



## **Chesterfield County, Virginia** **Internal Audit**

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**GREG L. AKERS**  
Director

**DATE:** June 5, 2017

**TO:** Joseph P. Casey, Ph.D.  
County Administrator

**FROM:** Greg L. Akers  
Director of Internal Audit

**SUBJECT:** Environmental Engineering Water Quality Audit

The Office of Internal Audit completed an audit of Environmental Engineering Water Quality, and the final report is attached.

We would like to thank Scott Smedley, Weedon Cloe, Laura Barry, and staff for their cooperation and assistance during this audit.

Attachment

Copy: Bill Dupler, Deputy County Administrator for Community Development  
Scott Smedley, Director of Environmental Engineering  
Weedon Cloe, Water Quality Manager



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# Environmental Engineering Water Quality

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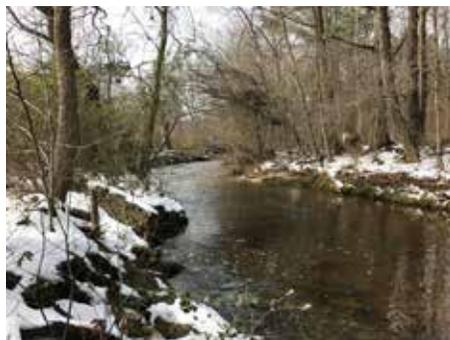
June 5, 2017



Midlothian Mines Creek



Chesterfield Trail Creek



Kingsland Creek



Powwhite Creek

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June 2017

# Highlights

Internal Audit Report to the Board of Supervisors/School Board



## Environmental Engineering Water Quality

### What We Found

#### Background

The Water Quality (WQ) section of Environmental Engineering ensures that development projects within Chesterfield County meet the regulatory requirements of the Chesapeake Bay Preservation Act. Pursuant to Chesapeake Bay Preservation Area Designation and Management Regulations, the Department of Environmental Quality (DEQ) conducts periodic reviews to ensure program compliance.

#### TMDL Program Summary

In 2010, the Environmental Protection Agency established the Chesapeake Bay Total Maximum Daily Load (TMDL) to restore water quality in the Chesapeake Bay by reducing nitrogen, phosphorous, and sediment pollution discharged into the bay from tributaries within the watershed. The Department of Environmental Engineering (DEE) is responsible for overall implementation of the related Municipal Separate Stormwater Sewer System (MS4) permit and reporting requirements. Within DEE, the Water Quality section performs ambient water quality monitoring, while the Stormwater section is responsible for MS4 permit compliance and management.

In 2016, Environmental Engineering developed the required TMDL Action Plan. This Plan is the first of three Chesapeake Bay TMDL Action Plans to be developed by the County during three five-year permit terms (FY15 – FY29). The plan provides a framework for Chesterfield County’s efforts to reduce discharges of nutrients and sediment from MS4 sources. During this first permit cycle (FY15 – FY19) as of FY16, the County has implemented or expects to implement a combination of projects and practices to achieve the required reductions. The projects include regional stormwater treatment facilities, stream restoration and stabilization projects, existing structural Best Management Practice (BMP) enhancements and outfall retrofits, and installation of new treatment facilities.

#### Commendations

RPA program testing was completed with no findings; we commend the Water Quality section for:

- Their program to ensure RPA construction projects obtain Resource Protection Area Designation (RPAD) and Water Quality Impact Assessment (WQIA) required for Chesapeake Bay Preservation Act compliance, and
- Implementing a Soil and Water Quality Conservation assessment plan for all active agriculture lands within the County’s Chesapeake Bay RPAs.

#### Required Resource Protection Area Application Not on File for Approved Building Permit

A test of 25 projects requiring a building permit located in an RPA revealed 1 project did not have a required RPAD application on file. Chesapeake Bay RPA violations can lead to court action requiring payment of fines and/or an individual RPA restoration plan.

Management concurred with 1 of 1 recommendations to be implemented by May 1, 2018.

We appreciate the cooperation received from management and staff while conducting this audit.

### Why We Did This Review

Internal Audit conducted this review as part of our FY17 audit plan approved by the County Administrator and School Board Superintendent.

The audit focused on reviewing Water Quality section records for security, accuracy, and compliance. In particular, our objectives were to:

- Verify Resource Protection Area (RPA) compliance with Chesapeake Bay Preservation Act.
- Verify action plan is present for June 2016 DEQ audit recommendation.
- Provide TMDL program summary.
- Report results to County Administrator.

### What We Recommend

- Environmental Engineering implement a control to determine if a project requires additional Water Quality Impact Assessment (WQIA) application, review, and inspection.



For more information, please contact Greg L. Akers, at 804-748-1240 or akersg@chesterfield.gov

## **INTRODUCTION**

### **BACKGROUND**

The Environmental Engineering Water Quality audit was a regularly scheduled audit on the FY17 audit plan approved by the County Administrator and School Superintendent. The Department of Environmental Engineering is divided into two functional divisions:

Development Division – performs plan reviews, inspections and floodplain management, and customer service.

Watershed Management Division – performs drainage maintenance operations, Best Management Practice (BMP) maintenance and inspections, water quality, stormwater permit management, and street signing.

The Water Quality section, within the Watershed Management Division, has processes in place to ensure that development projects within Chesterfield County meet the regulatory requirements of the Chesapeake Bay Preservation Act. In addition, the section is tasked with managing the ambient water quality monitoring component of the County’s Virginia Stormwater Management Program (VSMP) Municipal Separate Storm Sewer System (MS4) permit. Projects performed by the Water Quality section include: plan/plat reviews, Resource Protection Area Designation (RPAD) confirmations, and Water Quality Impact Assessments (WQIAs).

The Department of Environmental Quality (DEQ) ensures water resources remain clear and abundant by establishing water quality standards, developing policy, and performing compliance reviews. Pursuant to Chesapeake Bay Preservation Area Designation and Management Regulations, the DEQ conducts periodic reviews to ensure program compliance. Through this process, the County has an independent resource to ensure programs are in place to provide Chesterfield County with clean and abundant water sources.

### **TMDL PROGRAM SUMMARY**

In 2010, the Environmental Protection Agency established the Chesapeake Bay Total Maximum Daily Load (TMDL), putting Virginia, along with five other states and the District of Columbia on what has been called a “pollution diet.” Its objective is to restore water quality in the Chesapeake Bay by reducing nitrogen, phosphorous, and sediment pollution discharged into the bay from tributaries within the watershed.

In 2014, the County was reissued its MS4 permit. The permit authorizes the discharge of stormwater from the MS4 and requires the implementation of programs which control and manage stormwater to reduce the discharge of pollutants to surface waters. The Department of Environmental Engineering (DEE) is responsible for overall implementation of the permit and reporting requirements. Within DEE, the Water Quality section performs ambient water quality monitoring, while the Stormwater section is responsible for MS4 permit compliance and management.

**TMDL PROGRAM SUMMARY (continued)**

In 2016, Environmental Engineering staff developed the Chesapeake Bay TMDL action plan as required by the Chesapeake Special Condition component within Chesterfield County’s MS4 permit. This Plan is the first of three Chesapeake Bay TMDL Action Plans to be developed by the County during three five-year permit terms (FY15 – FY29). The plan provides a framework for Chesterfield County’s efforts to reduce discharges of nutrients and sediment from MS4 sources. During this first permit cycle (FY15 – FY19) as of FY16, the County has implemented or expects to implement a combination of projects and practices to achieve the required reductions. The projects include regional stormwater treatment facilities, stream restoration and stabilization projects, existing structural best management practice (BMP) enhancements and outfall retrofits, and installation of new treatment facilities.

Projects planned to meet required reductions during the first permit cycle:

<b>Project Name</b> (Source: Chesterfield County Chesapeake Bay TMDL Action Plan)
Midlothian Mines Stream Restoration
Wrens Nest Stream Restoration
Regional Stormwater Facility Little Tomahawk Creek (LTC) 20/25
Proctors Creek Outfall Retrofits
James River High School BMP Retrofits
Pocoshock Creek Stream Restoration
County Safety Complex BMP Retrofits
Bailey Bridge MS Outfall Retrofits

**OBJECTIVES**

Objectives of the audit were to:

- Verify Resource Protection Area compliance with Chesapeake Bay Preservation Act.
- Verify action plan is present for June 2016 Department of Environmental Quality audit recommendation.
- Provide TMDL program summary.
- Report results to County Administrator.

## SCOPE

Our audit work covered processes and transactions in FY16 and current operating environment. The prior calendar year was also included in some procedures to obtain a larger project population for Resource Protection Area (RPA) testing.

We considered the following County Administrative Policies and Procedures:

Accounting 1-11: County Capital Projects	Current regulations regarding Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC25-830)
Chesterfield County Environmental Engineering Standard Operating Procedures	Chesterfield County Ordinance – Chapter 17: Subdivision of Lane
Chesterfield County Resource Protection Area Guidance	Chesterfield County Ordinance – Chapter 19: Chesapeake Bay Preservation Areas

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Steve Sanderson, Senior Auditor, and Richard Slate, Staff Auditor, performed the audit work. Chesterfield County Internal Audit is a department within the organization of Chesterfield County/Schools.

## METHODOLOGY

Detailed information regarding the methodology can be found in the individual findings listed in the report. Our methodology included the following:

- Obtained CY15 and CY16 RPAD and WQIA project listing from Water Quality section to verify procedures were in place to comply with the Chesapeake Bay Preservation Act.
- Compared building permits to Geographic Information System to determine if RPAD or WQIA was required and performed.
- Acquired June 2016 DEQ audit and December 2016 compliance letter to County Administrator to determine that an action plan was in place to satisfy recommendation.
- Used TMDL program information from County budget, local news articles, and Environmental Engineering to create summary.

### **INTERNAL CONTROL CONCLUSION**

According to Government Auditing Standards, internal controls, in the broadest sense, encompass the agency's plan, policies, procedures, methods, and processes adopted by management to meet its mission, goals, and objectives. Internal controls include the processes for planning, organizing, directing, and controlling program operations. It also includes systems for measuring, reporting, and monitoring program performance. An effective control structure is one that provides reasonable assurance regarding:

- Efficiency and effectiveness of operations;
- Accurate financial reporting; and
- Compliance with laws and regulations.

Based on the results and findings of the audit test work, auditors concluded that internal controls were in place and there were minimal findings to question their ability to assist management in meeting its mission, goals, and objectives. Recommendations specific to improving these controls can be found in detail further in the audit report.

### **CLOSING**

We would like to thank Scott Smedley, Weedon Cloe, Laura Barry, Rebecca Stewart, and staff for their cooperation and assistance during the course of this audit.

## FINDINGS, RECOMMENDATIONS, RESPONSES

### Commendations

(Point Sheet C-1.2)

#### **CRITERIA:**

The Chesapeake Bay Preservation Act, enacted by the Virginia General Assembly in 1988, provides regulations and guidance for improving water quality in the Chesapeake Bay and other Virginia waters. The Water Quality section uses Resource Protection Area Designation (RPAD) applications and Water Quality Impact Assessment (WQIA) applications to review certain projects before they begin.

Pursuant to Chesapeake Bay Preservation Area Designation and Management Regulations, the Department of Environmental Quality (DEQ) conducts periodic reviews to ensure program compliance.

#### **CONDITION(S):**

Testing below was completed with immaterial, if any, findings noted:

15 applications for projects within an RPAD were tested for completeness. All of the application steps were initiated by Water Quality section staff, the results were added to the GIS (Geographic Information System), and there were appropriate explanations for any delays.

12 projects requiring a WQIA were tested. All of the applications tested included the required site documentation and land owner notification upon project completion.

A June 2016 DEQ compliance review determined a Soil and Water Quality Conservation assessment plan was not present for all active agriculture lands within the County's Chesapeake Bay Resource Protection Areas (RPAS). As a result, the Water Quality section implemented a plan.

#### **CAUSE:**

Water Quality section staff followed effective internal control policies and procedures during the period.

#### **EFFECT:**

Water Quality section staffs' effective and efficient management of public assets helps the County reach its goal of being a model for excellence in government. Chesterfield County's Chesapeake Bay Preservation Act program has no Virginia Code compliance findings.

#### **COMMENDATION:**

We commend the staff of the Water Quality section for no Chesapeake Bay Preservation Act compliance findings.

## FINDINGS, RECOMMENDATIONS, RESPONSES

### Building Permit Coordination

(Point Sheet C-1.1)

#### **CRITERIA:**

Per the Chesterfield County Chesapeake Bay Preservation Area Ordinance, the Resource Protection Area Designation (RPAD) process identifies perennial streams and connected/contiguous wetland features that necessitate a 100' wide buffer required to remain in a natural state. If a construction project is identified as having a Resource Protection Area (RPA) onsite or the potential presence of environmental features requiring an RPA, it may require further evaluation by the Water Quality (WQ) section before building permit issuance. When environmental features must be evaluated, an RPAD process is completed to identify the extent of the RPA onsite. Projects should be designed to not impact RPAs. In cases where the project will impact an RPA, the Chesterfield County Resource Protection Area Development and Encroachment Guidance illustrates the processes by which certain projects may encroach into an RPA. These projects must submit a RPA Buffer Modification Request application to the WQ section. The WQ section reviews and approves the request and supporting materials before allowing a project to begin.

#### **CONDITION:**

In 2016, there were 272 projects requiring a building permit located on parcels with a RPA present and/or demonstrated potential environmental features requiring an RPAD. Internal Audit tested 25 to determine if prior to permit issuance, an RPAD was required and completed or if the project impacted an RPA, an Encroachment Request was required and completed. 1 of 25 (4%) projects tested required an RPAD to be completed and did not have the required RPAD on file. Further review of this project demonstrated that all construction activities were conducted greater than 100 feet from environmental features.

#### **CAUSE:**

Environmental Engineering staff review projects and make decisions on need for WQIA application without consulting the Water Quality section.

#### **EFFECT:**

A required Resource Protection Area application was not prepared. Chesapeake Bay Resource Preservation Area violations can lead to court action requiring payment of fines and/or an individual RPA restoration plan.

#### **RECOMMENDATION:**

1. We recommend Environmental Engineering implement a control for the Water Quality section to determine if a project in a Resource Protection Area (RPA) requires additional WQIA application, review, and inspection.

#### **MANAGEMENT'S RESPONSE:**

1. *Concur. W. Weedon Cloe, Water Quality Manager, is responsible for implementing by May 1, 2018. The Community Development Division's Enterprise Land Management program, scheduled to launch in Spring 2018, incorporates the Water Quality Section as a reviewer for building permits and plans.*