STEPHANIE RAWLINGS-BLAKE
MAYOR

City of Baltimore
Department of Public Works
Annual Water Quality Report

BALTIMORE CITY
DPW
DEPARTMENT OF PUBLIC WORKS
RUDOLPH S. CHOW, P. E.
DIRECTOR

Reporting Period: January 1, 2015 to December 31, 2015

INSIDE THIS ISSUE:

Important Health Information

Water systems that store finished drinking water in uncovered reservoirs are now required by the Safe Drinking Water Act to be protected from potential environmental contaminants. At present the City has three uncovered finished-water reservoirs: Guilford, Druid Lake and Lake Ashburton.

The Towson reservoir tanks are complete and Montebello Filtration Plant II reservoir tanks are in service. Guilford Reservoir will be converted to underground tanks and be extensively landscaped by spring 2019. Druid and Ashburton will remain as lakes; however, they will no longer be used as drinking-water storage facilities. Buried tanks will serve that purpose.

Baltimore's drinking water meets or exceeds all federal drinking water standards. However, an uncovered reservoir used to store treated drinking water can be susceptible to contamination from animals, such as birds or insects. Inadequately treated water may contain disease-causing organisms including bacteria, viruses, and parasites that can result in such symptoms as nausea, cramps, diarrhea, and associated headaches.

These symptoms are also caused

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Protecting Drinking Water From Lead

As the region's water provider, the Baltimore City Department of Public Works serves 1.8 million residential and commercial customers and produces an average of 205 million gallons of drinking water daily.

The top priority for the Baltimore City Department of Public Works (DPW) is to provide our customers with high-quality drinking water. DPW tests for some 90 drinking water contaminants, including levels of lead, a contaminant which has recently been the focus of much national discussion.

The tragedy of lead-tainted tap water in Flint, Michigan, has reminded all Americans of the importance of maintaining clean, healthful water. DPW Director Rudy S. Chow, P.E., with decades of experience in the water industry, was among a delegation of experts who traveled to Flint this winter to advise that city's mayor.

As required by federal rules, DPW tests tap water for lead in at least 50 homes every three years. The 2015 test results show that our treatment techniques have kept lead levels in 90 percent of these houses at no more than 5 parts per billion. This is well below the action level of 15 parts per billion set by the Environmental Protection Agency's (EPA) Lead and Cooper rule. (*For the 2015 lead and copper test results please see the chart on page 3.*)

Baltimore's water sources – the Liberty, Loch Raven, and Prettyboy reservoirs – are surrounded by woodlands that protect the water. The drinking water is essentially lead-free when it leaves the water filtration plant – less than 2 parts per billion. Our water distribution mains are made of either concrete or iron, materials that do not contain lead. But lead can be released when the water comes in contact with plumbing fixtures that do contain lead. That is why DPW carefully treats its water with lime, an anti-corrosive agent which prevents lead from leaching out of household plumbing.

If you believe that you have lead plumbing in your home and would like to have your water tested, please call 311 (or 410-396-5352 in Baltimore County) to schedule an appointment. It may take several weeks, depending on the volume of requests.

Meanwhile, there are several steps you can take, some of them very simple, to reduce possible exposure to lead in tap water:

- Run water to flush out lead: If water has not been used for several hours, run water for 30 seconds to 2 minutes, or until it becomes cold, before using it for cooking or drinking. This will ensure that you are using water that has not been sitting in the pipes.
- Use cold water for cooking and preparing baby formula: Lead from plumbing dissolves more readily in hot water.
- Remove debris from faucet strainers or aerators: This practice removes rust and sediment.
- Identify and replace lead solder: Lead solder (which was commonly used to join copper pipes prior to 1986) appears dull gray and when scratched with a key becomes shiny. A licensed plumber is able to help identify and replace lead solder.

BALTIMORE CITY WATER QUALITY REPORT FOR 2015

In the year 2015, the City performed approximately 150,000 water quality analyses as part of a continuous effort to assure the water you drink meets or exceeds regulatory standards. The water is analyzed for more than 90 different drinking water contaminants. A summary of the finished water quality results is provided below. The data represents the most recent testing done in accordance with the requirements of EPA's Water Testing Regulations and were the only regulated substances found in your drinking water. Baltimore City's excellent drinking water meets or exceeds all these standards.

TERMS AND ABBREVIATIONS — What They Mean in Plain English

Term / Abbreviation	Definition	What it Means
PPM	Parts per million	1 ppm is the same as one drop in 10 gallons of water.
PPB	Parts per billion	1 ppb is the same as one drop in 10,000 gallons of water.
HLD	Highest Level Detected	Same as defined.
MCL	Maximum Contaminant Level	The highest level of a contaminant allowed by health regulations established by the Environmental Protection Agency.
MCLG	Maximum Contaminant Level Goal	Health related goals. The MCL is set as close to this "goal" as possible but with consideration to achievability and cost.
NTU	Nephelometric Turbidity Units	Units of measurement used to report the level of turbidity or "cloudiness" in the water.
AL	Action Level	If the "Action Level" for a particular contaminant is exceeded, a response that may include additional treatment steps and/or public education may have to be initiated by the water system.
TT	Treatment Technique	A "Treatment Technique" is a required process that is intended to reduce the amount of a specific contaminant in drinking water.
pCi/L	picoCuries per Liter	A measure of the level of radioactivity in the water.
TURBIDITY	Relates to a condition where suspended particles are present in the water.	Turbidity measurements are a way to describe the level of "cloudiness" of the water.
TOTAL/FECAL COLIFORMS	Indicator Bacteria	Type of bacteriological tests routinely used to determine if contamination has occurred in a drinking water system.
MRDL	Maximum Residual Disinfectant Level	Disinfectant level beyond which some people may experience irritating effects. Based on running annual average of monthly averages of distribution system samples computed quarterly.

MICROBIOLOGICAL CONTAMINANTS

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT	MONTEBELLO PLANTS	MAJOR SOURCES
TOTAL COLIFORMS	0	The presence of coliform bacteria in more than 5% of monthly samples will exceed the MCL.	Highest monthly percentage of positive samples: 2.8%* *Not a violation. All repeat samples were negative.	Highest monthly percentage of positive samples: 2.8%* *Not a violation. All repeat samples were negative.	Naturally present in the environment.
FECAL COLIFORMS and E. COLI	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or E. Coli positive.	Highest monthly percentage of positive samples: 0%	Highest monthly percentage of positive samples: 0%	Human and animal fecal waste.

TURBIDITY

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT		MONTEBELLO PLANTS		MAJOR SOURCES
TURBIDITY[1]	None	Treatment Technique (TT)	HLD	LOWEST %	HLD	LOWEST %	Soil run-off.
		Filtration	0.06 NTU	100	0.25 NTU	100	

1. Turbidity cannot exceed 1 NTU and must be less than or equal to 0.3 NTU in at least 95% of measurements taken each month. Lowest % is the lowest percentage of monthly filtered water turbidity samples less than 0.3 NTU.

ARSENIC RESULTS

SUBSTANCE	MCL	ASHBURTON PLANT	MONTEBELLO PLANTS	MAJOR SOURCES
ARSENIC	0.010 ppm	<0.003 ppm	<0.003ppm	Erosion of natural deposits.

LEAD AND COPPER TESTING

Lead and copper testing was last required by regulatory standards in 2015. During that year, the testing involved 52 "tier 1" or high risks homes. To determine compliance, the 52 test results were arranged from the lowest value to the highest. The 90th percentile value is identified by: 52 x 0.9 = 46.8. Therefore, the 47th value, arranged from lowest to highest, must be below the "action level" for lead and copper. Our system met this compliance standard. Testing will be required again in 2018.

LEAD AND COPPER TESTING RESULTS (2015)

SUBSTANCE	ACTION LEVEL	90TH PERCENTILE	SAMPLE RESULTS GREATER THAN ACTION LEVEL
LEAD	15 ppb	5 ppb	2
COPPER	1,300 ppb	343 ppb	0

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 Baltimore 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 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 drinking 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 EPA Safe Drinking Water Hotline at 1-800-426-4791 or at http://www.epa.gov/safewater/lead.

INORGANIC CONTAMINANTS

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT		MONTEBELLO PLANTS		MAJOR SOURCES
			HLD	RANGE	HLD	RANGE	
BARIUM	2 ppm	2 ppm	0.02 ppm	0.02 ppm	0.04ppm	0.03-0.04 ppm	Discharge of drilling wastes & metal refineries; erosion of natural deposits.
NITRATE (AS NITROGEN)	10 ppm	10 ppm	2.20 ppm	1.18 - 2.20 ppm	2.95 ppm	0.66 - 2.95 ppm	Run-off from fertilizer use; leaching from septic tanks; erosion of natural deposits.

FLUORIDE

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT			MONTEBELLO PLANTS			MAJOR SOURCES
			HLD	RANGE	AVERAGE	HLD	RANGE	AVERAGE	
FLUORIDE	4 ppm	4 ppm	0.72ppm	0.61 - 0.72 ppm	0.68 ppm	1.69 ppm	0.09 - 1.69 ppm	0.69 ppm	Water additive that promotes strong teeth.

CHLORINE

SUBSTANCE	MRDLG	MRDL	RUNNING ANNUAL AVG. OF MONTHLY SAMPLES COMPUTED QUARTERLY	MAJOR SOURCE
CHLORINE	4 ppm	4 ppm	0.54 ppm (Based on 5038 distribution system samples collected in 2015)	Water treatment additive to disinfect supply.

RADIOACTIVE CONTAMINANTS

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT	MONTEBELLO PLANTS	MAJOR SOURCES
BETA PHOTON EMITTERS	0 mrem/yr	50 pCi/L*	<1.5 pCi/L	<4 pCi/L	Erosion of natural deposits.
ALPHA EMITTERS	0 pCi/L	15 pCi/L	<1 pCi/L	<2 pCi/L	Erosion of natural deposits.

*The MCL for Beta Photon Emitters is 4 millirems per year (a measure of radiation absorbed by the body). The EPA considers 50 pCi/l to be a level of concern for this contaminant.

VOLATILE ORGANIC CHEMICALS

SUBSTANCE	MCLG	MCL	ASHBURTON PLANT			MONTEBELLO PLANTS			MAJOR SOURCES
			HLD (LRAA)	RANGE (LRAA)	*AVERAGE (LRAA)	HLD (LRAA)	RANGE (LRAA)	*AVERAGE (LRAA)	
TOTAL THM'S	N/A	80 ppb	70 ppb	11-70 ppb	48 ppb	77 ppb	11-77 ppb	53 ppb	By-product of drinking water chlorination.
HAA(5)	N/A	60 ppb	57 ppb	14-57 ppb	42 ppb	**61 ppb	2-61 ppb	37 ppb	By-product of drinking water chlorination.

**The Carney sample site exceeded the HAA (5) MCL in April. The locational running annual average (LRAA) was 61 ppb.

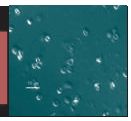
Violation

Testing results from calendar year 2015 indicate that our system exceeded the (MCL) maximum contamination level for Haloacetic acids (HAA5) at one sampling location. The HAA(5) MCL is 60 ppb. The Carney site LRAA for the period from July 2014- June 2015 was 61 ppb. HAA's are a type of disinfection by- product that is formed when chlorine reacts with natural organic matter in the water. We are working to minimize the formation of HAA(5) while ensuring an adequate level of disinfection to protect consumers from exposure to bacteria. We have since taken samples at this location and throughout the system. They currently show that we meet required standards.

A Consumer Confidence Report (CCR) reporting violation occurred during 2015. The CCRs, referred to by DPW as the Water Quality Report, were issued to customers on time; however, verification to the Maryland Department of the Environment was submitted late.

CRYPTOSPORIDIUM RESULTS RANGE

Liberty: 0.0 Oocyst/Liter
Loch Raven: 0.0 Oocyst/Liter
Susquehanna River: 0.0 Oocyst/Liter



Microscopic view of Cryptosporidium oocysts

Cryptosporidium (crip-toe-spor-ID-ee-um) is a protozoan, a single-celled parasite that can invade and reside in the intestines of animals and people. This organism is found in some surface water (lakes, reservoirs, rivers, etc.) And also groundwater under the influence of surface water. Infection of healthy individuals by this organism can cause a gastrointestinal illness referred to as cryptosporidiosis (crip-toe-spor-id-ee-o-sis), which may produce symptoms including diarrhea, headache, abdominal cramps, nausea, vomiting and low-grade fever. The symptoms usually last one to two weeks.

For immunocompromised people, however, the infection can continue and last for several months. Because there are no effective medical treatments, prolonged infection can be fatal for severely immunocompromised individuals. Human transmission routes include ingestion of contaminated food or drinking water or through direct contact with fecal matter.

The City monitors its raw water sources for the presence of Cryptosporidium using the services of environmental laboratories employing the latest available and approved analytical methods.

SECONDARY CONTAMINANTS

Sodium levels in the water supply are often of concern to consumers who contact our facilities. Sodium naturally occurs in raw waters but the concentration can be increased due to the influence of run-off from road surfaces treated with rock salt during snow and ice removal efforts. During the year 2015, the average sodium concentrations measured in the finished water from the Ashburton and Montebello Water Treatment Plants were 19.6 ppm and 23.7 ppm respectively and are considered low.

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 healthcare providers. EPA/CDC guideline on appropiate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 1 (800) 426-4791. If you have specific health concerns, consult your doctor.

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by other factors. Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised people, such as persons with cancer having 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.

The United States Environmental Protection Agency and Centers for Disease Control and Prevention 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 1-800-426-4791. If you have specific health concerns, consult your doctor.

Protecting and Preserving Our Watersheds

Baltimore uses surface water from rainfall and snowmelt as the source of its water. This water, approximately 75-billion gallons of storage volume at maximum capacity, is collected and stored in the City-owned and operated watersheds: Liberty, Loch Raven, and Prettyboy.

These reservoir lands were established for the sole purpose of protecting our drinking water supply. The forests and other vegetation remove nutrients and prevent erosion and runoff. Protecting these lands is a full-time job for our team of Environmental Police Officers, biologists, maintenance personnel and the public.

Eighteenth Annual Water Quality Report

This is the 18th edition of Baltimore City's Annual Water Quality Report that the Department of Public Works is pleased to make available to Baltimore's customers. This report for our Water System (PWSID#:0300002) contains information regarding the quality of the water you drink, as well as educational and important public health notices and contacts. The information in this Drinking Water Quality Report, covering the year 2015, is being provided to you in addition to other notices that may be required by law.

Questions about this report, questions about drinking water quality, or information on source water assessments and requests for additional copies should be directed to one of the City's Water Quality Laboratories (Ashburton - 410-396-0150 or Montebello - 410-396-6040).

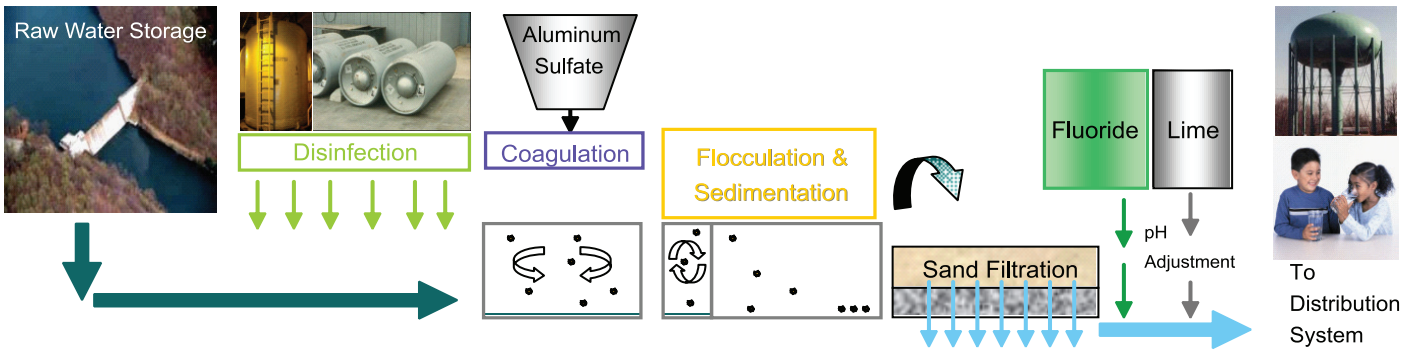
We are pleased to inform you that tours of the treatment plants are being offered; however, some restrictions may need to be observed based on ongoing facility security requirements.

This report, along with more information about water quality, system history and common water quality concerns, can be accessed through the Baltimore City Department of Public Works' website at: www.publicworks.baltimorecity.gov.

For questions or Customer Service call 311 in Baltimore City or 410-396-5352 outside Baltimore City.

Baltimore's Water Treatment Process

When the water reaches the filtration plants, sufficient chlorine is added to kill many of the microorganisms that could otherwise potentially cause illness...



Consumers should be aware that drinking water, including bottled water, might reasonably be expected to contain at least small amounts of some contaminants.

How Can Impurities Get In the Water Supply?

As water travels over the surface of the land, it dissolves naturally occurring minerals and can pick up substances resulting from the presence of animals or from human activity. Contaminants may include:

- *Viruses and bacteria that may come from sewage treatment plants, septic systems, live stock, and wildlife*
- *Salts and metals that can be naturally occurring or result from stormwater runoff, wastewater discharges, and farming*
- *Organic chemicals that are by-products of industrial processes and petroleum production, agriculture, gas stations, stormwater runoff, and septic systems*
- *Radioactive contaminants, which can be naturally occurring.*

In order to assure that tap water is safe to drink, the Environmental Protection Agency (EPA) sets regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations set limits for contaminants in bottled water that must provide the same protection for public health. Consumers should be aware that drinking water, including bottled water, might 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 (800-426-4791).

You Can Help with Water System Security

Water system security continues to be an enormously important issue. If you notice suspicious activities in or around local water utilities, such as persons cutting, or climbing facility fencing, loitering, tampering with equipment or other similar activities, please contact your local law enforcement agency immediately by dialing 911. For other suspicious activities that may appear non-threatening such as persons videotaping or photographing facilities, equipment or structures, please call 410-396-6762.