

Annual Report on
Water Quality

FORT BELVOIR JUNE 2006



This is Fort Belvoir's annual report on water quality in accordance with the 1996 Safe Drinking Water Act. The data in this report are a result of drinking water quality testing performed in 2005.



Is Your Water Safe to Drink?

Absolutely. Fort Belvoir’s Directorate of Public Works and Fairfax Water (formerly Fairfax County Water Authority) test the water for more than 120 contaminants and of the few contaminants that were found, all were well below EPA’s maximum contaminant levels. The maximum contaminant levels are established by the U.S. Congress in the Safe Drinking Water Act of 1974 and its revisions in 1986 and 1996. Testing is performed by Fairfax Water on a daily basis at the treatment plant and Fort Belvoir performs additional testing to the water that is distributed on Post.

These standards and other drinking water regulations are constantly reviewed by the EPA and, if needed, revised to reflect the latest medical research. In the Commonwealth of Virginia, the Department of Health enforces these standards and regulations.

Water Treatment

Fairfax Water must process its intake (raw) water to assure it is safe to drink. The treatment includes both chemical and physical processes. When river water enters the treatment plant, it is treated with ozone, which enhances future treatment steps. Next, chemicals known as coagulants are added to cause any small particles to adhere to one another and settle out of the water. A filtering step then removes any remaining particles that didn’t settle. Additional chemical treatment is then employed: chlorine to inactivate harmful microorganisms; fluoride to protect teeth; and a corrosion inhibitor to minimize dissolution of lead used in older household plumbing. Activated charcoal and potassium permanganate are included in the treatment process if the raw water has an odor or unpleasant taste. The water furnished to Fort Belvoir has received chlorine to control the proliferation of microorganisms in the water mains. Fort Belvoir monitors the water to ensure that chlorine is maintained throughout the distribution system.

People at Risk

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. The EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

What is the Source of Your Drinking Water?

The drinking water Fort Belvoir distributes to its 27,000 consumers is purchased from Fairfax Water, which serves the majority of northern Virginia and is the state’s largest water utility. Fairfax Water draws surface water from two primary sources: the Potomac River and the Occoquan Reservoir fed by the Occoquan River. Fairfax Water’s treatment facilities are located at opposite ends of Fairfax County and feed an interconnected distribution system. The water supplied to Fort Belvoir comes from the Occoquan Reservoir and is

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treated at the Frederick P. Griffith, Jr. Treatment Plant, located near the Town of Occoquan on the southern border of Fairfax County.

Source Water Characteristics

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 radioactive material, and can pick up substances resulting from the presence of animal or human activity. Contaminants that may be present in the source waters 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 production, 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 by-products of industrial processes and petroleum production, and can also come from gasoline storage, 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 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 (800-426-4791).

What is Being Done to Improve Fort Belvoir's Water Quality?

Fort Belvoir

Fort Belvoir's Directorate of Public Works is continuously striving to provide better service to its customers. Every spring, in coordination with Fairfax Water, Fort Belvoir opens up hydrants and flushes its water mains to remove accumulated sediment and residue. In addition, maintenance of the fire hydrants and valves that are critical to the distribution system and fire protection is accomplished.

When new development occurs at Fort Belvoir, the Directorate of Public Works uses a computer software model to predict the effects the new demand will have on the water system. This process ensures that any new development will not impact the water supply of our existing customers. Fort Belvoir works closely with Fairfax Water on operation, maintenance, and resource planning issues and will continue to maintain a working relationship in order to provide the highest quality water to its customers.

New Griffith Water Treatment Plant In Operation

Fairfax Water, the state's largest water utility, put into service its new, state-of-the-art water treatment plant on May 4th, 2006 at 8:54 am. The Griffith Water Treatment Plant will replace the three aging Occoquan and Lorton Treatment Plants serving southern Fairfax County and will provide Fairfax Water customers with advanced treatment technology and improved water quality. The plant is capable of producing 120 million gallons of water each day and utilizes ozone and granular activated carbon filters to provide better disinfection and remove taste and odor causing substances. More information about Fairfax Water is available on their website, <http://www.fairfaxwater.org>



Source Water Assessment and Protection

Under provisions of the Safe Drinking Water Act, states are required to develop comprehensive Source Water Assessment Programs (SWAPs) that identify the watersheds that supply public tap water, provide an inventory of contaminants present in the watershed, and assess susceptibility to contamination in the watershed. Based on the criteria developed by the state, the Potomac River and The Occoquan Reservoir were determined to be of high susceptibility to contamination. This determination is consistent with the state's finding of other surface waters (rivers, lakes, streams) throughout the Commonwealth of Virginia.

The assessment consists of an evaluation of the maps of the watershed area, an inventory of known land use activities, and documentation of any known source water contamination within the last five years.

What is a source water assessment?

The Federal Safe Drinking Water Act Amendments of 1996 require each state to develop a SWAP that includes delineation of the contributing watershed area upstream of the water supply intake, identification of potential sources of contamination, and determination of the susceptibility of the intake to contamination from those sources.

Who is responsible for conducting the assessment?

The Virginia Department of Health (VDH) is responsible for conducting source water assessments in Virginia. Fairfax Water applied for and received a grant to conduct the assessment, and has completed the SWAP on behalf of VDH. Fairfax Water also owns several wells, which account for less than 1 percent of their water production. VDH has conducted the assessments for these wells.

A secure version of the report is available by contacting Fairfax Water or by visiting their Website, <http://www.fairfaxwater.org>.



FAQs

Q. Why does my water sometimes have a chlorine taste and odor?

- A.** During the months of April, May, and June you may notice the taste and odor of chlorine in your water. This is because, during this time, we use free chlorine, which provides the best method of disinfection during the water main flushing done each spring to maintain a high level of water quality. Keeping an open container of drinking water in the refrigerator allows the chlorine to dissipate, which usually improves the taste.

Q. Where does lead in drinking water come from and should I be concerned?

- A.** In older homes where lead is present in pipes and solder connections, it may dissolve into the water when the water sits for long periods of time. In 1986, lead was banned from use in pipes and solder. The water that Fort Belvoir purchases from Fairfax Water contains a corrosion inhibitor to slow this dissolution process. Fort Belvoir tests the water in certain homes for lead according to EPA regulations and the water has always tested well below EPA limits. More information on lead is available on page 7.

Q. Who makes the rules and regulations for drinking water?

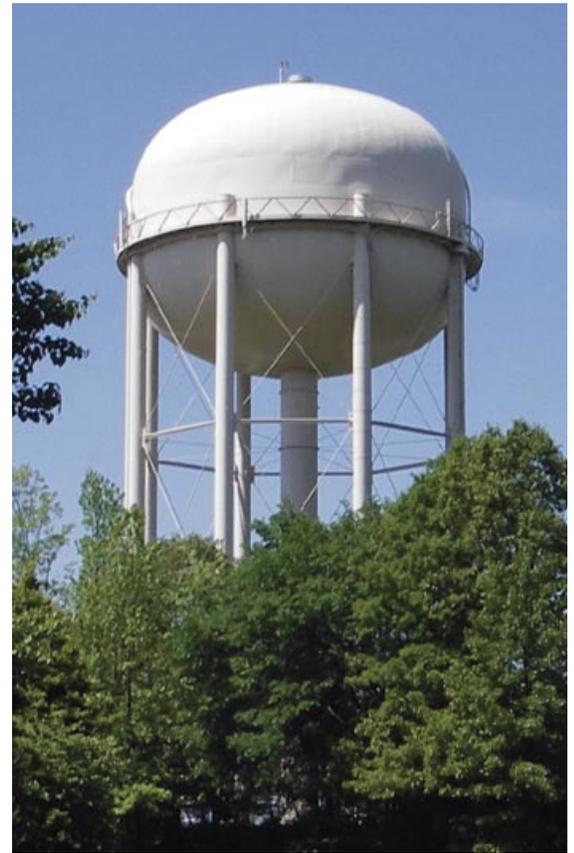
- A.** Regulations are made by both federal and state agencies. The Safe Drinking Water Act (SDWA) was passed by Congress in 1974 and amended in 1986 and 1996. It is governed by the United States Environmental Protection Agency (EPA). The Web site for these standards is <http://www.epa.gov/safewater/standards.html>. In addition to the SDWA, the EPA has promulgated several specific rules, including the Total Coliform Rule and the Lead and Copper Rule, to address various types of water contaminant problems.

Q. Can I store my drinking water indefinitely?

- A.** No. The disinfectant in drinking water will eventually dissipate even if it is stored in a closed container. Some experts believe that water could be stored in a closed container up to six months before needing to be replaced.

Q. Do I need to treat the tap water in any way before I place fish in an aquarium?

- A.** Yes. Chlorine is used for disinfection purposes, which can be harmful to fish. Two types of chlorine are used—free chlorine and chloramines. Chloramines are normally used from July through March, and free chlorine is used from April through June. Free chlorine and chloramines dechlorination are performed differently. Chemical additives with directions for dechlorinating either free chlorine or chloramines from water for use in fish tanks or ponds are available at fish supply stores.



If you have questions...

The point of contact at Fort Belvoir for water quality information is **Patrick McLaughlin, Division Chief, Environmental and Natural Resource Division (703-806-4007) or e-mail environmental@belvoir.army.mil**. For questions or information on Fairfax Water treatment facilities and processes, contact Fairfax Water at 703-698-5800. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791) or on EPA's Web site at <http://www.epa.gov/safewater/index.html>.



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2005 SUMMARY OF FINISHED WATER CHARACTERISTICS

Components	Lorton and J.J. Corbalis Treatment Plants						
	MCLG	MCL	Average	Minimum	Maximum	Violation	Major Source in Drinking Water
Atrazine (ppb)	3	3	0.11	ND	0.17	No	Runoff from herbicide used on row crops
Simazine (ppb)	4	4	0.02	ND	0.009	No	Herbicide runoff
Chloroform (ppb)	NRL	NRL	19.3	3.4	47.1	No	By-product of drinking water disinfection
Bromodichloromethane (ppb)	NRL	NRL	7.2	4.0	12.6	No	By-product of drinking water disinfection
Chlorodibromomethane (ppb)	NRL	NRL	2.8	1.5	3.8	No	By-product of drinking water disinfection
Bromoform (ppb)	NRL	NRL	0.1	ND	0.5	No	By-product of drinking water disinfection
Metolachlor (ppb)	NRL	NRL	0.12	ND	0.21	No	Runoff from herbicide used on row crops
Barium (ppm)	2	2	0.055	0.028	0.136	No	Discharge of drilling wastes; discharge from metal refineries; erosion from natural deposits
Chromium	100	100	ND	ND	1	No	Discharge from steel and pulp mills; Erosion of natural deposits
Fluoride (ppm)	4	4	0.8	0.5	1.5	No	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories
Nitrate [as Nitrogen] (ppm)	10	10	1.2	0.7	2.8	No	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite [as Nitrogen] (ppm)	1	1	ND	ND	0.02	No	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Radium 228 ³ (pCi/L)	0	5	0.5	0.2	1.2	No	Erosion of natural deposits
Beta/photon Emitters ^{1,2} (pCi/L)	0	50	4.1	ND	4.0	No	Decay of natural and man-made deposits
Alpha Emitters ³ (pCi/L)	0	15	0.7	0.2	1.2	No	Erosion of natural deposits

TESTING OF PROCESS WATER

Turbidity	
MCLG	TT (NTU)
MCL	TT (NTU)
Average Annual Turbidity	0.07
Highest Single Measurement	0.64
Lowest Monthly % Samples Meeting Treatment Technique Turbidity Limit	99.992%
Major Source in Drinking Water	Soil runoff
Violation (Yes/No)	No
Total Organic Carbon	
MCLG	N/A
MCL	TT (Ratio)
Quarterly Running Annual Average (ppm)	1.2
Minimum (ppm)	0.6
Maximum (ppm)	1.5
Major Source in Drinking Water	Naturally present in environment
Violation (Yes/No)	No

Turbidity

Turbidity is a measure of the cloudiness of water quantified by nephelometric turbidity units (NTU). Turbidity in excess of 5 NTU is just noticeable to the average person and is usually caused by suspended matter or impurities that interfere with the clarity of water. Turbidity itself has no health effects and is not a direct indicator of health risks. However, turbidity is monitored because it provides a good indication of the effectiveness of the treatment process. Turbidity levels are measured by Fairfax Water at all stages of the treatment process. According to EPA regulations, the turbidity level of filtered water shall be less than or equal to 0.5 NTU in at least 95% of the measurements taken each month, and shall at no time exceed 5 NTU.

Total Organic Carbon

Total Organic Carbon (TOC) is a measure of the organic carbon and has no direct health effects. However, it provides a medium for the formation of disinfection by-products. These by-products include trihalomethanes and haloacetic acids. Compliance with the treatment technique (TT) reduces the formation of these disinfection by-products.

Footnotes

1. Results are an average of Lorton/Occoquan 2003 and Corbalis 2005 data points.
2. The MCL for the Beta particles is written as 4mrem/year. EPA considers 50 pCi/L to be the level of concern for Beta particles.
3. Testing performed in 2003.
4. Measured at Fort Belvoir in 2004.

Abbreviations and Definitions

In the tables and elsewhere in this report you may find terms and abbreviations you might not be familiar with. The following definitions are provided to help you better understand these terms:

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.

ND: Non-detect, laboratory analyses indicate that the contaminant is not present.

NRL: No regulatory limit.

NTU: Nephelometric Turbidity Unit.

pCi/L: Picocuries per liter, a measure of radioactivity in water.

ppb: Parts per billion or micrograms per liter (ug/L). Corresponds to one penny in \$10,000,000.

ppm: Parts per million or milligrams per liter (mg/L). Corresponds to one penny in \$10,000.

Total Coliform: A bacteria test which indicates that potentially harmful bacteria may be present.

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

2005 DISTRIBUTION SYSTEM WATER QUALITY

Microbiological Contaminants

Total Coliform Bacteria	
MCLG	0
MCL	Presence not to exceed 5% of monthly samples
Fort Belvoir's Results	1 of 327 samples tested positive, retested negative
Meets EPA Standards	Yes
Major Source in Drinking Water	Naturally present in the environment
Violation (Yes/No)	No

The Fort Belvoir Directorate of Public Works performs monthly sampling for microbiological contaminants in the water distribution system. During calendar year 2005, one sample tested positive for total coliform. Appropriate actions were taken and additional samples were collected that tested negative for total coliform. This Microbiological Contaminants table lists the results of our microbiological testing which is required by the EPA. Samples testing positive for total coliform bacteria, which occur naturally in the environment, must not exceed 5% of the total number of monthly samples.

Total Trihalomethanes and HAA-5		TTHMs	HAA-5
Running Annual Average MCLG		0 ppb	0 ppb
Running Annual Average MCL		80 ppb	60 ppb
System Running Average	Annual	65 ppb	56 ppb
	Quarterly	42–65 ppb	41–56 ppb
System Range		15–118 ppb	19–78 ppb
Meets EPA Standards		Yes	Yes
Major Source in Drinking Water		By-product of drinking water disinfection	By-product of drinking water disinfection
Violation		No	No

Trihalomethanes (TTHMs) and haloacetic acids (HAA-5s) are compounds that can be formed when drinking water is disinfected with chlorine. The chlorine combines with naturally occurring organic matter in the water to form TTHMs and HAA-5s. These disinfection by-products are suspected carcinogens and are regulated by the EPA. The concentration limit set by the EPA is 80 ppb for TTHMs and 60 ppb for HAA-5s based on the running average of quarterly sampling results. Some people who drink water containing trihalomethanes in excess of the MCL over many years could experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer. Fairfax Water regulates its chlorination process to minimize TTHM and HAA-5 formation. During 2005, the Fort Belvoir quarterly running average concentration for disinfectant by-products were all within the EPA limits for both TTHMs and HAA-5s.

Metals ⁴	Copper	Lead
Action Level (AL)	1.3 ppm	15 ppb
Fort Belvoir 90th Percentile	0.059 ppm	3 ppb
Number of Fort Belvoir Sites Above 90th Percentile	0	1
Meets EPA Standards	Yes	Yes
Major Source in Drinking Water	Corrosion of household plumbing systems	Corrosion of household plumbing systems
Violation (Yes/No)	No	No

Because of Fort Belvoir's excellent past lead and copper results, we have been placed on Ultimate Reduced Monitoring, requiring us to collect 30 samples every three years from houses on Post. The Fort Bevoir Directorate of Public Works most recently sampled for lead and copper in 2004. The Lead and Copper Rule requires that 90% of the samples from high-risk homes must have levels less than 15 ppb of lead and 1.3 ppm of copper. Fort Belvoir's most recent samples had lead levels of 3 ppb and copper levels of 0.059 ppm (see Metals table). The number and location of sample sites are based on Fort Belvoir's population and plumbing conditions. The EPA requires us to analyze the first water drawn out of the faucet in the morning, since water that sits in your plumbing system's pipes overnight has the highest risk of lead and copper contamination.

Infants and young children typically are more vulnerable to lead in drinking water than the general population. If you are concerned about potential elevated lead levels in your home's water and would like to minimize the levels, simply flush the cold tap water for 30 seconds to two minutes prior to using it for cooking or drinking. For more information on lead and copper in drinking water, call the Fort Belvoir Directorate of Public Works, Environmental and Natural Resources Division at 703-806-4007.



Fort Belvoir
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Water Quality

JUNE 2006

IMPORTANT
Drinking Water Quality Information Inside

Please recycle



To Our Customers:
We are pleased to report that your water meets or
exceeds all standards set for quality and safety.

Residential Customer
Fort Belvoir, Virginia 22060

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Directorate of Public Works
Environmental and Natural Resource Division
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