



NAVAL SUPPORT ACTIVITY BAHRAIN (NSA I) 2015 DRINKING WATER CONSUMER CONFIDENCE REPORT



Is our water safe to drink?

NSAI Bahrain's drinking water system provides water that is safe and Fit for Human Consumption (potable), although raw water received at BANZ warehouses area and AV Unit remains Fit for Hand Washing and Showering purposes only as determined by the Installation Commanding Officer's Record of Decision dated 10-Feb-2014. Personal at BANZ warehouses area and AV Unit are authorized to use only bottle water for drinking purpose. We are proud to support the Navy's commitment to provide safe and reliable drinking water to our service members and their families. This annual Consumer Confidence Report includes general and mandatory information to educate everyone about our water source(s), treatment processes, standard requirements, and other details to help assure you that our water is safe to drink.

Our drinking water fully complies with the DOD's Final Governing Standards (FGS), which are derived from the U.S. DoD Overseas Environmental Baseline Guidance Document (OEBGD), U.S. Environmental Protection Agency (EPA) and Bahrain drinking water standards. When Bahrain and U.S. standards differ, the *most protective* requirement is adopted into the FGS. A detailed list of constituents found in our drinking water is included in this report, along with a comparison to the maximum levels considered safe for the general public by these standards.

Where does our water come from and how is it treated?

NSA Bahrain purchases treated water from the Kingdom of Bahrain Electricity & Water Authority (EWA). This water comes from the ocean and is treated at the Al Hidd Water Plant, a multi-stage flash distillation plant. Water received from the City of Manama- Hidd Plant is further treated at NSA I Bahrain facility using 3-stage Reverse Osmosis (RO) units, to render the water potable, and of high aesthetic quality. Disinfection of the water is achieved by chlorination. This potable water is stored in secured and controlled access tanks at each facility for direct distribution to various outlets throughout the NSAI water distribution network.

Why are there contaminants in drinking water?

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. NSA Bahrain drinking water source is distilled; however, distillation is not 100% effective in removing all contaminants because: 1) droplets of un-vaporized liquid can be carried with the steam prior to distillation, and 2) some contaminants have boiling points similar to water and will be vaporized and condensed with the distilled water. In order to ensure that tap water is safe to drink, regulations limit the amount of certain contaminants in water provided by public water systems.

Consequently, some contaminants may be present in drinking water, such as:

- **Microbial contaminants**, such as viruses and bacteria, that may come from wildlife, sewage treatment plants, septic systems, and livestock;
- **Disinfection by-products**, such as chlorine and chloramine used to remove pathogens from the water;

- **Pesticides and herbicides**, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses;
- **Inorganic contaminants**, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, or farming;
- **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; and
- **Radioactive contaminants**, which can be naturally occurring or be the result of oil and gas production and mining activities.

The presence of contaminants does not necessarily indicate that water poses a health risk. In order to ensure that tap water is safe to drink, regulations limit the amount of certain contaminants in water provided by public water systems. Regular sampling is conducted to detect the level of contaminants in the water system. If the results are above regulatory limits, you will be notified by Email and Public Notification. You can learn more about contaminants and any potential health effects by visiting the EPA's Drinking Water Standards web site:

<http://permanent.access.gpo.gov/lps21800/www.epa.gov/safewater/standards.html>

Source water assessment

In September 2013 the Naval Facilities Engineering Command (NAVFAC) conducted a comprehensive sanitary survey of the NSA Bahrain drinking water system, the Sanitary Survey report was finalized in March 2014 the next sanitary survey will be conducted on Apr 2016. This survey provided an evaluation of the adequacy of the drinking water source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water. NAVFAC is continually improving the drinking water system based on the recommendations in the report.

Some people must use special precautions

There are people who 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, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the EPA's Safe Drinking Water webpage: www.epa.gov/safewater/sdwa.

Additional Information For Arsenic

Some people who drink water containing arsenic well in excess of the MCL for many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer. Arsenic enters drinking water supplies from natural deposits in the earth or from agricultural and industrial practices. Information on arsenic in drinking water and steps you can take to minimize exposure is available from the USEPA Safe Drinking Water website:

<http://water.epa.gov/drink/contaminants/basicinformation/arsenic.cfm>

Additional Information For Bromate

If present, elevated levels of bromate can cause serious health problems. Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer. Information on bromate in drinking water and the steps you can take to minimize exposure is available from the USEPA Safe Drinking Water website: www.epa.gov/safewater/sdwa

Additional Information For Iron

Iron is regulated as a secondary contaminant by USEPA, because it may cause discolored water or aesthetic effects in drinking water, such as unpleasant odor or taste. Exceeding a secondary standard may cause people to stop using the water even though the water is actually safe to drink. Secondary standards are set to provide public water systems guidance on removing these chemicals to levels that are below what most people will find noticeable. Activities taken to reduce the iron concentration in NSA I drinking water include flushing the distribution system to remove settled particulates. Information on iron in drinking water and the steps you can take to minimize exposure is available from the USEPA Safe Drinking Water website: www.epa.gov/safewater/sdwa

Additional Information For 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. NAVFAC EURAFSWA NSA Bahrain Public Works is responsible for providing high-quality drinking water and has direct control over the materials used in plumbing components on the facility. This ensures that no lead service lines or components are used on the drinking water system. As a general safety practice, whenever - and wherever - you plan to use tap water for drinking or cooking, you can minimize the potential for lead exposure by flushing the tap for 30 seconds to 2 minutes prior to use. Information on lead in drinking water and steps you can take to minimize exposure is available from the USEPA Safe Drinking Water website: www.epa.gov/safewater/lead

Additional Information For Nitrite

Infants below six months who drink water containing nitrite in excess of the maximum contaminant level (MCL) could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. The major sources of nitrite in drinking water are runoff from fertilizer use; leaching from septic tanks, sewage; and erosion of natural deposits. Information on nitrite in drinking water and steps you can take to minimize exposure is available from the USEPA Safe Drinking Water website: <http://water.epa.gov/drink/contaminants/basicinformation/nitrite.cfm>

Water Quality Data Table –NSA I

The table below lists all of the drinking water contaminants and relevant sampling data collected during the 2015 calendar year (unless otherwise noted). The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. All contaminants detected in NSA I Bahrain's drinking water are below the Maximum Contaminant Levels (MCLs) allowed by FGS, DoD, and EPA applicable requirements.

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Your Water	Units	Sample Date	Violation	Typical Source
Inorganic Components							
Sodium	N/A	N/A	14	mg/l	31-Oct-2015	NO	Erosion of natural deposits; Leaching
Boron	N/A	N/A	0.02	mg/l	28-Jan-2015	NO	Erosion of natural deposits; Leaching
Silica	N/A	N/A	0.26	mg/l	28-Jan-2015	NO	Erosion of natural deposits; Leaching
Calcium	N/A	N/A	1.3	mg/l	29-Apr-2015	NO	Erosion of natural deposits; Leaching
Magnesium	N/A	N/A	0.06	mg/l	31-Oct-2015	NO	Erosion of natural deposits; Leaching
Sulfate	250	N/A	1.3	mg/l	31-Oct-2015	NO	Runoff/leaching from natural deposits
Potassium	N/A	N/A	0.18	mg/l	29-Apr-2015	NO	Erosion of natural deposits; Leaching
Arsenic	N/A	0.01	N/D	mg/l	31-Oct-2015	NO	It occurs in soil and minerals and it may enter air, water and land through wind-blown dust and water run-off
Bromate	N/A	0.01	N/D	mg/l	31-Oct-2015	NO	Erosion of natural deposits; Leaching
Iron	N/A	0.3	0.03	mg/l	28-Jan-2015	NO	Occurs naturally in the soil, sediments and ground water and some rocks
Copper	N/A	1.3	N/D	mg/l	31-Oct-2015	NO	Corrosion of household plumbing systems; erosion of natural deposits
Lead	N/A	0.015	N/D	mg/l	31-Oct-2015	NO	Corrosion of household plumbing systems; erosion of natural deposits
Nitrite	N/A	1.0	0.01	mg/l	31-Oct-2015	NO	Runoff/leaching from natural deposits
Total Trihalomethanes	N/A	0.08	0.02	mg/l	29-Apr-2015	NO	Byproduct of drinking water disinfection
Chloroform	N/A	N/A	0.02	mg/l	29-Apr-2015	NO	Byproduct of drinking water disinfection
Note: All other Inorganic Compounds, Organic Compounds, Pesticides, PCBs, Radionuclides and Total Coliforms were not detected							

N/D= Not Detected, i.e below PQL

PQL= Practical Quantitation Limit of the best method

Unit Descriptions	
Term	Definition
ppm	ppm: parts per million, or milligrams per liter (mg/L)
ppb	ppb: parts per billion, or micrograms per liter (µg/L)
pCi/L	pCi/L: picocuries per liter (a measure of radioactivity)
NA	NA: not applicable
ND	ND: Not detected
NR	NR: Monitoring not required, but recommended.

INFORMATION ON ADDITIONAL FACILITIES MANAGED BY NSA:

AV UNIT:

The Aviation Unit, also formally referred to as “Air Logistics Department,” is located next to the Bahrain International Airport. The unit includes active duty military, military reservists, DOD civilians, and local national civilians. The source water from the City water distribution system is stored at the site in two above ground cylindrical storage tanks of 5,000 and 6,000 Gal capacities. The AV Unit facilities receive the non-potable water from these tanks via the onsite distribution system.

Currently NSA Bahrain AV Unit has no treatment facility. The analytical results of water supplied by the City are listed below:

Location	Compliance Status
AV UNIT	Remains Fit for hand washing and showering purpose only

Water Quality Data Table – AV Unit

The table below lists all of the water contaminants and relevant sampling data collected during the 2015 calendar year (unless otherwise noted). The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. All contaminants detected in AV Unit Tank water are below the Maximum Contaminant Levels (MCLs) allowed by FGS, DoD, and EPA applicable requirements.

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Your Water	Units	Sample Date	Violation	Typical Source
Inorganic Components							
Sodium	N/A	N/A	65	mg/l	30-Aug -2015	NO	Erosion of natural deposits; Leaching
Boron	N/A	N/A	0.33	mg/l	30-Aug -2015	NO	Erosion of natural deposits; Leaching
Silica	N/A	N/A	0.68	mg/l	30-Aug -2015	NO	Erosion of natural deposits; Leaching
Calcium	N/A	N/A	44	mg/l	30-Aug -2015	NO	Erosion of natural deposits; Leaching

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Your Water	Units	Sample Date	Violation	Typical Source
Inorganic Components							
Magnesium	N/A	N/A	6.8	mg/l	30-Aug -2015	NO	Erosion of natural deposits; Leaching
Sulfate	250	N/A	23	mg/l	30-Aug -2015	NO	Runoff/leaching from natural deposits
Potassium	N/A	N/A	2.4	mg/l	30-Aug- 2015	NO	Erosion of natural deposits; Leaching
Arsenic	N/A	0.01	N/D	mg/l	30-Aug- 2015	NO	It occurs in soil and minerals and it may enter air, water and land through wind-blown dust and water run-off
Bromate	N/A	0.01	N/D	mg/l	14-Dec -2015	NO	Erosion of natural deposits; Leaching
Iron	N/A	0.3	0.08	mg/l	25-Feb 2015	NO	Occurs naturally in the soil, sediments and ground water and some rocks
Copper	N/A	1.3	0.05	mg/l	14-Dec -2015	NO	Corrosion of household plumbing systems; erosion of natural deposits
Lead	N/A	0.015	N/D	mg/l	14-Dec- 2015	NO	Corrosion of household plumbing systems; erosion of natural deposits
Nitrite	N/A	1.0	N/D	mg/l	14-Dec 2015	NO	Runoff/leaching from natural deposits
Total Trihalomethanes	N/A	0.08	0.009	mg/l	25-Feb-2015	NO	Byproduct of drinking water disinfection
Bromoform	N/A	0.08	0.009	mg/l	25-Feb-2015	NO	Byproduct of drinking water disinfection
Note: All other Inorganic Compounds, Organic Compounds, Pesticides, PCBs, Radionuclides, and Total Coliforms were not detected.							

N/D= Not Detected, i.e below PQL

PQL= Practical Quantitation Limit of the best method

Unit Descriptions	
Term	Definition
ppm	ppm: parts per million, or milligrams per liter (mg/L)
ppb	ppb: parts per billion, or micrograms per liter (µg/L)
pCi/L	pCi/L: picocuries per liter (a measure of radioactivity)
NA	NA: not applicable
ND	ND: Not detected
NR	NR: Monitoring not required, but recommended.

Reason for Non Potability of AV Unit Water and Mitigation Measures:

The AV unit water distribution system is owned by the facility lessor and is currently used for hand washing and showering purpose only. The reasons for the system being not fully fit for Human Consumption as per Final Governing Standards (FGS), March 2012 guidelines can be outlined as:

1. The source of water at the AV Unit is the Host Nation municipal water system. Despite presumption that the water in the Host Nation system has been treated and is potable, the water is by military doctrine considered non-potable until approved for use. The Host Nation water may be contaminated after it has been treated through broken water lines or cross-connections in the storage and distribution systems that are not readily visible.
2. The Raw water storage tanks in the AV unit do not have a Navy standard maintenance program. Lack of a cross connection and back flow prevention program for the distribution system.

As a risk mitigation measure, personnel at the AV unit are advised to purchase bottled water from local water bottling companies that have been certified by the US Army Veterinarian to meet US guidelines.

BANZ WAREHOUSES

The BANZ warehouse is the Navy leased facility owned and operated by BANZ Group B.S.C. It is located just southwest of NSA I. The BANZ warehouse facility receives water from the City directly supplied through two connections. There is no additional water treatment at the BANZ area. The water system consists of separate domestic, fire, and irrigation water distribution systems. NSA Bahrain PWD maintains the fire systems. The source water is pumped from the City water distribution system to the above ground storage tanks of approximately 139,000 gallons capacities located near warehouses # 8 and 12.

Currently NSA Bahrain BANZ Area has no treatment facility. The compliance of water at this facility is listed below:

Location	Compliance status
BANZ Area	Remains Fit for hand washing and showering purpose only

Water Quality Data Table – BANZ Area

The table below lists all of the water contaminants and relevant sampling data collected during the 2015 calendar year (unless otherwise noted). The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. All contaminants detected in BANZ Area Tank water are below the Maximum Contaminant Levels (MCLs) allowed by FGS, DoD, and EPA applicable requirements.

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Your Water	Units	Sample Date	Violation	Typical Source
Inorganic Components							
Sodium	N/A	N/A	41	mg/l	1-Dec- 2015	NO	Erosion of natural deposits; Leaching
Boron	N/A	N/A	0.009	mg/l	1-Dec -2015	NO	Erosion of natural deposits; Leaching
Silica	N/A	N/A	0.39	mg/l	30-Aug - 2015	NO	Erosion of natural deposits; Leaching
Calcium	N/A	N/A	40	mg/l	1-Dec -2015	NO	Erosion of natural deposits; Leaching
Magnesium	N/A	N/A	3.8	mg/l	1-Dec -2015	NO	Erosion of natural deposits; Leaching
Sulfate	250	N/A	8.2	mg/l	1-Dec- 2015	NO	Runoff/leaching from natural deposits
Potassium	N/A	N/A	7	mg/l	30-Aug - 2015	NO	Erosion of natural deposits; Leaching
Arsenic	N/A	0.01	N/D	mg/l	1-Dec- 2015	NO	It occurs in soil and minerals and it may enter air, water and land through wind-blown dust and water run-off
Bromate	N/A	0.01	N/D	mg/l	1-Dec- 2015	NO	Erosion of natural deposits; Leaching
Iron	N/A	0.3	0.07	mg/l	25-Feb- 2015	NO	Occurs naturally in the soil, sediments and ground water and some rocks
Copper	N/A	1.3	0.03	mg/l	1-Dec- 2015	NO	Corrosion of household plumbing systems; erosion of natural deposits
Lead	N/A	0.015	N/D	mg/l	1-Dec- 2015	NO	Corrosion of household plumbing systems; erosion of natural deposits

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Your Water	Units	Sample Date	Violation	Typical Source
Inorganic Components							
Nitrite	N/A	1.0	N/D	mg/l	1-Dec -2015	NO	Runoff/leaching from natural deposits
Total Trihalomethanes	N/A	0.08	0.009	mg/l	31-May-2015	NO	Byproduct of drinking water disinfection
Bromoform	N/A	0.08	0.009	mg/l	31-May-2015	NO	Byproduct of drinking water disinfection
Note: All other Inorganic Compounds, Organic Compounds, Pesticides, PCBs, Radionuclides, and Total Coliforms were not detected.							

N/D= Not Detected, i.e below PQL

PQL= Practical Quantitation Limit of the best method

Unit Descriptions	
Term	Definition
ppm	ppm: parts per million, or milligrams per liter (mg/L)
ppb	ppb: parts per billion, or micrograms per liter (µg/L)
pCi/L	pCi/L: picocuries per liter (a measure of radioactivity)
NA	NA: not applicable
ND	ND: Not detected
NR	NR: Monitoring not required, but recommended.

Reason for Non Potability of BANZ Area Water and Mitigation Measures:

The source of water at the BANZ Area is the Host Nation municipal water system. Despite presumption that the water in the Host Nation system has been treated, the water is considered Not Fit For Human Consumption by military doctrine. The Host Nation water may be contaminated after it has been treated through broken water lines or cross-connections in the storage and distribution systems that are not readily visible. Since the City source water is not further treated at the BANZ Area, it is classified as not fit for human consumption and remains fit for hand washing and showering purpose only.

As a risk mitigation measure, personnel at the BANZ area are advised to purchase bottled water from local water bottling companies that have been certified by the US Army Veterinarian to meet US guidelines.

Important Drinking Water Definitions	
Term	Definition
MCLG	MCLG: Maximum Contaminant Level Goal: 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	MCL: Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
TT	TT: Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.
AL	AL: Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements.
Variances and Exemptions	Variances and Exemptions: EPA permission not to meet an MCL or a treatment technique under certain conditions.
MRDLG	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 to control microbial contaminants.
MRDL	MRDL: Maximum residual disinfectant level. The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MNR	MNR: Monitored Not Regulated
MPL	MPL: State Assigned Maximum Permissible Level

Violation(s) or Exceedance(s)/Missed Sampling Events:

There were no violations, exceedances, or missed sampling events during the year 2015 for any test parameters for NSA I, AV Unit and BANZ Area.

Points of Contact

If you have any questions regarding this report or about the drinking water processes, please contact:

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