Is Guam's Drinking Water Safe to Drink?

Yes, today, Guam's drinking water is definitely safe to drink! Guam's water system is tested continuously to ensure the safety of our drinking water. The routine microbiological tests we perform on the distribution system look for the presence of indicator organisms called coliform bacteria. If these indicator organisms are detected, there is a potential that other pathogenic (disease causing) organisms may also be present. Our system is well protected against microbial contamination and the water we drink contains a small amount of chlorine in it to maintain an extended disinfectant capability. Guam Environmental Protection Agency (GEPA) and United States Environmental Protection Agency (USEPA) supply us with guidelines or Maximum Contaminant Levels (MCLs) for these bacteria. The MCL for coliform bacteria is none detected in 95% of the samples tested per month. Our water system performs very well with respect to this standard.

In 2015, GWA conducted more than 2000 tests for over 100 contaminants that may be in our drinking water. The results show that the water provided by GWA meets the MCLs established for the regulated contaminants, as required by the Guam Primary and Secondary Safe Drinking Water Regulations and the Federal Safe Drinking Water Act (see 2015 Water Quality Data included in this report). On the rare occasions where contaminants have been tested at levels approaching or exceeding the standards in individual samples, either the source has been taken off line, treatment has been installed to meet the standard, or the levels have fluctuated and the system has met the standard on the annual average result, as required by the regulations. For more information about our drinking water, please call the GWA Laboratory Services Division at (671) 632-9697 or (671) 637-2895.

What is the Source of Our Drinking Water?

The main source of Guam's drinking water is groundwater pumped from an underground aquifer, by over 121 wells, into the water distribution system. Surface sources used by GWA include an intake from the Ugum River plus water purchased from the US Navy Water System (Fena). Spring water from Santa Rita is used to supplement the water supply from Fena for the villages of Asan, Piti, Anigua, Agat, Santa Rita and some areas in Barrigada and Mongmong-Toto-Maite.

It has long been recognized that our water sources need protection, and GWA is determined to protect our very high quality water against contamination, not only from percolation and runoff of surface pollution, but also salt-water intrusion due to over-pumping of the aquifer. We are working with the GEPA and the Water and Environmental Research Institute, University of Guam (WERI) to determine the vulnerability of our water sources to contamination and to improve our pro-active management of the aquifer. Copies of the Guam Water Data Management System reports are available at GEPA and at WERI and on their web sites.

Why are there Monitored Contaminants in the Water?

Drinking water, including bottled water, may reasonably be expected to contain at least trace amounts of some monitored compounds of natural origin. The presence of these components in drinking water does not necessarily indicate that the drinking water poses a health risk. GWA closely coordinates with USEPA & GEPA on changes to the list of monitored compounds. More information about monitored compounds/ contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline at 1-800-426-4791 or GEPA's Safe Drinking Water Program at (671) 300-4796.

In compliance with the Guam Primary and Secondary Safe Drinking Water Regulations (GPSSDWR), our drinking water is monitored for all the regulated and unregulated contaminants as it leaves our potable water sources. The contaminants measured include

- Microbial contaminants, such as viruses and bacteria, which may be native to the tropical soils, may come from sewage spills, septic systems, agricultural livestock operations or wildlife
- Inorganic contaminants, such as salts and metals, which can be naturally occurring, result from storm water runoff, commercial wastewater discharges, or farming.
- · Pesticide and herbicide contaminants, which may come from a variety of sources such as agriculture, urban storm water runoff, and home uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- Radioactive contaminants, which can be naturally occurring or be the result of improper disposal of radioactive waste.

This report shows only the contaminants that have been detected. If you would like a complete listing of GWA test results, or if you have any questions regarding this report, please call Francis Lizama, at our Laboratory Services Division at (671) 632-9697 or (671) 637-2895 during normal business hours.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 people, and infants can be particularly at risk from infections. These people should seek advice about drinking water, from their health care providers. EPA/Center for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.

Is our Water System Meeting other Rules that Govern our Operations?

Disinfection By-Products Regulations: Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBP's). EPA sets standards for controlling the levels of disinfectants and DBP's in drinking water including trihalomethanes (THM's) and haloacetic acids (HAA5's). We are pleased to report that as of November 2014, all of GWA's Distribution Systems are in compliance with the DBP regulations.

Other Information

Stipulated Order for Preliminary Relief and the 2011 Court Order

In December 2002, a civil suit was filed against GWA and the Government of Guam by the United States Department of Justice (DOJ) seeking to address Public Health compliance issues in GWA's wastewater and drinking water systems. In June 2003, Federal DOJ, USEPA, GWA and the Government of Guam negotiated the terms of the Stipulated Order for Preliminary Relief; Civil Case No. 02-00035 (SO). With it GWA, under EPA oversight, undertook a broad initiative to improve its facilities and to provide safe, reliable service to the island while meeting all regulations. The compliance issues to be addressed under the SO included drinking water focused construction and rehabilitation projects, and training of GWA personnel. There were reporting requirements and notice provisions incorporated in the SO that were more stringent than normal regulatory reporting. A full scale Water Resources Master Plan was also produced.

USEPA was satisfied with GWA's progress with the SO mandates and USEPA & Guam EPA concur that GWA's drinking water now meets or exceeds all of the SDWA and GPSSDWR requirements.

On October 10, 2011, the SO was replaced by a District Court Order (CO) which recognizes GWA's progress in providing reliable and safe drinking water and which is focused more on environmental issues and the need to work through the projects identified in the Water Resources Master Plan, GWA is working closely with both USEPA and Guam EPA in order to achieve or exceed the goals of the CO.

A copy of the "Water Resources Master Plan" and the "Order for Preliminary Relief RE: Deadlines for Projects Under the Amended Stipulated Order, Civil Case No. 02-00035" are posted on the GWA web site at:<http://guamwaterworks.org/compliance-and-safety/>. If you need more information on the CO, please call Paul Kemp, GWA Assistant General Manager - Compliance and Safety at (671) 300-6885.

Q: Does GWA conduct free tap water tests when a complaint or request is made?

GWA conducts tests at a consumer's tap only when specific water complaints, such as taste, discoloration, odor, or presence of particulate matter, are received from the customer. If customers are curious about what's in their water, they should contact a private laboratory to have a sample analyzed. These laboratories are listed in the telephone directories under Laboratories-Analytical.

Q: Do customers need to purchase water filter units for their homes? Does GWA offer consumer guides to home filtration systems?

The water supply served to Guam's residents is safe to drink and use, and does not require treatment by a home filtration unit. We do not offer any information or consumer guides on filtration systems. Customers should conduct their own research about water filter products when making a decision on whether to purchase such a system or device. In incidents of water quality complaints, GWA will not test water that has been altered by the installation of a filtration system. The customer may need to contact a private laboratory to have a sample analyzed, or check with the product representative or manufacturer for assistance.

Q: Does GWA treat water?

Yes, GWA treats water in accordance with all federal and state drinking water regulations. Currently, GWA treats drinking water with chlorine and in certain areas of Guam the water is treated with granular activated carbon (GAC). GWA's Surface Water Treatment Plant on the Ugum river uses a continuous micro-filtration membrane process prior to disinfection. Fena lake surface water purchased by GWA is also filtered.

Q: Is all of our drinking water on Guam chlorinated?

Yes, almost all of the water pumped into GWA water distribution system is chlorinated. Because our distribution system is interconnected, waters from chlorinated sources will mix with unchlorinated supplies to provide satisfactory protection before it is delivered to any customers. Small amounts of chlorine in the water are found everywhere on Guam. Concentrations can range from 0.7 - 1.6 milligrams per liter (ppm) of chlorine throughout the water system. Since excessive amounts of chlorine can affect the taste and odor of drinking water, GWA adds only what is needed to keep disease-causing bacteria from contaminating our water supply. If you experience a strong chlorine smell or taste in your water, contact GWA Monitoring Laboratory at (671) 632-9697.

Q: Is fluoride added to the drinking water here on Guam? GWA does not add fluoride to our water supply. However, Federal regulations require that all military installations add both fluoride and chlorine to their water supplies regardless of water quality and water in the Agat-Santa Rita area and parts of the GWA Central system which have purchased water blended from various sources may have small amounts of fluoride in the water.

Frequently Asked **Ouestions**



Permit No. 88 UƏ ,ebegime8 UIAY 90stage **DTS TASA9**

ANNUAL

GUAM WATERWORKS AUTHORITY IS GUAM'S WATERS SAFE TO DRINK? HUNGGAN! YES GUAM'S WATER IS SAFE TO DRINK

Postal Customer

****ECBM28EDDW

P.O. Box 3010, Hagåtña, Guam 96932

YTIAOHTUA SAROWABTAW MAUĐ

PRIMARY STANDARDS: MANDATORY HEALTH-RELATED STANDARDS

CONTAMINANT (units)	MCLG MCL		MCLG MCL GROUND WA) WATER	R UGUM WATER		FENA WATER		Major Sources of Conteminant	
	WOLU	WICL	Range	RV	Range	RV	Range	RV	major Sources of Contaminant		
<i>Regulated VOCs</i> Trichloroethylene (TCE) (ppb)	0	5	0 - 0.77	0.73	nd	nd	nd	nd	Discharge from metal degreasing sites		
Regulated SOCs Chlordane (ppb) Endrin (ppb)	0 0	2 2	nd - 1.4 nd - 0.03	1.4 0.03	nd nd	nd nd	nd nd	nd nd	Banned termiticide residue Banned insecticide residue		
Regulated IOCs Antimony (ppb) ¹ Arsenic (ppb) ¹ Barium (ppb) ¹ Chromium (ppb) ¹ Fluoride (ppm) ¹ Nitrate-N (ppm) Selenium (ppb) ¹	6 0 2000 100 4 10 50	6 2000 100 4 10 50	nd - 1.7 nd - 4.4 nd - 35 nd - 23.0 nd - 0.2 0.9 - 4.8 nd - 11	1.7 4.4 35.0 23 0.02 4.80 11.00	nd nd - 5.6 nd - 0.061 <0.2 nd	nd nd 5.6 nd 0.06 <0.2 nd	nd nd - 12.0 nd nd - 0.73 0.23 - 2.7 nd	nd nd 12.0 nd 0.73 2.1 nd	Discharge from petroleum refineries; ceramics; electronics Erosion of natural deposits Erosion of natural deposits Erosion of natural deposits Water additive; naturally occurring Runoff from fertilizer use; leaching from sewage Discharge from petroleum refs; erosion of natural deposits		
Radionuclides1 Radium 226 (pCi/L) Radium 228 (pCi/L) Gross Alpha Activity (pCi/L) Gross Beta Activity (pCi/L)	0 0 0 0	5 5 15 50*	<1 - 2.2 <1.00 <3 - 14.0 <3 - 8.7	2.2 <1.00 14.00 8.70	<1.00 <1.00 <3.00 <3.00	<1.00 <1.00 <3.00 <3.00	<1 - 1.4 <1.00 <3 - 6.0 <3 - 5.6	1.4 <1.00 6.0 5.6	Erosion of natural deposits Erosion of natural deposits Erosion of natural deposits Decay of natural and man-made deposits		

* The MCL for beta particles is 4 mrem/year. However, EPA considers 50 pCi/L to be the level of concern for beta particles.

LEAD AND COPPER RULE

			NORTHERN		CENTRAL		SOUTHERN			
CONTAMINANT (units)	MCLG	MCLG MCL	90th Percentile Level	Samples above AL	90th Percentile Level	Samples above AL	90th Percentile Level	Samples above AL	Major Sources of Contaminant	
Copper (ppb) ² Lead (ppb) ²	1300 0	AL=1300 AL=15	160 4.3	0 0	205 2.85	0 0	103.5 1.7	0 0	Corrosion of household plumbing; erosion of natural deposits	

MICROBIAL CONTAMINANTS²

			NORTHERN		CENTRAL		SOUTHERN		Maior Courses of Conteminent	
CONTAMINANT (units)	MCLG	MCL	90th Percentile Level	Samples above AL	90th Percentile Level	Samples above AL	90th Percentile Level	Samples above AL	Major Sources of Contaminant	
Total Coliform (TC) Fecal coliform (FC) or E. coli	0 0	5% See Note 1	No No	1.0% 0	No No	0.0% 0	No No	0.0% 0	Naturally present in environment Human and animal fecal waste	

Note 1: MCL = a routine sample and a repeat sample are TC positive, and one is also FC or E. coli positive

DISINFECTION BYPRODUCTS AND DISINFECTION RESIDUALS²

CONITAMINANT (unite)	MCLG	MCL	NORTHERN		CENTRAL		SOUTHERN		Major Sources of Contaminant	
	WOLU	WICL	Violation	RV	Violation	RV	Violation	RV	Major Sources of Containinant	
HAA5 (Five Haloacetic Acids) (ppb)2 Total Trihalomethanes (ppb)2	n/a n/a	60 80	No No	ND 5.8	No No	20.0 61.0	No No	16.6 40.5	By-product of drinking water chlorination By-product of drinking water chlorination	
	MRDLG	MRDL								
Chlorine (ppm)2	4	4	0.0 - 3.5	3.5	0.0 - 3.3	3.3	0.0 - 3.0	3.0	Water additive to control microbes	

TURBIDITY AS INDICATOR OF FILTRATION PERFORMANCE

CONTAMINANT (units)	MCLG	MCI	UGUM	WATER	FEN/	A WATER	Major Sources of Contaminant	
			Range	RV	Range	RV	iviajui Suurces ui Guntanninant	
Turbidity (ntu)	n/a	TT See Note 2	100.0%	No	100.00%	No	Soil runoff	

Note 2: TT = 95 % of samples measured every 4 hours < 0.3 ntu

UNREGULATED CONTAMINANTS (MONITORING REQUIRED)*

CONTAMINANT (units)	MCLG	MCI	GROUND	WATER	UGUM WATER	
	WICEG	WICE	Range	RV	Range	RV
Unregulated VOCs Bromodichloromethane (ppb) Bromoform (ppb) Chlorodibromomethane (ppb) Chloroform (ppb)	ns ns ns ns	ns ns ns ns	nd - 4 nd - 11 nd - 7.9 nd - 9.5	4 11 7.9 9.5	nd - 11 nd - 0.94 nd - 4.8 nd - 15	11 0.94 4.8 15
Unregulated SOCs Dieldrin (ppb)	ns	ns	nd - 1.5	1.5	nd	nd
Unregulated IOCs Sulfate (ppm)1	ns	250	3.2 - 64	64	nd - 13	13

** Unregulated contaminant monitoring helps EPA to determine where certain contaminants occur and whether there is a need to regulate those contaminants.

UNREGULATED CONTAMINANTS (MONITORING REQUIRED)**

CONTAMINANT (units)	MCLG MCL		GROUND WATER	UGUM WATER	FENA WATER	
	WIOLU	WICE	Range	Range	Range	
Chloride (ppm) Conductivity (µmho/cm) pH (units)	n/a n/a n/a	250 1600 6.5 - 8.5	25 - 515 379 - 2330 6.76 - 8.1	31 - 47 119 - 450 7.29 - 7.87	23 - 55 102 - 444 6.85 - 7.88	

*** Secondary MCL monitoring helps GWA to determine areas in need of adjustment, additional maintenance or rehabilitation in order to provide a high quality water that appeals to the consumer.

ADDITIONAL CONSTITUENTS ANALYZED

CONTAMINANT (units)	MCLG	MCI	GROUND WATER	UGUM WATER	FENA WATER
	WIOLU	WICE	Range	Range	Range
Alkalinity as CaCO3 (ppm) Sodium (ppm) Hardness as CaCO3 (ppm)	n/a n/a n/a	n/a n/a n/a	146 - 321 9.4 - 280 176 - 556	25 - 54 nd - 9.9 24 - 70	62 - 190 nd - 16 84 - 204



About the Data:

1. Data presented in these tables list the results of tests done between Jan 1 – Dec 31, 2015. Tables list only the contaminants detected. Detection does not necessarily mean a violation or exceedence of an MCL or Treatment Technique. GWA monitors for some constituents less than once per year because they are not expected to vary significantly from year to year. Therefore, some of the water quality data reported, although representative, may be more than one year old. If you have questions about this water quality report, please contact Paul J. Kemp, M.S., GWA's AGM for Compliance and Safety at (671) 300-6885.

2. Microbial, lead and copper, haloacetic acid (HAA5), and total trihalomethane (TTHM) samples were taken from the distribution system, not from source waters. Compliance with MCL for HAA5 and TTHM monitoring is based on ARA (annual running average) calculated quarterly. Compliance for chlorine is based on ARA calculated monthly (highest average).





FENA WATER								
Range	RV							
nd - 4.5 nd - 2.8 nd - 3.4 nd - 11	4.5 2.8 3.4 11							
nd	nd							
nd - 15	15							

Definitions & Abbreviations

- MCLG: Maximum Contaminant Level Goal, or the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- MCL: Maximum Contaminant Level, or the highest level of a contaminant allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technique.
- **MRDL:** Maximum Residual Disinfectant Level, or the level of a disinfectant that may not be exceeded at the consumer's tap without an unacceptable possibility of health effects.
- MRDLG: Maximum Residual Disinfectant Level Goal, or the maximum level of a disinfectant added to the water treatment at which no known or anticipated adverse health effect would occur. MRDLGs allow for a margin of safety.
- AL: Action Level, or the concentration of a contaminant which, when exceeded triggers treatment or other requirements that a water system must follow. Copper AL = 1300 ppb; Lead AL = 15 ppb.
- **T**: Treatment Technique or a required process intended to reduce the level of a contaminant in drinking water.
- **RV:** Reporting Value, or that value used for determining compliance with the MCL, and is the highest average value for any single source tested. For VOCs and SOCs, RV= the highest annual average. For IOCs and radionuclides, RV= the highest value detected. If the RV is below the MCL, the water is meeting the health and safety-based standards.
- **Range:** range of values actually detected in samples from all the water tested
- **VOC:** Volatile Organic Chemical
- **SOC:** Synthetic Organic Chemical
- **IOC:** Inorganic Chemical
- **ntu:** nephelometric turbidity units
- **ppm:** parts per million, or milligrams per liter
- **ppb:** parts per billion, or micrograms per liter
- **ppt:** parts per trillion, or nanograms per liter
- **pCi/L:** picocuries per liter, a measure of radioactivity
- mrem/yr: millirems per year, a measure of radioactivity
- **nd:** not detectable at testing limits

- **n/a:** not applicable
- **ns:** no standard

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