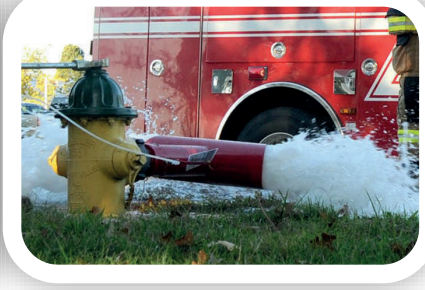
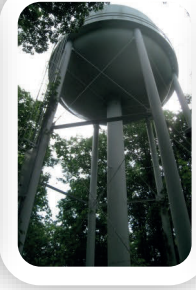
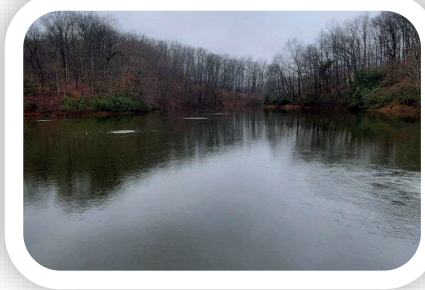




2021 Annual Drinking Water Consumer Confidence Report

Marine Corps Base Quantico Mainside Water System (PWSID 6153675)



Message from the Public Works Officer

Dear MCB Quantico Water Customer,

The Public Works Branch (PWB) of the Marine Corps Base Quantico G-F, Installation and Environment Division, is proud to present this year's (2021) Annual Water Quality Report that details the outstanding quality of Base's Mainside Water System. The Mainside Water System routinely conducts drinking water quality monitoring through numerous water quality tests according to State and Federal regulations. This report summarizes our water quality monitoring results for the period **January 1 through December 31, 2021.**

Public health and the safety of our water consumers is our top priority and our goal is to provide you with a safe and dependable supply of drinking water. In order to meet this goal, our "Water System Working Group (WSWG)" Team with personnel from the Water Treatment Plant, Utility Section, Facility Maintenance Section, Engineering Section, and Natural Resource & Environmental Affairs Branch meet monthly and continue process improvements to proactively address water quality concerns and issues throughout the year. The followings are some of our recent efforts and changes implemented to improve our water quality:

- 1) Completed a project to modernize and upgrade our chemical feed systems and control systems, allowing us to further optimize finished water quality.
- 2) Continued reliable operation of our new aeration system in our source water reservoir to improve our raw water quality.
- 3) Increased security on our system with improved security camera monitoring system and fences.

- 4) Continued successful implementation on our water system flushing and management programs to systematically and comprehensively flush the Mainside water distribution system and reduce water age (water retention) to further ensure water quality in the Mainside system through the following water programs:

- Biannual Uni-direction Flushing (UDF) Program,
- Periodic Spot Flushing Program on dead-end areas
- Water Storage Tank Turnover Program
- Comprehensive Water Tank Inspection and Cleaning Program
- Raw Water Line Flushing Program.
- Water sampling/testing tracking Program for successful completion of all samples on time and in compliance during 2021.

In spite of many challenges during 2021 including the global COVID-19 pandemic, our multifaceted **Team is proud to announce that we have not had a single drinking water quality violation** (i.e., fully in compliance with all water quality parameters). Our utilities team including our boots-on-ground Utility Shop Maintenance personnel & our 24/7 Plant operators and assistant staff will continue to strive to provide safe drinking water of the highest quality to our families and the Quantico community.


CDR Benjamin Hofman P.E.

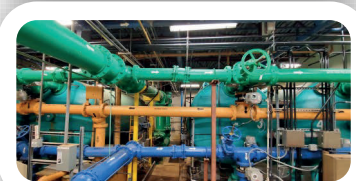
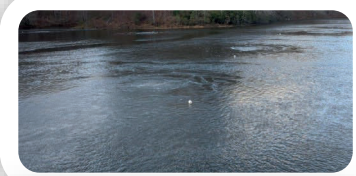
Public Works Officer, Marine Corps Base Quantico

We Want To Hear From You

In order to meet increasingly stringent water quality requirements, we are constantly planning and funding projects to address many water-related issues including source water protection, system operation and maintenance improvement, and timely upgrade and replacement of water system infrastructure (pipes, pump stations and tanks) and treatment plant facility. We value your inputs on our water quality and water system related issues. You can call us at 703-432-2466 (PWB Water Commodities Manager) for any water related questions and inputs. To stay informed on important water related public notifications, please visit us on line at <https://www.quantico.marines.mil/water-quality/>.



GF-Public Works Branch, Utilities
MCB Quantico
Public Works Customer Service Desk
(703) 784-2072



Regarding This Report

This report contains summarized information on all regulated contaminants found in your drinking water based on water quality tests performed for a variety of contaminants. 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.

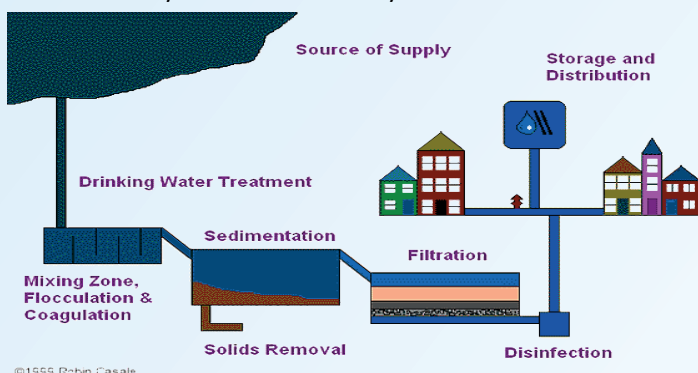
Sources of Water

All of the water sources for MCB Quantico Mainside System are located inside of the MCB Quantico Base territory and protected from general public access. However, if you witness any illegal activities (e.g., illegal dumping) around or in base waterways, please report your observations to MCB Quantico Security Battalion at 703-784-2251. The Virginia Department of Health (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, and we routinely check and mitigate runoff potential. There was no evidence of contamination of the water source in any of our testing.

Mainside Water Treatment Plant

Our Mainside water system (PWSID No. 6153675) and its treatment plant utilizes protected surface water sources and a conventional treatment process (coagulation, flocculation, precipitation, filtration and disinfection process) to deliver potable water to the Base's Mainside customers (located in east side of I-95).

The Mainside Water Treatment Plant (with a design capacity of 3.17 million gallons per day) provided an average of approximately 1.0 million gallons per day in 2021, through approximately 59 miles of water line. Mainside Water Treatment Plant treats source water through its conventional water treatment process (coagulation, flocculation, sedimentation, filtration and disinfection). We recently completed a project to modernize and upgrade our treatment chemical feed systems and control systems



Potential Sources of Water Contaminants

The principal source of water for the Mainside Water System is within the boundaries of MCB Quantico and area of ~ 17.4 square miles of land feeds into our Reservoir. As water travels over the surface of the land or through the ground, it dissolves naturally oc-

curing 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 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 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, 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 <https://www.epa.gov/ground-water-and-drinking-water>.



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 strongly recommend that our customers not use water from the hot water tap for consumption. Any contaminants found in the water may accumulate in your 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 the purpose of cooking and consumption.



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. A total of 4 positive total coliform samples were detected throughout 2021 but all of them were negative for *E. coli* and all of their repeat samples were negative for total coliform. **We are proud to announce that we did not have any samples test present for *E. coli* (i.e., no *E. coli* MCL violation) during the 2021 calendar year.**

Disinfection Byproducts

MCB Quantico Mainside Water System collects disinfection byproducts samples (including Total Trihalomethanes and Haloacetic Acids samples) from 4 different locations every quarter.

During 2021 (all four quarters monitoring events), none of annual running averages from all required disinfection byproducts samples exceeded Total Trihalomethanes (TTHM) MCL (80 ppb) and Halo acetic Acids (HAA5) MCL (60 ppb). In other words, **MCB Quantico Mainside Water system is in compliance with TTHM and HAA5 MCLs throughout 2021.**

Throughout the year, we've continuously performed disinfection byproducts reduction measures (including the uni-directional flushing program, water storage tank turn-over practice, water storage tank inspection & cleaning, spot flushing) and these recent operational efforts improved our water quality (i.e., TTHM and HAA5 reduction). We anticipate further water quality improvement through these operational measures coupled with the on-going recent chemical feed system and their control system upgrades.

Lead and Copper

During 2019, we completed all required testing for lead and copper.

Based on our triennial lead and copper sampling schedule, we are scheduled to conduct next lead and copper testing in 2022. 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 30 seconds to 2 minutes, 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 <https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water>.

Unregulated Contaminant Monitoring Rule

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 began in April 2018 and continued in 2019.

The fifth Unregulated Contaminant Monitoring Rule (UCMR 5), as proposed, by EPA would require us to collect 30 chemical contaminants between 2023 and 2025 using analytical methods developed by EPA and consensus organizations.

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 fact sheets about the UCMR5 testing, go to:

<https://www.epa.gov/sites/production/files/2021-01/documents/ucmr5-proposal-factsheet-draft.pdf>

Cryptosporidium in Source Water

Cryptosporidium testing from MCB Quantico Mainside Water System source water was completed in October 2018 and results indicate that MCBQ Raw Source Water is safe to consume once treated. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

Conclusion

All of our Public Works Utilities Team work around the clock to provide top quality water to our families, co-workers and the Quantico Community.

In order to meet your needs of a safe and dependable water supply, we will continue to make improvements to our treatment facility and supply lines that benefit all of our customers. During our biannual uni-directional flushing events, water mains and fire hydrants are flushed through our systematic uni-directional flushing program. This may cause temporary water discoloration which can be resolved by running the tap until the water is clear. Please help us in our goal of ensuring a safe and sustainable water system by careful use of this resource, which is the heart of our community, our way of life and our children's future.

Learn About Your Drinking Water



To stay informed on important water related public notifications, please visit us on line at <https://www.quantico.marines.mil/water-quality/>.



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 <https://www.epa.gov/ground-water-and-drinking-water>.



Please visit Virginia Department of Health (VDH) Office of Drinking Water (ODW) website for VDH drinking water compliance information:

<https://www.vdh.virginia.gov/drinking-water/>



For any questions about our drinking water, call at 703-432-2466 (MCBQ GF-Public Works Branch FMS Utilities and Energy Management Section).

Quantico Marine Corps Base Water Quality Report Mainside 2021

Primary Regulated Contaminants

Microbiological Results	MCLG	MCL	No. of Samples Indicating Presence of Bacteria	Number of Monthly Samples	Violation	Major source in drinking water.
Total Coliform Bacteria	0	NA*	Total of 4 samples* during 2021: One (1) in Jul 2021; One (1) in Aug 2021; Two (2) in Sep 2021 * None of their repeat samples show presence of total coliform	20	No	Naturally present in the environment and Human & animal fecal waste
E. Coli	0	A routine sample & a repeat sample are coliform positive & one is also fecal coliform positive. **	0	20	No	Naturally present in the environment and Human & animal fecal waste

* Two or more total coliform positive samples per month will trigger Level 1 assessments and corrective actions accordingly. ** Any E.coli MCL violation triggers Level 2 assessment and corrective actions accordingly.

Lead & Copper (Metals) (Customer's Tab)	MCLG	Action Level	90th Percentile	Number of sites tested	No. of Sites Exceeding action level	Range Low to Highest	Violation	Source
Copper (ppm)	0	1.3 ppb	0.24 ppm	30	1	0.02 ppm to 2.10 ppm	No	Corrosion of household plumbing systems
Lead (ppb)	0	15 ppb	5 ppb	30	0	<2.0 ppb to 13 ppb	No	Corrosion of household plumbing systems

MCB Quantico Mainside Water System is on reduced monitoring for these parameters based upon historical results (as granted by the State). The results above are collected from the most recent monitoring period in 2019. The next lead and copper monitoring is scheduled in 2022.

Substance (units)	MCLG	MCL	Level Detected (ppm)	Range Low to High		Violation	Source
				Minimum (ppm)	Maximum (ppm)		
Fluoride (ppm) Results from distribution.	4	4	0.21	0 (Non Detect)	0.67	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 ^A = 4	3.10	0.20	3.10	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	No	Leaching from septic tanks, fertilizer, erosion of natural deposits.
Barium (ppm)	2	2	0.13	Only 1 sample collected/tested		No	Erosion of natural deposits.

^A MRDL: Maximum Residual Disinfection Level (in mg/L or ppm)

Radical (pCi/L)	MCLG	MCL	Level Detected	Range Low to High	When Tested	Violation	Source
Gross Beta (pCi/L)	0	50 pCi/L *	ND	One test, <4.80 pCi/L Below minimum detectable activity	2019	No	Erosion of natural deposits.
Radium 226 (pCi/L)	0	N/A	ND	One test <0.456 pCi/L Below minimum detectable activity	2019	No	Erosion of natural deposits.
Radium 228 (pCi/L)	0	N/A	ND	One test <1.22 pCi/L Below minimum detectable activity	2019	No	Erosion of natural deposits.
Radium 226 + 228 (combined)	0	5 pCi/L	ND	One test Below minimum detectable activity.	2019	No	Erosion of natural deposits.
Gross Alpha (pCi/L)	0	15 pCi/L	ND	One test <3.09 pCi/L Below minimum detectable activity.	2019	No	Erosion of natural deposits.
Uranium (ppb)	0	30 ppb	ND	One test <1.0 ppb Below minimum detectable level.	2019	No	Erosion of natural deposits.

* EPA considers 50 pCi/L to be the level of concern. Test results from 2019 sampling.

Disinfection By-Products	MCLG	MCL	Highest Locational Running Annual Average [†] (During CY 2021)	Range Low to High		Violation	Source
				Minimum (ppb)	Maximum (ppb)		
Trihalomethane THM (ppb)	0	80 ppb	58 ppb	15	127	No	By-product of drinking water disinfection.
Haloacetic Acids Group HAAS (ppb)	0	60 ppb	39 ppb	11	53	No	By-product of drinking water disinfection.

[†] During CY 2021, none of annual running averages from all required disinfection byproducts samples exceeded Total Trihalomethanes (TTHM) MCL (0.080 mg/L) and Halo acetic Acids (HAAS) MCL (0.060 mg/L).

Total Organic Carbons (TOC)	MCLG	MCL	Quarterly Running Annual Average of monthly TOC Range Low to High		Combined Filtered Water TOC in mg/L Range Low to High		Violation	Source
			Minimum Ratio	Maximum Ratio	Minimum (ppm)	Maximum (ppm)		
Treatment Technique (TT)	N/A	TT & ORQQ ≥1	1.38	1.67	1.14	2.12	No	Naturally present in environment

[†] Treatment Technique (TT) Compliance with treatment technique is a removal ratio of 1.0 and higher and is based upon a Quarterly Running Annual Average (QRAA) of the monthly ratios of actual Total Organic Carbon removal between the source water and the treated water in a calendar year (not based on an individual result). The ratio of removal is calculated as "the actual TOC removal percent (between the source water and treated water) divided by the required TOC removal (based on source water TOC and alkalinity). Total Organic Carbon (TOC) has no health effects. However, it provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes and haloacetic acids. Compliance with the treatment technique reduces the formation of these disinfection byproducts.

Turbidity (NTU)	MCLG	MCL	Annual avg.	Range Low to High	Highest single measurement	Month with lowest average*	Source
Nephelometric (NTU)	N/A	TT	0.09	0.00 to 0.37	0.37	NA 100% of samples during 2021 were less than 0.3 NTU	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 (From One Test)	Violation	Source
Aluminum (mg/L)	N/A	0.05 to 0.2 ppm	0.033	No	Naturally present in environment
Iron (mg/L)	N/A	0.3 ppm	0.1	No	Naturally present in environment
Chloride (mg/L)	N/A	250ppm	6.75	No	Naturally present in environment
Sulfate (mg/L)	N/A	250ppm	37.9	No	Naturally present in environment
Manganese (mg/L)	N/A	0.050 ppm	0.0088	No	Naturally present in the environment; addition of water treatment substances.
Total Dissolved Solid (mg/L)	N/A	500ppm	103	No	Naturally present in environment
Color (CU)	N/A	15 CU	2	No	Naturally occurring organics.
Sodium (mg/L)	N/A	N/A	25	No	Salt water intrusion, leaching from soil, chemicals used in water treatment.
Zinc (mg/L)	N/A	5 ppm	0.009	No	Naturally present in environment; runoff/leaching from natural deposits and industrial wastewastes

Substance monitored under Unregulated Contaminant Monitoring Rule (UCMR)

No substances monitored during CY 2021.

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 (ppm) and milligrams per liter (mg/L) 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 (µg/L)	Parts per billion (ppb) and micrograms per liter (µg/L) 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 (pCi/L) is a measure of the radioactivity in the water.
Nephelometric (NTU) Turbidity unit measurement	Nephelometric turbidity unit (NTU) 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 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 (MCLG)	The "Maximum Contaminant Level 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.