

# Household Water Quality

## Culpeper County 2008-2017

The Virginia Household Water Quality Program provides affordable water testing and education through local Extension offices to the 1.7 million Virginians who rely on wells, springs or cisterns for their household water supply.

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## What's in your water?

Municipal water supplies are regulated under the Safe Drinking Water Act, which mandates routine testing and treatment. Maintenance and testing of private water supplies (wells, springs and cisterns) is the responsibility of the owner. Virginia Cooperative Extension offers water testing and education for private water supply users across the state

Drinking water clinics are held in county Extension offices each year. Here's how it works:

### #1 Kickoff Meeting

Participation is voluntary and open to anyone with a well, spring or cistern. Participants pick up a sample kit and receive instructions about how to collect the samples from their household tap and where and when to drop off their samples.

### #2 Sampling

Following directions carefully, participants collect their samples and complete a short questionnaire. Samples are dropped off locally, so shipping is unnecessary. We coordinate getting the samples to Virginia Tech's campus for analysis.

### #3 Analysis

Samples are analyzed for total coliform and E. coli bacteria, nitrate, lead, copper, arsenic, fluoride, sodium, hardness, iron, manganese, total dissolved solids, pH, and sulfate. The cost for one sample kit in 2017 was \$55. Confidential results are prepared and returned to the Extension office.

### #4 Results

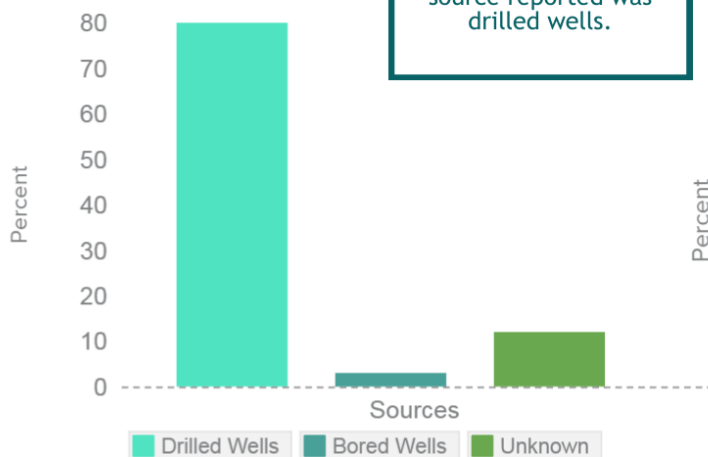
Results are returned to participants and explained at a local interpretation meeting. Information is provided about addressing water quality problems, routine care, and maintenance of private water supplies.

## Water Systems in Culpeper County (2008- 2017)

127 samples analyzed  
Serving 185 people  
Well depth: 0-700 feet  
Well age: 3-87 years

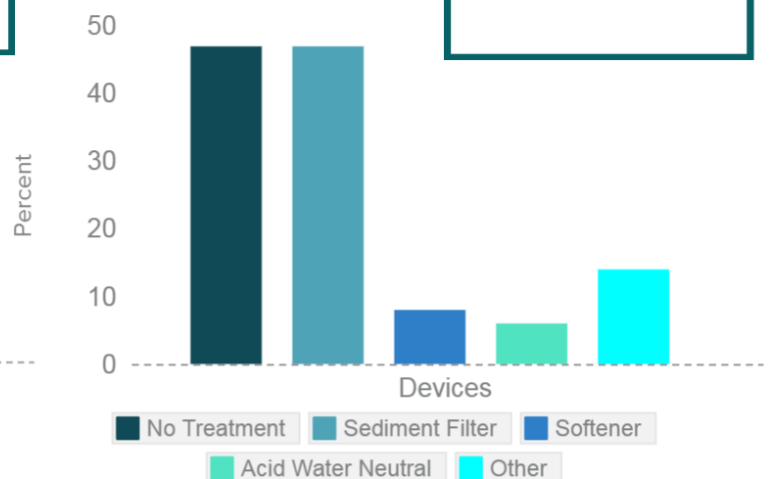
### Systems

Twelve percent of participants did not know what type of system they had. The most common source reported was drilled wells.



### Treatment

53% of participants reported having treatment installed. The most common device was a sediment filter.



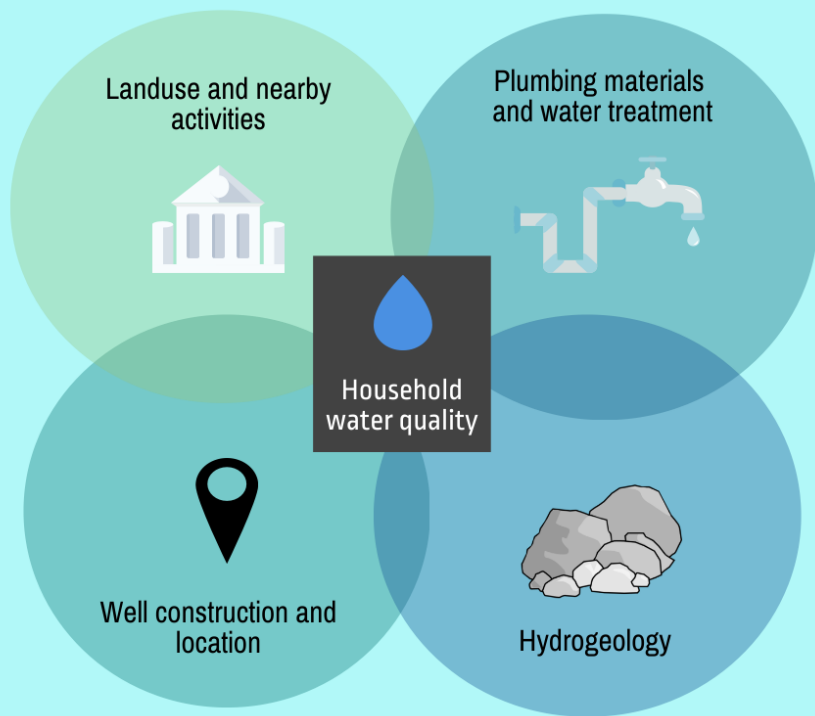
## Where do contaminants come from?

Contaminants in water may be health-related (e.g., bacteria) or a nuisance (e.g., hardness causing scale) and can come from a variety of sources.

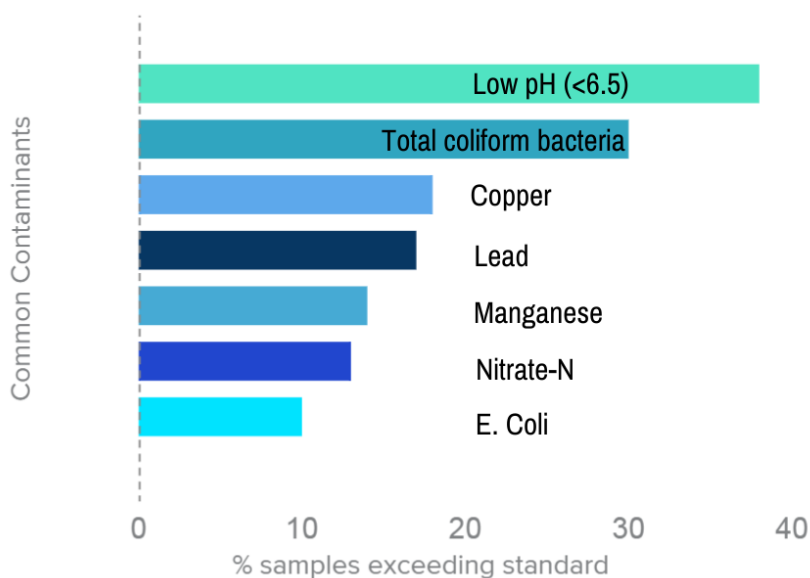
Some contaminants originate from geology, the sediment or rock where the water is stored. Others are a result of land usage or activities on the earth's surface, such as lawn fertilizer, animal waste, or chemical spills.

Proper construction of a well can protect household water quality by preventing surface water, which may carry many contaminants, from entering the groundwater supply. Wells should be constructed with proper casing, grout seal, and a sealed well cap. Contamination sources, such as livestock and septic systems should be at least 50 feet away from the well head.

Treatment devices and plumbing components can also influence water quality by adding contaminants or changing water chemistry.



## Household water quality in Culpeper County: Common Contaminants



The most common contaminants found in household water in Culpeper County were low pH, total coliform bacteria, copper, lead, manganese, nitrate, and E. coli.

Low pH (<6.5) can occur naturally in parts of Virginia geology. pH below 6.5 was found in 38% of samples. Although not a concern in itself, low pH can be a driver of how corrosive the water is. Once the water enters the house it can result in metals such as copper and lead leaching into the water from plumbing components that contain these metals, such as brass fittings or copper pipes.

Total coliform bacteria presence is an indication that surface water may be entering a well and other more harmful microorganisms may be present. Total coliform was found in 30% of the Culpeper County samples. E. coli were found in 10% of the samples and are a sign that human or animal waste is entering the water supply.

Lead was found in first draw samples exceeding 0.015 mg/L in 17% of samples, and copper exceeding 1 mg/L in 18% of samples

For more information about other common contaminants, please visit our Resources Page.

Special thanks to the residents of Culpeper County who participated in the Virginia Household Water Quality Program drinking water clinics. Extension agents Carl Stafford, Claire Lillard, and Becky Sheffield, among other partners, were instrumental in the program's success.

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