

ROANOKE COUNTY, VIRGINIA  
TOTAL MAXIMUM DAILY LOAD (TMDL) ACTION PLAN  
FOR

Roanoke River PCB TMDL Development (Virginia)



June 30, 2016  
*Revised December 6, 2016*

## Executive Summary

Polychlorinated Biphenyls (PCBs) are a family of 209 man-made chemicals that were widely used in electrical and heat transfer equipment from 1929 and 1979. However, a 1970 study found that PCBs were carcinogens (cancer-causing agents), which ultimately lead to their manufacturing ban. Over a number of years, the Virginia Department of Environmental Quality (DEQ) conducted various types of monitoring in order to assess the PCB pollution in the Roanoke River and its tributaries. Based on the monitoring results, a PCB Total Maximum Daily Load (TMDL) for waterbodies in the Roanoke River watershed was approved on December 9, 2010 by the Virginia State Water Control Board. The TMDL established PCB wasteload allocations (WLA) for stormwater discharges from the County's Munciple Separate Storm Sewer System (MS4) into Mason Creek, Peters Creek, Tinker Creek, Wolf Creek, an unnamed tributary to the Roanoke River, and the Roanoke River.

In order to comply with the County's General MS4 Permit, the County is required to develop a TMDL Action Plan that details how the County will reduce PCBs discharged through the MS4 while also providing enhanced public education and outreach and employee training programs. As described in the PCB TMDL Action Plan, the County will concentrate on interrupting the PCB pathway from current sources to the receiving waters. Given the widespread distribution of potential current sources, the County will direct its initial efforts on increasing the public and county staff's general awareness regarding PCB current sources. Increased awareness will lead to better implementation of pollution prevention strategies and ultimately minimize the discharges from current sources of PCBs. The County will utilize existing Best Management Practices (BMPs) found in the Roanoke County MS4 Program Plan, as revised March 23, 2015, to minimize the potential of PCBs discharging from sources within the MS4 service area and into the impaired waters. The County will measure the effectiveness of these efforts by documenting compliance with the schedules and milestones included within.

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## Acronyms and Definitions

### Acronyms

BOS	Roanoke County Board of Supervisors
BMP	Best Management Practice(s)
CIP	Capital Improvement Plan
DEQ	Virginia Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
LA	Load Allocation
MCM	Minimum Control Measure
MG	Milligram
MOS	Margin of Safety
MS4	Municipal Separate Storm Sewer System
MS4 General Permit	Virginia General Permit for Stormwater Discharges from Small MS4s
PCBs	Polychlorinated Biphenyls
PCBs TMDL	Final Roanoke River PCBs TMDL Development (Virginia)
POC	Pollutant(s) of Concern
PPM	Parts per Million
Special Condition	Special Conditions for Approved TMDLs Other than the Chesapeake Bay TMDL
SOP	Roanoke County Standard Operating Procedures
TMDL	Total Maximum Daily Load
VPDES	Virginia Pollutant Discharge Elimination System
WLA	Wasteload Allocation
WQBELs	Water Quality Based Effluent Limits
YR	Year

### Definitions

- Current Sources of PCBs:- Current sources generate PCB loads that have a defined, disruptable pathway to a water body. Such sources, in theory, can be controlled without eliminating the source of PCBs by blocking the pathway. Examples of current sources include PCB-contaminated soils that wash from upland areas, leachate from landfills and industrial disposal areas, leaking transformers and storage containers, discharges of PCB-contaminated effluent, local deposition of atmospheric PCBs accumulated from off-gassing contaminated sites, and a variety of other sources.
- Legacy Sources of PCBs: Legacy sources generate PCB loads to a water body that cannot be easily controlled because there is no disruptable pathway from the source to the affected water body. Control of the source requires direct removal. In all cases, the source exists at an interface with the water body where there is a continuous exchange of material. Examples of legacy sources include in-stream contaminated sediments, stream bank soils that are not part of a contaminated site, biota, and atmospheric deposition to surface waters.

## Chapter 1. Introduction

Polychlorinated Biphenyls (PCBs) are a family of 209 man-made chemicals that were manufactured between 1929 and 1979. Certain properties held by PCBs made them very attractive for use in electrical or heat transfer equipment and machinery; paints, plastics, and rubber materials, as well as pigments, dyes, carbonless copy paper, and numerous other materials. These desirable properties include chemical stability, high-boiling points, and non-flammability. In the 1970s, studies found that PCBs were carcinogens (cancer-causing agents), which caused their manufacturing to be banned in the United States in 1979.

As a result of their past prolific use and their chemical stability, PCBs are still found in the environment today. Historic releases and spills of these slowly decomposing organic compounds have contributed to their accumulation in the sediments and stream bottoms of many streams and rivers, including the Roanoke River and some of its tributaries. PCB-containing equipment and materials manufactured before 1979 that remain in use today likely still contain PCBs; such products may serve as current sources of PCBs if they are not maintained and disposed of in proper fashion. Deposition of minute concentrations of PCBs found in the atmosphere and the release of soils contaminated with PCBs, which are picked up and carried into downstream water bodies, represent other current sources of PCB pollution. The releases of PCBs from legacy and current sources have led to present day water pollution concerns, since impacted water bodies cannot meet federal and state water quality standards.

The physical properties of PCBs vary based on their exact molecular composition but, in general, have no taste or smell and range in consistency from light-colored oily liquids to colorless or yellowish waxy solids. They are generally hydrophobic and readily attach to sediment particles. Once PCBs have been discharged into water bodies and deposited in sediments, they break down slowly and are released back into the water column. As bottom-feeding organisms filter the contaminated sediments, PCBs accumulate in their bodies. When other animals, such as fish and birds, eat organisms lower in the food chain, the PCB concentrations accumulate in their bodies at a higher concentration. This biological magnification of PCB levels in the food chain causes threats to animals and humans. In fact, the Virginia Department of Health has placed health advisories on the Roanoke River due to PCBs. Within the Roanoke Valley, upstream from the Niagara Dam, the Virginia Department of Health recommends avoiding or limiting consumption of carp, redbreast sunfish, redhorse sucker, smallmouth bass, largemouth bass, rock bass, and bluehead chub.

Over a number of years, the Virginia Department of Environmental Quality (DEQ) has conducted various types of monitoring (i.e., in fish tissue, sediment, and water) in order to assess the PCB pollution in the Roanoke River and its tributaries. Based on this monitoring, the United States Environmental Protection Agency (EPA) published a Total Maximum Daily Load (TMDL) study in December 2009 entitled: *Final Roanoke River PCB TMDL Development (Virginia)*. A TMDL is the maximum amount of a pollutant that a water body can receive and still meet water quality standards. For Roanoke County water bodies, those standards are established by Virginia Code §62.1-44.15.3a. When a water body is found to not meet the water quality standards, it is considered impaired and a TMDL is developed. The TMDL identifies the pollutants that are causing the impairment, the pollutant sources, and how much the pollutant must be reduced in order for the water body to meet water quality standards. TMDLs consider all sources of pollutants including those from non-point, or unregulated sources, such as agriculture and urban land uses, and those from point, or regulated sources, such as industrial or municipal treatment plants, industrial stormwater, and municipal separate storm sewer systems (MS4s).

A TMDL contains three separate components:

- The portion of the maximum pollutant load assigned to unregulated non-point pollutant sources is known as a load allocation (LA).
- The portion of the maximum pollutant load assigned to regulated point sources is known as the wasteload allocation (WLA).
- The final portion of the maximum pollutant load not assigned to either the LA or the WLA, but kept in reserve as a margin of safety (MOS).

Each component is contained in the following equation: TMDL = WLA + LA + MOS

While a TMDL incorporates the required reductions for both non-point sources and point sources, TMDL Implementation Plans are developed for reducing LA from only non-point sources through voluntary implementation. Point sources are required to implement pollutant reduction actions sufficient to meet WLAs to comply with Virginia Pollutant Discharge Elimination System (VPDES) permits. The Roanoke County MS4 is considered a point source under the federal Clean Water Act and the Virginia State Water Control Law and is regulated under the Virginia General Permit for Stormwater Discharges from Small MS4s (MS4 General Permit). The MS4 General Permit contains a Special Condition that requires Roanoke County to develop and implement a TMDL Action Plan for any TMDL that includes a specific wasteload for pollutant(s) allocated to the MS4 for each of the approved TMDLs (Attachment 1).

The PCB TMDL, approved by EPA on April 9, 2010 and subsequently by the Virginia State Water Control Board on December 9, 2010, established numeric TMDLs for waterbodies in the Roanoke River watershed (Table 1). The TMDLs WLAs are for all regulated discharges (VPDES individual permits and MS4s).

**Table 1. Virginia Water Bodies with PCB TMDLs Located within the Roanoke County Jurisdictional Boundaries**

Upper Roanoke River PCB TMDL Individual Water body TMDL	Overall TMDL		
	WLA (mg/yr)*	LA (mg/yr)	MOS (mg/yr)
Mason Creek	9.1	193.2	10.6
Peters Creek	65.4	31.2	5.1
Tinker Creek	103.9	3,414.2	185.2
Wolf Creek	10.0	20.3	1.6
Unnamed Tributary to the Roanoke River	0.5	1.3	0.1
Roanoke River	28,157.7	3,455.7	1,663.9

\*Includes allocations to VPDES individual permits and MS4s (Cities of Roanoke and Salem, and Roanoke County).

The PCBs TMDLs WLAs are further broken down to provide a WLA for Roanoke County's MS4 area including allocated wasteloads for the Roanoke County MS4 for stormwater discharges into Mason Creek, Peters Creek, Tinker Creek, Wolf Creek, an unnamed tributary to the Roanoke River and the Roanoke River (Table 2).

**Table 2. PCB TMDL Wasteloads Allocated to the Roanoke County MS4\***

TMDL	Roanoke County		
	Existing Baseline (mg/yr.)	WLA (mg/yr.)	Percent Reduction
Mason Creek	12.4	0.1	99.050%
Peters Creek	490.0	4.7	99.050%
Tinker Creek	4,045.4	38.4	99.050%
Wolf Creek	1,053.2	10.0	99.050%
Unnamed Tributary to the Roanoke River	52.8	0.5	99.050%
Roanoke River	5,038.7	47.9	99.050%

\*Although the Town of Vinton has a MS4 permit, the TMDL inadvertently did not issue any WLAs to the Town of Vinton's MS4 area. The WLAs that should have been allocated to the Town were, instead, included in Roanoke County's WLAs.

The MS4 General Permit Special Condition to address TMDLs requires the development of a TMDL Action Plan that includes:

- A list of its legal authorities, such as: ordinances, state and other permits, orders, specific contract language, and inter-jurisdictional agreements applicable to reducing the pollutant identified in each applicable WLA;
- An updated list of all additional management practices, control techniques, system designs, and engineering methods -- beyond those implemented to meet the MS4 General Permit Minimum Control Measures (MCMs) -- which have been implemented as part of the MS4 Program Plan and are applicable to reducing the pollutants of concern (POCs) identified in the WLA;
- An enhanced public education, outreach, and employee training program to promote methods to eliminate and reduce discharges of the POCs identified in the WLA;
- Identification and assessment of potential significant sources of pollutant(s) from facilities of concern owned or operated by the County, not covered under a separate VPDES permit; and
- A method to assess TMDL Action Plans for their effectiveness in reducing the POCs identified in the WLAs.

This Roanoke County PCB TMDL Action Plan contains these requirements in the following Chapters:

- Chapter 1. Introduction to the PCB TMDL and its Impact on Roanoke County
- Chapter 2. Watershed Descriptions
- Chapter 3. Roanoke County Legal Authorities
- Chapter 4. Roanoke County Municipal Property Assessment
- Chapter 5. PCB TMDL Action Plan Schedule and Milestones
- Chapter 6. PCB TMDL Action Plan Assessment
- Chapter 7. Follow-up and MS4 Annual Reporting

## Chapter 2. County Watershed Descriptions

Individual general watershed descriptions are provided below for those watersheds in the County's MS4 that were allocated a wasteload in the PCB TMDL. Maps associated with these watersheds were drawn using the U.S. Census Bureau's 2000 Roanoke Urbanized Area boundaries rather than 2010 Urbanized Area boundaries (Figure 1). Wasteloads were calculated in the TMDL using the 2000 Urbanized Area. PCB loads from those areas of the County which were newly added in the 2010 Urbanized Area were addressed as part of the TMDL load allocation. The Virginia Department of Environmental Quality (DEQ) must modify the PCB TMDL before these loads become part of the County's wasteloads.

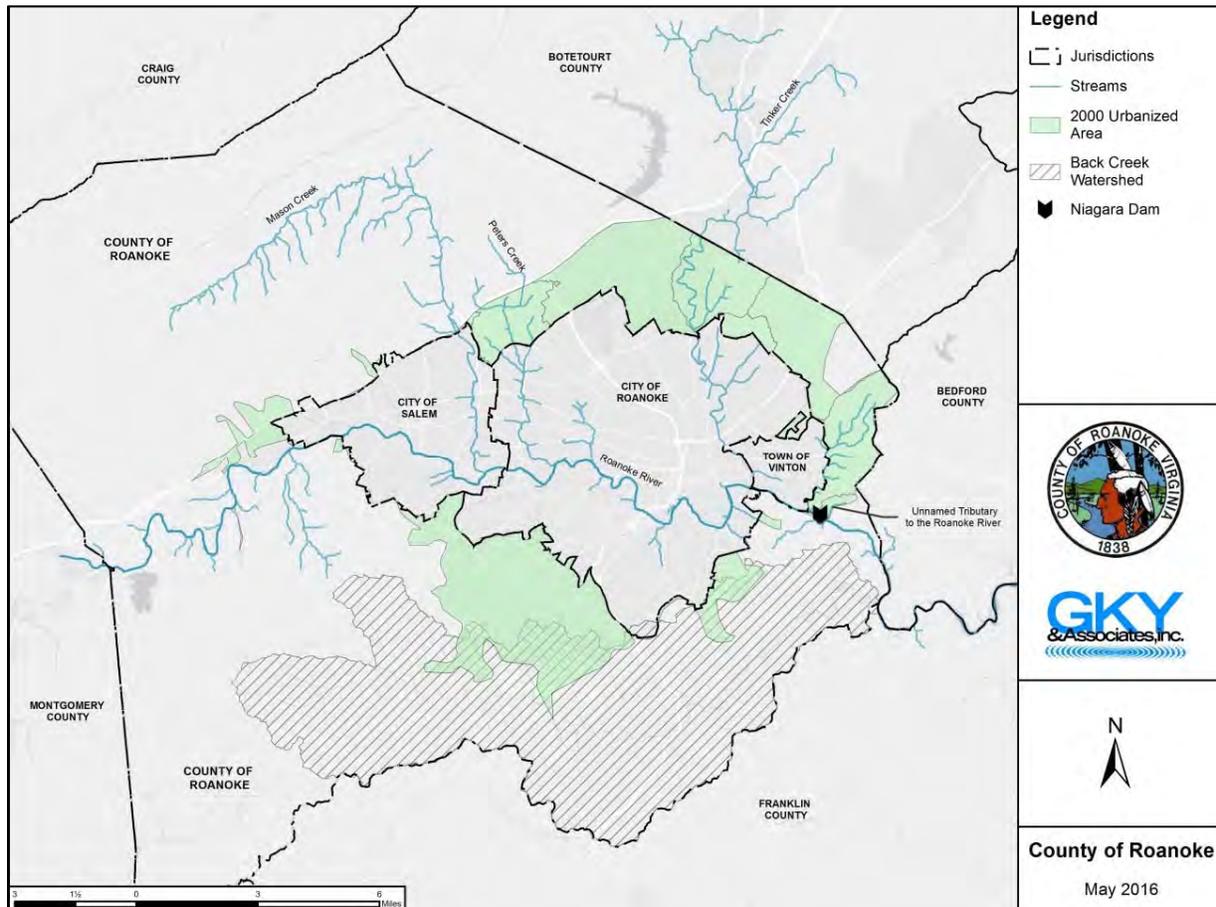


Figure 1. Roanoke County Watersheds with PCB TMDL Wasteload Allocations Based on the 2000 U.S. Census Bureau's Roanoke Urbanized Area

### Mason Creek

The Mason Creek watershed is located in the north central portion of the County; it receives runoff from the County, as well as the Cities of Roanoke and Salem, and it enters the Roanoke River upstream of the Niagara Dam (Figure 2). According to the 2013 County of Roanoke MS4 Program Plan, the primary land uses in the Mason Creek watershed are forest / open space (80%) and residential (10%). The County's 2000 MS4 urbanized drainage area for Mason Creek totals 71 acres to which a PCB wasteload of 0.1 mg/yr. was allocated.

### Peters Creek

The Peters Creek watershed is located in the central portion of the County. It receives runoff from Roanoke County and the cities of Roanoke and Salem, and it enters the Roanoke River upstream of the Niagara Dam (Figure 3). According to the 2013 County of Roanoke MS4 Program Plan, the primary land uses in the Peters Creek watershed

are residential (40%) and forest / open space (35%). The County's MS4 urbanized drainage area for Peters Creek totals 1,551 acres, to which a PCB wasteload of 4.7 mg/yr. was allocated.

### **Tinker Creek**

The Tinker Creek watershed is located in the northeast portion of the County. It receives runoff from the counties of Roanoke and Botetourt, the cities of Roanoke and Salem, and the Town of Vinton, and it enters the Roanoke River upstream of the Niagara Dam (Figure 4). According to the 2013 County of Roanoke MS4 Program Plan, the primary land uses in the Tinker Creek watershed are forest / open space (50%) and agricultural (25%). The County's MS4 urbanized drainage area for Tinker Creek totals 2,678 acres, to which a PCB wasteload of 38.4 mg/yr. was allocated.

### **Wolf Creek**

The Wolf Creek watershed is located in the eastern portion of the County. It receives runoff from the County and the Town of Vinton, and it enters the Roanoke River upstream of the Niagara Dam (Figure 5). According to the 2013 County of Roanoke MS4 Program Plan, the primary land uses in the Wolf Creek watershed are forest / open space (40%) and residential (35%). The County's MS4 urbanized drainage area for Wolf Creek totals 1,472 acres, to which a PCB wasteload of 10.0 mg/yr. was allocated.

### **Unnamed Tributary to the Roanoke River**

The unnamed tributary to the Roanoke River associated with the Upper Roanoke River TMDL is identified as Watershed Segment 3032, which is located in the eastern portion of the County. The unnamed tributary runs parallel to the Blue Ridge Parkway on National Park Land (Figure 6). The primary land uses in the unnamed tributary watershed is forest / open space with the urbanized area of 191 acres being primarily residential. County GIS data indicates limited stormwater infrastructure in the watershed, primarily draining a limited residential area west of the tributary. The tributary discharges downstream of the Niagara Dam; however, it was still allocated a PCB wasteload of 0.5 mg/yr.

### **Roanoke River**

The Roanoke River bisects Roanoke County running from west to east. The upper Roanoke River, which is the applicable portion of this Action Plan, begins from its headwaters downstream to the Niagara Dam (Figure 7). MS4 permit holders physically interconnected with the County include the County of Botetourt, the Cities of Salem and Roanoke, the Town of Vinton, the Virginia Department of Transportation and the Virginia Western Community College. The primary land uses for areas outside of the specific tributaries mentioned above and for Back Creek, which discharges into the Roanoke River below the Niagara Dam, include forest / open space and residential. Limited commercial land use is spread throughout the watershed, and pockets of industrial land use are found in the northwest and west central portions of the County. The County MS4 urbanized drainage area for the Roanoke River is approximately 17,894 acres, for which a PCB wasteload of 47.9 mg/yr. was allocated.

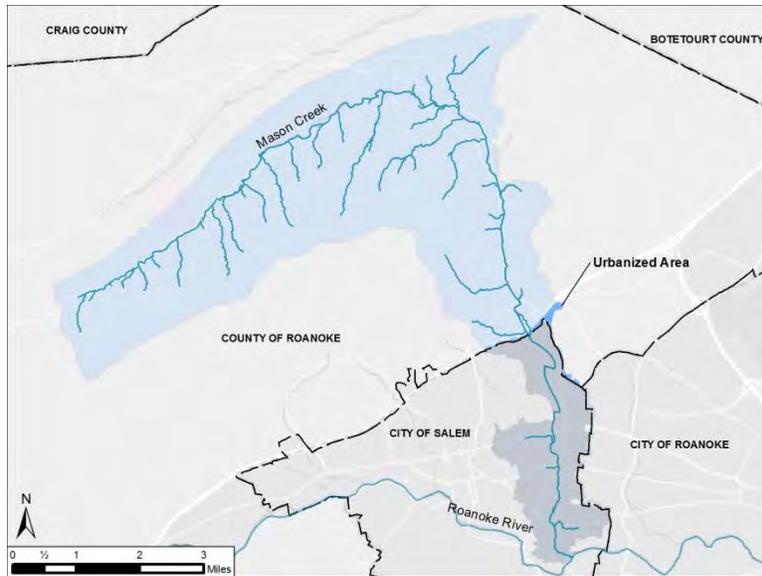


Figure 2. Mason Creek Watershed denoting the 2000 MS4 Service Area (Urbanized Area)

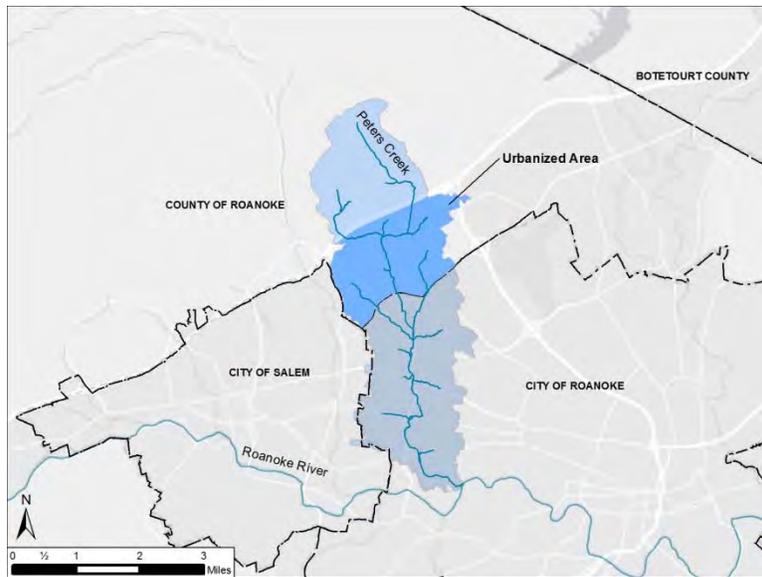


Figure 3. Peters Creek Watershed denoting the 2000 MS4 Service Area (Urbanized Area)

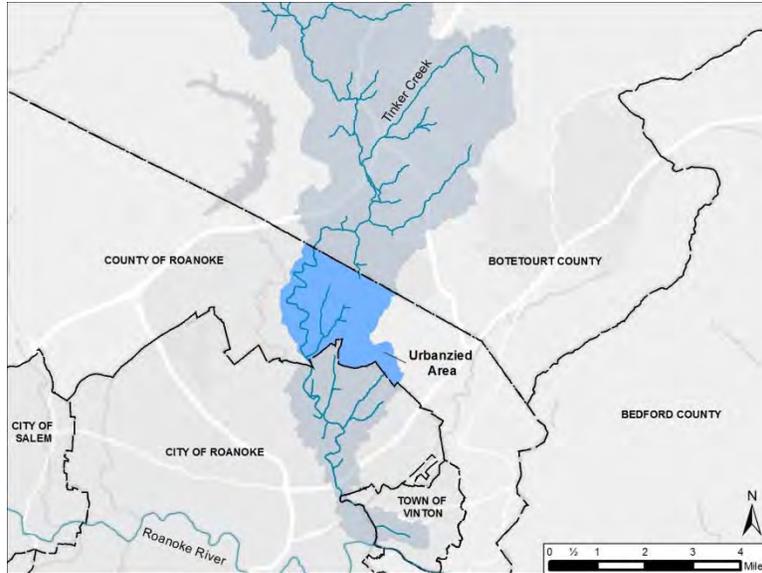


Figure 4. Tinker Creek Watershed denoting the 2000 MS4 Service Area (Urbanized Area)

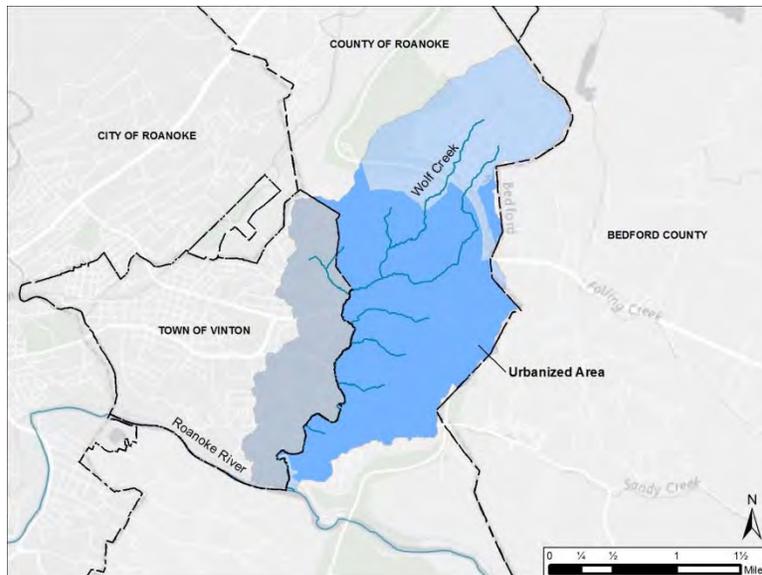


Figure 5. Wolf Creek Watershed denoting the 2000 MS4 Service Area (Urbanized Area)

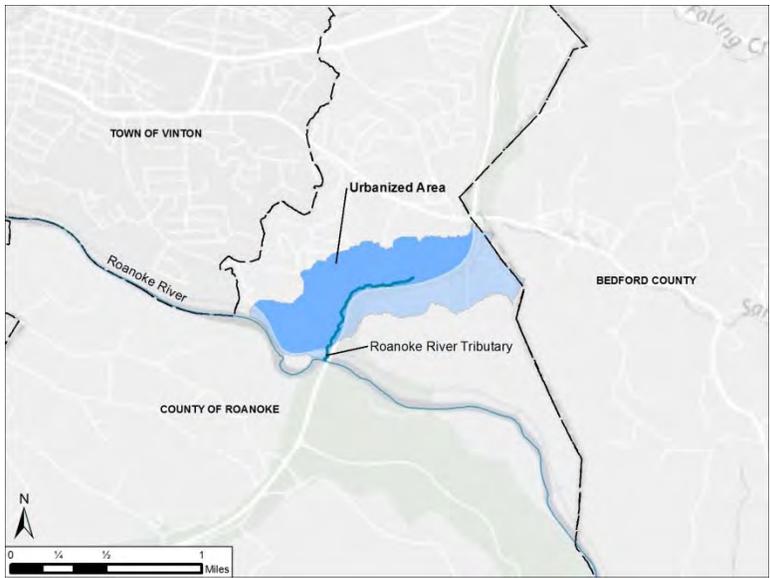


Figure 6. Unnamed Tributary Watershed denoting the 2000 MS4 Service Area (Urbanized Area)

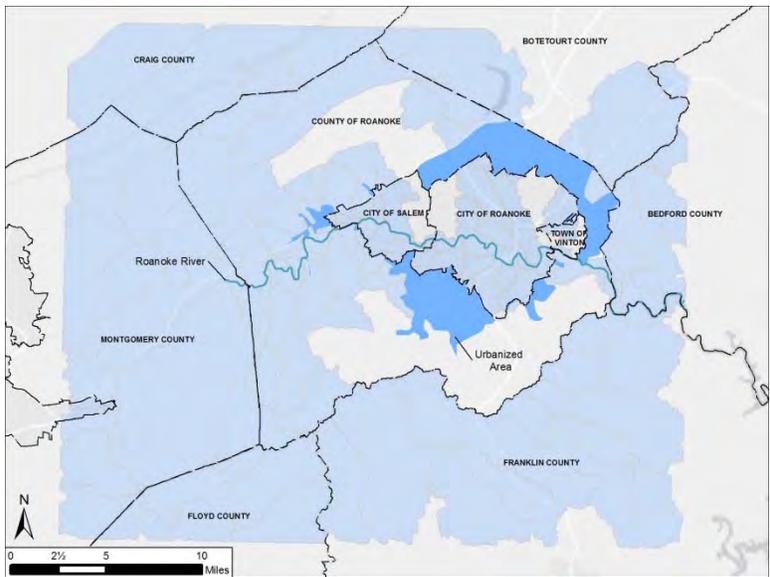


Figure 7. Remaining Roanoke River Watershed denoting the 2000 MS4 Service Area (Urbanized Area)

## **Chapter 3. Roanoke County Legal Authorities**

As part of the PCBs TMDL Action Plan, Roanoke County is required to maintain a list of its legal authorities that are applicable in minimizing the PCBs being discharged from the MS4 into the impaired waters. Legal authority is granted by the Roanoke County Board of Supervisors (BOS) and can be in the form of statute(s), ordinance(s), permits, orders, specific contract language, or inter-jurisdictional agreements. Ordinances passed by the BOS are included in the County's Codified Ordinances, which are available via the County's website.

The PCBs TMDL states that the "widespread use of PCBs before their ban coupled with their stable molecular nature has caused a general distribution of the pollutant in air, soil, and water." Significant PCB sources, such as that of atmospheric deposition from sources outside the County and legacy PCBs deposited along the riverbanks, are outside the County's legal control. The attempt to regulate the actual discharge of PCBs into the County's MS4 and its receiving waters would be futile, as the pollutants are so widespread and in such minute quantities. For this reason, the County will implement a pollutant minimization approach based on interrupting the PCBs pathway from potential current sources before the PCBs can enter the impaired waterbodies. The County will first concentrate on increasing both public and County employee awareness regarding current potential PCB sources and how to interrupt their entry into the County's MS4. This does not require legal authority from the Roanoke County BOS. Where applicable, the County will utilize various sections of existing County Code to interrupt the pathway of PCBs from current sources. As PCBs are not currently being overtly discharged, the County will concentrate on minimizing potential PCBs pollution from current sources such as contaminated sediments, localized air deposition as a result of local burning activities, and illegal dumping. The applicable County ordinances for these types of actions are described, as follows:

### **Chapter 8.1 – Erosion and Sediment Control**

PCBs in the environment can attach themselves to sediment and be transported by stormwater runoff to nearby receiving waters; therefore, in an effort to interrupt the flow path of these harmful chemicals to the MS4 and local waterways, the County will continue to implement its local Erosion and Sediment Control Program. Under Chapter 8.1 of the County Code, operators of land-disturbing activities greater than 2,500 square feet will continue to be required to prepare and implement either an "Agreement in Lieu of an Erosion and Sediment Control Plan" or a formal Erosion and Sediment Control Plan. The County's erosion and sediment control permitting threshold of 2,500 square feet is less than the state required permitting threshold of 10,000 square feet due to the County's commitment to control sediment discharges from regulated land disturbing activities. Implementation of these documents will help to minimize loosened sediments from leaving construction sites and, by default, also minimize any attached PCBs from entering the impaired receiving waters.

### **Chapter 9 – Fire Prevention and Protection**

The County will continue to implement its restrictions on open burning. This interrupts the pathway of PCBs entering the MS4 as a result of localized atmospheric deposition. Under Chapter 9, neither open burning nor the use of a special incineration device for the disposal of hazardous wastes or their containers is permitted. In addition, when open burning is permitted as part of on-site commercial maintenance activities, the material being burned must not include demolition waste (e.g., shingles, plastics, paints, and liquids). The continued implementation of this Chapter as part of the Fire Marshall's Office daily operations will assist in minimizing both the release of PCBs into the atmosphere and, in turn, their deposition into local soils and impervious land uses. By minimizing their release, the quantity of PCBs available to be washed into the MS4 during storm events is minimized.

### **Chapter 13 – Offenses – Miscellaneous**

To interrupt the pathway of PCBs entering the MS4 as a result of illegal dumping or disposal of waste materials, the County will continue to enforce Section 13-13 of its Code: Unlawful disposal of rubbish and other waste material. Section 13-13 makes it illegal for anyone to dump or dispose of any rubbish, trash,

garbage, litter or other waste substance or materials in or upon and along any public property. The continued implementation of Section 13-13, as part of the County's daily operations, will minimize wastes with PCBs from being illegally discharged; in turn, this will minimize their exposure to precipitation during storm events.

## **Chapter 24 – Illicit Discharges**

To interrupt the pathway of PCBs entering the MS4 as a result of direct disposal of materials that potentially contain PCBs, the County will continue to enforce Chapter 24, which prohibits any discharge to the MS4 that is not composed entirely of stormwater, except as conditioned. Chapter 24 also prohibits the connection to the storm sewer system of any structure that conveys liquid other than stormwater or conditioned discharges. The continued implementation of Chapter 24, as part of the County's daily operations, will minimize the discharge of materials that may potentially contain PCBs.

The County will continue to rely on the daily enforcement of these ordinances to minimize, to the best of its ability, the release of PCBs from current sources, which may then be discharged through the County's MS4. The long-term enforcement of these ordinances, albeit to primarily address specific issues not related to PCBs, will help to minimize the discharge of PCBs from current sources into the impaired waters.

The County has minimal legal authority, if any, to address legacy sources of PCBs, such as in-stream contaminated deposits or deposits on private property. The County has similar authority limitations in the incorporated town of Vinton. Vinton operates its own regulated MS4; however, it was not allocated a wasteload in the TMDL. DEQ has acknowledged this fact and has stated that the oversight will be corrected when the PCBs TMDL is opened for modification. Similarly, neither the Virginia Department of Transportation nor the Virginia Western Community College was allocated a wasteload for PCBs. Roanoke County hereby requests that this oversight is also corrected when the PCBs TMDL is opened for modification.

## Chapter 4. Roanoke County Municipal Property Evaluation

As part of the MS4 Permit's special conditions for approved TMDLs, other than the Chesapeake Bay TMDL, Roanoke County is required to "assess all significant sources of pollutant(s) from facilities of concern owned or operated by the MS4 operator that are not covered under a separate VPDES permit and identify all municipal facilities that may be a significant source of the identified pollutant." For the purposes of this assessment, a significant source of pollutant(s) from a facility of concern means *a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL.*<sup>1</sup> According to the TMDL, "the widespread use of PCBs before their ban coupled with their stable molecular structure has caused a generalized distribution of the pollutant in air, soil and water."

Roanoke County conducted a desktop review to identify potential current sources of PCBs and their relationship to the County's MS4. A summary of each of the aspects reviewed is included below.

- **PCBs Commercial Storage Facilities**  
EPA permits facilities to store PCBs waste according to federal regulations. Review of the EPA Region 3 list of permitted facilities ([www.epa.gov/pcbs/list-approved-polychlorinated-biphenyl-pcb-commercial-storage-facilities-epa-region](http://www.epa.gov/pcbs/list-approved-polychlorinated-biphenyl-pcb-commercial-storage-facilities-epa-region)) found that **none** of the permitted facilities were owned or operated by the County of Roanoke or were located within the County's jurisdictional boundaries.
- **PCBs Commercial Disposal Facilities**  
EPA also permits facilities to accept and dispose of PCBs waste according to federal regulations. Review of the EPA Region 3 list of permitted facilities ([www.epa.gov/pcbs/list-polychlorinated-biphenyl-pcb-disposal-approvals-epa-region](http://www.epa.gov/pcbs/list-polychlorinated-biphenyl-pcb-disposal-approvals-epa-region)) found that **none** of the permitted facilities were owned or operated by the County of Roanoke or were located within the County's jurisdictional boundaries.
- **Registered Transformers Containing PCBs**  
EPA requires registration of known PCBs transformers. PCBs transformers are any transformer that contains 500 ppm or greater PCBs dielectric. Review of EPA's 324-page "Most Recent" EPA Regulated Transformer Data ([www.epa.gov/pcbs/registering-transformers-containing-polychlorinated-biphenyls-pcbs](http://www.epa.gov/pcbs/registering-transformers-containing-polychlorinated-biphenyls-pcbs)) found **no** registered PCBs transformers were owned by the County. Additionally, no registered PCBs transformers were located within the County's jurisdictional boundaries.
- **Proximity of County MS4 Infrastructure to Point Sources Allocated a Wasteload in the PCBs TMDL**  
The PCBs TMDL allocated 45 individual wasteloads to 44 industrial point sources in the Upper Roanoke River and its tributaries located below the confluence of the South and North Roanoke Rivers. GIS analysis of these industrial facilities identified three of the 44 were located within the County's MS4 Service Area (2000 Urbanized Area). The other industrial facilities were located in the City of Roanoke, the City of Salem, and the Town of Vinton or outside the County's MS4 Service Area. Of the three located within the County's MS4 Service Area, two facilities have been sold since TMDL approval and would have undergone Environmental Assessments as a condition of sale. One property no longer maintains an active DEQ under the VPDES General Permit for Industrial Activity Stormwater Discharges (Industrial General Permit) and the second facility now conducts industrial activities regulated under the Industrial General Permit (VAR051803) but the SIC is not identified to have PCB concerns. The remaining third facility, which drains through off-site stormwater infrastructure before discharging into Big Bear Rock Branch, is regulated by DEQ under the VPDES General Permit for Industrial Activity Stormwater Discharges (VAR050741). Based on state regulatory activity regarding this facility, the County does not believe that downstream drainage infrastructure could be considered a significant source of PCBs. The County will reconsider this if informed otherwise by DEQ.

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<sup>1</sup> 9VAC25-890-40 B(2)(d)

- Proximity of County MS4 infrastructure to industrial facilities with SIC codes subject to PCBs monitoring Guidance

DEQ Guidance Memo No. 09-2001<sup>2</sup> (Monitoring Guidance) identified specific industrial operations that were more likely to discharge PCBs than others. The Monitoring Guidance identified the types of facilities by their Standard Industrial Classification (“SIC”) codes. Facilities whose SIC codes matched those identified in the Monitoring Guidance are subject to PCB monitoring. The County compared the list of 18 industrial facilities in Roanoke County that are covered under the Industrial General Permit against the SIC codes found in Table 1 of the Monitoring Guidance. Aside from facilities previously identified as being allocated a wasteload, seven VPDES permitted facilities were identified as having an applicable SIC code. Of these seven facilities, six of the facilities were outside of the MS4 Service Area identified in the TMDL. The remaining industrial facility is regulated under the industrial permit (VAR052297) and discharges into the Upper Tinker Creek watershed. Based on state regulatory activity regarding this facility, the County does not believe that downstream drainage infrastructure could be considered a significant source of PCBs. The County will reconsider this if informed otherwise by DEQ.
- County Property Pollutant Identification Inspections

Between 2009 and 2012, Roanoke County collected potential pollution data on 189 County properties, of which 142 were located within the County’s MS4 Service Area. Review of the existing inspection data was completed to identify any potential County facilities that may be a potential significant source of PCBs. Four County properties (three in the County and one in the Town of Vinton) were identified as having electrical transformers containing PCBs located on or adjacent to them (Table 3). These transformers are owned by the Appalachian Power Company, not the County. The transformers are assumed to each contain PCBs concentrations less than 500 ppm, as they are not registered with EPA as a PCBs transformer.

**Table 3. Roanoke County Properties with Transformers Containing PCBs Identified During County Inspections**

Parcel	Address	Transformer No.	Responsible County Department
076.16-02-07.00-0000	0 Ledgewood Avenue	#300-6517	General Services (SOLD)
076.16-02-08.00-0000	3131 Electric Road	#300-6517	General Services (SOLD)
060.16-06-32.00-0000	800 Washington Avenue	#255-4	Library (VINTON) (SOLD)
055.00-01-08.00-0000	3050 Green Hill Park	#3507	Parks, Recreation & Tourism

Subsequent to the countywide Pollutant Identification Inspections, the County’s BOS approved the sale of the properties located at 3131 Electric Road, 0 Ledgewood, and 800 Washington Avenue. Thus, these properties are no longer owned or operated by the County. The sole remaining property with a transformer containing PCBs is 3050 Green Hill Park, which is a park facility supervised by the Department of Parks, Recreation and Tourism.

- Capital Improvement Program Activity Review

Construction materials such as caulk, paints, electrical transformers and fluorescent light ballasts that were used and installed in buildings between 1950 and 1979 could potentially contain PCBs. Review of existing County data found that eleven<sup>3</sup> County properties located within the MS4 Service Area were found to have been constructed between 1950 and 1979. Of these eleven, two were in the Mason Creek watershed and one was in the Tinker Creek watershed. A review of the approved County of Roanoke, Virginia Capital Improvement Program in Fiscal Years 2016 - 2025 found that none of the identified buildings were scheduled to undergo demolition or major renovation during the remainder of this MS4 General Permit cycle.

<sup>2</sup> TMDL Guidance Memo No. 09-2001. Guidance for monitoring of point sources for TMDL development using low-level PCB method 1668. March 2009.

<sup>3</sup> One of the eleven properties with buildings constructed between 1950 and 1979 owned by the County was sold.

**As a result of the desktop assessment of available data, baseline PCBs loading rates at County properties are not expected to produce a pollutant load greater than that of any similar land use elsewhere in the County.** The County recognizes that this desktop assessment represents a point-in-time analysis and that conditions can change. As such, the County has incorporated proactive actions into the TMDL Action Plan to minimize the possibility of a County facility, such as those identified above, becoming a significant source of PCBs. These proactive actions are incorporated into the Schedule and Milestones found in Chapter 5.

## Chapter 5. Schedules and Milestones for Implementation of Existing and New Practices Including Enhancement of Public Education BMPs

As previously stated, the County will concentrate on interrupting the PCB pathway from current sources to the receiving waters. Given the widespread distribution of potential current sources, the County will direct its initial efforts on increasing the public and county staff's general awareness regarding PCB current sources. Increased awareness will lead to better implementation of pollution prevention strategies and ultimately minimize the discharges from current sources of PCBs. The County will utilize existing Best Management Practices (BMPs) found in the Roanoke County MS4 Program Plan, as revised March 23, 2015, to minimize the potential of PCBs discharging from sources within the MS4 service area and into the impaired waters. A narrative description of how and when these existing actions will be used is provided below:

### BMP 1-2 Roanoke County Stormwater Informational Mailer

Roanoke County will promote general public awareness of PCBs and their potential sources by publishing an article regarding PCBs in its Stormwater Informational Mailer.

<b>Existing BMP</b>	BMP 1-2 Roanoke County Stormwater Informational Mailer
<b>Public Education Enhancement</b>	Roanoke County will incorporate PCB awareness into its existing Stormwater Informational Mailer.
<b>Rationale</b>	Given the widespread distribution of PCB current sources identified by the TMDL, the County feels that increased public awareness may be the best opportunity to minimize the discharge of PCBs from current sources. As an example of the widespread distribution of the Stormwater Informational Mailer, the mailer was distributed to a minimum of 32,000 addresses located across the County in previous years' mailings.
<b>Implementation Date</b>	Prior to December 1, 2017
<b>Measureable Goal/ Milestone</b>	The Department of Community Development will publish one article regarding PCBs, their history and how to help control their discharge into the environment in its Stormwater Informational Mailer by December 31, 2017.
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

### BMP 1-5 Stormwater Public Awareness Program

Roanoke County will promote public awareness information regarding PCBs and their potential sources specifically to the development community by incorporating the PCBs Awareness Fact Sheet (Attachment 2) into the informational materials provided by the Department of Community Development's permitting office.

<b>Existing BMP</b>	BMP 1-5 Stormwater Public Awareness Program
<b>Public Education Enhancement</b>	Roanoke County will enhance its current Stormwater Public Awareness Program by directing PCB-specific outreach towards the development community. Increased awareness will be promoted through the inclusion of the PCB Awareness Fact Sheet with the additional stormwater informational materials provided to those in the development community applying for a demolition permit.
<b>Rationale</b>	Given that a potential significant source of current PCBs is from old construction materials, it is important that the development community recognize their role in controlling PCBs. Pollution prevention activities, such as proper disposal of construction waste materials on the part of the developer, will interrupt the PCBs' pathway to the receiving waters
<b>Implementation Date</b>	January 1, 2017
<b>Measureable Goal/ Milestone</b>	The Department of Community Development will provide those applying for demolition permits the PCBs Awareness Fact Sheet by including it with the stormwater informational materials provided by the County permit technicians.
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

### **BMP 1-6 Roanoke County Stormwater Webpage**

Roanoke County will promote general public awareness of PCBs and their potential sources by placing the PCBs Awareness Fact Sheet on its existing stormwater webpage.

<b>Existing BMP</b>	BMP 1-6 Roanoke County Stormwater Webpage
<b>Public Education Enhancement</b>	The County has developed a PCB Awareness Fact Sheet and an associated PCB PowerPoint presentation. These will be placed on the County's Stormwater Webpage for access by the general public.
<b>Rationale</b>	Given the widespread distribution of PCBs sources identified in the TMDL, the County believes that increased public awareness provides the best opportunity to minimize the discharge of PCBs from current PCBs sources. By placing the PCB Awareness Fact Sheet and associated PCB PowerPoint presentation on the County's stormwater webpage, additional awareness regarding PCBs will be generated.
<b>Implementation Date(s)</b>	January 1, 2017
<b>Measureable Goal/ Milestone</b>	The PCB Awareness Fact Sheet will be placed on the County's stormwater webpage.
<b>Measureable Goal/ Milestone</b>	The PCB PowerPoint presentation will be placed on the County's stormwater.
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

### **BMP 3-2 Illicit Discharge Ordinance**

Roanoke County will continue to identify and eliminate illicit discharges in accordance with Chapter 24 of the County Code.

<b>Existing BMP</b>	BMP 3-2 Illicit Discharge Ordinance
<b>Rationale</b>	The Department of Community Development will investigate illicit discharge complaints as part of its Illicit Discharge Detection and Elimination Program. The County will contact the Blue Ridge DEQ Regional office in order to develop a collaborate approach for dealing with potential illicit discharges involving PCBs.
<b>Implementation Date</b>	Continuing
<b>Measureable Goal/ Milestone</b>	The Department of Community Development will continue to investigate illicit discharge complaints as part of its Illicit Discharge Detection and Elimination Program.
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

#### **BMP 4-4 Erosion and Sediment Control Inspections**

Roanoke County will continue to implement its local Erosion and Sediment Control program. Through implementation of this program, the discharge of sediments, which may potentially have PCBs adhered to them as a result of atmospheric deposition, will be minimized.

<b>Existing BMP</b>	BMP 4-4 Erosion and Sediment Control Inspections
<b>Rationale</b>	PCBs adhere to sediments. Thus, by interrupting the pathway of loosened sediments from entering the County's MS4, PCBs attached to such sediments are minimized from entering local impaired waters. The County has already lowered the regulatory threshold in which erosion and sediment controls are required to 2,500 square feet.
<b>Implementation Date</b>	Continuing
<b>Measureable Goal/ Milestone</b>	Roanoke County will continue to implement its local Erosion and Sediment Control Program, as approved by DEQ.
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

#### **BMP 5-4 Stormwater Management Facility Post-Construction Inspection**

As part of its Stormwater Management Post-Construction Inspections program, the County will continue to conduct annual visual site inspections of County owned stormwater facilities and periodic visual site inspections of privately owned stormwater facilities once every 5-years. During these inspections, County staff will look for evidence that the stormwater facility is working properly, specifically that adequate vegetation exists for facility stability and that water is not ponding in the facility for periods longer than designed.

<b>Existing BMP</b>	BMP 5-4 Stormwater Management Facility Post-Construction Inspection
<b>Rationale</b>	Stormwater BMPs provide both water quality and water quantity controls. As such, pollutants settle out and are retained in the BMP. By ensuring that the BMPs are functioning as designed and are being properly maintained, the BMPs will continue to interrupt the pathway of any potential PCBs from entering into the downstream impaired waters. By properly disposing of the sediments during maintenance, as described in the Standard Operating Procedure (SOP) manual, potential PCBs-laden sediments will be eliminated as a potential source.
<b>Implementation Date</b>	July 1, 2016 and continuing
<b>Measureable Goal/ Milestone</b>	Roanoke County will conduct inspections on stormwater BMPs owned and operated by the County and private BMPs <u>in accordance to its DEQ-approved BMP inspection schedule.</u>
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

## BMP 6-4 Employee Training

Roanoke County will incorporate PCB Awareness Training into its Employee Training Program. It is anticipated that through good housekeeping practices, such as the proper collection and disposal of materials from drainage structure cleaning and facility maintenance, sources of potential PCBs will be minimized and the pathway for their entry into the MS4 will be interrupted.

<b>Existing BMP</b>	BMP 6-4 Employee Training
<b>Employee Training Enhancement</b>	Roanoke County will develop and incorporate employee training on PCBs, their history and how to help control their discharge into the environment into the Roanoke County Employee Training program. The County has developed a PCB PowerPoint presentation that individuals in certain job classes will be shown.
<b>Rationale</b>	As the County is not actively using, storing, or producing PCBs, the County will concentrate on waste management. Proper disposal of debris collected as a result of stormwater maintenance and wastes from general facility maintenance will interrupt the pathway of PCBs travelling to the receiving waters. By incorporating the PCB PowerPoint presentation into the employee training program, County employee awareness of PCBs, their sources, and how to minimize their introduction into the environment becomes part of the County's employee training program.
<b>Responsible Party</b>	Department of Community Development will take the lead, but individual County departments are responsible for ensuring their department staff adheres to its contents.
<b>Implementation Date #1</b>	June 30, 2017
<b>Measureable Goal/ Milestone #1a</b>	The Department of Community Development will identify the job classes requiring the PCB training and notify the individual County departments of the additional training requirements.
<b>Measureable Goal/ Milestone #1b</b>	The Department of Community Development will place the PCB Fact Sheet and PowerPoint presentation on the County's intranet page (Café)
<b>Implementation Date #2</b>	June 30, 2018
<b>Measurable Goal/ Milestone #2</b>	The PCB PowerPoint presentation will be shown for all job classes identified in Measurable Goal #1a.
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

## BMP 6-5 Standard Operating Procedures

Roanoke County will incorporate the PCB Awareness Fact Sheet and PowerPoint presentation into the County's Water-Quality Related SOP Manual. It is anticipated that through good housekeeping practices, such as the proper collection and disposal of materials from drainage structure cleaning and facility maintenance, sources of potential PCBs will be minimized and the pathway for their entry into the MS4 will be interrupted.

<b>Existing BMP</b>	BMP 6-5 Standard Operating Procedures
<b>Employee Training Enhancement</b>	Roanoke County will increase County employee awareness by placing the PCB Awareness Fact Sheet and the PowerPoint presentation into the Roanoke County Water-Quality Related SOP Manual
<b>Rationale</b>	The County has developed SOPs for minimizing pollutant discharges. As the County is not actively using, storing, or producing PCBs, the County will concentrate on waste management. Proper disposal of debris collected as a result of stormwater maintenance and wastes from general facility maintenance will interrupt the pathway of PCBs travelling to the receiving waters. By incorporating the PCBs Awareness Fact Sheet and associated PowerPoint presentation into the SOP manual, County employee awareness of PCBs, their sources, and how to minimize their introduction into the environment becomes part of the County's employee training program.
<b>Implementation Date</b>	June 30, 2017
<b>Measurable Goal/ Milestone</b>	The County will update the SOP manual to include the PCB Fact Sheet and PowerPoint presentation.
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

### **Additional County Efforts Beyond Stormwater Management Efforts**

Given the TMDL assumption that PCBs are widely dispersed across the impaired watershed in minute quantities, Roanoke County has several non-stormwater related programs that will further interrupt the pathway of PCBs entering the environment from current sources. Implementation of these programs, while not specifically part of this TMDL Action Plan, continue to effectively minimize the amount of available PCBs in the overall environment. Their implementation will assist the County in overall long-term reductions of the discharge of PCBs. These efforts include the following:

#### **Emergency Spill Response and Containment**

The Roanoke County Fire and Rescue provides emergency response services to the residents of the County. As part of this service, 160 uniformed employees and 100 volunteers are trained in hazardous materials operations. In response to spills and accidental releases, Fire and Rescue provides assistance to the responsible party in mitigating containment of an accidental release.

<b>TMDL-Specific BMP</b>	Emergency Spill Response and Containment
<b>Rationale</b>	Roanoke County first responders are the first line of attack on spills and accidental releases. These individuals are trained to contain materials and coordinate with properly licensed and trained private clean-up companies for controlling releases. Entry into the environment of PCBs from potential sources such as leaking transformers will be minimized.
<b>Implementation Date</b>	Continuing
<b>Measurable Goal/ Milestone</b>	Roanoke County will provide assistance to the responsible party in mitigating containment of accidental releases.
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

#### **Regulation of Open Burning**

Roanoke County regulates open burning under Chapter 9 of the County Code. Under Chapter 9, the County has placed restrictions on the burning of construction and demolition waste and debris. The release of PCBs contained in construction wastes and debris into the environment from local airborne deposition is minimized with the implementation of Chapter 9.

<b>TMDL-Specific BMP</b>	Prohibition of Demolition Debris Burning
<b>Rationale</b>	The burning of demolition debris containing PCBs allows for their entry into the atmosphere and deposition into the nearby lands. Prohibiting the burning of demolition debris eliminates potential entry of PCBs into the atmosphere before it can be deposited and contaminate stormwater.
<b>Implementation Date</b>	Continuing
<b>Measurable Goal/ Milestone</b>	Roanoke County will prohibit open burning of demolition waste and debris under Chapter 9 of the County Code.
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

### Regulation of Illegal Dumping and Littering

Roanoke County regulates illegal dumping and littering under Chapter 13 of the County Code. Chapter 13 provides the County the legal authority necessary to minimize the amount of debris and wastes that may have incidental PCBs.

<b>TMDL-Specific BMP</b>	Prohibition of Illegal Dumping and Littering
<b>Rationale</b>	The illegal dumping and littering of materials potentially containing PCBs allows for their slow degradation and entry into the environment. Prohibition of illegal dumping and littering will minimize this method of PCB entry into the environment.
<b>Implementation Date</b>	Continuing
<b>Measurable Goal/ Milestone</b>	Roanoke County will prohibit illegal dumping and littering under Chapter 13 of the County Code
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

### Contract Language

Roanoke County uses general contract language in its contracts to ensure that demolition and construction wastes are properly disposed in landfills. The proper disposal of demolition and construction waste minimizes the amount of PCBs that are available for entry into receiving waters by interrupting their pathway.

<b>TMDL-Specific BMP</b>	Proper Waste Disposal Notification
<b>Rationale</b>	The proper disposal of wastes potentially containing PCBs minimizes their entry into the environment.
<b>Implementation Date</b>	January 1, 2017
<b>Measurable Goal/ Milestone</b>	Roanoke County demolition and construction contracts will contain language notifying the contractors that all wastes must be properly disposed in landfills.
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

### DEQ Coordination

Roanoke County will continue to coordinate with the DEQ through its Blue Ridge Regional Office. Through combined state and local efforts, it is anticipated that the quantity of PCBs being discharged from current sources into the waters in and around Roanoke County will diminish. In addition, DEQ will continue to strategize on how best to remove the legacy pollutants that currently exist in these impaired waterways.

<b>TMDL-Specific BMP</b>	DEQ Coordination
<b>Rationale</b>	DEQ is the state authority regarding PCB clean-up and disposal.
<b>Implementation Date</b>	January 1, 2017
<b>Measurable Goal/ Milestone</b>	Roanoke County will notify DEQ within 30-days of any potential PCB discharges that it identifies for DEQ coordination and follow-up
<b>Evaluation and Modification</b>	The effectiveness of this BMP will be evaluated at the time of MS4 General Permit reapplication and any necessary modifications will be proposed as part of reapplication.

## Chapter 6. Evaluation of TMDL Action Plan

PCBs continue to enter the Roanoke River and its tributaries, albeit at an ever-reducing rate. Given the long-term stability of PCBs, their existence in soils, air, and water and their prevalence in the impaired water bodies, it is unlikely that the water quality standards for PCBs will be met in the foreseeable future. As a result of being issued a wasteload allocation for the discharge of PCBs into its MS4, Roanoke County is required to reduce the amount of PCBs being discharged to the system in order to meet the allocation. These current sources have a defined, disruptable pathway to a water body, which in theory can be controlled without eliminating the source of the PCBs. The TMDL recognizes this and also states that “non-numeric WQBELs (BMPs) will be used to comply with the provisions of the TMDL.”

The goal of Roanoke County’s PCBs TMDL Action Plan for this permit cycle is to increase the overall awareness of PCBs and their sources in order to further identify and minimize the innumerable potential current sources. The BMPs selected for meeting this initial goal were non-numeric BMPs for which efficiencies cannot be measured. As such, the County will measure the effectiveness of this plan by documenting implementation of the schedule and whether or not the milestones have been met. The County will also report to DEQ in the annual report any additional potential PCB sources identified as part of its efforts.

The County has chosen to not evaluate the PCBs Action Plan through monitoring during the remainder of the current permit cycle for a variety of reasons, including:

- “Hydrophobic properties of PCBs make them difficult to detect in water quality samples” (PCBs TMDL, page 8).
- “Atmospheric deposition has been shown to be a significant pathway of PCBs cycling in freshwater systems” (PCBs TMDL, page 44).
- “The development of PCBs TMDLs in the Roanoke River watershed is subject to adaptive implementation and ongoing source investigation whereby sources of PCB contamination are continuously being reviewed and updated on the basis of the best available data. The discussion of current sources of PCBs, therefore, should be considered the most up-to-date information at the time of development of the TMDLs, rather than a complete and final characterization” (PCBs TMDL, page 52).
- “Loads calculated for all WLA sources are estimates” (PCBs TMDL, page 69).
- The PCBs TMDL states that MS4 permit holders will be held accountable for meeting the monitoring requirements in DEQ’s Monitoring Guidance. However, the Monitoring Guidance states that the monitoring requirements are not applicable to MS4s. As such, the PCB TMDL is in direct conflict with the Monitoring Guidance. Due to the high cost of implementing a PCBs monitoring program in order to identify previously unknown sources of PCBs, DEQ must provide clear direction and guidance regarding monitoring expectations.
- The County has chosen to use BMPs that do not have numeric efficiencies in order to comply with the WLA. The approach taken by the County is consistent with the directions provided by the PCB TMDL. However, by following the recommended approach, there is not a methodology for accurately determining the pollutant reductions as a result of BMP implementation.

During the remainder of this permit cycle, the County has opted to forego modeling as a means to evaluate the PCBs Action Plan because its selected BMPs for compliance are non-structural in nature, and such activities do not have efficiencies that can be effectively modeled. The County has identified measurable goals with implementation dates in Chapter 5.

The County will revisit these rationalizations as part of its reapplication for coverage under the next version of the MS4 General Permit, which will become effective in 2018. The County is hopeful that DEQ will provide additional direction by that time.

## Chapter 7. Follow-Up and Reporting

To comply with the Special Conditions, Roanoke County will provide DEQ with a summarized report of the activities implemented as part of this TMDL Action Plan. In addition, the County will notify DEQ of any potential suspected sources of PCBs that are identified during the County's MS4 implementation.

The County will review and revise this TMDL Action Plan to include updated BMPs and other steps that it will take during the next permit cycle, as part of its reapplication for MS4 General Permit coverage. The County will:

- Continue the TMDL Action Plan, as outlined in this document.
- Review requirements in any draft MS4 General Permit.
- Review the CIP to determine if any additional County properties constructed between 1950 and 1980 are scheduled for major renovation or demolition.
- Review the County SOPs to determine if PCB-specific language must be inserted in individual County SOPs.
- Review any modifications to the PCBs TMDL and associated DEQ guidance regarding monitoring or modeling that would provide the County additional direction.
- Review any modifications to the PCBs TMDL by DEQ to incorporate additional acreage that is now considered in the MS4 Service Area, as a result of a more recent U.S. Census Bureau delineation of Urbanized Areas.

**Attachment 1. MS4 General Permit Special Conditions for Approved  
TMDL Other than the Chesapeake Bay TMDL**

B. Special conditions for approved total maximum daily loads (TMDL) other than the Chesapeake Bay TMDL. An approved TMDL may allocate an applicable wasteload to a small MS4 that identifies a pollutant or pollutants for which additional stormwater controls are necessary for the surface waters to meet water quality standards. The MS4 operator shall address the pollutants in accordance with this special condition where the MS4 has been allocated a wasteload in an approved TMDL.

1. The operator shall maintain an updated MS4 Program Plan that includes a specific TMDL Action Plan for pollutants allocated to the MS4 in approved TMDLs. TMDL Action Plans may be implemented in multiple phases over more than one state permit cycle using the adaptive iterative approach provided adequate progress to reduce the pollutant discharge in a manner consistent with the assumptions and requirements of the specific TMDL wasteload is demonstrated in accordance with subdivision 2 e of this subsection. These TMDL Actions Plans shall identify the best management practices and other interim milestone activities to be implemented during the remaining terms of this state permit.

a. In accordance with Table 1, the operator shall update the MS4 Program Plans to address any new or modified requirements established under this special condition for pollutants identified in TMDL wasteload allocations approved prior to July 9, 2008.

b. In accordance with Table 1, the operator shall update the MS4 Program Plan to incorporate approvable TMDL Action Plans that identify the best management practices and other interim milestone activities that will be implemented during the remaining term of this permit for pollutants identified in TMDL wasteload allocations approved either on or after July 9, 2008, and prior to issuance of this permit.

c. Unless specifically denied in writing by the department, TMDL Action Plans and updates developed in accordance with this section become effective and enforceable 90 days after the date received by the department.

2. The operator shall:

a. Develop and maintain a list of its legal authorities such as ordinances, state and other permits, orders, specific contract language, and interjurisdictional agreements applicable to reducing the pollutant identified in each applicable WLA;

b. Identify and maintain an updated list of all additional management practices, control techniques and system design and engineering methods, beyond those identified in Section II B, that have been implemented as part of the MS4 Program Plan that are applicable to reducing the pollutant identified in the WLA;

c. Enhance its public education and outreach and employee training programs to also promote methods to eliminate and reduce discharges of the pollutants identified in the WLA;

d. Assess all significant sources of pollutant(s) from facilities of concern owned or operated by the MS4 operator that are not covered under a separate VPDES permit and identify all municipal facilities that may be a significant source of the identified pollutant. For the purposes of this assessment, a significant source of pollutant(s) from a facility of concern means a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL. (For example, a significant source of pollutant from a facility of concern for a bacteria TMDL would be expected to be greater at a dog park than at other recreational facilities where dogs are prohibited);

e. Develop and implement a method to assess TMDL Action Plans for their effectiveness in reducing the pollutants identified in the WLAs. The evaluation shall use any newly available information, representative and adequate water quality monitoring results, or modeling tools to estimate pollutant reductions for the pollutant or pollutants of concern from implementation of the MS4 Program Plan. Monitoring may include BMP, outfall, or in-stream monitoring, as appropriate, to estimate pollutant reductions. The operator may conduct monitoring, utilize existing data, establish partnerships, or collaborate with other MS4 operators or other third parties, as appropriate. This evaluation shall include assessment of the facilities identified in subdivision 2 d of this subsection. The methodology used for assessment shall be described in the TMDL Action Plan.

3. Analytical methods for any monitoring shall be conducted according to procedures approved under 40 CFR Part 136 or alternative methods approved by the Environmental Protection Agency (EPA). Where an approved method does not exist, the operator must use a method consistent with the TMDL.

4. The operator is encouraged to participate as a stakeholder in the development of any TMDL implementation plans applicable to their discharge. The operator may incorporate applicable best management practices identified in the TMDL implementation plan in the MS4 Program Plan or may choose to implement BMPs of equivalent design and efficiency provided that the rationale for any substituted BMP is provided and the substituted BMP is consistent with the assumptions and requirements of the TMDL WLA.

5. Annual reporting requirements.

a. The operator shall submit the required TMDL Action Plans with the appropriate annual report and in accordance with the associated schedule identified in this state permit.

b. On an annual basis, the operator shall report on the implementation of the TMDL Action Plans and associated evaluation including the results of any monitoring conducted as part of the evaluation.

6. The operator shall identify the best management practices and other steps that will be implemented during the next state permit term as part of the operator's reapplication for coverage as required under Section III M.

7. For planning purposes, the operator shall include an estimated end date for achieving the applicable wasteload allocations as part of its reapplication package due in accordance with Section III M.

## **Attachment 2. PCB Awareness Fact Sheet**

# Polychlorinated Biphenyls (PCBs) FACTS



## What are PCBs?

PCBs are a group of man-made compounds that were widely used in the past, mainly in electrical equipment, because of their non-flammability and stability. PCBs have no taste or smell and range in consistency from oil to a waxy solid. Their manufacturing was banned in 1979 because of growing environmental and health concerns.

## PCBs and the Environment

PCBs can still be found in the environment. Levels of PCBs currently exist in the air, soil, and water from previous releases. Because of their stability, PCBs do not break down in the environment. They often attach to sediment that is washed into local waterways, such as the Roanoke River, where they accumulate in living organisms.

## Products that may contain PCBs

Although no longer commercially produced, PCBs may be present in products and materials made before the 1979 PCBs ban. Products that may contain PCBs include:

- ◆ Transformers and capacitors
- ◆ Electrical equipment (voltage regulators, switches, re-closers, bushings, etc.)
- ◆ Oil used in motors and hydraulic systems
- ◆ Old electrical devices or appliances containing capacitors having PCBs
- ◆ Fluorescent light ballasts
- ◆ Cable insulation
- ◆ Thermal insulation material including fiberglass, felt, foam, and cork
- ◆ Adhesives and tapes
- ◆ Oil-based paint
- ◆ Caulking
- ◆ Plastics
- ◆ Floor finish

## Preventing the Release of PCBs

**Caution must be taken to prevent PCBs from being released through:**

- ◆ Spills and leaks from electrical and other equipment
- ◆ Improper disposal and storage
- ◆ Illegal or improper dumping of wastes containing PCBs
- ◆ Burning wastes containing PCBs

**It is important to minimize the amount of PCBs in the environment by:**

- ◆ Properly replacing all fluorescent light ballasts containing PCBs
- ◆ Properly disposing of caulk, paint, and other building materials with PCBs during planned renovations and repairs
- ◆ Taking precautions during renovations so that building materials with PCBs do not contaminate surrounding surfaces
- ◆ Using properly trained and licensed contractors to remove, clean-up, and dispose of materials containing PCBs
- ◆ Consulting with regulatory officials when questions arise regarding PCBs

## More Information on PCBs

**To learn more about PCBs visit:**

- ◆ Virginia Department of Environmental Quality <https://www.deq.state.va.us>
- ◆ Environmental Protection Agency <https://www.epa.gov/pcb>



**Older Fluorescent light ballasts (FLBs)** can contain PCBs. Because of this, FLBs should be removed and disposed of by trained professionals.



**Transformers containing PCBs**, which contain more than 50 ppm of PCBs, are subject to specific EPA regulations. Proper PCBs identification labels must be visible near the access and on the transformer itself.



**Old paint and caulk** and surrounding substrate (brick, masonry, cinder block, wood, etc.) contain PCBs. Care must be taken during removal of these materials to avoid the creation of dust and to contain contaminated waste.

## **Attachment 3. PCB PowerPoint Presentation**

# POLYCHLORINATED BIPHENYLS (PCBs)

Community Development Department  
Stormwater Management Division

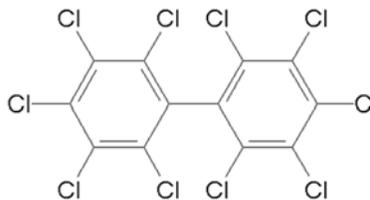
5204 Bernard Drive  
Roanoke, VA 24018



## What are PCBs?

- Polychlorinated Biphenyls (PCBs)
- A group of 209 man-made compounds, widely used in the past, mainly in electrical equipment

- Properties of PCBs:
  - No taste or smell
  - Range in consistency from oil to a waxy solid
  - Non-flammable
  - High boiling point
  - Very stable



# PCBs Manufacturing

- Manufactured between 1929 and 1979
- Properties of PCBs made them very attractive for use in:
  - Electrical or heat transfer equipment
  - Paints, plastics, and rubber materials
  - Pigments, dyes, carbonless copy paper
  - Numerous other materials
- In the 1970s, studies found that PCBs were *carcinogens* (cancer-causing agents)
  - Manufacturing of PCBs banned in the United States in 1979



# PCBs and the Environment

- Despite their ban, PCBs are still found in the environment.
- Levels of PCBs still exist in the air, soil, and water from previous releases and current incidental releases.
- PCBs do not easily break down in the environment.
- PCBs attach to sediment, which then get washed via stormwater runoff into local waterways.



Niagara Dam, Roanoke, VA



## Products that may Contain PCBs

- PCBs may be present in products and materials **made before the 1979 PCB ban.**
- Products that may **still** contain PCBs include:
  - Transformers and capacitors
  - Electrical equipment
  - Oil used in motors and hydraulic systems
  - Old electrical devices or appliances
  - Cable insulation
  - Thermal insulation material including fiberglass, felt, foam, and cork



**PCB-contaminated transformers**, which contain more than 50 ppm of PCBs, are subject to specific EPA regulations. Proper PCB identification labels must be visible near the access and on the transformer itself.

## Products that may Contain PCBs

- Products that may **still** contain PCBs include:
  - Adhesives and tapes
  - Oil-based paint
  - Caulking
  - Plastics
  - Floor finish
  - Fluorescent light ballasts



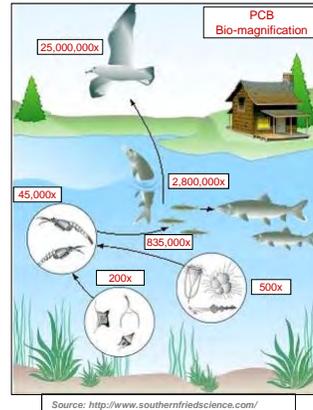
**Old paint and caulk and surrounding substrate** (brick, masonry, cinder block, wood, etc.) can create dust containing PCBs during renovations.



**Fluorescent light ballasts (FLBs)** containing PCBs should be removed and disposed of by trained professionals.

# Exposure to PCBs

- PCBs (a known cancer-causing chemical) accumulate in living organisms and get passed along the food chain.
  - PCBs remain stored in fatty tissues.
- PCBs generally “bio-magnify” along the food-chain.
  - Meaning PCB concentrations are greater in organisms that are higher up in the food chain
- Humans can absorb PCBs from what they eat or drink.
  - Consuming fish, shell fish, and other aquatic animals from waters contaminated with PCBs
  - Drinking contaminated water
  - Infants may be exposed to PCBs passed along through breast milk.



# The Clean Water Act and PCBs

- According to the federal Clean Water Act, each state must develop **TMDLs** for all the waters identified on their list of impaired waters.
- TMDL = Total Maximum Daily Load
  - Maximum amount of a pollutant (i.e., PCBs) allowed to enter a waterbody in order that it will still meet water quality standards
  - “Pollution Diet”
- A TMDL determines a pollutant reduction target and allocates load reductions necessary to reduce the source(s) of the pollutant.

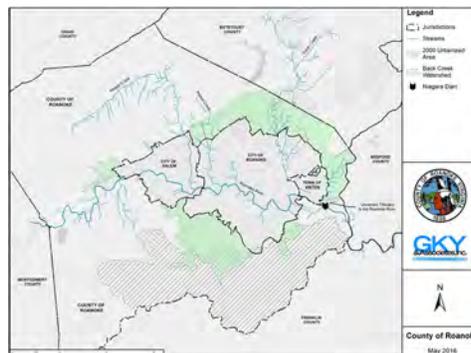
# The TMDL Impacts Roanoke County

- A PCB TMDL has been developed for the Roanoke River.
- Roanoke County must reduce the input of PCBs from its Municipal Separate Storm Sewer System (MS4) in accordance with the PCB TMDL in order to comply with the County's MS4 [stormwater] permit.



# And Local Waters

- The PCB TMDL allocated the County's MS4 the following wasteloads:
  - Mason Creek (0.1 mg/yr.)
  - Peters Creek (4.7 mg/yr.)
  - Tinker Creek (38.4 mg/yr.)
  - Wolf Creek (10 mg/yr.)
  - An unnamed tributary to the Roanoke River (0.5 mg/yr.)
  - Roanoke River (47.9 mg/yr.)



## The County MS4 Allocation is Minute



The annual wasteload (quantity allowed to be discharged) allocated to the Roanoke County MS4 is approximately equivalent in weight to 1/10 of a \$1 bill.\*

*\*Not to Scale*



## Every Little Effort Helps

- Everyone can help stop PCBs from being released by using their knowledge of PCBs and employing caution to prevent:
  - Spills and leaks from electrical and other equipment containing PCBs
  - Improper disposal and storage of materials containing PCBs
  - Illegal or improper dumping of PCBs-containing wastes
  - Burning of wastes containing PCBs



## Minimizing PCB Releases

- Everyone can help minimize the amount of PCBs in the environment by:
  - Properly replacing all PCBs-containing fluorescent light ballasts
  - Properly disposing of caulk, paint, and other PCBs-containing building materials during planned renovations and repairs
  - Taking precautions during renovations so that PCBs-containing building material does not contaminate surrounding surfaces
  - Using properly trained and licensed contractors to remove, clean-up, and dispose of PCBs-containing materials
  - Consulting with regulatory officials when questions arise regarding PCBs



## More Information on PCBs

- To learn more about PCBs visit:
  - Virginia Department of Environmental Quality (<http://www.deq.virginia.gov>)
  - Environmental Protection Agency (<https://www.epa.gov/pcbs>)

