NEW YORK CITY - 1998 DRINKING WATER SUPPLY AND QUALITY STATEMENT

In accordance with Section 1150 of the New York State Public Health Law, as amended in 1998, and the National Primary Drinking Water Regulations, 40 CFR Part 141, of the Environmental Protection Agency, all drinking water suppliers are required to provide the public with an annual statement describing the water supply and the quality of its water. The New York City Department of Environmental Protection is pleased to present its 1998 Annual Water Supply Statement/Consumer Confidence Report.

New York City's Water Supply

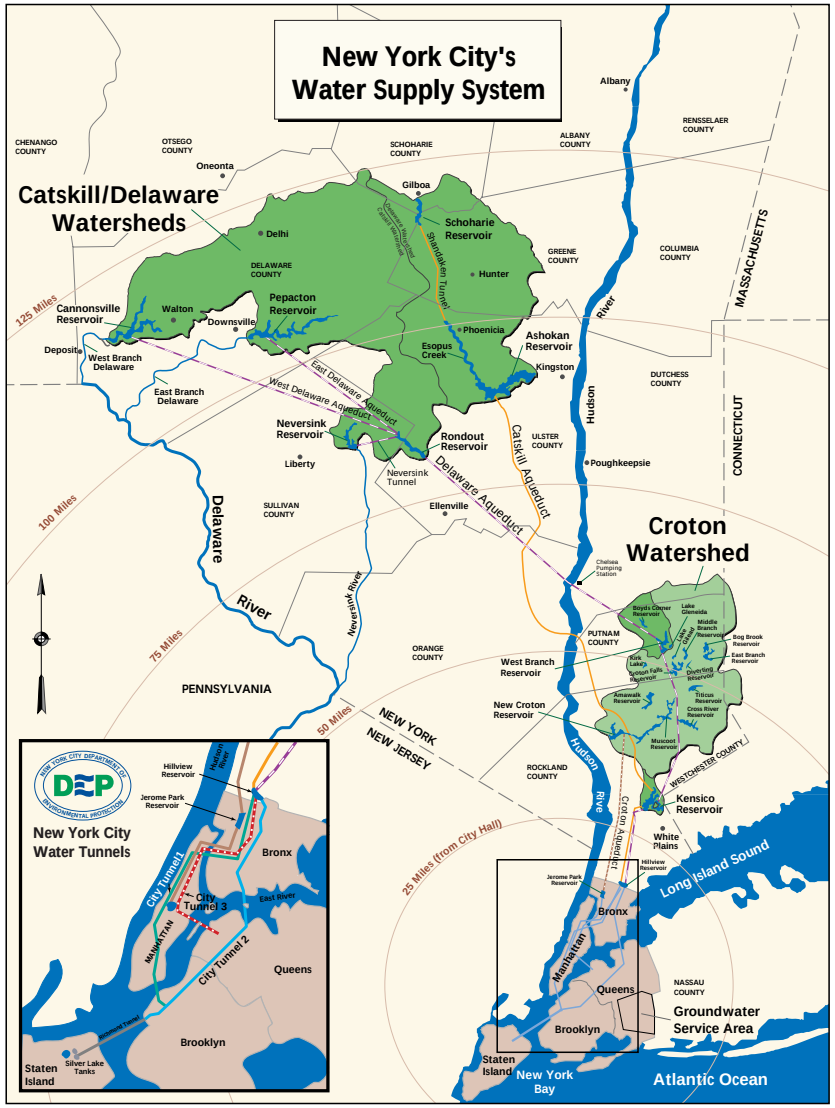
The New York City surface (reservoir) water supply system provides approximately 1.3 billion gallons of safe drinking water daily for nearly 8 million residents of New York City, as well as visitors, commuters and approximately one million people living in Westchester, Putnam, Ulster, and Orange counties. In addition to our surface water supplies, approximately 520,000 people in southeastern Queens receive groundwater or a blend of groundwater and surface water. In all, the City system supplies high quality water to nearly half the population of New York State.

Where Does New York City's Water Come From?

Most of New York City's water is supplied from a network of 19 reservoirs and three controlled lakes in a 1,969 square-mile watershed that extends 125 miles north of New York City. The Croton system, the City's original upstate supply, provides about 10% of our daily water from 12 reservoir basins in Putnam, Westchester, and Dutchess counties. Approximately 90% of our water comes from the Catskill/Delaware watershed, located in Delaware, Greene, Schoharie, Sullivan, and Ulster counties, west of the Hudson River. In 1998, New York City's groundwater system in southeastern Queens operated 27 wells to supply an average of 31 million gallons of drinking water per day, or about two percent of the City's total use.

What's in the Source Water?

The sources of drinking water worldwide (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 radioactive elements. As it moves, water also absorbs substances present due to human and animal activity.



Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, soil, farming, domestic animals, and wildlife.
- Inorganic contaminants, such as salts, nutrients and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, septic systems, and naturally occuring organic matter from decaying vegetation.
- Radioactive contaminants, which can be naturally-occurring.

Regulation of Drinking Water

In order to ensure that tap water is safe to drink, the New York State Department of Health and the United States Environmental Protection Agency (EPA) prescribe regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water.

All drinking waters 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 EPA's Safe Drinking Water Hotline (800) 426-4791.

Water Quality

The New York City Department of Environmental Protection (DEP) operates the water supply system that delivers water to City residents. The monitoring program — far more extensive than required by law —demonstrates that the quality of New York City's drinking water remains high, meeting all health-related State and Federal drinking water standards. (Color, an aesthetic condition in the Croton and Groundwater systems, excedes the standard on seasonal basis.)

DEP monitors the water in the distribution system, the upstate reservoirs and feeder streams, and the wells that are the sources for our supply. Water quality is monitored continuously as the water enters the distribution system, and is tested at sampling points throughout the entire City. Water is analyzed for a broad spectrum of microbiological, chemical, and physical measures of quality. In 1998, DEP collected more than 39,000 in-City samples and performed approximately 424,000 analyses.

Test Results

The results of the tests conducted on distribution water samples under DEP's Distribution System Monitoring Program in 1998 are summarized in the **tables in this Statement**. Data is presented separately for the Croton, Catskill/Delaware, and Groundwater systems. More detailed results can be obtained from DEP. Whether a particular user receives Croton, Catskill/Delaware, groundwater, or a mixture, depends on location, system operations, and consumer demand.

The State requires DEP to monitor for some parameters less than once per year because the concentrations of these parameters do not change frequently. Some of these data, though representative, are more than one year old. Unregulated parameter monitoring helps EPA to determine where certain parameters occur and whether it needs to regulate those parameters.

Lead in Drinking Water

New York City water is lead-free when it is delivered from the City's upstate reservoir system, but water can absorb lead from solder, fixtures, and pipes found in the plumbing of some buildings or homes. At-the-tap lead monitoring is conducted at various households around the City semi-annually. Based on the results of the 1998 monitoring of 107 homes, the tap water at some of these homes exceeded the Lead Action Level (AL).

Infants and young children are typically more vulnerable to lead in drinking water than the general population. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

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. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested. You may also flush your tap for 30 seconds to 2 minutes, until it is cold, before using water that has been standing in the pipes for more than six hours. Use only cold water for cooking, drinking, and making baby formula. To request a free kit to test for lead in your drinking water, call DEP's 24-hour Help Center at (718) DEP-HELP. Additional information is available from the EPA's Safe Drinking Water Hotline (800) 426-4791.

Cryptosporidium and Giardia

While there is no evidence of illness related to the New York City water supply, Federal and New York State law requires all water suppliers to notify their customers about the potential risks of *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. Most healthy individuals can overcome the disease within a few weeks.

According to the EPA and the Centers for Disease Control and Prevention (CDC), it is unclear how most cases of cryptosporidiosis in the United States are contracted. The relative importance of various risk factors are unknown. Such factors include eating contaminated food, swallowing contaminated recreational water while swimming or camping, contact with animals, contact with human waste, certain sexual practices, or drinking contaminated water. Individuals who think they may have cryptosporidiosis or giardiasis should contact their health care provider immediately.

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 or dialysis, people with Crohn's disease or 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 about the need to take extra precautions such as boiling water, using a certified bottled water or a specially approved home filter. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the EPA's Safe Drinking Water Hotline (800) 426-4791.

NYC DEP's Monitoring for Pathogens

To better understand the nature of potential risks, in 1992 the City added a pathogen monitoring component to its comprehensive watershed monitoring program. Since then, samples have been collected weekly from the effluents of Kensico and New Croton Reservoirs, before water is first chlorinated in the Catskill/Delaware and Croton systems, respectively. Current test methods, however, do not allow us to determine if the organisms are dead nor if they are capable of causing disease.

In 1998, as part of the routine sampling program, 104 samples of Kensico Reservoir effluent and 51 samples of New Croton Reservoir effluent were collected and analyzed for *Giardia* cysts and *Cryptosporidium* oocysts and showed no confirmed detections of either organism. Of the 104 Kensico Reservoir samples, 5 samples were presumed positive for *Giardia* and no samples were confirmed positive. Likewise, two samples were presumed positive for *Cryptosporidium* at Kensico, but none confirmed. The New Croton Reservoir samples produced no *Giardia* cysts, and no *Cryptosporidium* oocysts.

In a separate study, conducted for EPA's Information Collection Rule (ICR), 24 samples of Kensico Reservoir effluent and 12 samples of New Croton Reservoir effluent were collected and analyzed for *Giardia* cysts and *Cryptosporidium* oocysts. This study used a different method of analysis prescribed by the ICR. Of the 24 Kensico Reservoir samples, 19 samples were presumed positive for *Giardia*, and 3 samples were confirmed positive. Three samples were presumed positive for *Cryptosporidium* at Kensico, and one was confirmed positive. The New Croton Reservoir samples resulted in one sample presumed positive, and none confirmed positive for *Giardia*, and one sample presumed positive and one confirmed positive for *Cryptosporidium*.

How is New York City's Water Treated?

All surface water and groundwater entering New York City's distribution system is treated with chlorine, fluoride, orthophosphate, and, in some cases, sodium hydroxide. New York City uses chlorine to meet the New York State Sanitary Code and Federal Safe Drinking Water Act disinfection requirements. A small amount of fluoride (one part per million) to help prevent tooth decay has been added to the City's water supply since the mid-1960s in accordance with the New York City Health Code. Orthophosphate is added to create a protective film on pipes which reduces the release of metals such as lead from household plumbing. Sodium hydroxide is added to the water to raise the pH and reduce corrosivity.

A sequestering phosphate is added at several wells to keep naturally occurring minerals, mainly iron and manganese, from settling out in distribution and household piping. Air stripper facilities operate at several wells to remove volatile organic chemicals.

Ensuring a Safe and Sufficient Supply of Water

Watershed Programs

1998 was the first full year of implementation of the watershed protection and partnership programs set forth in the January 1997 Watershed Memorandum of Agreement (MOA). Building on the achievements of prior years -- including the important 1997 finalization of the MOA -- DEP continued implementation of four key programs: the acquisition of watershed lands; the enforcement of strengthened Watershed Regulations; the expansion of environmental and economic partnership programs that target specific sources of pollution in the watershed; and the development of water quality models to help provide a framework for assessing the progress of the watershed protection program. In addition, DEP continued implementation of a number of special studies of water quality, and advanced the upgrades of City-owned and non-City-owned watershed wastewater treatment plants.

Land Acquisition

In 1998, DEP met the goals for solicitation of owners of watershed lands set forth in the 1997 Filtration Avoidance Determination (FAD) and the MOA. Specifically, DEP solicited owners of 51,266 acres of watershed lands in designated priority areas. Through December 1998, DEP had 13,098 acres either acquired or under purchase contract.

Watershed Regulations

On May 1, 1997, enhanced Watershed Rules and Regulations (WR&R) became effective, replacing regulations that had been in place since 1953. The Regulations are vital to water supply protection and provide a higher level of defense against modern-day threats to water quality. By vigorously enforcing the new Regulations, DEP is ensuring that the City's source waters are protected. These measures include aggressive policing and inspection of the watershed; greatly increased water quality monitoring; systematic inspections of wastewater treatment plants; investigations of other potentially-polluting activities; and legal actions against polluters.

In 1998, DEP staff reviewed over 769 applications for new or remediated septic systems, 21 stormwater pollution prevention plans and over 75 other projects that proposed one or more regulated activities. In addition, DEP staff issued 19 Notices of Violation and over 810 Notices of Failure.

In another initiative designed to help DEP monitor development activities in the watershed, DEP established a schedule whereby project review staff regularly attend planning board meetings in the watershed. Through these meetings, DEP stays abreast of important projects in the watershed and ensures close coordination with local authorities.

Environmental and Economic Partnership Programs

As of December 31, 1998, New York City had made over $230 million in payments to support a variety of partnership programs in accordance with the terms of the MOA. West of the Hudson River, many of the partnership programs are being administered by the Catskill Watershed Corporation (CWC), a non-profit corporation formed solely for that purpose. Together, CWC and DEP continued to implement programs that remediated 339 failing septics in the Catskill and Delaware watershed, secured contracts with municipalities that are eligible for the upgrade of facilities that store winter road de-icing materials, and developed program rules for the construction of new stormwater control facilities to comply with the WR&R.

Wastewater Treatment Plant Upgrades

The wastewater treatment plant (WWTP) upgrade program met two significant milestones in 1998. By May, all WWTP owners in the Catskill/Delaware and East-of-Hudson watersheds signed agreements to participate in the program. By November, those owners gained DEP approval of upgrade compliance schedules to meet the requirements of section 18-36(a)(10) of the WR&R. In addition, upgrades were also completed at city owned Catskill/Delaware WWTPs located in Pine Hill, Grand Gorge, and Tannersville.

Capital Improvements

City Water Tunnel No. 3.

In August 1998, Mayor Rudolph W. Giuliani and DEP Commissioner Joel A. Miele Sr., P.E. announced the activation of the first stage of City Water Tunnel No. 3. The tunnel, the largest capital construction project in New York City history, will eventually span more than 60 miles and is expected to be finished in 2020 at an estimated cost of $6 billion dollars.

Currently, City Tunnel No. 3 is serving the Upper East and Upper West Sides of Manhattan, Roosevelt Island, and many neighborhoods in the Bronx west of the Bronx River. The activated portion of the tunnel, constructed in bedrock 250 to 800 feet below the surface, runs 13 miles, beginning at Hillview Reservoir in Yonkers.

The operation of Tunnel No. 3 will allow inspection and repair to take place on City Tunnels No.1 or 2 for the first time since they were put into operation in 1917 and 1936, respectively, thereby ensuring the future reliability of the water delivery system.

Hillview Reservoir

December 1998 saw the completion of a project to remove sediment from the bottom of Hillview Reservoir. The sediment removal, in conjunction with waterfowl control, improved chlorination and improved pH control, have contributed to the decrease in microbial levels seen in distribution water over the last 4 years. Since November 1994, DEP has collected approximately 43,000 compliance samples, only two of which tested positive for E. coli.

Croton Filtration Plant

The City is planning to build a treatment facility to filter water from the Croton system. A preferred location for the filtration plant, the Mosholu Driving Range of Van Cortland Park in the Bronx, was announced in December 1998 and a design for the proposed facility is being prepared. The Croton filtration plant is slated to be operational by 2007.

The fedral Surface Water Treatment Rule (SWTR) requires that all water supplies be filtered by June 29, 1993, unless the system meets special criteria to receive a waiver. Even though Croton water quality is high, it experiences seasonal color problems and will be subjected to stricter standards for disinfection by-products in the near future. In 1992, the City entered into a Stipulation with the New York State Department of Health calling for the construction of a Croton filtration facility.

In May 1998, the City entered into a Consent Decree with the United States and the State of New York, thereby settling an enforcement action brought against the City because it is not filtering Croton water at this time. In November 1998, the U.S. District Court for the Eastern District of New York approved the Consent Decree. The Consent Decree supercedes the 1992 Stipulation and sets out a revised timetable for the design and construction of the Croton filtration facility.

Until DEP begins to filter Croton water we are required 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.*

Water Conservation

Did you know that the average single family household in New York City uses approximately 100,000 gallons of water each year, at a cost of $1.25 per 100 cubic feet of water (748 gallons), or about $167.00 each year? Although New York City is fortunate to have a plentiful supply of reasonably priced drinking water, everyone should do their part to conserve this precious resource.

In its ongoing efforts to save water, DEP: uses sonar equipment to survey all water supply piping for leaks; replaces approximately 55 miles of old water supply pipe a year; equips fire hydrants with special locking devices; and installs home water meters to encourage conservation. These programs and others have proven successful and together have reduced water consumption in the City by approximately 200 million gallons per day in the last five years. This is more water than the City of Boston or Westchester County uses in a day.

Here are some ways that you can help save water:

- Repair all leaks promptly. Leaks waste water 24 hours a day, 7 days a week. Check all faucets for leaks.
- Install aerators on all sinks and use a high-pressure, low-flow showerhead. Replacing old fixtures with water conserving models can produce substantial savings without reducing effectiveness and comfort.
- Order a Home or Apartment Water Saving Kit. If you are an apartment building owner/manager or a home owner, you can obtain a free leak survey, along with water saving showerheads and other products. Call our Leak Survey contractor at (718) 326-9426 for information.
- Water your garden in the evening instead of the heat of day to reduce evaporation.

Frequently Asked Questions

What can I do about chlorine odors in tap water?

Chlorine odors may be more noticeable when the weather is warmer.

Chlorine is essential to kill organisms that may cause disease. The following are ways you can remove the chlorine odor from your drinking water.

- Fill a pitcher and let it stand in the refrigerator overnight. (This is the best way.)
- 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.

Sometimes my water is a rusty brown color. What causes this?

Brown water is often the result of street construction or water main work being done in the area. Any disturbance to the main, including the opening of a fire hydrant, can cause pipe sediment to shift, resulting in brown water. The settling time of the main will vary, depending on the size of the water main. In addition, brown 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 is probably 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.

Drinking water often looks cloudy when first taken from a faucet, but then clears up. Why?

Air becomes trapped in the water as a very large volume of pressurized water travels down the long distance of the aqueducts to the City. The water, as a result, can sometimes appear cloudy or milky. This condition presents no threat to public health. The cloudiness is temporary and clears quickly after the water is drawn from the tap and the excess air is released.

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 health-based drinking water standards. Also, bottled water costs up to 1,000 times more than the City's drinking water.

Is New York City's water "hard?"

Hardness is a measure of calcium in the water. The less calcium in the water ("soft" water), the easier it is to create lather and suds. New York City's water is predominantly "soft."

Contact Us

For a copy of this report, to report unusual water characteristics, or to request a free kit to test for lead in your drinking water, call DEP's 24-hour Help Center at (718) DEP-HELP.

For more information on *Giardia* and *Cryptosporidium*, please contact the Parasitic Disease Surveillance Unit of the New York City DEP and DOH at: (212) 788-4728.

To report any polluting activities occurring in the watershed, call 1-888-DEP-NYC1, 24-hours a day.

To view this 1998 Statement, announcements of public hearings, or other information, visit DEP's Web site at: www.ci.nyc.ny.us/dep

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.

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 informacje 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，或者詢問懂得這份報告的人。

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

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEP

NEW YORK CITY - 1998 DRINKING WATER SUPPLY AND QUALITY STATEMENT
Data Tables

REGULATED CONVENTIONAL PHYSICAL AND CHEMICAL PARAMETERS

PARAMETERS (unit)	DOH	US EPA	CATSKILL-DELAWARE SYSTEM			CROTON SYSTEM			GROUNDWATER SYSTEM			SOURCE OF PARAMETER
	MCL	MCLG	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	(IF DETECTED)
Alkalinity (mg/L - Calcium Carbonate)	NDL	-	227	3.9 - 19.5	10.7	39	32.5 - 56.1	49.4	413	10.0 - 227.2	66.4	Erosion of natural deposits
Antimony (mg/L)	0.006	0.006	155	ND	ND	36	ND	ND	103	ND	ND	
Arsenic (mg/L)	0.05	-	155	ND	ND	36	ND	ND	103	ND	ND	
Asbestos (million fibers/L - longer than 10 µm) [1]	7.0	7	1	ND	ND	-	-	-	-	-	-	
Barium (mg/L)	2.00	2	155	ND	ND	36	ND	ND	103	ND - 0.09	< 0.05	Erosion of natural deposits
Beryllium (mg/L)	0.004	0.004	155	ND	ND	36	ND	ND	103	ND	ND	
Cadmium (mg/L)	0.005	0.005	155	ND	ND	36	ND	ND	104	ND	ND	
Chloride (mg/L)	250.0	-	155	5.6 - 15.1	9.1	36	41.7 - 54.4	48.4	384	8.0 - 144.0	51.5	Erosion of natural deposits
Chromium (mg/L)	0.10	0.1	155	ND	ND	36	ND	ND	103	ND - 0.008	< 0.002	Erosion of natural deposits
Color - entry points (color units)	15 [2]	-	920	3 - 15	7	233	**5 - 19**	9	727	**ND - 34**	5	Iron and manganese; or organic sources, such as algal growth
Copper (mg/L)	1.3 [3]	1.3	233	ND - 0.15	0.01	40	ND - 0.10	< 0.01	368	ND - 0.78	0.07	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Cyanide (mg/L) [4]	0.2	0.2	239	ND	ND	36	ND	ND	100	ND - 0.05	< 0.02	Erosion of natural deposits, runoff from fertilizer
Fluoride (mg/L)	2.2	-	9040	ND - 1.31	1.07	841	0.60 - 1.18	1.05	1475	ND - 1.52	1.01	Erosion of natural deposits; water additive which promotes strong teeth; runoff from fertilizer
Gross Alpha particle (pCi/L) [5]	15	-	9	ND	ND	3	ND	ND	1	ND	ND	Erosion of natural deposits
Gross Beta particle (pCi/L) [5]	50	-	9	ND - 1.0	< 0.7	3	1.2 - 2.1	1.7	1	1.8	1.8	Decay of natural and man-made deposits
Iron (mg/L)	0.3 [6]	-	155	0.01 - 0.12	0.04	36	0.03 - 0.11	0.07	335	ND - 3.50	0.22	Erosion of natural deposits
Lead (mg/L)	0.015 [3]	0	233	ND - 0.007	< 0.002	40	ND	ND	368	ND - 0.017	< 0.002	Corrosion of household plumbing systems; erosion of natural deposits
Manganese (mg/L)	0.3 [6]	-	155	ND - 0.06	0.02	36	0.03 - 0.09	0.05	335	ND - 0.48	0.05	Erosion of natural deposits
Mercury (mg/L)	0.002	0.002	157	ND	ND	36	ND	ND	103	ND	ND	
Nickel (mg/L)	0.1 [7]	-	155	ND	ND	36	ND	ND	103	ND	ND	
Nitrate (mg/L nitrogen)	10	10	155	0.09 - 0.39	0.18	36	0.16 - 0.67	0.32	384	ND - 8.85	3.67	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (mg/L nitrogen)	1	1	155	ND	ND	36	ND	ND	233	ND	ND	
pH (pH units)	6.5 to 8.5	-	9043	6.6 - 7.8	-	841	6.8 - 7.6	-	1478	5.8 - 8.3	-	
Selenium (mg/L)	0.05	0.05	155	ND	ND	36	ND	ND	103	ND - 0.003	< 0.002	Erosion of natural deposits
Silver (mg/L)	0.1	-	155	ND	ND	36	ND	ND	103	ND	ND	
Sodium (mg/L)	NDL [8]	-	158	5.4 - 9.7	7.0	36	17.9 - 27.5	22.4	156	2.4 - 50.0	25.8	Erosion of natural deposits
Specific Conductance (µmho/cm)	NDL	-	9043	66 - 179	79	841	180 - 332	273	1478	65 - 792	323	
Sulfate (mg/L)	250.0	-	155	5.7 - 10.6	7.4	36	12.1 - 15.2	13.7	384	8.0 - 128.0	41.4	Erosion of natural deposits
Temperature (°F)	NDL	-	9030	37 - 77	56	840	39 -70	50	1475	39 - 77	60	
Thallium (mg/L)	0.002	0.0005	155	ND	ND	36	ND	ND	103	ND	ND	
Turbidity - entry points (NTU)	5 [9]	-	921	0.3 - 1.6	0.6	233	0.4 - 1.5	0.7	727	0.1 - 4.1	0.3	Soil erosion and stream sediments
Turbidity - distribution (NTU)	5 [10]	-	8118	0.2 - 4.1	0.6	608	0.3 - 2.2	0.7	1478	0.1 - 4.9	0.5	Soil erosion and stream sediments
Zinc (mg/L)	5	-	155	ND	ND	36	ND	ND	334	ND - 0.50	0.07	Erosion of natural deposits

[1] *Reported asbestos data was collected in 1993.*

[2] *MCL violation determination: If a sample exceeds 15 color units, a second sample must be collected from the same location within 2 weeks. If the average of the two results exceeds 15 color units, then an MCL violation has occurred. In the Croton system there were 2 color violations on 6/30/98 and 12/21/98. The Groundwater system experienced eleven violations between March and September 1998.*

[3] *Action limit (not an MCL) measured at the tap. Data presented reflect distribution system levels, except Groundwater which is sampled at internal taps. See the separate table for Lead and Copper Rule Sampling.*

[4] *Cyanide was analyzed after distillation from acid, which frees cyanides from compounds that might not be toxic. Cyanide was found in only two samples (from the Groundwater System).*

[5] *Reported radiological data for gross alpha, gross beta, and tritium are for samples collected during 1997.*

[6] *If iron and manganese are present, the total concentration of both should not exceed 0.5 mg/L. Higher levels may be allowed by the State when justified by the supplier of water.*

[7] *USEPA MCL; NYSDOH has not set an MCL for this parameter.*

[8] *Water with >20 mg/L of sodium should not be consumed by people on severely restricted sodium diets. Water with >270 mg/L of sodium should not be consumed by people on moderately restricted sodium diets.*

[9] *MCL is the average of two consecutive days. Data presented are individual sample results.*

[10] *MCL is the monthly average. Data presented are individual sample results.*

UNREGULATED CONVENTIONAL PHYSICAL AND CHEMICAL PARAMETERS

PARAMETERS (unit)	NYS DOH	CATSKILL-DELAWARE SYSTEM			CROTON SYSTEM			GROUNDWATER SYSTEM			SOURCE OF PARAMETER
	MCL	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	(IF DETECTED)
Aluminum (mg/L)	0.05 - 0.2 [11]	155	ND - 0.03	0.01	36	ND - 0.02	< 0.01	72	ND - 0.02	< 0.01	Erosion of natural deposits
Ammonia (mg/L nitrogen)	-	155	ND	ND	36	ND	ND	94	ND - 0.09	< 0.03	Animal waste and fertilizer runoff
Boron (mg/L)	-	155	ND - 0.09	0.04	36	ND - 0.10	0.06	72	0.02 - 0.19	0.08	Erosion of natural deposits
Bromide (mg/L)	-	24	ND	ND	13	ND - 0.02	< 0.02	15	0.10 - 0.14	0.12	Erosion of natural deposits
Calcium (mg/L)	-	235	4.2 - 11.6	5.8	39	14.8 - 24.8	21.4	392	4.6 - 98.1	28.3	Erosion of natural deposits
Carbon dioxide, dissolved (mg/L)	-	12	1.32 - 2.64	1.84	8	3.50 - 11.50	5.29	-	-	-	Present in air
Chemical Oxygen Demand (mg/L O_2)	-	155	1.2 - 7.8	4.2	36	6.4 - 9.8	8.4	72	ND - 6.1	1.8	
Chlorate (mg/L)	-	8	ND	ND	-	-	-	8	ND - 0.17	0.05	By-product of drinking water chlorination
Chlorine Residual, free (mg/L)	-	9040	0.05 - 2.20	0.81	841	0.08 - 2.20	0.67	1477	0.02 - 1.65	0.73	Water additive for disinfection
Color - distribution system (color units)	-	8111	3 - 40	7	608	3 - 24	9	1478	ND - 40	5	Presence of iron, manganese, and organics in water
Corrosivity (Langelier index)	0 [11, 12]	155	-3.01 to -2.13	-2.55	36	-1.47 to -1.18	-1.32	124	-3.25 to 0.94	-1.21	
Dissolved Oxygen (mg/L)	-	12	5.8 - 12.8	10.0	8	3.5 - 12.1	7.8	-	-	-	
Foaming Agents (mg/L linear alkyl sulfonate)	0.5 [11]	155	ND	ND	36	ND	ND	95	ND	ND	
Hardness (grains/gallon [US] $CaCO_3$)[13]	-	155	0.6 - 1.7	1.1	36	4.6 - 5.1	4.9	415	1.1 - 24.7	7.8	Erosion of natural deposits
Iodide (mg/L)	-	155	ND	ND	36	ND	ND	72	ND	ND	
Lithium (mg/L)	-	155	ND	ND	36	ND	ND	72	ND	ND	
Magnesium (mg/L)	-	155	0.99 - 2.40	1.34	36	6.5 - 8.80	7.64	72	2.00 - 40.50	14.32	Erosion of natural deposits
Phenols (mg/L phenol)	-	143	ND	ND	32	ND	ND	66	ND	ND	
Phosphate, Ortho- (mg/L)	-	9040	0.18 - 3.30	1.74	841	0.56 - 2.40	1.26	1477	0.65 - 3.30	1.50	Water additive for corrosion control
Phosphate, Total (mg/L)	-	155	0.10 - 3.25	1.51	36	0.63 - 1.88	1.08	124	0.36 - 5.20	1.83	
Potassium (mg/L)	-	155	0.37 - 3.50	0.70	36	1.60 - 2.40	1.92	72	0.66 - 4.80	2.00	Erosion of natural deposits
Silica [silicon oxide] (mg/L)	-	155	1.9 - 5.3	2.5	36	3.7 - 5.7	4.7	263	2.5 - 28.9	16.6	Erosion of natural deposits
Strontium (mg/L)	-	155	ND	ND	36	ND	ND	72	ND - 0.12	< 0.05	Erosion of natural deposits
Total Dissolved Solids (mg/L)	500 [11]	155	25 - 76	46	36	130 - 183	161	145	33 - 610	248	Metals and salts naturally occurring in the soil; organic matter
Total Organic Carbon (mg/L carbon)	-	155	1.2 - 2.1	1.5	36	2.2 - 3.5	2.6	72	ND - 2.0	0.4	Organic matter naturally present in the environment
Total Organic Halogen (mg/L)	-	155	0.07 - 0.23	0.16	36	0.19 - 0.33	0.25	72	ND - 0.21	0.03	By-product of drinking water chlorination
Tritium (^3H) - radiological (pCi/L) [5]	20000	9	ND	ND	3	ND	ND	1	ND	ND	Artificial radioisotope
UV 254 Absorbency (abs unit)	-	155	0.018 - 0.037	0.027	36	0.050 - 0.058	0.054	72	0.002 - 0.041	0.012	Organic matter naturally present in the environment

[11] *USEPA Secondary MCL; NYSDOH has not set an MCL for this parameter.*

[12] *A Langelier Index of less than zero indicates corrosive tendencies.*

[13] *Hardness of up to 3 grains per gallon is considered soft water; between 3 and 9 is moderately hard water.*

SPECIFIED ORGANIC CHEMICALS

PARAMETERS (mg/L)	NYS DOH	US EPA	CATSKILL-DELAWARE SYSTEM			CROTON SYSTEM			GROUNDWATER SYSTEM			SOURCE OF PARAMETER
	MCL	MCLG	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	(IF DETECTED)
Alachlor	0.002	0	4	ND	ND	6	ND	ND	45	ND	ND	
Aldicarb (Temik)	0.003	-	32	ND	ND	10	ND	ND	72	ND	ND	
Aldicarb sulfone	0.002	-	32	ND	ND	10	ND	ND	72	ND	ND	
Aldicarb sulfoxide	0.004	-	32	ND	ND	10	ND	ND	72	ND	ND	
Aldrin	0.005	-	4	ND	ND	1	ND	ND	38	ND	ND	
Atrazine	0.003	0.003	4	ND	ND	6	ND	ND	45	ND - 0.0002*	ND	Runoff from herbicide used on row crops
Benzo(a)pyrene	0.0002	0	4	ND	ND	6	ND	ND	45	ND	ND	
Butachlor	0.05	-	4	ND	ND	6	ND	ND	45	ND	ND	
Carbaryl	0.05	-	32	ND	ND	10	ND	ND	72	ND	ND	
Carbofuran (Furadan)	0.04	0.04	32	ND	ND	10	ND	ND	72	ND	ND	
Chlordane	0.002	0	4	ND	ND	1	ND	ND	45	ND	ND	
2,4-D	0.05	0.07	4	ND	ND	1	ND	ND	50	ND	ND	
Dalapon	0.2	0.2	4	ND	ND	1	ND	ND	50	ND	ND	
1,2-Dibromo-3-chloropropane	0.0002	0	109	ND	ND	33	ND	ND	109	ND	ND	
Dicamba	0.05	-	4	ND	ND	1	ND	ND	50	ND	ND	
Dieldrin	0.005	-	4	ND	ND	1	ND	ND	42	ND - 0.00004*	ND	Runoff from pesticide use
Di(2-ethylhexyl) adipate	0.4	-	4	ND	ND	6	ND	ND	45	ND	ND	
Di(2-ethylhexyl) phthalate	0.006	0	4	ND	ND	6	ND	ND	45	ND - 0.001	< 0.0006	Plasticizer in flexible plastics
Dinoseb	0.007	0.007	4	ND	ND	1	ND	ND	47	ND	ND	
Diquat	0.02	0.02	31	ND	ND	11	ND	ND	79	ND	ND	
Endothall	0.1	0.1	4	ND	ND	1	ND	ND	45	ND	ND	
Endrin	0.002	0.002	4	ND	ND	1	ND	ND	42	ND	ND	
Ethylene dibromide (EDB)	0.00005	0	109	ND	ND	33	ND - 0.0001§	ND	109	ND	ND	Runoff from fungicide use
Glyphosate	0.7	0.7	4	ND	ND	1	ND	ND	45	ND	ND	
Heptachlor	0.0004	0	4	ND	ND	1	ND	ND	38	ND	ND	
Heptachlor epoxide	0.0002	0	4	ND	ND	1	ND	ND	41	ND - 0.00001	< 0.00001	Breakdown of heptachlor, runoff of pesticide
Hexachlorobenzene	0.001	0	4	ND	ND	6	ND	ND	45	ND	ND	
Hexachlorocyclopentadiene	0.05	0.05	4	ND	ND	6	ND	ND	45	ND	ND	
3-Hydroxycarbofuran	0.05	-	32	ND	ND	10	ND	ND	72	ND	ND	
Lindane	0.0002	0.0002	4	ND	ND	1	ND	ND	41	ND	ND	
Methomyl	0.05	-	32	ND	ND	10	ND	ND	72	ND	ND	
Methoxychlor	0.04	0.04	4	ND	ND	6	ND	ND	45	ND	ND	
Metolachlor	0.05	-	4	ND	ND	6	ND	ND	45	ND	ND	
Metribuzin	0.05	-	4	ND	ND	6	ND	ND	45	ND	ND	
Oxamyl (Vydate)	0.2	0.2	32	ND	ND	10	ND	ND	72	ND	ND	
Pentachlorophenol	0.001	0	4	ND	ND	1	ND	ND	50	ND	ND	
Picloram	0.5	0.5	4	ND	ND	1	ND	ND	50	ND	ND	
Polychlorobiphenyls [PCB]	0.0005(14)	0	4	ND	ND	1	ND	ND	42	ND	ND	
Propachlor	0.05	-	4	ND	ND	6	ND	ND	45	ND	ND	
Simazine	0.004	0.004	4	ND	ND	6	ND - 0.00005*	ND	45	ND	ND	Runoff from herbicide use
Toxaphene	0.003	0	4	ND	ND	1	ND	ND	45	ND	ND	
2,4,5-TP (Silvex)	0.01	0.05	4	ND	ND	1	ND	ND	50	ND	ND	
Vinyl chloride	0.002	0	164	ND	ND	41	ND	ND	103	ND	ND	

* *The contaminant was detected in only one sample. The level found was below the MCL.*

§ *The contaminant was detected in only one sample. The initial sample was above the MCL, but the repeat was ND. Therefore no MCL exceedence occurred.*

(14) *MCL is for total PCB measured as decachlorobiphenyl.*

REGULATED ORGANIC CONTAMINANTS

Principal Organic Contaminants have an MCL of 0.005 mg/l. In total 164 samples were collected in the Catskill/Delaware system, 41 in the Croton system, and 102 in the groundwater system.

Principle Organic Contaminants not detected:

Benzene, Bromobenzene, Bromochloromethane, Bromomethane, sec Butylbenzene, tert-Butylbenzene, Carbon Tetrachloride, Chlorobenzene, Chloroethane, Chloromethane, 2-Chlorotoluene, 4-Chlorotoluene, Dibromomethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-Dichloroethane, 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, n-Propylbenzene, Styrene, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, Toluene, 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

PARAMETERS (mg/L)	NYS DOH	US EPA	CATSKILL-DELAWARE SYSTEM			CROTON SYSTEM			GROUNDWATER SYSTEM			SOURCE OF PARAMETER
	MCL	MCLG	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	(IF DETECTED)
Principle Organic Contaminants detected at levels below the MCL												
n-Butylbenzene	0.005	-	164	ND	ND	41	ND	ND	102	ND - 0.0022*	ND	Residue of gasoline
Dichlorodifluoromethane	0.005	-	164	ND	ND	41	ND	ND	102	ND - 0.002	< 0.0005	Leaching from refrigerators and air conditioners
Methylene chloride	0.005	0	164	ND - 0.0008*	ND	41	ND	ND	102	ND - 0.0011*	ND	Discharge from dry cleaners
Tetrachloroethylene	0.005	0	164	ND	ND	41	ND	ND	102	ND - 0.011[15]	0.001	Discharge from dry cleaners
1,2,3-Trichlorobenzene	0.005	-	164	ND	ND	41	ND	ND	102	ND - 0.0014*	ND	Runoff from pesticide
1,2,4-Trichlorobenzene	0.005	0.07	164	ND	ND	41	ND	ND	102	ND - 0.0013*	ND	Runoff from pesticide
Disinfection By-Products												
Total Trihalomethanes[16]	0.10	-	164	0.008 - 0.080	0.031	41	0.035 -	0.045	102	ND - 0.021	0.004	By-product of drinking water chlorination

* *The contaminant was detected in only one sample. The level found was below the MCL.*

[15] *Though an individual sample result exceeded 0.005 mg/L, no MCL violation occurred in 1998. Determination of MCL violation: If a sample exceeds the MCL, one to three more samples must be collected from the same sampling point within 30 days. If at least one of the confirming samples is positive and the average of the initial and all confirming samples exceeds the MCL, then an MCL violation has occurred.*

[16] *MCL is the calculated quarterly running average. In 1998 the MCL was never exceeded. Data presented are based on individual sample results.*

UNSPECIFIED ORGANIC CHEMICALS (Revised February 2000)

Unspecified Organic Chemicals not detected:

Acenaphthene, Acenaphthylene, Acetochlor, Acifluorfen, Anthracene, Betazon, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[g,h,I]perylene, a-BHC, b-BHC, d-BHC, g-BHC, Bromocil, Butylbenzylphthalate, Caffeine, Carboxin, a-Chlordane, g-Chlordane, Chlorobenzilate, Chloroneb, Chlorothalonil (Draconil, Bravo), Chrysene, Cyanazine, 2,4-DB, p,p'DDD, p,p'DDE, p,p'DDT, Diazinon, Dibenz[a,h]anthracene, 3,5-Dichlorobenxoic acid, Dichlorprop, Dimethoate, Dimethylphthalate, 2,4-Dinitrotoluene, Di-N-octylphthalate, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin aldehyde, Etridiazole, EPTC, Fluoranthene, Fluorene, Indeno[1,2,3-cd] pyrene, Malathion, Methiocarb, MGK - 264, Molinate, Naphthalene, 4-Nitrophenol, trans-Nonachlor, Norflurazon, Paraquat, Parathion, Permethrin, Phenanthrene, Prometryn, Propoxur (Baygon), Pyrene, 2,4,5-T, Terbacil, Terbufos, Tetrachloroterephthalic acid, Thiobencarb, Trifluralin, Vernolate

PARAMETERS (mg/L)	DOH	CATSKILL-DELAWARE SYSTEM			CROTON SYSTEM			GROUNDWATER SYSTEM			SOURCE OF PARAMETER
	MCL	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	(IF DETECTED)
Disinfection By-Products detected											
Bromoacetic acid	0.05	105	ND - 0.002	< 0.00016	20	ND - 0.0002	< 0.00016	41	ND - 0.002	0.0002	By-product of drinking water chlorination
Bromochloroacetic acid	0.05	105	0.0006 - 0.0025	0.0014	20	0.0007 - 0.0018	0.0013	41	ND - 0.002	0.0006	By-product of drinking water chlorination
Bromochloroacetonitrile	0.05	78	ND - 0.0006	0.0003	20	0.0007 - 0.0014	0.001	44	ND - 0.0009	0.0002	By-product of drinking water chlorination
Chloral Hydrate	0.05	80	0.001 - 0.016	0.006	18	0.003 - 0.009	0.0058	50	ND - 0.014	0.0008	By-product of drinking water chlorination
Chloroacetic acid	0.05	105	ND - 0.003	0.001	20	ND - 0.003	0.002	41	ND - 0.001	< 0.00022	By-product of drinking water chlorination
Chloropicrin	0.05	112	ND - 0.0009	0.0006	24	0.0003 - 0.0009	0.0005	54	ND - 0.0003	< 0.00010	By-product of drinking water chlorination
Dibromoacetic acid	0.05	105	ND - 0.0009	< 0.00010	20	ND - 0.002	0.0002	41	ND - 0.002	0.0007	By-product of drinking water chlorination
Dibromoacetonitrile	0.05	77	ND - 0.0006	< 0.00010	20	ND - 0.0006	0.0002	45	ND - 0.0024	0.0007	By-product of drinking water chlorination
Dichloroacetic acid	0.05	105	0.009 - 0.037	0.018	20	0.007 - 0.021	0.013	41	ND - 0.011	0.0015	By-product of drinking water chlorination
Dichloroacetonitrile	0.05	99	0.001 - 0.004	0.003	27	0.0005 - 0.009	0.005	53	ND - 0.0014	0.0002	By-product of drinking water chlorination
1,1-Dichloropropanone	0.05	85	0.0002 - 0.001	0.0005	27	0.0005 - 0.0024	0.001	51	ND - 0.0003	< 0.00010	By-product of drinking water chlorination
Trichloroacetic acid	0.05	105	0.008-0.050	0.002	20	0.027 - 0.043	0.035	41	ND - 0.015	0.002	By-product of drinking water chlorination
Trichloroacetonitrile	0.05	91	ND - 0.0002	< 0.00010	27	ND - 0.0005	< 0.00010	49	ND	ND	By-product of drinking water chlorination
1,1,1-Trichloropropanone	0.05	93	0.001 - 0.005	0.003	27	0.0003 - 0.0095	0.0038	54	ND - 0.0016	0.0002	By-product of drinking water chlorination
Unspecified Organic Chemicals detected											
DCPA (Dacthal)	0.005	4	ND	ND	1	ND	ND	25	ND - 0.0041	0.0003	Runoff from pesticide use
Di-n-Butylphthalate	0.005	4	ND	ND	6	ND	ND	45	ND - 0.0007	< 0.00050	Plasticizer from flexible plastics
Diethylphthalate	0.005	4	ND	ND	6	ND	ND	45	ND - 0.004	0.0006	Plasticizer from flexible plastics
Isophorone	0.05	4	ND	ND	6	ND	ND	45	ND - 0.0007*	ND	Runoff from pesticide use, solvent in paints
Methyl tert-butyl ether (MTBE)	0.05	164	ND - 0.005	< 0.0005	41	ND - 0.0006	< 0.0005	102	ND - 0.062[17]	0.0035	Additive to gasoline in the winter

* *The contaminant was detected in only one sample. The level found was below the MCL.*

[17] *Though an individual sample result exceeded 0.05 mg/L in the Groundwater System, no MCL violation occurred in 1998. Determination of MCL violation: If a sample exceeds the MCL, one to three more samples must be collected from the same sampling point within 30 days. If at least one of the confirming samples is positive and the average of the initial and all confirming samples exceeds the MCL, then an MCL violation has occurred.*

LEAD AND COPPER RULE SAMPLING AT RESIDENTIAL WATER TAPS

PARAMETERS (mg/L)	NYS DOH MCL	US EPA MCLG	90th PERCENTILE VALUES	# SITES EXCEEDING ACTION LEVEL	SOURCE
Copper	AL= 1.3	1.3	0.179	All sample results were below the Action Level	Corrosion of household plumbing systems
Lead	**AL = 0.015**	**0**	**0.016**	**12 of 107 samples (more than 10 %) collected between July and December 1998 exceeded the Action Level of 0.015 mg/L**	**Corrosion of household plumbing systems**

MICROBIAL PARAMETERS

PARAMETERS (units)	NYS DOH MCL	US EPA MCLG	# SAMPLES	RANGE	AVERAGE	SOURCE
Total Coliform Bacteria (% of samples positive/month)	5%	0	11350	ND - 0.5%	0.23%	Naturally present in the environment
E. coli (CFU/ml)	(18)	0	11350	0 - 1*	0	Human and animal fecal waste
Heterotrophic Plate Count (CFU/ml)	TT	-	11184	ND - 500	1	Naturally present in the environment

* *Only one sample with one colony was detected.*

(18) *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 the MCL is exceeded.*

AL = Action Level: The concentration of a contaminant, which if exceeded, triggers treatment or other requirements which a water system must follow. An exceedence occurs if more than 10% of the samples exceed the Action Level.

MCL = Maximum Contaminant Level: 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

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

mg/L = milligrams per liter

ND = Non-Detect

NDL = No Designated Limit

TT = Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water

Parameters with highlighted and bolded values indicate a violation

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION

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