



2022 Annual Consumer Confidence Report Naval Station, Guantanamo Bay (NSGB)

WATER SOURCE AND TREATMENT

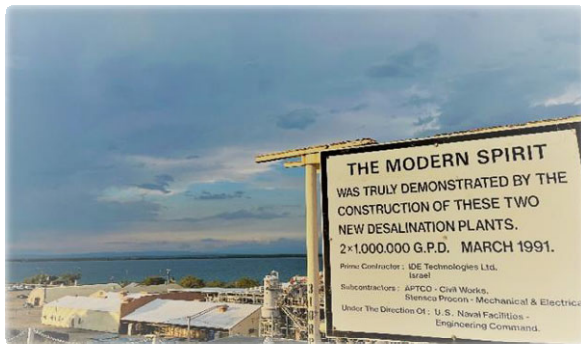
The 2022 Annual Drinking Water Quality Report is designed to inform NSGB residents about the quality of water and services delivered to residents every day. NSGB is responsible for providing a safe and dependable supply of drinking water. This report is provided to demonstrate that the water produced at NSGB is safe to drink and fit for human consumption. There were no drinking water samples which exceeded the Maximum Contaminant Levels (MCL) during calendar year 2022.

The installation's drinking water source is sea water drawn from Guantanamo Bay, approximately 220 feet out into the bay from the seawater holding tank. The surface water is turned into drinking water through the process of reverse osmosis (RO) which is the application of pressure to a concentrated solution that causes the passage of a liquid from the concentrated solution to a weaker solution across a semi-permeable membrane. The membrane allows the passage of water (solvent), but does not allow the passage of the dissolved solids (solutes), including salts. The RO plant is currently capable of producing approximately 1.5 million gallons per day. Water produced from the RO plant is transferred to water storage tanks before being processed through the water treatment plant (WTP3). WTP3 adds additional lime to make the water less corrosive and adds necessary minerals (i.e. calcium). WTP3 also adds fluoride which has been shown clinically to reduce tooth decay. At the treatment plant, water is held in large storage tanks before entering the distribution system.



NSGB Ferry Landing

MONITORING REQUIREMENTS



NSGB Desalination Plant

NSGB routinely monitors the potable water for contaminants per applicable environmental regulations – the Environmental Final Governing Standards for Cuba (FGS) and CNICINST 5090 Series. Except where indicated otherwise, this report is based on the results of monitoring for the period of January 1 to December 31, 2022. This report shows the water quality results and what they mean. In case of any questions about the quality of water at NSGB or if any additional information is needed on the Overseas Drinking Water Program, please contact Public Works Department, Environmental Division at x-5625 or x-5627.

POTENTIAL CONTAMINANTS

Typical sources of drinking water (both tap water and bottled water) include oceans, rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over land or through the ground, it dissolves naturally occurring minerals. In some cases, water can pick up radioactive material and other substances resulting from human or animal activities.

Contaminants that may be present in source water include:

1. Microbial contaminants, such as viruses and bacteria, can be naturally occurring or may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
2. Inorganic contaminants, such as salts and metals, can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
3. Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
4. 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.
5. Radioactive contaminants, which can be naturally occurring or the result of oil and gas production and mining activities.

To ensure tap water is safe to drink, the United States Environmental Protection Agency (EPA) prescribes regulations, which limit certain contaminants in water provided by public water systems. The FGS and CNICINST 5090 series regulations are modeled after the EPA's regulations and result in safe drinking water. NSGB tests drinking water for the following:

- microorganisms
- disinfection byproducts
- inorganic chemicals
- organic chemicals (synthetic organic chemicals, SOC and Volatile Organic Compounds)
- radionuclides



*Reverse Osmosis Process
in Water Operations*

No samples have exceeded the contaminants' Maximum Contaminant Level (MCL) during calendar year 2022 – the drinking water provided on NSGB is fit for human consumption.

INFORMATION ON BACTERIOLOGICAL TESTING

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. NSGB collects 10 routine coliform samples each month (120 tests/year) at designated housing and facilities throughout the installation. On December 7, 2022, one routine sample tested positive for Total Coliform. A repeat sample on the same tap, together with upstream and downstream sampling points, was conducted in response to the positive test and the results of those tests were all negative. NSGB uses Chlorine to effectively prevent bacteriological contamination throughout the water system. Chlorine level in sample collected on December 7th was sufficient to eliminate Total Coliform bacteria. To resolve the issue, corrective actions were taken by the Water Systems Manager over the next several days.

For more information on coliform testing, please visit the following EPA website:

<https://www.epa.gov/dwreginfo/revised-total-coliform-rule-and-total-coliform-rule>.

INFORMATION ON LEAD

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. When water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. Routine sampling for lead is conducted in accordance with the Lead and Copper Rule and the Lead in Priority Areas (LIPA) Program.



VULNERABLE RESIDENTS

Drinking water (including bottled water) may reasonably be expected to contain at least small amounts of contaminants. Their presence does not necessarily indicate that water poses a health risk. Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons (such as those 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. People who are immunocompromised should seek advice about drinking water from their health care providers;

EPA, the Center for Disease Control and Prevention (CDC) for guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426- 4791).

TERMS AND ABBREVIATIONS

The following definitions are provided to help better explain the terms and abbreviations in this document.

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers further treatment or other procedures that the water system must follow to lower the level.

Level 1 Assessment: A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

Level 2 Assessment: A Level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an *E. coli* MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.

MCL: Maximum Contaminant Level. The highest level of a contaminant that is allowed in drinking water (by regulation).

mg/L: milligrams per liter; equivalent to parts per million (ppm).

ug/L: micrograms per liter; equivalent to parts per billion (ppb).

ND: Not detectable. A value below the detectable limit by the lab test procedure.

U – data qualifier; compound was analyzed but not detected.

(<) - “Less than” means the contaminant was not detected, or was detected at a level below the Minimum Reporting Level.

NPDWR: National Primary Drinking Water Regulations: legally enforceable standards that apply to public water supply systems. Primary standards aim at protecting drinking water quality by setting limits on the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in public water systems.

NSDWR: National Secondary Drinking Water Regulations: non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply.

NTU: Nephelometric Turbidity Units: a measure of the clarity of water. Turbidity is measured with an instrument called a nephelometer, which measures the intensity of light scattered by suspended matter in the water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Total coliforms: a group of related bacteria that are naturally present in the environment and are not harmful to humans (with few exceptions). EPA considers total coliforms a useful indicator of other pathogens for drinking water. Total coliforms are used to determine the adequacy of water treatment and the integrity of the distribution system.

Treatment Technique: a required process intended to reduce the level of a contaminant in drinking water.

Turbidity: A measure of the cloudiness of water. We measure turbidity because it is a good indicator of the effectiveness of the water treatment system.

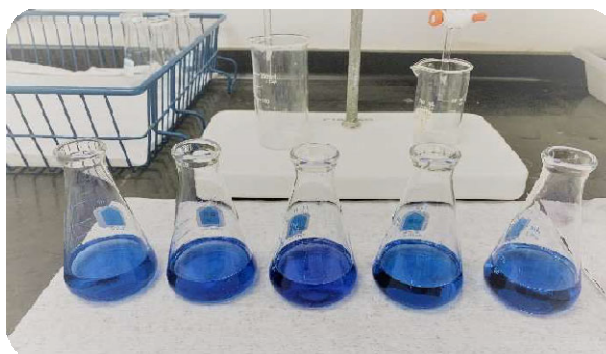


TABLE 1. NPDWR (Enforceable)

Contaminant	Sampling Site	Units	MCL or Highest Level Allowed	Level Detected (or Range of Detections)	Violations (Y/N)	Annual Average	Typical Source of Contaminant	Potential Health Effects from Long Term Exposure Above MCL
A. ORGANICS								
Volatile Organic Contaminants								
Benzene	Water Plant #3 (Bldg 815)	ug/L	5	0.27 U	No	0.27 U	Discharge from factories; Leaching from gas storage tanks and landfills	Anemia; decrease in blood platelets; increased risk of cancer
Carbon tetrachloride		ug/L	5	0.38 U	No	0.38 U	Discharge from chemical plants and other industrial activities	Liver problems; increased risk of cancer
Chlorobenzene		ug/L	100	0.32 U	No	0.32 U	Discharge from chemical and agricultural chemical factories	Liver or kidney problems
o-Dichlorobenzene		ug/L	600	0.31 U	No	0.31 U	Discharge from industrial chemical factories	Liver, kidney, or circulatory system problems
p-Dichlorobenzene		ug/L	75	0.37 U	No	0.37 U	Discharge from industrial chemical factories	Anemia; liver, kidney or spleen damage; changes in blood
1,2-Dichloroethane		ug/L	5	0.41 U	No	0.41 U	Discharge from industrial chemical factories	Increased risk of cancer
1,1-Dichloroethylene		ug/L	7	0.44 U	No	0.44 U	Discharge from industrial chemical factories	Liver problems
cis-1,2-Dichloroethylene		ug/L	70	0.40 U	No	0.40 U	Discharge from industrial chemical factories	Liver problems
trans-1,2-Dichloroethylene		ug/L	100	0.40 U	No	0.40 U	Discharge from industrial chemical factories	Liver problems
Dichloromethane		ug/L	5	0.38 U	No	0.38 U	Discharge from pharmaceutical and chemical factories	Liver problems; increased risk of cancer
1,2-Dichloropropane		ug/L	5	0.16 U	No	0.16 U	Discharge from industrial chemical factories	Increased risk of cancer
Ethylbenzene		ug/L	700	0.32 U	No	0.32 U	Discharge from petroleum refineries	Liver or kidneys problems
Styrene		ug/L	100	0.31 U	No	0.31 U	Discharge from rubber and plastic factories; Leaching from landfills	Liver, kidney, or circulatory system problems
Tetrachloroethylene		ug/L	5	0.36 U	No	0.36 U	Discharge from factories and dry cleaners	Liver problems; increased risk of cancer
1,2,4-Trichlorobenzene		ug/L	70	0.45 U	No	0.45 U	Discharge from textile-finishing factories	Changes in adrenal glands
1,1,1-Trichloroethane		ug/L	200	0.28 U	No	0.28 U	Discharge from metal degreasing sites and other factories	Liver, nervous system, or circulatory problems
1,1,2-Trichloroethane		ug/L	5	0.24 U	No	0.24 U	Discharge from industrial chemical factories	Liver, kidney, or immune system problems

Contaminant	Sampling Site	Units	MCL or Highest Level Allowed	Level Detected (or Range of Detections)	Violations (Y/N)	Annual Average	Typical Source of Contaminant	Potential Health Effects from Long Term Exposure Above MCL
Trichloroethylene	Water Plant #3 (Bldg 815)	ug/L	5	0.39 U	No	0.39 U	Discharge from metal degreasing sites and other factories	Liver problems; increased risk of cancer
Toluene		mg/L	1	0.00029 U	No	0.00029 U	Discharge from petroleum factories	Nervous system, kidney, or liver problems
Vinyl Chloride		ug/L	2	0.42 U	No	0.42 U	Leaching from PVC piping; Discharge from plastics factories	Increased risk of cancer
Xylenes		mg/L	10	0.00049 U	No	0.00049 U	Discharge from petroleum factories; Discharge from chemical factories	Nervous system damage
Total Trihalomethane (TTHM)	AV-526 LP BEQ	mg/L	0.080	0.00844 - 0.05175	No	0.0354	By-product of drinking water disinfection	Liver, kidney or central nervous system problems; increased risk of cancer
	B-2502 Seaside Galley			0.00833 – 0.01417	No	0.0108		
Haloacetic Acids (HAA5)	AV-526 LP BEQ	mg/L	0.060	0.00687 – 0.02210	No	0.0141	By-product of drinking water disinfection	Increased risk of cancer
	B-2502 Seaside Galley			0.00288 – 0.01052	No	0.0054		
Synthetic Organic Contaminants including Pesticides and Herbicides								
2,4-D	Water Plant #3 (Bldg 815)	ug/L	70	0.0950 U	No	0.0950 U	Runoff from herbicide used on row crops	Kidney, liver, or adrenal gland problems
2,4,5-TP [Silvex]		ug/L	50	0.09 U	No	0.09 U	Residue of banned herbicide	Liver problems
Alachlor		ug/L	2	0.15 U	No	0.15 U	Runoff from herbicide used on row crops	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer
Atrazine		ug/L	3	0.09 U	No	0.09 U	Runoff from herbicide used on row crops	Cardiovascular system or reproductive problems
Benzo(a)pyrene [PAH]		ug/L	0.2	0.015 U	No	0.015 U	Leaching from linings of water storage tanks and distribution lines	Reproductive difficulties; increased risk of cancer
Carbofuran		ug/L	40	0.51 U	No	0.51 U	Leaching of soil fumigant used on rice and alfalf	Problems with blood, nervous system, or reproductive system
Chlordane		ug/L	2	0.053 U	No	0.053 U	Residue of banned termiticide	Liver or nervous system problems; increased risk of cancer
Dalapon		ug/L	200	0.90 U	No	0.90 U	Runoff from herbicide used on rights of way	Minor kidney changes
Di(2-ethylhexyl) adipate		ug/L	400	0.50 U	No	0.50 U	Discharge from chemical factories	Weight loss, liver problems, or possible reproductive difficulties.
Di(2-ethylhexyl) phthalate		ug/L	6	0.50 U	No	0.50 U	Discharge from rubber and chemical factories	Reproductive difficulties; liver problems; increased risk of cancer

Contaminant	Sampling Site	Units	MCL or Highest Level Allowed	Level Detected (or Range of Detections)	Violations (Y/N)	Annual Average	Typical Source of Contaminant	Potential Health Effects from Long Term Exposure Above MCL
1,2-Dibromo-3-chloropropane	Water Plant #3 (Bldg 815)	ug/L	0.2	0.0061 U – 0.0063 U	No	0.0062 U	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards	Reproductive difficulties; increased risk of cancer
Dinoseb		ug/L	7	0.18 U	No	0.18 U	Runoff from herbicide used on soybeans and vegetables	Reproductive difficulties
Diquat		ug/L	20	0.37 U	No	0.37 U	Runoff from herbicide use	Cataracts
Dioxin [2,3,7,8-TCDD]		ug/L	0.00003	0.0000101 U - 0.0000108 U	No	0.0000104 U	Emissions from waste incineration and other combustion; Discharge from chemical factories	Reproductive difficulties; increased risk of cancer
Endothall		ug/L	100	6 U	No	6 U	Runoff from herbicide use	Stomach and intestinal problems
Endrin		ug/L	2	0.0069 U	No	0.0069 U	Residue of banned insecticide	Liver problems
Ethylene dibromide (EDB)		ug/L	0.05	0.0091 U – 0.0093 U	No	0.0092 U	Discharge from petroleum refineries	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer
Glyphosate		ug/L	700	5.90 U	No	5.90 U	Runoff from herbicide use	Kidney problems; reproductive difficulties
Heptachlor		ug/L	0.4	0.0060 U	No	0.0060 U	Residue of banned pesticide	Liver damage; increased risk of cancer
Heptachlor epoxide		ug/L	0.2	0.0052 U	No	0.0052 U	Breakdown of heptachlor	Liver damage; increased risk of cancer
Hexachlorobenzene		ug/L	1	0.0063 U	No	0.0063 U	Discharge from metal refineries and agricultural chemical factories	Liver or kidney problems; reproductive difficulties; increased risk of cancer
Hexachlorocyclopentadiene		ug/L	50	0.0190 U	No	0.0190 U	Discharge from chemical factories	Kidney or stomach problems
Lindane		ug/L	0.2	0.0071 U	No	0.0071 U	Runoff/leaching from insecticide used on cattle, lumber, gardens	Liver or kidney problems
Methoxychlor		ug/L	40	0.0068 U	No	0.0068 U	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock	Reproductive difficulties
Oxamyl [Vydate]		ug/L	200	1.80 U	No	1.80 U	Runoff/leaching from insecticide used on apples, potatoes and tomatoes	Slight nervous system effects
PCBs [Polychlorinated biphenyls]		ug/L	0.5	0.0930 U	No	0.0930 U	Runoff from landfills; Discharge of waste chemical	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer
Pentachlorophenol		ug/L	1	0.0380 U	No	0.0380 U	Discharge from wood preserving factories	Liver or kidney problems; increased cancer risk
Picloram		ug/L	500	0.09 U	No	0.09 U	Herbicide runoff	Liver problems

Contaminant	Sampling Site	Units	MCL or Highest Level Allowed	Level Detected (or Range of Detections)	Violations (Y/N)	Annual Average	Typical Source of Contaminant	Potential Health Effects from Long Term Exposure Above MCL
Simazine	Water Plant #3 (Bldg 815)	ug/L	4	0.06 U	No	0.06 U	Herbicide runoff	Problems with blood
Toxaphene		ug/L	3	0.12 U	No	0.12 U	Runoff/leaching from insecticide used on cotton and cattle	Kidney, liver, or thyroid problems; increased risk of cancer
B. INORGANICS								
Antimony	Water Plant #3 (Bldg 815)	mg/L	0.006	0.0010 U	No	0.0010 U	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	Increase in blood cholesterol; decrease in blood sugar
Arsenic		mg/L	0.01	0.000250 U	No	0.000250 U	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer
Asbestos		MFL	7	<0.20	No	<0.20	Decay of asbestos cement water mains; Erosion of natural deposits	Increased risk of developing benign intestinal polyps
Barium		mg/L	2	0.0030 U – 0.0031	No	0.0030 U	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	Increase in blood pressure
Beryllium		mg/L	0.004	0.0010 U – 0.0020 U	No	0.0010 U	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries	Intestinal lesions
Cadmium		mg/L	0.005	0.000250 U – 0.00050 U	No	0.000250 U	Corrosion of galvanized pipes. Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints	Kidney damage
Chromium		mg/L	0.1	0.0005 U	No	0.0005 U	Discharge from steel and pulp mills; Erosion of natural deposits	Allergic dermatitis
Copper	Residential units	mg/L	AL = 1.3	0.0010 U – 0.38 90 th percentile: 0.22	No	0.0470	Corrosion of household plumbing systems; Erosion of natural deposits	<u>Short term exposure:</u> Gastrointestinal distress <u>Long term exposure:</u> Liver or kidney damage
Cyanide	Water Plant #3 (Bldg 815)	mg/L	0.2	0.00040 U	No	0.0040 U	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories	Nerve damage or thyroid problems
Fluoride		mg/L	4	0.4 – 0.68	No	0.56	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and	Bone disease (pain and tenderness of the bones); Children may get mottled teeth

Contaminant	Sampling Site	Units	MCL or Highest Level Allowed	Level Detected (or Range of Detections)	Violations (Y/N)	Annual Average	Typical Source of Contaminant	Potential Health Effects from Long Term Exposure Above MCL
							aluminum factories	
Lead	Residential units	mg/L	AL = 0.015	0.0005 U – 0.00065 <i>90th percentile: 0.00052</i>	No	0.00030	Corrosion of household plumbing systems; Erosion of natural deposits	<u>Infants and children</u> : Delays in physical or mental development; children could show slight deficits in attention span and learning abilities; <u>Adults</u> : Kidney problems; high blood pressure
Mercury	Water Plant #3 (Bldg 815)	mg/L	0.002	0.000011 U – 0.000012	No	0.000011 U	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland	Kidney damage
Nitrate (as N)		mg/L	10	0.20 U – 0.40 U	No	0.20 U	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits	Infants below the age of six months who drink water containing nitrate/nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.
Nitrite (as N)		mg/L	1	0.20 U – 0.40 U	No	0.20 U	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits	
Selenium		mg/L	0.05	0.0012 U	No	0.0012 U	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines	Hair or fingernail loss; numbness in fingers or toes; circulatory problems
Thallium		mg/L	0.002	0.000250 U	No	0.000250 U	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories	Hair loss; changes in blood; kidney, intestine, or liver problems
C. MICROBIALS								
Total Coliform (TC) Bacteria	Residential Units / Water Storage Tanks	No. of Positive Samples	No more than 1 Positive Sample each Month	1 Positive Total Coliform	No	N/A	Naturally present in the environment	Not a health threat in itself; it is used to indicate whether other potentially harmful bacteria may be present
E. coli (EC)	Residential Units / Water Storage Tanks	No. of Positive Samples	Routine and repeat samples are TC+ and either is EC+ or system fails to take repeat samples	Zero	No	N/A	Human and animal fecal waste	Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems.

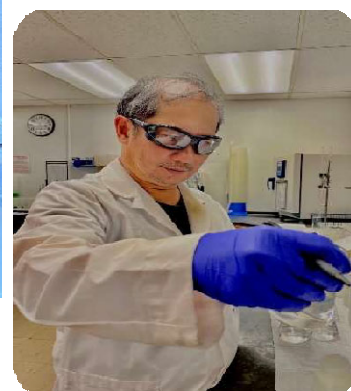
Contaminant	Sampling Site	Units	MCL or Highest Level Allowed	Level Detected (or Range of Detections)	Violations (Y/N)	Annual Average	Typical Source of Contaminant	Potential Health Effects from Long Term Exposure Above MCL
			following EC+ routine sample or system fails to analyze TC+ repeat sample for E. coli					
Turbidity	Reverse Osmosis Plant Product Water	NTU	≤0.3 NTU in at least 95% of the samples in any month; must not exceed 1 NTU	0.10 – 0.30	No	N/A	Soil runoff	Turbidity has no health effects but can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms.

TABLE 2. NSDWR (Recommended/Non-Enforceable)

Contaminant	Sampling Site	Units	MCL or Highest Level Allowed	Level Detected (or Range of Detections)	Violations (Y/N)	Typical Source of Contaminant
Sodium	Water Plant #3 (POE)	mg/L	N/A	100 – 110	N/A	breakdown of natural minerals and deposits
Chlorides		mg/L	250	150 – 230	N	breakdown of natural minerals & deposits
Iron		mg/L	0.30	0.20 U	N	water distribution pipe corrosion
Sulfate		mg/L	250	3.0 – 8.3	N	run-off from fertilizer use; erosion of natural deposits
Total Dissolved Solids		mg/L	500	288 – 346	N	breakdown of natural minerals and deposits

For additional information, you may contact:

Environmental Division
Public Works Department
Naval Station Guantanamo Bay, Cuba
757-458-5625 or 757-458-5627



DEMONSTRATION OF WATER QUALITY SAMPLING