

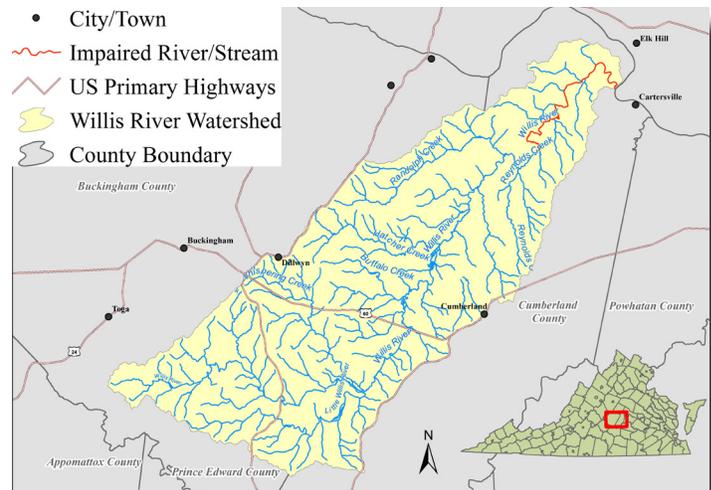
### Project Location and Background

The Willis River watershed is part of the James River Basin (HUC 02080205, VAC-H35R and VAC H36R). The land area is approximately 177,936 acres. The watershed is comprised of forest (75%), water (1%), wetlands (2%) agricultural (21%), and urban (1%) land uses. Located approximately 60 miles west of Richmond in the Piedmont, the Willis River and its tributaries in Buckingham and Cumberland counties were placed on Virginia's 303(d) list in 1996 due to violations of the State's fecal coliform bacteria standard. The original impairment stretched from the confluence with the James River upstream to Reynolds Creek (14.53 miles). The segment was extended in the 2004 cycle to include the entire Willis River from the headwaters to the mouth (61.34 miles). The fecal coliform TMDL for the Willis River was completed in 2002. In 2005, a TMDL implementation plan was completed for the watershed. An implementation project began in August 2005 with an award of a grant from the Virginia Department of Conservation and Recreation to the Peter Francisco Soil and Water Conservation District.

**Table 1.** Willis River BMP Summary: August 2005 – June 2015

Control measure	Units	Needed	Installed	%
<b>Agricultural</b>				
Livestock exclusion fencing	F	476,190	231,968	49
Livestock exclusion fencing	S	318	66	21
Riparian buffer	A	-	67	-
Stream crossing and hardened access	S	-	10	-
Loafing lot management	S	-	1	-
Waste storage facility	S	-	4	-
Composting facility	S	-	3	-
Veg. cover on cropland	S	-	77	-
<b>Residential septic</b>				
Septic tank pumpout	S	100	76	76
Septic system repair	S	3	12	400
Septic system installation	S	2	8	400

NOTE: BMP counts only include 319 funded projects and BMPs funded by the VA Agricultural Cost Share and Conservation Resource Enhancement Programs; A = Acres, S = System, F = Feet



### Implementation Highlights

This project is administered by the Peter Francisco Soil and Water Conservation District (PFSWCD). Residential and agricultural conservation successes have largely been the result of partnerships between the PFSWCD and Virginia Cooperative Extension, VA Farm Bureau, the VA Cattlemen's Association, and the USDA – Natural Resources Conservation Service. Numerous tours have been held to promote the agricultural and residential BMPs offered under the TMDL implementation plan, along with presentations at civic clubs throughout the watersheds, postcard mailings advertising the program, personal contacts with farmers and residents, and meetings updating the community about the water quality improvements.

From July 2014 through June 2015 one livestock stream exclusion practice was installed protecting 2,089 linear feet of stream. During this period fourteen septic pump outs, and two septic system installations were also completed. Since the beginning of the project in July 2005 through June 2015, there have been 88 agricultural practices completed and approximately 44 miles of stream exclusion fencing installed. For the residential program to date, 96 septic projects have been implemented.

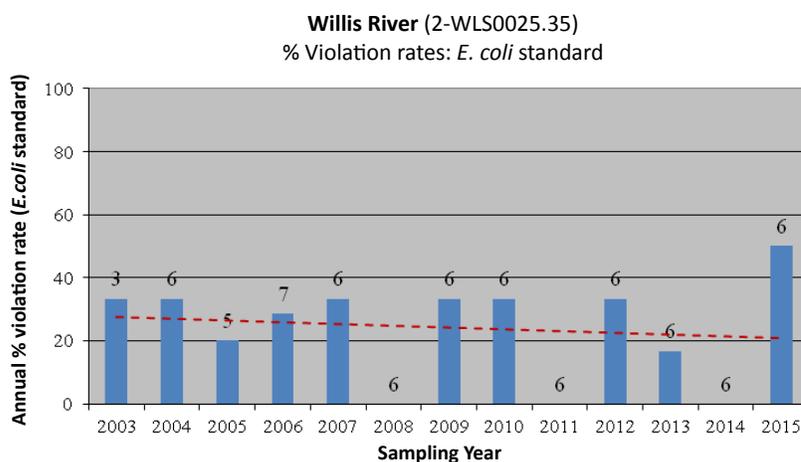
### Pollution Reductions

Pollution reductions for bacteria, nitrogen, phosphorus and sediment for BMPs installed during the project period are summarized in Table 2.

**Table 2.** Pollution Reductions for the Willis River : August 2005-June 2015

Period	Pathogens: coliform (cfu/100mL)	Nitrogen (lbs/yr)	Phosphorous (lbs/yr)	Sedimentation-Siltation (T/yr)
July 2014-June 2015	1.82E+14	1,037	126	175
August 2005 -June 2015	1.87E+16	10,715	1,917	1,864

### Water Quality Monitoring Results



Water quality data collected by VADEQ from 2003 through 2015 was analyzed to determine the impact of BMPs implemented in the project area on *E. coli* violation rates and associated long term trends.

The bar graph above shows the percent violation rate for samples collected annually at monitoring station 2-WLS0025.32 that did not meet the water quality standard of 235 cfu/100 mL. The number of samples collected each year is shown above each bar. The linear trend fitted to the data shows a decreasing trend in violation rates over the sampling period, indicating improvements in water quality condition in the Willis River watershed. Analysis of data from several sites has shown significant improvements in water quality, resulting in the delisting of three segments in the 2006 Water Quality Assessment & Integrated Report (Table 3).

61 stream miles listed  
34.5 stream miles delisted  
57% of goal met

**Table 3.** Willis River de-listings

Site	Station	Miles	Violation rate
VAC-H35R_WLS02A04	2-WLS004.27	9.92	2/20 (10%)
VAC-H36R_WLS02A06	-	8.11	1/20 (5%)
VAC-H36R_WLS01A00	2-WLS042.78	16.68	2/21 (9.5%)

This Virginia Nonpoint Source Management Program is managed by Virginia Department of Environmental Quality and is funded, in part, through grants from the U.S. Environmental Protection Agency, under the Clean Water Act Section 319.

For more information regarding Virginia's Nonpoint Source Management Program, please visit us on the web at: <http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/NonpointSourcePollutionManagement.aspx>

### For more information, contact:

Ram Gupta, VADEQ TMDL Coordinator  
ram.gupta@deq.virginia.gov; (804)698-4184

Kyle Bolt, Peter Francisco SWCD  
TMDL Conservation Specialist  
kyle.bolt@vaswcd.org

