



2016 Water Quality Report

Public Water System ID: 1510702

Prepared By: 412th Test Wing – Bioenvironmental Engineering

Annual Consumer Report

We are pleased to present the Air Force Research Laboratory (AFRL) 2016 Annual Water Quality Report. We feel it is important that our consumers know about where our water comes from, what it contains, and how it compares to requirements set by regulatory agencies. This report is a snapshot of last year's water quality. We are committed to providing you this information because informed customers are our best allies.

Last year, as in years past, our tap water met or exceeded all U.S. Environmental Protection Agency (USEPA) and State drinking water health requirements. Through regular monitoring we have detected some contaminants, but they are present in levels considered acceptable.

Contaminants detected in our water system and the amount detected, are included in the tables published within this report.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Where Does Our Water Come From?

The AFRL Drinking Water System draws water from one source - groundwater. In 2016, groundwater was supplied from wells located within the Edwards Air Force Base and AFRL boundary. These wells are fed by the Antelope Valley Aquifer and recharged through normal rainfall and groundwater flow.

Source Water Assessment

The 412th Civil Engineering (CE) Squadron produced the 2003 Source Water Assessment, completed 18 June 2003, and it is on file in the CE office (661-277-5000). This assessment looks at possible contamination sources that may affect the base water supply. Possible contaminating activities for the wells surveyed in this assessment include nearby abandoned wells, storm drainage discharge, above ground water storage tanks, and nearby roads. The health risks from these activities are diminished through weekly monitoring of the potable water system.

Description of Water Treatment Process

Our water is treated through disinfection with chlorine, which kills dangerous bacteria and other microorganisms that may be in the water. Disinfection is considered to be one of the major public health advances of the 20th century, and the 412th Civil Engineering Squadron monitors the disinfectant levels on a daily basis.

What Is In Our Drinking Water?

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 about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's (EPA) Safe Drinking Water Hotline (800-426-4791). **Continued on pg 2.**

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:

- Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential areas.
- Organic chemical contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.

- Radioactive contaminants that can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the State Water Resources Control Board (State Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health.

WATER CONSERVATION TIPS

- Turn water off when shaving and brushing your teeth.
- Run only full loads in washing machine and dishwasher.
- Adjust lawn sprinklers to water the grass not the street.
- Take shorter showers. Turn water off while lathering up.
- Use the garbage can rather than the garbage disposal.

Water is a natural resource not to be wasted.

Consumption Note for Susceptible Individuals

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, 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. USEPA/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 Safe Drinking Water Hotline (1-800-426-4791).

TIPS FOR PROTECTING YOUR WATER

Protection of drinking water is everyone's responsibility. You can help protect your community's drinking water source in several ways:

- Eliminate excess use of lawn and garden fertilizers and pesticides – they contain hazardous chemicals that can reach your drinking water source.
- Pick up after your pets.
- If you have your own septic system, properly maintain your system to reduce leaching to water sources or consider connecting to a public water system.
- Dispose of chemicals properly; take used motor oil to a recycling center.
- Volunteer in your community. Find a watershed or wellhead protection organization in your community and volunteer to help. If there are no active groups, consider starting one. Use USEPA's Adopt Your Watershed to locate groups in your community, or visit the Watershed Information Network's How to Start a Watershed Team.
- Organize a storm drain stenciling project with your local government or water supplier. Stencil a message next to the street drain reminding people "Dump No Waste – Drains to River" or "Protect Your Water". Produce and distribute a flyer for households to remind residents that storm drains dump directly into your local water body.



Pictured above: Technicians from the 412th Aerospace Medicine Squadron, Bioenvironmental Engineering Flight conducting routine water testing at locations spanning the water distribution system. Water samples are collected, tested by a certified laboratory, and results are submitted to the State Water Resources Control Board to demonstrate compliance with all requirements and regulations.

Water Quality Data Table

All sources of drinking water contain some naturally occurring contaminants. At low levels, these substances are generally not harmful in our drinking water. Removing all contaminants would be extremely expensive, and in most cases, would not provide increased protection of public health. Additionally, some naturally occurring minerals provide benefits by improving the taste of drinking water and providing nutritional value at low levels.

In order to ensure that tap water is safe to drink, the USEPA prescribes regulations which limit the amount of contaminants in water provided by public water systems. The tables on the following pages list all of the drinking water contaminants that were detected during the 2016 calendar year of this report. Although many more contaminants were tested, only those substances listed below were detected in our water.

The USEPA and State allow us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently, or because the system is not considered vulnerable to this type of contamination. As such, some of our data, though representative, are more than one year old.

In these tables you may find terms and abbreviations that might not be familiar to you. To help you better understand these terms, we have provided the definitions below.

Important Terms Used	
Term	Definition
AL	Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
MCL	Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.
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 are set by the U.S. Environmental Protection Agency.
MFL	MFL: million fibers per liter, used to measure asbestos concentration
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.
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.
N/A	Not Applicable
ND	Not Detected
pCi/L	pCi/L: picocuries per liter (a measure of radioactivity)
PDWS	Primary Drinking Water Standards: MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.
PHG	Public Health Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.
ppb	ppb: parts per billion, or micrograms per liter (µg/L)
ppm	ppm: parts per million, or milligrams per liter (mg/L)
SDWS	Secondary Drinking Water Standards: MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect the health at the MCL levels.

Water Quality Data Table

Contaminant	MCL EPA Limit	PHG	Average	Range	Sample Date	Violation	Major Sources in Drinking Water
Inorganic Contaminants (PDWS)							
Aluminum (ppm)	1	0.6	0.118	0.109 - 0.126	2015	No	Erosion of natural deposits; residue from some surface water treatment processes
Arsenic (ppb)	10	0.004	8.01	7.63 - 8.39	2016	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Barium (ppm)	1	2	0.037	0.032 - 0.042	2015	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Total Chromium (ppb)	50	MCLG= 100	7.605	7.38 - 7.83	2015	No	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Hexavalent Chromium (ppb)	10	0.02	5.67	5.38 - 5.95	2014	No	Discharge from electroplating factories, leather tanneries, wood preservation, chemical synthesis, refractory production, and textile manufacturing facilities; erosion of natural deposits
Fluoride (ppm)	2	1	0.392	0.322 - 0.462	2015	No	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
Nitrate (as N) (ppm)	10	10	0.465	0.430 - 0.500	2016	No	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Nitrite (as N) (ppm)	1	1	0.458	0.451 - 0.465	2016	No	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Lead (ppb)	AL=90% of bldgs. <15	0.2	4.71	10 sites sampled; 0 sites over AL	2015	No	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (ppm)	AL=90% of bldgs. <1.3	0.3	0.0401	10 sites sampled; 0 sites over AL	2015	No	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Radioactive Contaminants (PDWS)							
Gross Alpha (pCi/L)	15	MCGL=0	3	ND - 3	2015	No	Erosion of natural deposits
Uranium (pCi/L)	20	0.43	2.68	2.68	2016	No	Erosion of natural deposits
Disinfectants & Disinfection By-Products (PDWS)							
Total Trihalomethanes (ppb)	80	N/A	1.75	ND - 1.75	2016	No	Byproduct of drinking water disinfection
Secondary Standard Contaminants (SDWS)							
Calcium (mg/L)	N/A	N/A	22.95	17.6 - 28.3	2015	No	Leaching from natural deposits
Chloride (mg/L)	500	N/A	9.31	6.32 - 12.3	2015	No	Runoff/leaching from natural deposits; seawater influence
Color (Units)	15	N/A	2	ND - 4	2015	No	Naturally-occurring organic materials
Hardness (mg/L)	N/A	N/A	78	58 - 98	2015	No	The sum of polyvalent cations present in the water, generally naturally occurring magnesium and calcium
Iron (µg/L)	300	N/A	204	ND - 408 ¹	2015	No	Leaching from natural deposits; industrial wastes
Manganese (µg/L)	50	N/A	0.97	ND - 1.94	2015	No	Leaching from natural deposits
Sodium (mg/L)	N/A	N/A	58.8	50.4 - 67.2	2015	No	Leaching from natural deposits
Specific Conductance (µs/Cm)	1600	N/A	396.5	394 - 399	2015	No	Substances that form ions when in water; seawater influence
Sulfate (mg/L)	500	N/A	62.35	55.2 - 69.5	2015	No	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids (mg/L)	1000	N/A	274.5	266 - 283	2015	No	Runoff/leaching from natural deposits
Turbidity, Laboratory (Units)	5	N/A	0.573	0.205 - 0.941	2015	No	Soil runoff

1- The elevated measurement above the MCL is based off of one sample, at one well. Finished water is a mixture of water from AFRL wells; the "Average" column is most representative of water provided to consumers.

Additional Information Regarding 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. The 412th Bioenvironmental Engineering Flight and 412th Civil Engineering Squadron are 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 exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you do so, you may wish to collect the flushed water and reuse it for another beneficial purpose, such as watering plants. 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 (800-426-4791) or at <http://www.epa.gov/lead>.

Additional Information Regarding PFCs: PFOS/PFOA

Perfluorinated Compounds (PFCs) are a class of synthetic fluorinated organic chemicals used in many industrial and consumer products such as nonstick cookware, waterproof fabric, some food packaging and firefighting foam.

The USEPA released health advisory guidance in May 19, 2016 for PFCs: Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulphonate (PFOS), it established lifetime health advisory levels of 70 parts per trillion for PFOA and PFOS in drinking water. More information on these contaminants can be found at the EPA's webpage <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>.

As part of a DoD Initiative, the Bioenvironmental Engineering Office sampled the AFRL drinking water supply. No PFCs were detected in the drinking water supply, and no additional drinking water testing is required at this time.

Common Water Quality Observations

The 412th Bioenvironmental Engineering Flight and 412th Civil Engineering Squadron make every effort to ensure the water provided to AFRL is safe for consumption and the installation is notified should water quality deteriorate.

Some locations may experience brown or rusty water coming from their faucets; more often in older buildings or houses. This is usually caused by a higher concentration of minerals in the water. This does not mean that the water is not safe. Any brown or rusty water that does not run clear after running faucets for several minutes should be reported to facility maintenance.

Another common occurrence is white cloudy water. This is due to more oxygen in the water and most often noticed during colder months. Any cloudy water that does not clear up after sitting for a couple minutes should be reported to facility maintenance.

Additional Information Regarding Arsenic

While our drinking water meets federal and state standard for arsenic, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The U.S. Environmental Protection Agency continues to research the health effects of low levels of arsenic which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

Additional Information Regarding Fluoride

The AFRL water system contains naturally occurring fluoride. AFRL does not add additional fluoride to the water system due to State requirements and the scope/size of the water distribution system. The natural level of fluoride present in the water system is below the maximum contamination limit (MCL) of 2.0 parts per million (ppm).

In 2015, the U.S. Department of Health and Human Services released a Public Health Service recommendation of 0.7 ppm as the optimal fluoride level in drinking water to prevent tooth decay. Your local dentist or pediatrician can prescribe daily fluoride brushing, tablets, or drops for you and your children to ensure you receive enough fluoride.



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