

# Reliability Comes from Many Sources

Chesapeake is fortunate to have two treatment plants and contracts to purchase treated water from the cities of Norfolk and Portsmouth. Additional water is available from an auxiliary well source that is used during peak demands. These sources are described below.

The City's Northwest River Water Treatment Plant treats up to 10 million gallons per day (MGD) from the Northwest River. The plant also treats brackish groundwater from four wells located along South Battlefield Boulevard. The plant's capabilities include both the conventional processes of coagulation, sedimentation, and filtration, as well as reverse osmosis (RO) membrane treatment. This supply generally serves customers south of Military Highway, but is subject to periodic adjustment depending on consumption patterns.

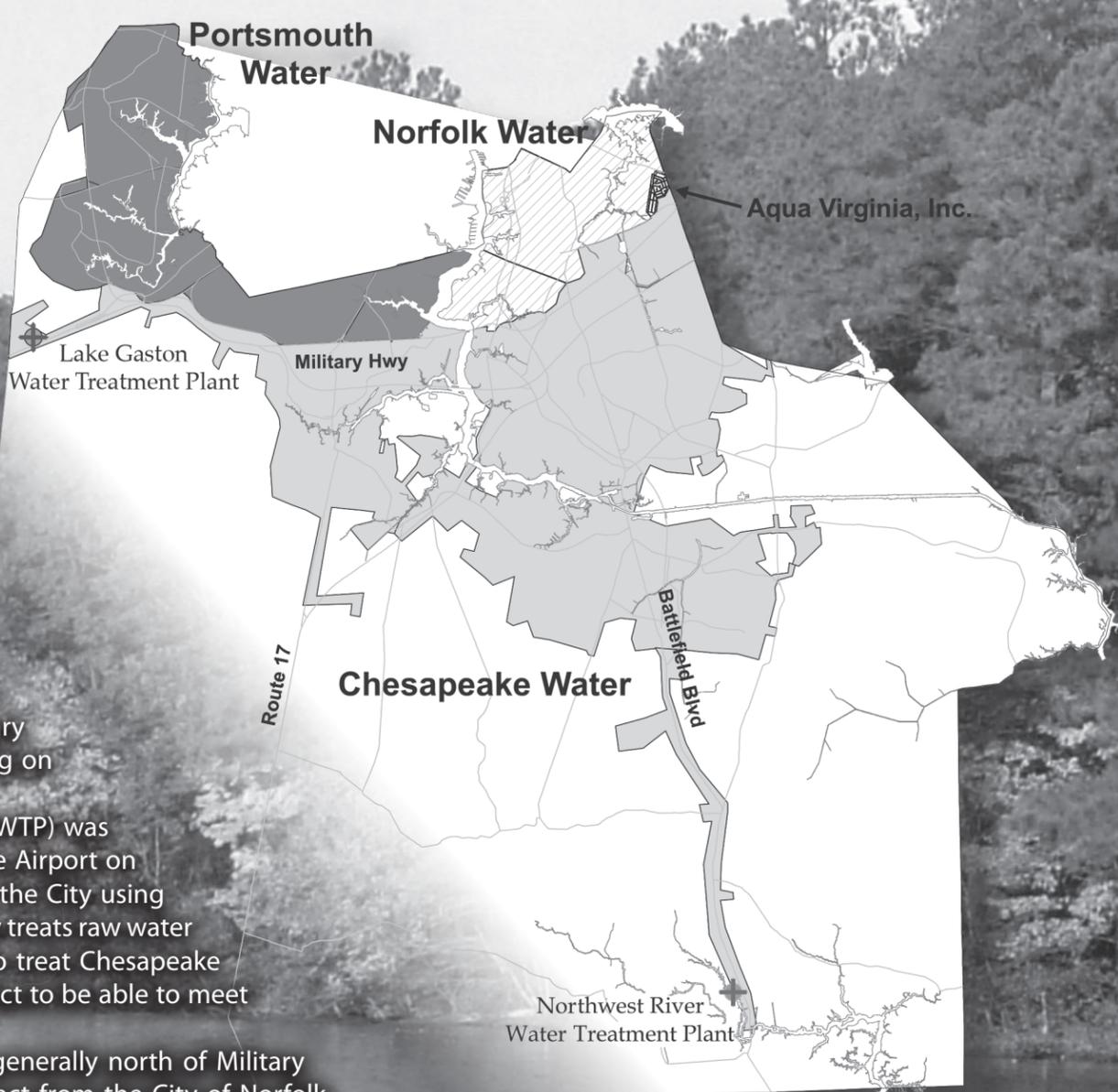
In April 2006, the Lake Gaston Water Treatment Plant (LGWTP) was dedicated. Located west of the Hampton Roads Executive Airport on Virginia Route 58, it provides 8 MGD of treated water for the City using low pressure ultrafiltration technology. The plant currently treats raw water purchased from Norfolk, but will, in the future, be able to treat Chesapeake water from Lake Gaston. With this added source, we expect to be able to meet our projected water demands beyond the year 2040.

Customers in the Indian River and South Norfolk areas, generally north of Military Highway, receive treated water purchased through contract from the City of Norfolk.

Customers in Western Branch and Deep Creek, generally north of Military Highway, receive treated water purchased through contract from the City of Portsmouth. These sources are of excellent quality and also meet or exceed the SDWA standards.

The Western Branch wells are located near the Hampton Roads Executive Airport. This source consists of groundwater from Wells #1 and #3 and the Aquifer Storage and Recovery (ASR) well. Since fluoride occurs naturally in the native water, the wells are used to provide natural fluoridation for treated water from the LGWTP.

A private water company, Aqua Virginia, Inc., has a franchise area in the Norfolk Highlands neighborhood, which serves approximately 523 customers. The Aqua Virginia customer service number is 877-987-2782.



## Drinking Water of the Highest Quality

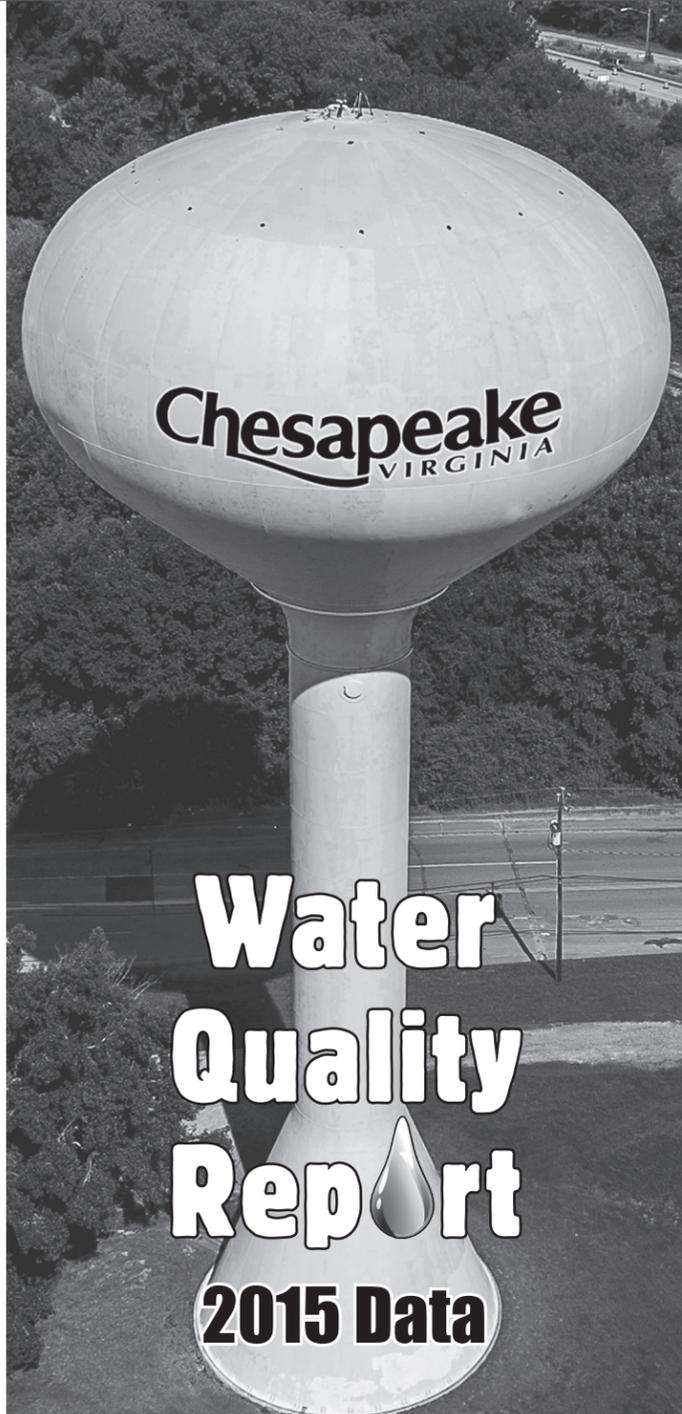
The federal Safe Drinking Water Act (SDWA) sets the standards for drinking water and this annual water quality report is one of the provisions of those standards. Chesapeake meets or surpasses these standards. You can be assured that reliability, quality and affordability are at the heart of our mission in Public Utilities.

In order to produce the approximately 15 million gallons a day for about 65,000 accounts, hundreds of thousands of analyses throughout the treatment process are performed annually for treatment of drinking water. Water quality sampling in approximately 400 homes and businesses around the city tells the story of how well we are doing.



**Chesapeake**  
VIRGINIA

Department of Public Utilities  
Post Office Box 15225  
Chesapeake, VA 23328



# Water Quality Report

2015 Data

City of Chesapeake  
Department of Public Utilities

# 2015 WATER QUALITY TABLE

The table contains the highest level and range, if available, detected by analyses performed in calendar year 2015, or the most recent testing in accordance with the regulations. An additional 151 compounds were tested for and not detected.

## Regulated Substances

Substance (Unit)	MCL	MCLG	NWR & LG			Likely Source	Meets EPA Stds.
			average & range	N	P		
Barium (ppb)	2000	2000	29 ND – 29	30 30 – 40	28 NA	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	Yes
Chlorine, Total (ppm) Running annual average and range	MRDL 4	MRDLG 4	3.27 0.20 – 4.40	2.96 0.20 – 4.40	2.64 0.20 – 3.96	Water additive used to control microbes	Yes
Nitrate (ppm)	10	10	0.11 0.10 – 0.12	0.11 0.02 – 0.23	0.05 ND – 0.219	Runoff from fertilizer use, leaching from septic tanks, sewage, erosion of natural deposits	Yes
Total Organic Carbon (TOC) Annual average and range	TT (1.00 annual average removal ratio)	NA	1.47 1.12 – 1.56 (Ratio of actual organic removal to required removal for the NWR Water Treatment Plant only)	2.40 1.8 – 3.1 (Highest annual avg., Raw values are in ppm)	1.99 1.34 – 2.90 (Highest annual avg., Raw values are in ppm)	Naturally present in environment	Yes
Fluoride (ppm) level detected	MCL/MCLG 4	EP#1 1.00	EP#2 0.92	0.6 0.1 – 0.9	0.7 0.5 – 1.8	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories	Yes

## Lead and Copper (90th Percentile)

Substance (Unit)	MCL	MCLG	NWR & LG 90% Range (2015)	N <sup>1</sup> 90% Range (2014)	P <sup>1</sup> 90% Range (2015)	Likely Source	Meets EPA Stds.
Copper (ppm) [house tap]	AL=1.3	1.3	0.100 ND – 0.235	0.100 ND – 0.148	0.148 ND – 0.175	Corrosion of household plumbing	Yes
Lead (ppb) [house tap]	AL=15	0	ND ND – 15.2	ND ND – 7	2 ND – 14.6	Corrosion of household plumbing	Yes
# of Samples above AL of 1.3 ppm for copper			0 out of 105	0 out of 30	0 out of 31		Yes
# of Samples above AL of 15 ppb for lead			0 out of 105	0 out of 30	0 out of 31		Yes

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water occurs primarily from materials and components associated with service lines and home plumbing. The City of Chesapeake is responsible for providing high quality drinking water, but that do not have health-based standards set under the Safe Drinking Water Act (SDWA). Every five years EPA reviews the list of contaminants and selects no more than 30 unregulated substances to be monitored by public water systems. This monitoring provides a basis for regulatory actions to protect public health.

2. Norfolk and Portsmouth systems are on **Reduced Monitoring**. This means after meeting three consecutive years of lead and copper monitoring with results below the Action Level, EPA reduces sampling frequency to once every three years. The next testing for Norfolk will be in 2017 and Portsmouth will be in 2018.

## Unregulated Contaminant Monitoring Rule (Highest & Range)

EPA uses the Unregulated Contaminant Monitoring Rule (UCMR) program to collect data for substances suspected to be present in drinking water, but that do not have health-based standards set under the Safe Drinking Water Act (SDWA). Every five years EPA reviews the list of contaminants and selects no more than 30 unregulated substances to be monitored by public water systems. This monitoring provides a basis for regulatory actions to protect public health.

Substance	NWR/LG		SN		WB	
	Entry Point	Distribution System	Entry Point	Distribution System	Entry Point	Distribution System
Chlorate (ppb)	730 (220 – 730)	270 (220 – 270)	380 (170 – 380)	470 (380 – 470)	240 (230 – 240)	230 (230 – 230)
Chromium-6 (ppb)	0.08 (ND – 0.08)	0.09 (0.04 – 0.09)	0.38 (0.21 – 0.38)	0.38 (0.22 – 0.38)	0.04 (0.04 – 0.04)	0.06 (0.04 – 0.06)
Chromium, Total (ppb)	ND	ND	0.5 (0.3 – 0.5)	0.4 (0.3 – 0.4)	0.4 (0.4 – 0.4)	0.5 (0.4 – 0.5)
Molybdenum (ppb)	2.6 (ND – 2.6)	2.7 (2.2 – 2.7)	1.5 (1.3 – 1.5)	1.4 (1.4 – 1.4)	ND	ND
Strontium (ppb)	54.2 (2.3 – 54.2)	54.9 (48.9 – 54.9)	37.5 (33.7 – 37.5)	34.2 (33.9 – 34.2)	68.9 (65.5 – 68.9)	65.4 (62.1 – 65.4)

## LT2 Rule

The LT2 Rule is a National Primary Drinking Water Regulation that requires monitoring, reporting, and public notification for all Public Water Systems (PWS) that use surface water or ground water under the direct influence of surface water. The LT2 Rule was developed to improve the control of microbial pathogens, specifically the protozoan *Cryptosporidium* in drinking water, and to address risk trade-offs with disinfection byproducts. The LT2 Rule requires PWSs to monitor their source water (influent water prior to treatment plant) for *Cryptosporidium*, and/or *E. coli*, and turbidity.

*Cryptosporidium* is commonly found in surface water throughout the U.S. Our monitoring indicates the presence of these organisms in our raw water source **only** and not our treated drinking water supply.

Sampling of our **raw water source** has shown the following:

March 2015 - December 2015						
Sampling Event		Method SM 1623	Method SM 1623	Quanti-Tray/2000	Method EPA 180.1 Rev 2	
Date	Sample Point	<i>Cryptosporidium</i>	Giardia	<i>E. coli</i>	Turbidity	
1	3/10/2015	RS001 (NWR)	0.095	<0.095	7.3	13.3
1	3/10/2015	RS002 (LG)	<0.095	<0.095	6.3	2.4
2	11/10/2015	RS001 (NWR)	0.25	<0.062	648.8	4.41
2	11/10/2015	RS002 (LG)	0.089	<0.089	1	1.42
3	12/8/2015	RS001 (NWR)	<0.083	0.083	35	1.89
3	12/8/2015	RS002 (LG)	<0.083	<0.083	1	1.77

## Additional Water Quality Parameters (Non-Regulated)

These substances are not considered harmful, but some can affect the taste and odor of drinking water.

Substances (Unit)	Suggested Limit	NWR & LG highest level & range	N highest level & range	P highest level & range
Aluminum (ppm)	0.05 – 0.20	ND	0.06 ND – 0.06	NA
Ammonia (ppm) *results were the lowest to highest of the monthly average readings	None	0.28* 0.13 – 0.28	0.5* ND – 0.5	NA
Chloride (ppm)	250	82 35 – 82	21 13 – 21	22 NA
Hardness – total (ppm)	None	24 ND – 24	61 26 – 61	30 14 – 30
Manganese (ppm)	0.05	ND	0.03 ND – 0.03	NA
Nickel (ppb)	100	ND	3 ND – 3	NA
pH (pH units) *results were the lowest to highest of the monthly average readings	6.5 – 8.5	NWR* 7.83 7.70 – 7.83	LG* 7.99 7.68 – 7.99	7.9 7.3 – 7.9
Silica (ppm)	None	ND	8 3 – 8	NA
Sodium (ppm)	250	66 63 – 66	27 10 – 27	101 42 – 101
Sulfate (ppm)	250	18 ND – 18	34 22 – 34	59 NA
Zinc (ppm)	5	0.23 0.21 – 0.23	0.20 0.02 – 0.20	NA

## Turbidity

Substance (Unit)	MCL	MCLG	NWR	LG	N	P	Likely Source	Meets EPA Stds.
Turbidity – clarity (NTU) NWR – Turbidity data is from the combined filter effluent. LG – Turbidity data is from the manganese contactors	Max TT, 1	NA	0.19 0.06 – 0.19	0.10 0.03 – 0.10	0.26 NA	0.13 0.03 – 0.13	Soil run-off	Yes
	Min TT, less than or equal to 0.3, greater than 95% of the time	NA	100	100	100	100		

## Microorganisms

Substance	MCL	MCLG	NWR & LG	N	P	Likely Source	Meets EPA Stds.
Total Coliform Bacteria	5.0% or less of monthly samples are positive	0	1.0% August 2015	0%	0%	Naturally present in the environment	Yes

## Disinfection Byproducts

Substance (Unit)	MCL	MCLG	NWR & LG		N		P		Likely Source	Meets EPA Stds.
			Range at Sampling Sites*	Highest Running Average**	Range at Sampling Sites*	Highest Running Average**	Range at Sampling Sites*	Highest Running Average**		
TTHM – Total Trihalomethanes (ppb)	80*	0	19 – 49	33	28 – 69	57	26 – 70	48	By-product of drinking water chlorination	Yes
HAA – Total Haloacetic Acids (ppb)	60*	0	ND – 31	22	19 – 56	43	16 – 55	32	By-product of drinking water chlorination	Yes

\*Range of individual readings. \*\*MCL is the highest "locational" running annual average.

## Radionuclides

Substance (Unit)	MCL	MCLG	NWR & LG <sup>1</sup>		N (2015)	P (2014)	Likely Source	Meets EPA Stds.
			EP#1	EP#2				
Beta/Photon emitters <sup>1</sup> (pCi/L) *Average for the year	50	0	NA	NA	3.0	5.0	Decay of natural and man-made deposits	Yes
Combined radium-226/228 (pCi/L) # next test will be in 2020	5	0	NA	NA	NA	0.6	Erosion of natural deposits	Yes

1. EPA considers 50 pCi/L to be the level of concern for Beta particles  
2. Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of developing cancer.  
3. The NWR system is under reduced monitoring and the schedule for sample collection is once every 6 years. Samples for the NWR Plant were collected in January, 2014 and samples for the Lake Gaston Water Treatment Plant were collected in August, 2014.

## Table Definitions

Substances in your drinking water are routinely reported to the Virginia Department of Health in accordance with Federal and State Regulations. The 2015 Water Quality Table shows the results of our monitoring for the period of January 1<sup>st</sup> to December 31<sup>st</sup> 2015 unless otherwise stated. In the table and elsewhere in this report you will find many terms and abbreviations you might not recognize. The following definitions are provided to help you better understand these terms:

**Additional Water Quality Parameters** – non-regulated compounds that may affect drinking water aesthetics such as taste, odor and color.

**AL (Action Level)** – the concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

**EP (Entry Point)** – the place where water from the source after application of any treatment is delivered to the distribution system.

**EP#1 (Entry Point #1)** – water from the Northwest River Water Treatment Plant.

**EP#2 (Entry Point #2)** – water from the Lake Gaston Water Treatment Plant.

**HAA's (Haloacetic Acids)** – byproducts of disinfection.

**Likely Source** – the major sources of the compounds detected in finished water.

**LG (Lake Gaston)** – compounds detected in the finished water processed at the Lake Gaston Water Treatment Plant (Entry Point #2).

**MCL (Maximum Contaminant Level)** – the highest level of a contaminant that is allowed in drinking water. MCLs are set by EPA as close to the MCLGs as feasible using the best available treatment technology.

**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.

**MRDL (Maximum Residual Disinfectant Level)** – 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.

**MRDLG (Maximum Residual Disinfectant Level Goal)** – 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 contamination.

**mrem/year** – Millirems per year is a measure of radiation.

**N** – finished water supplied by the City of Norfolk for Chesapeake customers.

**NA** – not available.

**ND** – not detected, lab analysis indicates that the contaminant is not present or was below the level of detection based on EPA approved analysis techniques.

**NTU (Nephelometric Turbidity Unit)** – a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

**NWR (Northwest River)** – compounds detected in the finished water processed at the Northwest River Water Treatment Plant (Entry Point #1).

**P (Portsmouth)** – finished water supplied by the City of Portsmouth for Chesapeake customers.

**pCi/L (Picocuries per Liter)** – a measure of radioactivity.

**ppb (parts per billion)** – one part per billion is the equivalent of one minute in 2,000 years, or one penny in \$10,000,000.

**ppm (parts per million)** – One part per million is the equivalent of one minute in 2 years, or one penny in \$10,000.

**TOC (Total Organic Carbon) TT** – This value represents the waterworks' ability to meet TOC percent removal requirements based on an annual average of the monthly percent removal ratios. TOC percent removal requirements are met when the value is greater than or equal to 1.00.

**TT (Treatment Technique)** – a required process intended to reduce the level of a contaminant in drinking water.

**TTHMs (Total Trihalomethanes)** – compounds formed during the disinfection of drinking water.

## Want More Information?

If you have any questions about this report or need more information, please contact the Water Quality Laboratory at 757-382-3550. The following telephone numbers are provided for specific issues or questions:

Customer Service (billing).....757-382-6352  
Laboratory (water quality).....757-382-3550  
Water Quality Hotline.....757-382-6360

Visit our web site for online information at [www.CityofChesapeake.net](http://www.CityofChesapeake.net), then click on "Public Utilities."

Contact us by E-mail at [water@CityofChesapeake.net](mailto:water@CityofChesapeake.net).

Our Business Office is located at City Hall, second floor, 306 Cedar Road, Chesapeake, VA 23322. Normal business hours are 8:00 a.m. to 5:00 p.m., Monday through Friday. Address correspondence to Chesapeake Department of Public Utilities, 306 Cedar Road, Chesapeake, VA 23322.

Director of Public Utilities ..... David E. Jurgens, P.E.  
Assistant Director ..... Theodore F. Garty, P.E.  
Utility Engineer ..... T. Edward West, P.E.  
Fiscal Administrator..... Tracy S. Gregory, CPA  
Customer Service Manager..... S. Chase Cowan  
Water Resources Management Administrator ..... A. Craig Maples  
Water and Wastewater Administrator ..... Heather R. Stanton, P.E.

## Waterworks Permit Identification Numbers

Northwest River System (including the Lake Gaston Water Treatment Plant) – PWSID 3550051  
South Norfolk/Indian River System – PWSID 3550052  
Western Branch System – PWSID 3550050

## Public Participation

Public Utilities is an enterprise department and is funded by customer fees, not taxes. We are, however, a part of the City of Chesapeake government. Our legislative body is the Chesapeake City Council, which holds hearings on budget and other financial matters, approves contracts, and considers ordinances that create or amend local laws. Some of these matters affect the operation of Public Utilities. The City Council meets on the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> Tuesdays of each month at 6:30 p.m. in the City Council Chambers, First Floor, City Hall Building, at 306 Cedar Road. The meetings are televised live on WCTV Channel 48, the local government access cable channel, and on the City website, [www.CityOfChesapeake.net](http://www.CityOfChesapeake.net). Agendas for upcoming meetings are available on the City's website, or may be requested from the City Clerk's office at 757-382-6151.

## Information for Special Populations

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as those with cancer and undergoing chemotherapy, those who have undergone an organ transplant, persons 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 Environmental Protection Agency/Centers for Disease Control guidelines on appropriate means to reduce the risk of infection by *Cryptosporidium* and other microbiological contaminants are available from the Safe Drinking Water Act Hotline at 1-800-426-4791.

## Information about Source Water

A detailed source water assessment was conducted in 2001 by the Hampton Roads Planning District Commission. The Northwest River, like other surface water sources, was determined to have a high susceptibility to contamination. Our deep wells, like other groundwater sources, were determined to be low in susceptibility to contamination using the criteria developed by the state in its approved Source Water Assessment Program. The report consists of maps showing the source water assessment area, an inventory of known land use activities of concern, and documentation of any known contamination within the last 5 years. The report is on file at the Public Utilities Department.

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 activity. Substances that may be present in source water include: (1) microbial contaminants, such as viruses and bacteria, which may come from wildlife, sewage treatment plants, septic systems, and agricultural livestock operations; (2) inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, mining, or farming; (3) pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses; (4) organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and may also originate from gas stations, urban stormwater runoff, and septic systems; (5) radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

To ensure the tap water is safe to drink, the EPA prescribes regulations that limit the amount of contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide similar 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 Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791 or accessing the EPA website at [www.epa.gov/safewater/](http://www.epa.gov/safewater/).