



*Water testing performed in 2009*



*Presented By:*  
CITY OF OAK RIDGE

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PWS ID#: TN000522

## Maintaining High Standards

Once again we are proud to present our annual water quality report. This report covers all testing performed between January 1, 2009, and December 31, 2009. Over the years, we have dedicated ourselves to producing drinking water that meets all state and federal drinking water standards. We continually strive to adopt new and better methods for delivering the best quality drinking water to you. As new challenges to drinking water safety emerge, we remain vigilant in meeting the challenges of source water protection, water conservation, and community education while continuing to serve the needs of all our water users.

## 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. *Cryptosporidium* is a microbial parasite which is found in surface water throughout the U.S. Although *Cryptosporidium* can be removed by filtration, the most commonly used filtration methods cannot guarantee 100 percent removal; nevertheless, the monthly monitoring of our source water detected no presence of *Cryptosporidium* in 12 samples. *Cryptosporidium* infections, causing nausea, diarrhea, and abdominal cramps, are usually gone within ten weeks in most healthy individuals. However, immunocompromised people are at a greater risk of developing severe, life-threatening illness. 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 [www.epa.gov/safewater/hotline/](http://www.epa.gov/safewater/hotline/).



## Protecting Our Water Source

Our water, which is surface water, comes from the 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 [www.tn.gov/environment/dws/dwassess.shtml](http://www.tn.gov/environment/dws/dwassess.shtml), or you may contact the Oak Ridge Water System to view a copy of our source water assessment.

## How Is My Water Treated and Purified?

The treatment process consists of a 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 is added. The addition of this substance causes small particles to adhere to one another (called floc), making them heavy enough to settle into a basin from which sediment is removed. Chlorine is then added for disinfection. At this point, the water is filtered through layers of fine coal and silica sand. As smaller, suspended particles are removed, turbidity disappears and clear water emerges. Chlorine is added again as a precaution against any bacteria that may still be present. We 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.

## Community Participation

Members of the public are encouraged to provide their input by attending City Council meetings. These meetings are normally scheduled for the second Monday of every month at 7:00 p.m. at the Oak Ridge Municipal Building, 200 S. Tulane Avenue, Oak Ridge, Tennessee.

### What Are PPCPs?

When cleaning out your medicine cabinet, what do you do with your expired pills? Many people flush them down the toilet or toss them into the trash. Although this seems convenient, these actions could threaten our water supply.

Recent studies are generating a growing concern over pharmaceuticals and personal care products (PPCPs) entering water supplies. PPCPs include human and veterinary drugs (prescription or over-the-counter) and consumer products, such as cosmetics, fragrances, lotions, sunscreens, and house cleaning products. Over the past five years, the number of U.S. prescriptions increased 12 percent to a record 3.7 billion, while nonprescription drug purchases held steady around 3.3 billion. Many of these drugs and personal care products do not biodegrade and may persist in the environment for years.

The best and most cost-effective way to ensure safe water at the tap is to keep our source waters clean. Never flush unused medications down the toilet or sink. Instead, check to see if the pharmacy where you made your purchase accepts medications for disposal, or contact your local health department for information on proper disposal methods and drop-off locations. You can also go on the Web at [www.Earth911.com](http://www.Earth911.com) to find more information about disposal locations in your area.

## Questions?

For more information about this report, or for any questions relating to your drinking water, please call Scott Jackson, Public Works Operations Manager, at (865) 425-1875.

## Substances That Could Be in Water

In order to ensure that tap water is safe to drink, the 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 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.

# Q & A

## Which household activity wastes the most water?

Most people would say the majority of water use comes from showering or washing dishes; however, toilet flushing is by far the largest single use of water in a home (accounting for 40% of total water use). Toilets use about 4-6 gallons per flush, so consider an ultra-low-flow (ULF) toilet, which requires only 1.5 gallons.

## Should I use hot water to make baby formula?

No. Hot water may contain impurities such as rust, copper, and lead that come from the hot water heater and plumbing in your house. These impurities can generally dissolve into hot water faster than into cold water.

## What type of container is best for storing water?

Consumer Reports has consistently advised that glass or BPA-free plastics such as polyethylene are the safest choices. To be on the safe side, don't use any container with markings on the recycle symbol showing "7 PC" (that's code for BPA). You could also consider using stainless steel or aluminum with BPA-free liners.

## How much emergency water should I keep?

Typically, 1 gallon per person per day is recommended. For a family of four, that would be 12 gallons for 3 days. Humans can survive without food for 1 month, but can only survive 1 week without water.

## Lead and 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 home plumbing. The City of Oak Ridge 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 [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).



## Information on the Internet

For information about the City of Oak Ridge, please visit our Web site ([www.cortn.org](http://www.cortn.org)). The U.S. EPA Office of Water ([www.epa.gov/watrhome](http://www.epa.gov/watrhome)) and the Centers for Disease Control and Prevention ([www.cdc.gov](http://www.cdc.gov)) Web sites provide a substantial amount of information on many issues relating to water resources, water conservation, and public health. Also, the Tennessee Department of Environment and Conservation has a Web site ([www.tn.gov/environment](http://www.tn.gov/environment)) that provides complete and current information on water issues in our own state.

### 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 most 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 [www.epa.gov/safewater/crossconnection.html](http://www.epa.gov/safewater/crossconnection.html). You can also call the Safe Drinking Water Hotline at (800) 426-4791.

## Sampling Results

We are pleased to report that during the past year, the water delivered to your home or business complied with, or did better than, all state and federal drinking water requirements. Each year we analyze more than 10,000 water samples for bacteria, turbidity, inorganic contaminants, lead and copper, nitrate, volatile organic contaminants, total trihalomethanes, and synthetic organic contaminants. For your information, we have compiled the table below showing what substances were detected in our drinking water during 2009 or the last year analyzed. Although all of the substances listed are under the Maximum Contaminant Level (MCL) set by the U.S. EPA, we feel it is important that you know exactly what was detected and how much of the substance was present in the water. 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. (Total coliform bacteria is not included in the table below because there were no positive samples detected out of the 360 routine samples taken.)

### REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Barium (ppm)	2009	2	2	0.033	NA	No	Erosion of natural deposits
Chlorine (ppm)	2009	[4]	[4]	3.2	1.2–3.2	No	Water additive used to control microbes
Fluoride (ppm)	2009	4	4	1.1	0.10–1.1	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Haloacetic Acids [HAA] <sup>1</sup> (ppb)	2009	60	NA	40	12.8–49	No	By-product of drinking water disinfection
Nitrate (ppm)	2009	10	10	0.27	NA	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] <sup>1</sup> (ppb)	2009	80	NA	52	19–71	No	By-product of drinking water chlorination
Total Organic Carbon <sup>2</sup> (ppm)	2009	TT	NA	1.4	1.1–1.4	No	Naturally present in the environment
Turbidity <sup>3</sup> (NTU)	2009	TT	NA	0.19	0.03–0.19	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2009	TT	NA	100	NA	No	Soil runoff

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)	2009	1.3	1.3	0.13	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Lead (ppb)	2009	15	0	3	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
Chloride (ppm)	2009	250	NA	9.3	NA	No	Runoff/leaching from natural deposits

### UNREGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Sodium (ppm)	2009	9.3	NA	Erosion of natural deposits
Sulfate (ppm)	2009	36	NA	Erosion of natural deposits

<sup>1</sup>We were required by the U.S. EPA to conduct an evaluation of our distribution system. This is known as an Initial Distribution System Evaluation (IDSE) and is intended to identify locations in our distribution system that have elevated disinfection by-product concentrations. Disinfection by-products (e.g., HAAs and TTHMs) result from continuous disinfection of drinking water and form when disinfectants combine with organic matter that naturally occurs in the source water.

<sup>2</sup>In 2009 the water treatment plant met the treatment technique requirements for total organic carbon.

<sup>3</sup>Turbidity is a measure of the cloudiness of the water. It is monitored because it is a good indicator of the effectiveness of the filtration system.

## 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.

**NA:** 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.

**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):** The highest level of a contaminant that is allowed in drinking water in order to protect against unpleasant aesthetic effects such as color, taste, odor, and staining of plumbing fixtures (e.g., tubs and sinks) and of clothing during laundering.

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