2003

Wright-Patterson AFB

H_2O Quality Report

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Important Telephone Numbers
Bioenvironmental Engineering
255-6815
CE Customer Service
257-3131
CE Water Department
257-1928
Office of Environmental Management
257-2201
Safe Drinking Water Hotline
(800) 426-4791

Sources of Water

The source of WPAFB's drinking water is the Miami Buried Valley Aquifer. This aquifer is a large underground area of water-bearing sand and gravel deposits.

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WPAFB has two community public water systems that feed from this groundwater aquifer. This natural aquifer provided WPAFB with approximately 1.4 billion gallons of water in 2003. There are six wells that serve Area A/C and four wells that serve Area B. Each well system has its own individual treatment process. Treatment includes: air stripping (to remove any volatile organic chemicals), and chlorine disinfection (to eliminate bacteria). The entire base now receives fluoridated water, effective in 2003. Housing residents receive water which has been both fluoridated and softened. The exception is Page Manor where the water is received from Montgomery County. Those residents will receive their consumer information from the Montgomery County Sanitary Engineering Department.

The Base began developing a well field protection program in 1994 to protect this vital aquifer. Every other year WPAFB completes a comprehensive pollution source survey of all facilities located in the well field area. The information is used to develop an effective management plan of our well field areas. The WPAFB Groundwater Guardian Team has received the Groundwater Guardian Award for the continued dedication and commitment to local groundwater protection to assure a safe water supply for generations to come.

If you have any questions about the drinking water on base please call Bioenvironmental Engineering at 255-6815.

Meeting EPA Standard Again!!!

The base continued to meet all U.S. Environmental Protection Agency (EPA) and state drinking water health standards in 2003. The EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. To comply with Safe Drinking Water Act amendments, WPAFB will be annually issuing a report on water quality monitoring performed on its drinking water. The purpose of this report is threefold:

1. **to advise consumers on sampling results**
2. **to advance understanding of drinking water**
3. **To heighten awareness of the need to protect our precious water resource**

The Bioenvironmental Engineering office can be reached at 255-6815 to answer any and all of your health concerns.

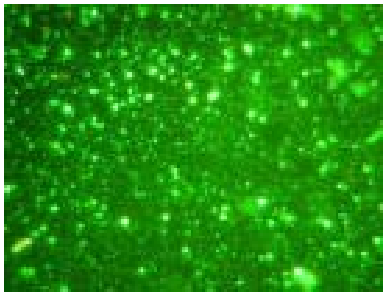
Contamination Concerns

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 activities.

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 runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.



Common microbial contaminates in water sample from river stained green.. Small pinprick dots are viruses, and larger brighter dots are bacterial cells.

"WPAFB makes every effort to ensure the delivery of clean, safe water through a variety of programs…"

Organic chemicals, including synthetic and volatile organics, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff and septic systems.

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

Radioactive materials, which 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 EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Association (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health. 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 water poses a health risk.

More information about contaminants and potential health effects can be obtained by calling the Bioenvironmental Engineering office at 255-6815 or the Safe Drinking Water Hotline (800-426-4791).

WPAFB makes every effort to ensure the delivery of clean, safe water through a variety of programs including: *annual hydrant flushing, backflow prevention, water quality monitoring, water treatment and wellhead protection.*

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-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 all infants can be particularly at-risk to infections. These people should seek advice about drinking water from their health care providers. EPA/(CDC) Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at (800-426-4791).

Opportunities to Participate

Water quality meetings are held monthly.

The water program at Wright-Patterson AFB is managed by personnel from the 74 AMDS/SGPB Bioenvironmental Engineering, 88 ABW/CE Water Department, and 88 ABW/EMO Environmental Management. These organizations meet once a month for a scheduled water quality meeting. For information on the scheduled meeting date for the current month , please call Bioenvironmental Engineering at 255-6815.

Did you know that over 4,500 samples were taken from the base water system?

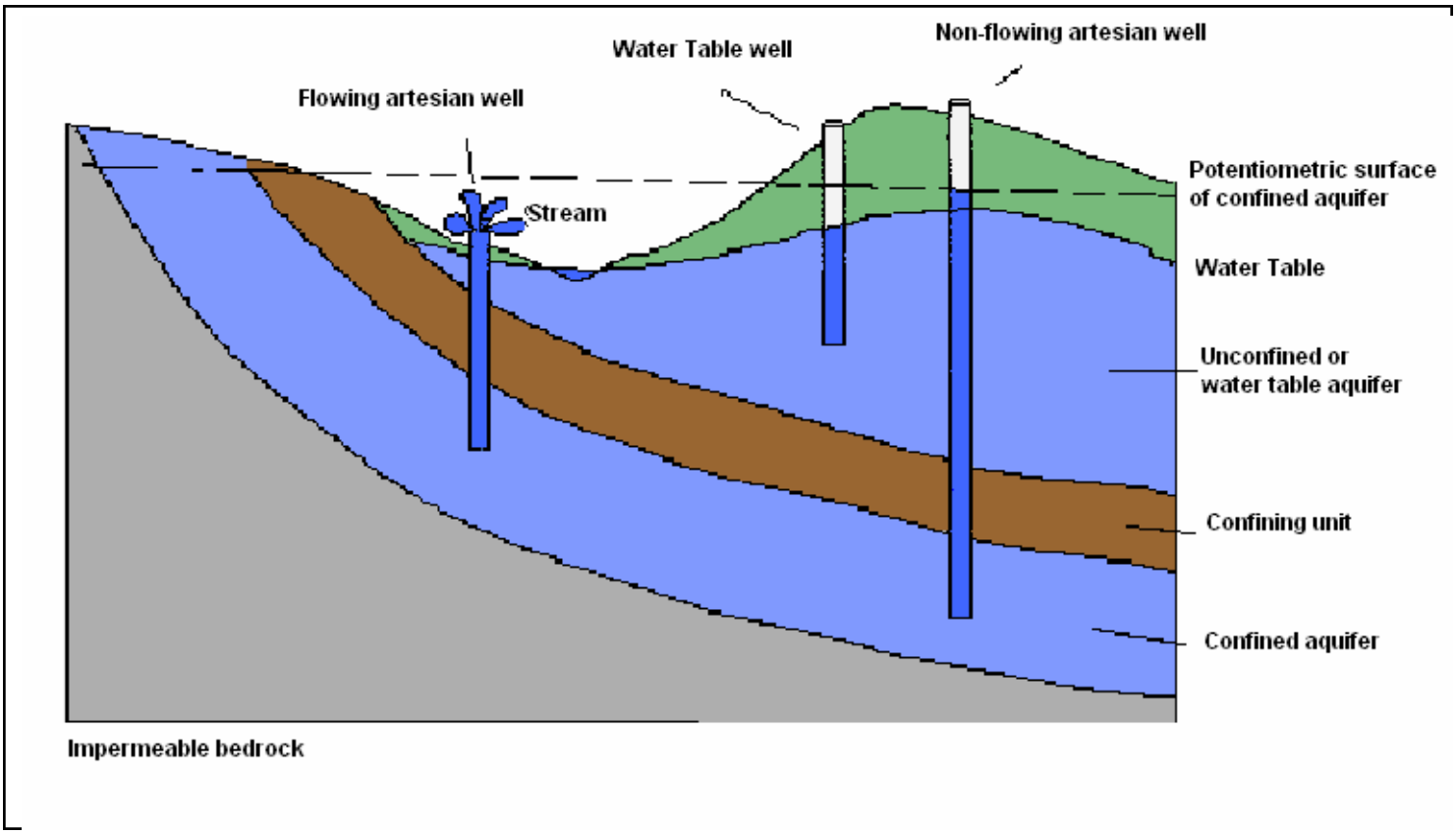
What is a Groundwater Aquifer?

Aquifer is the term given to a rock unit that will yield water in usable quantities to wells or springs. An aquifer can be visualized as a giant underground sponge which holds water and which, under certain conditions, will allow water to move through it. Depending on the type, the aquifer may contain both the saturated and unsaturated zones, or just the saturated zone.

The water-bearing rocks that compose aquifers consist either of unconsolidated (soil-like) deposits or consolidated rocks. Most consolidated rocks (otherwise known as bedrock) consist of rock and mineral particles of different sizes and shapes that have been welded together by heat and pressure or chemical reaction into a rock mass. Aquifers of this type are commonly composed of one or more of the following rocks: sandstone, limestone, granite, or lava. Water flows through these rocks through fractures, gas pores, and other openings in the rock.

Most unconsolidated materials consist of material derived from the disintegration of consolidated rocks. Unconsolidated deposits include, in different types of unconsolidated deposits, some or all of the following materials in varying combinations: soil-like materials, gravel, sand, silt, clay, and the fragments of shells of marine organisms. Sand dunes and gravel piles are examples of unconsolidated material. Water flows through these materials through the natural openings between particles.

The physical properties of aquifer materials and of the aquifers themselves (i.e., thickness, depth) are important in determining how quickly ground water will move and what routes it will take as it moves through an aquifer. This knowledge helps decide how best to get water out of the ground for drinking water, irrigation, and other uses. These same properties are important in defining how contaminants originating on the surface will flow in the aquifer and in determining an appropriate cleanup remedy if the aquifer becomes contaminated.



The Bioenvironmental Engineering office can be reached at 255-6815 to answer any questions you may have.

Girl Scout Water Drop Patch

This project was jointly developed by the United States Environmental Protection Agency (EPA) and the Girl Scout Council of the Nation's Capital (GSCNC). The purpose of the project is to encourage girls to:

- Make a difference in their communities by becoming watershed and wetlands stewards
- Use their skills and their knowledge to educate others in their communities about the need to protect the nation's valuable water resources
- Explore the natural world to gain an interest in science and math.

For more information on achieving the Water Drop Patch please visit http://www.epa.gov/adopt/patch/

Contaminants Detected and Tested for in Areas A/C and Area B

The table on the following page lists all of the drinking water contaminants that we detected during the 2003 calendar year. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table is from testing accomplished from January 1 -- December 31, 2003. The State of Ohio requires monitoring for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Therefore, some of the data, though representative of the water quality, is more than one year old.

"The State requires monitoring for certain contaminants…"

There are some important drinking water definitions you will need to know to help you better understand the results reported.

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 MCLGs as feasible using the best available treatment technology.
AL: Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

There may also be some unfamiliar units of description you will need to understand.

NA: Not applicable
ND: Not detected
ppm: parts per million, or milligrams per liter (mg/L)
ppb: parts per billion, or micrograms per liter (ug/L)
pCi/L: picocuries per liter (a measure of radioactivity).
**** Number of monthly positive samples:** Number of samples taken monthly that were positive
[a]**:** 90th percentile sample result
[b]**:** Average of all results
[c]**:** Highest compliance value

Water samples are collected and sent to laboratories for analysis.

If you have any questions about the results reported or need help interpreting the data in the table please call Bioenvironmental Engineering at 255-6815.

Contaminant	Unit of Measurement	MCLG	MCL	*Area A/C Highest Level Detected	*Area B Highest Level Detected	Area A/C Range	Area B Range	Violation	Possible source of contamination
Inorganic Contaminant									
Barium (8/22/02)	ppm	2	2	0.17	0.12	ND - 0.17	0.35 - 0.12	No	Discharges of drilling wastes; discharge from metal refineries; Erosion of natural deposits
Copper (CY2003)	ppm	1.3	AL=1.3	0.870[a]	0.561[a]	NA	NA	No	Erosion of natural deposits
	One out of 30 samples was found to have copper levels in excess of the Action Level of 1.3 ppm in Area A/C. Zero out of 30 samples was found to have copper levels in excess of the Action Level of 1.3 ppm in Area B. The SDWA states 90% of samples must be below the action level. WPAFB is in compliance with this standard.								
Fluoride	ppm	4	4	0.68	0.95	0.19-0.68	0.27-0.95	No	Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Lead (CY2003)	ppb	0	AL=15	2.47[a]	2.85[a]	NA	NA	No	Corrosion of household plumping systems
	One out of 30 samples was found to have lead levels in excess of the Action Level of 15 ppb in Area A/C. Zero out of 30 samples was found to have lead levels in excess of the Action Level of 15 ppb in Area B. The SDWA states 90% of samples must be below the action level. WPAFB is in compliance with this standard.								
Nitrate (measured as Nitrogen)	ppm	10	10	3.8	2.7	3.5 - 3.8	2.2 - 2.7	No	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion from natural deposits
Microbiological Contaminates									
Total Coliform**	# Positive	0	1	0	0	0	0	0	Naturally present in the environment
Radioactive Contaminates									
Alpha Emitters	(pCi/L)	0	15	<1	<1	NA	NA	No	Erosion of natural deposits
Unregulated Contaminates									
Bromodichloromethane	ppb	NA	NA	3.1[b]	4.4[b]	0.98-4.9	2.2-6.6	No	By-product of drinking water chlorination
Bromoform	ppb	NA	NA	0.5[b]	0.61[b]	0.32-0.7	0.5-0.72	No	
Chloroform	ppb	NA	NA	2.3[b]	3.5[b]	0.37-4.1	1-6	No	
Chloromethane	ppb	NA	NA	0.1[b]	0.04[b]	0.07-0.11	ND-0.07	No	
Dibromochloromethane	ppb	NA	NA	2.3[b]	3.4[b]	1.3-3.1	2.3-4.4	No	
Volatile Organic Chemicals									
Total Trihalomethanes	ppb	NA	100	11.0[c]	17.8[c]	5.32 - 24.6	13.4 - 21.4	No	By-product of drinking water chlorination
Xylenes	ppm	10	10	ND	0.27	NA	ND-0.27	No	Discharge from petroleum and chemicals

Try This at Home: Awesome Aquifers

Objective

Groundwater is water that is found underground in the spaces and cracks between soil, sand and gravel. Often hidden from view, in this activity you will "see" what groundwater looks like and learn some basic groundwater vocabulary.

Materials Needed

2 clear cups
Sand
Gravel or aquarium rock
Pitcher of water

Procedure

1. Fill both cups with layers of sand and gravel to about 3/4 from the top of each cup. Remember that in nature, **aquifers** consist of layers of sand, gravel and rock.

School children try the Awesome Aquifer experiment to better learn about underground water.

2. In one of the cups, pour water slowly into it. Watch how the water fills the spaces between the particles of sand and gravel. Does the water appear to move faster through the sand or faster through the gravel? Why?
3. Now continue to fill this cup with water to the top (above the top of the sand and gravel). Water that is located above ground, like rivers and lakes, is called **surface water**. Water below the ground's surface is called **groundwater**.
4. In the second cup, slowly pour water into the cup until the water line is about one inch below the top of the sand/gravel. Look closely at this line created by the water. This line is called the **water table**. Water below the water table is called the **saturation zone**.
5. Now pretend that your pitcher of water is a large rain cloud and pour some more water into your second aquifer until the water table is about one half an inch below the surface of the gravel. Your groundwater supply has just been **recharged**. This is what happens when it rains or snows and water **infiltrates** (or sinks) into the ground.

"...in this activity you will "see" what groundwater looks like..."

Optional Extension

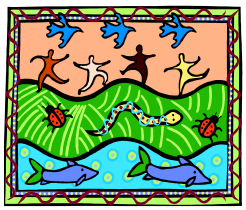
Use colored water or powdered drink mix to represent a source of groundwater contamination. Sprinkle or pour the contamination on the top of a cup filled with gravel and water. Sprinkle water (rain) on top of the gravel. Observe and discuss what happens.

Conclusion

We have learned that groundwater is water that is found underground in the cracks and spaces in soil, sand and gravel. We have learned that groundwater is stored in--and moves through--the layers of sand and gravel. This geologic formation of sand and gravel which stores groundwater is called an aquifer. Aquifers get more water when they are recharged by rain and snow.

Activity Source

The Groundwater Gazette, published by The Groundwater Foundation.



Kids Can Protect Groundwater Too.

Even with all of the contamination threats to groundwater, it CAN be protected by kids like you who educate the people in their homes and communities about the water they drink. You can actually start protecting groundwater right at home! Investigate your home for products (paints, cleaners, etc.) that would contaminate the groundwater if they were poured down the drain or dumped on the ground outside. If you live in a house with a lawn, find out about all the chemicals (pesticides, fertilizers, etc.) that are used on the lawn. Talk to your family members about how hazardous household or lawn products can contaminate the groundwater. Instead of pouring chemicals down the drain, they can be used up so there is only a container left. Purchase "environmentally safe" products over hazardous ones. Chemical use on lawns can be reduced to prevent large amounts of contaminants getting into the groundwater.

WPAFB is a Groundwater Guardian Community

Call Bioenvironmental Engineering at 255-6815 with any questions.

THIS REPORT IS AVAILABLE ON THE WEB:
https://www.bio.wpafb.af.mil/default.htm

Groundwater Guardian encourages communities to begin and enhance groundwater awareness and protection activities. Groundwater Guardian supports communities in their efforts and recognizes their achievements. Visit the Kids Corner at http://www.groundwater.org/kc/kidsprotect.html. Learn more about Groundwater Guardian at http://www.groundwater.org/gg learnmore.html.

Frequently Asked Questions

What is hard water?

Hard water contains amounts of two minerals called calcium and magnesium. It got nicknamed hard when people found it difficult to make washing suds or lather from the water.

Why does the water sometimes look rusty?

Iron causes the rusty discoloration: it is not a health risk.

Rusty or reddish tinted water may occur because of a sudden change in pressure due to improper flushing of a fire hydrant, etc. Iron causes the discoloration: it is not a health risk. The normal flow of water will usually clear the mains within two hours or less. Check your water by flushing a commode bowl three times every 15 to 20 minutes. If you live on near the end of a long, main distribution line, additional flushing may be required. Galvanized iron pipes or fittings within a home or building may also cause discolored water. Running the water will clear the piping system. If the hot water is rusty, the water heater may need to be flushed.

Is it ok to drink from a garden hose?

The water 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.

Chemicals used to make your hose flexible are not good for you and neither are the bacteria that may be growing inside the hose.

Will using a home water filter make the water safer or healthier?

Most filters improve the taste, smell and appearance of water, but they don't necessarily make the water safer or healthier. Please keep in mind that filters require regular maintenance; if ignored, water quality problems may occur.