2020 Annual Consumer Confidence Report
Commander, Fleet Activities Chinhae (CFAC)

This report meets Commander, Navy Installations Command Policy Letter 5200, Ser N4/13U84441, 15 Oct 13.
This report reflects monitoring data collected in 2020 is updated annually by July 1st.
이 보고서는 귀하의 식수에 대한 중요한 내용이 실려 있습니다. 그러므로 이 보고서를 이해할 수 있는 사람에게 번역해 달라고 부탁하시기 바랍니다.

Your Water is Fit for Human Consumption!

Commander, Fleet Activities Chinhae (CFAC) is pleased to provide this annual Consumer Confidence Report (CCR) for the CFAC Drinking Water System.

This report is designed to inform you about the quality of water and services we deliver to you every day. Our goal is to provide to you a safe and dependable supply of drinking water. This report is based on the results of our monitoring for the period of January 1 to December 31, 2020. If you have any questions about the quality of water at CFAC or would like more information on the Overseas Drinking Water Program, please contact the Public Works Department, Environmental Division at 763-8814.

Source of Water

Our drinking water comes from groundwater that lies deep under the earth's surface and consists mostly of rain and melting snow that has filtered through hundreds of feet of soil. This water fills spaces between rocks and soils and creates an aquifer. Aquifers are underground bodies of water that can be located in underground soils or can occur in fractured bedrock deep underground. CFAC draws this water from four (4) groundwater wells located within the Installation.

Water Treatment & Distribution System

The Public Works Department (PWD) Chinhae operates the water treatment and distribution system servicing this Installation. A 95,000-gallon underground concrete raw water storage tank receives water from the groundwater wells. Pumps transfer the raw groundwater from the raw water tank into the water treatment plant (WTP). The groundwater is treated by four multimedia filters arranged in a series-parallel configuration. Following filtration to remove sediments, the raw groundwater is disinfected by an on-site chlorine treatment that kills potentially harmful bacteria and viruses. The water is then treated by an air stripping tower that removes dissolved carbon dioxide and reduces corrosivity. The treated water is held in large storage tanks before entering the distribution system to the customers tap.

Overseas Drinking Water Program

U.S. Navy overseas installations are required to meet or exceed the National Primary Drinking Water regulations promulgated under the Safe Drinking Water Act of 1974, adopted in Commander, Navy Installations Command (CNIC) Manual 5090 Series, and are the same standards used in the U.S. to ensure safe drinking water. CFAC is also required to meet all criteria established in the Korean Environmental Governing Standards (KEGS) to ensure Department of Defense (DoD) activities and installations in Korea protect human health and the natural environment through the promulgation of specific environmental compliance criteria.

The Installation Commanding Officer has established an Installation Water Quality Board (IWQB) tasked with ensuring there is a reliable supply of drinking water for all persons using CFAC facilities. IWQB is currently taking steps to meet all requirements of the Navy's Overseas Drinking Water (ODW) program. And the Regional Water Quality Board (RWQB) granted CFAC a Conditional Certificate To Operate (CTO) for its water system. CFAC is expected to receive a Full CTO when all significant deficiencies identified from the 2019 Sanitary Survey are corrected. All deficiencies have either been corrected or are in the process of implementing corrective actions.

Source Water Assessment

In Jun 2019, the Navy Water Quality Oversight Council (WQOC) conducted a comprehensive sanitary survey of the CFAC drinking water system. Sanitary surveys are performed every three years and evaluate eight elements of an ODW system for the adequacy of the drinking water source, treatment, distribution system, finished water storage, facilities, monitoring & reporting, operation & maintenance and operator for producing and distributing safe drinking water. CFAC is continually improving the drinking water system based on the recommendations contained in the 2019 sanitary survey report.

Educational Information

Potential Contaminants

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include bacteria, organic and inorganic chemicals, and radionuclides.

Drinking water, including bottled water, may reasonably be expected to contain at least trace amounts of some contaminants. The presence of contaminants does not necessarily indicate that the 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 persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, persons with HIV/AIDS or other immune disorders, some elderly, and infants can be particularity at risk from infections. These people should seek advice about drinking water from their health care providers. EPA and the Center 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 Hotline at 1-800-426-4791.

Other Potential Contaminants

Coliforms in Drinking Water

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other potentially harmful bacteria may be present in drinking water. It is a warning of potential problems if coliforms are found in more water samples than allowed. Information on total coliforms in drinking water is available at https://www.epa.gov/dwreginfo/revised-total-coliform-rule-and-total-coliform-rule

Lead

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. Our tap water did not exceed the lead drinking water health standards required by the KEGS. To take extra precaution in avoiding possible lead contamination, when water has been sitting for several hours, you can further minimize the potential for lead exposure by flushing the tap for 30 seconds to two minutes before using water for drinking or cooking.

Information on lead in drinking water is available at http://www.epa.gov/safewater/lead

Lead in Priority Areas

For the safety and wellness of youth at Child Development Center / Youth Center, all drinking water outlet was tested every five years or whenever outlets are added or replaced. In 2019, five year recurring sampling was conducted and drinking water samples were collected from water outlets at all Child Development Center / Youth Center. Sampling confirmed all outlets were below the EPA recommended new screening level of 15 ppb for lead.

Nitrate/Nitrite

Nitrates are naturally present in soil, water, and food. Nitrates themselves are relatively nontoxic. However, when swallowed, they are converted to nitrites that can react with hemoglobin in the blood creating methemoglobin. This methemoglobin cannot transport oxygen thus causing conditions of shortness of breath and blue baby syndrome. Our tap water did not exceed the Nitrate/Nitrite drinking water health standards required by the KEGS. Information on Nitrate in drinking water is available at http://water.epa.gov/drink/contaminants/basicinformation/nitrate.cfm

Per- and Polyfluoroalkyl Substances (PFAS)

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 United States, 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) used for fighting petroleum fires at airfields and in industrial fire suppression processes because they rapidly extinguish fires, saving lives and protecting property. 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. Information on PFAS in drinking water is available at https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos

Total Trihalomethanes (TTHM) and Halo acetic Acids (HAA5)

TTHM and HAA5 are groups of chemicals formed when the naturally-occurring organic materials in raw water reacts with the chlorine which is added as disinfectant. The source of organic materials in raw water is though decaying vegetation. Potential health effects from

exposure to THM and HAA5 depend on a variety of factors, including concentration of the chemicals, and duration and frequency of exposure. Some people who drink water containing TTHMs in excess of the MCL over many years may experience liver, kidney or central nervous system problems and increased risk of cancer. Information on the byproducts is available at https://www.epa.gov/your-drinking-water/table-regulated-drinking-water-contaminants#Byproducts

Frequently Asked Questions

What should I do, if I'm concerned about presence of the COVID-19 virus in drinking water?
CFAC PWD treatments system include filtration and disinfectants such as chlorine that remove or kill bacteria, virus and pathogens before they reach the tap.

Why does the water sometimes look rusty?
Rusty or reddish tinted water may occur because of a sudden change in pressure which can cause rust in distribution piping to become dislodged. Iron causes the discoloration (rust is a secondary drinking water standard having mostly cosmetic or aesthetic effects) and it is not a health risk. If water looks rusty, flush the tap for three minutes or until clear before using water. Running the water will clear the piping system. If hot tap water is rusty, the water heater may need to be flushed.

I don't like the taste/smell/appearance of my tap water. What's wrong with it?
Even when water meets standards, you may still object to its taste, smell, or appearance. Taste, smell and appearance are also known as aesthetic characteristics and do not pose health risks. Common complaints about water aesthetics include: temporary cloudiness (typically caused by air bubbles) or chlorine taste (which can be improved by letting the water stand exposed to the air). If you want to improve the taste, smell and appearance of water, you can install a home water filter. Please keep in mind that filters require regular maintenance and replacement; if ignored, water taste, smell, or appearance issues may reoccur.

Is it okay to drink from a garden hose?

The water coming out of the tap and into the hose is safe but a garden hose is treated with special chemicals that make it flexible. Those chemicals are not good for you and neither are the bacteria that may be growing inside the hose.
An ordinary garden hose submerged in a bucket of water or swimming pool can result in backflow contamination. To protect our water supply, a simple screw-on vacuum breaker (photo) must always be attached to the faucet when a garden hose is used.

Is there a regulation for PFAS in drinking water?
There is currently no established federal water quality regulation for any PFAS compounds. In May 2016, the EPA established a health advisory (HA) level at 70 ppt for individual or combined concentrations of perfluoro octanoic acid (PFOA) and perfluoro-octane sulfonic acid (PFOS). Both chemicals are types of PFAS.
Out of an abundance of caution for your safety, the Department of Defense's (DoD) PFAS testing and response actions go beyond EPA Safe Drinking Water Act requirements. In 2020 the DoD promulgated a policy to obtain drinking water results for PFAS at all purchased water systems.
The EPA's health advisory states that if water sampling results confirm that drinking water contains PFOA and PFOS at individual or combined concentrations greater than 70 ppt, water systems should quickly undertake additional sampling to assess the level, scope, and localized source of contamination to inform next steps.

Has CFAC tested its water for PFAS?
Yes. In December 2020, samples were collected from Water Treatment Plant (WTP), B802. We are informing you that 6 of the 18 PFAS compounds covered by the sampling method were detected above the method reporting limit (MRL). PFOA and PFOS were below the EPA HA level. The results are provided in the table on page 5. As PFOA and PFOS were below the EPA HA, there is no immediate cause for concern.

Water Quality Monitoring

CFAC uses Navy Operator Certification Authority (NOCA) approved laboratory methods to analyze our drinking water and monitors drinking water for the following constituents.

Group	Potential Contaminants	Frequency of Sampling
Micro-organisms	Total Coliform	Monthly
Disinfectants	Residual Chlorine	Hourly, Daily, Monthly
Disinfection Byproducts	TTHM, HAA5	Annually
Inorganic Chemical	Metals, Nitrate/Nitrite Lead & Copper	Every 3 years, Annually Biannually
Organic Chemical	Synthetic (Volatile and Pesticides)	Quarterly
Radionuclides	Alpha Particles, Radium, Uranium	Every 4 years

2020 Water Quality Data

In 2020, PWD Chinhae tested CFAC's drinking water for many possible contaminants. The following table lists the categories with which a particular contaminant is associated. The below results show that CFAC's drinking water complies with all the pertinent standards and as such is:

Fit for Human Consumption

REGULATORY CRITERIA – KEGS & CNIC M 5090.1				LABORATORY RESULTS		
Contaminant	Typical Sources	Unit	MCL, AL, TT or MRDL	Results		Violation
				Low	High	
MICROBIOLOGICAL						
Total Coliform	Naturally present in the environment	NA	No more than one positive sample per month	Negative	Negative	**No**
DISINFECTANT RESIDUAL AND DISINFECTANT/DISINFECTION BYPRODUCTS						
Residual Chlorine	Water additive used to control microbes	mg/L	MRDL = 4.0	0.32	0.64	**No**
Halo Acetic Acids (HAA5)	Byproduct of drinking water disinfection	mg/L	Annual average 0.06	ND	ND	**No**
Total Trihalomethanes (TTHM)		mg/L	Annual average 0.08	0.0040	0.0040	**No**
INORGANIC CHEMICALS						
Nitrate (as N)	Runoff from fertilizer use; Leaking from septic tanks; Sewage; Erosion of natural deposits	mg/L	10	2.3	2.3	**No**
Nitrite (as N)		mg/L	1	ND	ND	**No**
Lead	Corrosion of household plumbing systems; erosion of natural deposits.	mg/L	0.015 based on 90th percentile results exceeding AL	ND	0.0025	**No**
Copper		mg/L	1.3 based on 90th percentile results exceeding AL	0.032	0.170	**No**
SYNTHETIC ORGANIC CHEMICALS (SOCs)						
Semi Volatile Organics & Pesticides /PCB	Run off from landfills; Discharge of waste chemicals; Runoff from herbicide used on crops and soil fumigants	mg/L	$3x10^{-8}$ to 0.7	ND	ND	**No**
Volatile Organics	Discharge from industrial and agricultural chemical factories	mg/L	0.002 to 10	ND	ND	**No**

Contaminant	Typical Sources	Unit	Health Advisory Level	Results	Action
				DoD	
Per-and Polyfluoroalkyl Substances (PFAS)					
PFOA	Food packaging, stain resistant, nonstick products, water repellents, waxes, paints, cleaning products, firefighting foams	ng/L	70 for PFOA, PFOS or PFOS + PFOA	6.8	**No Action needed**
PFOS				4.0	
PFBS			NA	2.3	
PFHxS			NA	8.9	
PFHpA			NA	7.0	
PFHxA			NA	9.7	
PFDA			NA	ND	
PFNA			NA	ND	
PFDoA			NA	ND	
PFTeDA			NA	ND	
PFTrDA			NA	ND	
PFUdA			NA	ND	
9Cl-PF3ONS			NA	ND	
11CL-PF3ONS			NA	ND	
GenX			NA	ND	
ADONA			NA	ND	
EtFOSAA			NA	ND	
MeFOSAA			NA	ND	

Terms and Abbreviations

You may find unfamiliar terms and abbreviations in the tables below and throughout the document. To help you better understand these terms we've provided the following definitions:

Data Table Key: Unit Descriptions

mg/L	mg/L: number of milligrams of substance in one liter of water
ppb	ppb: parts per billion, or micrograms per liter
ppt	ppt: parts per trillion, or nanograms per liter
NA	NA: not applicable
ND	ND: not detected

Important Drinking Water Definitions

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 MCLG 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.
AL	Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water systems must follow.
MRDL	Maximum Residual Disinfectant Level: The highest level of a disinfectant allowed in drinking water (4 mg/L of chlorine). There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Full name of PFAS (Per-and Polyfluoroalkyl Substances)

PFOA	Perfluoro-n-octanoic acid	PFTeDA	Perfluoro-n-tetradecanoic acid
PFOS	Perfluorooctane sulfonic acid	PFTrDA	Perfluoro-n-tridecanoic acid
PFBS	Perfluoro-1-butane sulfonic acid	PFUdA	Perfluoro-n-undecanoic acid
PFHxS	Perfluorohexane sulfonic acid	9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid
PFDA	Perfluoro-n-decanoic acid	11CL-PF3ONS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
PFDoA	Perfluoro-n-dodecanoic acid	GenX	Hexafluoropropylene oxide dimer acid
PFHpA	Perfluoro-n-heptanoic acid	ADONA	4,8-dioxa-3H-perfluorononanoic acid
PFHxA	Perfluoro-n-hexanoic acid	EtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
PFNA	Perfluoro-n-nonanoic acid	MeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid