Marine Corps Base Quantico

Crossroads of the Marine Corps

2017 Annual Drinking Water Quality Report

Mainside Water System PWSID 6153675

Introduction

Marine Corps Base Quantico G-F, Installation and Environment Division, is pleased to present the Base's Mainside Annual Water Quality Report for 2017. This report is designed to inform you about the quality of water and services we deliver to you every day.

Our constant goal is to provide you, the consumer, with a safe and dependable supply of drinking water.

We are committed to ensuring the quality of your water. To help us meet this goal, we have established a Water Quality Response Team. Personnel from the Base Naval Health Clinic join with our Physical Science Technician, to respond to customer concerns and water quality questions. Together, they have the resources to test the chemical and bacteriological quality at the consumers tap.

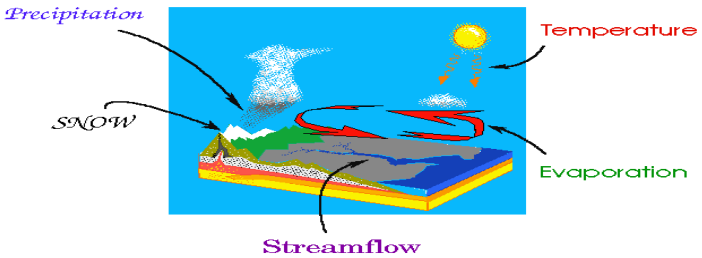
Our Mainside water (PWSID No. 6153675) comes from protected surface water sources. The water is processed at the Mainside Water Treatment Plant.

Summary

Office of Drinking Water
Safe Drinking Water for a Healthy Virginia

The Mainside Water Treatment Plant routinely monitors for constituents in your drinking water according to State and Federal laws. This report shows the results of our monitoring for the period **January 1 through December 31, 2017.**

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:

i. ***microbial contaminants***, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
ii. ***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.
iii. ***pesticides and herbicides***, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
iv. ***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 stormwater runoff, and septic systems.
v. ***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, USEPA prescribes regulations that 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.

Drinking water, including bottled water, may reasonably be expected to contain at least a small amount of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about drinking water contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking water Hotline at 1-800-426-4791 or visiting their website at

http://water.epa.gov/drink/index.cfm.

The Facts

This report contains information on all regulated contaminants found in your drinking water. Additionally, over 85 water tests are performed for a variety of contaminants not found in the water delivered to the Base.

An explanation of the results is included in a data table at the end of this report.

Maximum Contaminant Levels (MCL's) are set at very stringent levels by the USEPA. In developing the standards USEPA assumes that the average adult drinks 2 liters of water each day throughout a 70-year life span. USEPA generally sets MCL's at levels that will result in no adverse health effects for some contaminants or a one-in-ten-thousand to one-in-a-million chance of having the described health effect for other contaminants.

Source Water

The VDH conducted a source water assessment in 2002. The purpose was to determine the relative susceptibility of the source water to activities in the watershed. Our source water was calculated to have a high susceptibility to contamination due to ongoing Base activities. There was no evidence of contamination of the water source in any of our testing.

Microbial Analysis

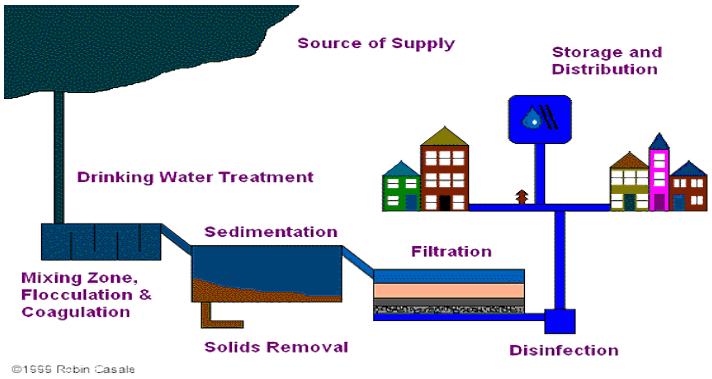
Total Coliform: *Coliforms* are bacteria that are present naturally in the environment and are used as an indicator that other, potentially harmful bacteria, may be present. When Coliform bacteria are found, special follow-up tests are done to determine if harmful bacteria are present in the water supply. If the limit is exceeded, the water supplier must notify the public by newspaper, radio, or television. We had two coliform samples out of one hundred eighty test present for coliform only, routine repeat samples were collected and all tested absent for coliform.

Disinfection By-products

During 2017 the 12–month average monitoring for Total Trihalomethanes (TTHM) revealed an exceedance of 0.110 mg/L and is over the Primary Maximum Contaminant Level (MCL) of 0.080 mg/L. This exceedance has caused MCBQ to be in violation of the Maximum Contaminant Level for Total Trihalomethanes. Some people who drink water containing TTHM in excess of the MCL over many years may have an increased risk of getting cancer. To maintain acceptable levels of TTHM, we are implementing all sampling requirements in accordance with regulations and conducting a comprehensive flushing protocol of our water distribution system along with an improved operational contingency plan.

Should Some People Take Special Precautions?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune system compromised persons such as persons with cancer undergoing chemotherapy, people who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly and infants can be partially at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the USEPA Safe Drinking Water Hotline at 1-800-426-4791. We constantly monitor the water supply for various contaminants.



We strongly recommend that our customers not use water from the hot water tap for consumption. Any contaminants found in the water may accumulate in the hot water tank. This would be true anywhere, regardless of the water source. This does not mean that there is anything wrong with our drinking water. All water tests are conducted on water from the cold-water tap. Our concern is that the water quality is unknown when water from the hot-water tap is consumed. We believe you are better served by heating cold-water for this purpose.

Lead and Copper

During August and September 2015, the Base completed testing for Lead and Copper in the distribution system. Samples from thirty sites were tested according to an approved sampling plan. . More information about drinking water contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline at 1-800-426-4791 or visiting their website at http://water.epa.gov/drink/index.cfm. 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. Marine Corps Base Quantico 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 15 to 30 seconds, until it becomes cold or reaches a steady temperature before using the 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 *USEPA's Safe Drinking water Hotline at 1-800-426-4791 or visit http://water.epa.gov/safewater/lead*.

Additional Tests and Monitoring

Unregulated Contaminant Monitoring Rule 4 (UCMR4)

The Safe Drinking Water Act (SDWA), as amended in 1996, requires the USEPA to establish criteria for a program to monitor unregulated contaminant and publish a list of contaminants to be monitored every five years.

USEPA published the first set of contaminants in 1999. Unregulated Contaminant Monitoring Rule 4 (UCMR4)sampling will begin in April 2018. Safe Drinking Water Act (SDWA) requirement mandated publishing the next set of unregulated contaminants to be monitored and the requirements for such monitoring. Implementation of this final rule benefits the environment by providing USEPA and other interested parties with scientifically valid data on the occurrence of the contaminants in drinking water; thereby, permitting the assessment of the population potentially being exposed and the levels of exposure. These results are the primary resource of occurrence and provide exposure data for the USEPA to determine whether to regulate these contaminants.

To view Contaminant Candidate List for UCMR4 testing, go to:

http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr4/index.cfm

MCBQ started testing for Cryptosporidium in Source Water

Testing started in October 2016 and will take twenty four months to complete, this testing is an ongoing effort to ensure MCBQ water is safe to consume.

Conclusion

Thank you for allowing us to continue providing your family with clean, quality water this year. In order to maintain a safe and dependable water supply we sometimes need to make improvements that benefits all of our customers. As announced on the Base water quality webpage,

https://www.quantico.marines.mil/Water-Quality/, water mains and fire hydrants are flushed twice a year. This may cause temporary water discoloration. We apologize for any inconvenience. Our goal is to provide water of excellent quality to every customer. We in the Utilities Section, work around the clock to provide top quality water to every tap. Our customers can help protect themselves and our water system by careful use of this resource, which is the heart of our community, our way of life and our children's future.

Stay Hydrated!

Our energy level is greatly affected by the amount of water we drink. A 5% drop in body fluids will cause a 25-30% loss of energy in the average person.

• If you lose 5% of your body's water, you will likely run a fever.

• If you lose 10% of your body's water, you will have difficulty moving and may not be able to move at all.

• Losing 12% of your body's water can result in death.

• Most people can exist for over 30 days without food, but only 4-7 days without water. Even mild dehydration will slow down metabolism as much as 3%.

• One glass of water will reduce midnight hunger pangs for most people.

• Water leaves the stomach five minutes after consumption.

• Lack of water is one of the primary triggers of daytime fatigue.

• Preliminary research indicates that 8-10 glasses of water a day could significantly ease back and joint pain for up to 80% of sufferers.

• A mere 2% drop in body water can trigger fuzzy, short-term memory, trouble with basic math, and difficulty focusing on the computer screen or on a printed page.

Quantico Marine Corps Base Water Quality Report Mainside 2017

Microbiological Results	MCLG	MCL	No. of Samples Indicating Presence of Bacteria	Highest no.	Number of Monthly Samples	Violation	Major source in drinking water.
Total Coliform Bacteria	0	One positive sample per Month	2	NA	15	No	Naturally present in the environment
Fecal Coliform	0	A routine sample & a repeat sample are coliform positive & one is also fecal coliform.	NA	NA	NA	No	Naturally present in the environment

For 2017 we had two samples that tested positive for coliform only. One in June and the other in August, routine repeat samples where collected and all tested negative for coliform.

Primary Regulated Contaminants

Metals (units)	MCLG	Action Level	90th Percentile	Number of sites tested	No. of Sites Exceeding action level	Range Low to Highest	Viloation	Source
Copper (ppm)	0	1.3ppm	0.628	30	0	0.043 to 1.18 ppm	No	Corrosion of household plumbing systems
Lead (ppb)	0	15ppb	3.72	30	1	<1.0 to 20.2 ppb	No	Corrosion of household plumbing systems

The Lead and Copper results are from August and September 2015; next test are to be conducted in June-August 2018.

Substance (units)	MCLG	MCL	Average	Range Low to High	Violation	Source
Fluoride (ppm) Results from distribution.	4	4	0.83	0.50-1.70	No	Added to the drinking water to promote dental health; erosion of natural deposits; discharge from fertilizer and aluminum factories.
Chlorine (ppm) Results from distribution system.	MRDLG=4	MRDL=4	1.15pm	0.10-3.70	No	Added to drinking water as a disinfectant.
Nitrate-Nitrite (ppm) Sample from entry point.	MCLG	10	One test below detection level	N/A	No	Leaching from septic tanks, fertilizer, erosion of natural deposits.

Radiological (pCi/L)	MCLG	MCL	Average	Range Low to High	When Tested	Violation	Source
Gross Beta	0	50*	NA	One test <1.2 Pci/L Below minimum detectable level.	2013	No	Erosion of natural deposits.
Radium 228	0	5 pCi/L	NA	One test <0.7 PCi/L Below minimum detectable level.	2013	No	Erosion of natural deposits.
Gross Alpha	0	15pCi/L	NA	One test <0.5 PCi/L Below minimum detectable level.	2013	No	Erosion of natural deposits.

*** EPA considers 50 pCi/l to be the level of concern. Test results from 2013; because results are so low the next tests currently scheduled for 2019.**

Disinfection By-Products	MCLG	MCL	Quarterly Running Annual Average	Range Low to High	Violation	Source
Trihalomethane THM (ppb)	0	80ppb	51ppb	23ppb to 92ppb	Yes	By-product of drinking water disinfection.
Haloacetic Acids Group HAA5 (ppb)	0	60ppb	35ppb	26ppb to 58ppb	No	By-product of drinking water disinfection.

Total Organic Carbons (TOC)	MCLG	MCL	Running Annual Average	Range Low to High	Violation	Source
Treatment Technique (TT)	N/A	N/A	N/A	N/A	*Yes	Naturally present in environment

*There were no violations of the TOC treatment technique in 2017. *However, in November 2017, we failed to conduct required monitoring for TOC, for which we received a notice of violation. We have revisited our sampling procedures to ensure all future samples are collected.

Treatment Technique (TT) Compliance with treatment technique is a removal ratio of 1.0 and higher. The ratio of removal is the actual Total Organic Carbon removed between the source water and treated water.

Turbidity (NTU)	MCLG	MCL	Annual avg.	Range Low to High	Highest single measurement	Month with lowest average	Source
Nephelometric (NTU)	N/A	TT	0.04	0.02-0.27	0.27	May-99%	Soil runoff.

Turbidity levels are measured during the treatment process after the water has been filtered, but before disinfection. The turbidity level of filtered water shall be less than or equal to 0.3 NTU in at least 95 percent of the monthly measurements, and shall at no time exceed 1 NTU.

Secondary Regulated Contaminants

Secondary Contaminants (units)	PMCL	SMCL	Results	Violation	Source
Chloride (ppm)	N/A	250ppm	One test 7.23ppm	No	Naturally present in environment
Sulfate (ppm)	N/A	250ppm	One test 21ppm	No	Naturally present in the environment; addition of water treatment substances.
Total Dissolved Solid (ppm)	N/A	500ppm	One test 95ppm	No	Naturally present in environment

Non Regulated Substance Monitored

UCMR3 Results

Non Regulated Contaminants (units)	MCLG	MCL	Results		Violation	Source
Samples from Distribution System			Average	Range		
Chromium (total)	NRL	NRL	< 0.2 ug/L	<0.2 ug/L	NA	Found naturally in rocks, plants, soil and volcanic dust, and animals.
Cobalt	NRL	NRL	<1 ug/L	<1 ug/L	NA	Naturally present in various minerals.
Molybdenum	NRL	NRL	<1 ug/L	<1 ug/L	NA	Metal used in manufacturing of steel and cast iron.
Strontium	NRL	NRL	25.5 ug/L	19-40 ug/L	NA	Fallout from atmospheric nuclear weapons tests conducted in the 1950s and 1960s.
Vanadium	NRL	NRL	<0.2ug/L	<0.2ug/L	NA	Used in iron and steel manufacturing.
Chromium-6	NRL	NRL	<0.04 ug/L	<0.03-0.062 ug/L	NA	Found naturally in rocks, plants, soil and volcanic dust, and animals.
Chlorate	NRL	NRL	280 ug/L	200-330 ug/L	NA	By-product of drinking water disinfection, also found in some pesticides.

UCMR3 Results Continued

Non Regulated Contaminants (units)	MCLG	MCL	Results		Violation	Source
Samples from Entry Point			Average	Range		
Chromium (total)	NRL	NRL	< 0.2 ug/L	<0.2 ug/L	NA	Found naturally in rocks, plants, soil and volcanic dust, and animals.
Cobalt	NRL	NRL	<1 ug/L	<1 ug/L	NA	Naturally present in various minerals.
Molybdenum	NRL	NRL	<1 ug/L	<1 ug/L	NA	Metal used in manufacturing of steel and cast iron.
Strontium	NRL	NRL	19 ug/L	15-24 ug/L	NA	Fallout from atmospheric nuclear weapons tests conducted in the 1950s and 1960s.
Vanadium	NRL	NRL	<0.2 ug/L	<0.2 ug/L	NA	Used in iron and steel manufacturing.
Chromium-6	NRL	NRL	.074 ug/L	.046-.096 ug/L	NA	Found naturally in rocks, plants, soil and volcanic dust, and animals.
Chlorate	NRL	NRL	228 ug/L	61-410 ug/L	NA	By-product of drinking water disinfection, also found in some pesticides.

Key to acronyms and abbreviations.

Non-Detects ND	Laboratory analysis indicates that the constituent is below the detection level.
Parts per million, PPM & Milligrams per liter MG/L	Parts per million and milligrams per liter are the same. One part per million corresponds to one minute in two years, or a penny in $10,000.
Parts per billion PPB & Micrograms per liter Mcg/L	Parts per billion and Micrograms per liter are the same. One part per billion corresponds to one minute in 2000 years, or a penny in $10,000,000.
Picocuries per liter (pCi/l)	Picocuries per liter is a measure of the radioactivity in the water.
Nephelometric (NTU) Turbidity unit measurement	Nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just visibly cloudy with the naked eye.
Action Level AL	Concentration of a contaminant which, if exceeded, triggers treatment or other requirements a water system must follow.
Treatment Techniques (TT)	A treatment technique is a required process intended to reduce level of contaminant in drinking water
Maximum Contaminant Level MCL	The highest level of a contaminate 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 MCLG	The "Goal" (MCLG) is the level of a contaminant in drinking water below which there is no known or expected risk to MCLG's allow for a margin of safety.
Maximum Residual Disinfection Level MRDL	The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfection is necessary for control of microbial contaminants.
Maximum Residual Disinfection Level Goal MRDLG	The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLG does not reflect the benefits of the use of disinfectants.
No Regulatory Limit NRL	A substance or chemical constituent that is of interest but currently does not have a regulatory limit or concentration.