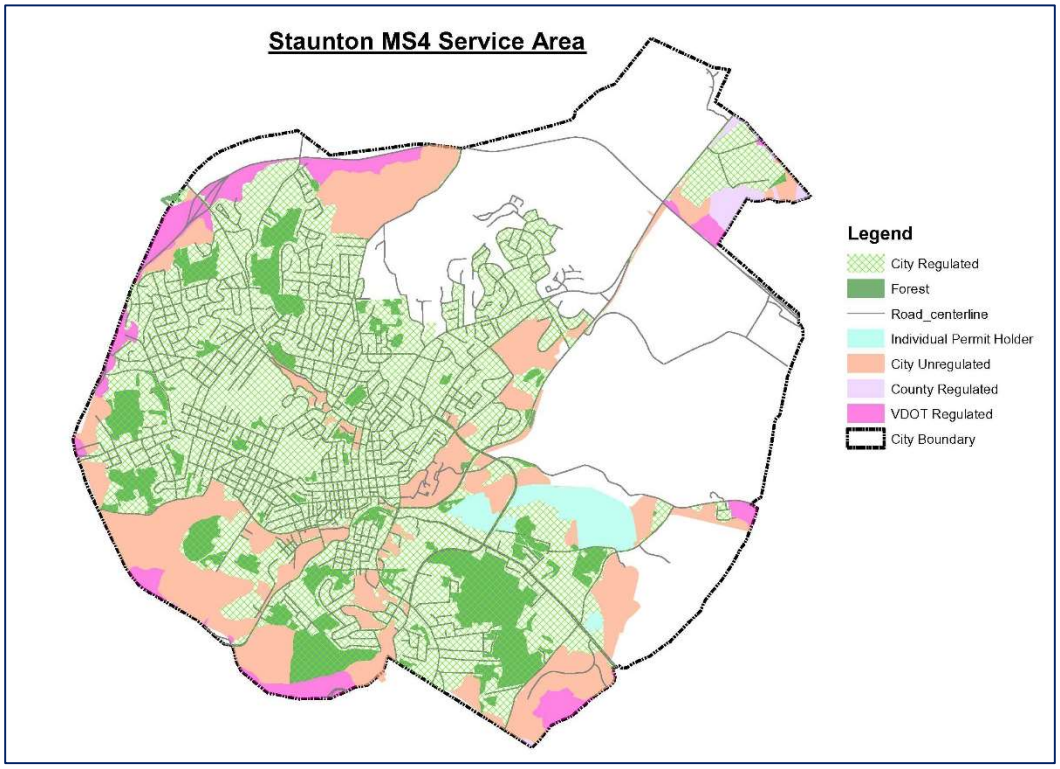
## 4.0 - Estimated Existing Source Loads and Calculated Total Pollutant of Concern Reductions

The Virginia Department of Environmental Quality requires that existing MS4 communities provide Pollutant of Concern (POC) reductions based on the 2009 service area during the current permit cycle (November 1, 2023 to October 31, 2028). As a 2013 MS4 community, Staunton is required to complete the 100% L2 POC reductions during the 2023-2028 permit cycle. The Department of Environmental Quality is currently updating the VPDES general permit (9VAC25-890-40) and has provided a draft fact sheet of the revisions, effective November 1, 2023, and proposed textual changes to Part IIA – Chesapeake Bay TMDL Special Condition. Among other changes, the proposed general permit removes the sediment reduction requirement for Phase III. Staunton's third cycle load reductions have been developed utilizing the 2010 Census data, the 2013-2018 TMDL guidance document, Guidance Memo No. 20-2003 (effective February 3, 2021), the draft fact sheet, and the proposed Part IIA. The following sections describe the methodologies used to determine the potential load reduction requirements.

### 4.1 – MS4 Service Area Delineation Methodology

Existing stormwater mapping, high-resolution aerial photographs (VGIN "Most Recent Imagery"), U.S. Census 2010 urbanized area boundaries, City of Staunton boundaries, and available topographic mapping were utilized to delineate the City's MS4 area. Each of these data sets was integrated into a GIS Environment and delineation determinations were developed utilizing best professional judgement by City Staff. Field investigations were performed in areas where digital data was insufficient to make reasonable determinations. Areas of sheet flow into the City boundary and out from the City boundary were considered. The evaluation identified minimal interactions between VDOT and Augusta County. In accordance with DEQ TMDL guidance, some areas were eliminated from the MS4 regulated area. These include areas already covered by a general VPDES permit, areas which drain to surface waters without connection to MS4 infrastructure, and stream corridors. It is anticipated that further MS4 area refinement will be performed as additional information becomes available. The total MS4 service area was determined to be 4,975 acres.

**Figure 1 – MS4 Service area map**




4.2 – Pervious and Impervious Surface Calculations

The City of Staunton has developed extensive impervious area data sets as part of the implementation and operation of their stormwater utility fee. This data was generated by City engineering staff utilizing a combination of the best available aerial imagery and field verifications. The areas were digitized into GIS mapping. These mapping layers were then integrated into the MS4 service area delineation to determine the total regulated pervious and impervious area. Table 1 provides the acreage of each.

**Table 1 – Regulated Pervious and Impervious Area**

| Subsource | Total Existing Acres Served by MS4 |
|---|---|
| Regulated Urban Impervious | 1,631 |
| Regulated Urban Pervious | 3,344 |

4.3 – Estimating Existing Loads

The regulated urban pervious and impervious acreage was used to estimate the total existing source loads for each POC. The City is located within the Potomac River watershed, thus, the loading rates provided in Table 3b of the proposed Part IIA - Chesapeake Bay TMDL Special Condition state code were used. Table 2 provides a summary of the estimated existing source loads.

**Table 2 - Calculation Sheet for Estimating Existing Source Loads for the Potomac River Basin (Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)**

| Subsource | Pollutant | Total Existing Acres Served by MS4 (6/30/2014) | 2009 EOS Loading Rate (lbs/acre/yr) | Estimated total POC Load Based on 2009 Progress Run (lbs/yr) | Cumulative POC Load Based on 2009 Progress Run (lbs/yr) |
|---|---|---|---|---|---|
| Regulated Urban Impervious | Nitrogen | 1,631 | 16.86 | 27,499 | 61,133 |
| Regulated Urban Pervious | | 3,344 | 10.07 | 33,674 | |
| Regulated Urban Impervious | Phosphorus | 1,631 | 1.62 | 2,642 | 4,013 |
| Regulated Urban Pervious | | 3,344 | 0.41 | 1,371 | |

4.4 – Required Reductions from Existing Loads

The City of Staunton was not required to achieve any reductions during the first permit cycle (July 1, 2013-June 30, 2018). During the second permit cycle (July 1, 2018 – June 30, 2023) the city was required to meet 40% of the calculated reduction goals. The original estimates were based on Guidance Memo No. 15-2005, issued May 18, 2015, effective for the 2013-2018 permit cycle. The estimates have been updated to comply with Guidance Memo No. 20-2003, issued February 6, 2021, for the 2018-2023 permit cycle. The change in methodology between the two guidance memos resulted in only minor decreases to the cumulative reduction required for both the second and third permit cycles.

The load reductions required for the third permit cycles have not been defined in the current TMDL guidance document but are provided in the revisions to the VPDES General Permit discussed in Section 4.0. The loading rates used in the Phase III permit cycle are unchanged from those in the Phase II cycle. Phase III requires an additional 60% reduction in POC discharge for a cumulative total of 100% reduction. The City of Staunton was not able to fully implement the second cycle reductions required due to impacts from the COVID epidemic and the City's need to focus resources on flood recovery and mitigation due to flooding events in 2020. The reductions that were not achieved will be made up during the third permit cycle and are included in the 100% reduction requirements.

Table 3 summarizes the estimated required loads for the Phase III permit cycle. This action plan has been developed to address the third permit cycle reductions and make up reductions from the second permit cycle.

**Table 3 - Calculation Sheet for Determining Total POC Reductions Required During the Third Permit Cycle for Staunton, Virginia (Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)**

| Subsource | Pollutant | Estimated total POC Load Based on 2009 Progress Run (lbs/yr) | Percentage of MS4 required Chesapeake Bay total L2 loading reduction | 100% Cumulative Reduction Required by 10/31/2028 (lbs/yr) | Sum of 100% Cumulative Reduction (lbs/yr) |
|---|---|---|---|---|---|
| Regulated Urban Impervious | Nitrogen | 27,499 | 9% | 2,475 | 4,495 |
| Regulated Urban Pervious | | 33,674 | 6% | 2,020 | |
| Regulated Urban Impervious | Phosphorus | 2,642 | 16% | 423 | 522 |
| Regulated Urban Pervious | | 1,371 | 7.25% | 99 | |

## 5.0 - Means and Methods to Meet Required Reductions

### 5.1 – Introduction

Staunton is required to identify means and methods that may be employed to achieve the required second cycle pollutant reductions identified in Section 4. The following sections describe how the City anticipates achieving the reductions required by the special condition. These strategies were developed using the TMDL Guidance Document published by the Department of Environmental Quality dated February 6, 2021.

### 5.2 – Existing Credits

The City of Staunton will use credits for existing projects and programs that have been previously implemented in accordance with DEQ's TMDL guidance. The city will take credit for BMP's that were installed between January 1, 2006 and June 30, 2009 that have not been previously reported to DEQ. The city will also receive credit for any structural BMP's installed after July 1, 2009, providing treatment for previously untreated areas. Table 4 below identifies existing project crediting for each POC from the Phase I and Phase II permit cycles.

**Table 4 - Existing Load Reductions**

| SITE | Year | BMP TYPE | POLLUTANT REDUCTIONS (lbs/yr) | |
|---|---|---|---|---|
| | | | TN | TP |
| Firehouse Parking Lot | 2010 | Land Use Change | 0.11 | 0.01 |
| Montgomery Hall Park | 2015 | Land Use Change | 0.65 | 0.03 |
| Firehouse Parking Lot | 2013 | Land Use Change | 0.23 | 0.01 |
| Lake Tams Shoreline Stabilization Phase II | 2015 | BMP Retrofit | 366 | 39 |
| Western State Land Conversion | 2024 | Land Use Change | 1,064 | 0 |
| | | **Total** | **1,431** | **39** |

5.3 – New Project Reductions

The City of Staunton developed a study in 2014 that evaluated City owned lands and local streams to identify BMP retrofit potential. The study identified 50 projects that were ranked by cost per pound of POC removal. The city has included two of these projects in their capital improvement program (CIP) during the 2023-2028 permit cycle. Table 5 identifies these projects and anticipated reductions. The city continues to develop additional capital improvement projects that will have a positive impact on water quality. Staunton reserves the right to move forward with additional projects as they are developed and as funding is available. Constituent reductions will be reported in the annual MS4 report. Nutrient bank credits will be applied to the City's TMDL reduction requirements as needed to comply with the L2 load reduction requirements.

**Table 5: Proposed Projects for 2023-2028 Permit Cycle**

| SITE | Year | BMP TYPE | POLLUTANT REDUCTIONS (lbs/yr) | |
|---|---|---|---|---|
| | | | TN | TP |
| Existing Load Reduction | | | 1431 | 39 |
| Peyton Creek Stream Restoration – Constitution Drive Gypsy Hill Park | 2024 | Stream Restoration – Protocol 1 & 2 | 367 | 57 |
| Cole Avenue Stream Restoration – 2384 Cole Avenue | 2025 | Stream Restoration – Protocol 1 (Main channel); Protocol 5 (Tributary) | 50 | 25 |
| | | **Anticipated Projects Subtotal** | **417** | **82** |
| | | **Total Reductions to be Implemented by 2028** | **1,848** | **121** |
| | | Required 3rd Cycle Reductions | **4,495** | **522** |
| | | **Excess Load Reductions** | **(2,647)** | **(401)** |
| | | Nutrient Credits | 4,010 | 401 |
| | | **Total Excess Load Reductions** | **1,363** | **0** |

5.4 – Alternative Strategies

The City of Staunton reserves the right to modify this TMDL action plan to use strategies and/or methodologies that have not been included in this document. Those alternative strategies may be used to replace and/or enhance pollutant reduction strategies presented in the TMDL Action Plan. Alternative strategies may include, but are not limited to:

- Emerging BMP technologies
- Redevelopment credits
- Land use conversions
- Public private partnerships
- Trading

5.5 – Future Considerations

The existing programs and projects identified in Section 5.2 do not meet the required third cycle permit reductions. All the proposed projects presented in Section 5.3 will need to be constructed to meet the TN and TP reductions for the 2023-2028 permit cycle.

## 6.0 - Means and Methods to Offset Increased Loads from New Sources Initiating Construction between July 1, 2009 and June 30, 2014

Land disturbing activities greater than one acre utilizing an average impervious land cover greater than 16% are required to provide additional offsets. The City employed an average land cover condition of 16% for all land disturbing activities between July 1, 2009, and June 30, 2014. No projects where constructed that were greater than one acre that resulted in a greater than 16%

land cover condition. It is not anticipated that additional reductions will be required to offset new sources during this period.

### 7.0 - Means and Methods to Offset Increased Loads from Grandfathered Projects Beginning Construction between July 1, 2014 through October 31, 2023

The City of Staunton is not aware of any projects that qualify as grandfathered projects in accordance with Virginia code 9VAC25-870-48. It is not anticipated that any offset reductions will be required for projects constructed between July 1, 2014 and October 31, 2023. The city will continue to evaluate potential grandfathered projects prior to completion of the Chesapeake Bay action plan.

### 8.0 - Estimated Cost of Compliance and Funding

Compliance with the Chesapeake Bay TMDL will be a costly endeavor for the City of Staunton. Currently, there are few opportunities to achieve state or federal funding for stormwater compliance projects. An opinion of probable costs for compliance has been developed to assist the City for the purposes of financial planning. The future projects identified in this action plan have been included in Staunton's Capital Improvement Plan. However, not all of them have been funded at this time. These projects do not provide enough nutrient reduction for the Phase III permit cycle, so the purchase of nutrient credits will be required unless the city completes additional projects not listed here. These estimates were developed utilizing available BMP costing information and generalized assumptions regarding the applicability of BMP's. More accurate cost estimates will be developed during future planning efforts. Table 6 summarizes the opinion of probable compliance costs in 2023 dollars for the two projects currently planned and estimates the cost to purchase 386 lbs of total phosphorus credits. The city is continuing to evaluate the anticipated costs of full compliance as well as operation and maintenance of current best management practices. The city will also continue to seek grant funding opportunities to advance the program.

**Table 6 – Estimated Third Cycle Compliance Costs**

| Project | Estimated Cost (2023$) |
|---|---|
| Peyton Creek Stream Restoration | $1,511,067 |
| Cole Avenue Stream Restoration | $939,381 |
| Nutrient Credits | $7,300,000 |
| **Total** | $9,750,448 |

## 9.0 - Public Comment on Draft Action Plan

This section to be included upon completion of public comment period.