Naval Support Activity (NSA) Mid-South Annual Water Quality Report for Year 2017

Why are we doing this report?

In order to ensure that tap water is safe to drink, the United States Environmental Protection Agency (EPA) and Tennessee Department of Environment and Conservation (TDEC), Division of Water Resources, regulate the amount of certain contaminants in water provided by public water systems. Congress, in its 1996 amendments to the Safe Drinking Water Act, mandated that the EPA promulgate regulations requiring community water systems to annually publish and provide, to their customers, Consumer Confidence Reports (CCRs). These reports must describe the quality of the water supplied to customers and provide educational information on health effects of various contaminants. All community systems that serve less than 10,000 persons must deliver the completed CCR to their customers by July 1 each year. Our system serves approximately 8,066 people.

In 1998 the TDEC commissioner, Milton Hamilton, instructed community water systems serving fewer than 10,000 persons to publish their CCR in a local newspaper rather than mailing a copy to each customer. The regulations require the CCR to contain certain mandatory language. In some cases, this language does not directly apply to our deep-well water source. However, we have included both the required report data along with information about the uniqueness of our water. Information in this report represents results of testing during the calendar year 2017 or when sampling was most recently required. The sampling results are summarized in Table 1, Table 2 and Table 3 below. We welcome this opportunity to inform you of the high quality of water that is delivered to our customers at NSA Mid-South.

What is the source of our water?

Our public water system serving NSA Mid-South is a groundwater system consisting of five wells and a 4.2 million-gallon-per-day capacity water treatment plant. Of the five wells, two are in the Memphis Sands aquifer and are approximately 500 feet deep. Three are in the Fort Pillow aquifer and are approximately 1,400 feet deep. The water treatment plant is designed to remove naturally occurring iron and provide chlorination and fluoridation. The plant consists of a coke-tray aerator, polymer addition and mixing, gravity filtration, chlorination, and fluoride addition. Currently, the system is producing an average of around 250,000 gallons per day. Treated water is taken from the 2 million gallon clear well by five high-service pumps rated at 1,040 gal/min each and pumped to the distribution system and a 500,000 gallon elevated tank.

Table 1.

Contaminants	***MCLG[1]***	***MCL[2]***	***Level found***	***Date***	***Violation***	***Typical Source***
Total Coliform Bacteria (RTCR)	***0***	TT Trigger[7]	*None*	*Monthly*	*No*	Naturally present in the environment.
Fluoride	4 PPM[3]	4 PPM[3]	Average: .74 PPM Range: .52-1.18 PPM	*Monthly*	*No*	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizers & aluminum factories.
Barium	2 PPM[3]	2 PPM[3]	0.057 PPM	3/17/14	*No*	Discharge from metal refineries; Discharge of drilling wastes; Erosion from natural deposits.
Lead	0 PPB[4]	AL[5]=15 PPB[4]	1.84 PPB, 90th percentile	6/10/17	*No*	Corrosion of household plumbing systems; erosion of natural deposits.
Copper	1.3PPM[3]	AL[5]=1.3 PPM[3]	0.168 PPM, 90th percentile	6/9/17	*No*	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives.
Sodium	No MCLG	NO MCL	10.1 PPM	4/10/17	*No*	Erosion of natural deposits; used in water treatment.
Combined Radium 226, Radium 228	0 pCi/l[6]	5 pCi/l[6]	.71 pCI/l	4/23/14	*No*	Erosion of natural deposits.
Total Haloacetic Acids	No MCLG	60 PPB	1.43 PPB	8/29/17	*No*	By-products of drinking water chlorination
Total trihalomethanes	No MCLG	80 PPB	2.24 PPB	8/29/17	*No*	By-products of drinking water chlorination.

*Contaminants that are below detection limit are not included in table.

[1] **MCLG**- Maximum contaminant level goal or 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.
[2] **MCL**- Maximum contaminant level or 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.
[3] **PPM**- Parts per million or milligrams per liter, explained in the terms of money as one penny in $10,000
[4] **PPB**- Parts per billion or micrograms per liter, explained in terms of money as one penny in $10,000,000.
[5] **AL** - Action Level, or the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
[6] **pCi/l**- Picocuries per liter
[7] **TT**- Treatment Technique, or a required process intended to reduce the level of a contaminant in drinking water.

Table 2.

Contaminant	**MRDLG[1]**	**MRDL[2]**	**Level Found**	**Date**	**Violation**	**Typical Source**
Chlorine	4.0 PPM	4.0 PPM	Average:1.27 Range:.37-2.16	Daily	No	Water additive used to control microbes

[1] **MRDLG** – Maximum Residual Disinfectant Goal, or 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.
[2] **MRDL** – Maximum Residual Disinfectant Level, or the highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for the control of microbial contaminants.

Table 3. Voluntary Monitoring

Contaminant	*EPA Health Advisory	Level Found	Date	Violation	Likely Source
Perfluorinated Compounds	.07 PPB	Not Detected	1/20/16	No	Used in firefighting foams to extinguish petroleum fires

*In May of 2016, EPA established drinking water health advisory of .07 PPB. EPA has not issued a Maximum Contaminant Level for drinking water. Currently under review to determine if it may require regulation under the Safe Drinking Water Act

There have been some questions about the safety of our drinking water after Military Times released a report about contaminates in drinking water which listed Millington as a site with a contaminated well. We wanted to ensure you the water available to personnel and residents on the installation is safe to drink and use. The well referenced in the article is a different well than the one that supplies water to the installation. The drinking water used in all facilities and residences on the installation is supplied from an aquifer. This water is tested annually and exceeds state standards. Additionally, the Installation's drinking water was specifically tested for PFAS and PFOS in 2016 and no contaminates were detected

We work hard to protect your drinking water source from contamination. To do so, we developed and maintain a Wellhead Protection Plan in accordance with Rule 0400-45-1.34 under the State of Tennessee Safe Drinking Water Act. The plan was approved by the State in August 1996, with the most recent update completed in November 2017. This plan examines the various processes that are located within the area where our water is being supplied to our wells. If you have any questions about your drinking water source, please call PWD Environmental Division at 901-874-5367.

The State of Tennessee has completed a Source Water Assessment on our system. A hard copy can be viewed in Bldg. 455, Public Works Environmental Division, or you can view it on the web at: https://www.tn.gov/content/dam/tn/environment/documents/source water assessment epa report aug 2003.pdf Groundwater is potentially susceptible to contamination from industrial and agricultural sources in the area; however, frequent monitoring has shown that NSA Mid-South's water remains free of these contaminants.

Does my drinking water meet EPA standards and other rules that govern our operations?

Yes, our drinking water meets or exceeds all of EPA's health standards. During our last water plant inspection from TDEC in January 2017, we received a numerical rating of 99 out of 100 points, placing us among the state's "approved" public water systems. The State and EPA require us to test our water on a regular basis to ensure its safety and to report the results of this monitoring. The chart above shows contaminants for which we have sampled recently. None of the results exceeded regulatory limits. The

data presented are the most recent testing results, completed in accordance with regulations.

Fluoride is added to our water at levels recommended by the EPA and the US Department of Health and Human Services to help prevent tooth decay. Some people who drink water that contains fluoride well in excess of the MCL over many years could get bone disease. This could include pain and tenderness of the bones, and children's teeth could become discolored. Some people who drink water that contains barium well in excess of the MCL over many years could experience an increase in their blood pressure.
Some people who drink water that contains high levels of sodium could develop high blood pressure. Our levels are well below the MCLs for all of these components.

TDEC requires all public water systems to test various sites in their distribution system for lead and copper. Corrosion of household plumbing systems and erosion of natural deposits are the sources for these contaminants. During the most recent round of lead and copper sampling, 0 out 40 samples taken contained concentrations exceeding the action level. We have never exceeded the action level for these contaminants. For these contaminants, 90 percent of the buildings tested must have lead levels below 15 parts per billion and copper levels below 1.3 parts per million. This measurement is referred to as meeting the 90th percentile. Our 90th percentile for lead was 1.84 PPB and 0.168 PPM for copper.

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. NSA Mid-South 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 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 http://www.epa.gov/safewater/lead. The potential health effects from copper, well in excess of the MCL, are stomach and intestinal distress and Wilson's disease.

Because of a chemical reaction between chlorine and naturally occurring organic matter in water, certain by-products such as trihalomethanes and haloacetic acids are formed during the process of disinfection. A certain percentage of people who drink water with levels of trihalomethanes and haloacetic acids well over the MCL for many years could have liver or kidney problems, deficiencies in the central nervous system, and higher cancer risk. Safe Drinking Water Regulation 0400-45-1-.36 requires us to submit a collection of one residence time-sample result for haloacetic acids and one

residence time-sample result for total trihalomethanes during July 1 through September 30 once every year. Our next sample date is August 2018.

As required, we have to analyze our water for gross alpha activity. Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer. Our most recent analysis, conducted in April 2014, showed gross alpha and radium 228 to be below detection limit. Radium 226 was present at 0.71 picocuries per liter (pCi/L). The MCL for gross alpha emitters is 15 pCi/L; the combined radium 226 and radium 228 MCL is 5 pCi/L.

Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.

Perfluorinated compounds (PFOS and PFAS) are part of a class of man-made chemicals used in many industrial and consumer products to make the products resist heat, stains, water, and grease. Limited human studies show perfluorinated compounds may be associated with developmental delays in fetuses & children; decreased fertility; increased cholesterol; changes to the immune system; increased uric acid levels; changes in liver enzymes; and prostate, kidney, and testicular cancer

Why does the water sometimes look rusty?

Rusty or reddish tinted water may occur because of a sudden change in pressure due to improper flushing of a fire hydrant, etc. Iron causes the discoloration; it is not a health risk. The normal flow of water will usually clear the main water distribution lines within two hours or less. Check your water by flushing a commode three times. If the hot water is rusty, the water heater may need to be flushed.

Why are there contaminants in our water?

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 water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA’s Safe Drinking Water Hotline at (800) 426-4791.

The sources of drinking water (both tap water and bottled water) include aquifers, 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 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 can also, come from gas stations, urban stormwater 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 and Tennessee Department of Environment and Conservation prescribe regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Do I need to take any special precautions?

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/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.

How can I get involved?

Please feel free to call your PWD Environmental Division Manager, Jim Heide, at 901-874-5367 any time during regular operating hours with your questions and concerns. These operating hours are from 7 a.m. until 4:00 p.m. Monday – Friday.

Other contacts for more information:

- EPA Safe Drinking Water Hotline, (800) 426-4791

- Tennessee Division of Water Resources, (615) 532-0191
- TDEC, Memphis Environmental Field Office, 901-371-3015
- Memphis and Shelby County Health Department, (901) 544-7741