CITY OF ANNAPOLIS

2018 ANNUAL WATER QUALITY REPORT

Reporting Period January 1, 2018 to December 31, 2018

Here in Annapolis, you turn on the tap and safe, potable drinking water comes out. Every. Single. Time. It's something many people might take for granted. Truth is, it is not that way for all people in all parts of the world (or even all parts of America). Aging infrastructure and tight municipal budgets have given rise to concerns about the safety and security of drinking water for many people (but not for Annapolis).

That's why I'm pleased to bring you the 2019 Water Quality Report, an annual accounting of how we are doing in our delivery of water to the more than 40,000 people who rely on the Annapolis City water supply. We are consistently hitting our marks for delivery of safe water to our residents.

How do we do it?

Did you know that all Annapolis water comes from three aquifers, the Magothy, Upper Patapsco and Lower Patapsco? These provide all our water – which has been independently judged to be some of the best tasting water around.

But, for the 150 years we've been delivering water, it wasn't always the tastiest and cleanest. Up until the 1920s, water was provided by a dammed spillway that was predominantly storm water runoff. That system was installed in the late 19th Century, initially as fire prevention for the State Capital. It later became the source for drinking water for City residents. It wasn't pretty. It didn't look good. And I can imagine it didn't taste that great either. In the 1930s, we tapped into the underground water supply and we've been getting our drinking water from that plentiful source ever since.

To maintain the high quality of our drinking water, the City of Annapolis' recently completed state-of-the-art Water Treatment Plant has improved energy efficiency and meets the Silver Leed certification standards. In March of 2019, the facility was a finalist for a Green Building Award from the Maryland division of the United States Green Building Council (USGBC). We are proud of maintaining our infrastructure and our ability to deliver a quality product to residents who rely on it (and maybe take it for granted).

We do it for you and your loved ones.

Cheers!

Mayor Gavin Buckley

En Espanol: Este informe contiene information muy importante. Traduscalo o hable con un amigo quien entienda bien.

This report is intended to inform you about the quality of water we deliver to you everyday. As regulations and standards change and new challenges face the drinking water industry, we will continue to adopt new and better methods to deliver the best quality drinking water to you in the most cost effective manner.

Customer Service

Billing Questions (including high water bills)
410-263-7953

Emergency Hotline after hours and weekends
410-224-2140

Department of Public Works (8:00 am to 4:30 pm)
410-263-7949

Website

Visit our website at www.annapolis.gov for additional information. A PDF version of this report can be downloaded from our website.

Additional copies of this report may be obtained at the Department of Public Works Office, 145 Gorman Street, 2nd Floor.

Questions about this Report

Please call the Water Plant Superintendent or Assistant Superintendent at 410-260-3433.

WATER QUALITY DATA 2018

The table below shows those contaminants which were present at levels above the minimum detection limit but below the maximum contaminant level (MCL). Annual testing is not conducted for all contaminants, the last testing date where detectable quantities were present is shown below going back 5 years.

Contaminants	Maximum Contaminant Level		Avg	Level Detected	Sample Date	Violation	Sources of Contamination
	MCL	MCLG					
Inorganic							
Flouride (ppm)	4	4	0.601	0.601-0.601	May 2017	No	Erosion of natural deposits; water additive which promotes strong teeth.
Barium (ppm)	2	2	n/a	0.0083	April 2017	No	Erosion of natural deposits; discharge of drilling wastes; discharge from metal refineries.
Lead (ppb)	AL=15	0	n/a	ND	Aug 2017	No	Corrosion of household plumbing systems
Copper (ppm)	AL=1.3	1.3	n/a	0.0039	Aug 2017	No	Corrosion of household plumbing systems
Radioactive							
Strontium (ppb)	unregulated		43	41 ~ 45	Apr 2014	No	Erosion of natural deposits.
Metals							
Sodium (ppm)	n/a	n/a	n/a	3.18	Apr 2017	No	Naturally present in the environment.
Disinfectant and Disinfection By-Products							
Chlorine (ppm)	MRDL=4	MRDLG=4	1.0	1-1.1	n/a	No	Water additive used to control microbes.
Total Trihalomethanes (ppb) STAGE 2	80	n/a	5.4	1.2 – 9.5	Quarterly 2018	No	By-product of chlorinated organic matter.
Chlorate (ppb)	unregulated		177	167 ~ 186	Apr 2014	No	By-product of chlorinated organic matter.
Bromochloroacetic Acid	unregulated		0.430	0.319-0.541	Jan/Jul 2018	No	By-product of chlorinated organic matter.
Dichloroacetic Acid	unregulated		0.814	0.237-1.390	Jan/Jul 2018	No	By-product of chlorinated organic matter.

Maximum Contaminant Level (MCL): Highest level of contaminant allowed in drinking water. MCLs are set as close to MCLGs as possible.

Maximum Contaminant Level Goal (MCLG): Level of 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 goal or 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 contaminants.

Maximum residual disinfectant level or MRDL: 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.

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

ppm: Parts per million (equivalent to milligrams per liter).

ppb: Parts per billion (equivalent to micrograms per liter).

pCi/L: Picocuries per liter.

ND: Non-detectable.

Information from EPA

As water travels over the land or underground, it dissolves naturally-occurring minerals and can pick up substances or contaminants such as microbes, inorganic and organic chemicals, and radioactive substances. All drinking water, including bottled water, may contain at least very small amounts of some of these substances. It is important to remember that the presence of these substances does not necessarily pose a health risk. More information about contaminants and their potential health effects can be obtained via the Environmental Protection Agency's (EPA) Safe Drinking Water Hotline at 1-800-426-4791 or website at http://www.epa.gov/ogwdw/hotline.

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 stormwater 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 stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
- Radioactive contaminants, which can be naturally-occurring or the result of oil and gas production and mining activities.

In 2003, the City and Anne Arundel County completed a study of the outcrop areas of the aquifers used in raw water sources for our Treatment Plant. The study concluded that there are no immediate threats to the raw water quality and little chance of any change to this condition in the future.

In 2014 and 2018, the City, like all water agencies, was required by the Environmental Protection Agency to test for 21 (2014) and 28 (2018) additional unregulated contaminants. Two of the substances were detected, and are listed in the Water Quality Table. The substances (strontium and chlorate in 2014 and Bromochloroacetic Acid and Dichloroacetic Acid in 2018) are tested to determine whether there is a need for further testing or regulation.

City Water History

1863 State House caught fire. Maryland Lawmakers were concerned about having an adequate supply of water to fight the fire.

1865 Maryland General Assembly chartered the Annapolis Water Company. Maryland lawmakers ordered the creation of the company for the purpose of providing "pure, healthful water for all purposes."

1866 Waterworks began operation. It was designed by nationally recognized civil engineer William Rich Hutton, who was born in Washington DC.

1912 Annapolis' water plant was one of the first to add a filtration system. Maryland State Board of Health reported that Annapolis water was far superior to that of Maryland's largest City.

1929 The filtration building was built. This building was the main portion of the water treatment system used until 2017.

Prior to 1931 Water was piped from the reservoir to man-made settling basins, then distributed from the pump house.

1939 Annapolis drilled its first drinking water well and began mixing that with water from the reservoir.

1985 During water distribution repair, City personnel discovered some wooden water pipes that were used to carry water to City residents. We estimate that these pipes pre-date the civil war.

City of Annapolis

Gavin Buckley | Mayor

Teresa Sutherland | City Manager

City Council

Alderwoman Eleanor "Elly" Tierney	Ward One
Alderman Frederick M. Paone	Ward Two
Alderwoman Rhonda Pindell Charles	Ward Three
Alderwoman Shelia M. Finlayson	Ward Four
Alderman Marc Rodriquez	Ward Five
Alderwoman Shaneka Henson	Ward Six
Alderman Robert Savidge	Ward Seven
Alderman Ross H. Arnett, III	Ward Eight

Department of Public Works

David Jarrell, P.E. | Director

Oscar White | Acting Superintendent
Annapolis Water Treatment Plant

Citizens are welcome to attend City Council meetings for an opportunity to comment on legislation that may affect the quality of the drinking water. Meetings are held twice a month at 7:00 pm. Please refer to the schedule of meetings on the City Website at www.annapolis.gov. For a quick link, https://www.annapolis.gov/calendar.aspx?CID=24

Did you know?

- The United States uses nearly 80% of its water for irrigation and thermoelectric power.
- Of all the water on earth, humans can use only about 0.3% of this water. The usable water is found in groundwater aquifers, rivers, and freshwater lakes.
- 780 million people worldwide lack access to an improved water source.
- The driest half of the planet houses 85% of the population.
- 90% of the world's supply of fresh water is located in Antarctica.

City of Annapolis
Department of Public Works
145 Gorman Street, 2nd Floor
Annapolis, Maryland 21401

https://www.epa.gov/watersense/fix-leak-week

Help Protect Your Local Water System

Water system security is a shared responsibility. Citizens, businesses, and neighborhood watch groups are asked to report suspicious activity to the City. Suspicious activity includes someone opening or connecting to a fire hydrant, climbing or cutting a fence around pumping stations or elevated water tanks, tampering with manhole covers.

DO NOT confront strangers. Instead, report suspicious activity. During normal business hours, call Public Works at 410-263-7949 or, after hours/ weekends, call 410-224-2140.

What information to provide when reporting to the City:

- take a picture
- write-down tag numbers
- type of vehicle
- a description of individuals and the date and time of activity

Judge's Choice Award: The new Annapolis Water Treatment Plant was the first Annapolis City Capital project to receive a LEED Silver Certification. An upgrade from an aging facility built in 1930, the new plant uses advanced technology to improve operations and save costs through reduced energy and chemical use. Two new pumps conserve water resources by recycling clarified spent filter backwash into the treatment process. Additionally, active monitoring and controls of the recycling pumps increase energy efficiency and reduce chemical usage. The cost savings for these processes are estimated in the millions of dollars.

Never Down the Drain: Fats, Oils and Grease

Fat, oil and grease (FOG) is the number one cause of sewage backups in homes. FOG builds up in the sewer lines when people wash grease down the drain. Once in the sewer, FOG sticks to the pipe and thickens, and over time can block the entire pipe. Blockages in pipes can send sewage out of manholes into streets and the Bay, or into homes. Sewer backups can cause damage to homes or businesses, are a health hazard, and threaten the environment.

FOG is found in:

- Liquid oil used for sautéing or frying
- Butter, lard, margarine or shortening
- Meat fats such as from bacon or hamburger

Do:

- Scrape solid greasy food waste into the trash.
- Pour liquid grease to cool in a container, and throw in the trash.
- Use a paper towel to wipe grease out of the pan prior to washing.
- Place used liquid oil in a sealable container, and throw in the trash.

Don't:

- Pour fat, oil or grease down a drain, garbage disposal or toilet.
- Use hot water to rinse grease off of cookware, utensils, dishes or other surfaces.

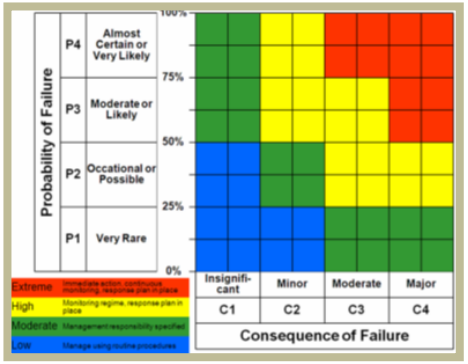
OUT OF SIGHT, BUT NOT OUT OF MIND

WATER DISTRIBUTION SYSTEM IMPROVEMENTS

Though much attention is paid to the sources of water and the treatment processes, of equal importance are the buried pipes that transport water to homes and businesses. Although these pipes may be out of sight and out of mind, they get attention from the folks that work for the City Department of Public Works (DPW). Behind the scenes, much work goes into assessing, planning and designing water pipe replacement projects.

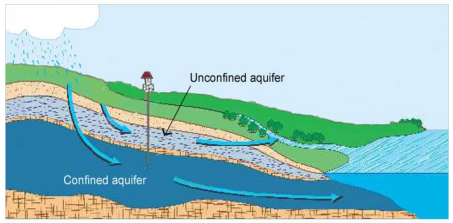
The City's water pipe network dates as far back as 1867. To address the aging pipes, DPW has been proactive in incorporating asset management principles such as risk and performance into its program for prioritizing pipe replacement. These principles, which use both probability of failure and consequence of failure in decision-making, allow the City to do "the right project at the right time." This has resulted in a comprehensive plan that the City will use going forward not only with pipe replacements, but also to increase the life of remaining pipes. The City's efforts were recently recognized by the American Water Works Association by including Annapolis in their "Leading Business Practices in Asset Management Report".

Wood Water Pipe



The City will be ramping up water pipe replacement projects and management strategies identified in the Plan. Many areas where replacements are recommended also require other infrastructure improvements, including natural gas line replacement and street resurfacing. The City has identified about 3 miles of water mains that will be replaced in the next 18 months. The work will include replacement of water mains, service connections from the main, and water meter boxes. These improvements will enhance to the City's ability to reliably provide quality drinking water to its citizens and businesses.

Where does Annapolis' water come from?



The City of Annapolis' water supply originates from eight wells. These wells range from 250 to 1000 feet deep. The wells are drilled into three aquifers: Magothy, Upper Patapsco, and Lower Patapsco. The three aquifers are similar in water characteristics, and the water from each is treated in the same manner.

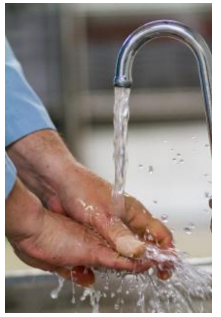
The City of Annapolis water treatment plant produces and delivers over 1.5 billion gallons of water each year to residents and businesses.

Lead and Copper Rule

With the recent water situation in Flint, Michigan, there is significant concern about the presence of lead in drinking water. Lead released into the environment makes its way into the air, soils, and water. Lead can remain in the environment indefinitely. Children and pregnant women are particularly susceptible to the health effects of lead poisoning. Lead can occur in tap water, and when detected, it usually comes from older home plumbing or lead service pipes. Generally, high levels of lead in drinking water are caused by two factors, both of which must be present. The first is the presence of lead pipes as mentioned above. Unlike Flint, lead service pipes are rare in Annapolis. The second factor is the corrosivity of the drinking water. When the City of Flint changed their drinking water source, they did not adequately adjust their water treatment to ensure that the water wasn't corrosive. Corrosive water encourages the dissolving of lead in the pipes, leading to high concentrations of lead in the water. The City's water treatment plant has a proactive corrosion control program to minimize lead leaching from plumbing materials. Every three years, the City of Annapolis takes water samples from 30 representative homes in the City. The sampling and testing is done in accordance with the requirements of EPA's Lead and Copper Rule. The test results are used to determine if the corrosion control program is working. The test results have consistently shown that the corrosion control program keeps lead levels to a minimum. **For 2017, our most recent Lead and Copper Rule sampling and testing, lead was not detected in any of the samples**. Monthly sampling and testing is also performed in the distribution system to determine if adjustments are required at the water treatment plant to prevent the water from being corrosive.

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 City of Annapolis is responsible for providing high quality drinking water, but cannot control the variety of materials used in residential 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 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 at http://www.epa.gov/safewater/lead.

Vulnerable Populations



Some people are more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as people 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 individuals should seek advice about drinking water from their health providers. EPA and the Center 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 (1-800-426-4791).

Cryptosporidium is a microscopic organism that is common in surface water. The organism comes from animal wastes in the watershed and is removed by a well-maintained water treatment process.

Annapolis Water Treatment Plant

Our mission is to produce and distribute quality drinking water to our Customers. City water is pumped from three different aquifers and treated at the water treatment facility. Water is delivered to your home through a comprehensive water distribution and storage system.

City of Annapolis' Water Treatment Process

Wells

Water is pumped from three underground aquifers.

Aeration

Once pumped out of the ground, water is passed through large aerators to add oxygen and remove dissolved gases.

Chemical Addition

Chlorine, lime, and alum are added to adjust the pH and disinfect the water.

Sedimentation Basins

Coagulation, flocculation, and sedimentation are processes that remove solid particles such as iron.

Filtration

Filtration removes remaining suspended matter by passing the water through filter media.

Fluoride Addition

Fluoride is added to the water to aid in the prevention of tooth decay.

Clearwell

Storage of finished water prior to entering the distribution system.

Distribution System

After undergoing the treatment process, finished water enters the distribution system. It is delivered to 11,700 homes and businesses throughout the City of Annapolis. The water distribution system is comprised of 138 miles of water mains. In addition to water mains, the distribution system consists of fire hydrants, valves, elevated storage tanks, and various other components that allow for the finished water to be delivered to the City's homes and businesses.