Drinking Water Quality
Annual Report for Calendar Year 2021

Yokota Air Base & Tama Hills
(Published: 2022)

この年次報告書には横田基地の飲料水の水質についての重要な情報が記載されいています。 この英語版が正式な原本として公示されますが、日本語での説明が必要な方は第 374 医療部衛生環境課(担当:篠崎) 内線 225-8040 までご連絡下さい。

This annual report summarizes the quality of water delivered by Yokota Air Base, Japan. Under the "Consumer Confidence Reporting Rule" of the federal Safe Drinking Water Act (SDWA), community water systems are required to report this water quality information to the consuming public. Presented in this report is information on the source(s) of our water, its constituents, and the associated health risks. This report is designed to strengthen public understanding about the safety of their public water systems; technical language included is required by the Environmental Protection Agency (EPA). **The drinking water systems at Yokota Air Base and Tama Hills are safe and reliable.**

1. Drinking Water Sources for Yokota Air Base and Tama Hills

Yokota: Yokota AB is located on the island of Honshu Japan, 25 miles west of Tokyo in the densely populated area of the Kanto Plain. The system is currently supplied from groundwater sources with 11 total active wells. These sources provide water to five different treatment and distribution plants within three distinct areas on the base (East, Main, and West). The water supply, pumped from wells with an average of 2.1 million gallons per day, is then sent to the on-base treatment plants for disinfection and fluoridation then pumped to elevated storage tanks prior to entering the distribution system. The population served on Yokota AB is 10,863 people (as of June 2021).

*Yokota AB also maintains connections to **Musashi-Murayama** and **Fussa** cities used during **emergency situations only** treated at **Ozaku** and **Fussa-Musashinodai** treatment plants (monitoring is adjusted to accommodate the change if used).*

Tama: The water supply system at Tama Hills Recreational Annex consists of two wells within the annex. Chlorination of the water occurs at two water treatment plants. The Tama Hills water system serves approximately 200 transient personnel, the water consumption average during the highest usage season is 67,000 gallon per day.

2. Common Sources of Drinking Water Contamination

Drinking water sources (both tap 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 other substances from animal or human activity. Contaminants that may be present in source water include:

- ***Microbial contaminants***: Viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- ***Inorganic contaminants:*** 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.
- ***Pesticides and herbicides***: May come from agriculture, urban storm water runoff, and residential uses.
- ***Organic chemical contaminants***: Including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can come from gas stations, urban storm water runoff, and septic systems.
- ***Disinfectant Byproducts***: By-product of drinking water disinfection, intended to kill or inactivate pathogenic microorganisms in water.
- ***Radioactive Contaminants:*** Can be naturally-occurring or the result of oil/gas production and mining activities.

3. Water Safety and Quality Assurance Responsibilities

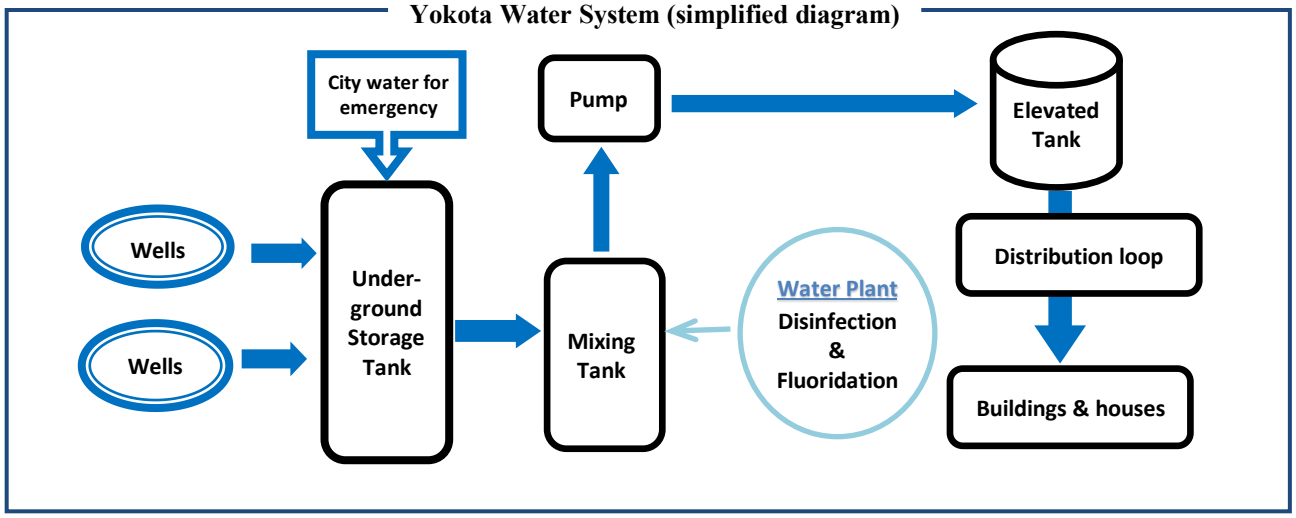
The 374th Civil Engineer Squadron (CES) manages the maintenance and operations of the drinking water supply and distribution system. CES Utilities personnel operate 24 hours a day to maintain sufficient pressurization, disinfection, and fluoridation. At all water plants, the operator also monitors pH, Chlorine residual and Fluoride concentration.

The 374th Operational Medical Readiness Squadron (OMRS) Bioenvironmental Engineering (BE) Flight monitors the quality of drinking water provided to consumers and addresses any health related concerns. Analysis is conducted by EPA-certified laboratories for all contaminants. Additionally, microbial contaminants analysis is conducted in the BE Lab (Bldg. 1585, Rm LB02) on a weekly basis.

The Drinking Water Working Group (DWWG), required by AFI 48-144, is held quarterly in the BE Conference Rm (Bldg. 1585, Rm LB03) by members of CE Utility Shop, CE Environmental Element, and BE. The DWWG meets to address all local DW issues involving compliance, risk reduction, and continuous improvement. DWWG has the authority to call a special meeting with Public Affairs (PA), Base Legal (JA), or other related members as needed. Consumers are welcome to attend this meeting; please call 225-8040 for more information.

4. Drinking Water Treatment Information

Water is treated at the plant before it is sent to the distribution system. The treatment method is chlorination or electrochemical generation for disinfection. BE monitors the levels of chlorine, fluoride, and presence of bacteria at the distribution sites weekly at Yokota and monthly at Tama. BE contacts the CES Utilities shop when adjustments are needed.



5. Drinking Water Monitoring

Yokota BE routinely monitors for over 170 contaminants using EPA-certified laboratories and approved methods in accordance with Japan Environmental Governing Standards (JEGS), December 2020 and EPA regulations.

- ***Microbial contaminants:*** Sampling is conducted every week at distribution points (such as child care facilities, elementary schools, youth center and the hospital), the analysis includes chlorine and pH levels and coliform testing. Coliforms are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Tests for both total and fecal coliforms have been negative in Yokota's water.
- ***Other contaminants* (*inorganic, pesticides & herbicides, organic, disinfectant byproducts and radioactive*)**: Monitored on a different frequency respectively as shown below Table 1;

Table 1. Contaminant Groups and Monitoring Frequencies <as of CY 2021>

Contaminant Group	Chemical Name	Monitoring Frequency	Sampling Location
Microbial	Total coliform, Fecal coliform, pH, Free Available Chlorine	Weekly	CDCs, Schools, Hospital, Aircraft watering point, Tama Site
Inorganic	Metals, (e.g. arsenic, selenium, mercury, nickel, sodium, etc.) Note 1 **(13 Total)**	Once every 3 years	5 water plants at Yokota 2 water plants at Tama
	Nitrate, Nitrite, Total Nitrate/Nitrite	Annually	
	Asbestos	Once every 9 years	
	Corrosivity	Once	Wells
Synthetic Organic Chemical	**<Volatile Organic Chemicals>** Benzene, Trichloroethylene, Carbon Tetrachloride, etc. Note 2 **(21 Total)**	Quarterly	5 water plants at Yokota 2 water plants at Tama
	<Pesticides/PCBs> Herbicides, Dioxin, etc. Note 3 **(33 Total)**	2 consecutive quarters every 3 years	5 water plants at Yokota 2 water plants at Tama
Disinfectant By-Products	Total Trihalomethanes (TTHM) Total Haloacetic Acids (HAA5)	Note 4 Quarterly: Yokota Annually : Tama	8 distribution sites at Yokota 4 distribution sites at Tama
Lead & Copper from plumbing materials	Lead, Copper	Once every 3 years	Yokota: 30 homes Tama: 5 facilities
Radionuclide Compounds	Gross Alpha and Beta, Radium226/228,Uranium	Note 5 Once every 4 years	5 water plants at Yokota 2 water plants at Tama

Note 1 **A listing of inorganic compounds tested can be found in JEGS Chapter 8, Table 8.2**
Note 2 **A listing of volatile organic compounds tested can be found in JEGS Chapter 8, Table 8.5**
Note 3 **A listing of synthetic volatile organic compounds tested can be found in JEGS Chapter 8, Table 8.5**
Note 4 **Changed monitoring frequency based on JEGS updated requirement in Chapter 8, Table 8.7**
Note 5 **Reduced monitoring frequency based on low historical radiological compound levels**

6. Special Precautions

Although our water is safe to drink and meets all water quality standards, some individuals are more susceptible to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer and 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. These people should seek advice about drinking water from their health care providers.

Lead is a toxic material, known to be harmful to human health if ingested or inhaled. Lead in the body can cause damage to the brain, kidneys, nervous system, and red blood cells. Children, infants, pregnant women, and their unborn children are especially vulnerable to lead. In children, lead has been associated with impaired mental and physical development as well as hearing problems. The harmful effects of lead in the body can be subtle and may occur without any obvious signs of lead poisoning. Blood levels as low as 10 micrograms per deciliter (ug/dL) are associated with harmful effects on children's learning and behavior. Minimizing sources of exposure to lead can help reduce the number of children with elevated blood

lead levels. Although drinking water is not typically the primary source of lead exposure in children, it can contribute to total lead exposure. Lead can also be introduced into the body through soil and air, which contributes to the total amount of lead exposure. In response, the EPA has set a cumulative blood lead level of less than 10 ug/dL. Therefore, reducing the amount of lead in the drinking water is an important part of reducing a child's overall exposure to lead in the environment. **The measured concentrations at Yokota are all below the action level.**

Copper: The primary sources of copper in drinking water are corrosion of household plumbing systems and erosion of natural deposits. Copper enters the water ("leaches") through contact with the plumbing. Copper leaches into water through corrosion – dissolving or wearing away of metal caused by a chemical reaction between water and your plumbing. Copper can leach into water primarily from pipes, but fixtures, faucets (brass), and fittings can also be a source of copper contaminants. The amount of copper in your water also depends on the types and amounts of minerals in the water, how long the water stays in the pipes, the amount of wear in the pipes, the water's acidity and its temperature. When water sits in copper pipes or plumbing containing copper for several hours or more, the copper may dissolve into the water. This means the first water drawn from the tap for the day may contain elevated levels of copper. **As a precaution, consumers are encouraged to flush water from their faucets for 60 seconds before consumption after the faucet has remained unused for four or more hours. The measured concentrations at Yokota are all below the action level.**

7. Monitoring Results in Calendar Year 2021

OUR DRINKING WATER MEETS ALL JEGS AND EPA REQUIREMENTS.

Table 2 (Yokota Water System), Table 3 (Tama Water System) and **Table 4 (Non-Regulated Compound)** summarize monitoring results.

Table 2. 2021 Yokota AB Water System Detected Contaminants

<Detected Chemicals Only>

Substances	Violation? Yes / No	Units	Detected Level		MCLG	MCL	Last Sampled	Major Sources in Drinking Water
			Highest	Lowest		EPA (JEGS)		
Inorganics Monitoring Frequency: Annually for Nitrate, every 3 years for other Inorganics *Only chemicals detected are listed below, 12 others were tested.*								
Nitrate	**No**	ppm	**3.6**	0.67	10	**10** (10)	Jan 2021	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Arsenic	**No**	ppb	**3.0**	ND	0	**10** (10)	Apr 2021	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Barium	**No**	ppm	**3.4**	ND	2	**2** (2)	Apr 2021	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Fluoride	**No**	ppm	**1.0**	0.6	4	**4** (4)	Apr 2021	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Sodium	**No**	ppm	**18**	12	N/A	**N/A** (N/A)	Apr 2021	Erosion of natural deposits
Volatile Organic Compounds Monitoring Frequency: Quarterly *Only chemicals detected are listed below, 19 others were tested.*								
1,1-Dichloroethylene	**No**	ppb	**0.9**	ND	7	**7** (7)	Oct 2021	Discharge from industrial chemical factories
Tetrachloroethylene	**No**	ppb	**1.2**	ND	0	**5** (5)	Oct 2021	Discharge from factories and dry cleaners
Disinfectant By-Products Monitoring Frequency: Quarterly *Only chemicals detected are listed below, HAA5 chemicals were not detected*								
Total Trihalomethanes (TTHM)	**No**	ppb	**3.7**	ND	N/A	**80** (80)	Oct 2021	By-product of drinking water disinfection

Radionuclides Compounds Monitoring Frequency: every 4 years								
Combined Radium 226 and 228	**No**	pCi/L	**1.64**	ND	0	**5** (5)	Nov 2020	Erosion of natural deposits
Gross Alpha	**No**	pCi/L	**0.95**	0.12	0	**15** (15)	Nov 2020	
Uranium	**No**	pCi/L	**0.09**	0.02	0	**30** (30)	Nov 2020	

Table 3. 2021 Tama Hills Water System Detected Contaminants

<Detected Chemicals Only>

Substances	Violation? Yes / No	Units	Detected Level		MCLG	MCL	Last Sampled	Major Sources in Drinking Water
			Highest	Lowest		EPA (JEGS)		
Inorganics Monitoring Frequency: Annually for Nitrate, every 3 years for Other Inorganics *Only chemicals detected are listed below, 14 others were tested.*								
Nitrate	**No**	ppm	**0.65**	0.003	10	**10** (10)	Jan 2021	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Sodium	**No**	ppm	**7.9**	7.9	N/A	**N/A** (N/A)	Apr 2021	Erosion of natural deposits
Disinfectant By-Products Monitoring Frequency: Annually *Only chemicals detected are listed below*								
Total Trihalomethanes (TTHM)	**No**	ppb	**24.8**	0.9	N/A	**80** (80)	Jul 2021	By-product of drinking water disinfection
Total Haloacetic Acids (HAA5)	**No**	ppb	**2.4**	ND	N/A	**60** (60)	Jul 2021	By-product of drinking water disinfection
Radionuclides Compounds Monitoring Frequency: every 4 years								
Combined Radium 226 and 228	**No**	pCi/L	**1.19**	1.08	0	**5** (5)	Nov 2020	Erosion of natural deposits
Gross Alpha	**No**	pCi/L	**0.3**	0.3	0	**15** (15)	Nov 2020	
Uranium	**No**	pCi/L	**0.08**	ND	0	**30** (30)	Nov 2020	

Non Regulated Compounds: Yokota AB and Tama Hills

- Per-and Polyfluoroalkyl Substances (**PFAS**): Perfluorooctanoic Acid (PFOA), Perfluorooctane Sulfonate (PFOS) and 16 other substances. (EPA Method 537.1 for PFAS analysis)

Table 4. 2021 Yokota AB Water System

<PFAS >

Water Source	Violation? Yes / No	Units	Detected Level		EPA Health Advisory	MCL	Last Sampled	Major Sources in Drinking Water
			Highest	Lowest		JEGS		
DoD-Owned (Yokota Water)	**No**	ppt	**28.8**	5.0	**70**	N/A	Jul 2020	Component of aqueous film forming foam, a Firefighting foam.
***Non-DoD (City Water)**	**No**	ppt	**8.2**	ND	**70**	N/A	Oct 2020	Component of aqueous film forming foam, a Firefighting foam.

<Tama Hills: No PFAS has been detected from Tama water source>

Background: PFOA and PFOS has been used for decades in many commercial products such as stain resistant carpeting, firefighting foam, nonstick cookware, fabric coatings and some food packaging. The EPA continues to develop the science on any health effects on humans and evaluate whether these contaminants should be regulated in our drinking water. On May 19, 2016, the EPA established lifetime health advisory levels of 70 parts per trillion for PFOA and PFOS in drinking water. These compounds are classified as emerging contaminants due to evolving regulatory standards.

We continue to monitor the water sources: Although PFOA and PFOS are unregulated and commonly used, the Air Force is taking aggressive measures to reduce the risk of mission-related PFOA and PFOS contamination to installation and supporting communities' drinking-water sources. We've been monitored those contamination annually since 2016. Additionally, in accordance with the Defense for Environment Memorandum, *(Testing of Air Force Owned Drinking Water System for PFAS, dated 31 March 2020), and (PFAS Sampling for Installations with *Non-Department of Defense Drinking Water Systems, dated 25 Aug 2020),* Yokota BE has immediately started monitoring for PFAS including Non-DoD water source (purchase from city water) and all results were below the Health Advisory level (70 ppt) at all monitoring locations. Furthermore, by the above guidance rules the Yokota water system's monitoring frequency can be reduced for PFAS to every 2 years. Next sampling will be conducted in July 2022.

Terms Defined

EPA - United States Environmental Protection Agency
JEGS - Japan Environmental Governing Standards **(JEGS)**, December 2020
Maximum Contaminant Level (MCL) - 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.
Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no expected health risk. MCLGs allow for a margin of safety.
N/A - Not applicable, No MCL established**.**
ND - Means not detected and indicates that the substance was not found by laboratory analysis.
Part per million (ppm) – 1/1,000,000; One ppm corresponds to 1 minute in 2 years, or a single penny in $10,000.
Part per billion (ppb) – 1/1,000,000,000; One ppb corresponds to 1 minute in 2,000 years, or a single penny in $10,000,000.
Part per trillion (ppt) – 1/1,000,000,000,000; One ppt corresponds to 1 minute in 2,000,000 years, or single penny in $10,000,000,000
Picocuries per liter (pCi/L) - Picocuries per liter is a measure of radioactivity in water.

For more information

Organization	DSN	Service Area
374 OMRS Bioenvironmental Engineering	225-8040	Drinking water quality concerns
374 CES Water & Fuel System Maintenance	225-7089	Water treatment and distribution

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