2024 Annual Drinking Water Quality Report

(Consumer Confidence Report)

RAMSTEIN AIR BASE, GERMANY

This report contains important information about your drinking water. If you do not understand it, please have someone explain or translate it for you.

Dieser Bericht enthält wichtige Informationen zu Ihrem Trinkwasser. Wenn Sie diesen Bericht nicht lesen können, lassen Sie ihn sich von jemandem erklären oder übersetzen.

Introduction

The Bioenvironmental Engineering (BE) Flight is pleased to present this year's Annual Drinking Water Quality Report (Consumer Confidence Report – CCR) for Ramstein Air Base (AB) and the surrounding Kaiserslautern Military Community (KMC), specifically for Air Force owned assets, as required by Department of the Air Force Instruction 48-144, *Drinking Water Surveillance Program*, and the Final Governing Standards for Germany (FGS-G). This report provides an overview of the 2024 drinking water quality from 1 January 2024 through 31 December 2024 and details about where your water comes from, what it contains, and how it compares to standards set by regulatory agencies. We hope this report will raise your understanding of drinking water issues and awareness of our need to protect your drinking water sources. Our goal is to provide you with a safe, quality, and reliable drinking water supply. We are committed to providing you with this information because informed customers are the best allies.

Water Sources

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, natural radioactive material, and can pick up substances resulting from the presence of animals or from human activity. In order to ensure that tap water is safe to drink, the final governing standard for Germany, published in 2020, prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Contaminants that may be present in source water include:

- Microbial Contaminants: such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

- 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.

- Pesticides and Herbicides: which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

- 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.

- Per- and Polyfluoroalkyl Substances (PFAS): a group of thousands of man-made chemicals used in a variety of industries and consumer products around the globe since the 1940s.

Where do we get our drinking water?

The Kaiserslautern Military Community (KMC) drinking water systems provide water to approximately 16,000 customers at Ramstein Air Base (AB). Bioenvironmental Engineering (BE) collects a total of 23 samples per month at multiple locations around the installation, the Contingency Training Squadron compound, Bann, and Einsiedlerhof. Additional samples are collected to meet AF unique requirements and ensure water quality across the entire installation. Ramstein AB water systems are classified as community water systems by HQ USAFE/AFRICA and German Authorities.

The KMC area draws all its drinking water from deep wells several hundred feet below ground. The water is pumped from these wells, treated, and then distributed to our communities. Within the KMC, there are many water distribution systems. Ramstein AB has one system, supplied by three water treatment facilities. Since 2016, the two Contingency Training Squadron systems are supplied with potable water from the City of Ramstein-Miesenbach. Since November 2007, Vogelweh, including Kapaun Air Station, is supplied from the City of Kaiserslautern water provider Stadtwerke Kaiserslautern (SWK).

Drinking Water and Your Health

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information on contaminants and potential health effects can be obtained by calling BE at DSN 314-479-2220 (+49-6371-46-2220). Some people may be more vulnerable to contaminants in drinking water than the general population.

Immunocompromised 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 are more susceptible to risk of infection. These people should seek advice about drinking water from their health care providers. The Environmental Protection Agency (EPA) and Center for Disease Control (CDC) published guidelines on appropriate means to lessen the risk of infection from Cryptosporidium and other microbial contaminants and are available from the Safe Drinking Water Hotline (1-800-426-4791).

Is there Lead in my Water?

Although BE regularly tests lead levels in the drinking water, it is possible that lead and/or copper levels at your home are higher because of materials used in the plumbing. If present, elevated levels of lead can cause serious 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. Ramstein AB is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead and copper exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. However, when BE collects lead samples, it is taken from the first draw (without flushing) to get an accurate representation of how much potential lead is being released (if at all), and action levels for lead were not exceeded in 2023. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or http://www.epa.gov/safewater/lead.

What is PFAS?

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 such as aqueous film-forming foam, or AFFF, used for fighting petroleum fires at airfields and in industrial fire suppression processes. PFAS compounds 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?

The Department of Defense (DoD) is in the initial sampling phase and must be completed by April 2027. For Ramstein AB, initial sampling requires four quarterly samples collected 3-4 months apart. BE will begin the initial sampling in fiscal year 2026. Compliance monitoring for PFAS in the water system will be after April 2027. PFAS sample results collected in 2024 can be found in the table below. Previous PFAS results can be found in 2023's water quality report located here:
https://www.ramstein.af.mil/Portals/6/documents/Drinking_Water_Quality_Reports/Tab%202%20Ramstein%20CCR%202023_Final%20draft.pdf

A Final Word on Water Quality

Your water quality team at Ramstein AB works around the clock to provide safe, dependable water at every tap. But they can only ensure the success of today's mission if everyone contributes. Tomorrow's success will depend on all of us, working together, to protect our vital water resources.

Remember, the water we use does not quickly return to the aquifer, but is, for the most part, "consumed" by our actions. The military installation (Ramstein AB) and many nearby villages draw water from the same aquifer. Conservation is therefore essential to protect our water supply.

You should also consider ways you can reduce your water consumption, i.e. don't let the water run while brushing your teeth, take a shower versus taking a bath. There are numerous ways to save our most valuable natural resource for us and the future of our children. If you have ideas to reduce usage and contamination of this valuable resource, submit it to the Ramstein AB Drinking Water Quality Working Group (POC – BE). These efforts will help protect the future water supply by reducing the overall consumptive use.

Customer Reviews Welcome

We are available to address any questions or concerns you may have. Housing residents should contact the Housing Office with any water concerns. Dorm residents should contact their building manager or their Airman Dorm Leader.

For more information on this report or base drinking water quality, please call BE at DSN 314-479-2220 (0049-6371-462220) or the 86 CES Environmental Management Flight at DSN 314-480-7712.

About the Following Pages

The table below lists all of the drinking water contaminants that we detected during the calendar year of this report. Throughout 2024, **87 contaminants** were tested for three different treatment plants located on Ramstein AB. All sources of drinking water contain some naturally occurring contaminants. The FGS-G requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not vary significantly from year to year, or the system is not considered vulnerable to this type of contamination. If this changes, and levels are elevated, increased monitoring frequency will occur in accordance with the FGS-G.

Definitions and Abbreviations

Action Level (AL): the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Average: regulatory compliance with some Maximum Contaminant Levels (MCLs) are based on running annual average of monthly samples.
Haloacetic Acids (HAA5): a type of disinfection byproduct when adding chlorine to the water as a treatment method.
Maximum Contaminant Level (MCL): the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the Maximum Contaminant Level Goal (MCLG) 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 known or expected risk to health. MCLGs allow for a margin of safety.
Maximum Residual Disinfectant Level (MRDL): the highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
Maximum Residual Disinfectant Level Goal (MRDLG): 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 contamination.
Milligrams per liter (mg/L): unit of measurement for concentration by weight of a substance in the water.
millirem per year (mrem/yr): a measure of radiation absorbed by the body.
Million Fibers per Liter (MFL): a measure of the presence of asbestos fibers that are longer than 10 micrometers.
Minimum Detection Limit (MDL): a detection limit for the lab to be able to detect the chemical of concern in the water.
Nephelometric Turbidity Units (NTU): measurement of the clarity, or turbidity, of water.
Non-Detect (N.D.): a measurement used when the sample result was below the detection capabilities of the lab.
Picocuries per Liter (pCi/L): measurement of the natural rate of disintegration of radioactive contaminants in water.
pH: measurement of acidity/basicity with7.0 being neutral.
parts per trillion (ppt): one part substance per trillion parts water, or nanograms per liter.
Running Annual Average (RAA): average results for the most recent four quarters.
Secondary Maximum Contaminant Level (SMCL): recommended level for a contaminant that is not regulated and has no MCL.
Total Trihalomethanes (TTHM): a set of chemicals that are disinfection byproducts.
Treatment Technique: a required process intended to reduce the level of a contaminant in drinking water.

How to Read the Data Tables

Starting with a substance, read across. The year sampled is 2024 (January through December). MCL shows the highest level of contaminant allowed. MCLG is the goal level for that substance (this may be lower than what is allowed). Average Amount Detected represents the measured amount (less is better). Range tells the highest and lowest amounts measured. A 'No' under Violation means the amount of substance met government requirements. A "Yes" under Violation means there was an exceeded sample that required a public notification to either inform residents of the potetential increased risk, or a "do not drink" notice. Typical Source tells where the substance usually originates. Unregulated substances are measured, but maximum allowed contaminant levels have not been established by the government.

Missed Sampling Parameters

BE is required to sample over 90 chemicals for three water plants and several more locations across the installation. Depending on the parameter, samples are required monthly, quarterly, annually or greater. This leads to over 250 samples collected annually. Sometimes, sampling parameters can be missed for several different reasons, from miscommunication with ordering the sampling kits, the language barrier when communicating with a host nation lab, broken sampling bottles that cannot be analyzed after collection, or human error. If there was an increased risk due to missing any samples, this would have been communicated within 30 days of missing the parameter. Below is a list of sampling parameters that were missed in 2024.

Parameter	Frequency	Missed Frequency	Increased Risk?
Ammonium	Quarterly	Quarter 1-4	No

Water Quality Results for Detected Chemicals

Residual Disinfectants	Unit of Measure	MRDL	MRDLG	Average Level	Minimum Level	Maximum Level	Violation	Typical Source
Free Available Chlorine	ppb	4000	4000	421.3	0	1630	No	Water additives used to control microbes

Contaminant	Unit of Measure	MCLG[2]	MCL	Level Found	Violation	Typical Source
Total Coliform	# of Positives	0	5% of Monthly Samples	0	No	Naturally present in the environment
E. Coli	# of Positives	0	Any Positive	0	No	Contamination from sewage or animal waste
Chloroform (TTHM)	Sum, mg/L	0.07	-	N.D.	No	By-products of drinking water chlorination
Bromodichloromethane (TTHM)	Sum, mg/L	0	-	N.D.	No	By-products of drinking water chlorination
Dibromochloromethane (TTHM)	Sum, mg/L	0.06	-	0.004	No	By-products of drinking water chlorination
Bromoform (TTHM)	Sum, mg/L	0	-	N.D.	No	By-products of drinking water chlorination
Total TTHMs[2]	mg/L	N/A	0.08	0.004	No	By-products of drinking water chlorination
Total HAA5s[2]	mg/L	N/A	0.03	N.D.	No	By-products of drinking water chlorination
Aluminum	mg/L	N/A	0.2	0.0096	No	Naturally present in the environment, corrosion of pipes
Antimony	mg/L	N/A	0.005	N.D.	No	Naturally present in the environment
Arsenic	mg/L	N/A	0.0056	N.D.	No	Natural sources

Contaminant	Unit of Measure	MCLG[2]	MCL	Level Found	Violation	Typical Source
Barium	mg/L	N/A	2.0	0.0875	No	Naturally present in the environment, industrial processes
Beryllium	mg/L	N/A	0.0004	N.D.	No	Industrial processes, naturally occurring in the environment
Boron	mg/L	N/A	1.0	N.D.	No	Naturally occurring in the environment
Bromate	mg/L	N/A	0.01	0.024	Yes	By-products of drinking water disinfection
Chromium	mg/L	N/A	0.05	N.D.	No	Industrial processes, naturally occurring in the environment
Copper	mg/L	N/A	2.0	0.232	No	Erosion of natural deposits; leaching from wood preservatives; corrosion of household plumbing systems
Lead	mg/L	N/A	0.01	0.017	No	Corrosion of household plumbing systems, industrial processes
Manganese	mg/L	N/A	50	0.0000173	No	Naturally present in the environment, industrial processes, and corrosion of manganese-containing pipes and equipment.
Mercury	mg/L	N/A	0.001	N.D.	No	From atmospheric deposition (rain, snow, etc.) runoff
Molybdenum	mg/L	N/A	0.001	N.D.	No	From atmospheric deposition (rain, snow, etc.) runoff
Nickel	mg/L	N/A	0.02	0.016	No	Industrial processes, naturally occurring in the environment, and corrosion of nickel-containing alloys.
Nitrate	mg/L	10	10	1.98	No	Runoff from fertilizer use; leaking from septic tanks, sewage; erosion of natural deposits
Nitrite	mg/L	N/A	0.5	N.D.	No	Runoff from fertilizer use; leaking from septic tanks, sewage; erosion of natural deposits
Total Nitrite/Nitrate	mg/L	N/A	50	1.38	No	Runoff from fertilizer use; leaking from septic tanks, sewage; erosion of natural deposits
Selenium	mg/L	N/A	0.01	N.D.	No	Naturally occurring in the environment, industrial processes, and runoff from agricultural and mining activities

Contaminant	Unit of Measure	MCLG[2]	MCL	Level Found	Violation	Typical Source
Silver	mg/L	N/A	0.01	N.D.	No	Naturally occurring in the environmental
Thallium	mg/L	N/A	0.002	0.00015	No	Industrial processes like metal mining
Total Alpha	Bq/L	N/A	0.5	0.00745	No	Naturally occurring radioactive material
Total Beta	Bq/L	N/A	1	0.17982	No	Naturally occurring radioactive material
Uranium	Bq/L	N/A	30	N.D.	No	Naturally occurring radioactive material
Zinc	mg/L	N/A	5	0.0083	No	Naturally occurring in minerals and rock formations
Carbon Tetrachloride	mg/L	N/A	0.005	N.D.	No	Industrial wastewater runoff
1,4-Dichlorobenzene	mg/L	N/A	0.6	N.D.	No	Industrial wastewater runoff
1,2-Dichlorobenzene	mg/L	N/A	0.6	N.D.	No	Industrial wastewater runoff
1-1-Dichloroethene	mg/L	N/A	0.003	N.D.	No	Industrial runoff from production of plastic wrap, adhesives, and synthetic fiber
cis-1-2-dichloroethene	mg/L	N/A	0.07	N.D.	No	Industrial wastewater runoff
trans-1-2-Dichloroethene	mg/L	N/A	0.1	N.D.	No	Industrial wastewater runoff
1,1,1-Trichloroethane	mg/L	N/A	0.2	N.D.	No	Industrial wastewater runoff
1,1,2-Trichloroethane	mg/L	N/A	0.2	N.D.	No	Industrial wastewater runoff
1,2-Dichloroethane	mg/L	N/A	0.003	N.D.	No	Industrial wastewater runoff

Contaminant	Unit of Measure	MCLG[2]	MCL	Level Found	Violation	Typical Source
Dichloromethane	mg/L	N/A	0.005	N.D.	No	Wastewater runoff from paint, aluminum forming, coal mining, metal foundries, etc.
1,1,2-Trichloroethane	mg/L	N/A	0.005	N.D.	No	Industrial runoff from production of vinyl chloride
1,2,4-Trichlorobenzene	mg/L	N/A	0.007	N.D.	No	Industrial wastewater runoff
1-2-Dichloropropane	mg/L	N/A	0.005	N.D.	No	Used in farming soil, runoff from paint strippers, varnishes and finish remover
Ethylbenzene	mg/L	N/A	0.7	N.D.	No	Wastewater contaminated with gasoline or other fuels
Styrene	mg/L	N/A	0.1	N.D.	No	Industrial wastewater runoff from production of polymers
Tetrachloroethene	mg/L	N/A	0.005	N.D.	No	Industrial wastewater runoff
Trichloroethylene	mg/L	N/A	0.005	N.D.	No	Leaks and spills from industrial storage tanks
Toluene	mg/L	N/A	1	N.D.	No	Industrial manufacturing, petrochemical storage and landfills
Vinyl Chloride	mg/L	N/A	0.0005	N.D.	No	Runoff from vinyl chloride manufacturing or processing plants
Xylenes, total	mg/L	N/A	10	N.D.	No	Refinement and use of petroleum products
Benzo(a)pyrene	mg/L	N/A	0.00001	N.D.	No	Natural and man-made sources
Benzo[g,h,i]perylene	mg/L	N/A	-	N.D.	No	Byproduct of combustion and industrial sites
Benzo[k]fluoranthene	mg/L	N/A	-	N.D.	No	Discharges from industrial processes and vehicle runoff
Benz[a]anthracene	mg/L	N/A	-	N.D.	No	Leaching from petroleum products

Contaminant	Unit of Measure	MCLG[2]	MCL	Level Found	Violation	Typical Source
Benzo[b]fluoranthene	mg/L	N/A	-	N.D.	No	Industrial waste discharge and runoff from fossil fuel combustion
Total PAHs	mg/L	N/A	0.0001	N.D.	No	Industrial waste, combustion, vehicle emssions, and natural resources
PFOS	ppt	N/A	4.0	N.D.	No	PFAS
PFOA	ppt	N/A	4.0	N.D.	No	PFAS
PFHxS	ppt	N/A	10	N.D.	No	PFAS
HFPO-DA (GenX)	ppt	N/A	10	N.D.	No	PFAS
PFNA	ppt	N/A	10	N.D.	No	PFAS
PFBS	ppt	N/A	Used in Hazard Index	2.6	No	PFAS

Notes:

1: Some individual parameters have an MCLG, but there is no violation for exceeding an MCLG.

2: Total TTHM and HAA5 was calculated based on FGS-P: Chapter 3, Page 66, Drinking Water, "11 Noncompliance exists when the annual average of quarterly averages of all samples, compounded quarterly, exceeds the TTHM MCL, 0.080 mg/L or the HAA5 the MCL, 0.060 mg/L."

Violations

Violation 1: Bromate MCL Exceedance			
A lifetime of drinking bromate at higher levels has an increased lifetime cancer risk of 2 in 10,000. Some people who ingested large amounts of bromate had gastrointestinal symptoms such as nausea, vomiting, diarrhea and abdominal pain. Some individuals who ingested very high concentrations of bromate also experienced adverse effects in kidney, nervous system, and hearing loss. However, the levels of bromate were low, but still slightly exceeding the MCL. The violation was detected and reported in accordance with the FGS-G. The MCL for bromate is a running annual average.			
Violation Type	**Violation Begin**	**Violation End**	**Violation Explanation**
MCL	19 September 2023	TBD	BE performs quarterly sampling of bromate in Ramstein AB's drinking water system. During the first, second, third, and fourth quarter sampling period, it was identified that Ramtein AB's drinking water system had exceeded the MCL of 0.01 mg/L. The highest results during these quarters were: 0.074 mg/L (Q1), 0.027 mg/L (Q2), 0.041 mg/L (Q3), 0.072 mg/L (Q4). One of the three water plants exceeded in all quarters of 2024, one plant exceeded in two quarters, and one plant was below in all quarters. BE is continuing to work with CE on resolving the elevated results. BE collected additional water samples in May 2025, with analysis provided by the Aberdeen Public Health Center (APHC), indicating non-detectiable levels of bromate. BE will continue using this analytical lab in the future and when the violation is resolved, a public notification will be pushed to inform the customers.