



# 2011

## Anne Arundel County Drinking Water Quality Report

### 2011 PERFORMANCE

Anne Arundel County Department of Public Works' Bureau of Utility Operations is proud to present the 2011 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 2011, 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 a variety of other water quality analyses performed throughout the year.

In 2011 there were approximately 10,306 water quality samples collected within with the County's drinking water system, and approximately 42,327 analyses were performed for 129 various parameters. There were no water quality violations.

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.

### 2011 SYSTEM IMPROVEMENTS

Each year, through the Capital Improvement Program, the County manages projects designed to improve the drinking water system by responding to and anticipating future growth, as well as preventing the deterioration of the County's existing system. More than 35 projects at an estimated cost of over \$40 million are on-going at any time.



New Filter Gallery at the Arnold WTP

During 2011, work was completed on a major 5 year, \$35 million dollar, upgrade project at the Arnold Water Treatment Plant. This project involved doubling the plant's capacity from 8 million gallons per day (mgd) to 16 mgd, which makes it currently the largest water treatment plant in Anne Arundel County. As a part of this project, four new wells were installed, the programming controls were upgraded, and the treatment infrastructure at the plant was essentially doubled in capacity.



New Arnold Well House

The completion of this project has greatly enhanced the County's ability to produce a larger percentage of the drinking water supplied to our customers, as opposed to purchasing a portion of it from Baltimore City. Water produced at the Arnold Water Treatment plant is now able to be pumped, via a new 36" diameter transmission main, up to the northern sections of the County including Glen Burnie and Pasadena.



Arnold #9 Well



Arnold Sedimentation Basin

In addition to the Arnold Water Treatment Plant upgrade, other projects underway in 2011 included the construction of the new Elvaton Elevated Storage Tank, as well as various other projects such as the replacement of wells, cleaning and lining of existing distribution pipes, rehabilitation of water services, fire hydrants, and other components of the water distribution system.

**FROM THE GROUND TO YOUR GLASS:  
WATER'S JOURNEY THROUGH THE TREATMENT AND DISTRIBUTION PROCESSES**

The County's public water system is divided into 8 water service areas, as is illustrated in the map inside of 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 only use ground water from wells as a supply source. Like the majority of the water utilities in the United States, Anne Arundel County uses a multi-step treatment process to ensure that the water delivered to our citizens is of the highest quality. Below is a brief description of the various steps in the water treatment process:

**The Water Treatment Process**

WELLS  
Water is taken from underground wells (150-1,200 ft deep) in the Patapsco, Patuxent, and Aquia aquifers



Well

AERATION  
Once removed from the ground, water is then passed through large aerators to add oxygen and remove dissolved gasses



Aerators

CHEMICAL ADDITION  
Chemicals such as chlorine and lime are added to adjust the pH and to disinfect the water



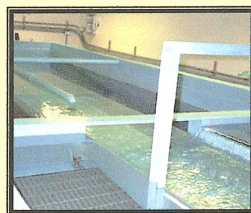
Chemical Feed Pumps

COAGULATION, FLOCCULATION, SEDIMENTATION  
These processes remove solid particles such as iron



Sedimentation Basin

FILTRATION  
Filtration further removes suspended matter by passing the water through filter media



Filter Basin

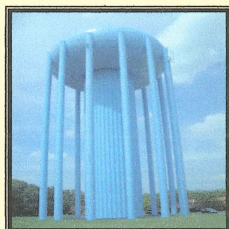
FLUORIDE ADDITION  
Fluoride is added to the water to aid in the prevention of tooth decay



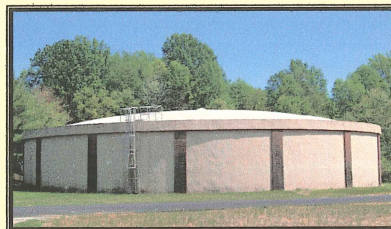
Fluoride Feed Pump

DISTRIBUTION

After undergoing the treatment process, finished water enters the distribution system. It is then delivered to over 106,000 homes and businesses throughout Anne Arundel County. The water distribution system is comprised of a network of over 1,250 miles of water mains. In addition to water mains, the distribution system consists of fire hydrants, valves, elevated storage tanks, and various other components which make it possible for the finished water to be delivered to the County's homes and businesses.



Elevated Storage Tank

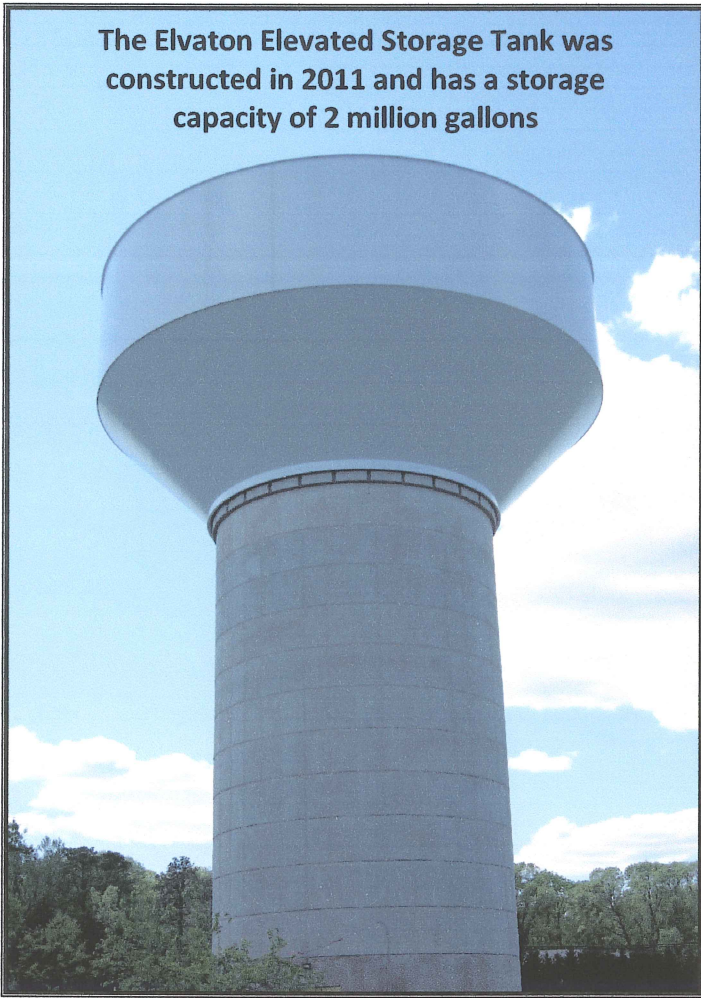


Ground Storage Tank



Fire Hydrant

The Elvaton Elevated Storage Tank was constructed in 2011 and has a storage capacity of 2 million gallons



## DID YOU KNOW...

THE COUNTY'S DISTRIBUTION SYSTEM CURRENTLY INCLUDES **24** ELEVATED STORAGE TANKS (EST'S) WITH STORAGE CAPACITIES RANGING FROM **250,000 – 2,000,000 GALLONS.**

### CONTACT US:

MORE INFORMATION ABOUT THE DEPARTMENT OF PUBLIC WORKS CAN BE FOUND BY VISITING US ONLINE AT:  
[www.aacounty.org/dpw](http://www.aacounty.org/dpw)

24 HOUR EMERGENCY HOTLINE	410-222-8400
(FROM SOUTH COUNTY)	410-451-4118
Billing Office	410-222-1144
DPW CUSTOMER RELATIONS	410-222-7582
DPW GENERAL INFORMATION	410-222-7500

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

## INFORMATION ABOUT 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 may be obtained from the Public Works' Customer Relations staff by calling 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 within 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

## DEFINITIONS OF TERMS USED IN THE WATER QUALITY DATA TABLE

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

**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.

**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

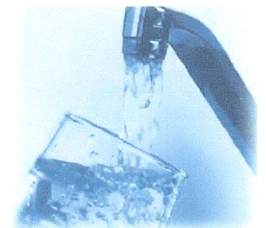
**ppm:** Parts per million or milligrams per liter. One part per million is the equivalent of 1 cent in \$10,000 or one minute in two years.

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



## 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 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 reservoirs 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 0.01 mg/l. Testing has indicated that there is no arsenic in the public water system.

### **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. Anne Arundel County is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. Testing has indicated that lead is not present in the public drinking water system at concentrations that would cause any health concerns. 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://epa.gov/safewater/lead>.

### **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 have been completed for all of the County's water systems.

## **ADDITIONAL 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 1-800-426-4791 or visiting [www.epa.gov/safewater](http://www.epa.gov/safewater).

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.

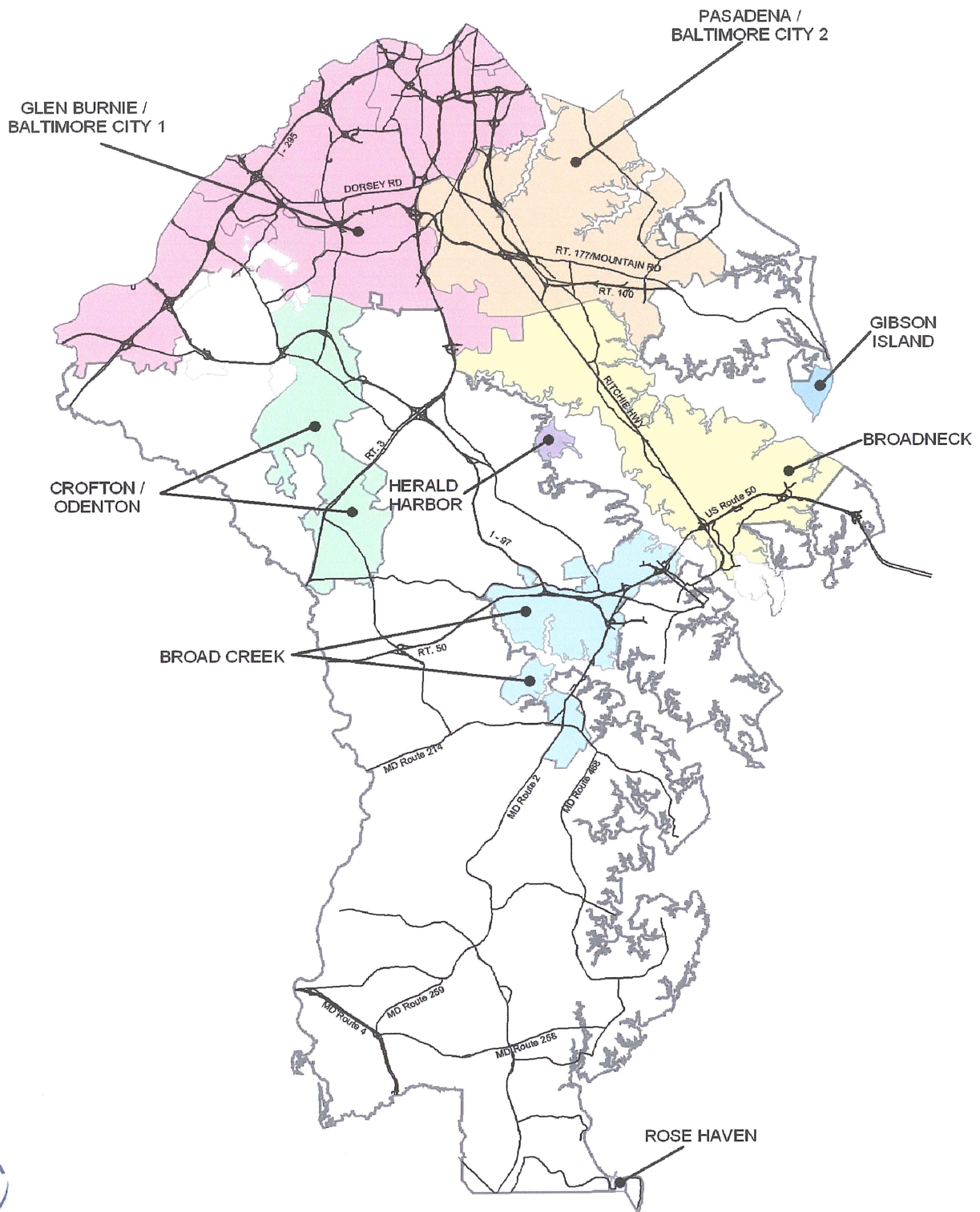
**Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are by products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

**Radioactive contaminants**, which can be naturally occurring or can be the result of oil and gas production and mining activities.

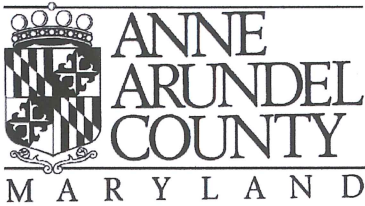
# Anne Arundel County Water Service Areas

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

Broad Creek  
Gibson Island  
Herald Harbor  
Rose Haven



***A Commitment to Excellence!***



Postal  
Permit

County Executive John R. Leopold

*Anne Arundel County  
Department of Public Works  
Ronald E. Bowen, Director  
Heritage Office Complex  
2662 Riva Road  
Annapolis, MD 21401-7374*

*Contact us:  
Phone: 410-222-7582  
Fax: 410-222-4374  
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Web site: [www.aacounty.org/dpw](http://www.aacounty.org/dpw)*

## 2011 DRINKING WATER QUALITY REPORT

A Message from the County Executive  
June 2012

Dear Residents,

I am proud to present the 2011 Drinking Water Quality Report for Anne Arundel County and pleased to announce that the drinking water produced and delivered to your home or business is clean and safe for consumption.

This annual report summarizes the thousands of water quality tests administered for the previous year. It also reflects the outstanding management and dedication of our Bureau of Utility Operations employees. These public servants work diligently everyday to meet and exceed all state or federal regulatory requirements for water quality.



My administration is committed to providing any and all resources needed to manage, maintain or upgrade our infrastructure to continue our long-standing record of providing citizens of our County with the highest quality and cleanest water.

Please take time to read this important information.

Sincerely,

A handwritten signature in black ink, appearing to read "John R. Leopold".

JOHN R. LEOPOLD  
County Executive

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



## 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.

**Note 4:** The “range of detection” numbers represent individual analysis results, not an average. There were no MCL violations at any facility.

**Note 5:** 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 6:** Testing for some parameters is not required on an annual basis. Some results reflect the most recent testing between 2009-2011.

**Note 7:** Testing required by EPA to determine if an MCL/health standard should be set.

### **General Notes:**

\*The drinking water was analyzed for more than 110 other parameters. These contaminants do not appear in the data table because they were not detected.

**DRINKING WATER QUALITY DATA --- 2011**

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	0.25%	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	0.1	100%	1.0	99.9%	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	3	1 - 3	6	ND - 6	1	1 - 1	NT	N/A	NT	N/A	ND	N/A	NT	N/A	NT	N/A	3, 6	Erosion and/or decay of natural deposits.
Combined Radium	pCi/l	5	0	3	1 - 3	5	ND - 5	1	1 - 1	NT	N/A	NT	N/A	NT	N/A	NT	N/A	ND	N/A	3, 6	Erosion and/or decay of natural deposits.
<b>Inorganic Contaminants</b>																					
Barium	ppb	2000	2000	20	10 - 20	40	40 - 40	36	7 - 36	16	16 - 16	8	8 - 8	9	9 - 9	ND	N/A	70	70 - 70	6	Erosion and/or decay of natural deposits; discharge of drilling wastes; discharge from metal refineries.
Cadmium	ppb	5	5	3	ND - 3	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	6	Erosion and/or decay of natural deposits; corrosion of household plumbing systems, discharge from metal refineries.
Fluoride	ppm	4	4	1.5	ND - 1.5	1.6	ND - 1.6	2.0	ND - 2.0	1.6	0.1 - 1.6	1.8	ND - 1.8	1.1	ND - 1.1	1.0	ND - 1.0	2.0	ND - 2.0		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	2.7	2.5 - 2.7	ND	N/A	ND	N/A	N/D	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	15	3 - 15	12	ND - 12	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	6	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	ND	0	ND	0	ND	0	ND	0	5, 6	Erosion and/or decay of natural deposits; corrosion of household plumbing systems.
Copper	ppb	AL = 1300	1300	60	0	60	0	60	N/A	52	0	28	0	38	0	49	0	33.00	0	5, 6	Erosion and/or decay of natural deposits; corrosion of household plumbing systems.
<b>Disinfection By-Products</b>																					
Total Trihalomethanes	ppb	80	N/A	1.6	ND - 4.4	17.7	1.0 - 53.2	0.4	ND - 1.6	3.3	2.5 - 4.1	3.2	2.6 - 3.9	4.1	1.1 - 7.5	1.5	ND - 7.5	10.7	6.7 - 14.1	4, 6	By-product of drinking water treatment processes.
Total Haloacetic Acids	ppb	60	N/A	0.3	ND - 0.3	18.7	ND - 57.2	ND	N/A	ND	N/A	ND	N/A	1.5	ND - 5.1	0.9	ND - 5.1	7.3	5.7 - 8.6	4, 6	By-product of drinking water treatment processes.
<b>Volatile Organic Contaminants / Synthetic Organic Contaminants</b>																					
Tetrachloroethene	ppb	5	0	ND	N/A	2.7	2.6 - 2.7	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	6	Leaching from pvc pipes; discharge from factories and dry cleaners.
<b>Unregulated Contaminants</b>																					
Methyl-tert-butyl-ether	ppb	N/A	N/A	ND	N/A	0.7	0.6 - 0.7	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	6	Octane enhancer of fuel products.
Sodium	ppm	N/A	N/A	2.5	2.4 - 2.5	16.1	16.1 - 16.1	3.8	2.3 - 3.8	2.8	2.8 - 2.8	4.4	4.4 - 4.4	4.4	4.4 - 4.4	3.2	3.2 - 3.2	6.1	6.1 - 6.1	6, 7	Naturally present in the environment; by-product of drinking water treatment processes.
Sulfate	ppm	N/A	N/A	17.0	5.5 - 17.0	20.0	ND - 20.0	NT	N/A	8.8	8.8 - 8.8	NT	N/A	19.4	19.4 - 19.4	NT	N/A	10.9	10.9 - 10.9	6, 7	Naturally present in the environment.