

## **Annual Water Quality Report - Reporting Year 2021**

City of Oak Ridge  
P.O. Box 1  
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PWSID#: TN0000522

### **We've Come a Long Way**

Once again we are proud to present our annual water quality report covering the period between January 1 and December 31, 2021. In a matter of only a few decades, drinking water has become remarkably safer and more reliable than at any other point in human history. Over the years, we have dedicated ourselves to producing drinking water that meets all state and federal standards. We continually strive to adopt the best methods for delivering quality drinking water to your homes and businesses. As new challenges to drinking water safety emerge, we remain vigilant in meeting the goals of source water protection, water conservation, and community education while continuing to serve the needs of all of our water users. Please remember that we are always available to assist you, should you ever have any questions or concerns about your water.

For more information about this report, or for any questions relating to your drinking water, please call Mark Terry at (865) 425-1620.

### **Community Participation**

Members of the public are encouraged to provide their input by attending Oak Ridge City Council meetings. These meetings are normally scheduled for the second Monday of every month beginning at 7:00 p.m. at the Oak Ridge Municipal Building, 200 S. Tulane Avenue, Oak Ridge, Tennessee. The City Council meeting schedule is posted on the City website at [www.oakridgetn.gov](http://www.oakridgetn.gov).

### **Important Health Information**

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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, 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>.

### **Substances That Could Be in Water**

In order to ensure that tap water is safe to drink, U.S. EPA and the Tennessee Department of Environment and Conservation prescribe regulations which limit the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which 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, in some cases, radioactive material; and 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 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.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

### **Where Does My Water Come From?**

Our water, which is surface water, comes from Melton Hill Lake. Our goal is to protect our water from contaminants. We are working with the state to determine the vulnerability of our water source to potential contamination. The Tennessee Department of Environment and Conservation (TDEC) has prepared a Source Water Assessment Program (SWAP) Report for the untreated water sources serving this water system. The SWAP Report assesses the susceptibility of untreated water sources to potential contamination. To ensure safe drinking water, all public water systems treat and routinely test their water. Water sources have been rated as reasonably susceptible (high), moderately susceptible (moderate) or slightly susceptible (low) based on geologic factors and human activities in the vicinity of the water source. The Oak Ridge Water System source is rated as reasonably susceptible to potential contamination.

An explanation of Tennessee's Source Water Assessment Program, the Source Water Assessment summaries, the susceptibility scorings, and the overall TDEC report to the U.S. EPA can be viewed online at <https://www.tn.gov/environment/program-areas/wr-water-resources/water-quality/source-water-assessment.html>, or you may contact the Oak Ridge Water System to view a copy of our source water assessment.

### **Source Water Assessment**

A Source Water Assessment Plan (SWAP) is now available at our office. This plan 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.

### **Water Treatment Process**

The treatment process consists of the following series of steps. First, raw water is drawn from Melton Hill Lake and receives an oxidant before being pumped to the water treatment plant. The water then goes to a mixing tank where polymer (a coagulant) is added. The addition of this substance coupled with gentle mixing (flocculation) causes small particles to adhere to one another (forming floc); over a relatively short period of time the floc particles become heavy enough to settle into a basin from which sediment is removed. A small amount of chlorine is then added to the settled water to finalize the pre-filtration portion of the process. Next, the water is filtered through layers of fine coal and silica sand. As smaller, suspended particles are removed, turbidity disappears and clear water emerges. After filtration, a higher dose of chlorine is added to the water for disinfection purposes. Our water system's

operators carefully monitor the amount of chlorine, adding the lowest quantity necessary to protect the safety of your water without compromising taste. Finally, fluoride (used to prevent tooth decay) and a corrosion inhibitor (used to protect distribution system pipes) are added before the water is pumped to sanitized reservoirs, water towers, and into your home or business.

### **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. The City of Oak Ridge Water System 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 30 seconds to two 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 <http://www.epa.gov/safewater/lead>.

### **Water Main Flushing**

Distribution mains (pipes) convey water to homes, businesses, and hydrants in your neighborhood. The water entering distribution mains is of very high quality; however, water quality can deteriorate in areas of the distribution mains over time. Water main flushing is the process of cleaning the interior of water distribution mains by sending a rapid flow of water through the mains.

Flushing maintains water quality in several ways. For example, flushing removes sediments like iron and manganese. Although iron and manganese do not pose health concerns, they can affect the taste, clarity, and color of the water. Additionally, sediments can shield microorganisms from the disinfecting power of chlorine, contributing to the growth of microorganisms within distribution mains. Flushing helps remove stale water and ensures the presence of fresh water with sufficient dissolved oxygen, disinfectant levels, and an acceptable taste and smell.

During flushing operations in your neighborhood, some short-term deterioration of water quality, though uncommon, is possible. You should avoid tap water for household uses at that time. If you do use the tap, allow your cold water to run for a few minutes at full velocity before use and avoid using hot water, to prevent sediment accumulation in your hot water tank.

Please contact us if you have any questions or if you would like more information on our water main flushing schedule.

### **Test Results**

The City of Oak Ridge Water System water is monitored for many different kinds of contaminants on a very strict sampling schedule. The information below represents only those substances that were detected; our goal is to keep all detects below their respective maximum allowed levels.

The State allows us to monitor for certain substances less 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.

### Regulated Substances

Substance (Unit of Measurement)	Year Sampled	MCL [MRDL]	MCLG [MRDLG]	Amount Detected	Range (Low-High)	Violation	Typical Source
Barium (ppm)	2020	2	2	0.0287	N/A	No	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Chlorine (ppm)	2021	[4]	[4]	2.27	0.34 - 3.09	No	Water additive used to control microbes
Fluoride (ppm)	2021	4	4	0.55	0.49 - 0.60	No	Erosion of natural deposits run- off from fertilizer and aluminum factories; water additive that promotes strong teeth
Haloacetic Acids [HAAs] Stage II DBPs (ppb)	2021	60	N/A	34	23 - 42	No	By-product of drinking water disinfection
Nitrate (ppm)	2021	10	10	0.245	N/A	No	Run-off from fertilizer use; leaching from septic tanks or sewers; erosion of natural deposits
Total Coliform Bacteria (RTCT after April 1, 2016) positive samples	2021	TT	0	0	N/A	No	Naturally present in the environment
Total Organic Carbon (TOC) (ppm) <sup>1</sup>	2021	TT	TT	0.306	0.78 - 0.93	No	Naturally present in the environment
Turbidity (NTU) <sup>2, 3</sup>	2021	TT	N/A	0.07	0.02 - 0.07	No	Soil run-off
Total Trihalomethanes [TTHMs] Stage II DBPs (ppb)	2021	80	N/A	49	35 - 55	No	By-product of drinking water disinfection

<sup>1</sup> Our System met the treatment technique (TT) for Total Organic Carbon removal with 30.6% removal (25% required).

<sup>2</sup> Turbidity is a measure of the cloudiness of water. It is monitored because it is a good indicator of the effectiveness of the filtration process.

<sup>3</sup> Our system met the treatment technique (TT) for turbidity with 100% of monthly samples below the limit of 0.3 NTU.

## Lead and Copper

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

Substance (Unit of Measurement)	Year Sampled	Action Level (AL)	MCLG	Amount Detected (90 <sup>th</sup> Percentile)	Sites Above AL/Total Sites	Violation	Typical Source
Lead (ppb)	2021	15	0	2.51	0/30 *	No	Corrosion of household pumping systems; erosion of natural deposits
Copper (ppm)	2021	1.3	0	0.12	0/30 *	No	Corrosion of household pumping systems; erosion of natural deposits

*\* During the most recent round of lead and copper testing, 0 of 30 households sampled contained concentrations exceeding the action level.*

## Unregulated Substances \*\*

Substance (Unit of Measure)	Year Sampled	SMCL	MCLG	Amount Detected	Range (Low-Hight)	Violation	Typical Source
Sulfate (ppm)	2020	250	N/A	18.5	N/A	No	Run-off/leaching of natural deposits; industrial wastes
Zinc (ppm)	2020	5	N/A	0.605	N/A	No	Run-off/leaching of natural deposits; industrial wastes
Sodium (ppm)	2021	N/A	N/A	9.23	N/A	No	Erosion of natural deposits; used in some water treatment processes
Aluminum (ppm)	2020	0.05 - 0.2	N/A	0.068	N/A	No	Run-off/leaching of natural deposits
Chloride (ppm)	2020	250	N/A	8.57	N/A	No	Run-off/leaching of natural deposits; industrial wastes
Total Dissolved Solids [TDS] (ppm)	2020	500	N/A	156	N/A	No	Run-off/leaching of natural deposits; industrial and agricultural wastes

*\*\* Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted. For additional information call the Safe Drinking Water Hotline at (865) 426-4791.*

## Table of Definitions

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

**N/A:** Not applicable.

**ND (Not detected):** Indicates that the substance was not found by laboratory analysis.

**NTU (Nephelometric Turbidity Units):** Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

**ppm (parts per million):** One part substance per million parts water (or milligrams per liter); one can also think of it as being like one penny in \$10,000 worth of pennies.

**ppb (parts per billion):** One part substance per billion parts water (or micrograms per liter); one can also think of it as being like one penny in \$10,000,000 worth of pennies.

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

**LRAA (Locational Running Annual Average):** The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters. Amount Detected values for TTHMs and HAAs are reported as LRAAs.