Urban Area

2020 Annual Drinking Water Report
Includes Testing for 2019
Dedicated to Delivering Clean Water

Dear Customer,

This year, perhaps more than any other because of the impacts of COVID-19, the safety of your drinking water has never been more important. The people of the Albemarle County Service Authority (ACSA) work hard to ensure you drink safe, dependable water by conducting thousands of water quality tests annually to assure that it is always of the highest quality. Your drinking water again met or exceeded all regulatory requirements in 2019.

The ACSA and the Rivanna Water and Sewer Authority (RWSA), in partnership with the Virginia Department of Health (VDH), work cooperatively to ensure that you receive a safe and reliable supply of drinking water. The RWSA collects, stores and treats the water, while the ACSA purchases the treated water and delivers it to you through our distribution system.

The ACSA is committed to providing you, the customer, with this information since informed customers are indeed our best allies. We encourage you to contact us and tell us what you think of this report; your suggestions are always welcomed. If you wish to receive a “hard-copy” of the report, please contact Tim Brown at 977-4511, Ext. 119, or at tbrown@serviceauthority.org.

Thank you,

Gary B. O’Connell
Executive Director
Albemarle County Service Authority

Our Customer Service representatives are available Monday-Friday from 8am to 5pm to assist you in person, via email, or by phone. Information is also available on our website, www.serviceauthority.org.

168 Spotnap Road
Charlottesville, Virginia 22911
(434) 977-4511
custserv@serviceauthority.org
Important Information about Your Water

A CSA Board of Directors

Clarence Roberts, Chair - Rivanna District
Jennifer Sulzberger, Vice Chair - Samuel Miller District
John Parcells - White Hall District
Charles Tolbert - Jack Jouett District
Nathan Moore - Rio District
Richard Armstrong - Scottsville District

The ACSA Board of Directors holds meetings on the third Thursday of each month at 9am at 168 Spotnap Road. Call (434) 977-4511 or visit www.serviceauthority.org for more information.

The Rivanna Water & Sewer Authority (RWSA) Board of Directors holds meetings on the fourth Tuesday of each month at 2pm at 695 Moore’s Creek Lane. Call (434) 977-2970 or visit www.rivanna.org for more information.

Your Water Supply & Treatment

The RWSA operates three water treatment plants (WTP) to provide water to the City of Charlottesville and the urban “ring” served by the ACSA. The South Rivanna WTP is sourced by the South Rivanna Reservoir; the Observatory WTP is sourced by the Ragged Mountain and Sugar Hollow Reservoirs; and the North Rivanna WTP is sourced by the North Fork Rivanna River.

All are surface water supplies, replenished by precipitation, stream flow, overland flow, and groundwater flow. All supplies have a low mineral content, are low in hardness or scale ("soft"), and there is little of the iron or manganese commonly found in the area’s groundwater. The treated water doesn’t have any iron or manganese.

Each plant employs both physical and chemical treatment processes before releasing water into the distribution system. Sodium hypochlorite is used at all three plants to disinfect the treated water. Fluoride is added at each plant to promote good dental health. The water provided to your tap may vary from time to time depending on demand, the level of storage in the system, and your location.

Significant upgrades to all three plants were completed in 2018 related to the Stage 2 Disinfection Byproducts Rule. An advanced treatment process that employs granular activated carbon (GAC) was installed to result in higher quality water. In particular, the concentration of disinfection byproducts (TTHMs and HAAs; see discussion of contaminants) has been significantly reduced. Average TTHMs were down 20% and average HAAs were down 37% in 2019 compared to 2018. In addition to lowering these chemical compounds, GAC serves as a barrier to other potential contaminants and improves certain taste and odor issues.

Water Treatment for Corrosion Control

It is standard practice that a phosphate chemical be added to drinking water supplies during treatment in order to reduce corrosion of the metal pipes in the distribution system and in customer plumbing. The chemical forms a protective layer on the inside of the pipes, reducing corrosion and the possibility of mainly lead and copper from entering the water.

For more than 30 years, the RWSA has used a polyphosphate product for corrosion control, and it has been very effective in keeping lead and copper out of customer water supplies. The RWSA evaluated for implementation a new, blended, orthophosphate product to optimize distribution system lead and copper corrosion control. Due to the focus on the coronavirus pandemic, implementation of this new product has been postponed until late 2020 or 2021.
Important Information about Your Water

Advanced Treatment Using Granular Activated Carbon (GAC)

in 2012, with the essential support of our customers, the ACSA joined the City of Charlottesville, Albemarle County, and the Rivanna Water & Sewer Authority to approve the installation of granular activated carbon (GAC) systems on the water treatment for our Urban Area, Scottsville, and Crozet service areas. GAC is very effective in improving water quality in distribution systems. It was added to our treatment processes to aid in the additional removal of organics that, when combined with chlorine, create disinfection byproducts (DBPs) regulated by the EPA.

GAC also provides improved water taste and odor, and it is proven to be highly effective at removing a series of man-made and naturally occurring contaminants that are being found in a growing number of water supplies across the county. While testing has shown our service areas are not impacted by these contaminants, GAC provides an added level of treatment for the future protection of our drinking water.

Installation of the GAC systems was completed in 2018 and the reduction of DBPs has been dramatic. We are extremely proud of the results that have been achieved because they demonstrate how community support and investment in our water treatment will result in excellent drinking water quality now and for years to come.

Water Quality Standards

The information in this report has been collected and reported in accordance with the drinking water standards established by the USEPA and the VDH. The RWSA conducts extensive testing of the source waters and the treated water before it ever leaves the plants, as well as testing weekly, monthly and quarterly samples within the distribution system.

In addition to the data contained in this report, other testing includes such parameters as the “heavy” metals, volatile organic compounds, and pesticides of the treated water. They are not listed here since none of these parameters was detected. More specific information can be obtained by contacting Tim Brown at 977-4511, ext. 119, or at tbrown@serviceauthority.org.

As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals, and in some cases radioactive material, as well as substances resulting from the presence of animals, and human activities. In other words, all surface water supplies are exposed to a wide array of “contaminants” at varying concentrations. The presence of these contaminants, however, does not necessarily indicate that water poses a health risk, and even bottled water may reasonably be expected to contain at least minimal amounts of some contaminants.

More information about contaminants and potential health effects can be obtained by calling the EPA Safe Drinking Water Hotline (800-426-4791) or by visiting their website (www.epa.gov/safewater). See also the discussion of Cryptosporidium contained in this report.

Internal Issues of Mold

The most common water-related complaint we have received from our customers over the years is the occasional appearance of a black growth on toilets, and in fixtures like faucets and shower heads. This is a harmless form of mold; the water is completely safe to drink. The mold is not coming into your home through our water pipes. Instead, the mold is the result of airborne spores and there not being enough chlorine in the water to prevent mold growth. The spores come from hardwood forests, construction sites, and mulch piles. In particular, we have seen a very clear link between mold and mulch supplies for several years.

Testing in 2018 and 2019 identified the mold as very common types. More information, including tips on control, can be obtained by visiting our website at www.serviceauthority.org/watersupplyfaq.html.
Important Information about Your Water

Cryptosporidium

Cryptosporidium is a microbial pathogen found in surface waters throughout the U.S. Ingestion of Cryptosporidium may cause cryptosporidiosis, an abdominal infection characterized by nausea, diarrhea, and abdominal cramps. Cryptosporidium may be spread through means other than drinking water. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people are at risk of developing a potentially life-threatening illness.

Although filtration removes the pathogen, the most commonly used filtration methods cannot guarantee 100% removal. The RWSA makes every effort to optimize the filtration process at all of the WTPs to ensure the greatest degree of Cryptosporidium removal. Based on the results of recent studies, our water sources have been placed in the lowest risk category for exposure to Cryptosporidium.

Fluoride

The naturally-occurring fluoride content of our source waters (reservoirs and streams) is quite low. Therefore, fluoride is added to your water at the treatment plants to promote good dental health. Fluoridation of drinking water was first introduced in the U.S. in the 1940s, and the Centers for Disease Control and Prevention named it one of the ten great public health achievements of the 20th century.

In 2011, the U.S. Department of Health and Human Services (HHS), jointly with the U.S Environmental Protection Agency (EPA), recommended that the level of fluoride added to drinking water be reduced from a range of 0.7-1.2 ppm to 0.7 ppm. The RWSA immediately put this change into effect at all treatment plants.

The main reason for this proposed action is that Americans have access to more sources of fluoride than they did decades ago. In addition to the fluoride added to many public water supplies, it is found in toothpastes and mouth rinses, and is routinely applied to children’s teeth by dental professionals. HHS officially decreased the recommended level of fluoride in drinking water to 0.7 ppm in 2015. The range of fluoride added to your water in 2019 was 0.54-0.82 ppm.

Lead in Drinking Water

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and internal plumbing. RWSA and the ACSA are responsible for providing high-quality drinking water; it is non-corrosive, has a corrosion inhibitor added to the water to coat the pipes, and is delivered to you in pipes that are free of lead.

However, we cannot control the variety of materials used in the plumbing components of houses and businesses. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before drinking or cooking. If you are concerned about lead in your water you may wish to have your water tested. The periodic lead and copper testing at select, high-risk households last occurred in the summer of 2019. (See the data chart.)

A trace amount of lead was found in only one of the 30 samples. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (800-426-4791) or at www.epa.gov/safewater/lead.
Important Information about Your Water

What if I Am Immuno-compromised?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as those with cancer undergoing chemotherapy; people who have undergone organ transplants; persons with HIV/AIDS or other immune system disorders; and some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. EPA and CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from EPA's Safe Drinking Water Hotline (800-426-4791) or by visiting their website - www.epa.gov/safewater.

### 2019 Water Quality Test Results

<table>
<thead>
<tr>
<th>Primary Standards - Potential Health Risk</th>
<th>MCLG</th>
<th>MCL</th>
<th>ACSA Water Result</th>
<th># Samples &gt; AL</th>
<th>Range of Detections</th>
<th>Violation?</th>
<th>Typical Source of Contaminant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MICROBIOLOGICAL ORGANISMS; RELATED MEASUREMENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Coliform Bacteria (1)</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Naturally present in the environment</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria (1)</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Human and animal fecal waste</td>
</tr>
<tr>
<td>Turbidity (max. single value)</td>
<td>N/A</td>
<td>1 (5)</td>
<td>0.3 NTU</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>Soil runoff</td>
</tr>
<tr>
<td>Turbidity (% of monthly samples below 0.3 NTU)</td>
<td>N/A</td>
<td>At least 95% (5)</td>
<td>100%</td>
<td>N/A</td>
<td>100%</td>
<td>No</td>
<td>Soil runoff</td>
</tr>
<tr>
<td><strong>RADIOACTIVE COMPOUNDS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combined Radium (6)</td>
<td>0 pCi/l</td>
<td>5 pCi/l</td>
<td>0.7 pCi/l</td>
<td>N/A</td>
<td>&lt;0.5-0.7 pCi/l</td>
<td>No</td>
<td>Erosion of natural deposits</td>
</tr>
<tr>
<td>Gross Alpha (6)</td>
<td>0 pCi/l</td>
<td>15 pCi/l</td>
<td>&lt;0.38 pCi/l</td>
<td>N/A</td>
<td>&lt;0.3-&lt;0.38 pCi/l</td>
<td>No</td>
<td>Decay of natural deposits</td>
</tr>
<tr>
<td>Gross Beta (6,7)</td>
<td>0 pCi/l</td>
<td>50 pCi/l</td>
<td>1.7 pCi/l</td>
<td>N/A</td>
<td>1.1-1.7 pCi/l</td>
<td>No</td>
<td>Erosion of natural deposits</td>
</tr>
<tr>
<td><strong>INORGANIC COMPOUNDS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead (8)</td>
<td>0 ppb</td>
<td>15 ppb (AL)</td>
<td>&lt;2.00 ppb (9)</td>
<td>0</td>
<td>&lt;2.00-3.09 ppb</td>
<td>No</td>
<td>Corrosion of household plumbing</td>
</tr>
<tr>
<td>Copper (8)</td>
<td>1.3 ppm</td>
<td>1.3 ppm (AL)</td>
<td>0.065 ppm (9)</td>
<td>0</td>
<td>&lt;0.020-0.108</td>
<td>No</td>
<td>Corrosion of household plumbing; erosion of natural deposits</td>
</tr>
<tr>
<td>Barium</td>
<td>2 ppm</td>
<td>2 ppm</td>
<td>0.018 ppm (9)</td>
<td>N/A</td>
<td>&lt;0.010-0.018</td>
<td>No</td>
<td>Erosion of natural deposits; drilling waste discharges</td>
</tr>
<tr>
<td>Fluoride</td>
<td>4 ppm</td>
<td>4 ppm</td>
<td>0.67 ppm</td>
<td>N/A</td>
<td>0.54-0.82 ppm</td>
<td>No</td>
<td>Water additive that promotes strong teeth</td>
</tr>
<tr>
<td>Nitrates</td>
<td>10 ppm</td>
<td>10 ppm</td>
<td>0.42 ppm</td>
<td>N/A</td>
<td>0.06-0.42 ppm</td>
<td>No</td>
<td>Fertilizer runoff</td>
</tr>
<tr>
<td><strong>DISINFECTION &amp; DISINFECTION BYPRODUCT CONTAMINANTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free Residual Chlorine</td>
<td>MRDL=4 ppm</td>
<td>MRDLG=4 ppm</td>
<td>1.13 ppm (10)</td>
<td>N/A</td>
<td>0.4-1.94 ppm</td>
<td>No</td>
<td>Water additive to control microbes (disinfectant)</td>
</tr>
<tr>
<td>Total Trihalomethanes (TTHMs)</td>
<td>0</td>
<td>80 ppb</td>
<td>39 ppb (11)</td>
<td>N/A</td>
<td>&lt;1-52 ppb</td>
<td>No</td>
<td>Disinfection byproduct</td>
</tr>
<tr>
<td>Haloacetic Acids (HAAs)</td>
<td>0</td>
<td>60 ppb</td>
<td>24 ppb (11)</td>
<td>N/A</td>
<td>1.26 ppb</td>
<td>No</td>
<td>Disinfection byproduct</td>
</tr>
</tbody>
</table>
Important Information about Your Water

2019 Water Quality Test Results (continued)

<table>
<thead>
<tr>
<th>Secondary Standards/Aesthetic Factors</th>
<th>MCLG</th>
<th>MCL</th>
<th>ACSA Water Result</th>
<th># Samples &gt; AL</th>
<th>Range of Detections</th>
<th>Violation?</th>
<th>Typical Source of Contaminant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloride</td>
<td>N/A</td>
<td>250 ppm</td>
<td>7.3-15.0 ppm</td>
<td>N/A</td>
<td>7.3-15.0 ppm</td>
<td>No</td>
<td>Runoff/leaching of natural deposits</td>
</tr>
<tr>
<td>Iron</td>
<td>N/A</td>
<td>0.3 ppm</td>
<td>&lt;0.05 ppm</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>Runoff/leaching of natural deposits</td>
</tr>
<tr>
<td>Manganese</td>
<td>N/A</td>
<td>0.05 ppm</td>
<td>&lt;0.01 ppm</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>Runoff/leaching of natural deposits</td>
</tr>
<tr>
<td>pH</td>
<td>N/A</td>
<td>6.5-8.5 ppm</td>
<td>7.5-7.6 (mth. avg.)</td>
<td>N/A</td>
<td>7.5-7.6 (mth. avg.)</td>
<td>No</td>
<td>Runoff/leaching of natural deposits</td>
</tr>
<tr>
<td>Sulfate</td>
<td>N/A</td>
<td>250 ppm</td>
<td>&lt;5.0-27.0 ppm</td>
<td>N/A</td>
<td>&lt;5.0-27.0 ppm</td>
<td>No</td>
<td>Runoff/leaching of natural deposits</td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>N/A</td>
<td>500 ppm</td>
<td>56-108 ppm</td>
<td>N/A</td>
<td>56-108 ppm</td>
<td>No</td>
<td>Runoff/leaching of natural deposits</td>
</tr>
</tbody>
</table>

OTHER PARAMETERS OF INTEREST

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MCLG</th>
<th>MCL</th>
<th>ACSA Water Result</th>
<th># Samples &gt; AL</th>
<th>Range of Detections</th>
<th>Violation?</th>
<th>Typical Source of Contaminant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkalinity</td>
<td>N/A</td>
<td>N/A</td>
<td>18-63 ppm (mth avg.)</td>
<td>N/A</td>
<td>18-63 ppm</td>
<td>N/A</td>
<td>Runoff/leaching of limestone minerals</td>
</tr>
<tr>
<td>Conductivity</td>
<td>N/A</td>
<td>N/A</td>
<td>100-170 micromhos/cm</td>
<td>N/A</td>
<td>100-170 micromhos/cm</td>
<td>N/A</td>
<td>Runoff/leaching of natural deposits</td>
</tr>
<tr>
<td>Hardness</td>
<td>N/A</td>
<td>N/A</td>
<td>14-37 ppm</td>
<td>N/A</td>
<td>14-37 ppm</td>
<td>N/A</td>
<td>Runoff/leaching of limestone minerals</td>
</tr>
<tr>
<td>Sodium</td>
<td>N/A</td>
<td>N/A</td>
<td>6.49-29.2 ppm</td>
<td>N/A</td>
<td>6.49-29.2 ppm</td>
<td>N/A</td>
<td>Runoff/leaching of natural deposits</td>
</tr>
</tbody>
</table>

(1) Unit of measurement for total and fecal coliform bacteria is the presence or absence of bacteria in a 100 ml sample.

(2) Of the 960 routine samples collected in 2019, eight (8) samples indicated the presence of total coliform bacteria. Four (4) of these samples indicated the presence of fecal coliform bacteria. These were likely due to operator error in August.

(3) Fecal coliform MCL: A routine sample and a repeat sample are total coliform positive, and at least one is also fecal coliform positive.

(4) No repeat sample indicated a positive result for fecal coliform bacteria or total coliform bacteria.

(5) The MCL for turbidity is for no single measurement to exceed 1 NTU, and for 95% of all measurements to be below 0.3 NTU.


(7) The EPA considers 50 pCi/l to be the level of concern for beta particles.

(8) Sampled in July 2019 from select, high-risk residences. To be sampled again in 2022.

(9) The value reported is the 90th percentile of all data (30 samples) collected.

(10) The value reported is the highest quarterly, system-wide average.

(11) TTHM and HAA results are averaged over four quarters at each sampling location to determine compliance with the MCL. Range of detections is from 2019, but "Result" includes late 2018 and 2019.

UCMR-4

The 1996 Safe Drinking Water Act amendments established the Unregulated Contaminant Monitoring Rule (UCMR) program. This program mandates that the U.S. Environmental Protection Agency (EPA) issue a list every five years of some thirty (30) unregulated contaminants. Data are collected throughout the country over a two-year period, and then analyzed to determine whether any of these contaminants should be classified as regulated (i.e., a potential health risk) and, if so, at what level should the regulation be set.

Contaminants are in the general categories of pesticides, herbicides, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, hormones, and more. Testing is mandated for all systems serving a population greater than 10,000, and for select smaller systems.
Important Information about Your Water

UCMR-4 (continued)

Currently, testing is underway for the fourth list of contaminants (UCMR-4). The current list includes metals, pesticides, VOCs, SVOCs, alcohols, various disinfection byproducts (originating from disinfection of the water), and cyanotoxins (chemicals that are released into surface water supplies by algae).

The Rivanna Water and Sewer Authority began testing for UCMR-4 contaminants in the Urban system in February 2019 according to a schedule delivered to them by the EPA. Testing will continue in 2020 for several cyanotoxin contaminants. Compounds that were detected in 2019 include the following disinfection byproducts:

- Bromochloroacetic acid – Urban, Crozet, Scottsville – 0.71 - 2.5 ppb
- Bromodichloroacetic acid - Urban, Crozet, Scottsville – 0.67 - 2.4 ppb
- Chlorodibromoacetic acid – Urban only – 0.34 ppb

And the following metal:
- Manganese – Urban and Scottsville – 0.43-1.6 ppb

Each of the above contaminants has been detected in a large majority of water systems across the country. The results of the cyanotoxin testing later this year will be reported to you in the 2021 Water Quality Report.

For more information regarding the UCMR-4 program, please visit the following website: https://www.epa.gov/dwucmr/fourth-unregulated-contaminant-monitoring-rule.

What Do All the Numbers Mean?

First, they show your drinking water met or exceeded all regulatory requirements during 2019. We are fortunate to have reliable sources for your drinking water needs, and well-operated treatment facilities. The information provides you with details on each potentially harmful contaminant or compound detected in your drinking water.

Definitions

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

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

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. The addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to public health.

ppb: Parts per billion or micrograms per liter (ug/l). One part substance per billion parts of a solution.

ppm: Parts per million or milligrams per liter (mg/l). One part substance per million parts of a solution.

pCi/l: Picocuries per liter. This is a measure of radioactivity.

Nephelometric Turbidity Unit (NTU): A measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Action Level (AL): The concentration of a contaminant, which, if exceeded, trigger treatment of other actions by the water provider. This term is typically limited to discussions of lead and copper concentrations.

N/A: Not applicable. <: Less than.
Important Information about Your Water

The Potential Health Risks Associated with These Contaminants

**Total and Fecal Coliform Bacteria.** Coliforms are a large group of bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present. Fecal coliform bacteria and E. coli, in particular, indicate a likely contamination from human or animal wastes. These microorganisms can result in short-term effects such as nausea, headache, cramps and diarrhea, and they pose a special health risk for infants, young children, the aged, and those with severely compromised immune systems.

**Turbidity** is a measure of the clarity of water. On its own, elevated turbidity has no health effects. However, turbid water can interfere with disinfection and may provide a medium for microbial growth. Elevated turbidity may also indicate the presence of disease-causing organisms, including bacteria, viruses or parasites that can cause such symptoms as nausea, headache, cramps and diarrhea.

**Combined Radium, Gross Alpha and Gross Beta.** These are naturally-occurring forms of radiation, resulting from certain minerals that are radioactive. When these minerals are eroded into the source water, radiation in the water may result. Some people who drink water containing radium, or alpha or beta emitters, over many years may have an increased risk of getting cancer.

**Lead and Copper.** The USEPA Lead and Copper Rule mandates a household testing program for these metals, and the values reported in the chart are from samples that were collected from select households. Infants and children who drink water containing lead in excess of the Action Level could experience delays in physical or mental development. Adults who drink this water over many years could possibly develop kidney problems or high blood pressure. See the box for additional information on lead. Copper is an essential nutrient, but some who drink water containing copper in excess of the Action Level could experience gastrointestinal distress in a relatively short period of time. Some who drink this water over many years could develop kidney or liver damage. Individuals with Wilson’s disease should consult their doctor.

**Barium** is a metal that is naturally-occurring in rock and the soil. Some people who drink water containing barium in excess of the MCL over many years may experience an increase in their blood pressure.

**Fluoride** is an element added at the water treatment plants to promote strong teeth. Some people who drink water containing fluoride in excess of the MCL over many years could develop bone disease, with pain and tenderness of the bones. Children who drink water containing fluoride in excess of the MCL may develop mottled teeth. See the box for additional information on fluoride.

**Nitrate** is a form of nitrogen found primarily in fertilizers, sewage, and runoff from natural deposits. Infants below the age of six months who drink water containing nitrate in excess of the MCL could develop “blue baby syndrome” in which there is a bluish coloration of the skin and shortness of breath. The infant can become seriously ill and, if untreated, may die.

**Chlorine** is added at the treatment plant to inactivate disease-causing microbes. Some people who use water containing chlorine in excess of the MRDL could experience irritation of the eyes, nose and skin. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.

**Trihalomethanes and Haloacetic Acids** are compounds formed by the interaction of chlorine with naturally-occurring organic matter, and they are sometimes referred to as disinfection by-products. Chlorine is added at the treatment plant to inactivate disease-causing microbes, and organic matter is naturally present from leaves and decaying plants in the reservoirs and streams.

Some people who drink water containing these compounds in excess of the MCL over many years may experience problems with their liver, kidneys or central nervous system, and may have an increased risk of getting cancer.