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## 2007 Drinking Water Quality Report

### A Message from the County Executive June 2008

Greetings,

Clean drinking water is vital to the health and welfare of every citizen, and I am committed to meeting or exceeding water quality standards. This 2007 Annual Drinking Water Quality Report contains the results of water quality testing performed throughout the calendar year. Anne Arundel County has once again met or exceeded standards set by state and federal regulators. In this year's Capital Budget, I have provided the resources for maintenance and upgrades to our water treatment system. Safe and healthy water has been a priority of mine for two decades in public service, whether the challenge was radium in wells or monitoring the health of our aquifers. I hope you will take the time to read this important information.



Sincerely,

A handwritten signature in cursive script, appearing to read "John R. Leopold".

JOHN R. LEOPOLD  
County Executive

Printed on recycled paper...  
Please recycle this report...



# 2007 Anne Arundel County Drinking Water Report



Anne Arundel County Department of Public Works' Bureau of Utility Operations is proud to present the 2007 Drinking Water Quality Report. Over the years, we have been dedicated to consistently providing drinking water that meets or exceeds all state and federal drinking water standards. As regulations and standards change and new challenges face the drinking water industry, we will continue to strive to adopt new and better methods to deliver the best quality drinking water to our customers in the most cost-effective manner.

In 2007, the drinking water provided by Anne Arundel County met all health and safety regulations. This report contains information about the sources, treatment and delivery of your drinking water, as well as the results of numerous tests performed throughout the year. We encourage you to take the time to read this report to learn more about the quality of your drinking water.

Water treated and distributed by Anne Arundel County is continually monitored for quality by the County's state certified laboratory, the State, and private laboratories. In 2007 approximately 10,450 water quality samples were collected and approximately 37,670 analyses performed for 142 parameters. The results were no violations (regulatory non-compliances).

The County's public water system is divided into eight water service areas as illustrated in the map in this report. All of the service areas receive drinking water produced at County water treatment facilities. Two of the service areas also receive drinking water that is purchased by the County from Baltimore City. The City facilities use surface water from reservoirs as a supply source. The County facilities use ground water from wells as a supply source.

Water produced in the County is taken from deep wells (150-1,000 feet deep) in the Patapsco, Patuxent and Aquia aquifers. Ground water flows from recharge areas, where water flows into the ground to re-supply a water source, into the aquifers, through which water travels at a slow rate to the area that the wells are located.

Ground water treated by the County typically goes through the following processes: aeration for oxidation of iron; chlorine addition for disinfection; lime addition for pH adjustment; sedimentation and filtration for iron and particle removal; and fluoride addition to prevent dental decay. Treated water enters the "distribution" system which consists of about 1,250 miles of water mains that deliver the water directly to customers.

## 2007 System Improvements

Each year, through the Capital Improvement Program, the County manages projects designed to improve drinking water by responding to and anticipating future growth, as well as preventing the deterioration of the County's existing system. More than 25 projects are on-going at any time. One of the major projects that was completed in 2007 was the upgrade of the Herald Harbor Water Treatment Plant.

Current projects include: the expansion of the Arnold and Crofton Meadows Water Treatment Plants; new elevated water storage tanks in Crofton, Jacobsville, Elvaton, Severn, Maryland City, and other areas; a new water booster pumping station in the Severn area to improve water supply to the western part of the County; and new transmission mains to enhance the flexibility of transferring water from one part of the County to another. Other ongoing projects provide for the cleaning and lining of existing distribution pipes, rehabilitation of water services, valves, fire hydrants, and other parts of the water distribution system.

## Information on Your Water System

In addition to this annual report, information about your water system is provided in "Customer Updates" which are included in your utility bill, as well as comprehensive information on the Department of Public Works' internet site at [www.aacounty.org/dpw](http://www.aacounty.org/dpw). Other informational materials are available from Public Works' Customer Relations staff at 410-222-7582.

Most printed informational materials are also available under the Customer Relations link on the web site. In addition, all capital projects, which include improvements and/or additions to the water supply system, are included in the annual budget presented by the County Executive to the County Council each spring. Public hearings are held throughout the County and public comment is welcome.

The County also maintains a "Ten Year Master Plan for Water Supply and Sewage Systems". The County Budget and Master Plan can be reviewed at any branch of the County library. For information on the Master Plan, contact the Long Range Planning Section, Office of Planning and Zoning at 410-222-7432.

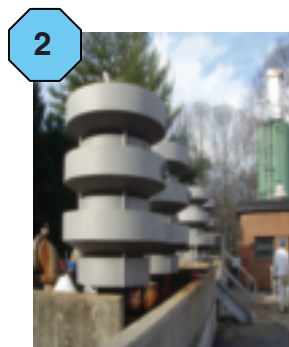
## HOW IS WATER TREATED SO THAT YOU MAY DRINK IT?

Like the majority of the water utilities in the United States, we use a multi-step treatment process to ensure that the water delivered to our citizens is of the highest quality. The information below provides a brief description of the water treatment process most commonly used in Anne Arundel County.

### THE WATER TREATMENT PROCESS



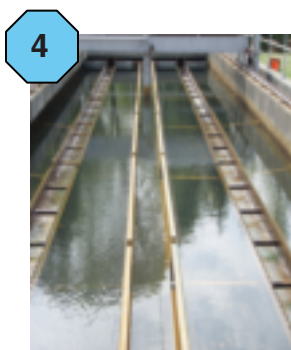
**1**  
**Wells**  
(well pump at a water treatment facility)



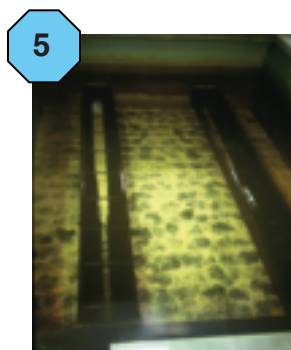
**2**  
**Aeration**  
(new aerators at Severndale Water Treatment Plant)



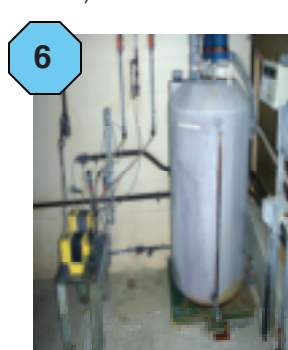
**3**  
**Chemical Addition**  
(chlorine feeders)



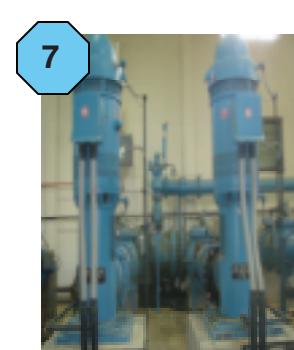
**4**  
**Coagulation, Flocculation, Sedimentation**  
(sedimentation basin at Crofton Meadows I Water Treatment Plant)



**5**  
**Filtration**  
(filter being backwashed at Crofton Meadows II Water Treatment Plant)



**6**  
**Fluoride Addition**  
(fluoride pump)



**7**  
**Distribution**  
(high service pump pushing water out to distribution system)

- 1. Wells-** Water is removed from deep underground aquifers by well pumps
- 2. Aeration-** Water is passed through large aerators to add oxygen and remove dissolved gases
- 3. Chemical Addition-** Chemicals are added to disinfect the water and adjust the pH
- 4. Coagulation, Flocculation, Sedimentation-** These processes are used to remove solid particles from the water
- 5. Filtration-** Further remove or suspend matter by passing the water through filter media
- 6. Fluoride Addition-** Fluoride is added to the water to aid in the prevention of tooth decay
- 7. Distribution-** Treated water enters about 1,250 miles of water mains which deliver the water to citizens throughout the County

## Learn more about...

### **Radium...**

Radium is a naturally occurring substance which, if exposed to acidic conditions (low pH), can leach into groundwater. The EPA has set maximum contaminant levels for radium that are based on lifetime exposure. The County and State monitor the public water system. Some people who drink water containing combined radium in excess of the MCL over many years, may have an increased risk of getting cancer. However, the risk is very small.

### **Radon...**

Radon is a naturally occurring radioactive gas that may cause cancer, and may be found in drinking water and indoor air. The EPA advises that some people who are exposed to radon in drinking water may have an increased risk of cancer over the course of their lifetime, especially lung cancer. Radon in soil under homes is the biggest source of radon in indoor air, and a greater risk of lung cancer than radon in drinking water. For more information, call the EPA's Radon Hotline (800-SOS-RADON) or visit the website at [www.epa.gov/radon](http://www.epa.gov/radon). Testing has indicated that radon is not present in the public water system at concentrations which would cause any health concerns.

### **Cryptosporidium...**

Cryptosporidium is a microscopic parasite that may cause diarrhea, fever and related gastroenteric disorders in infected humans and animals. Cryptosporidium may find its way into drinking water that comes from surface water, such as reservoirs, rivers or lakes. Cryptosporidium is not a problem in drinking water taken from aquifers via deep wells. Since the source of drinking water from Baltimore City is reservoirs, the City monitors its raw water sources for cryptosporidium. Samples from the raw water sources were analyzed and determined to be free of viable organisms. The City protects its water supply reservoirs to help prevent these organisms from entering the water supply.

### **Arsenic...**

Arsenic is a naturally occurring substance, which, if contained in drinking water, could increase the risk of serious health concerns such as circulatory problems. The current EPA level for this contaminant is 10 mg/l. Testing has indicated that there is no arsenic in the public water system.

### **Lead...**

The source of lead in drinking water is normally from leaching in individual home plumbing systems and not from source water, water treatment processes, or the water distribution system. Testing has indicated that lead is not present in the public drinking water system at concentrations that would cause any health concerns.

### **Source Water Assessment...**

Source Water Assessment is a process for evaluating the vulnerability to contamination of the source of a public drinking water supply. The assessment does not address the treatment process, or the storage and distribution aspects of the water system, which are covered under separate provisions of the Safe Drinking Water Act. The Maryland Department of the Environment is the lead agency in developing these Assessments. Source Water Assessments are in progress but have not yet been completed for all of the County's water systems.

## Information from the EPA...

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 Environmental Protection Agency's Safe Drinking Water Hotline at (800) 426-4791.

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. EPA/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.

The sources of drinking water (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, in some cases, radioactive materials, 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, which may come from waste 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 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 by products 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 can be the result of oil and gas production and mining activities.



**DRINKING WATER QUALITY DATA --- 2007**

PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVELS		GLEN BURNIE / BALTIMORE CITY #1 ZONE		PASADENA / BALTIMORE CITY #2 ZONE		BROADNECK ZONE		CROFTON / ODENTON ZONE		BROAD CREEK ZONE		GIBSON ISLAND ZONE		HERALD HARBOR ZONE		ROSE HAVEN ZONE		NOTES	TYPICAL SOURCES OF CONTAMINATION
		MCL	MCLG	highest level	range of detection	highest level	range of detection	highest level	range of detection	highest level	range of detection	highest level	range of detection	highest level	range of detection	highest level	range of detection	highest level	range of detection		
<b>Microbiological Contaminants</b>																					
Total Coliforms	#	< 5% positive	0% positive	N/A	0%	N/A	0%	N/A	0%	N/A	0%	N/A	0%	N/A	0%	N/A	0%	N/A	0%	1	Naturally present in the environment.
Turbidity	NTU	TT	N/A	0.08	100%	0.47	96%	NT	N/A	NT	N/A	NT	N/A	NT	N/A	NT	N/A	NT	N/A	2	Soil run-off.
<b>Radioactive Contaminants</b>																					
Alpha Emitters	pCi/l	15	0	2	0.8 - 2.5	3	0.9 - 4.8	1	0.6 - 1.3	NT	N/A	NT	N/A	NT	N/A	NT	N/A	NT	N/A	3, 5	Erosion and/or decay of natural deposits.
Combined Radium	pCi/l	5	0	3	1.2 - 3.2	4	1.4 - 6.4	2	1.1 - 2.8	NT	N/A	NT	N/A	NT	N/A	NT	N/A	NT	N/A	3, 5	Erosion and/or decay of natural deposits.
<b>Inorganic Contaminants</b>																					
Barium	ppb	2000	2000	20	ND - 20	40	ND - 40	21	4 - 21	21	21 - 21	14	14 - 14	9	9 - 9	3	3 - 3	72	72 - 72	5	Erosion and/or decay of natural deposits; discharge of drilling wastes; discharge from metal refineries.
Fluoride	ppm	4	4	1.3	ND - 1.3	1.6	ND - 1.6	1.8	0.1 - 1.8	1.5	0.1 - 1.5	1.2	0.1 - 1.2	1.3	0.2 - 1.3	0.9	0.2 - 0.9	1.9	0.1 - 1.9		Erosion and/or decay of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories.
Nitrate	ppm	10	10	2.2	0.6 - 2.2	2.6	1.0 - 2.6	0.2	ND - 0.2	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A		Erosion and/or decay of natural deposits; leaching from septic tanks; sewage.
Nickel	ppb	100	N/A	ND	N/A	3	ND - 3	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	5	Erosion and/or decay of natural deposits; discharge of drilling wastes; discharge from metal refineries.
Lead	ppb	AL = 15	0	ND	1	ND	1	ND	1	ND	0	4	0	ND	0	ND	0	ND	1	4, 5	Erosion and/or decay of natural deposits; corrosion of household plumbing systems.
Copper	ppm	AL = 1.3	1.3	ND	0	ND	0	ND	0	0.03	0	0.04	0	0.07	0	0.36	0	0.65	0	4, 5	Erosion and/or decay of natural deposits; corrosion of household plumbing systems.
<b>Disinfection By-Products</b>																					
Total Trihalomethanes	ppb	80	N/A	50.3	4.1 - 59.7	50.8	3.0 - 62.9	2.5	ND - 4.5	2.6	0.6 - 3.7	2.8	1.0 - 5.0	5.1	5.1 - 5.1	ND	N/A	9	9.0 - 9.0	3, 5	By-product of drinking water treatment processes.
Total Haloacetic Acids	ppb	60	N/A	32.3	3.4 - 43.0	45.5	ND - 60.6	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	4.6	4.6 - 4.6	3, 5	By-product of drinking water treatment processes.
<b>Volatile Organic Contaminants / Synthetic Organic Contaminants</b>																					
Tetrachloroethene	ppb	5	0	ND	N/A	2.1	ND - 1.9	ND	N/A	ND	N/A	NT	N/A	NT	N/A	NT	N/A	ND	N/A	5	Leaching from pvc pipes; discharge from factories and dry cleaners.
Di(2-ethylhexyl)phthalate	ppb	6	0	1.8	ND - 1.8	3.1	ND - 3.1	NT	N/A	1.4	1.4 - 1.4	NT	N/A	NT	N/A	NT	N/A	NT	N/A	5	Discharge from rubber and chemical factories.
<b>Unregulated Contaminants</b>																					
Sodium	ppm	N/A	N/A	14.1	1.1 - 14.1	16.2	0.8 - 16.2	3.7	0.7 - 3.7	3.6	0.8 - 3.6	2.1	0.7 - 2.1	5.3	2.7 - 5.3	4.3	0.9 - 4.3	7.5	6.2 - 7.5	5, 6	Naturally present in the environment; by-product of drinking water treatment processes.
Sulfate	ppm	N/A	N/A	14.2	14.2 - 14.2	17.0	ND - 17.0	NT	N/A	8.4	8.4 - 8.4	8.0	8.0 - 8.0	16.0	16.0 - 16.0	NT	N/A	9.0	9.0 - 9.0	5, 6	Naturally present in the environment.

## Notes for the Data Table

**Note 1:** The “MCL” and the “MCLG” for Total Coliforms is based on the percentage of “positive coliform results” in a given month. The MCL requires that less than or equal to 5% of the samples test positive. The percentage of positive sample results is shown in the “range of detection” column.

**Note 2:** Turbidity standards are based on a “treatment technique” and are only applicable to systems using surface water as a source. The maximum Turbidity allowed in a given month is 1 NTU, and 95% of the results must be less than 0.3 NTU. This % is indicated in the “range of detection” column.

**Note 3:** Compliance with the MCL for these contaminants is based on the average of four quarterly samples. The “range of detection” numbers represent individual analysis results, not an average. There were no MCL violations at any facility.

**Note 4:** Compliance with the MCL for Lead and Copper is based on the “90<sup>th</sup> percentile” value of all analysis results. The number of sample results exceeding the MCL for these parameters is indicated in the “range of detection” column.

**Note 5:** Testing for some parameters is not required on an annual basis. Some results reflect the most recent testing between 2005-2007.

**Note 6:** Testing required by EPA to determine if an MCL/health standard should be set.

**General Note:** The drinking water was analyzed for more than 120 other parameters. These contaminants do not appear in the data table because they were not detected.

## Definitions of Terms Used in the Water Quality Data Table

**Maximum Contaminant Level Goal (MCLG):** Level of contaminant in drinking water below which there is no known or expected risk to health, MCLG’s allow for a margin of safety.

**Maximum Contaminant Level (MCL):** Highest level of a contaminant allowed in drinking water. MCL’s are set as close to MCLG’s as feasible using the best available treatment technology.

**Action Level:** Concentration of a contaminant which, if exceeded, triggers a treatment or other requirement which a water system must follow.

**N/A:** Not applicable

**ND:** Not detectable at testing limit

**NT:** Not tested

**ppm:** Parts per million or milligrams per liter. One part per million is the equivalent of 1 cent in \$10,000 or one minute in two years.

**ppb:** Parts per billion or micrograms per liter. One part per billion is the equivalent of 1 cent in \$10,000 or minute in two thousand years.

**pCi/l:** Picocuries per liter (a measure of radiation)

**NTU:** Nephelometric turbidity units (a measure of water clarity)

**TT:** Treatment technique, a required process intended to reduce the level of a contaminant in drinking water.

## Contact Us:

<b>24 Hour Emergency Hotline</b>	<b>410-222-8400</b>
<b>(from South County)</b>	<b>410-451-4118</b>
<b>Billing Office</b>	<b>410-222-1144</b>
<b>DPW Customer Relations</b>	<b>410-222-7582</b>
<b>DPW General Information</b>	<b>410-222-7500</b>

For more information about the Department of Public Works or to contact us by email, visit our website at:

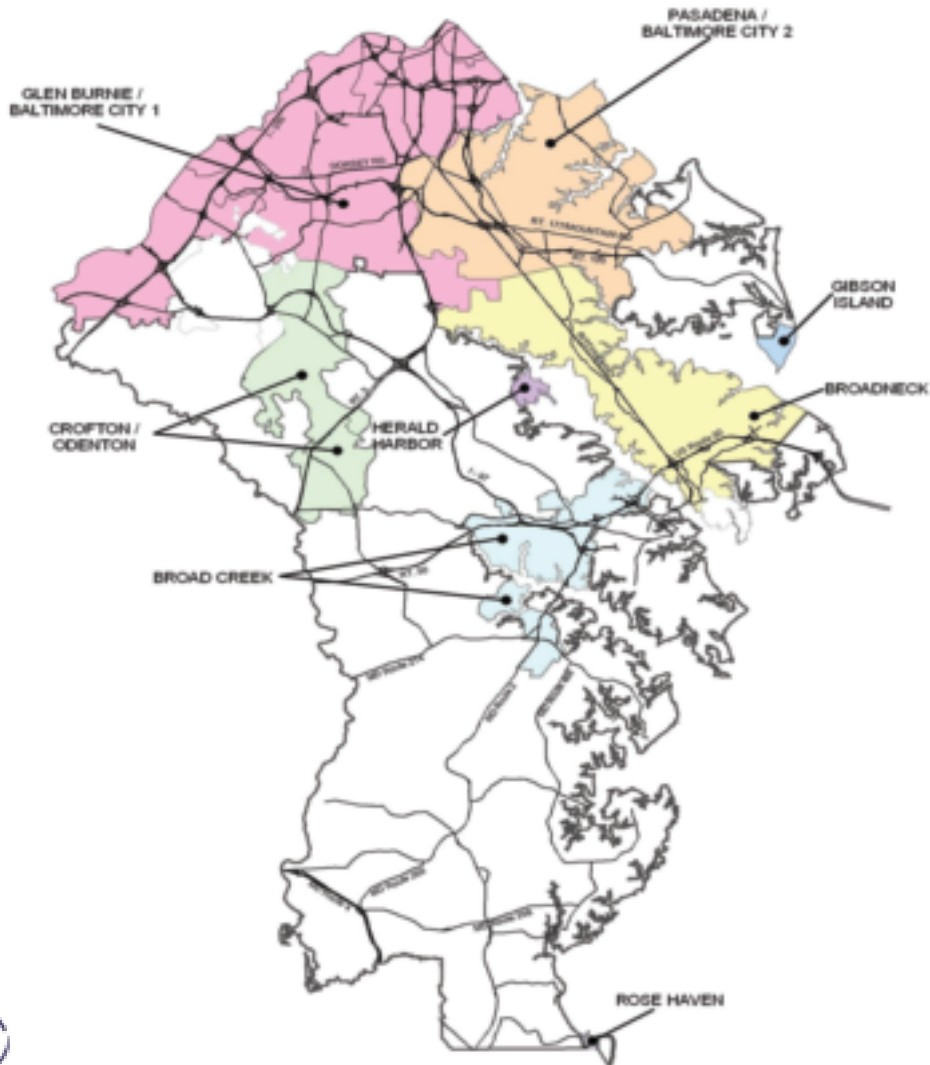
**[www.aacounty.org/dpw](http://www.aacounty.org/dpw)**

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

## Anne Arundel County Water Service Areas

Glen Burnie/Baltimore City #1  
Pasadena/Baltimore City #2  
Broadneck  
Crofton/Odenton

Broad Creek  
Gibson Island  
Herald Harbor  
Rose Haven



***A Commitment to Excellence!***

### ***A Leader in the Drinking Water Community by active membership in:***

\***Association of Metropolitan Water Agencies (AMWA)** works with large publicly owned drinking water systems that provide clean, safe drinking water to more than 110 million Americans. AMWA works with congress and federal agencies to help ensure safe and cost-effective federal drinking water laws and regulations.

\***American Water Works Association (AWWA)** has 56,000 members and serves as a clearinghouse for information and expertise. With it's broad based knowledge and proven experience, AWWA acts as an advocate and voice for the drinking water community.

\***American Water Works Association Research Foundation (AWWARF)** is an international non-profit research organization whose mission is to enable water utilities and other professionals to provide safe and affordable drinking water to consumers.

\***American Public Works Association (APWA)** is an international educational and professional association of public agencies, private sector companies, and individuals dedicated to providing high quality public works goods and services.