

Quality on Tap Report
Annual Drinking Water Quality Report
Salem City Water Department
For the Year 2016, Results from the Year 2015

We are pleased to present to you this year's Annual Drinking Water Quality Report. This report is designed to inform you about the quality water and services we deliver to you every day. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources.

We are committed to ensuring the quality of your water. Our water sources include four wells. Our wells draw groundwater from the Mount Laurel -Wenonah Aquifer at a depth of over 160 feet. Three are all located in the City of Salem and the forth in Quinton Township. In addition, we draw surface water from two other sources, one located in Quinton Township and the other in Alloway Township.

The New Jersey Department of Environmental Protection (NJDEP) has completed and issued the Source Water Assessment Report and Summary for this public water system, which is available at WWW.state.nj.us/dep/swap or by contacting NJDEP's Bureau of Safe Drinking Water at (609) 292-5550. You may also contact your public water system to obtain information regarding your water system's Source Water Assessment. This water system's source water susceptibility ratings and a list of potential contaminant sources is attached in this report.

We are pleased to report that our drinking water meets all federal and state safety requirements.

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, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

EPA requires monitoring for over 80 drinking water contaminants. Those contaminants listed in the table are only contaminants detected in your water.

TEST RESULTS						
Contaminant	Violation Y/N	Level Detected	Units of Measurement	MC LG	MCL	Likely Source of Contamination
Turbidity (Tested Continuously)	No	Range was 0.024 to 0.068	NTU	N/A	TT =1.0 no more than 5% of the monthly samples may exceed 0.3 NTU's nor any sample exceed 1.0 NTU	Soil runoff

TEST RESULTS						
Contaminant	Violation Y/N	Level Detected	Units of Measurement	MC LG	MCL	Likely Source of Contamination
Regulated Contaminants: Tested per regulations						
Total Organic Carbon (Test results 2015)	No	Running Annual Average 1.86 Lowest Quarterly Average 1.73	ppm	N/A	TT % of removal < 1.0 not in compliance	Naturally present in the environment

Contaminant	Violation Y/N	Level Detected	Units of Measurement	MC LG	MCL	Likely Source of Contamination
Inorganic Contaminants: Tested per regulations						
Arsenic <i>Tested 10.07.15 per regulations</i>	No	2.80	ppb	N/A	50	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
Barium <i>Tested 10.07.15 per regulations</i>	No	0.034	ppm	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Copper <i>Tested 07.21.15 per regulations</i>	No	Samples ranged from < 0.05 to 0.44 90 th % = 0.35 No sample exceeded action level	ppm	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits
Cyanide <i>Tested 10.07.15 per regulations</i>	No	5.0	ppb	200	200	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
Lead <i>Tested 07.21.15 per regulations</i>	No	All samples were < 5.0 90 th % = < 5.0 No sample exceeded action level	ppb	0	AL=15	Corrosion of household plumbing systems, erosion of natural deposits
Nickel <i>Tested 10.07.15 per regulations</i>	No	1.6	ppb	N/A	N/A	Erosion of natural deposits
Fluoride <i>Tested 10.07.15 per regulations</i>	No	0.14	ppm	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories

Nitrate (as Nitrogen) <i>Tested 10.07.15 per regulations</i>	No	0.03	ppm	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium <i>Tested 10.07.15 per regulations</i>	No	15.9	ppb	50	50	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines

Stage II HAA5 and TTHM compliance is based on the locational running annual average (LRAA) calculated at each monitoring location.

Disinfection Byproducts: Tested on a quarterly basis						
Disinfection Byproducts - Stage-II HAA5 and TTHM						
Total Trihalomethanes TTHM Test results 2015 Location (2) 2,5,8,11/2015	No	Range = 28.0 – 81.1 Highest Detection = 81.1. Running Average = 51.1	ppb	N/A	80	By-product of drinking water disinfection
Total Trihalomethanes TTHM Test results 2015 Location (3) 2,5,8,11/2015	No	Range = 27.1 – 69.4 Highest Detection = 69.4 Running Average = 49.0	ppb	N/A	80	By-product of drinking water disinfection
Haloacetic Acids HAA5 Test results 2015 Location(2) 2,5,8,11/2015	No	Range = 9.11 – 24.97 Highest Detection = 24.97 Running Average = 13.35	ppb	N/A	60	By-product of drinking water disinfection
Haloacetic Acids HAA5 Test results 2015 Location(3) 2,5,8,11/2015	No	Range = 10.6 – 33.97 Highest Detection = 33.97 Running Average = 21.32	ppb	N/A	60	By-product of drinking water disinfection

Volatile Organic Carbon:						
Methyl tertiary butyl ether (MTBE) <i>Tested 07.7.15 per regulations</i>	No	0.38	ppb	70	70	Leaking underground gasoline and fuel oil tanks. Gasoline and fuel oil spills.
Ethylbenzene <i>Tested 07.7.15 per regulations</i>	No	0.03	ppb	700	700	Discharge from petroleum refineries

Regulated Disinfectants <i>Tested per regulations</i>	Level Detected (Average & Highest Detect)	MRDL	MRDLG
Chlorine	Average = 0.68, High = 0.73	4.0 ppm	4.0 ppm

Total Organic Carbon (TOC): We are required to remove a certain percentage of (TOC) from our drinking water on a monthly basis. Total Organic Carbon has no adverse health effects. However, TOC provides a medium for the formation of disinfection byproducts. These byproducts include Total Trihalomethanes (TTHMs) and Total Haloacetic Acids (HAA5s).

Drinking water containing these byproducts in the excess of the MCL may lead to the adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.

We have learned through our monitoring and testing that some contaminants have been detected. As you can see by the table, our system had no violations. We are proud that your drinking water meets or exceeds all Federal and State safety requirements.

If you have any questions about this report or concerning your water utility, please contact Mr. Frederick J. Mucci, III at (856) 935-0350. We want our valued customers to be informed about their water utility. If you want to learn more, please attend any of our regularly scheduled City Council meetings at the Salem City Municipal Building located at 1 New Market Street. Meetings are held on the first and third Monday of the 2nd, 3rd, 4th, 5th, 10th and 12th month. Meetings are held on the third Monday of the 1st, 6th, 7th, 8th, 9th and 11th month. All meetings are held at 7:30 PM.

The Salem Water Department routinely monitors for contaminants in your drinking water according to Federal and State laws. This table above shows the results of our monitoring for the period of January 1st to December 31st, 2015.

The state allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, are more than one year old.

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.

Contaminants 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 and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas projection, mining or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production and can, also come from gas stations, urban storm water runoff and septic systems.

- Radioactive contaminants which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. 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 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 Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

DEFINITIONS

In the following table you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms we've provided the following definitions:

Non-Applicable - (NA)

Non-Detects (ND) - Laboratory analysis indicates that the constituent is not present.

Parts per Million (ppm) or Milligrams per Liter (mg/l) - one part per million corresponds to one minute in two years or a single penny in \$10,000.

Parts per Billion (ppb) or Micrograms per Liter - one part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.

Picocuries per Liter (pCi/L) - Picocuries per liter is a measure of the radioactivity in water.

Nephelometric Turbidity Unit (NTU) - Nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU's is just noticeable to the average person.

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

Treatment Technique (TT) - A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.

Turbidity - The measurement of the cloudiness of the water. It is monitored because it is a good indication of water quality. High turbidity can hinder the effectiveness of disinfectants.

Maximum Contaminant Level - The "Maximum Allowed" (MCL) is the highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available treatment technology.

Maximum Contaminant Level Goal - The "Goal" (MCLG) is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.

Maximum Residual Disinfectant Goal (MRDLG) - The level of a drinking water disinfectant, below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contamination

Maximum Residual Disinfectant Level (MRDL) - 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.

Secondary Contaminant - Substances that do not have an impact on health. Secondary Contaminants affect aesthetic qualities such as odor, taste or appearance. Secondary standards are recommendations, not mandates.

Recommended Upper Limit (RUL) - Recommended maximum concentration of secondary contaminants. These reflect aesthetic qualities such as odor, taste or appearance. RUL's are recommendations, not mandates.

The new surface water treatment plant went online on April 1, 2012. The plant employs membrane filtration technology. Activated carbon to control taste and odor issues as well as disinfectant byproducts is added at the source. Water is pumped from the surface water sources to the plant and travels through a screening mechanism to remove large material. The water then enters pretreatment tanks where activated carbon is again added.

The pH is increased and fine bubble aeration is employed followed by a decrease in pH to oxidize iron and manganese. Water then travels through a rapid mix tank, where the addition of a coagulant helps bind small and colloidal particles. Then onto a flocculation basin which gently mixes the formulated floc. The water makes its way to the membrane filtration tanks where the flocculated material settles to the bottom of the vessels and the clear water is pulled through microscopic pores in the membranes. The clear water known as permeate is pumped through ultraviolet light disinfection units. A sequestering agent is added, pH is adjusted and calcium hypochlorite is added as a disinfectant prior to entering a baffled clearwell. Once the water passes through the clearwell it is pumped into the distribution system via clearwell pumps.

The plant experienced overwhelming taste and odor issues through the summer of 2012 and the summer of 2013. The City drilled a well in 2014 and has been utilizing 100% groundwater ever since with the exception of a few days in February 2015 due to a deep freeze and an inordinate amount of water mains breaks. Groundwater does not produce taste and odor issues. The City intends to continue to use ground water until such time design issues are addressed and implemented before returning to surface water. When the plant was under construction from approximately 2010 through 2012, the NJDEP sent the City a letter listing the requirements set forth by the construction permit. The letter required Salem to demonstrate removal/inactivation equal to or greater than the credit awarded of 5.5 -log removal/inactivation for *Cryptosporidium*, per 40 C.F.R. SS 141.715, 141.719 and 141.720 and provide documentation that the UV Validation test had been completed and submitted to the NJDEP, in accordance with C.F.R. S 141.720(d)(2) and N.J.A.C. 7:10-3.2 and 3.3. Salem failed to meet these requirements in violation of the regulations. Once the Water and Sewer Department became aware of the violations, we reached out to the manufacturer of the UV equipment for a copy of the validation tests that they have ran on their equipment. The City has been working with the manufacture of the UV Company, the USEPA as well as the NJDEP in regards to the acceptance of the information submitted by the UV Company. A decision as to the acceptance of the information submitted is currently under review by the NJDEP and EPA. The City was also required by the NJDEP in May of 2014 to change the location of a sampling site originally determined by the NJDEP to be the required site for quarterly THM and HAA5 sampling. After several rounds of sampling, it was concluded by the NJDEP that the original site was too close to another sampling site thus revealing similar results. The City was directed by the NJDEP to move to another location deemed more representative of the distribution system. The City moved to that site at once and has been sampling there ever since. The City failed to modify and submit a Stage 2 Monitoring Plan, as required by the NJDEP and USEPA in accordance with 40 C.F.R S141.622. That requirement has since been completed.

It should be pointed out that anything we add to our water is required to meet stringent standards in the industry. Any substance added to our water must meet American Water Works Association (AWWA) standards.

As part of our water quality-monitoring program, hundreds of quality control tests are performed on our water each year. We test for over 80 individual contaminants and perform additional monitoring at our water treatment facilities and throughout our distribution system. As noted, the table listed above contains only contaminants that were detected in the water.

The Safe Drinking Water Act regulations allow monitoring waivers to reduce or eliminate the monitoring requirements for asbestos, volatile organic chemicals and synthetic organic chemicals. Our system received monitoring waivers for the contaminant asbestos and synthetic organic chemicals.

Special considerations regarding children, pregnant women, nursing mothers, and others:

Children may receive a slightly higher amount of a contaminant present in the water than do adults, on a body weight basis, because they may drink a greater amount of water per pound of body weight than do adults. For this reason, reproductive or developmental effects are used for calculating a drinking water standard, if these effects occur at lower levels than other health effects of concern. If there is insufficient toxicity information for a chemical (for example, lack of data on reproductive or developmental effects), an extra uncertainty factor may be incorporated into the calculation of the drinking water standard, thus making the standard more stringent, to account for additional uncertainties regarding these effects. In the cases of lead and nitrate, effects on infants and children are the health endpoints upon which the standards are based.

Lead: 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 Salem City Water Department is responsible for providing high quality drinking water, but can not 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 second to 2 minutes before using water for drinking and 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>.

Salem Water Department- PWSID # 1712001

The Salem Water Department is a public community water system consisting of 4 wells, in which none are under the influence of surface water, and 2 surface water sources. The Salem Water Department does not purchase water from any other sources. The Salem Water Department's source water comes from the Mount Laurel-Wenonah aquifer, Elkinton Pond and Laurel Lake. The Salem Water Department does not purchase any treated water from any other water system.

Susceptibility Ratings for Salem Water Department Sources

The table below illustrates the susceptibility ratings for the seven contaminant categories (and radon) for each source in the system. The table provides the number of wells and intakes that rated high (H), medium (M), or low (L) for each contaminant category. For susceptibility ratings of purchased water, refer to the specific water system's source water assessment report.

The seven contaminant categories are defined at the bottom of this page. DEP considered all surface water highly susceptible to pathogens; therefore all intakes received a high rating for the pathogen category. For the purpose of Source Water Assessment Program, radionuclides are more of a concern for ground water than surface water. As a result, surface water intakes' susceptibility to radionuclides was not determined and they all received a low rating.

If a system is rated highly susceptible for a contaminant category, it does not mean a customer is or will be consuming contaminated drinking water.

The rating reflects the potential for contamination of source water, not the existence of contamination. Public water systems are required to monitor for regulated contaminants and to install treatment if any contaminants are detected at frequencies and concentrations above allowable levels. As a result of the assessments, DEP may customize (change existing) monitoring schedules based on the susceptibility ratings.

Sources	Pathogens			Nutrients			Pesticides			Volatile Organic Compounds			Inorganics			Radio-Nuclides			Radon			Disinfection Byproduct Precursors		
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
Wells – 4			2			2			2			2			2			2			2			2
GUDI – 0																								
Surface water Intakes – 2	2				2				1			2	2					2			2	2		

- **Pathogens:** Disease-causing organisms such as bacteria and viruses. Common sources are animal and human fecal wastes.
- **Nutrients:** Compounds, minerals and elements that aid growth, that are both naturally occurring and man-made. Examples include nitrogen and phosphorus.
- **Volatile Organic Compounds:** Man-made chemicals used as solvents, degreasers, and gasoline components. Examples include benzene, methyl tertiary butyl ether (MTBE), and vinyl chloride.
- **Pesticides:** Man-made chemicals used to control pests, weeds and fungus. Common sources include land application and manufacturing centers of pesticides. Examples include herbicides such as atrazine, and insecticides such as chlordane.
- **Inorganics:** Mineral-based compounds that are both naturally occurring and man-made. Examples include arsenic, asbestos, copper, lead, and nitrate.
- **Radionuclides:** Radioactive substances that are both naturally occurring and man-made. Examples include radium and uranium.
- **Radon:** Colorless, odorless, cancer-causing gas that occurs naturally in the environment. For more information go to <http://www.nj.gov/dep/rpp/radon/index.htm> or call (800) 648-0394.
- **Disinfection Byproduct Precursors:** A common source is naturally occurring organic matter in surface water. Disinfection byproducts are formed when the disinfectants (usually chlorine) used to kill pathogens react with dissolved organic material (for example leaves) present in surface water.

The Salem City Water Department works hard to provide top quality water to every tap. We ask that all our customers help us protect our water sources, which are the heart of our community, our way of life and our children's future. Please call our office if you have questions.