

## 2000 Annual Water Quality Report

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#### 2000 Water Quality Report

The Roanoke City Water Department is pleased to provide this water quality report to our customers. The Water Department is committed to providing the highest quality of drinking water, and this report includes information about where your water comes from, what it contains and how it compares to the standards set by regulatory agencies. The Water Department vigilantly safeguards the water supply and is proud to report that it was in full compliance with all monitoring and reporting requirements without a single violation.

For questions about the quality of our drinking water or this report, call the Roanoke City Water Department at 853-2596.

#### Health and General Information

As water travels over the land's surface or through the ground, it dissolves naturally occurring minerals and radioactive material, and can be polluted by animals or human activity.

Contaminants that might be expected in untreated water include biological contaminants, such as viruses and bacteria; inorganic contaminants, such as salts and metals; pesticides and herbicides; organic chemicals from industrial or petroleum use, and radioactive materials.

Turbidity as a contaminant has no health effects, however, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches. The percentage of samples meeting the turbidity limits specified (see chart) was 100% for the City water supply.

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 the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the U. S. Environmental Protection Agency's Safe Drinking Water Hotline at 800-426-4791. Information is also available through the Virginia Department of Health, VDH, at (540) 463-7136 and the Roanoke City Environmental Health Department at (540) 857-7663.

#### Special Information Available

Some people may be more vulnerable to contaminants in drinking water than the

general population. Immuno-compromised persons - such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly persons and infants - can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers, the Environmental Protection Agency, and the Centers for Disease Control. Guidelines to reduce the risk of infection by *Cryptosporidium* are available from the EPA's Safe Drinking Water Hotline at 800-426-4791.

### **Sources and Treatment of Your Drinking Water**

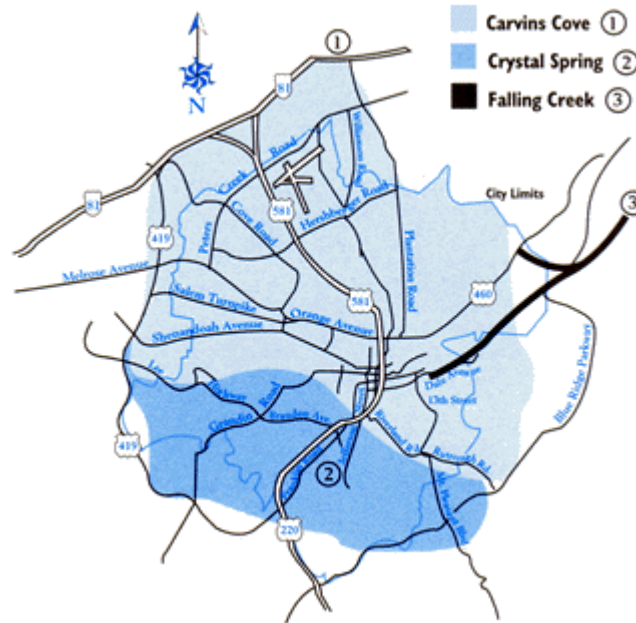
Carvins Cove Reservoir, a surface water source located near Hollins University, covers 630 acres and stores 6.5 billion gallons of water at full pond. The dam is 80 feet high and was constructed in 1927. Treatment at the plant includes aeration, flash mixing, coagulation, flocculation, sedimentation and filtration. After filtration, water is treated with chlorine for disinfection, fluoride for promoting strong teeth, and orthophosphate for corrosion control. Water is distributed throughout the community by six booster pump stations, six storage tanks, and pipes. Treatment capacity is 28 million gallons a day.

Falling Creek Reservoir, a surface water source located in Bedford County east of Vinton, covers 21 acres and stores 85 million gallons of water at full pond. It is fed by Beaver Reservoir that covers 69 acres and stores 435 million gallons of water at full pond. The dam at Falling Creek is 40 feet high and was constructed in 1897. The treatment process is similar to Carvins Cove, and water is distributed to the community by one storage tank and pipes. Treatment capacity is 1.5 million gallons a day.

Crystal Spring, a live spring at the base of Mill Mountain, is a groundwater source with an average flow capacity of four to six million gallons a day. The water is treated with chlorine and fluoride. Water is distributed throughout the community by four booster pump stations, eight storage tanks and pipes.

Water is also purchased from Roanoke County, Salem and Town of Vinton in the event of shortages or emergencies such as the drought of 1999. This water is mixed with Carvins Cove and Crystal Spring sources throughout the city service areas.

Customer service areas served by the different water sources are shown on the map below. Your water source depends on where you live. All of NE, NW, and the majority of SE to Reserve Avenue are served by Carvins Cove. Crystal Spring serves the SW section, and Falling Creek serves King Street NE to Rte 460 and along Rte 24 to 13th St. If you have a question on the source of your water, please call 853-2596 or 853-2595.



**Customer Service Areas**

### **Source Water Assessments**

Under a new program being developed by VDH, a detailed source water assessment will be conducted within the next few years to find ways to better protect our water sources. After the assessment is conducted, we will provide you with information about potential sources of contamination and measures to reduce or eliminate them.

### **Cryptosporidium and Giardia**

Cryptosporidium and Giardia are microscopic organisms that can result in diarrhea, fever and other gastrointestinal systems when ingested. The organisms come from animal and human wastes, and are eliminated by an effective treatment combination including filtration, sedimentation and disinfection. Roanoke City has tested for Cryptosporidium and Giardia in all three source waters and has never detected either organism.

### **Lead and Copper**

Roanoke water met all of the U. S. Environmental Protection Agency's new Action Level standards in the first round of testing for lead and copper in 1992. The regulations state that 90 percent of samples taken from drinking water taps in 100 "high risk" homes with lead services, pipes or lead solder in copper pipes must be below 0.015 parts per million for lead and 1.3 ppm for copper. Sampling has been conducted in accordance with the regulations since and results have been well below the Action Levels.

When it leaves our treatment plants, our water is virtually free of lead and copper. A building's plumbing can contain elements susceptible to corrosion and leach into tap water. If you are unsure whether your pipes contain lead or copper, run

the tap water until it changes temperature to assure that the building's plumbing has been flushed. Lead's suspected health effects in adults include high blood pressure, hearing problems, and kidney and nervous system disorders. In infants and children, lead can interfere with formation of red blood cells, cause low birth weight, delay physical and mental development, and is a probable cancer risk. Copper is a nutritionally essential element, but at high levels, copper can cause gastrointestinal difficulties such as nausea and diarrhea. Business and residential owners with lead or copper plumbing may have tests conducted by independent laboratories.

### Customer Views Welcome

If you are interested in learning more about the Water Department and water treatment, opportunities are available. Tours of the treatment plant for school, civic or other interested groups are available by request. Questions about water quality, comments or other interests should be directed to the Water Department Office by calling or writing to the phone number or address at the top of this page.

### 1999 Water Quality Data

| REGULATED SUBSTANCES           |       |                          |                                   |                                  |               |                |                    |   |
|--------------------------------|-------|--------------------------|-----------------------------------|----------------------------------|---------------|----------------|--------------------|---|
| Substance                      | Units | Ideal Goals (EPA's MCLG) | Highest Level Allowed (EPA's MCL) | Highest Level Detected at Source |               |                | (Range)/Average    | Source of Substance   |
|                                |       |                          |                                   | Carvin's Cove                    | Falling Creek | Crystal Spring |                    |   |
| Chlorine                       | ppm   |                          | 4-MDRL                            | 1.33*                            | 1.16*         | 0.98*          | (0.4 - 1.9) / 1.16 | Required Disinfectant added during treatment process to eliminate bacteria  |
| Chloride                       | ppm   |                          | 250                               | 8.9                              | <5            | 6              | (0 - 8.9) / 4.97   | naturally occurring in the environment  |
| fluoride                       | ppm   | 4                        | 4                                 | 1.08*                            | 0.84*         | 1.32*          | (0.1 - 3.6) / 1.08 | Erosion of natural deposits; water additive which promotes strong teeth; discharge from aluminum and fertilizer factories |
| Iron                           | ppm   |                          | 0.3                               | <0.01*                           | <0.01*        | <0.01*         | (0 - 0.30) / 0     | naturally occurring in the environment  |
| total nitrate & nitrate (as n) | ppm   | 10                       | 10                                | 0.11                             | <0.05         | 0.5            | (0 - 0.11) / 0.20  | run-off from fertilizer use; leaching from septic tanks; sewage; erosion of natural deposits                              |
| manganese                      | ppm   |                          | 0.05                              | 0.01*                            | 0.01*         | 0.01*          | (0 - 0.06) / 0     | Naturally occurring in the  |

|                               |             |                      |   |                       |                   |                       |                        |  |
|-------------------------------|-------------|----------------------|---|-----------------------|-------------------|-----------------------|------------------------|--|
|                               |             |                      |   |                       |                   |                       |                        | environment  |
| <b>Zinc</b>                   | ppm         |                      | 5   | <0.02                 | <0.02             | <0.02                 |                        | naturally occurring in the environment                     |
| <b>color</b>                  | color units |                      | 15  | <1*                   | <1*               | <1*                   | (0 - 13) / 0           | physical property of water                                 |
| <b>corrosivity</b>            |             | Non Corrosive        |   | Moderately aggressive | Highly aggressive | Moderately aggressive |                        | Physical property that occurs when water reacts with metal |
| <b>THM's</b>                  | ppb         | 0                    | 100   | 34.5                  | 31.1              | <0.05                 | (0 - 34.5) / 21.9      | by-product of drinking water chlorination                  |
| <b>ph</b>                     | pH units    |                      | 6.5-8.5   | 7.88*                 | 7.86*             | 7.78*                 | (6.7 - 9.0) / 7.84     | Acidity or basicity of water                               |
| <b>Total Dissolved Solids</b> | ppm         |                      | 500   | 104                   | 46                | 141                   | (46 - 141) / 97        | Physical property of water                                 |
| <b>Sulfate</b>                | ppm         |                      | 250   | 17.1                  | <5                | <5                    | (<5 - 17.1) / 5.7      | naturally occurring in the environment                     |
| <b>turbidity</b>              | NTU         | N/A                  | 0.5   | 0.351                 | 0.333             | 0.317                 | (0.317 - 0.35) / 0.334 | Soil run-off   |
| <b>Total Coliforms</b>        | MPN/100mL   | 0                    | Presence of coliform bacteria in >5% of monthly samples   | 0                     | 0                 | 0                     |                        | Naturally present in the environment                       |
| <b>Fecal Coliforms</b>        | MPN/100mL   | 0                    | A routine and a repeat sample are total coliform positive, and one is also fecal coliform or E. coli positive | 0                     | 0                 | 0                     |                        | Human and animal waste                                     |
| <b>Gross Alpha</b>            | pCi/L       | 0                    | 15  | 0.3                   | 0                 | 0.8                   | (0 - 0.8) / 0.37       | Erosion of natural deposits                                |
| <b>Gross Beta</b>             | pCi/L       | 0                    | 50  | 1.2                   | 1.0               | 3.2                   | (1.0 - 3.2) 1.8        | Decay of natural and man-made deposits                     |
| <b>UNREGULATED SUBSTANCES</b> |             |                      |   |                       |                   |                       |                        |  |
| <b>Ortho-Phosphate</b>        | ppm         | unregulated          |   | .96                   | 1.18              | <0.01*                | (0.26 - 1.8) / 0.71    | corrosion inhibitor added during treatment process         |
| <b>conductivity</b>           | umhos\cm    | unregulated          |   | 193                   | 68.2              | 257                   | (68.2 - 257) / 172.7   | Physical property of water                                 |
| <b>Sodium</b>                 | ppm         | No Limits Designated |   | 6                     | 9                 | <5                    | (0 - 9) / 5            | naturally occurring in the environment                     |
| <b>Lead and Copper</b>        |             |                      |   |                       |                   |                       |                        |  |

|   |     |             |          |                                    |         |                    |  |  |
|---|-----|-------------|----------|------------------------------------|---------|--------------------|--|--|
| <b>Lead</b>                             | ppb | 0 mg/L      | AL = 15  | 0 samples exceeded AL for the City |         |                    | (0 - 0.005)  | Natural\industrial deposits, plumbing solder, brass alloy in faucets |
| <b>Copper</b>                           | ppm | 1.3 mg/L    | AL = 1.3 | 0 samples exceeded AL for the City |         |                    | (0 - 0.654)  | Natural\industrial deposits, plumbing, wood preservatives            |
| <b>OTHER PARAMETERS (NOT REGULATED)</b> |     |             |          |                                    |         |                    |  |  |
| <b>Alkalinity</b>                       | ppm | unregulated | 75.83*   | 21.32*                             | 131.17* | (10 - 146) / 76.11 | Measurement of naturally occurring carbonates      |  |
| <b>Hardness</b>                         | ppm | unregulated | 86.22*   | 10.61*                             | 131.33* | (7 - 152) / 76.05  | Measurement of naturally occurring hardness metals |  |

\* Denotes a number derived from monthly compliance reports.

We constantly monitor the water supply for various contaminants to meet all regulatory requirements. This table lists only those contaminants that had some level of detection. Many other contaminants have been analyzed but were not present or were below the detection limits of the lab equipment.

The City has tested for Volatile Organics (VOC's), pesticides and synthetic organic compounds (SOC's) (1997) with none detected.

### Definitions:

#### 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.

ppm

One part per million (Ex. One minute in 2 years)

ppb

One part per billion (Ex. One minute in 2,000 years)

mg/L

Milligrams per liter (Ex. One minute in 2 years)

#### Action Level

The concentration of a contaminant that triggers treatment or other requirement that a water system must follow.

pCi/L

Picocuries per liter is a measure of the radioactivity of water. A picocurie is 10<sup>-12</sup> curies and is the quantity of radioactive material producing 2.22 nuclear transformations per minute.

Treatment Technique

A required process intended to reduce the level of a contaminant in drinking water.

MDRL

Maximum disinfection residual level.