



NEW YORK CITY 2015 DRINKING WATER SUPPLY AND QUALITY REPORT

NYC

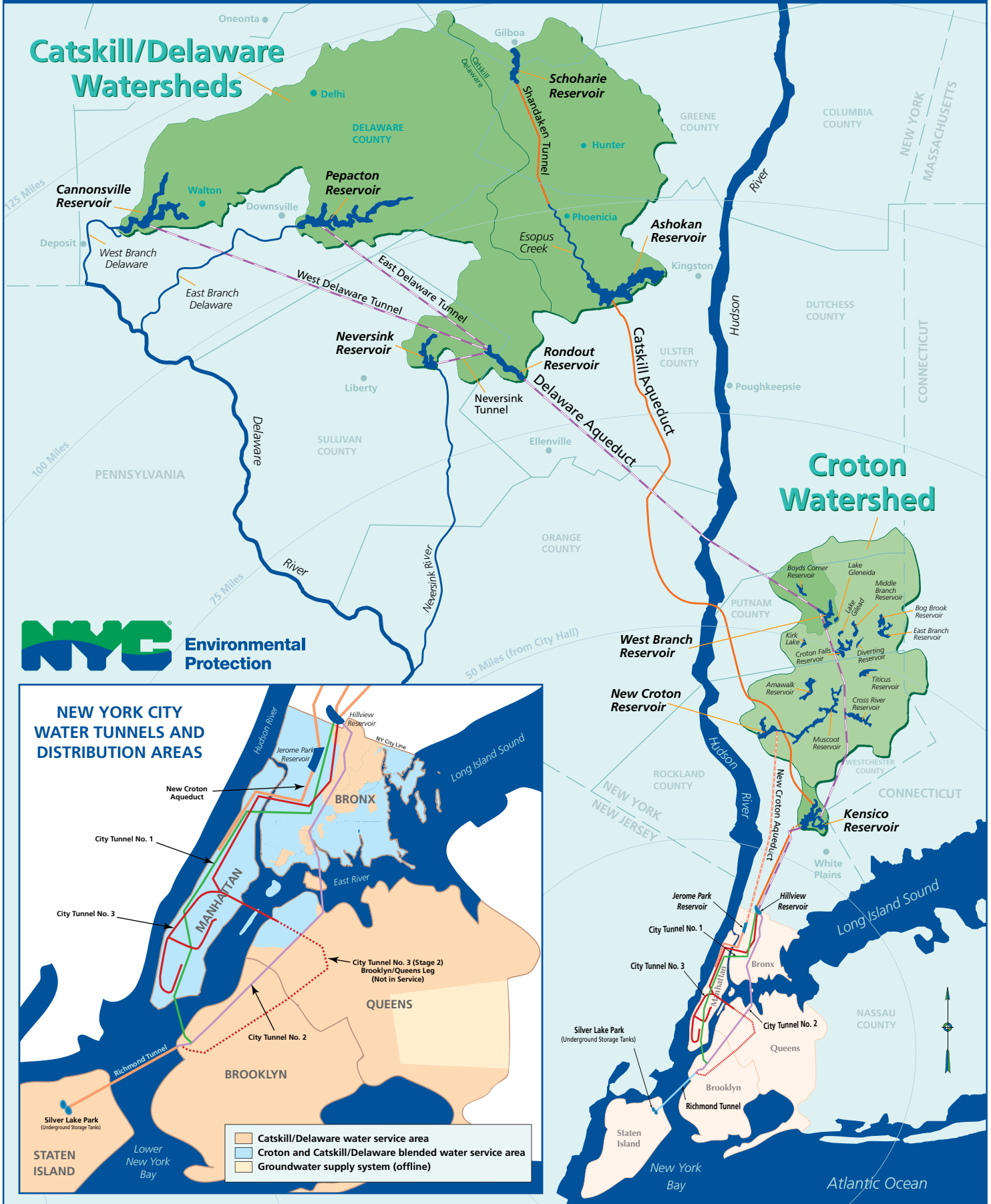
**Environmental
Protection**

Bill de Blasio
Mayor

Emily Lloyd
Commissioner

*Delaware Bypass Tunnel Shaft
Under Construction*

New York City's Water Supply System





Emily Lloyd
Commissioner

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Dear Friends:

New York City is fortunate to have some of the cleanest and best-tasting drinking water of any city in the world. We know that our City's water is great because scientists from the Department of Environmental Protection (DEP) test its quality hundreds of times each day, and hundreds of thousands of times each year.

In fact, our water quality scientists collect more than 47,000 samples of water each year. Those samples are gathered from our expansive reservoir system that stretches more than 125 miles into the Hudson Valley and Catskill Mountains. Water samples are also collected from streams that feed our reservoirs, tunnels that deliver our water to the City, and roughly 1,000 street-side sampling stations in the five boroughs. Those water samples are then delivered to one of DEP's four state-of-the-art laboratories where they are analyzed more than 570,000 times annually.

The data from this extensive scientific analysis can be found in the pages of this report. The conclusion of this work is simple: New York City has world-class drinking water.

We hope this year's report also provides peace of mind to our fellow New Yorkers who are concerned about lead and other potential contaminants that have affected a few drinking water supplies across the country this year. New York City is fortunate to have a protected and well-regulated watershed that surrounds our reservoirs. DEP is also vigilant about properly treating the City's water to prevent the type of incidents that transpired elsewhere. Because DEP takes these deliberate steps to protect our water supply and distribution system, we are confident that incidents such as these will not happen in New York City.

The City also benefits from an amazing system of reservoirs, tunnels and other infrastructure that collect and convey more than one billion gallons of drinking water each day. The aqueducts that carry water from the mountains to the City are considered a marvel of modern engineering. To keep our water system in a state of good repair, DEP has continued to make investments to maintain and improve our infrastructure. You will find details about several recent infrastructure projects in the pages that follow.

I am proud to present this report to the 8.5 million New Yorkers who rely on DEP to deliver safe, clean, high-quality drinking water every day.

Sincerely,

A handwritten signature in black ink that reads 'Emily Lloyd'. The signature is fluid and cursive, with a large, sweeping 'L' and 'y'.

Emily Lloyd
Commissioner

NEW YORK CITY'S WATER SUPPLY

The New York City Water Supply System provides approximately one billion gallons of safe drinking water daily to more than 8.5 million residents of New York City, and to the millions of tourists and commuters who visit the City throughout the year, as well as about 110 million gallons a day to approximately one million people living in Westchester, Putnam, Ulster, and Orange Counties. In all, the New York City Water Supply System provides nearly half the population of New York State with high-quality drinking water.

To ensure that high-quality drinking water is safe, reliable, and sufficient for now and the future, the Department of Environmental Protection (DEP) continues to make significant investments in water supply related infrastructure projects. Highlighted throughout this report, are some of the larger projects that are ongoing, or were completed in the past year to meet new regulatory requirements for treatment and to improve water supply reliability and resiliency. The projects include:

- ◆ Croton Water Filtration Plant
- ◆ City Water Tunnel No. 3
- ◆ Water Main Replacements
- ◆ Delaware Bypass Tunnel
- ◆ Gilboa Dam
- ◆ Catskill-Delaware Interconnection
- ◆ Rehabilitation of Shaft 3 - City Water Tunnel No. 1
- ◆ Staten Island Siphon

SOURCES OF NEW YORK CITY'S DRINKING WATER

New York City's surface water is supplied from a network of 19 reservoirs and three controlled lakes in a nearly 2,000-square-mile watershed, roughly the size of the State of Delaware, which extends 125 miles north and west of New York City. The New York City Water Supply System, Public Water System Identification Number (PWSID) NY7003493, consists of three individual water supplies: the Catskill/Delaware supply, located in Delaware, Greene, Schoharie, Sullivan, and Ulster Counties; the Croton supply, New York City's original upstate supply, in Putnam, Westchester, and Dutchess Counties; and a groundwater supply in southeastern Queens.

WATER SUPPLY OPERATIONS

The New York City Water Supply System map, located inside the front cover of this report, displays the Catskill/Delaware, Croton, and the groundwater supply system, and their distribution service areas. In 2015, New York City received a blend of drinking water from the Catskill/Delaware and Croton supplies, with the Catskill/Delaware supplying approximately 94 percent of the water, and approximately 6 percent supplied by Croton. Water from the groundwater supply was not fed into distribution in 2015.



Croton Water Filtration Plant

WATER TREATMENT

CATSKILL/DELAWARE SUPPLY

Due to the very high-quality of our Catskill/Delaware supply, New York City is one of only five large cities in the country with a surface drinking water supply that does not require filtration as a form of treatment. Rather, the Catskill/Delaware supply operates under a Filtration Avoidance Determination (FAD) and the water from the supply is treated using two forms of disinfection to reduce microbial risk. First, water is disinfected with chlorine before arriving at the Catskill/Delaware Ultraviolet (UV) Disinfection Facility. Chlorine is a common disinfectant added to kill germs and stop bacteria from growing on pipes. The UV Disinfection Facility, located on a New York City-owned, 153-acre property in the towns of Mount Pleasant and Greenburgh in Westchester County, is the largest of its kind in the world, consisting of fifty-six 40-million-gallons-per-day UV disinfection units, and is designed to disinfect a maximum of 2.4 billion gallons of water per day. At the facility, water is again disinfected as it flows under UV light. Exposure to UV light provides an additional measure to protect against potentially harmful microorganisms, such as *Cryptosporidium* and *Giardia*. UV treatment is a disinfection process that works by exposing the water to special lamps that emit UV light, which can inactivate harmful microorganisms. UV treatment does not change the water chemically, as nothing is added except energy. DEP also adds food grade phosphoric acid, sodium hydroxide, and fluoride to the water before sending it into distribution. Phosphoric acid creates a protective film on pipes that reduces the release of metals, such as lead, from household plumbing. Sodium hydroxide is added to raise the pH and reduce corrosivity, which also reduces potential exposure to lead.

DEP is one of the many water suppliers in New York State that, since 1966, has been treating its drinking water with a controlled, low level of fluoride for consumer dental health protection. The DEP target dose of fluoride was lowered from 0.8 mg/L to 0.7 mg/L on May 29, 2015, following updated United States Department of Health and Human Services recommendations. During 2015, other than brief outages to perform preventative and corrective maintenance, DEP provided continuous fluoride treatment on the Catskill/Delaware supply. In total, fluoride was off-line for less than one percent of the year.

CROTON WATER FILTRATION PLANT

The Croton water supply, because of factors related to the surrounding watershed area and water quality, is not covered by the FAD. Therefore, New York City built a filtration plant for the Croton water supply under a Consent Decree entered into between New York City, the United States, and the State of New York. The Croton Water Filtration Plant began delivery of water into distribution on May 7, 2015. The plant uses treatment processes involving coagulation, dissolved air floatation, filtration, and disinfection. During coagulation, chemicals are added to untreated water, causing any natural particulates to bunch together to become larger particles called floc. Most of the floc floats to the top and is skimmed off and any that remains is removed by filtration. The water is disinfected with chlorine and UV light. The treatment process helps to reduce color levels, the risk of microbiological contamination, and disinfection by-products, and it ensures compliance with stricter water quality standards. In addition, as with the Catskill/Delaware supply, Croton water is also treated with food grade phosphoric acid, sodium hydroxide, and fluoride.

During 2015, other than a one week outage from December 23 to 31 to help trace a leak in the distribution system, and brief disruptions resulting from pump changes and electrical supply disruptions, DEP provided continuous fluoride treatment to the Croton supply. In total, fluoride was off-line for less than three percent of the year.



CITY WATER TUNNEL No. 3

For over 45 years, New York City has been building City Water Tunnel No. 3. Being built in stages, City Water Tunnel No. 3 is one of the largest capital projects in New York City's history. Begun in 1970, City Water Tunnel No. 3 will enhance and improve New York City's water delivery system and create redundancy to allow the City to inspect and repair City Water Tunnels Nos. 1 and 2 for the first time since they were put into service in 1917 and 1936, respectively.

- ◆ The 13-mile Stage 1 section of City Water Tunnel No. 3 went into service in August 1998. It runs from Hillview Reservoir in Yonkers, through the Bronx, down Manhattan across Central Park, and into Astoria, Queens.
- ◆ Stage 2 of City Water Tunnel No. 3 consists of the Brooklyn/Queens leg and the Manhattan leg.
 - ◆ Tunneling on the 9-mile Manhattan leg of Stage 2 began in 2003, and was completed in 2008. Between 2008 and 2013, 10 new supply shafts were constructed that integrate the new tunnel section with the existing distribution system. The Manhattan leg was activated on October 16, 2013.
 - ◆ The Brooklyn/Queens leg is a 5.5-mile section in Brooklyn that connects to a 5-mile section in Queens. New York City completed the Brooklyn/Queens leg of the tunnel in May 2001, and substantially completed six of the eight shafts in 2006. The project is expected to be online by 2023. When activated, the Brooklyn/Queens leg will deliver water to Brooklyn, Queens, and Staten Island.



DRINKING WATER QUALITY

REGULATION OF DRINKING WATER

The 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 activities. Contaminants that may be present in source water include: microbial contaminants, inorganic contaminants, pesticides and herbicides, organic chemical contaminants, and radioactive contaminants.

In order to ensure that tap water is safe to drink, the New York State Department of Health (NYSDOH) and the United States Environmental Protection Agency (EPA) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The NYSDOH and the federal Food and Drug Administration's (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. The presence of contaminants does not necessarily indicate that water poses a health risk. These regulations also establish the minimum amount of testing and monitoring that each system must undertake to ensure that the tap water is safe to drink.

DEP's water quality monitoring program – far more extensive than that required by law – demonstrates that the quality of New York City's drinking water remains high and meets all health-related State and federal drinking water standards. Additional information concerning drinking water can be found at: www.epa.gov/safewater/ or www.health.ny.gov.

DRINKING WATER SAMPLING AND MONITORING

DEP monitors the water in the distribution system, upstate reservoirs and feeder streams, and wells that are sources for New York City's drinking water supply. Certain water quality parameters are monitored continuously as the water enters the distribution system, and DEP regularly tests water quality at nearly 1,000 water quality sampling stations throughout New York City. DEP conducts analyses for a broad spectrum of microbiological, chemical, and physical measures of quality. In 2015, DEP performed 383,200 analyses on 31,700 samples from the distribution system, meeting all State and federal monitoring requirements. Additionally, DEP performed 193,500 analyses on 15,500 samples from the upstate reservoir watersheds to support FAD watershed protection programs and to optimize water quality. Results of this regular monitoring are an indicator of whether New York City's drinking water meets all health-based and other drinking water standards. The results of the tests conducted in 2015 under DEP's distribution system monitoring program are summarized in the tables starting on following page.

HOW TO READ THE NEW YORK CITY DRINKING WATER QUALITY TESTING RESULTS

The following section of the *Drinking Water Supply and Quality Report* compares the quality of your tap water to federal and State standards for each parameter (if applicable). Table 1 reflects the compliance monitoring results for all regulated and non-regulated parameters, the number of samples collected, the range of values detected, the average of the values detected, and the possible sources of the parameters, unless otherwise footnoted. The monitoring frequency of each parameter varies and is parameter specific. Data presented are for the Catskill/Delaware and Croton systems, which were the only sources of water in 2015. Table 2 represents those parameters monitored for, but not detected in any sample. The monitoring results indicate that our drinking water met all drinking water standards in 2015.

Most of our data are representative of 2015 testing; the concentrations of these parameters or contaminants do not change frequently. For previous years' results you can view our reports at: www.nyc.gov/dep.

DEFINITIONS

ACTION LEVEL (AL):

The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements that a water system must follow. An exceedance occurs if more than 10 percent of the samples exceed the Action Level.

MAXIMUM CONTAMINANT LEVEL (MCL):

The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible, using the best available treatment technology.

MAXIMUM CONTAMINANT LEVEL GOAL (MCLG):

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.

MAXIMUM RESIDUAL DISINFECTANT LEVEL (MRDL):

The highest level of a disinfectant allowed in drinking water. The addition of a disinfectant is necessary for control of microbial contaminants.

MAXIMUM RESIDUAL DISINFECTANT LEVEL GOAL (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 contamination.

TREATMENT TECHNIQUE (TT):

A required process intended to reduce the level of a contaminant in drinking water.

90TH PERCENTILE VALUE:

The values reported for lead and copper represent the 90th percentile. A percentile is a value on a scale of 100 that indicates the percent of a distribution that is equal to or below the value. The 90th percentile is equal to or greater than 90 percent of the lead and copper values detected at your water system.

UNITS & ABBREVIATIONS:

CFU/mL = colony forming units per milliliter

mg/L = milligrams per liter (10^{-3} grams per liter)

MPN/100mL = most probable number per 100 milliliters

ND = lab analysis indicates parameter is not detected

NTU = nephelometric turbidity units

µg/L = micrograms per liter (10^{-6} grams per liter)

µS/cm = microsiemens per centimeter

NDL = no designated limit

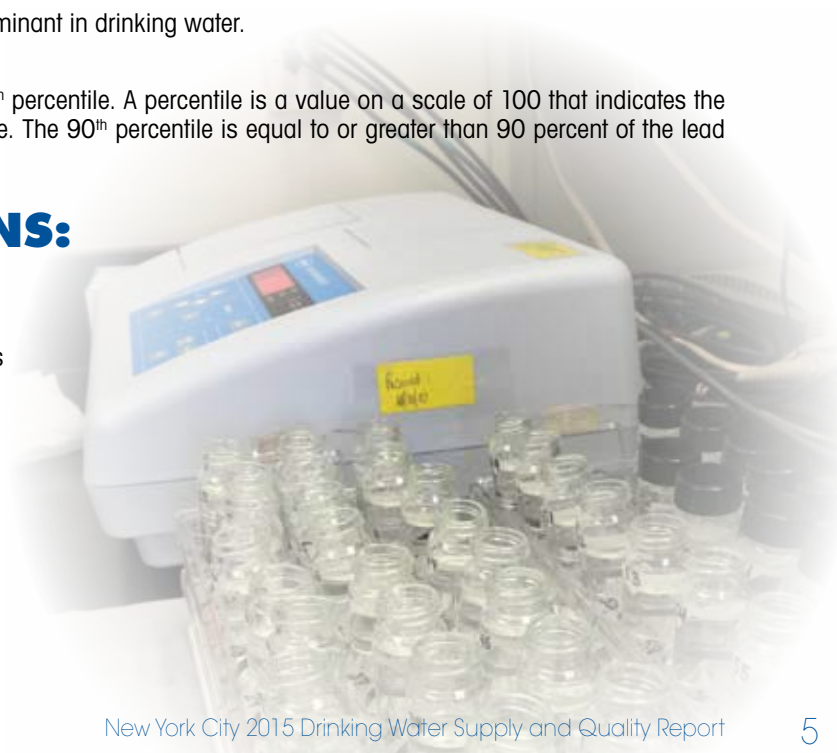


TABLE 1: DETECTED PARAMETERS

THIS TABLE SUMMARIZES THE MONITORING RESULTS FOR ALL DETECTED PARAMETERS

CONVENTIONAL PHYSICAL AND CHEMICAL PARAMETERS							
PARAMETER	NYSDOH MCL (Highest Level Allowed)	EPA MCLG (Ideal Goal)	# SAMPLES	RANGE	AVERAGE	MCL VIOLATION	SOURCES IN DRINKING WATER
Alkalinity (mg/L CaCO ₃)	-		291	13.5 - 76.7	20.8	No	Erosion of natural deposits
Aluminum (µg/L)	50 - 200 ⁽¹⁾		291	10 - 54	25	No	Erosion of natural deposits
Barium (mg/L)	2	2	291	0.013 - 0.045	0.018	No	Erosion of natural deposits
Calcium (mg/L)	-		292	5.8 - 28.2	8.2	No	Erosion of natural deposits
Chlorate (mg/L)	- ⁽²⁾		6	0.044 - 0.130	0.082	No	By-product of drinking water chlorination using sodium hypochlorite
Chloride (mg/L)	250		291	11 - 101	20	No	Naturally occurring; road salt
Chlorine Residual, Free (mg/L)	4 ⁽³⁾		15,550	0.00 - 1.8	0.65 ⁽³⁾	No	Water additive for disinfection
Chromium (µg/L)	100		297	ND - 1	ND	No	Erosion of natural deposits
Chromium VI (µg/L)	- ⁽²⁾		6	ND - 0.057	0.042	No	Erosion of natural deposits
Color - distribution system (color units - apparent)	-		14,065	2 - 35	6	No	Presence of iron, manganese, and organics in water
Color - entry points (color units - apparent)	15 ⁽⁴⁾		1,485	3 - 8	6	No	Presence of iron, manganese, and organics in water
Copper (mg/L)	1.3 ⁽⁵⁾	1.3	294	0.002 - 0.083	0.007	No	Corrosion of household plumbing systems; erosion of natural deposits
Corrosivity (Langelier index)	0 ⁽¹⁾⁽⁶⁾		291	-2.74 to -1	-2.2	No	
Fluoride (mg/L)	2.2 ⁽⁴⁾	4.0	1,976	ND - 0.9	0.7	No	Water additive which promotes strong teeth; erosion of natural deposits
Hardness (mg/L CaCO ₃)	-		292	20 - 110	29	No	Erosion of natural deposits
Hardness (grains/gallon[US]CaCO ₃) ⁽⁷⁾	-		292	1.1 - 6.3	1.6	No	Erosion of natural deposits
Iron (µg/L)	300 ⁽⁴⁾⁽⁸⁾		294	ND - 82	35	No	Naturally occurring
Lead (µg/L)	15 ⁽⁵⁾	0	294	ND - 8	ND	No	Corrosion of household plumbing systems; erosion of natural deposits
Lithium (mg/L)	-		292	ND - 0.002	ND	No	Erosion of natural deposits
Magnesium (mg/L)	-		292	1.2 - 9.6	2	No	Erosion of natural deposits
Manganese (µg/L)	300 ⁽⁴⁾⁽⁸⁾		294	ND - 37	14	No	Naturally occurring
Nickel (µg/L)	-		291	ND - 0.9	ND	No	Erosion of natural deposits
Nitrate (mg/L nitrogen)	10	10	291	0.1 - 0.55	0.2	No	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
pH (pH units)	6.8 - 8.2 ⁽⁹⁾		15,549	6.8 - 10.9	7.3	No	
Phosphate, Ortho- (mg/L)	1-4 ⁽⁹⁾		15,550	0.69 - 3.17	2.12	No	Water additive for corrosion control
Potassium (mg/L)	-		292	0.5 - 2.6	0.8	No	Erosion of natural deposits
Silica [silicon oxide] (mg/L)	-		291	1.6 - 6.8	2.7	No	Erosion of natural deposits
Sodium (mg/L)	NDL ⁽⁴⁾⁽¹⁰⁾		292	9 - 63	14	No	Naturally occurring; road salt; water softeners; animal waste
Specific Conductance (µS/cm)	-		15,550	82 - 522	121	No	
Strontium (µg/L)	-		298	19 - 91	28	No	Erosion of natural deposits
Sulfate (mg/L)	250		291	3.8 - 18	5.3	No	Naturally occurring
Temperature (°F)	-		15,550	33 - 87	54	No	
Total Dissolved Solids (mg/L)	500 ⁽¹⁾		291	40 - 281	74	No	Metals and salts naturally occurring in the soil; organic matter

CONVENTIONAL PHYSICAL AND CHEMICAL PARAMETERS (continued)

PARAMETER	NYSDOH MCL (Highest Level Allowed)	EPA MCLG (Ideal Goal)	# SAMPLES	RANGE	AVERAGE	MCL VIOLATION	SOURCES IN DRINKING WATER
Total Organic Carbon (mg/L carbon)	-		291	1.3 - 2.1	1.6	No	Organic matter naturally present in the environment
Turbidity ⁽¹¹⁾ - distribution system (NTU)	5 ⁽¹²⁾		14,065	ND - 5.5	1.1 ⁽¹²⁾	No	Soil runoff
Turbidity ⁽¹¹⁾ - source water (NTU)	5 ⁽¹³⁾		-	-	1.7 ⁽¹³⁾	No	Soil runoff
Turbidity ⁽¹¹⁾ - filtered water (NTU)	TT ⁽¹⁴⁾		-	-	0.11 ⁽¹⁴⁾	No	Soil runoff
UV 254 Absorbency (cm ⁻¹)	-		290	0.016 - 0.034	0.028	No	Organic matter naturally present in the environment
Zinc (mg/L)	5 ⁽⁴⁾		294	ND - 0.02	0.003	No	Naturally occurring

ORGANIC PARAMETERS

PARAMETER	NYSDOH MCL (Highest Level Allowed)	EPA MCLG (Ideal Goal)	# SAMPLES	RANGE	AVERAGE	MCL VIOLATION	SOURCES IN DRINKING WATER
Bromochloroacetic Acid (µg/L)	50		298	ND - 4.5	1.6	No	By-product of drinking water chlorination
Chloropicrin (µg/L)	50		22	0.20 - 0.72	0.46	No	By-product of drinking water chlorination
Chloral Hydrate (µg/L)	50		22	1.29 - 11.40	5.21	No	By-product of drinking water chlorination
Di(2-ethylhexyl)phthalate (µg/L)	6		87	ND - 0.92	ND	No	Probable source is sample contamination from plastic gloves or air particulates.
1,4-Dioxane (µg/L)	50		3	ND - 0.082 ⁽¹⁵⁾	ND	No	May enter the environment through its use as a solvent and in textile processing, printing processes, and detergent preparations.
Haloacetic Acid 5 (HAA5) (µg/L)	60 ⁽¹⁶⁾		298	15 - 56	43 ⁽¹⁶⁾	No	By-product of drinking water chlorination
Haloacetonitriles (HANs) (µg/L)	50		22	1.06 - 4.65	2.73	No	By-product of drinking water chlorination
Halogenated Ketones (HKs) (µg/L)	50		22	1.59 - 4.89	2.74	No	By-product of drinking water chlorination
Hexachlorocyclopentadiene (µg/L)	5		21	ND - 0.071	ND	No	Discharge from chemical factories
Total Organic Halogen (µg/L)	-		291	86 - 213	149	No	By-product of drinking water chlorination
Total Trihalomethanes (TTHM) (µg/L)	80 ⁽¹⁶⁾		289	9.1 - 64	42 ⁽¹⁶⁾	No	By-product of drinking water chlorination

MICROBIAL PARAMETERS

PARAMETER	NYSDOH MCL (Highest Level Allowed)	EPA MCLG (Ideal Goal)	# SAMPLES	RANGE	# SAMPLES POSITIVE	AVERAGE	HIGHEST MONTH % POSITIVE	MCL VIOLATION	SOURCES IN DRINKING WATER
Total Coliform Bacteria (% of samples positive/month)	5%	0	9,860	-	56	-	2%	No	Naturally present in the environment
<i>E. coli</i> (MPN/100mL)	⁽¹⁷⁾	0	9,860	-	0	-	0%	No	Human and animal fecal waste
Heterotrophic Plate Count (CFU/mL)	TT	-	12,226	ND - 5,700	165	2	-	No	Naturally present in the environment

LEAD AND COPPER RULE SAMPLING AT RESIDENTIAL WATER TAPS: JANUARY TO DECEMBER 2015

PARAMETER	NYSDOH AL	EPA MCLG (Ideal Goal)	90% OF YOUR LEVELS WERE LESS THAN	RANGE	# SAMPLES EXCEEDING AL	EXCEEDANCE	SOURCES IN DRINKING WATER
Copper (mg/L)	90% of homes less than 1.3	1.3	0.192	0.003 - 0.779	0 out of 350	No	Corrosion of household plumbing systems
Lead (µg/L)	90% of homes less than 15	0	12	ND - 110	23 out of 350	No	Corrosion of household plumbing systems

TABLE 2: NOT-DETECTED PARAMETERS

THE FOLLOWING PARAMETERS WERE MONITORED FOR, BUT NOT DETECTED IN ANY SAMPLE

CONVENTIONAL PHYSICAL AND CHEMICAL PARAMETERS

Antimony, Arsenic, Asbestos *, Beryllium, Bismuth-212 *, Bismuth-214 *, Cadmium, Cesium-134 *, Cesium-137 *, Cyanide, Gross Alpha *, Gross Beta *, Lead-212 *, Lead-214 *, Mercury, Nitrite, Potassium-40 *, Radium-226 *, Radium-228 *, Selenium, Silver, Thallium, Thallium-208 *, Thorium-234 *, Uranium *, Uranium-235 *

ORGANIC PARAMETERS

Principal Organic Contaminants:

Benzene, Bromobenzene, Bromochloromethane, Bromomethane, n-Butylbenzene, sec-Butylbenzene, tert-Butylbenzene, Carbon tetrachloride, Chlorobenzene, Chloroethane, Chloromethane, 2-Chlorotoluene, 4-Chlorotoluene, Dibromomethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Dichlorodifluoromethane, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethene, cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, 1,2-Dichloropropane, 1,3-Dichloropropane, 2,2-Dichloropropane, 1,1-Dichloropropene, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, p-Isopropyltoluene, Methylene chloride, n-Propylbenzene, Styrene, 1,1,1,2-Tetrachloroethane, 1,1,1,2,2-Tetrachloroethane, Tetrachloroethylene, Toluene, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethene, Trichlorofluoromethane, 1,2,3-Trichloropropane, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, m-Xylene, o-Xylene, p-Xylene

Specified Organic Contaminants:

Alachlor, Aldicarb (Temik), Aldicarb sulfone, Aldicarb sulfoxide, Aldrin, Atrazine, Benzo(a)pyrene, Butachlor, Carbaryl, Carbofuran (Furadan), Chlordane, 2,4-D, Dalapon, 1,2-Dibromo-3-chloropropane, Dicamba, Dieldrin, Di(2-ethylhexyl)adipate, Dinoseb, Diquat, Endothall, Endrin, Ethylene dibromide (EDB), Glyphosate, Heptachlor, Heptachlor epoxide, Hexachlorobenzene, 3-Hydroxycarbofuran, Lindane, Methomyl, Methoxychlor, Methyl-tertiary-butyl-ether (MTBE), Metolachlor, Metribuzin, Oxamyl (Vydate), Pentachlorophenol, Picloram, Polychlorinated biphenyls (PCBs), Propachlor, Simazine, Toxaphene, 2,4,5-TP (Silvex), 2,3,7,8-TCDD (Dioxin), Vinyl chloride

Unspecified Organic Contaminants:

Acenaphthene, Acenaphthylene, Acetochlor, Acetone, Acifluorfen, Allyl chloride, Ametryn, tert-Amyl ethyl ether, tert-Amyl methyl ether, Anthracene, Bentazon, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[g,h,i]perylene, alpha-BHC, beta-BHC, delta-BHC, Bromacil, 2-Butanone (MEK), tert-Butyl alcohol, Butylate, Butylbenzylphthalate, tert-Butyl ethyl ether, Carbon disulfide, Caffeine, Carboxin, Chloramben, alpha-Chlordane, gamma-Chlordane, Chlorobenzilate, 2-Chlorobiphenyl, 1-Chlorobutane, Chloroneb, Chlorothalonil (Draconil, Bravo), Chlorpropham, Chlorpyrifos (Dursban), Chrysene, Cycloate, 2,4-DB, DCPA(Dacthal), DCPA (total mono & diacid degradate), 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, DEF(Merphos), Diazinon, Dibenz[a,h]anthracene, Di-n-Butylphthalate, 3,5-Dichlorobenzoic acid, 2,3-Dichlorobiphenyl, Dichlorprop, Dichlorvos (DDVP), Diethyl ether, Diethylphthalate, Di-isopropyl ether, Dimethoate, Dimethylphthalate, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Di-N-octylphthalate, Diphenamid, Disulfoton, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin aldehyde, EPTC, Ethoprop, Ethyl methacrylate, Etridiazole, Fenamiphos, Fenarimol, Fluoranthene, Fluorene, Fluridone, alpha-HCH, beta-HCH, delta-HCH, 2,2',3,3',4,4',6-Heptachlorobiphenyl, Heptachlor epoxide (isomer B), 2,2',4,4',5,6'-Hexachlorobiphenyl, Hexachloroethane, Hexazinone, Indeno[1,2,3-cd]pyrene, Isophorone, Malathion, Methiocarb, Methyl acetate, Methyl iodide, Methyl paraoxon, 4-Methyl-2-pentanone (MIBK), Mevinphos, MGK264-isomer a, MGK264-isomer b, Molinate, Naphthalene, Napropamide, 4-Nitrophenol, cis-Nonachlor, trans-Nonachlor, Norflurzon, 2,2',3,3',4,5',6,6'-Octachlorobiphenyl, Paraquat, Parathion, Pebulate, Pendimethalin, 2,2',3',4,6-Pentachlorobiphenyl, Pentachloroethane, Permethrin (cis- & trans-), Phenanthrene, Prometryn, Pronamide, Propazine, Propoxur (Baygon), Pyrene, 2,4,5-T, Simetryn, Stirofos, Tebuthiuron, Terbacil, Terbufos, Terbutylazine, Terbutryn, 2,2',4,4'-Tetrachlorobiphenyl, Tetrahydrofuran, Thiobencarb, Triademefon, 2,4,5-Trichlorobiphenyl, Trichlorotrifluoroethane (Freon 113), Tricyclazole, Trifluralin, Vernolate

Unregulated Contaminant Monitoring Rule (UCMR3) Parameters:

Androstenedione, Bromochloromethane, Bromomethane, 1,3-Butadiene, Chlorodifluoromethane, Chloromethane, Cobalt, 1,1-Dichloroethane, Equilin, Estradiol, Estriol, Estrone, Ethynylestradiol, Molybdenum, Perfluorobutanesulfonic acid (PFBS), Perfluoroheptanoic acid (PFHpA), Perfluorohexanesulfonic acid (PFHxS), Perfluorononanoic acid (PFNA), Perfluorooctanesulfonic acid (PFOS), Perfluorooctanoic acid (PFOA), Testosterone, 1,2,3-Trichloropropane, Vanadium

FOOTNOTES

- (1) EPA Secondary MCL: NYSDOH has not set an MCL for this parameter.
 - (2) Chlorate and chromium (VI), also known as hexavalent chromium, were monitored for in June, September, and December 2015 under the requirements of the Unregulated Contaminant Monitoring Rule. No MCL has been established for chlorate and the NYSDOH chromium MCL is for chromium (total).
 - (3) Value represents MRDL, which is a level of disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. The MRDL is enforceable in the same manner as an MCL and is the calculated running annual average. Data presented are the range of individual sampling results and the highest of the four quarterly running annual averages.
 - (4) Determination of MCL violation: If a sample exceeds the MCL, a second sample must be collected from the same location within two weeks, or as soon as practical. If the average of the two results exceeds the MCL, then an MCL violation has occurred.
 - (5) Action Level (not an MCL) measured at-the-tap. The data presented in this table were collected from sampling stations at the street curb. For at-the-tap monitoring, see the Lead and Copper Rule Sampling at Residential Water Taps table.
 - (6) A Langelier Index of less than zero indicates corrosive tendencies.
 - (7) Hardness of up to 3 grains per gallon is considered soft water; between 3 and 9 is moderately hard water.
 - (8) If iron and manganese are present, the total concentration of both should not exceed 500 µg/L.
 - (9) NYSDOH established Optimal Water Quality Parameters (OWQP) under the Lead and Copper Rule which includes a range for pH and ortho-phosphate which are presented here. The reported average value for pH is the median value. The pH was elevated in two samples: at site 41650 (Forest Hills, 11375) on 9/1/15 with a pH of 10.9, which was attributed to a water main replacement project in the area; and site 47500 (Far Rockaway, 11693) on 10/5/15 at 8.6 which was attributed to a distribution operational adjustment to a nearby pressure regulator. All other samples collected in 2015 reflected pH in the expected ranges.
 - (10) Water containing more than 20 mg/L of sodium should not be used for drinking by people on severely restricted sodium diets. Water containing more than 270 mg/L of sodium should not be used for drinking by people on moderately restricted sodium diets.
 - (11) Turbidity is a measure of cloudiness of the water. Turbidity is monitored because it is a good indicator of water quality, because high turbidity can hinder the effectiveness of disinfection, and because it is a good indicator of the effectiveness of our filtration system.
 - (12) This MCL for turbidity is the monthly average rounded off to the nearest whole number. Data presented are the range of individual sampling results and the highest monthly average from distribution sites.
 - (13) This MCL for turbidity is on individual readings taken every four hours at the unfiltered Catskill/Delaware source water entry point. Value presented is the highest individual sampling result.
 - (14) This is a Treatment Technique performance standard for the Croton Filtration Plant. The value presented is the highest single combined filter effluent turbidity measurement which occurred on 6/15/15. In addition, 100% of the measurements were < 0.3 NTU, exceeding the State regulations which require that turbidity at the combined filter effluent must always be < 1.0 NTU and that 95% of the measurements be < 0.3 NTU.
 - (15) 1,4-Dioxane was monitored for in June, September, and December 2015 under the requirements of the Unregulated Contaminant Monitoring Rule, and was detected in only one sample collected from site 1SCL1 (Van Cortlandt Village, 10463) on 12/8/15.
 - (16) The MCLs for HAA5 and TTHMs are the calculated locational running annual average. The data in the Range column are the minimum and maximum values of all sample sites monitored in the distribution system whether for compliance purposes or not. The values in the Average column are the highest locational running annual averages under the Stage 2 Disinfectant and Disinfection By-Products Rule.
 - (17) If a sample and its repeat sample are both positive for coliform bacteria and one of the two samples is positive for *E. coli*, then an MCL violation has occurred.
- * NYSDOH allows monitoring for these contaminants less frequently than once per year. These data, though representative, are from 2012.





One of the nearly 1,000 water quality sampling stations throughout New York City

UNREGULATED CONTAMINANT MONITORING RULE (UCMR)

Under the 1996 amendments to the federal Safe Drinking Water Act and the Third Unregulated Contaminant Monitoring Rule (UCMR3), EPA is required once every five years to issue a new list of up to 30 unregulated contaminants that public water systems must monitor. The intent of the rule is to provide baseline occurrence data that EPA can combine with toxicological research to make decisions about potential future drinking water regulations. DEP is currently participating in the third round of this contaminant testing. The data from this sampling can be found in the tables of this report. For more information on the rule, and to see a list of the unregulated contaminants, go to water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3.

LEAD IN DRINKING WATER

New York City water is virtually lead-free when it is delivered from New York City's upstate reservoir system, but water can absorb lead from solder, fixtures, and pipes found in the plumbing of some buildings or homes. DEP has an active corrosion control program aimed at reducing lead absorption from service lines and internal plumbing. Under the federal Lead and Copper Rule, mandated at-the-tap lead monitoring is conducted at select households throughout New York City. In 2015, based on the results of this monitoring, the 90th percentile did not exceed 15 µg/L, the established standard or Action Level for lead. The at-the-tap monitoring results are presented in the table on page 7 of this report.

Lead in drinking water is colorless, odorless and tasteless; if present at elevated levels it can cause serious health problems, especially for pregnant women, infants, and young children. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. DEP 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 water, you may wish to have your water tested.

DEP offers a Free Residential Lead Testing Program that allows all New York City residents to have their tap water tested at no cost. The Free Residential Testing Program is the largest of its kind in the nation: DEP has distributed over 100,000 sample collection kits since the start of the program in 1992. To request a free kit to test for lead in your drinking water, call New York City's 24-hour helpline at 311 or visit www.nyc.gov/apps/311.

Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (1-800-426-4791) or at www.epa.gov/safewater/lead.

MONITORING FOR CRYPTOSPORIDIUM AND GIARDIA

In 1992, New York City started a comprehensive program to monitor its source waters and watersheds for the presence of *Cryptosporidium* and *Giardia*. In 2015, DEP collected samples weekly from the active outflow of the Kensico Reservoir, prior to chlorination, and before treatment at the Catskill/Delaware UV Disinfection

Facility. Downstream from the UV Disinfection Facility, weekly samples were collected from the outflow of Hillview Reservoir, just prior to secondary disinfection with chlorine, after which the water flows into distribution. In addition, DEP collected raw source water samples monthly from the outflow of the New Croton Reservoir from January through April, and weekly from the outflow of Jerome Reservoir after the Croton Water Filtration Plant came on-line in May 2015. While there is no evidence that any cases of cryptosporidiosis or giardiasis have been attributed to the New York City water supply, federal and State law requires all water suppliers to notify their customers about the potential risks from *Cryptosporidium* and *Giardia*. Cryptosporidiosis and giardiasis are intestinal illnesses caused by microscopic pathogens, which can be waterborne. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Some people may be more vulnerable to disease causing microorganisms, or pathogens, 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 individuals, and infants, can be particularly at risk from infections. These people should seek advice from their health care providers about their drinking water. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium*, *Giardia*, and other microbial contaminants are available from EPA's Safe Drinking Water Hotline at (800) 426-4791.

From January 1 to December 31, 2015, a total of 52 routine weekly samples were collected and analyzed for *Cryptosporidium* oocysts and *Giardia* cysts at the Kensico Reservoir outflow, 52 routine weekly samples and two supplementary samples were collected at the Hillview Reservoir outflow, and 39 routine samples were collected at the Croton System outflow. Samples were analyzed using standard EPA methods. Method 1623 was used through March of 2015 and Method 1623.1 using EasyStain began in April 2015. Neither test method is able to differentiate between organisms that are dead, alive, or capable of causing disease. Of the 52 routine Kensico Reservoir samples, eight were positive for *Cryptosporidium* (0 to 2 oocysts/50L), and 19 were positive for *Giardia* (0 to 8 cysts/50L). Of the 52 routine Hillview Reservoir samples, six were positive for *Cryptosporidium* (0 to 1 oocysts/50L), and five were positive for *Giardia* (0 to 2 cysts/50L). The two supplementary samples from Hillview Reservoir were resamples collected due to quality control issues. The results from these resamples were negative for both *Giardia* cysts and *Cryptosporidium* oocysts. Of the 39 routine Croton System source water samples, one was positive for *Cryptosporidium* (1 oocyst/50L) and one was positive for *Giardia* (2 cysts/50L). The presence of low levels of *Cryptosporidium* and *Giardia* detected in the source water required no action on the part of DEP. DEP's *Cryptosporidium* and *Giardia* data from 1992 to the present, along with weekly updates, can be viewed on the DEP website at www.nyc.gov/dep.

DEP's Waterborne Disease Risk Assessment Program conducts disease surveillance for cryptosporidiosis and giardiasis to track the disease incidence and syndromic surveillance for gastrointestinal illness to identify potential citywide gastrointestinal outbreaks. All persons diagnosed with cryptosporidiosis are interviewed concerning potential exposures, including tap water consumption. Disease and syndromic surveillance indicates that there were no outbreaks of cryptosporidiosis or giardiasis attributed to tap water consumption in New York City in 2015.



WATER MAIN REPLACEMENT

Drinking water is distributed to New York City's 8.5 million residents through a vast network of subsurface pipes known as water mains. To keep that distribution system in a state of good repair, DEP has continued to upgrade and replace many of its water mains that have been in service for decades. In 2015, DEP constructed more than 30 miles of new water mains at a cost of roughly \$116 million. Those projects included 1.2 miles of water mains in Manhattan and 2.6 miles of water mains in southeast Queens. Upgrades also included additional connections to the second stage of City Tunnel No. 3. Similar work on water mains will soon begin in the Richmond Hill and Jamaica neighborhoods in Queens. In the years ahead, DEP will continue to upgrade the network of pipes that provide high-quality drinking water to residents of the five boroughs.



WATER FOR THE FUTURE - DELAWARE BYPASS TUNNEL

New York City has implemented the Water for the Future program to supplement DEP's water supply, and to help meet water demands in an emergency. One major component of DEP's Water for the Future program is aimed at addressing the known leaks in the Rondout-West Branch Tunnel section of the Delaware Aqueduct, which conveys more than 50 percent of the daily drinking water for New York City. In November 2010, DEP unveiled a design to repair leaks in the 85-mile Delaware Aqueduct to ensure the integrity of New York City's vital infrastructure, which is fundamental to New York City's long-term growth and prosperity. The construction of the bypass tunnel, and the repair of the lining, will ensure that DEP can continue to deliver high-quality drinking water every day for decades to come. DEP began work on the bypass tunnel in the spring of 2013, and plans to connect it to the Delaware Aqueduct in 2022. Other projects that will be implemented as part of the Water for the Future program include the repair and rehabilitation of the Catskill Aqueduct and various conservation initiatives.

WATERSHED PROTECTION AND POLLUTION PREVENTION PROGRAMS

SOURCE WATER ASSESSMENT PROGRAM

Federal regulations require states to develop and implement Source Water Assessment Programs to: identify the areas that supply public tap water, inventory contaminants and assess water system susceptibility to contamination, and inform the public of the results. The states are given a great deal of flexibility on how to implement Source Water Assessment Programs. These assessments are created using available information to help estimate the potential for source water contamination. Higher susceptibility ratings do not mean that source water contamination has occurred or will occur in the water supply; rather, they indicate the need for water suppliers to implement additional precautionary measures.

In 1993, New York City secured its first FAD for the Catskill/Delaware supply, and, in 1997, the historic New York City Watershed Memorandum of Agreement was signed. Since that time, New York City has been implementing a series of programs to further reduce the susceptibility of all of its surface water supply to contamination from a variety of sources. These ongoing programs operate under the close scrutiny of both the NYSDOH and EPA. Because of these efforts, which are reported on in the *Watershed Water Quality Annual Report*, NYSDOH does not deem it necessary to perform a source water assessment on the New York City Water Supply. For information on the DEP *Watershed Water Quality Annual Report*, visit www.nyc.gov/dep.

MAINTAINING NEW YORK CITY'S WORLD-RENOWNED WATER SUPPLY

10-Year Filtration Avoidance Determination

The key elements for maintaining the high-quality of our drinking water are the watershed protection and pollution prevention strategies DEP employs upstate. These strategies are designed to keep pollution out of our upstate reservoirs and watercourses. DEP is currently implementing a 10-year FAD, issued by EPA in July 2007, and updated by NYSDOH in May 2014. Through watershed protection programs specified in the FAD, New York City maintains a high-quality surface drinking water supply without a requirement for filtration. As part of the FAD, New York City continues to enhance its existing source water protection programs, including, among others, a commitment from DEP to continue to acquire certain undeveloped land in the Catskill/Delaware watershed as a means of water quality protection. In 2014, New York City allocated an additional \$65 million (beyond the \$541 million committed previously) to be spent for this purpose. DEP also secured a 15-year water supply permit in 2010 from the New York State Department of Environmental Conservation that allows New York City to continue acquisition of sensitive watershed land to protect the largest unfiltered drinking water supply in the world. Furthermore, DEP is implementing new programs in the watershed to protect water quality and enhance community resiliency during flood events. Over the past two decades of source water protection, New York City has consistently demonstrated the commitment and ability to deliver effective programs to ensure the long-term quality of the water supply. For more information on DEP's watershed protection programs, visit www.nyc.gov/dep.

Key programs and selected accomplishments include:

- ◆ **Land Acquisition** – New York City acquires real property interests from willing sellers to further protect and buffer its 19 reservoirs and three controlled lakes in the Catskill/Delaware and Croton watersheds. In 2015, New York City, including its land trust partners that receive funding from the City, signed contracts with landowners to purchase more than 4,800 acres of sensitive watershed land. Since 1997, DEP has secured more than 140,000 acres of land and easements, adding to the roughly 42,000 acres surrounding the reservoirs that New York City owned in 1997. The property DEP owns is protected from development, which helps create natural buffers to avoid degradation of the water supply. The State of New York also owns and protects more than 200,000 acres of land in the New York City watershed.
- ◆ **Land Management** – With the acquisition of land over the past 19 years, New York City has become one of the largest landowners in the watershed region. DEP manages these properties to ensure that water quality is protected. DEP believes that protecting the watershed lands does not conflict with providing recreational access to members of the surrounding communities. Since 1997, DEP has increased the acreage of land and water open for recreation every year, and approximately 126,000 acres are now available for fishing, hiking, hunting, cross-country skiing, and other activities. DEP now has four of its west-of-Hudson reservoirs open for recreational boating by permit, which includes rowboats, canoes, kayaks, and small sailboats. In addition, in 2013, DEP initiated a pilot program that allows the use of electric motors on rowboats on the Cannonsville Reservoir.
- ◆ **Partnership Programs** – Many of New York City's watershed protection programs west of the Hudson River are administered by the Catskill Watershed Corporation, a nonprofit organization. Together, DEP and the Catskill Watershed Corporation have repaired or replaced more than 4,800 failing septic systems and authorized the construction of more than 70 stormwater control measures on properties in the watershed. New York City has also made available more than \$185 million for new community wastewater projects. When all projects are completed, they will be capable of treating a total of 1.7 million gallons of wastewater per day. Another DEP partnership program is the Stream Management Program, which encourages the stewardship of streams and floodplains in the watershed west of the Hudson River. Additionally, the Watershed Agricultural Program and Watershed Forestry Program both represent long-term successful partnerships between DEP and the nonprofit Watershed Agricultural Council. The underlying goal of both programs is to support and maintain well-managed family farms and working forests as beneficial land uses for water quality protection and rural economic viability. Together, these partnerships work with watershed residents to identify and eliminate potential pollution sources.



Catskill/Delaware Watershed Lands



GILBOA DAM

In 2014, DEP completed an award-winning project to rehabilitate Gilboa Dam. The dam, located in Schoharie County, is the northernmost piece of infrastructure in New York City's water supply system. Gilboa Dam impounds the waters of Schoharie Creek to form the City's Schoharie Reservoir. The \$138 million project to reconstruct the dam was recognized in 2015 as the National Dam Rehabilitation Project of the Year by the Association of Dam Safety Officials (ASDSO). ASDSO annually honors individuals and organizations that provide exemplary contributions to the improvement of dam safety throughout the United States. The award for Gilboa Dam is the organization's most prestigious honor, recognizing unique projects that advance state-of-the-art designs in the field of dam safety and exemplify the professional engineering and construction standards that dam safety requires. The Gilboa Dam rehab project was completed two years ahead of schedule. It was designed to address decades of weathering that had damaged the stone face of the dam, and to improve the dam's ability to withstand flooding from large storms. The project included the addition of approximately 234 million pounds of concrete, molded and dyed to resemble the original bluestone face of the dam, along with the installation of 500 massive spillway slabs and upgrades to the abutment walls that support the dam. Gilboa Dam, originally completed in 1927 as part of the City's Catskill System, is 2,024 feet long, 182 feet high, and more than 150 feet wide at its base. At nearly 90 years old, the dam still serves as a critical piece of infrastructure for New Yorkers – the water it impounds accounts for about 15 percent of the City's drinking water each year.

WATER CONSERVATION

DEP values the role of water conservation and demand management as a responsible way to plan for the long-term use of New York City's water supply. As a result, actual water demand is down more than 30 percent since the 1990s, despite consistent increases in our population.

The goal of DEP's water conservation efforts, since the release of PlaNYC2030, is to reduce water use in New York City and in upstate communities by a total of five percent, thereby lowering consumption by approximately 50 million gallons of water per day. Using both active and passive conservation, significant reductions have already been achieved since 2010 when demand was 1,039 million gallons per day. In 2015, the demand dropped 30 million gallons per day, to 1,009. There are five major strategies DEP outlined in the 2014 Water Demand Management Plan. Since the release of the plan, DEP added a sixth strategy. These strategies are detailed below.

- ◆ **Municipal Water Efficiency Program** – As part of this program, DEP has already begun a partnership with the New York City Department of Parks and Recreation to install activation buttons on spray showers at 400 playgrounds around New York City that will save 1.5 million gallons of water a day. More than 40,000 bathroom fixtures in 500 public school buildings are also being updated. These retrofits will conserve approximately 4 million gallons of water each school day.
- ◆ **Residential Water Efficiency Program** – To encourage water conservation in private properties, DEP has begun a voucher-based program to replace roughly 150,000 outdated residential toilets with high efficiency models. The toilet rebate program will build on the success of a similar rebate program that ran from 1994 to 1997 and replaced 1.3 million toilets.

- ◆ **Non-Residential Water Efficiency Program** – DEP recently honored restaurants for participating in the 2015 New York City Water Challenge to Restaurants. Each restaurant worked closely with DEP to: audit their water use, retrofit and replace inefficient water using equipment, and educate staff on using water wisely with the goal of reducing their annual water consumption by five percent. In total, ten restaurants achieved the five percent reduction in water consumption, conserving roughly 2.6 million gallons of water.
- ◆ **Water Distribution System Optimization** – DEP has developed a strategy to handle system repairs and upgrades, manage water pressure, and refine water meter accuracy and leak detection, in order to optimize New York City's water distribution system. Leaking and/or vandalized fire hydrants can also contribute significantly to water waste, as an illegally opened fire hydrant can release more than 1,000 gallons per minute. DEP repairs, replaces, and provides other maintenance services to thousands of hydrants annually.
- ◆ **Water Supply Shortage Management** – To prepare for droughts and other water shortages, DEP is in the process of revising its Water Shortage Rules, previously known as Drought Rules, so emergency reductions and prohibitions can be implemented in times of water shortages that are not the result of droughts.
- ◆ **Wholesale Water Efficiency Program** – DEP is working with its largest upstate wholesale water customers to develop conservation plans aimed at saving water and money. DEP will work with the upstate customers to identify demand management strategies with a goal of reducing their water use by five percent. DEP began by offering the planning service to the 10 largest upstate wholesale customers, which include communities in Orange and Westchester Counties.

New York City is fortunate to have reasonably priced drinking water as compared to other cities around the country. The average single-family household in New York City uses approximately 80,000 gallons of water each year, at a cost of \$3.82 per 100 cubic feet of water (748 gallons), or about \$409 a year. Since nearly all New York City residences receive wastewater collection and treatment services in addition to water service, the combined annual water and sewer charge for the typical New York City household using 80,000 gallons per year is \$1,058, consisting of \$409 for water service and \$649 for wastewater services (based on the Fiscal Year 2016 rates).

DEP asks that everyone do his or her part to conserve this important resource. All New Yorkers should observe good water conservation habits, and are required to obey New York City's year-round water use restrictions, which include a prohibition on watering sidewalks and lawns between November 1 and March 31, and between 11am and 7pm from April 1 to October 31. Remember, it is illegal to open fire hydrants at any time without a permit. However, during the summer, you can contact your local firehouse to have a DEP-approved spray cap installed on a hydrant.



CATSKILL-DELAWARE INTERCONNECTION

In 2015, DEP placed the Catskill-Delaware Interconnection into service. The roughly \$22 million interconnection was constructed in Ulster County at a location where the two aqueducts practically intersect, with one running only a few hundred feet below the other. The project will allow DEP to move as much as 365 million gallons per day from the Delaware Aqueduct into the Catskill Aqueduct. (Water cannot move the other way because the Delaware Aqueduct is a deep bedrock tunnel under pressure, and the Catskill is an open-channel tunnel built at the surface.) The interconnection will provide DEP with a new tool to reduce turbidity in the water supply system after large storms. Turbidity after large rainfall or snow-melt events can be problematic in the Catskill System because the streams and creeks that feed its reservoirs run through steep valleys comprised of loose silt and clay. These fine particles can be picked up by the fast-moving water and carried into Ashokan and Schoharie reservoirs. The new facility gives DEP the flexibility to introduce Delaware System water – which is not generally prone to high turbidity – into the Catskill Aqueduct to reduce turbidity and the need for additional treatment chemicals. Engineers envisioned a connection between the two aqueducts when they built the Delaware System in the 1940s. In fact, the east wall of the valve chamber at Delaware Aqueduct Shaft 4 was constructed with four arched openings – each temporarily closed by brick walls – that could one day allow pipes to be installed to move Delaware water into the Catskill Aqueduct. The new interconnection is one of several facilities that provide DEP with the flexibility to convey the best drinking water from different parts of its upstate reservoir system each day.



REHABILITATION OF SHAFT 3 - CITY WATER TUNNEL No. 1

Following the replacement of two 100-year-old, 13-foot-tall, 20,000-pound manganese bronze guard valves at Shaft 3 with 6,700-pound stainless steel valves, at a cost of \$1 million, DEP was able to complete a network of pipes through which filtered water from the Croton water supply can flow daily to Manhattan and the Bronx.

ADMINISTRATIVE AND JUDICIAL ORDERS

Hillview Reservoir is the last reservoir in the Catskill/Delaware system prior to distribution. On May 24, 2010, New York City and EPA entered into an Administrative Order on Consent which sets forth a milestone schedule to install a cover over the Hillview Reservoir by mid-2028. The milestones of a previous Administrative Order on Consent from 2008, between New York City and NYSDOH, were incorporated into the 2010 Administrative Order on Consent. Additionally, in August of 2011, EPA released a report entitled *Improving Our*

Regulations: Final Plan for Periodic Reviews of Existing Regulations, in which EPA indicated that it will evaluate the reservoir cover requirement of the Long Term 2 Enhanced Surface Water Treatment Rule. DEP has been actively involved in EPA's review process.

The Catskill/Delaware Ultraviolet Disinfection Facility, which began treating Catskill/Delaware water in October 2012, was constructed, and is operating, pursuant to an Administrative Order with EPA. DEP is in compliance with the Administrative Order.

DEP was required to construct a filtration plant for the Croton water supply under a Consent Decree entered into between New York City and the United States and the State of New York. On May 7, 2015, DEP commenced operation of the Croton Water Filtration Plant. Since commencing operation of the Croton Water Filtration Plant, DEP has delivered treated water for at least eight hours each day. On November 15, 2015, the Croton Water Filtration Plant successfully delivered a treated water flow of 290 million gallons per day (the plant's designed maximum flow) to the New York City drinking water distribution system, and the plant has remained in a state of readiness to deliver at least 145 million gallons per day. In order to terminate this Consent Decree, DEP must submit to NYSDOH documentation evidencing fulfillment of all other milestones listed in its Interim Approval of Completed Works by May 17, 2016.

Croton water was not fed into distribution between January 1, 2015 and May 6, 2015. Because the Croton Water Filtration Plant was not operational until May 7, 2015, DEP is required by law to make the following statement: Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. Since May 7, 2015, all water delivered to consumers from the Croton water supply has been filtered in accordance with the requirements of the Safe Drinking Water Act and the State Sanitary Code.

FREQUENTLY ASKED QUESTIONS

SOMETIMES MY WATER IS A RUSTY BROWN COLOR.

WHAT CAUSES THIS?

Brown or discolored water is commonly associated with plumbing corrosion problems inside buildings and from rusting hot water heaters. If you have an ongoing problem with brown water, it may be due to rusty pipes. It is recommended that you run your cold water for 2-3 minutes if it has not been used for an extended period of time. This will flush the line. You can avoid wasting water by catching your “flush” water in a container and using it to water plants or for other purposes. If you experience a sudden event of discoloration, it may be the result of disturbances of water mains which occur when water mains break, are being repaired, or there is adjacent construction outside of your building. Also fire hydrant use from firefighting or testing may cause brown water. The water pipes are pressurized, and a disturbance may stir up or re-suspend these sediments and cause the water to be discolored in a wide area. Discoloration is a temporary condition most often caused by particles of iron and manganese which have settled to the bottom of the water pipes buried under the roadways. The water pipes are pressurized and any sudden change in the flow of water within the pipes can cause them to vibrate, which, in turn, may loosen or re-suspend the brownish/red/orange particles of iron into the water. Flushing water from fire hydrants, by DEP, in areas affected by discolored water will usually eliminate or reduce the problem.

AT TIMES I CAN DETECT CHLORINE ODORS IN TAP WATER.

WHAT CAN I DO ABOUT IT?

Chlorine odors may be more noticeable when the weather is warmer. Chlorine is a disinfectant and is added to the water to kill germs. The following are ways you can remove the chlorine and its odor from your drinking water:

- Fill a pitcher and let it stand in the refrigerator overnight. This is the most effective way to address a chlorine odor in drinking water.
- Fill a glass or jar with water and let it stand in sunlight for 30 minutes.
- Pour water from one container to another about 10 times.
- Heat the water to about 100 degrees Fahrenheit.
- Once you remove the chlorine, be sure to refrigerate the water to limit bacterial regrowth.

IS NEW YORK CITY'S WATER “HARD”?

Hardness is a measure of dissolved calcium and magnesium in drinking water. The less calcium and magnesium in the water (“soft” water), the easier it is to create lather and suds. New York City’s Catskill/Delaware water supply is predominantly “soft” with a hardness of about 1.6 grain/gallon (CaCO_3). In areas of the City where Catskill/Delaware and Croton water supplies are blended, the hardness varies between 1.1 and 6.3 grain/gallon (CaCO_3).

SHOULD I BUY BOTTLED WATER?

You do not need to buy bottled water for health reasons in New York City since our water meets all federal and State health-based drinking water standards. In addition, bottled water costs up to 1,000 times more per year than New York City’s drinking water. When purchasing bottled water, consumers should look for the New York State Department of Health certification number (NYSHD CERT #).

Consumers can access additional information on New York State certified bottled water facilities within the United States that can sell bottled water within New York State at www.health.state.ny.us/environmental/water/drinking/bulk_bottle/bottled.htm. As an alternative to purchasing bottled water, use a reusable bottle and fill it with New York City tap water.

WHY DOES MY DRINKING WATER LOOK CLOUDY SOMETIMES?

Air becomes trapped in the water as it makes its long trip from the upstate reservoirs to the City. As a result, bubbles of air can sometimes cause water to appear cloudy or milky. This condition is not a public health concern. The cloudiness is temporary and clears quickly after water is drawn from the tap and the excess air is released.



STATEN ISLAND SIPHON

In February 2015, a tunnel boring machine (TBM) completed the excavation of a new, \$250 million water tunnel connecting Brooklyn to Staten Island. The new, deeper tunnel – called a siphon – will take drinking water under New York Harbor from Brooklyn to Staten Island. The 72-inch siphon was excavated at a depth of 100 feet and will replace two, nearly century old, existing water connections that run from Brooklyn to Staten Island at a much shallower depth. When the new tunnel is activated, these two old tunnels will be removed, and dredging will begin to deepen the Anchorage Channel, an important part of New York City’s water transportation infrastructure that provides the international shipping trade with access to New York Harbor, while the new tunnel will provide a redundant means to supply high-quality drinking water to Staten Island.

WHERE TO GO FOR ADDITIONAL INFORMATION

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 EPA's Safe Drinking Water Hotline at (800) 426-4791.

For additional copies of this report, to report unusual water characteristics, or to request a free kit to test for lead in your drinking water, call 311 or from outside New York City call (212) New-York or visit 311 online at www.nyc.gov/apps/311. TTY services are available by calling (212) 504-4115.

For more information about *Cryptosporidium* and *Giardia*, contact the Bureau of Communicable Diseases of the New York City Department of Health and Mental Hygiene at (347) 396-2600 or call 311 or visit www.nyc.gov/apps/311.

To contact the New York City Department of Health and Mental Hygiene about other water supply health-related questions, call 311 or visit 311 online at www.nyc.gov/apps/311. To contact the New York State Department of Health, Bureau of Water Supply Protection, call (518) 402-7650 or visit www.health.ny.gov.

To report pollution, crime or terrorism activity occurring in the watershed, call (888) H2O-SHED (426-7433).

To view the 2015 Drinking Water Supply and Quality Report, announcements of public hearings, and other information about the New York City Water Supply System, visit DEP's website at www.nyc.gov/dep.

Please share this information with other people who drink New York City tap water, especially those who may not have received this publication directly such as people who live in apartment buildings or nursing homes, attend schools, or have businesses. You can do this by posting this publication in a public place or distributing copies by hand mail or email.

Este reporte contiene información muy importante sobre el agua que usted toma. Haga que se la traduzcan o hable con alguien que la entienda.

Ce rapport contient des informations importantes sur votre eau potable. Traduisez-le ou parlez en avec quelqu'un qui le comprend bien.

Questo documento contiene informazioni importanti sulla vostra acqua potabile. Traducete il documento, or parlatene con qualcuno che lo può comprendere.

Rapò sa a gen enfòmasyon ki enpòtan anpil sou dlo w'ap bwè a. Fè tradwi-l pou ou, oswa pale ak yon moun ki konprann sa ki ekri ladan-l.

Ten raport zawiera bardzo istotną informację o twojej wodzie pitnej. Przetłumacz go albo porozmawiaj z kimś kto go rozumie.

В этом материале содержится важная информация относительно вашей питьевой воды. Переведите его или поговорите с кем-нибудь из тех, кто понимает его содержание.

這個報告中包含有關你的飲用水的重要信息。請將此報告翻譯成你的語言，或者詢問懂得擅份報告的人。

이 보고서는 귀하의 식수에 관한 매우 중요한 정보를 포함하고 있습니다. 이 정보에 대해 이해하는 사람에게 그 정보를 번역하거나 통역해 받으십시오.

এই প্রতিবেদনে আপনার পানীয় জল সম্পর্কে গুরুত্বপূর্ণ তথ্য রয়েছে

