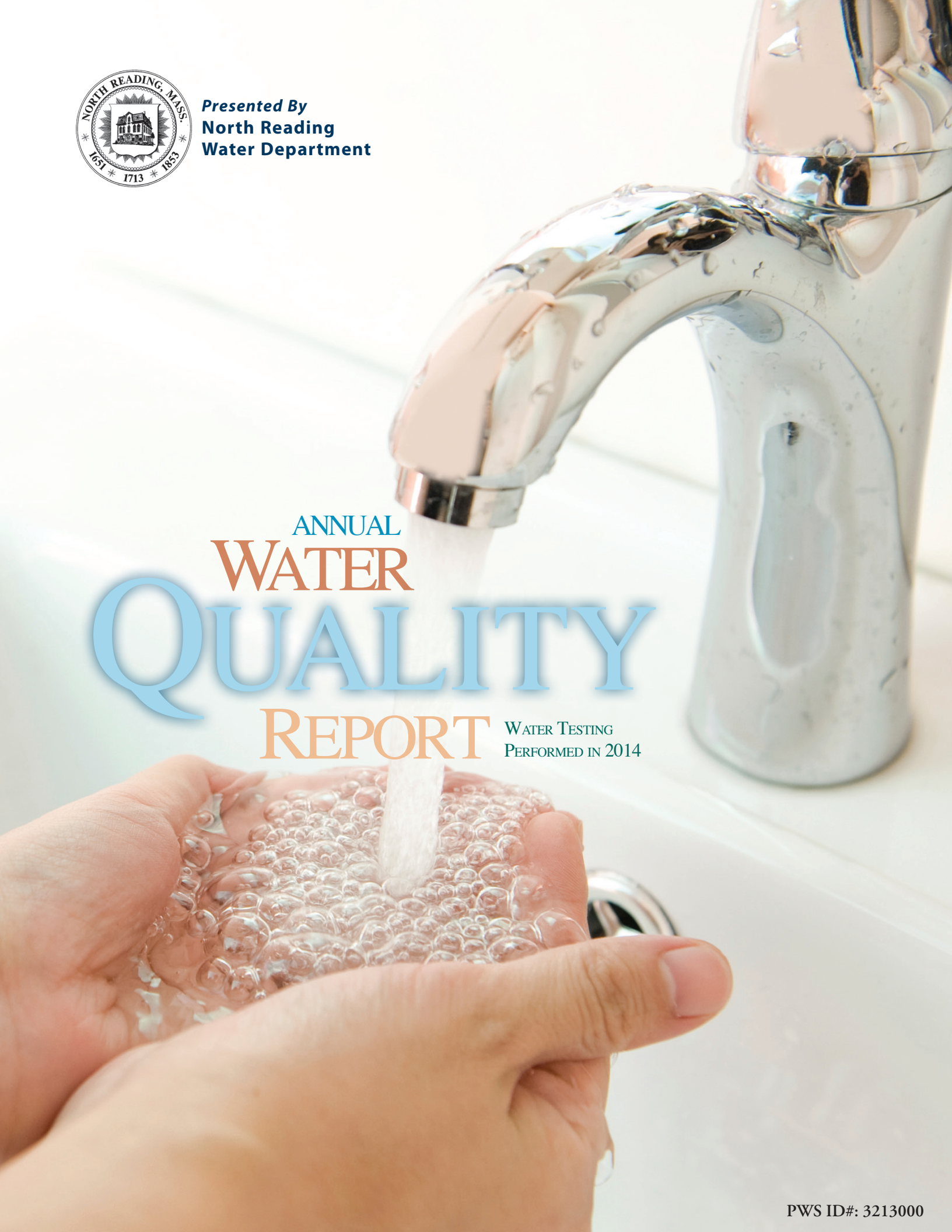
*Presented By*
**North Reading Water Department**

# ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2014



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## Our Mission Continues

We are proud to present once again our annual water quality report covering all testing performed between January 1 and December 31, 2014. Most notably, last year marked the 40th anniversary of the Safe Drinking Water Act (SDWA). This rule was created to protect public health by regulating the nation's drinking water supply. We celebrate this milestone as we continue to manage our water system with a mission to deliver the best-quality drinking water. By striving to meet the requirements of SDWA, we are ensuring a future of healthy, clean drinking water for years to come.

Please let us know if you ever have any questions or concerns about your water.

## The Benefits of Fluoridation

Fluoride is a naturally occurring element in many water supplies in trace amounts. In our system, the fluoride level is adjusted to an optimal level averaging one part per million (ppm) to improve oral health in children. At this level, it is safe, odorless, colorless, and tasteless. Our water system has been providing this treatment since the 1970s. There are over 3.9 million people in 140 Massachusetts water systems and 184 million people in the U.S. who receive the health and economic benefits of fluoridation.

## Where Does My Water Come From?

North Reading has four active wellfields from which we draw our water: the Lakeside Boulevard Wellfield, the Route 125 Well, the Railroad Bed Wellfield, and the Central Street Wellfield. In addition to these wellfields, we maintain two active interconnections with the Town of Andover that are used to supplement our wells.

In 2014, the North Reading Water Department supplied over 531 million gallons of water to the Town, averaging 1.46 million gallons per day. On the peak summer day, the water demand exceeded 2.23 million gallons.

The Water Department maintains approximately 80 miles of water mains that transport water through the community to more than 4,700 service connections. The water system also includes approximately 750 fire hydrants and three water storage tanks holding a combined 3.3 million gallons of water.

## Substances That Could Be in Water

To ensure that tap water is safe to drink, the Massachusetts Department of Environmental Protection (MassDEP) and the U.S. Environmental Protection Agency (U.S. EPA) prescribe regulations limiting the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and Massachusetts Department of Public Health (DPH) regulations establish limits for contaminants in bottled water that must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Substances that may be present in source water include:

**Microbial Contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife;

**Inorganic Contaminants**, such as salts and metals, which can be naturally occurring or may result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

**Pesticides and Herbicides**, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;

**Organic Chemical Contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and which may also come from gas stations, urban stormwater runoff, and septic systems;

**Radioactive Contaminants**, which can be naturally occurring or may be the result of oil and gas production and mining activities.

More information about contaminants and potential health effects can be obtained by calling the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

## Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as those with cancer undergoing chemotherapy, those who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or http://water.epa.gov/drink/hotline.

## What's a Cross-Connection?

Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment (boilers), systems containing chemicals (air conditioning systems, fire sprinkler systems, irrigation systems), or water sources of questionable quality. Cross-connection contamination can occur when the pressure in the equipment or system is greater than the pressure inside the drinking water line (backpressure). Contamination can also occur when the pressure in the drinking water line drops due to fairly routine occurrences (main breaks, heavy water demand), causing contaminants to be sucked out from the equipment and into the drinking water line (backsiphonage).

Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool or when attached to a chemical sprayer for weed killing. Garden hoses that are left lying on the ground may be contaminated by fertilizers, cesspools, or garden chemicals. Improperly installed valves in your toilet could also be a source of cross-connection contamination.

Community water supplies are continuously jeopardized by cross-connections unless appropriate valves, known as backflow prevention devices, are installed and maintained. We have surveyed all industrial, commercial, and institutional facilities in the service area to make sure that all potential cross-connections are identified and eliminated or protected by a backflow preventer. We also inspect and test each backflow preventer to make sure that it is providing maximum protection.

For more information, review the Cross-Connection Control Manual from the U.S. EPA's Web site at http://water.epa.gov/infrastructure/drinkingwater/pws/crossconnectioncontrol/index.cfm. You can also call the Safe Drinking Water Hotline at (800) 426-4791.

## How Is My Water Treated?

All water produced by the North Reading Water Department comes from gravel-packed wells. The sand and gravel around the wells act as a natural filter against many contaminants. As rainfall and melting snow pass through these soils, the water dissolves small amounts of the iron and manganese that make up these soils. Iron and manganese do not typically pose a health concern, but they do cause a number of aesthetic problems including unpleasant tastes and odors, discolored water, and staining of plumbing fixtures, and they can cause discolored laundry. Although the water is still safe to drink, treatment is still desirable.

The North Reading Water Department treats the water to remove or reduce the iron and manganese concentrations. The water is chemically treated to change the dissolved iron and manganese into small particles that are then filtered out of the water. Following filtration, a disinfectant (chlorine) is added to protect against microbial contaminants, the water is treated with potassium hydroxide to raise the pH of the water to make it less corrosive, and fluoride is added to assist in dental health.

## Questions?

If you are interested in learning more about North Reading's water supply, helping to protect our supplies, or if you have questions about your drinking water or about this report, please contact Mark Clark of the Water Department at (978) 664-6046.

## Lead in Home Plumbing

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 home plumbing. We are responsible for providing high-quality drinking water, but we 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 30 seconds to 2 minutes 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, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at www.epa.gov/safewater/lead.

## About Our Violations

The analytical reports for radionuclides and perchlorate for the sampling quarter July 1, 2014, to September 30, 2014, were submitted late to the Massachusetts Department of Environmental Protection (MassDEP). Quarterly reports are required to be submitted to MassDEP by the 10th day of the month following the reporting quarter. The reports for these contaminants were received by MassDEP on October 14, 2014, four days past the reporting deadline. The North Reading Water Department has incorporated changes to ensure reports are submitted and received by MassDEP within the reporting deadlines.

The Total Trihalomethanes (TTHM) level at one of four sampling locations exceeded the MCL of 80 ppb in April, July, and October of 2014. TTHMs form when chlorine is added to the drinking water as a disinfectant. The amount of chlorine being added has been reduced, and TTHM levels measured in January and April 2015 have been below the MCL. Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their livers, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

## Source Water Assessment and Protection Report

The Massachusetts Department of Environmental Protection (MassDEP) has prepared a Source Water Assessment and Protection (SWAP) Report for North Reading. This report is available at the Water Department office and is posted on the North Reading Web site (www.northreadingma.gov). This report is an assessment of the delineated area around our listed sources through which contaminants, if present, could migrate and reach our source water. It also includes an inventory of potential sources of contamination within the delineated area, and a determination of the water supply's susceptibility to contamination by the identified potential sources.

Every resident and property owner in North Reading plays an important role in ensuring the safety of the water supply. All of North Reading lies within the watershed of the Ipswich River. To help maintain the ecological health of the river and its tributaries, as well as the ponds and wetlands in North Reading, the Water Department has these recommendations:

- Limit the application of chemicals used for lawn maintenance. When you apply fertilizers, pesticides, and herbicides, any chemical not taken up by the vegetation can make its way to the water table. Follow the manufacturer's recommendations for application dosages and frequency.
- Store and dispose of hazardous wastes properly. We all use products that pose a threat to the environment. Used oils, fuels, paints, batteries, and older thermometers containing mercury are all examples of common household wastes that can, if not properly disposed of, contaminate water supplies. Contact the Department of Public Works at (978) 664-6060 or the Board of Health at (978) 664-6042 for more information on waste disposal.
- Report anyone making illegal use of fire hydrants. The only persons authorized to use fire hydrants in North Reading are the Fire Department and the Department of Public Works. In addition to the theft of water, the improper use of hydrants may cause a number of problems, including damage to the water mains, discolored water, and even contamination of the water system. Notify the Police Department or DPW if you observe anyone operating a fire hydrant without authorization.
- If you live or walk near the water supplies, help us guard against any activity that might threaten the supplies. The Water Department does receive chemical deliveries in tanker trucks, but only when an employee of the Water Department is present. Similarly, contractors performing maintenance work at our facilities are normally accompanied by an employee. Should you witness anything in the vicinity of a water supply facility that appears strange, please report it to the Police Department or DPW immediately.

The North Reading Department of Public Works is also in the process of implementing new storm water controls, as required by the U.S. Environmental Protection Agency (EPA), to help protect the Town's water resources against contamination and sedimentation resulting from water passing through North Reading's storm water drainage system. Please visit the Town's Web site at www.northreadingma.gov for more information on storm water and pollution prevention.

## Sampling Results

During the past year, we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The tables below show only those contaminants that were detected in the water. The state requires us to monitor for certain substances less often than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

We participated in the 3rd stage of the EPA's Unregulated Contaminant Monitoring Regulation (UCMR3) program by performing additional tests on our drinking water. UCMR3 benefits the environment and public health by providing the EPA with data on the occurrence of contaminants suspected to be in drinking water, in order to determine if the EPA needs to introduce new regulatory standards to improve drinking water quality.

### REGULATED SUBSTANCES

| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | MCL [MRDL] | MCLG [MRDLG] | AMOUNT DETECTED | RANGE LOW-HIGH | VIOLATION | TYPICAL SOURCE |
|---|---|---|---|---|---|---|---|
| **Alpha Emitters** (pCi/L) | 2014 | 15 | 0 | 1.2 | 0.0–1.2 | No | Erosion of natural deposits |
| **Arsenic** (ppb) | 2012 | 10 | 0 | 1 | 0–1 | No | Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes |
| **Barium** (ppm) | 2012 | 2 | 2 | 0.014 | 0.006–0.014 | No | Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits |
| **Chlorine** (ppm) | 2014 | [4] | [4] | 0.93 | 0.01–0.93 | No | Water additive used to control microbes |
| **Combined Radium** (pCi/L) | 2014 | 5 | 0 | 0.7 | 0–0.7 | No | Erosion of natural deposits |
| **Fluoride** (ppm) | 2012 | 4 | 4 | 1.20 | 0.88–1.20 | No | Water additive that promotes strong teeth |
| **Haloacetic Acids [HAAs]–Stage 2** (ppb) | 2014 | 60 | NA | 26.1 | 1.85–41.7 | No | By-product of drinking water disinfection |
| **Nitrate** (ppm) | 2014 | 10 | 10 | 0.58 | 0.33–0.58 | No | Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits |
| **Perchlorate** (ppb) | 2014 | 2 | NA | 0.636 | 0.096–0.636 | No | Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives |
| **TTHMs [Total Trihalomethanes]–Stage 2** (ppb) | 2014 | 80 | NA | 97.1 | 27.4–181 | Yes | By-product of drinking water disinfection. Please see note under "About Our Violations" |

**Tap water samples were collected for lead and copper analyses from sample sites throughout the community.**

| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | AL | MCLG | AMOUNT DETECTED (90TH%TILE) | SITES ABOVE AL/ TOTAL SITES | VIOLATION | TYPICAL SOURCE |
|---|---|---|---|---|---|---|---|
| **Copper** (ppm) | 2012 | 1.3 | 1.3 | 0.087 | 0/30 | No | Corrosion of household plumbing systems; Erosion of natural deposits |
| **Lead** (ppb) | 2012 | 15 | 0 | 5 | 1/30 | No | Corrosion of household plumbing systems; Erosion of natural deposits |

### SECONDARY SUBSTANCES

| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | SMCL | MCLG | AMOUNT DETECTED | RANGE LOW-HIGH | VIOLATION | TYPICAL SOURCE |
|---|---|---|---|---|---|---|---|
| **Manganese** (ppb) | 2014 | 50 | NA | 22 | 0–22 | No | Leaching from natural deposits |

## UNREGULATED SUBSTANCES [1]

| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | AMOUNT DETECTED | RANGE LOW-HIGH | TYPICAL SOURCE |
|---|---|---|---|---|
| **Bromodichloromethane** (ppb) | 2014 | 13 | 8.6–13.0 | By-product of drinking water chlorination |
| **Chlorodibromomethane** (ppb) | 2014 | 9.8 | 1.2–9.8 | By-product of drinking water chlorination |
| **Chloroform** (ppb) | 2014 | 32 | 12–32 | By-product of drinking water chlorination |
| **Nickel** (ppm) | 2012 | 0.002 | 0.001–0.002 | Natural sources |
| **Sodium** (ppm) | 2012 | 78 | 27–78 | Natural sources; Runoff from use of salt on roadways; By-product of treatment process |
| **Sulfate** (ppm) | 2012 | 24 | 15–24 | Natural sources |

## UNREGULATED CONTAMINANT MONITORING REGULATION STAGE 3 (UCMR3) [1]

| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | AMOUNT DETECTED | RANGE LOW-HIGH |
|---|---|---|---|
| **Chlorate** (ppb) | 2014 | 1,300 | 150–1,300 |
| **Hexavalent Chromium** (ppb) | 2014 | 0.100 | 0.054–0.100 |
| **Molybdenum** (ppb) | 2014 | 2.4 | 0–2.4 |
| **Strontium** (ppb) | 2014 | 170 | 66–170 |
| **Vanadium** (ppb) | 2014 | 0.40 | 0–0.40 |

[1] Unregulated contaminants are those for which the U.S. EPA has not established drinking water standards. The purpose of monitoring unregulated contaminants is to assist the EPA in determining their occurrence in drinking water and whether future regulation is warranted.

## Definitions

**90th Percentile:** Out of every 10 homes sampled, 9 were at or below this level.

**AL (Action Level):** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

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

**MCLG (Maximum Contaminant Level Goal):** 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.

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

**MRDLG (Maximum Residual Disinfectant Level Goal):** The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

**NA:** Not applicable

**pCi/L (picocuries per liter):** A measure of radioactivity.

**ppb (parts per billion):** One part substance per billion parts water (or micrograms per liter).

**ppm (parts per million):** One part substance per million parts water (or milligrams per liter).

**SMCL (Secondary Maximum Contaminant Level):** SMCLs are established to regulate the aesthetics of drinking water like taste and odor.