

Marine Corps Base Quantico, Va. 2010 Annual Drinking Water Quality Report Camp Barrett Water System [TBS / DOJ/ WTB] (System ID # 6153060, 6179100)



Introduction

Marine Corps Base Quantico G-5, Installation and Environment Division, is pleased to present the Base's *Camp Barrett* Annual Water Quality Report for 2010. 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 Water Quality Assurance Technician, to respond to customer concerns and water quality questions. Together, they have the resources to test the chemical and bacteriological quality at the consumer's tap.

Camp Barrett (PWSID No. 6153060) water is processed at a water treatment plant in Stafford County, Va. (PWSID No. 6179100). This service area includes The Basic School, the Department of Justice complex and the Weapons Training Battalion.

Summary

Both Stafford County and MCB Quantico Utilities routinely monitor for contaminants in your drinking water according to Federal and State laws. This report shows the results of our monitoring for the period **January 1 through December 31, 2010.**

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, the U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA) prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. FOOD AND DRUG ADMINISTRATION (FDA) 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 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



photo: USMC

Marine Major General Charles Dodson Barrett, the first Commanding General of the 3d Marine Division, was awarded the Distinguished Service Medal posthumously in recognition of his outstanding service during World War II. Born August 16, 1885 in Henderson, Kentucky, he was killed accidentally while on duty at Noumea, New Caledonia in the South Pacific October 8, 1943. Barrett is buried at Arlington National Cemetery.

2010 MCB Quantico Annual Drinking Water Quality Report

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.

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. The USEPA generally sets MCLs 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.

A *Source Water Assessment Report* (SWAR) was completed in 2002. It was determined that the source water was highly susceptible to contaminants.

Microbiological Analysis



Stafford County's water treatment plants and distribution system were in compliance for microbiological testing for 2010.

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 are pleased to report there were no positive bacteriological samples taken from the Camp Barrett distribution system (TBS/DOJ/WTB) in 2010.

Systems

We have three (3) different sources of water at Marine Corps Base Quantico.

We encourage our customers to report bad tasting or discolored water. At that time we will visit the site and determine if we need to run additional tests.

If you have any questions about this report or concerning your water utility, please contact Ms. Patricia Greek, Public Works Branch, at (703) 432-2466.

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, 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.

USEPA / CENTER FOR DISEASE CONTROL AND PREVENTION (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 be accumulated 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

The lead levels found in samples taken on base are well below regulatory limits.

The USEPA drinking water hot line can answer your questions about lead contamination. More information about contaminants and potential health effects can be obtained by calling the *USEPA Safe Drinking Water Hotline at 1-800-426-4791*.



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 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 Safe Drinking Water Hotline at 1-800-426-4791 or visit <http://www.epa.gov/safewater/lead>.*

Additional Monitoring

The Individual Distribution System Evaluation (IDSE)

The approved IDSE requires MCB Quantico to monitor its distribution system for disinfection byproducts. The Base evaluates the collected information and makes necessary changes in the distribution system such as changes in storage capacity or changing the distribution hydraulics so the freshest water is maintained throughout the system.

Camp Barrett Water System (TBS/ DoJ/ WTB)

Conclusion

Thank you for allowing us to continue providing your family with clean, quality water this past year. In order to maintain a safe and dependable water supply we sometimes need to make improvements that will benefit all of our customers.

As announced in the Base newspaper, *The Quantico Sentry*, 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.



Under a new program being developed by the VIRGINIA DEPARTMENT OF HEALTH (VDH), a detailed *Source Water Assessment* will be con-

ducted within the next few years to find ways to better protect our water sources.

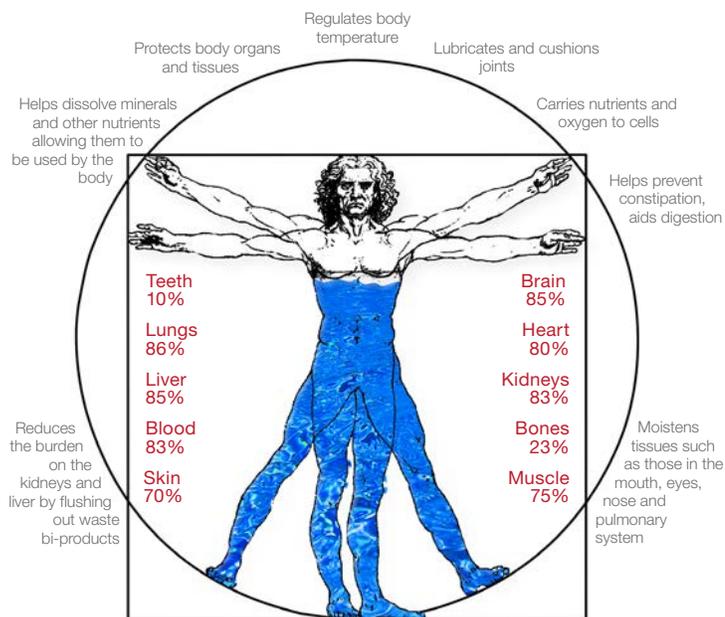
After the assessment is conducted, we will provide you with information about potential sources of contamination and measures to reduce or eliminate the sources of contamination.

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.

We don't often pause to consider the incredible value of a safe, reliable water supply and the water system that delivers it in our everyday lives. Consider what tap water does that no other water can do.

H₂O



THE HUMAN BODY IS 60% WATER

Only tap water delivers public health protection

In a world where an estimated 3 million people die every year from preventable waterborne disease, our water systems allow us to drink from virtually any public tap with a high assurance of safety. Each community water supply meets rigorous federal and state health-protective standards.

Fire protection

A well-maintained water system is critical in protecting our communities from the ever-present threat of fire. A system that provides reliable water at an adequate pressure can be the difference between a small fire and an urban inferno. The ability to suppress fires also influences new home construction, business location decisions and insurance rates.

Support for the economy

Businesses or housing developments do not succeed without a safe and sustainable water supply. Tap water is critical to businesses' day-to-day operations and is often a primary ingredient in the products they create. The incredible value of water is magnified during times of drought and when populations expand into arid climate.

The overall quality of life we enjoy

Any measure of a successful society — low mortality rates, economic diversity, productivity, and public safety — is in some way related to access to safe water. In North America, we take for granted that safe water is always accessible to drink, to wash our clothes, to water our lawns and for a myriad of other purposes. When water service is interrupted, we're all reminded of the extraordinary value of water resources and service.



2010 MCB Quantico Annual Drinking Water Quality Report

Camp Barrett Water System (TBS/DOJ/WTB)

(System ID # 6153060, 6179100)



BACTERIOLOGICAL QUALITY								
Microbiological Contaminants	MCLG	MCL	Percent Positive	Highest No. Positive	Monthly Samples	In Compliance	Source	
Total Coliform Bacteria	0	One Positive Sample per Month *	0	0	6	Yes	Naturally present in the environment	
* We may not exceed one positive sample per month. No positive samples in 2010.								
REGULATED CONTAMINANTS								
Metals								
Parameter	MCLG	Action Level (AL)	Results	No. of Sites Exceeding AL	Sampled Range	In Compliance	Source	
Copper (Cu) **	0	90% of samples tested must be below 1.3 ppm	0.1 ppm	0	< 0.05 ppm is the lowest detection level for copper. Range of samples tested was < 0.05 - .75 ppm	Yes	Corrosion of household plumbing systems	
Lead (Pb) **	0	90% of samples tested must be below 15 ppb	5 ppb	2	2 ppb is the lowest detection level for lead. Range of samples tested was < 2 - 6.65 ppb	Yes	Corrosion of household plumbing systems	
** The Lead and Copper results are from 2010. The next sampling event is scheduled for 2013. No samples were above the EPA Safe Drinking Water Act Action Level (AL).								
TTHM (Total Trihalomethanes)								
Parameter	Units	MCLG	MCL	Highest	Range	Average	In Compliance	Source
TTHM	ppb	N/A	80	51	17 - 51	31	Yes *	By-product of drinking water disinfection.
* Compliance is based on a 4 quarter running average.								
HAA5 (Haloacetic Acids Group 5)								
Parameter	Units	MCLG	MCL	Highest	Range	Average	In Compliance	Source
HAA5	ppb	N/A	60	34	13 - 34	23	Yes *	By-product of drinking water disinfection.
* HAA5 compliance is based on a 4 quarter running average.								
Regulated Contaminants as reported by the Stafford County Smith Lake Water Plant (PWSID No. 6179100)								
Fluoride								
Parameter	Units	MCLG	MCL	Average	Range	Highest	In Compliance	Source
Fluoride	ppm	4	4	0.89	0.49 - 1.21	1.21	Yes	Samples taken from distribution system. Added for healthy teeth.
Chlorine								
Parameter	Units	MRDLG	MRDL	Average	Range	Highest	In Compliance	Source
Chloramines (as Cl₂)	ppm	4	4	2.74	0.4 - 4.2	4.20	Yes	Samples taken from distribution system. Added to drinking water as a disinfectant.
There were no samples that tested above 4.0								
Radiological								
Parameter	Units	MCLG	MCL	Results	Range	In Compliance		Source
Gross Alpha	pCi/L	0	15 *	0.1	one test	Yes		Erosion of natural deposits.
* EPA considers 15 pCi/L to be the level of concern. These results are from 2002.								
Nitrates - Nitrites								
Parameter	Units	MCLG	MCL	Results	Range	In Compliance		Source
Nitrate-Nitrite (NO₃ - NO₂)	ppm	10	10	0.11	One Test	Yes		Leaching from septic tanks, fertilizer runoff and erosion of natural deposits.
TOC (Total Organic Carbons)								
Parameter	Units	MCLG	MCL	Removal Ratio	In Compliance		Source	
TOC	N/A	Treatment Technique	Average Removal Ratio ≥ 1.0	1.04 - 1.44	Yes		Naturally present in the environment	
Treatment Technique: TOC removal ratio must be above 1.0								
WATER QUALITY (Key to Abbreviations)								
[ND]	Non-Detects	Laboratory analysis indicates that the constituent is below the detection level.						
[ppm]	Parts per million	One part per million corresponds to one minute in two years, or a penny in \$10,000.						
[ppb]	Parts per billion	One part per billion corresponds to one minute in 2000 years, or a penny in \$10,000,000.						
[mg/L]	Milligrams per liter	Milligrams per liter is the same as parts per million.						
[µL]	Micrograms per liter	Micrograms per liter is the same as parts per billion.						
[pCi/L]	Picocuries per liter	Picocuries per liter is a measure of the radioactivity in the water.						
[NTU]	Nephelometric Turbidity Unit	Nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just visibly cloudy.						
[AL]	Action Level	Concentration of a contaminant which, if exceeded, triggers treatment or other requirements a water system must follow.						
[TT]	Treatment Techniques	A treatment technique is a required process intended to reduce level of contaminant in drinking water						
[MCL]	Maximum Contaminant Level	The "Maximum Allowed" is the highest level of contaminant allowed in drinking water. MCL's are set as close to MCLG's as feasible using the best available treatment technology.						
[MCLG]	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. MCLG's allow for a margin of safety.						
[MRDL]	Maximum Residual Disinfection Level	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.						
[MRDLG]	Maximum Residual Disinfection Level Goal	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.						

Marine Corps Base Quantico, Va.

2010 Annual Drinking Water Quality Report

Mainside Water System (System ID # 6153675)



Introduction

Marine Corps Base Quantico G-5, Installation and Environment Division, is pleased to present the Base's *Mainside* Annual Water Quality Report for 2010. 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 Water Quality Assurance Technician, to respond to customer concerns and water quality questions. Together, they have the resources to test the chemical and bacteriological quality at the consumer's tap.

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

Base Waterworks Receives Awards



Recently, the Mainside Water Facility received the *Bronze Excellence in Granular Media Filter Performance Award* for 2010 (we also received this award in 2008 and 2009). THE VIRGINIA DEPARTMENT OF HEALTH (VDH), OFFICE OF DRINKING WATER, recognized the

Base for achieving Virginia's *Optimization Program Goal for Filtration*. The Base waterworks succeeded in providing filtration performance three times below the UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) standards.

A lower water plant output turbidity indicates a higher rate of particulate removal; USEPA standard is 0.3 NTU (*see definition in data table*). The Base waterworks consistently maintained an effluent turbidity below 0.10 NTU. The low turbidity allows for an extremely effective disinfection process.

Summary

The Mainside Water Treatment Plant routinely monitors for constituents in your drinking water according to Federal and State laws. This report shows the results of our monitoring for the period **January 1 through December 31, 2010**.

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 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 byproducts 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, 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 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 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

2010 MCB Quantico Annual Drinking Water Quality Report

one-in-a-million chance of having the described health effect for other contaminants.

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. The 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.

Microbiological 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.

Systems

We have three (3) different sources of water at Marine Corps Base Quantico. We encourage our customers to report bad tasting or discolored water. At that time, we will visit the site and determine if we need to run additional tests.

If you have any questions about this report or concerning your water utility, please contact Ms. Patricia Greek, Public Works Branch, at (703) 432-2466.

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, 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.

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

In August 2009, the Base completed testing for Lead and Copper in the distribution system. Samples from *thirty* sites were tested according to an approved sampling plan. All samples were below USEPA Action Level (15 ppb). As a result, the next sample event for lead and copper is in 2012.

More information about contaminants and potential health effects can be obtained by calling the *USEPA Safe Drinking Water Hotline at 1-800-426-4791*.

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 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 Safe Drinking Water Hotline at 1-800-426-4791 or visit <http://www.epa.gov/safewater/lead>.*

Additional Tests and Monitoring

Cryptosporidium

Cryptosporidium is a microbial pathogen found in surface water throughout the US. Although filtration removes *Cryptosporidium*, the most commonly used filtration methods cannot guarantee 100% removal. The disease caused by *Cryptosporidium* is called *Cryptosporidiosis* and is caused by infection with oocysts. People can be exposed to oocysts from other people, animals, water, swimming pools, fresh food, soils, and any surface that has not been sanitized after exposure to feces. Symptoms range from mild to incapacitating diarrhea, cramps, loss of appetite, weight loss, nausea, and low-grade fever. Most healthy individuals can overcome the disease within a few weeks; however, immune compromised people, infants, small children, and the elderly are at greater risk of developing a life-threatening illness.

We encourage immune-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Currently, we are monitoring our source water for compliance under the USEPA's Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). The USEPA has developed this rule to provide increased source water protection against microbial pathogens, such as *Cryptosporidium*. Under the LT2ESWTR, the average concentration, 0.075 oocysts/liter, determines if additional treatment measures are needed. We began the two-year LT2ESWTR monitoring period in April 2008.

The data collected through December 2010 documents that *no cryptosporidium was detected in our source water.*

Unregulated Contaminant Monitoring Rule 2 (UCMR2)

The Safe Drinking Water Act (SDWA), as amended in 1996, re-

Mainside Water System

quires the USEPA to establish criteria for a program to monitor unregulated contaminants and to publish a list of contaminants to be monitored every five years.

USEPA published the first set of contaminants in 1999. This final regulation meets the *Safe Drinking Water Act* (SDWA) requirement by publishing the next set of unregulated contaminants to be monitored and the requirements for such monitoring.

This final rule describes the design for the second *Unregulated Contaminant Monitoring Regulation* cycle (UCMR 2) of 2007-2011. USEPA is requiring the monitoring of 25 chemicals using 5 different analytical methods. UCMR 2 monitoring began in 2008 and was completed in 2010.

Implementation of this final rule benefits the environment by providing USEPA and other interested parties with scientifically valid data on the occurrence of these contaminants in drinking water; thereby, permitting the assessment of the population potentially being exposed and the levels of that exposure. These results are the primary source of occurrence and provide exposure data for the USEPA to determine whether to regulate these contaminants.

UCMR2 testing for 2008 through 2010 indicates all constituents (e.g., flame retardants, pesticides, explosives) tested are *non-detectable* per USEPA guidelines.

Individual Distribution System Evaluation (IDSE)

The approved IDSE requires MCB Quantico to monitor its distribution system for disinfection byproducts. The Base evaluates the collected information and makes necessary changes in the

distribution system or treatment process.

Pending Contracts will Keep Water Fresh on Base

Automatic Flush Valves

Automatic flush valves and chlorine monitoring stations were installed at various locations aboard Quantico. The *Stage 2 Disinfection Byproduct Rule* requires the Base to reduce the age of water in the distribution system.

Distribution System Upgrade

Current work on the distribution system includes a redesign of some existing tanks so there is separate fill and effluent. This provides better turnover in storage tanks and fresher water.

Conclusion

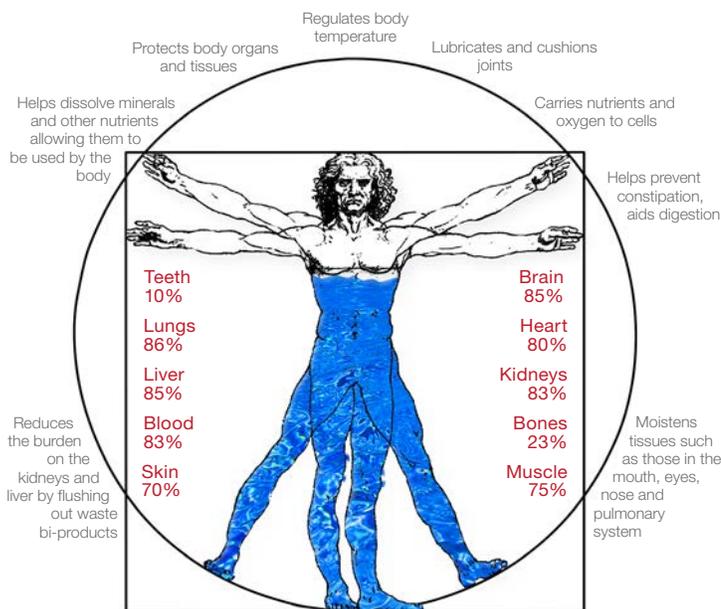
Thank you for allowing us to continue providing your family with clean, quality water this year. In order to maintain a safe and dependable water supply we sometimes need to make improvements that benefits all of our customers.

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H₂O



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Support for the economy

Businesses or housing developments do not succeed without a safe and sustainable water supply. Tap water is critical to businesses' day-to-day operations and is often a primary ingredient in the products they create. The incredible value of water is magnified during times of drought and when populations expand into arid climate.

The overall quality of life we enjoy

Any measure of a successful society — low mortality rates, economic diversity, productivity, and public safety — is in some way related to access to safe water. In North America, we take for granted that safe water is always accessible to drink, to wash our clothes, to water our lawns and for a myriad of other purposes. When water service is interrupted, we're all reminded of the extraordinary value of water resources and service.



2010 MCB Quantico Annual Drinking Water Quality Report

Mainside Water System (System ID # 6153675)



BACTERIOLOGICAL QUALITY								
Microbiological Contaminants	MCLG	MCL	Percent Positive	Highest No. Positive	Monthly Samples	In Compliance	Source	
Total Coliform Bacteria	0	One Sample per Month	0%	0	15	Yes	Naturally present in the environment	
There were no positive samples in 2010								
REGULATED CONTAMINANTS								
Metals								
Parameter	MCLG	Action Level (AL)	Results	No. of Sites Exceeding AL	Range	In Compliance	Source	
Copper (Cu) **	0	90% of samples tested must be below 1.3 ppm	0.183 ppm	0	< 0.05 ppm is the lowest detection level for copper. Range of samples tested was < 0.05 - 0.31 ppm	Yes	Corrosion of household plumbing systems	
Lead (Pb) **	0	90% of samples tested must be below 15 ppb	3.15 ppb	0	2.0 ppb is the lowest detection level for lead. Range of samples tested was < 2.0 - 6.96 ppb	Yes	Corrosion of household plumbing systems	
** The Lead and Copper results are from August 2009. Next tests to be conducted in June 2012. No samples were above the EPA Safe Drinking Water Act Action Level (AL).								
Turbidity								
Parameter	MCL			Units	Annual Average	Maximum Detected	In Compliance	Source
Turbidity	Treatment Technique (TT) - at least 95% of all samples taken each month must be 0.30 NTU or less; 1 NTU maximum.			NTU	0.05	0.18 NTU	Yes	Sediments from erosion, Resuspended sediments stirred up from the bottom of waterways, urban runoff
All filter results below 0.30 NTU								
TTHM (Total Trihalomethanes)								
Parameter	Units	MCLG	MCL	Highest	Range	Average	In Compliance	Source
TTHM	ppb	N/A	80	148	13 - 148	48	Yes *	By-product of drinking water disinfection.
* Compliance is based on a 4 quarter running average.								
HAA5 (Haloacetic Acids Group 5)								
Parameter	Units	MCLG	MCL	Highest	Range	Average	In Compliance	Source
HAA5	ppb	N/A	60	63	10 - 63	37	Yes *	By-product of drinking water disinfection.
* HAA5 compliance is based on a 4 quarter running average.								
TOC (Total Organic Carbons)								
Parameter	Units	MCLG	MCL	Removal Ratio	In Compliance			Source
TOC	N/A	Treatment Technique	Average Removal Ratio > 1.0	Average for Year - 1.64	Yes			Naturally present in the environment
Treatment Technique: TOC removal ratio must be above one (1.0).								
Inorganics								
Parameter	Units	MCLG	MCL	Average	Range	In Compliance		Source
Nitrate (NO₃)	ppm	N/A	10	0.05	N/A	Yes		Septic tanks, fertilizer runoff, natural deposits
Fluoride	ppm	4	4	1.3	0.30 - 1.6	Yes		Added for healthy teeth.
Chlorine (Cl ₂)								
Parameter	Units	MRDLG	MRDL	Average	Range	Highest	In Compliance	Source
Chlorine (Cl₂)	ppm	4	4	1.84	0.20 - 3.6	3.60	Yes	Samples taken from distribution system. Added to drinking water as a disinfectant.
Of 180 distribution system samples, there were no samples that tested above 4.0								
Radiological								
Parameter	Units	MCLG	MCL	Results	Range	In Compliance		Source
Gross Beta	pCi/L	0	50*	1.9	one test	Yes		Erosion of natural deposits.
Radium (²²⁶Ra)	pCi/L	0	5	0.5	one test	Yes		Erosion of natural deposits.
* EPA considers 50 pCi/L to be the level of concern. These results are from 2003. Because results were so low the next tests will be performed in 2013.								
NONREGULATED CONTAMINANTS								
Parameter	Units	MCLG	MCL	Average	Range	In Compliance		Source
Chloroform (CHCl₃)	ppb	N/A	no limit	37.50	10 - 85	Yes		By-Product of water chlorination.
Bromodichloromethane	ppb	N/A	no limit	6.3	3.5 - 10	Yes		By-Product of water chlorination.
Sulfate (SO₄)	mg/L	N/A	250	24.2	one test	Yes		Decay of organic material
WATER QUALITY (Key to Abbreviations)								
[ND]	Non-Detects			Laboratory analysis indicates that the constituent is below the detection level.				
[ppm]	Parts per million			One part per million corresponds to one minute in two years, or a penny in \$10,000.				
[ppb]	Parts per billion			One part per billion corresponds to one minute in 2000 years, or a penny in \$10,000,000.				
[mg/L]	Milligrams per liter			Milligrams per liter is the same as parts per million.				
[µ/L]	Micrograms per liter			Micrograms per liter is the same as parts per billion.				
[pCi/L]	Picocuries per liter			Picocuries per liter is a measure of the radioactivity in the water.				
[NTU]	Nephelometric Turbidity Unit			Nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just visibly cloudy.				
[AL]	Action Level			Concentration of a contaminant which, if exceeded, triggers treatment or other requirements a water system must follow.				
[TT]	Treatment Techniques			A treatment technique is a required process intended to reduce level of contaminant in drinking water				
[MCL]	Maximum Contaminant Level			The "Maximum Allowed" is the highest level of contaminant allowed in drinking water. MCL's are set as close to MCLG's as feasible using the best available treatment technology.				
[MCLG]	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. MCLG's allow for a margin of safety.				
[MRDL]	Maximum Residual Disinfection Level			The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.				
[MRDLG]	Maximum Residual Disinfection Level Goal			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.				

Marine Corps Base Quantico, Va.

2010 Annual Drinking Water Quality Report

Camp Upshur Water System (System ID # 6153063)



Introduction

Marine Corps Base Quantico G-5, Installation and Environment Division, is pleased to present the Base's *Camp Upshur* Annual Water Quality Report for 2010. 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 Water Quality Assurance Technician, to respond to customer concerns and water quality questions. Together, they have the resources to test the chemical and bacteriological quality at the consumer's tap.

The water sources for the Camp Upshur distribution system (PSWID No. 6153063) are two deep wells.

Summary

The Camp Upshur water system is routinely monitored for constituents in the drinking water according to Federal and State laws. This report shows the results of our monitoring for the period **January 1 through December 31, 2010**.

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.



photo: USMC

Marine Major General William P. Upshur, recipient of the nation's highest military decoration, the Medal of Honor during the Haitian Campaign in 1915. Born on October 28, 1881 in Richmond, Virginia., he died in plane crash near Sitka, Alaska, on August 18, 1943. Upshur is buried at the United States Naval Academy, Annapolis, Maryland.

In order to ensure that tap water is safe to drink, the UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (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 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 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

2010 MCB Quantico Annual Drinking Water Quality Report

variety of contaminants not found in the water delivered to consumers. An explanation of the results is included.

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. The USEPA generally sets MCLs 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.



Microbiological 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.

Systems

We have three (3) different sources of water at Marine Corps Base Quantico.

We encourage our customers to report bad tasting or discolored water. At that time we will visit the site and determine if we need to run additional tests.

If you have any questions about this report or concerning your water utility, please contact Ms. Patricia Greek, Public Works Branch, at (703) 432-2466.

Should Some People Take Special Precautions?

Some people may be more vulnerable to contaminants in drinking water than the general population.

We believe it is important for you to know that cryptosporidium may cause serious illness in immune system 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.

USEPA / Center for Disease Control and Prevention (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 be accumulated 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.

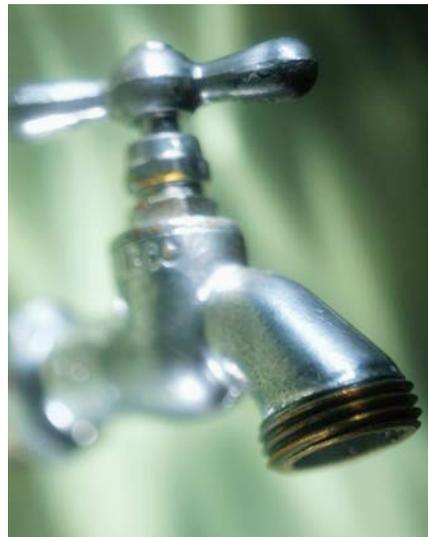
Lead and Copper

The lead levels found in samples taken at Upshur are well below regulatory limits.

The USEPA drinking water hot line can answer your questions about lead contamination. More information about contaminants and potential health effects can be obtained by calling the *USEPA Safe Drinking Water Hotline at 1-800-426-4791.*



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 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 Safe Drinking Water Hotline at 1-800-426-4791 or visit <http://www.epa.gov/safe-water/lead>.*

Camp Upshur Water System

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 will benefit all of our customers.

As announced in the Base newspaper, *The Quantico Sentry*, 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. If you have questions about what you can do to help, please contact our office for further information.



Under a new program being developed by the VIRGINIA DEPARTMENT OF HEALTH (VDH), a detailed *Source Water Assessment* will be conducted within the next

few years to find ways to better protect our water sources. After the assessment is conducted, we will provide you with information about potential sources of contamination and measures to reduce or eliminate the sources of contamination.

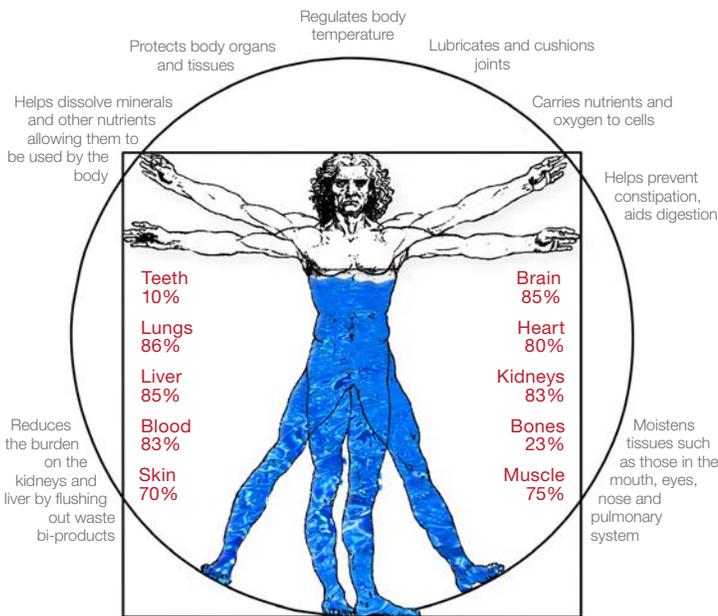
Our water sources are within the confines of the Base and are therefore protected from most outside sources of contamination.

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.

We don't often pause to consider the incredible value of a safe, reliable water supply and the water system that delivers it in our everyday lives. Consider what tap water does that no other water can do.

H₂O



THE HUMAN BODY IS 60% WATER

Only tap water delivers public health protection

In a world where an estimated 3 million people die every year from preventable waterborne disease, our water systems allow us to drink from virtually any public tap with a high assurance of safety. Each community water supply meets rigorous federal and state health-protective standards.

Fire protection

A well-maintained water system is critical in protecting our communities from the ever-present threat of fire. A system that provides reliable water at an adequate pressure can be the difference between a small fire and an urban inferno. The ability to suppress fires also influences new home construction, business location decisions and insurance rates.

Support for the economy

Businesses or housing developments do not succeed without a safe and sustainable water supply. Tap water is critical to businesses' day-to-day operations and is often a primary ingredient in the products they create. The incredible value of water is magnified during times of drought and when populations expand into arid climate.

The overall quality of life we enjoy

Any measure of a successful society — low mortality rates, economic diversity, productivity, and public safety — is in some way related to access to safe water. In North America, we take for granted that safe water is always accessible to drink, to wash our clothes, to water our lawns and for a myriad of other purposes. When water service is interrupted, we're all reminded of the extraordinary value of water resources and service.



2010 MCB Quantico Annual Drinking Water Quality Report

Camp Upshur Water System (System ID # 6153063)



BACTERIOLOGICAL QUALITY									
Microbiological Contaminants	MCLG	MCL	Percent Positive	Highest No. Positive	Monthly Samples	In Compliance	Source		
Total Coliform Bacteria	0	One Sample per Month	.05 %	0	1	Yes	Naturally present in the environment		
One sample collected in September 2010 tested positive. Six (6) repeat samples were collected/tested. All repeat samples tested negative.									
REGULATED CONTAMINANTS									
Metals									
Parameter	MCLG	Action Level (AL)	Results	Sites Exceeding AL	Range of Test Samples	In Compliance	Source		
Copper (Cu) **	0	90% of samples tested must be below 1.3 ppm	0.1 ppm	0	.052 - .225 ppm 90 th Percentile Sample .153	Yes	Corrosion of household plumbing systems		
Lead (Pb) **	0	90% of samples tested must be below 15 ppb	5 ppb	0	< 2 - 2.57 ppb 90 th Percentile Sample .248	Yes	Corrosion of household plumbing systems		
** The Lead and Copper results are from September 2008. Next tests to be conducted in 2011. No samples were above the EPA Safe Drinking Water Act Action Level (AL).									
Chlorine (Cl ₂)									
Parameter	Units	MRDLG	MRDL	Average	Sampled Range	Highest	In Compliance	Samples taken from distribution system.	Source
Chlorine (Cl₂)	ppm	4	4	1.03	0.60 - 1.60	1.60	Yes		Added to drinking water as a disinfectant.
No sample tested above 4.0									
Inorganic Contaminants									
Parameter	Units	MCLG	MCL	Average	Sampled Range	Highest	In Compliance	Source	
Arsenic (As)	ppm	None	.010	N/A	.002 (one sample)	.002	Yes	Erosion of natural deposits; Runoff from orchards, glass and electronics production waste.	
Barium (Ba)	ppm	2	2	0.31	0.24 - 0.38	0.38	Yes	Discharge of drilling waste; metal refineries and erosion of natural deposits.	
Nitrate-Nitrite (NO₃ - NO₂)	ppm	10	10	0.59	0.33 - 0.85	0.85	Yes	Leaching from septic tanks, fertilizer runoff and erosion of natural deposits.	
There are many sources of inorganic contamination. Some of it is man-made and some of it occurs naturally.									
NONREGULATED CONTAMINANTS									
Parameter	Units	MCLG	MCL	Average	Sampled Range	Highest	In Compliance	Source	
Chloride	ppm	None	250	11.2	9.0 - 13.4	13.4	Yes	Naturally present in the environment	
Sodium (Na)	ppm	None	None	23.9	23.4 - 24.3	24.3	Yes	Naturally present in the environment	
Zinc (Zn)	ppm	None	5 *	.03	.026 - .034	.034	Yes	Naturally present in the environment	
* Secondary Maximum Contaminant Level [SMCL] Reserved for non-life threatening substances. Testing is on a voluntary basis.									
WATER QUALITY (Key to Abbreviations)									
[ND]	Non-Detects	Laboratory analysis indicates that the constituent is below the detection level.							
[ppm]	Parts per million	One part per million corresponds to one minute in two years, or a penny in \$10,000.							
[ppb]	Parts per billion	One part per billion corresponds to one minute in 2000 years, or a penny in \$10,000,000.							
[mg/L]	Milligrams per liter	Milligrams per liter is the same as parts per million.							
[µ/L]	Micrograms per liter	Micrograms per liter is the same as parts per billion.							
[pCi/L]	Picocuries per liter	Picocuries per liter is a measure of the radioactivity in the water.							
[NTU]	Nephelometric Turbidity Unit	Nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just visibly cloudy.							
[AL]	Action Level	Concentration of a contaminant which, if exceeded, triggers treatment or other requirements a water system must follow.							
[TT]	Treatment Techniques	A treatment technique is a required process intended to reduce level of contaminant in drinking water							
[MCL]	Maximum Contaminant Level	The "Maximum Allowed" is the highest level of contaminant allowed in drinking water. MCL's are set as close to MCLG's as feasible using the best available treatment technology.							
[MCLG]	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. MCLG's allow for a margin of safety.							
[MRDL]	Maximum Residual Disinfection Level	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.							
[MRDLG]	Maximum Residual Disinfection Level Goal	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.							