2008 Annual Water Quality Report

Is Our Drinking Water Really Safe?

Yes. GWA takes the responsibility to provide safe drinking water very seriously. Like you, our families and we also drink the same water and share the same concerns about its quality. We are pleased to report that improvements to the island's drinking water and wastewater treatment systems, along with EPA oversight of the Guam Waterworks Authority (GWA), has resulted in the **safest drinking water Guam has experienced in decades.**

Federal and Guam laws require testing our drinking water for many different types of contaminants. This report contains the results of those tests performed on samples collected over the past year. These results show our water is safe to drink. Only contaminants that have been detected are listed.

GWA's drinking water sources contain low levels of a variety of chemicals. Some are of natural origin and some are man-made. Lots of chemicals occur naturally in water and some of these can be undesirable, if found in large quantities. Levels of these naturally occurring chemicals are normally so low that they pose no health problem. It's not really the presence of the chemical that is important. What is important is how much of the chemical is present. For example, some of the heavy metals, such as lead, cadmium and mercury, occur naturally in water, but their presence is at such a low level that most of the time they are not a problem.

Treatment becomes necessary when the amount of the contaminant approaches or exceeds the "Maximum Contaminant Level" (MCL). When this situation develops, GWA has opted to take the source off line or install and operate treatment facilities to remove the contaminants.

Nature does an excellent job in providing us with abundant drinking water. However, nature needs our active participation in order to maintain its clarity and purity. Use water wisely. Dispose of wastes properly and support recycling. **Protecting our water resources begins with protecting our environment.**

Sources of Our Drinking Water

Your water is derived from several sources including ground, surface and spring water. The island's principal source of potable water comes from groundwater contained in the aquifer beneath the northern half of the island. Groundwater is pumped from this underground aquifer into the water distribution system by over 121 wells. Surface sources used by GWA include an intake from the Ugum River and water purchased from the US Navy Water System (FENA). Water supply from FENA goes to the villages of Asan, Piti, Anigua, Agat, and Santa Rita. 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 Guam Environmental Protection Agency (GEPA) and the Water and Environmental Research Institute, University of Guam (WERI) to determine the vulnerability of our water sources to contamination. Copies of the Guam Water Data Management System reports are available at GEPA and at WERI and on their web sites.

Why are there Contaminants in the Water?

Drinking water, including bottled water, may reasonably be expected to contain at least trace amounts of some contaminants of natural origin. The presence of contaminants in drinking water does not necessarily indicate that the drinking 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 GEPA's Safe Drinking Water Program at **(671) 475-1660/1**.

In compliance with the Guam Primary Safe Drinking Water Regulations (GPSDWR), 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 stormwater runoff, commercial wastewater discharges, or farming.
- **Pesticide and herbicide contaminants**, which may come from a variety of sources such as agriculture, urban stormwater 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 stormwater runoff, and septic systems.
- **Radioactive contaminants**, which can be naturally occurring or be the result of improper disposal of radioactive waste.

If you would like a complete listing of GWA test results, or if you have any questions regarding this report, please call **Carmen Sian-Denton**, at our Laboratory Services Division at **(671) 632-9697 or 637-2895** during normal business hours.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly 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 Cryptosporydium 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?

Copper Rule: Previous monitoring results, from household taps sampled islandwide in January 1992, appeared to show that the system exceeded the Lead and Copper Rule (LCR) lead action level. In January 1996, GEPA issued a Notice of Violation and Compliance Order to GWA (PWS ID GU0000001), which included the need for a Corrosion Control Study to mitigate the lead contamination problem and meet the requirements of the LCR. The corrosion control study, completed in July 1998, recommended a corrosion control treatment. However, subsequent samplings, in 1998 and 2002, for lead and copper in the distribution system have shown levels to be in compliance with the Lead and Copper Rule. Island wide sampling for lead and copper is scheduled to begin again. GWA will be working in conjunction with GEPA to determine the sampling points necessary to complete this task.

Do You Need to Take Special Precautions?
Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your faucet may be higher than at other homes in the community as a result of piping and fixtures used in your water plumbing system. If you are concerned about elevated lead levels in your home's water supply, you may wish to have your water tested by a commercial certified laboratory (e.g. WERI). You could also flush your tap for 30 seconds to 2 minutes before using your tap water. Additional information is also available by calling GEPA at **(671) 475-1660/1.**

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).

Last year's monitoring of THM's and HAA5's showed violations in the Annual Running Average for some locations in the Central Distribution System (PWS ID GU0000003) which is served by water purchased from the Navy. Corrective action is required of the water purveyor (FENA Water Treatment Plant).

Do You Need to Take Special Precautions?
Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer. Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer. Additional information is also available by calling GEPA at **(671) 475-1660/1.**

Other Information

Stipulated Order for Preliminary Relief
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 and EPA, GWA and the Government of Guam negotiated the terms of the Stipulated Order for preliminary Relief; Civil Case No. 02-0035 (SO) by which GWA, under EPA oversight, undertook a broad initiative to restore its facilities and to provide safe, reliable service to the island while meeting all regulations. The compliance issues to be addressed under the SO include the management and organizational structure of GWA, independent operations and financial administration, construction and rehabilitation projects, and training of GWA personnel. There are reporting requirements and notice provisions incorporated in the SO that are more stringent than normal regulatory reporting. For the most part, EPA has been satisfied with GWA's progress with the SO mandates. GWA is working closely with both USEPA and Guam EPA in order to achieve or exceed the goals of the SO. A Water Resources Master Plan, an interim disinfection program, an interim disinfection residual level monitoring program, a leak detection and response program, a water meter improvement program and renovations of GWA's wastewater treatment systems including new deeper ocean outfalls are only some of the projects implemented under the terms of the SO, with guidelines and schedules that carry potential penalty provisions for failure to meet deadlines. Most of these projects are now completed.

A copy of the Stipulated Order for preliminary Relief; Civil Case No. 02-0035 is posted on the GWA web site: http://www.guamwaterworks.org/. A cumulative progress report, of the work done on SO projects, is also posted on this site titled the "Quarterly Compliance Progress Report". It is updated every three months. If you need more information on the SO, please call **Paul Kemp**, GWA Assistant General Manager for Compliance and Safety at **(671) 647-2605**.

Hunggan! Yes! Our water is safe to drink.

GUAM WATERWORKS AUTHORITY
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annual water quality report

2008

2008 WATER QUALITY DATA

PRIMARY STANDARDS: Mandatory Health-Related Standards

CONTAMINANT (units)	MCLG	MCL	GROUND WATER		UGUM WATER		FENA WATER		Major Sources of Contaminant
			Range	RV	Range	RV	Range	RV	
Regulated VOCs									
Carbon Tetrachloride (ppb)	0	5	nd	nd	nd	nd	nd	nd	Discharge from industrial activities
Tetrachloroethylene (PCE) (ppb)	0	5	nd - 1.5	1.5	nd	nd	nd	nd	Leaching from PVC pipes, discharge from dry cleaners
Trichloroethylene (TCE) (ppb)	0	5	nd - 1.4	1.4	nd	nd	nd	nd	Discharge from metal degreasing sites
Regulated SOCs									
Chlordane (ppb)	0	2	nd - 3.3	1.06	nd	nd	nd	nd	Banned termiticide residue
Endrin (ppb)	0	2	nd - 0.04	0.04	nd	nd	nd	nd	Banned insecticide residue
Picloram (ppt)	0	500	nd - 0.14	nd	nd	nd	nd	nd	Herbicide runoff
Regulated IOCs									
Antimony (ppb)[1]	6	6	nd - 1.8	2	nd	nd	nd	nd	Occurs naturally
Barium (ppb)[1]	2000	2000	nd - 13	13	nd - 2.2	2.2	nd - 6.2	6.2	Occurs naturally
Chromium (ppb)[1]	100	100	nd - 17	17	nd	nd	nd	nd	Erosion of natural deposits
Fluoride (ppm)[1]	4	4	nd - 0.82	0.82	nd - 0.05	0.1	nd - 0.74	0.74	Water additive; naturally occuring which promotes strong teeth
Nitrate-N (ppm)	10	10	nd - 4.5	4.50	nd	nd	nd	nd	Runoff from fertilizer use; leaching from sewage
Radionuclides [1]									
Radium 228 (pCi/l)	0	5	<0.5 - 5.6	2.10	nd	nd	nd - 5	n/a	Erosion of natural deposits
Gross Alpha Activity (pCi/l)	0	15	nd - 7.3	n/a	nd	nd	nd - 5	n/a	Erosion of natural deposits
Gross Beta Activity (pCi/l)	0	50*	nd - 10	n/a	nd	nd	nd - 4.5	n/a	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.

Microbial Contaminants[2]

CONTAMINANT (units)	MCLG	MCL	NORTHERN		CENTRAL		SOUTHERN		Major Sources of Contaminant
			Violation	RV	Violation	RV	Violation	RV	
Total Coliform (TC) (% positive/month)	0	5 %	No	0.1%	No	0%	No	0.3%	Naturally present in environment
Fecal coliform (FC) or *E. coli*	0	See Note 1	No	0	No	0	No	0	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 Residuals[2]

CONTAMINANT (units)	MCLG	MCL	NORTHERN		CENTRAL		SOUTHERN		Major Sources of Contaminant
			Violation	RV	Violation	RV	Violation	RV	
HAA5 (Five Haloacetic Acids) (ppb)[2]	n/a	60	nd - 60	22.1	nd - 84	62.5	14 - 95	53.3	By-product of drinking water chlorination
Total Trihalomethanes (ppb)[2]	n/a	80	nd - 112	74.4	5.5 - 110	87.3	24 - 86	61	By-product of drinking water chlorination
Chlorine (ppm)[2]	MRDLG 4	MRDL 4	nd - 3.5	1.4	0.3 - 3.0	1.6	0.5 - 3.0	1.2	Water additive to control microbes

Definitions and 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.
- **TT:** Treatment Technique or a required process intended to reduce the level of a contaminant in drinking water.
- **RV:** Reporting Value, or that 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

Turbidity as Indicator of Filtration Performance

CONTAMINANT (units)	MCLG	MCL	UGUM WATER		FENA WATER		Major Sources of Contaminant
			RV	Violation	RV	Violation	
Turbidity (ntu)	n/a	TT See Note 2	99.60%	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	MCL	GROUND WATER		UGUM WATER		FENA WATER	
			Range	RV	Range	RV	Range	RV
Unregulated VOCs								
Bromodichloromethane (ppb)	ns	ns	nd -2.6	2.6	7.1 - 11	11	7.4 - 17	17
Bromoform (ppb)	ns	ns	nd - 15	15	nd - 0.5	0.5	nd	nd
Chlorodibromomethane (ppb)	ns	ns	nd - 11	11.0	0.9 - 4.3	4.3	2.3 - 2.6	2.6
Chloroform (ppb)	ns	ns	nd - 2.0	2	13 - 37	37	12 - 56	56
Unregulated SOCs								
Dieldrin (ppb)	ns	ns	nd - 0.04	0.04	nd	nd	nd	nd
Unregulated IOCs								
Sulfate (ppm)[1]	ns	250	5.5 - 81	81	nd - 29	29	nd - 26	26

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

Secondary Maximum Contaminant Levels - Consumer Acceptance Limits***

CONTAMINANT (units)	MCLG	MCL	GROUND WATER	UGUM WATER	FENA WATER
			Range	Range	Range
Chloride (ppm)	n/a	250	14 - 762	9 - 29	20 - 31
Conductivity (mmho/cm)	n/a	1600	346 - 2664	120 - 155	195 - 257
pH (units)	n/a	6.5 - 8.5	7.18 - 7.59	7.09 - 7.49	6.97 - 7.49

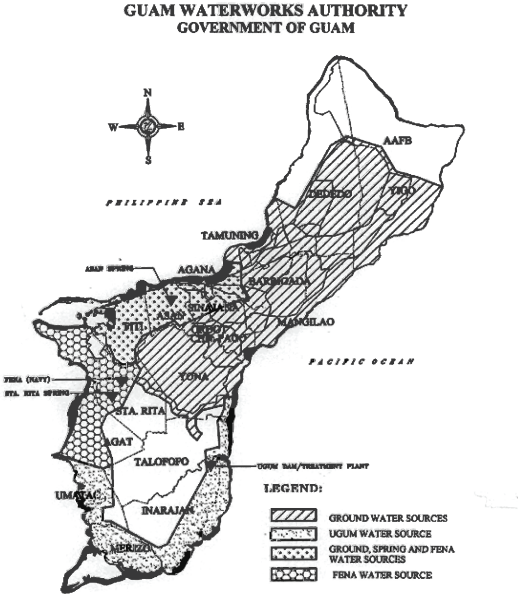
*** Secondary MCL monitoring helps GWA to determine areas in need of adjustment, additional maintenance or rehabilitation in order to provide a high quality water that appeals to the consumer.

Additional Constituents Analyzed

CONTAMINANT (units)	MCLG	MCL	GROUND WATER	UGUM WATER	FENA WATER
			Range	Range	Range
Alkalinity as $CaCO_3$ (ppm)	n/a	n/a	117 - 335	20 - 66	42 - 115
Sodium (ppm)	n/a	n/a	8.1 - 270	nd - 8.1	nd - 27
Hardness as $CaCO_3$ (ppm)	n/a	n/a	164 - 534	52 - 62	100 - 120

About the Data:

1. Data presented in these tables list the results of tests done between Jan 1 – Dec 31, 2008. 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 Carmen M. Sian-Denton, GWA's Monitoring Laboratory Services Administrator at 632-9697 or 637-2895.
2. Microbial, 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 calculated quarterly. Compliance for chlorine is based on ARA calculated monthly (highest average).



ISLAND OF GUAM WATER DISTRIBUTION