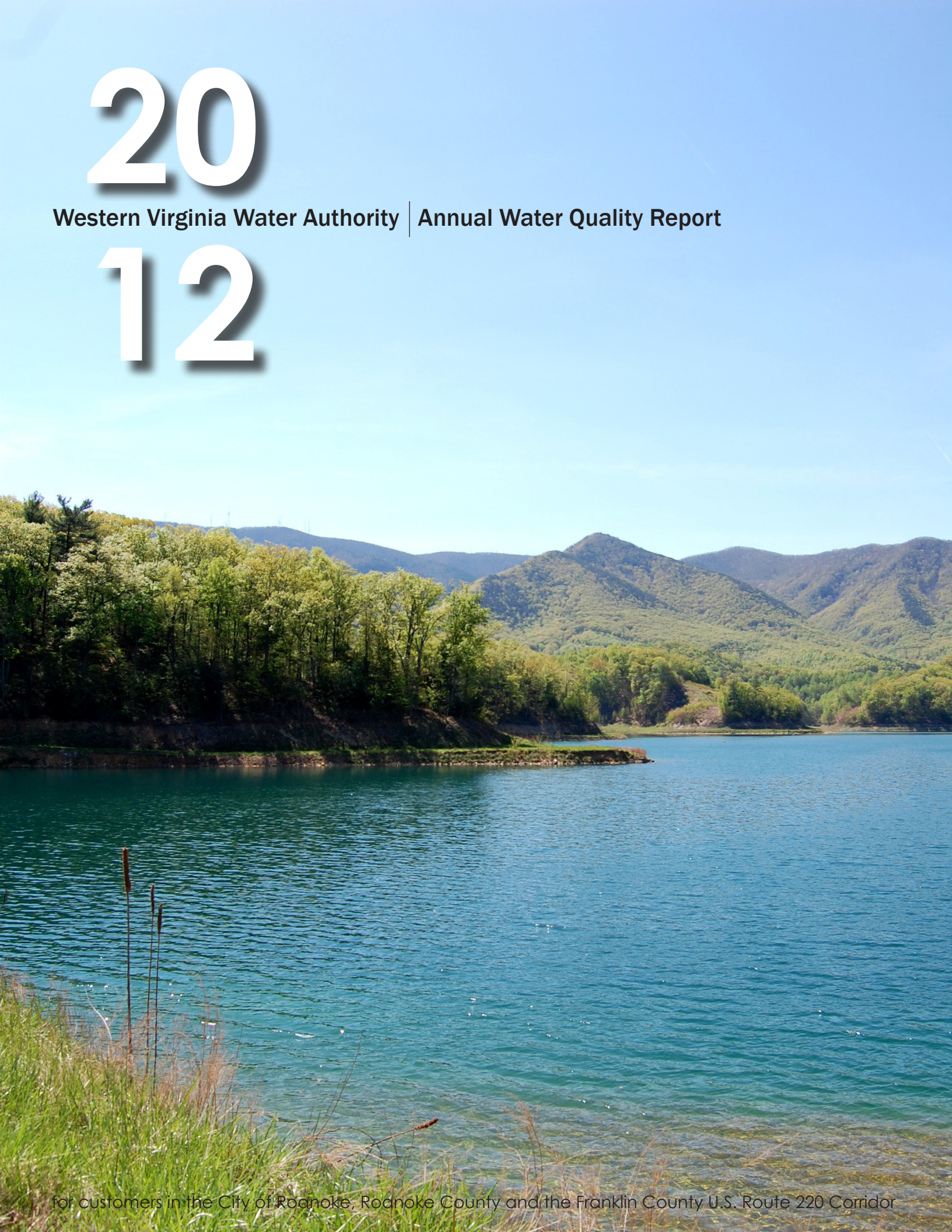
2012

Western Virginia Water Authority | Annual Water Quality Report



for customers in the City of Roanoke, Roanoke County and the Franklin County U.S. Route 220 Corridor

Your Water Quality Report

This water quality report, supplied annually to our water customers, contains information for customers in the City of Roanoke and Roanoke County about the source of your water, what it contains and how it compares to the standards set by regulatory agencies based on data collected during calendar year 2011. The Water Division of the Western Virginia Water Authority vigilantly safeguards your water supplies and is proud to report that in 2011, the Water Authority was in full compliance with all state and federal monitoring and reporting requirements without a single violation.

If you have questions about your water supply or any of the information in this report, please contact us. Or give us a call to schedule a tour of one of treatment facilities, schedule a free SOL-correlated classroom presentation or arrange for a civic presentation to your civic or community group.

Getting to Know Us

In July 2004, the Public Utility Departments of the City of Roanoke and Roanoke County merged to form the Western Virginia Water Authority, a new public body independent of local government. In November 2009, Franklin County joined the Water Authority, offering a larger regional approach to meeting our communities' water and wastewater needs.

The Authority is governed by a Board of Directors whose meetings are open to the public. Board members meet on the 3rd Thursday of every month with the exception of August and December. Our Executive Directors, pictured below are (L) Mike McEvoy, Executive Director Wastewater Services and (R) Gary Robertson, P.E., Executive Director Water Operations.

The Water Authority's headquarters, the Coulter Building, is in downtown Roanoke at 601 S. Jefferson Street, at the corner of Jefferson and Franklin. Free parking is available in front of the building on Jefferson Street, along adjacent streets and behind the building in the public parking lot on Franklin Road.

At the Coulter Building, water and sewer customers may pay their bills, start, stop or transfer service and receive free water conservation information. Our customer service representatives are available Monday-Friday from 8am to 5pm to assist you in person, on the phone at 540.853.5700, by FAX at 540.853.1600 or at info@westernvawater.org. Information is also available on our website www.westernvawater.org.

WESTERN VIRGINIA
WATER AUTHORITY

Water Sources

The Water Authority is fortunate to operate and manage several water sources – Carvins Cove Reservoir, Spring Hollow Reservoir, Crystal Spring, Falling Creek Reservoir, Smith Mountain Lake and several wells. Having this diversity of surface and groundwater sources, rather than a sole source, provides greater operational flexibility and reliability in the event of a drought or other emergency.

Using water from these sources, the Water Authority treats and delivers 23-million gallons of drinking water per day to more than 58,000 customer accounts (155,000 residents in the City of Roanoke and Roanoke County, as well as customers in Franklin County, the Town of Vinton, the City of Salem and Botetourt County). The Water Authority also maintains 48 drinking water storage tanks, 52 pump stations and over 1,000-miles of water main.

Carvins Cove Reservoir & Treatment Facility

Carvins Cove Reservoir is situated within Carvins Cove Natural Reserve, a 12,672-acre watershed near Hollins University in Botetourt County. The land in the reserve above the 1,200-foot contour is owned and managed by the City of Roanoke. The land below this elevation, and the reservoir, are owned and operated by the Western Virginia Water Authority. In addition to receiving water from the watershed, the reservoir is fed from two underground tunnels that carry overflow from Tinker and Catawba Creeks. This surface water source covers 630 acres and stores 6.5-billion gallons of water at full pond.

Carvins Cove Water Treatment Facility has the capacity to treat 28-million gallons of water from the reservoir every day. The water is first oxygenated and treated with chlorine dioxide to oxidize dissolved organic matter, iron and manganese. Water is aerated to remove unwanted dissolved gases and to oxidize dissolved metals, which reduces any unpleasant tastes and odors. Flash mixing of chemicals is the next step, where ferric sulfate is added to coagulate suspended particles. Water then flows into settling basins where the particles clump together, become heavy and settle to the bottom of the basins. The water is next filtered through gravel, sand and carbon and disinfected with chlorine. Fluoride is added to promote strong teeth, and orthophosphate is added to control corrosion in pipes.

A large part of the northeastern and northwestern parts of the city, and the majority of the southeastern part of the city, to Reserve Avenue, are served by Carvins Cove. Portions of northern and northeastern Roanoke County are also served by the Carvins Cove water source.

Carvins Cove Natural Reserve, the second largest municipal park in the United States, offers outdoor recreation opportunities, including boating, fishing, hiking and nature viewing. Visitors to the Natural Reserve are charged $2 per person for daily use or annual passes are available for $20. Payment drop boxes are located at the Bennett Springs and Timberview parking lots, or passes can be purchased from the Security Office on Reservoir Road. For more information, call the Natural Reserve at 540-563-9170.

How can you use water wisely? Follow the tips on the following pages.

The amount of water in the earth's water cycle has not changed over time. In fact, we are using the same water today that dinosaurs drank. However, the way we use water, and the rate at which we use it, have changed. Using water wisely helps protect our water supplies, especially during periods of drought.

Spring Hollow Reservoir & Treatment Facility

The water source for this system comes from the Roanoke River and is pumped into the Spring Hollow Reservoir, a 3.2-billion gallon side-stream storage reservoir. Water is withdrawn from the reservoir, oxygenated and treated with chlorine dioxide to oxidize dissolved organic matter, iron and manganese. Treatment at the Spring Hollow Treatment Facility includes clarification, filtration, chlorine disinfection and fluoridation.

The Spring Hollow Water Treatment Facility currently has the capacity to treat 18-million gallons of water a day and can be expanded to 36-million gallons a day. Treated water is stored in a two-million gallon storage tank then pumped through the north and south transmission lines to the distribution system. The current usage averages 5.19-million gallons a day. During an emergency, standby wells may be used to supplement the source water. Spring Hollow supplies water to various neighborhoods in Roanoke County and Franklin County through the southern distribution lines and in the City of Roanoke and Roanoke County along I-81 through the northern distribution lines.

Crystal Spring

Crystal Spring flows at the base of Mill Mountain in the southern part of the city. This groundwater source provides an average flow of 4-million gallons of water a day, which is filtered in the Crystal Spring Treatment Facility, completed in the fall of 2002. The plant's microfiltration system filters out all particles larger than 0.2 micron. One micron is one thousandth of a millimeter. Filtered water is treated with chlorine and fluoride and pumped to water customers from the Crystal Spring Pumping Station. Crystal Spring serves portions of southwest Roanoke County and the southwestern part of the city. With the capacity to filter five-million gallons of water a day, Crystal Spring Treatment Facility is the largest microfiltration plant in western Virginia.

Visitors to Crystal Spring Park are invited to tour the historic Crystal Spring Pump Station and the Snow Steam Pump. Located across the parking lot from the Treatment Facility, the History Museum of Western Virginia opens the pump station for free guided tours each Saturday (12noon-4pm) and Sunday (1pm - 4pm) between May and September.

Falling Creek and Beaverdam Creek Reservoirs

Falling Creek Reservoir is a surface water source located in Bedford County east of Vinton. It covers 21 acres and stores 85-million gallons of water at full pond. It is fed by Beaverdam Creek Reservoir, which covers 69 acres and stores 435-million gallons of water at full pond.

The treatment process of this water source is similar to that of Spring Hollow Treatment Facility; treatment capacity is 1.5-million gallons a day. Falling Creek Water Treatment Facility serves King Street northeast to Route 460 and along Route 24 to 13th Street.

How can you use water wisely? Check for toilet leaks.

Leaky toilets, pipes, hoses and faucets can account for almost 14% of home water use, and this water is not even used! Fix leaks immediately; to check for silent toilet tank leaks, place a few drops of food coloring, Kool-Aid or soda in the tank of the toilet, and do not flush the toilet. Wait at least 15-30 minutes (waiting overnight is even better). If the color you put in the tank appears in the bowl, the toilet is leaking.

Martin Creek System

Eight wells supply this groundwater source, which is disinfected with chlorine prior to distribution. Water is distributed throughout the community by two storage tanks and distribution piping consisting of 8-inch, 6-inch and 4-inch pipe. The total source/pump capacity is equal to 76,000 gallons per day. Current usage is approximately 28,000 gallons per day. This system supplies water to the Forest Edge and Carriage Hills areas.

Delaney Court System

One well supplies this groundwater source, which is disinfected with chlorine prior to distribution. Water is distributed throughout the community by a storage tank, a booster pump station and distribution piping consisting of 8-inch and 12-inch pipe. The total source/pump capacity is equal to 43,200 gallons per day. Current usage is approximately 6,400 gallons per day. This system supplies water to the Delaney Court subdivision.

Country Hills System

Groundwater obtained from one well is the source for this system. Chlorine is used to disinfect the water prior to distribution. Water is distributed throughout the community by a storage tank and distribution piping consisting of 6-inch, 4-inch and 2-inch pipe. The total source/pump capacity is equal to 43,200 gallons per day. Usage in 2011 was approximately 1,400 gallons per day.

Salem Source

The Water Authority contracts with the City of Salem to purchase water to supply Andrew Lewis Place, Robin Hood Park and along West Main Street in Roanoke County.

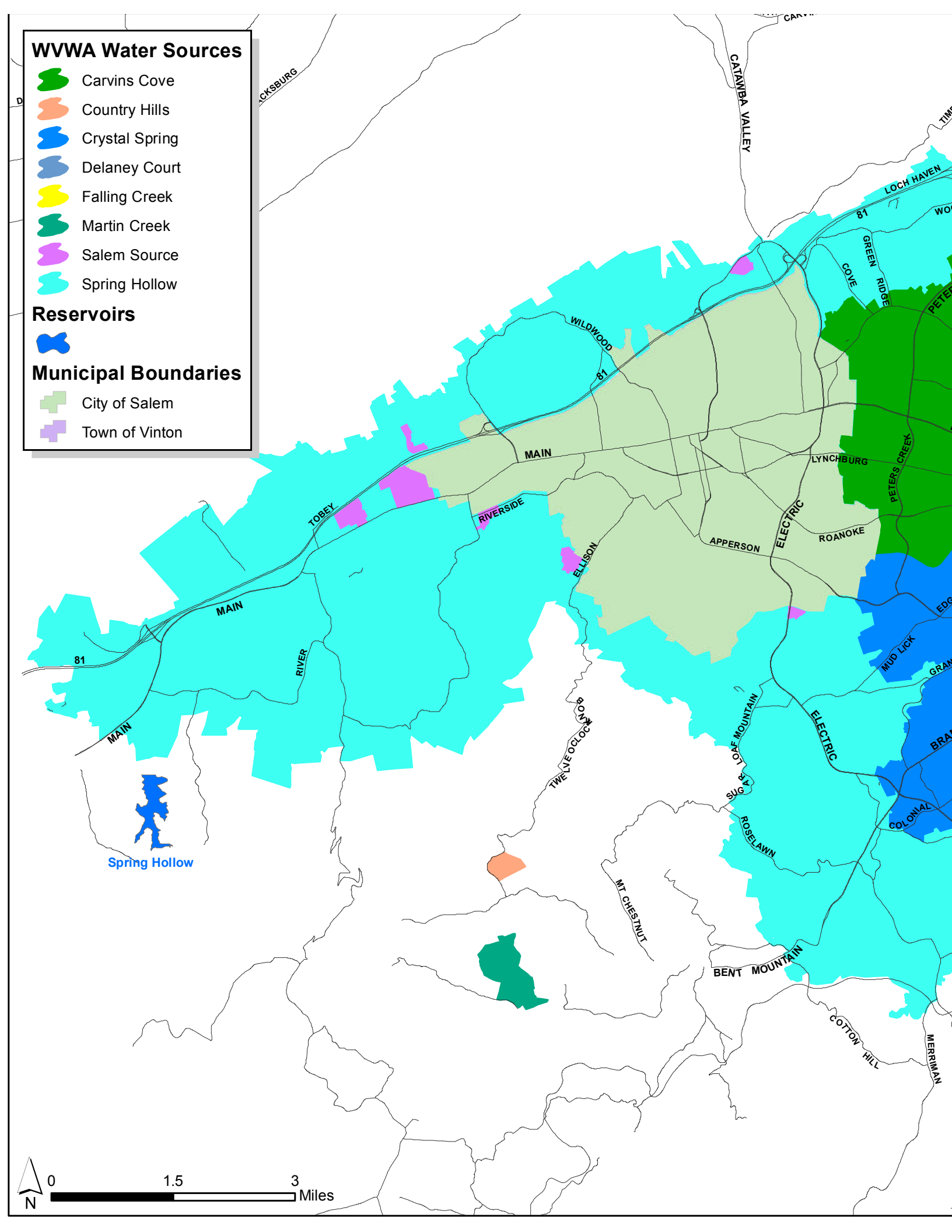
Franklin County

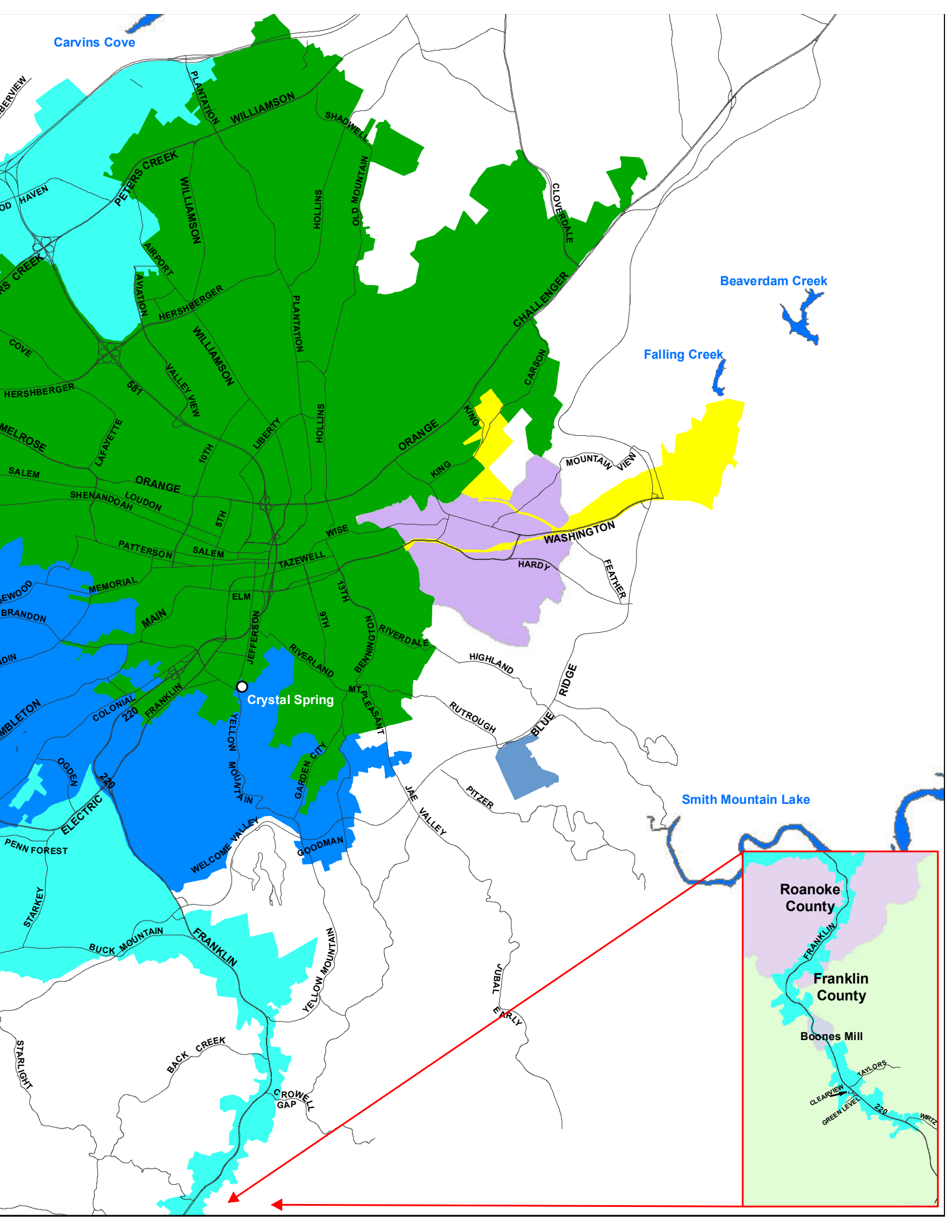
Customers who live along the U.S. Route 220 corridor in Franklin County receive water from the Spring Hollow Water Treatment Facility. In 2010, the 65,000 foot U.S. Route 220 water line was put into service, offering customers quality water service and fire protection.

Complete information about the sources of water for Franklin County customers in the Smith Mountain Lake area is available in the Authority's 2012 Franklin County Water Quality Report on the Authority's website at www.westernvawater.org.

How can you use water wisely? Fix leaky faucets.

A small leak can add up to gallons of wasted water. Use the drip calculator on the Conserve/Educate page at wwww.westernvawater.org to calculate how much water your drip is actually using. Repair leaks as soon as possible to reduce water loss.


WVWA Water Sources
Carvins Cove
Country Hills
Crystal Spring
Delaney Court
Falling Creek
Martin Creek
Salem Source
Spring Hollow
Reservoirs
Municipal Boundaries
City of Salem
Town of Vinton
CATAWBA VALLEY
LOCH HAVEN
81
GREEN RIDGE
COVE
WILDWOOD
MAIN
LYNCHBURG
PETERS CREEK
TOBEY
RIVERSIDE
ELECTRIC
APPERSON
ROANOKE
ELLISON
MUD LICK
RIVER
TWELVE OCLOCK
LOOF MOUNTAIN
SUGAR
ROSELAWN
COLONIAL
Spring Hollow
MT CHESTNUT
BENT MOUNTAIN
COTTON HILL
MERRIMAN
0
1.5
3
Miles
N


Carvins Cove
Beaverdam Creek
Falling Creek
Smith Mountain Lake
Crystal Spring
Roanoke County
Franklin County
Boones Mill
PLANTATION
WILLIAMSON
SHADWELL
PETERS CREEK
HOLLINS
OLD MOUNTAIN
CLOVERDALE
AIRPORT
AVIATION
HERSHBERGER
CHALLENGER
CARSON
COVE
581
VALLEY VIEW
LIBERTY
10TH
LAFAYETTE
MELROSE
SALEM
ORANGE
KING
MOUNTAIN VIEW
SHENANDOAH
LOUDON
5TH
WISE
PATTERSON
TAZEWELL
WASHINGTON
HARDY
FEATHER
MEMORIAL
ELM
13TH
9TH
BENNINGTON
RIVERDALE
BRANDON
MAIN
JEFFERSON
RIVERLAND
HIGHLAND
RIDGE
MT PLEASANT
COLONIAL
220
FRANKLIN
RUTROUGH
BLUE
YELLOW MOUNTAIN
GARDEN CITY
OGDEN
ELECTRIC
PITZER
JAE VALLEY
PENN FOREST
WELCOME VALLEY
GOODMAN
STARKEY
BUCK MOUNTAIN
FRANKLIN
YELLOW MOUNTAIN
JUBAL EARLY
STARLIGHT
BACK CREEK
CROWELL GAP
TAYLORS
CLEARVIEW
GREEN LEVEL
WIRTZ

Information About your Water

As water travels over the land's surface or through the ground, it dissolves naturally occurring minerals and can be polluted by animals and human activity. Contaminants in source water may come from septic systems, discharges from domestic or industrial wastewater treatment facilities, agricultural and farming activities, urban stormwater runoff, residual uses and many other activities. Water from surface sources is treated to make it suitable for consumption while groundwater may or may not require treatment. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

Turbidity, or the amount of suspended particles in water, does not always present health risks. Turbidity can, however, interfere with disinfection and provide a medium for microbial growth. Turbidity may also indicate the presence of disease causing organisms. These organisms can include bacteria, viruses and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches. Therefore, the U.S. Environmental Protection Agency and the Virginia Department of Health—our water quality regulators—set limits for turbidity. In 2011, 100 percent of the water samples from all Water Authority water sources met turbidity limits for compliance (see table on pages 10 and 11).

Through the water treatment process, contaminants are filtered from the Water Authority's water supply to safe levels, and turbidity levels are reduced well below legal limits. Constant testing ensures that the treated water supply remains safe. Some people may be more vulnerable to trace contaminants in drinking water than the general population. People whose immune systems have been compromised, such as cancer patients undergoing chemotherapy, people who have undergone organ transplants, people with HIV/AIDS or other immune system disorders and some older adults and infants, can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. Environmental Protection Agency/Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Environmental Protection Agency Safe Drinking Water Hotline at 1-800-426-4791.

Cryptosporidium & Giardia

Cryptosporidium and *Giardia* are microscopic organisms that can cause fever, diarrhea and other gastrointestinal symptoms when ingested. The organisms come from animal and human wastes and are eliminated through water filtration and disinfection. Even though the presence of these organisms is not regulated by the state or federal government, the Western Virginia Water Authority has tested for *Cryptosporidium* and *Giardia* in all of its water sources and has not detected either organism.

The following are other resources for drinking water safety information:

Virginia Department of Health:
540-463-7136

Centers for Disease Control and Prevention:
1-800-311-3435,
404-639-3311 or
404-639-3312 (TTY)

Roanoke Environmental Health Department:
540-857-7663

How can you use water wisely? Shorten your showers.

Shortening your shower from 15 minutes to five minutes can save up to 50-gallons of water. If you take a tub bath, only fill the tub one-third full to conserve water.

Lead and Copper

Copper is a nutritionally essential element, but at high levels, copper can cause gastrointestinal difficulties such as nausea and diarrhea. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. When water leaves the Water Authority's treatment facilities, it is virtually free of lead and copper. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The Water Authority is responsible for providing high quality drinking water but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 15 to 30 seconds or until it becomes cold or reaches a steady temperature before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water is available from the Safe Drinking Water Hotline at http://www.epa.gov/safewater/lead.

Water Discoloration

Changes in water pressure in water systems can occasionally cause drinking water to be discolored. The discoloration is caused by sediments in pipes mixing with clear water. The sediments occur naturally from the oxidation of iron in pipes. While discolored water is ordinarily safe to drink, it is best to flush any discolored water from pipes by turning on all cold-water faucets in your home or business. Avoid turning on hot-water faucets so the discolored water is not drawn into water heaters.

One cause of water pressure change is from the use or flushing of fire hydrants. Fire-EMS and Water Authority employees occasionally flush hydrants to ensure that they are working properly and to flush sediments out of pipes. Water pressure can also change in the event of water main breaks. If you notice evidence of a water main break or a leaking fire hydrant in the city or county, call 853.5700.

Source Water Assessment

The Western Virginia Water Authority has completed a source water assessment of Crystal Spring, Falling Creek and Carvins Cove water supplies. The assessment is a requirement of the Virginia Department of Health's (VDH) Source Water Assessment Program (SWAP) in accordance with the 1996 Amendments of the Safe Drinking Water Act. Based on the land use activities and potential sources of contamination in the assessment areas, the source water assessments determined that the Authority's water sources are susceptible to contamination. This designation does not mean that the source water has been impacted or that it will be impacted. It does mean that if there is a release of pollutants in the assessment area, the source water could be impacted.

The VDH completed a source water assessment of Spring Hollow Reservoir's water source, the Roanoke River. This source water assessment determined that the Roanoke River may be susceptible to contamination because it is surface water exposed to a wide array of contaminants at varying concentrations. Also, changing hydrologic, hydraulic and atmospheric conditions promote migration of contaminants from land use activities of concern into the Roanoke River. The assessment also determined that the Water Authority's wells might be susceptible to contamination because they are located in areas that promote migration of contaminants from land use activities of concern. More specific information may be obtained by contacting the Western Virginia Water Authority's Water Division at 540.853.5700.

How can you use water wisely? Don't water in the heat of the day.

Water your garden or lawn before 10 am or after 7 pm when temperatures are cooler to minimize evaporation. This will also allow the water to seep down to the plant's roots, creating more drought resistant plants.

Substance	Units	Ideal Goals (EPA's MCLG)	Highest Level Allowed (EPA's MCL)	Violation	Most Recent Data Presented as (Range) Average					
					Carvins Cove	Falling Creek	Crystal Spring	Spring Hollow	City of Salem	Country Hills (most recent data)
Chlorate	ppm		0.8	no	(0 - 0.07) 0.013	N/A	N/A	(0-0.03) 0.01		N/A
Chlorine	ppm		4-MDRL	no	(1.0 -1.3) 1.1	(1.1 - 1.4) 1.2	(0.9 - 1.0) 1.0	(1.2 -1.3) 1.2	(1.15 - 1.62)	(0.25 - 0.98) 0.69
Chlorite	ppm		0.8	no	(0 - 0.09) 0.013	N/A	N/A	(0 - 0.08) 0.016		N/A
Fluoride	ppm	4	4	no	(0.5 - 0.9) 0.6	(0.52 - 0.73) 0.66	(0.6 - 0.8) 0.6	(0.66 - 0.83) 0.7	(0.70 - 0.93)	0.4
Total Organic Carbon	ppm	TT	N/A	no	(1.62 - 1.96) 1.67	(1.33 - 2.08) 1.63	N/A	(1.04 - 1.29) 1.19	(0.00 - 1.36)	N/A
Total Nitrate & Nitrite (as N)	ppm	10	10	no	0.1	0.05	0.69	0.4	0.48	0.9
TTHM'S	ppb	0	80	no	(1 - 106) 32					
HAA5's	ppb	0	60	no	(ND - 96) 31					
pH	pH units		6.5 - 8.5	no	(7.4 - 8.1) 7.7	(7.0 - 7.3) 7.2	(7.6 - 7.9) 7.8	(7.5 - 7.7) 7.6	(7.25 - 8.04)	7.06
Turbidity	NTU	TT	0.3	no	(0.11 - 0.24) 0.14	(0.12 - 0.28) 0.21	(0.03 - 0.06) 0.04	(0.06 - 0.09) 0.07	(0.014 - 0.151)	0.9
Total Coliforms	MPN/ 100 mL or P/A	0	Presence of coliform bacteria in >5% of monthly samples	no	0	0	0	0	3	0
Fecal Coliforms	MPN/ 100 mL or P/A	0	A routine and a repeat sample are total coliform positive, and one is also fecal coliform or E. coli positive.	no	0	0	0	0	0	0
Most Recent Monitoring Period										
Gross Alpha	pCi/L	0	15	no	-0.78	0.1	ND	1.85	< 1.1	0.3
Gross Beta	pCi/L	0	50	no	1.5	1.3	1.3	3.11	2.0	2.1
Radium 226/228	pCi/L	0	5	no	0.03/0.79	0.1	ND	0.68	0.8	0.08
Lead	ppb	0 ppb	AL = 15	no	0 samples exceeded AL 90th percentile 4.3 ppb				0 samples exceeded AL	ND
Copper	ppm	1.3 ppm	AL = 1.3	no	0 samples exceeded AL 90th percentile 0.608 ppm				0 samples exceeded AL	0.003
Other Parameters (Not Regulated)										
Iron	ppm	unregulated	0.3	n/a	(0.014 - 0.035) 0.02	(0.01 - 0.017) 0.01	ND	ND		0.008
Manganese	ppm	unregulated	0.05	n/a	(0.009 - 0.012) 0.01	(0.01 - 0.018) 0.01	ND	0.0003	< 0.01	ND
Zinc	ppm	unregulated	5	n/a	ND	0.28	0.002	ND	< 0.01	ND
Alkalinity	ppm	unregulated		n/a	(53 - 58) 56	(14 - 16) 16	124	(119 - 128) 124	(97 - 181)	106
Hardness	ppm	unregulated		n/a	(57 - 62) 59	(13 - 17) 15	(120-154) 138	(153 - 160) 156	(146 - 238)	105
Orthophosphate	ppm	unregulated		n/a	(0.99 - 1.08) 1.03	(0.7 - 0.91) 0.82	ND	ND	< 0.05	ND
Conductivity	µmhos/ cm	unregulated		n/a	154.2	106.7	269.1	302.3		241
Sodium	ppm	unregulated		n/a	6.86	14.4	2.99	4.97	6.45	7.88
Corrosivity		unregulated	<-2.0 highly aggressive >0.0 non aggressive	n/a	-0.66	-2.49	-0.11	-0.2		-0.9

2011 Water Quality Data

This table summarizes water-testing results from 2011 for both regulated and nonregulated substances. The THMs/HAA5s were derived from running annual averages. The Western Virginia Water Authority constantly monitors its water supplies for various contaminants to meet all regulatory requirements.

The Water Authority has tested for volatile organics (VOC's), pesticides, synthetic organic compounds (SOCs) and total organic carbons (TOCs), all of which met with current state and federal standards for drinking water. MTBE (methyl-tert-butyl ether) was detected in Martin Creek Well #1 with 0.8 ppb with a trigger level of 15 ppb. All regulated substances must be tested annually, except for lead and copper and SOCs, which must be tested every three years, and radiologicals, which must be tested every three to six years. Many other primary contaminants have been analyzed but were not present or were below the maximum contaminant level.

Wells in service 2011 - North Lakes #6, Muse Spring, Starkey 1A, Starkey #3, LaBelleview #7, Longridge #2, Garden City #2, Country Hills and Campbell Hills.

Delaney Court (most recent data)	Martin Creek (most recent data)	Wells (most recent data)	Source of Substance
N/A	N/A	N/A	By-product of drinking water chlorine dioxide
(0.25 - 1.59) 0.97	(0.42 - 1.21) 0.73		Required Disinfectant added during treatment process to eliminate bacteria
N/A	N/A		By-product of drinking water chlorine dioxide
0.56	(0.14 - 0.44) 0.3	(0.13 - 0.86) 0.42	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from aluminum and fertilizer factories
N/A	N/A	N/A	
1.45	(ND - 0.83) 0.25	(0.05 - 0.90) 0.44	Run-off from fertilizer use; leaching from septic tanks, sewage; Erosion of natural deposits
3.3	6.8		By-product of drinking water chlorination
ND	1.3		By-product of drinking water chlorination
7.13	(6.27 - 7.78) 7.18	(6.90 - 8.04) 7.55	Acidity or basicity of water
ND	(0.12 - 2.06) 1.14	(0.08 - 5.13) 1.34	Soil run-off
1	0	0	Naturally present in the environment
0	0	0	Human and animal waste
0.2	(0.30 - 3.3) 1.58	(0.3 - 2.0) 1.02	Erosion of natural deposits
2	(0.90 - 3.3) 2.36	(0.7 -3.1) 2.17	Decay of natural and man-made deposits
0.9	0.6/0.92	0.24/0.69	Erosion of natural deposits
0 samples exceeded AL 90th percentile 5.0 ppb	0 samples exceeded AL 90th percentile 6.2 ppb		Natural\industrial deposits, plumbing solder, brass alloy in faucets
0 samples exceeded AL 90th percentile 0.414 ppb	0 samples exceeded AL 90th percentile 0.141 ppm		Natural\industrial deposits, plumbing, wood preservatives
0.002	(0.01 - 0.12) 0.08	(0.0014 - 0.96) 0.20	Naturally occurring in the environment
0.001	(0.002 - 0.09) 0.02	(0.0040 - 0.05) 0.02	Naturally occurring in the environment
0.006	(0.02 - 1.06) 0.28	(0.0035 - 0.22) 0.05	Naturally occurring in the environment
107	(34.5 - 206) 148	(98 - 384) 158	Measurement of naturally occurring carbonates
104	(156 - 325) 220	(105 - 399) 175	Measurement of naturally occurring hardness metals
			Corrosion inhibitor added during treatment process
232	(376 - 769) 521	(241 - 1000) 437	Physical property of water
8.55	(12 - 18.9) 14.9	(0.724 - 12.6) 6.06	Naturally occurring in the environment
-1	(-2.07 - 0.4) -1	(-0.9 -0.69) -0.03	Physical property of water that occurs when water reacts with metal

Water Hardness

As water naturally flows over rocks and through the soil, it picks up minerals. The more calcium and magnesium present, the harder your water. While water hardness is not a safety issue, you may notice increased mineral build-up or soap residue with harder water.

Hardness can be expressed as PPM - parts per million or GPG - grains per gallon.

PPM	GPG	Rating
0 - 75	0 - 4.3	Soft
76 - 150	4.4 - 8.7	Moderately Hard
151 - 300	8.8 - 17.5	Hard
over 300	17.6 +	Very Hard

Definitions

Action Level (AL):
The concentration of a contaminant that triggers treatment or other requirement that a water system must follow.

HAA5s: Haloacetic acids.

Maximum Contaminant Level (MCL):
The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLG as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG):
The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Residual Disinfection Level (MRDL):
The highest level of a disinfection allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

mg/L: Milligrams per liter (for example, one minute in two years).

MPN: Most probable number.

ND: Analyte was not detected or was below the method detection limit of the laboratory's instrumentation.

NTUs: Nephelometric Turbidity Units; a measure of turbidity.

pCi/L: Picocuries per liter is a measure of the radioactivity in water.

ppm: One part per million (for example, one minute in two years).

ppb: One part per billion (for example, one minute in 2,000 years).

TTHMs: Total Trihalomethanes

Treatment Technique (T.T.): A required process intended to reduce the level of a contaminant in drinking water.

µg/L: Micrograms per liter (for example, one minute in 2,000 years).

µmhos/cm: Micromhos per centimeter; a measure of conductivity.

WESTERN VIRGINIA WATER AUTHORITY

Saving Water
Saving Energy

The Western Virginia Water Authority is upgrading infrastructure, performing energy retrofits and improving our customer service. Authority staff and professional contractors are in the process of replacing all 58,000 water meters in our Roanoke service area, installing a remote system-wide automatic meter reading system and replacing pumps with more energy efficient equipment.

What does this mean to you?

- Your water meter will be replaced with a new electronic water meter that will automatically transmit meter readings through a wireless network to our billing system.
- Real-time readings mean your monthly bill is based on actual consumption.
- You will have faster notification if there is a suspected leak at your property.
- You will have cleaner air to breathe - wireless transmission means our meter trucks won't be driving through your neighborhood to collect meter readings.

While we are excited about this new project, we also know that you might have some questions. More information is available at www.westernvawater.org (Click on the Saving Water • Saving Energy link) or give us a call at 853.5700.

WESTERN VIRGINIA
WATER AUTHORITY
601 S. Jefferson Street
Roanoke, VA 24011

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