NAVAL SUPPORT ACTIVITY BAHRAIN (NSA II, NSA III, BANZ) 2023 DRINKING WATER CONSUMER CONFIDENCE REPORT

Is our water safe to drink?

Yes. Naval Support Activity NSA II, NSA III, BANZ Bahrain's drinking water system provides water that is safe and fit for Human Consumption (FFHC, or potable), as determined by the Installation Commanding Officer's Record of Decision and as routinely confirmed by laboratory sampling results (received monthly, quarterly, and semi-annually). 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, 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 Department of Defense's (DoD) Bahrain 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 II Bahrain purchases treated water from the Kingdom of Bahrain Electricity & Water Authority (EWA). This city 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 Al Hidd Plant is further treated by using Reverse Osmosis (RO) and approved process chemicals prior to purification. Disinfection of the water is achieved by chlorination. Potable water is stored in secured and controlled access tanks at each facility for direct distribution to various outlets throughout NSA II water distribution network. NSA II water is trucked to BANZ above ground water tank (AST) since Apr 2022 and to NSA III aboveground water tank (AST) since May 2022.

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 II 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.
- **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 March 2022, Naval Facilities Engineering Systems Command (NAVFAC) together with the Navy and Marine Corps Force Health Protection Command (NMCFHPC) conducted a comprehensive sanitary survey of the NSA Bahrain drinking water system. This survey, conducted every three years, provides an evaluation of the adequacy of the drinking water source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water. NAVFAC's Public Works Department (PWD) Bahrain 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 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. PWD Bahrain is responsible for providing high-quality drinking water and has direct control over the materials used in plumbing components on the installation. 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 EPA Safe Drinking Water website: www.epa.gov/safewater/lead

Table 1 below shows the summary of results of lead samples taken in 2023.

Table 1

Contaminant	EPA's Action Level	Ideal Goal (EPA's MCLG)	Location	90% of Test Levels were Less Than	# of Tests With Levels Above EPA Action Level	Violation	Typical Source
Lead	15ppb	0ppb	NSA II	N/D	0 of 40	NO	Corrosion of household plumbing
			NSA III	N/D	0 of 20	NO	Corrosion of household plumbing
			BANZ	N/D	0 of 20	NO	Corrosion of household plumbing
Copper	1.3ppm	1.3ppm	NSA II	0.017ppm	0 of 40	NO	Corrosion of household plumbing
			NSA III	0.029ppm	0 of 20	NO	Corrosion of household plumbing
			BANZ	N/D	0 of 20	NO	Corrosion of household plumbing

Water Quality Data Table –NSA II

Table 2 below lists the drinking water contaminants and relevant sampling data collected during the 2023 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 II drinking water are below the MCLs allowed by FGS, DoD, and EPA applicable requirements.

Table 2

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Your Water	Units	Sample Date	Violation	Typical Source
Inorganic Components							
Sodium	N/A	N/A	6.5	mg/L	23-JUL -2023	NO	Erosion of natural deposits; Leaching
Zinc	N/A	5	0.13	mg/L	23-JAN-2023	NO	Erosion of natural deposits; Leaching

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Your Water	Units	Sample Date	Violation	Typical Source
Inorganic Components							
Silica	N/A	N/A	ND	mg/L	25-APR-2023	NO	Erosion of natural deposits; Leaching
Calcium	N/A	N/A	2.4	mg/L	25-OCT -2023	NO	Erosion of natural deposits; Leaching
Chlorides	N/A	N/A	2.6	mg/L	25-APR -2023	NO	Erosion of natural deposits; Leaching
Sulfate	250	N/A	N/D	mg/L	23-JUL -2023	NO	Runoff/leaching from natural deposits
Copper	N/A	1.3	N/D	mg/L	23-JUL -2023	NO	Erosion of natural deposits; Leaching
Nitrates	N/A	10	N/D	mg/L	25-OCT -2023	NO	Byproduct of drinking water disinfection
Total Nitrite and Nitrate	N/A	10	N/D	mg/L	25-OCT -2023	NO	Byproduct of drinking water disinfection
Note: All other Inorganic Compounds, Organic Compounds, Pesticides, PCBs, Total Trihalomethanes and Radionuclides, Lead, Copper and Total Coliforms were not detected							

Table 3

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Level Detected (Average)	Range of Detections	Violation	Typical Source
Disinfectant Residual and Disinfectant By-Products						
Chlorine (ppm)	4.0	4.0	1.06	1.0-1.11	NO	Drinking water disinfectant added for treatment
Total Trihalomethanes (TTHM; ppb)	N/A	80	25	6-50	NO	By-products of drinking water disinfectant
Haloacetic Acids (HAA; ppb)	N/A	60	35.5	20-45	NO	By-products of drinking water disinfectant

Unit Descriptions	
Term	**Definition**
mg/L	ppm: parts per million, or milligrams per liter (mg/L)
N/A	not applicable
N/D	Not detected N/D= Not Detected, i.e. below PQL

	PQL= Practical Quantitation Limit of the best method
ppb	Parts per billion
ppt	Parts per trillion

INFORMATION ON ADDITIONAL FACILITIES MANAGED BY NSA:

NSA III (AV UNIT):

The NSA III (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. A project to haul water FFHC from NSA II treatment plant and stored in several new Aboveground Storage Tanks (AST) throughout the AV Unit was completed in May 2022. FFHC water was transported by a 17,000-liter (4,500-gallon) truck to the AV Unit and transferred into the following tanks, each accompanied by a new pump station:

- 20,000-liter (5,000-gallon) FRP AST serving Buildings 460, 466R, and 471R
- 20,000-liter (5,000-gallon) FRP AST serving Buildings 480 and 461R
- 20,000-liter (5,000-gallon) FRP AST serving the ablution units located near the main gate
- 12,000-liter (3,000-gallon) FRP AST serving Building 479
- 12,000-liter (3,000-gallon) FRP AST serving Building 475R
- 1,000-liter (250-gallon) AST serving the eyewash station near Building 483
- 3,000-liter (800-gallon) AST serving Buildings 469 and 472R

Water Quality Data Table – NSA III (AV Unit)

Table 4 below lists the drinking water contaminants and relevant sampling data collected during the 2023 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 III AV Unit drinking water are below the MCLs allowed by FGS, DoD, and EPA applicable requirements.

Table 4

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Your Water	Units	Sample Date	Violation	Typical Source
Inorganic Components							
Sodium	N/A	N/A	6.6	mg/L	25-APR-2023	NO	Erosion of natural deposits; Leaching
Chlorides	N/A	N/A	3.3	mg/L	25-JUL-2023	NO	Erosion of natural deposits; Leaching
Silica	N/A	N/A	N/D	mg/L	25-APR-2023	NO	Erosion of natural deposits; Leaching
Calcium	N/A	N/A	1.2	mg/L	25-JUL-2023	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	N/D	mg/L	26-OCT-2023	NO	Erosion of natural deposits; Leaching
Sulfate	250	N/A	0.35	mg/L	24-JAN-2023	NO	Runoff/leaching from natural deposits
Potassium	N/A	N/A	0.27	mg/L	25-JUL-2023	NO	Erosion of natural deposits; Leaching
Iron	N/A	0.3	N/D	mg/L	25-JUL-2023	NO	Occurs naturally in the soil, sediments and ground water and some rocks
Copper	1.3	1.3	N/D	mg/L	26-OCT-2023	NO	Corrosion of household plumbing systems; erosion of natural deposits
Nitrates	N/A	10.0	N/D	mg/L	24-JAN-2023	NO	Runoff/leaching from natural deposits
Total Nitrite and Nitrates	N/A	10.0	N/D	mg/L	24-JAN-2023	NO	Byproduct of drinking water disinfection
Note: All other Inorganic Compounds, Organic Compounds, Pesticides, PCBs, Radionuclides, and Total Coliforms were not detected.							

Table 5

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Level Detected (Average)	Range of Detections	Violation	Typical Source
Disinfectant Residual and Disinfectant By-Products						
Chlorine (ppm)	4.0	4.0	0.97	0.72-1.1	NO	Drinking water disinfectant added for treatment
Total Trihalomethanes (TTHM; ppb)	N/A	80	13	8.0-20.0	NO	By-products of drinking water disinfectant
Haloacetic Acids (HAA; ppb)	N/A	60	6.8	3.0-6.0	NO	By-products of drinking water disinfectant

Unit Descriptions	
Term	**Definition**
mg/L	ppm: parts per million, or milligrams per liter (mg/L)
N/A	not applicable
N/D	Not detected N/D= Not Detected, i.e. below PQL

	PQL= Practical Quantitation Limit of the best method
ppb	Parts per billion
ppt	Parts per trillion

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. A project to haul FFHC water from the NSA II water treatment to the BANZ Warehouse area was completed in Apr 2022. FFHC water was transported by a 17,000-liter (4,500-gallon) truck to the BANZ Ware-house area and transferred into the following tanks, each accompanied by a new pump station:

- Ten (10) small (1000-liter (250-gallon] or less) FRP ASTs serving Building 420
- 2,000-liter (500-gallon) FRP AST serving ablution units located on the north-east side of Building 420
- 2,000-liter (500-gallon) FRP AST serving Building 421
- Two 2,000-liter (500-gallon) FRP ASTs serving Building 422
- 2,000-liter (500-gallon) FRP AST serving Warehouse 3
- Two 2,000-liter (500-gallon) FRP ASTs serving Warehouse 4
- 2,000-liter (500-gallon) FRP AST serving Warehouse 5
- One 10,000-liter (2,500-gallon) FRP AST and one 2,000-liter (500-gallon) FRP AST serving Warehouse 6
- 2,000-liter (500-gallon) FRP AST serving Warehouse 7
- 2,000-liter (500-gallon) FRP AST serving Warehouse 8
- One 12,000-liter (3,000-gallon) FRP AST and three 2,000-liter (500-gallon) FRP ASTs serving Warehouse 12

Water Quality Data Table – BANZ Area

Table 6 below lists the water contaminants and relevant sampling data collected during the 2023 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 drinking water are below the MCLs allowed by FGS, DoD, and EPA applicable requirements.

Table 6

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Your Water	Units	Sample Date	Violation	Typical Source
Inorganic Components							
Sodium	N/A	N/A	6.6	mg/L	23-JUL-2023	NO	Erosion of natural deposits; Leaching
Chlorides	N/A	N/A	3.2	mg/L	23-JUL-2023	NO	Erosion of natural deposits; Leaching

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Your Water	Units	Sample Date	Violation	Typical Source
Inorganic Components							
Silica	N/A	N/A	N/D	mg/L	26-OCT-2023	NO	Erosion of natural deposits; Leaching
Calcium	N/A	N/A	3.0	mg/L	23-JUL-2023	NO	Erosion of natural deposits; Leaching
Magnesium	N/A	N/A	N/D	mg/L	26-OCT-2023	NO	Erosion of natural deposits; Leaching
Sulfate	250	N/A	N/D	mg/L	24-JAN-2023	NO	Runoff/leaching from natural deposits
Potassium	N/A	N/A	N/D	mg/L	26-OCT -2023	NO	Erosion of natural deposits; Leaching
Iron	N/A	0.3	N/D	mg/L	26-OCT-2023	NO	Occurs naturally in the soil, sediments and ground water and some rocks
Copper	1.3	1.3	N/D	mg/L	24-JAN-2023	NO	Corrosion of household plumbing systems; erosion of natural deposits
Nitrates	N/A	10	N/D	mg/L	24-JAN-2023	NO	Runoff/leaching from natural deposits
Total Nitrite and Nitrate	N/A	10	N/D	mg/L	24-JAN-2023	NO	Byproduct of drinking water disinfection
Note: All other Inorganic Compounds, Organic Compounds, Pesticides, PCBs, Radionuclides, and Total Coliforms were not detected.							

Table 7

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Level Detected (Average)	Range of Detections	Violation	Typical Source
Disinfectant Residual and Disinfectant By-Products						
Chlorine (ppm)	4.0	4.0	0.92	0.73-1.03	NO	Drinking water disinfectant added for treatment
Total Trihalomethanes (TTHM; ppb)	N/A	80	11	10-12	NO	By-products of drinking water disinfectant
Haloacetic Acids (HAA; ppb)	N/A	60	6	4.8-8.0	NO	By-products of drinking water disinfectant

Unit Descriptions

Term	Definition
mg/L	ppm: parts per million, or milligrams per liter (mg/L)
N/A	not applicable
N/D	Not detected N/D= Not Detected, i.e. below PQL PQL= Practical Quantitation Limit of the best method
ppb	Parts per billion
ppt	Parts per trillion

Important Drinking Water Definitions	
Term	**Definition**
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	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	Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.
Variances and Exemptions	Variances and Exemptions. EPA permission not to meet an MCL or a treatment technique under certain conditions.
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	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.

Violation(s) or Exceedance(s)/MISSED SAMPLING EVENTS:

There were no violations, exceedances, or missed sampling events noted during the year 2023 for any test parameters for NSA II, NSA III, BANZ. This section also provides the Tier 3 notification requirements in accordance with Navy policy and USEPA procedures. Tier 3 notifications do not have an impact on human health but are required to be reported. When water systems violate a drinking water standard that does not have a direct impact on human health (in this case failing to take a required sample on time) the water supplier has up to a year to provide a notice of this situation to its customers. For NSA II, NSA III, BANZ, there were no missed sampling events or any test exceedances during year 2023.

What are per- and polyfluoroalkyl substances and where do they come from?

Per- and polyfluoroalkyl substances (PFAS) are a group of thousands of man-made chemicals. PFAS have been used in a variety of industries and consumer products around the globe, including in the U.S., since the 1940s. PFAS have been used to make coatings and products that are used as oil and water repellents for carpets, clothing, paper packaging for food, and cookware. They are also contained in some foams (aqueous film-forming foam or AFFF) currently used for fighting petroleum fires at airfields and in industrial fire suppression processes. PFAS chemicals are persistent in the environment and some are persistent in the human body – meaning they do not break down and they can accumulate over time.

Is there a regulation for PFAS in drinking water?

On April 10, 2024, the US EPA established MCLs for a subset of PFAS chemicals.

Compound	Final MCLG	Final MCL
PFOA	Zero	4.0 ppt
PFOS	Zero	4.0 ppt
PFHxS	10 ppt	10 ppt
PFNA	10 ppt	10 ppt
HFPO-DA (commonly known as GenX Chemicals)	10 ppt	10 ppt
Mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS	1 (unitless) Hazard Index	1 (unitless) Hazard Index

EPA requires implementation of sampling in accordance with the new MCLs within three years of the publication date and implementation of any required treatment within five years.

These limits did not apply for the 2023 calendar year because they had not been published. However, the DoD proactively promulgated policies to monitor drinking water for PFAS at all service owned and operated water systems at a minimum of every two years. The DoD policy states that if water sampling results confirm that drinking water contains PFOA and PFOS at individual or combined concentrations greater than the 2016 EPA health advisory (HA) level of 70 ppt, water systems must take immediate action to reduce exposure to PFOS or PFAS. For levels less than 70 ppt but above the 4 ppt level (draft at the time of policy publication), DoD committed to planning for implementation of the levels once EPA's published MCLs take effect.

Has NSA II Bahrain tested its water for PFAS In 2023?

Yes. In AUG 2023, samples were collected from NSA II.

We are pleased to report that drinking water testing results were below the Method Reporting Limit (MRL) for all 29 PFAS compounds covered by the sampling method, including Perfluorooctanoic acid (PFOA) and Perfluorooctanoic sulfonic acid (PFOS). This means that PFAS were not detected in your water system. In accordance with DoD policy, the water system will be resampled every two years for your continued protection.

Points of Contact

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

Sean Suk

Installation Environmental Program Director
Coordinator, Installation Water Quality Board
Phone: +973-17-85-4603
Email: seung.h.suk.civ@us.navy.mil