New York City 2007 Drinking Water Supply and Quality Report

✓ Clean
✓ Healthy
✓ Refreshing
✓ Zero sugar
✓ Fat Free

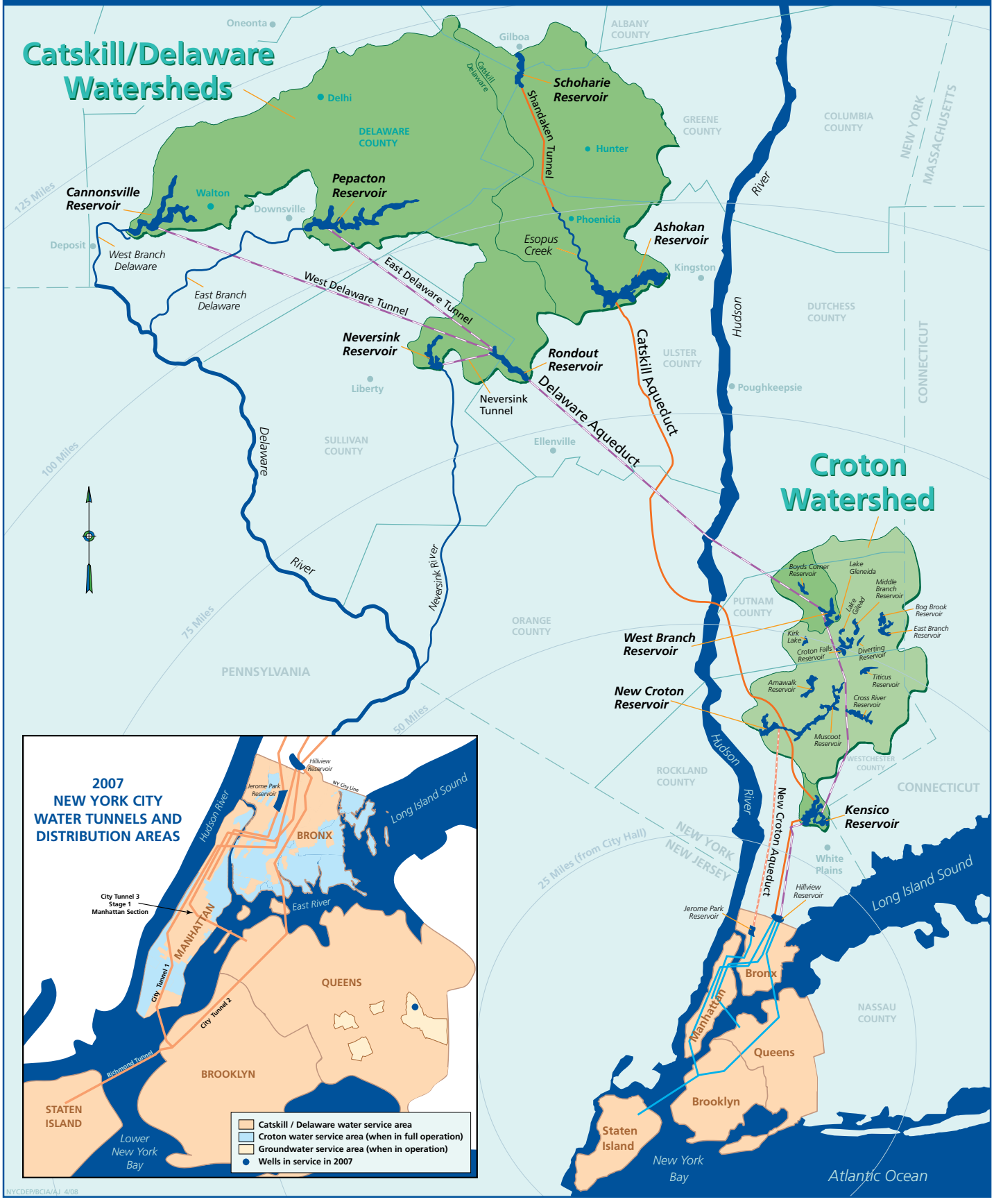
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP

www.nyc.gov/dep

Michael R. Bloomberg, Mayor
Emily Lloyd, Commissioner

New York City's Water Supply System



NYCDEP/BCIA/AJ 4/08

The City of New York

DEPARTMENT OF ENVIRONMENTAL PROTECTION

59-17 Junction Boulevard
Flushing, New York 11373

Emily Lloyd
Commissioner

Dear Water Customer:

Each day, more than 1.1 billion gallons of fresh, clean water is delivered from large upstate reservoirs – some more than 125 miles from the city – to the taps of 9 million customers throughout New York State.

The system responsible for this feat is an engineering marvel. It consists of 19 reservoirs and more than 6,000 miles of pipes, aqueducts and tunnels. The Delaware Aqueduct, at 85-miles long, is the longest continuous tunnel in the world, and runs at depths of more than 1,500 feet in some places. Even more impressive, the system is almost entirely gravity driven, delivering high-quality water to you without emitting climate-changing greenhouse gases.

Under Mayor Bloomberg's PlaNYC initiative, the New York City Department of Environmental Protection is working to ensure the long-term viability and sustainability of this truly historic system. We are finishing City Water Tunnel No. 3 in order to shut down, inspect and repair City Tunnel No. 1, which has been in continuous operation for nearly a century. We have taken the first steps toward repairing the Delaware Aqueduct, and continuing to protect our watershed by purchasing and conserving watershed land with more than $300 million in new funds.

All of these initiatives will continue to enhance the operation of our system and improve the quality of our drinking water, but we also need help from you. To maintain our water system, we encourage all of our customers to enjoy NYC tap water, which, as recently confirmed by the US Environmental Protection Agency, is among the highest-quality and best-tasting water in the world. Drinking NYC water is one of the most important investments you can make in our system.

With no carbohydrates, sugar or calories, NYC water is good for your health, and particularly good for young children, who are most susceptible to obesity and other related diseases. It is also much cheaper than bottled alternatives. Drinking two liters of NYC water each day will cost just $0.50 a year, whereas drinking two liters of bottled water a day will cost more than $1400 a year.

Perhaps most importantly, because 47 million gallons of fossil fuels are used to produce all the plastic bottles Americans use each year, which results in one billion pounds of CO_2 added to the atmosphere, each time you drink NYC water instead of a bottled alternative, you are protecting our environment and helping to curb the impact of climate change on our water supply system.

In summer of 2007, DEP partnered with the City Department of Health and Mental Hygiene to promote NYC tap water and to teach New Yorkers about this invaluable resource. With your help, we can continue the message of this campaign so that all of our customers, in addition to the millions of people who work in or visit New York City each year, know to reach for the tap instead of a bottled drink the next time they're thirsty.

Sincerely,

Emily Lloyd

NEW YORK CITY 2007 DRINKING WATER SUPPLY AND QUALITY REPORT

The New York City Department of Environmental Protection (DEP) is pleased to present its 2007 Annual Water Quality Report. This report was prepared in accordance with Part 5-1.72 of the New York State Sanitary Code (10NYCRR), and the National Primary Drinking Water Regulations, 40 CFR Part 141 Subpart O, of the United States Environmental Protection Agency (EPA), which require all drinking water suppliers to provide the public with an annual statement describing the water supply and the quality of its water.

New York City's Water Supply

The New York City surface (reservoir) water supply system provides approximately 1.1 billion gallons of safe drinking water daily to over 8 million residents of New York City; approximately one million people living in Westchester, Putnam, Ulster, and Orange counties; as well as the millions of tourists and commuters who visit the City throughout the year. In addition to our surface water supplies, fewer than 100,000 people in southeastern Queens may receive groundwater or a blend of groundwater and surface water. In all, the City system supplies nearly half the population of New York State with high quality water.

Source 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 1,972 square-mile watershed that extends 125 miles north and west of New York City. Due to the City's ongoing efforts to maintain the appropriate volume and high quality of water in the distribution system, there is some rotation in the water sources used by DEP. In 2007, 99% of our water came from the Catskill/Delaware System (Public Water System Identification Number [PWSID] NY7003493), located in Delaware, Greene, Schoharie, Sullivan, and Ulster counties, west of the Hudson River. The Croton System (PWSID NY7003666), the City's original upstate supply, provided, on average, 1% of the daily supply to the City from 12 reservoir basins in Putnam, Westchester, and Dutchess counties. New York City's Groundwater System (PWSID NY7011735) in southeastern Queens supplied less than 0.1% of the City's total usage.

Regulation of Drinking 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, 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 EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The State Health Department's 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.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at (800) 426-4791.

Ensuring a Safe, Reliable and Sufficient Water Supply

Source Water Assessment Program

The Safe Drinking Water Act (SDWA) Amendments of 1996 required states to develop and implement Source Water Assessment Programs (SWAP) 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 SDWA gave states a great deal of flexibility on how to implement SWAP. These assessments were to be created using available information, and to help estimate the potential for source water contamination. Elevated susceptibility ratings do not mean that source water contamination has or will occur in the water supply, but instead indicate the need for water suppliers to implement additional precautionary measures.

Starting in 1993, and culminating in 1997 with the historic watershed agreement and Filtration Avoidance Determination (FAD), New York City began implementation of a series of programs to reduce the susceptibility of the surface water supply to contamination from a variety of sources. These programs, which are still ongoing, operate under the close scrutiny of both the NYSDOH and the EPA. Due to these efforts, further detailed below, the SWAP methodologies applied to the rest of the state were not applied to the New York City water supply by NYSDOH.

Watershed Protection Programs

10-Year Filtration Avoidance Determination from EPA

In July of 2007, the EPA issued a 10-year Filtration Avoidance Determination (FAD), covering 2007 to 2017, based on the Long-term Watershed Protection Program DEP submitted in December, 2006. The new FAD is the first 10-year filtration avoidance waiver ever granted to New York City; all earlier FADs were for five-year periods.

The primary changes to the City's watershed protection program that EPA incorporated into the new FAD relate to land acquisition. DEP will invest a total of $300 million to acquire environmentally-sensitive lands in the watersheds east and west of the Hudson River. This 10-year commitment includes $241 million in new money as well as $59 million remaining from previous land acquisition funding. In addition, the City will increase its efforts to work with land trusts and other non-profit organizations in purchasing watershed lands, which should expedite the process and allow more property to be protected.

The new FAD also reflects the City's significant new programmatic commitments in many other areas, including: new resources for septic repairs, community wastewater solutions in select communities and storm water controls; continued implementation of stream restoration projects; enhancements to control polluted runoff from both small and large watershed farms; and a host of other initiatives designed to protect and enhance water quality. In addition, the City is proceeding with construction of a facility to provide enhanced water disinfection using ultraviolet light, the world's largest, to provide additional water quality protection for consumers of Catskill/Delaware water (more information on this facility can be found on page 5).

Land Acquisition

The City buys real property interests from willing sellers only, with the goal of further protecting and buffering the 19 reservoirs and controlled lakes in the Catskill, Delaware and Croton watershed systems. Surrounding these reservoirs are 1.2 million acres of land, of which the City owned 45,000 acres in 1997. Since the Land Acquisition Program began in 1997, the City and its partner, the Watershed Agricultural Council (WAC) have secured almost 84,000 acres in fee simple or conservation easements. In all, the City now owns more than 128,000 acres, land which is now protected from development and managed pro-actively to protect water quality. DEP solicits parcels for acquisition based on the presence of critical natural features, such as streams and wetlands and/or proximity to reservoirs, as well as potential for development. During 2007, DEP continued to solicit – and re-solicit – owners of such sensitive watershed properties.

Land Management

With the City's acquisition of land over the past 10 years, it has become one of the largest single landowners in the watershed region. These properties must be managed to ensure that water quality is protected. To achieve this critical objective, DEP has developed and implemented land management programs that identify specific beneficial uses and projects for the City's water supply lands that include opening properties for recreational use.

Since 1997, DEP has increased the acreage open for recreation every year, and 46,000 acres are now available for fishing, hiking, hunting, cross-country skiing and other passive activities. An additional 13,267 recreation Access Permits were issued in 2007, for a total of more than 105,000 valid permits.

DEP and the New York State Department of Environmental Conservation (DEC) reached an agreement to open approximately 11,000 acres of City-owned land adjacent to State-owned land to hiking, hunting, fishing and trapping without the need for a City Access Permit. DEC will patrol the City watershed property to enforce regulations, help protect the environment, and further assist in the management of these lands. The change will be in effect for the 2008-2009 hunting season.

Partnership Programs

Many of the City's watershed protection programs west of the Hudson River are administered by the Catskill Watershed Corporation (CWC), a non-profit corporation formed for this purpose. Together, the CWC and DEP have repaired or replaced more than 2,600 failing septic systems and financed the construction of 58 stormwater control measures to address existing stormwater runoff.

The Community Wastewater Management Program (CWMP) administered by CWC funds the planning, design and construction of community septic systems or septic maintenance districts in hamlets west-of-Hudson. CWMP projects have been completed in the hamlets of Bovina and DeLancey and are underway in Hamden, Bloomville, Boiceville and Ashland.

Through its New Infrastructure Program, DEP is also financing the construction of new wastewater treatment plants (WWTPs) in communities that have areas of failing or likely-to-fail septic systems. Roxbury, Andes, Windham, Hunter, Fleischmanns and Prattsville have completed construction of wastewater treatment facilities. DEP's sewer extension program, which connects new sewer lines to City-owned treatment plants west-of-Hudson, completed work in the Village of Tannersville in 2006; other projects are in design or under construction in Grahamsville, Margaretville, Grand Gorge and Pine Hill.

Forestry

The Watershed Forestry Program is a successful public-private partnership that supports well-managed working forests as a beneficial land use for watershed protection. Since 1997, DEP has contracted with the locally-based WAC to administer and implement core program tasks that emphasize pollution prevention and forest stewardship practices. WAC also receives matching grants from the United States Department of Agriculture (USDA) Forest Service to help strengthen the economic viability of the wood products industry, develop forest management and riparian plans, promote urban-rural conservation education and support targeted outreach. Accomplishments of the Watershed Forestry Program include the development of more than 680 forest management plans covering over 121,000 watershed acres, the completion of more than 150 forest road best management practices (BMP) projects, the training of approximately 100 professional foresters and watershed loggers, and the annual sponsorship of numerous landowner and school-based forestry education programs that have reached thousands of people who either live in the watershed or consume the water supplied by the watershed.

Wastewater Treatment Plant Upgrades

More than 100 non-City-owned WWTPs in the upstate watershed are being upgraded to provide state-of-the-art treatment of pathogens and substantially reduce nutrients in their waste streams. Under this City-funded effort, plants generating 97% of the west-of-Hudson WWTP flow have been upgraded. In the Croton Watershed, plants producing 43% of the flow have been fully upgraded; facilities accounting for another 43% of the flow are in the construction phase; while another 27 plants (generating 14% of the flow) are in the design phase.

Watershed Agricultural Program

The Watershed Agricultural Program (WAP) has been in operation since 1992 fostering a comprehensive effort to develop and implement pollution prevention practices on watershed farms. Almost 95% of the commercial farms in the City's Catskill/Delaware watersheds participate in this voluntary program, which works to reduce agricultural pollution, while improving the economic viability of the farms involved. Funded primarily by the City, WAP is administered by the community-based, not-for-profit WAC. More than $30 million has been spent on implementation of BMPs for over 300 farms in the Catskill/Delaware and Croton watersheds since 1992. Six farms began voluntary implementation of their plans in 2007.

The City has augmented the program with a City/federal cost-sharing effort known as the Conservation Reserve Enhancement Program (CREP). CREP pays farmers to re-establish vegetative buffers on sensitive riparian buffer lands near streams and ponds.

Improved Reliability

Catskill/Delaware UV Facility

EPA published new regulations in the Federal Register on January 5, 2006, including the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), to improve control of microbial pathogens. In preparation for the new rule which was first proposed in August 2003, New York City designed an ultraviolet (UV) light disinfection plant for the Catskill/Delaware System. In 2007, DEP substantially completed the site preparation for the construction of the plant, and in January 2008 facility construction started. The facility is expected to begin operation in 2012. The plant is located at the New York City-owned Eastview site, a 153-acre property situated in the towns of Mount Pleasant and Greenburgh in Westchester County, New York. The Catskill/Delaware facility will consist of fifty-six 40-million gallon per day UV Disinfection Units and is designed to disinfect a maximum of 2.4 billion gallons of water per day. The plant will provide an additional barrier of microbiological protection by inactivating potentially harmful organisms such as *Cryptosporidium* and *Giardia*. This treatment will supplement DEP's existing microbial disinfection programs.

Croton Filtration Plant

The City's goals are to ensure that water from all three of its water supply systems is at all times protected against microbiological contamination, is aesthetically pleasing, and meets all drinking water quality standards. With respect to the Croton System, the City is proceeding with the construction of a filtration plant for Croton System water, pursuant to the terms of a November 1998 federal court Consent Decree entered into with the United States and the State of New York. The filtration plant is expected to reduce color levels, the risk of microbiological contamination, and disinfection byproduct (DBP) levels in the Croton System water. The filtration plant will also ensure compliance with stricter water quality standards. In September 2004, the City commenced construction of the Croton Filtration Plant at the Mosholu Golf Course site. During 2007, site preparation work for the plant was substantially completed and a notice to proceed for plant construction was issued. Structural concrete placement in the main excavation pit, and excavation of the raw water tunnel and treated water tunnels will continue to make steady progress in 2008.

As part of an agreement between the City and the Parks Department, more than $200 million generated from water and sewer revenues will be spent on improvements to more than 70 Bronx Parks and recreational facilities. In 2007, work was completed on eight recreational facilities totaling $11.1 million in improvements. A key project completed in 2007 was Sachkerah Woods Playground, located just south of the DEP Filtration Plant site.

In conjunction with plant construction, DEP has opened a community outreach office adjacent to the Mosholu site. The office, located at 3660 Jerome Avenue, Bronx, New York is open Monday through Friday from 9 AM to 5 PM. For more information, the telephone number of the center is (718) 231-8470.

The City remains committed to maintaining a comprehensive watershed protection program for the Croton System. 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.*

City Water Tunnel No. 3

Construction of City Tunnel No. 3, one of the largest capital projects in New York City's history, began in 1970. Tunnel No. 3 will enhance and improve the City's water delivery system, and allow for the inspection and repair of City

Tunnels No. 1 and 2 for the first time since they were put into service, in 1917 and 1936, respectively. The 13-mile Stage 1 section 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 Tunnel No. 3 consists of the Brooklyn/Queens leg and the Manhattan leg. The Brooklyn/Queens leg is a 5.5-mile section in Brooklyn that connects to a 5-mile section in Queens. These were completed in May of 2001. It is anticipated that the Brooklyn/Queens section, which will deliver water to Staten Island, Brooklyn and Queens, will be activated by 2013. Tunneling on the Manhattan portion of Stage 2 began in 2003 and was completed in 2006. Almost 9 miles were excavated & lined with concrete. In addition, nine new supply shafts have been constructed on the Manhattan leg. The supply shafts will integrate the new tunnel section with the existing distribution system. Work on the distribution chambers, which are underground facilities atop the shafts, continues and should be completed in 2009. The Manhattan leg is expected to begin water delivery by 2013. Facility planning for Stage 3 of the tunnel is ongoing, with a final facility plan and conceptual design expected by mid-2008. Stage 3, referred to as the Kensico-City Tunnel (KCT) involves construction of a 16-mile section that extends from the Kensico Reservoir to a valve chamber in the Bronx. When completed, the KCT will be able to deliver water directly from Kensico Reservoir to Tunnel No. 3. In total, Tunnel No. 3 will span 60 miles. Construction is expected to be completed by 2025.

Hillview Reservoir

Due to violations of the Total Coliform Rule (TCR) in the distribution system in 1993 and 1994 that were attributed to conditions at Hillview Reservoir, DEP entered into a 1996 Administrative Order (AO) with NYSDOH, amended in 1997 and again in 1999, requiring DEP to complete four activities: 1) remove Hillview Reservoir sediments; 2) undertake a biofilm research study of the distribution system; 3) investigate the integrity of the Hillview Reservoir dividing wall; and 4) install a cover over the Hillview Reservoir. DEP completed all of the action items stipulated in the AO except item 4, the covering of the Hillview Reservoir. DEP also instituted an improvements program which included facility and operational modifications designed to prevent a recurrence of the TCR violations: increasing the chlorine residual in the basins of Hillview Reservoir, and initiating an avian (bird) deterrent program. Significant capital improvements to the Hillview Reservoir structures, chemical addition facilities, and flow control facilities were also undertaken. Many elements of the improvements program went beyond the actions required by the AO. DEP did not meet the AO milestone for commencing construction of a cover (April 30, 2002) or completing construction of a cover (December 31, 2005). After negotiations to amend the construction date, DEP has reached an agreement with NYSDOH to modify the AO and extend the covering milestone. The final AO was signed in February 2008.

Groundwater System Enhancements

In the late 1990s, after purchasing the wells in southeastern Queens and assuming responsibility for the delivery of drinking water from those wells to the adjacent communities, DEP embarked upon a broad program to integrate New York City's surface water supply with the groundwater supplied by the aquifer system below southeastern Queens. As part of the Brooklyn-Queens Aquifer Feasibility Study, DEP continues to investigate the use of the deep aquifers for water storage and to develop plans for a treatment plant at Station 6 in Jamaica.

Station 6 Groundwater Treatment Plant

DEP continues to develop plans for a new groundwater treatment plant to replace DEP's existing facility located at Station 6 in Jamaica, Queens. This state-of-the-art facility will produce high quality drinking water and control groundwater flooding while providing educational resources and community meeting space. Once built, Station 6 will provide between 10 and 12 million gallons per day of drinking water. Construction will not commence before 2012. As part of the Station 6 project, DEP has implemented a comprehensive community outreach program. This ongoing program includes small group meetings, large public forums, distribution of informational materials, and a Citizens Advisory Committee that meets on a monthly basis. More information about the Groundwater System can be found at www.nyc.gov/dep/groundwater.

Aquifer Storage and Recovery

In addition to improving the quality of groundwater from Queens' aquifers through treatment, DEP is investigating the possibility of improving the groundwater supply by using the deep aquifers (Magothy and Lloyd) to provide additional storage for surface water. Working with regional agencies, DEP is developing an Aquifer Storage and Recovery (ASR) project. Currently, the Lloyd Aquifer's resources are depleting, mainly due to rate of consumption by Long Island communities that is greater than the aquifer's natural rate of recharge. ASR would help to replenish the Lloyd Aquifer by injecting surplus water from New York City's upstate surface water reservoirs into the aquifer. This water would be stored in both deep aquifers and, when necessary, the City could extract a portion of this potable water to supplement its drinking water supply.

This process will benefit both the City and communities on Long Island. New York City will benefit from a new in-City drinking water supply -- created without many of the attendant construction costs and community disturbances involved in traditional capital projects. Most importantly, the City would also gain a temporary alternate water supply in case of an emergency, such as a drought or the need to shut down one of the City's three aqueducts. The injection process will have an added benefit in that it will recharge the aquifer. This recharging process would help to guard the aquifer against saltwater intrusion, protecting Long Island beach communities' underground drinking water from salinization, which is a long-term threat to their supply.

The West Side Corporation Site

The West Side Corporation (WSC), located at 107-10 180th Street in Jamaica, was a dry cleaning storage and distribution center that handled large amounts of the chemical tetrachloroethylene (also known as "PERC" or PCE) between 1969 and 1982. When the business closed, it left behind spills and storage tank leaks that resulted in the seepage of hazardous chemicals, including PERC, through the soil and into the groundwater. Today, DEP and the DEC are working together to clean up both the soil and the groundwater contamination caused by the spills.

Water Conservation

The average single family household in New York City uses approximately 100,000 gallons of water each year, at a cost of $2.02 per 100 cubic feet of water (748 gallons), or about $270 each year. Since virtually all City residences are connected to the public sewer system and, therefore, receive wastewater collection and treatment services as well, the combined annual water and sewer charge for the typical NYC household using 100,000 gallons per year is $627, consisting of $270 for water service and $357 for wastewater services. New York City is fortunate to have reasonably priced drinking water; however, everyone should do their part to conserve this precious resource. All New Yorkers are encouraged to observe good water conservation habits, and are required to obey the City's year-round water use restrictions, which include a prohibition on watering sidewalks and lawns between November 1 and March 31, and between 11 AM to 7 PM from April 1 to October 31. It is illegal to open fire hydrants at any time. You can help save water by ordering a Home or Apartment Water Saving Kit by calling the City's helpline, 311. If you are an apartment building owner/manager or a homeowner, you can also obtain a free leak survey. Call DEP's Leak Survey contractor at (718) 326-9426 for information.

Water Treatment

All surface water and groundwater entering New York City's distribution system is treated with chlorine, fluoride, food grade phosphoric acid 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 (SDWA) disinfection requirements. Fluoride, at a concentration of one part per million, is added to help prevent tooth decay and has been added since 1966 in accordance with the New York City Health Code. Phosphoric acid is added to create a protective film on pipes that reduces the release of metals such as lead from household plumbing. Sodium hydroxide is added to Catskill/Delaware water to raise the pH and reduce corrosivity.

In the Groundwater System, DEP has the ability to apply a sequestering agent at several wells to prevent the precipitation of naturally occurring minerals, mostly iron and manganese, in the distribution mains and customers' household piping. However, none of these wells were in operation in 2007. Air stripper facilities can be operated at several wells to remove volatile organic chemicals. The only well in operation in 2007 had an air stripper in operation.

Fluoride

During 2007, fluoride was not continuously supplied in the Catskill/Delaware System due to upgrades and repair work on the fluoride feed system. Fluoridation facilities for the Catskill System were offline over 38% of the time, with the longest period of fluoridation interruption being 90 days. Fluoridation facilities for the Delaware System were offline over 28% of the time, with the longest period of fluoridation interruption being 52 days. NYSDOH Bureau of Dental Health has indicated that a brief interruption of fluoridation to the Catskill/Delaware System is not expected to have a significant impact on dental health. Interruption of fluoridation in 2007 did not require public notification.

Operational Changes

As part of a multi-year program to inspect and rehabilitate the New Croton Aqueduct, the Croton System was removed from service on October 14, 2005. On July 6, 2007, the Croton System was put into distribution with the activation of the Mosholu Pump Station, which pumps Croton water into City Tunnel No. 1. On October 12, 2007 the Mosholu Pump Station was shut down. Croton water was not fed into distribution for the remainder of the calendar year.

For the Groundwater System, Well 5 was the only well online for a brief portion of the year. Well 5 was only operated in January and February of 2007, and supplied a daily average of 1.1 million gallons of drinking water per day. The pumping of water at the well was started and stopped on a daily basis, depending upon the water demand of the service area. Operational information for the Groundwater System can be found at www.nyc.gov/dep/groundwater. The map on the inside front cover represents the Catskill/Delaware, Croton, and Groundwater service areas. This map depicts the Croton and Groundwater service areas when in operation.

Stage 2 Microbials and Disinfection Byproducts Rules

To control microbial contaminants, in 1989 EPA promulgated the Surface Water Treatment Rule (SWTR), which established maximum contaminant level goals (MCLGs) for viruses, bacteria and *Giardia*. It also includes treatment technique requirements for filtered and unfiltered systems specifically designed to protect against the adverse health effects of exposure to these microbial pathogens. In addition, the Total Coliform Rule (TCR), revised in 1989, established a maximum contaminant level (MCL) for total coliforms.

DEP adds chlorine to disinfect the drinking water and protect it from microbes. However, chlorine can react with naturally-occurring materials in the water to form byproducts, such as trihalomethanes and haloacetic acids, which may pose health risks. In 1979, EPA set an interim MCL for total trihalomethanes (TTHM). The addition of a disinfectant to the water supply creates a challenge of balancing protection from microbial pathogens, with the need to simultaneously minimize the health risks from DBPs.

Amendments to the SDWA in 1996 required EPA to develop rules to achieve this balance. The Stage 1 Disinfectants and Disinfection Byproducts Rule and Interim Enhanced Surface Water Treatment Rule, promulgated in December 1998, were the first phase in a rulemaking strategy required by Congress as part of the 1996 Amendments to the SDWA. In January 2006, the final Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR) and the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) were promulgated. These regulations build upon earlier rules to increase protection against microbial contaminants, especially *Cryptosporidium*, and at the same time, reduce potential health risks of DBPs. The Stage 2 Regulations affect how DEP operates the water supply, leading to increased monitoring and reporting, adjustments of chemical additions, and construction of new infrastructure. For more information on the Stage 2 Regulations, visit: www.epa.gov/safewater/disinfection.

Drinking Water Quality

DEP's water quality monitoring program - far more extensive than 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. In 2004, DEP

received a Notice of Violation (NOV) from NYSDOH for failure to accurately report monitoring of at-the-tap lead concentrations for two consecutive monitoring periods. Because of the NOV, DEP has taken additional action to educate the public about lead in drinking water, and to replace certain lead service lines (discussed in more detail below). In 2007, at-the-tap concentrations for lead and copper did not exceed their Action Levels of 15 µg/L and 1.3 mg/L respectively.

Drinking Water Monitoring

DEP monitors the water in the distribution system, the upstate reservoirs and feeder streams, and the wells that are the sources for the City's supply. Certain water quality parameters are monitored continuously as the water enters the distribution system, and water quality is regularly tested at sampling points throughout the entire City. DEP conducts analyses for a broad spectrum of microbiological, chemical, and physical measures of quality. In 2007, DEP collected more than 30,600 samples from the City's distribution system and performed more than 426,800 analyses.

DEP conducts most of its distribution water quality monitoring at approximately 1,000 fixed sampling stations throughout the City. These stations, visible in many neighborhoods, allow DEP to collect water samples throughout the distribution system in an efficient and sanitary manner. The approximate boundaries of the service areas for all three City Systems are displayed in the map on the inside of the front cover.

Test Results

The results of the tests conducted in 2007 on distribution water samples under DEP's Distribution System Monitoring Program are summarized in the tables in this Report. These tables reflect the compliance monitoring results for all regulated and nonregulated parameters. The tables present both the federal and State standard for each parameter (if applicable), the number of samples collected, the range of values detected, the average of the values detected, and the possible sources of the parameters. The monitoring frequency of each parameter varies and is parameter specific. Data are presented separately for the Catskill/Delaware, Croton, and Groundwater Systems. Whether a particular user received water from the Catskill/Delaware, Croton, or Groundwater System supplies, or a mixture, depends on location, system operations, and consumer demand. Those parameters monitored, but not detected in any sample, are presented in a separate box. The State requires monitoring for some parameters less than once per year because the concentrations of these parameters do not change frequently. Accordingly, some of these data, though representative, are more than one year old. For specific information about water quality in your area, New York City residents should call the City of New York's 24-hour helpline at 311.

Color

The Croton System experiences seasonal water quality problems associated with elevated color levels, resulting from naturally occurring minerals and organic matter present in the water. In the Croton System, there was one violation of the color MCL at the Croton entry point on August 26, 2007, and a second occurred at the same location on October 9, 2007. An MCL violation occurs when the average of the two color results for two consecutive days exceeds the MCL of 15 apparent units. Color has no health effects unless detected in very high concentrations. In some instances, color may be objectionable to some people at as low as 5 apparent units. The presence of elevated color levels is aesthetically objectionable and suggests that the water may need additional treatment.

Turbidity

One Croton System entry point turbidity sample exceeded 1.49 NTUs on August 25, 2007 with a value of 2.33 NTU. If the daily entry point analysis exceeds 1 NTU, a repeat sample must be taken within one hour. DEP failed to collect a repeat sample on August 25, 2007 and was issued a Tier 3 monitoring violation by NYSDOH.

There was another Croton System entry point turbidity sample which exceeded 1.49 NTU on October 8, 2007 with a value of 2.62 NTU. DEP failed to collect a repeat sample on October 8, 2007 and was issued a second Tier 3 monitoring violation by NYSDOH.

Turbidity has no health effect. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. Please pay special attention to the additional statement in this document regarding Cryptosporidium.

Lead in Drinking Water

New York City water is virtually 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. Under the federal Lead and Copper Rule (LCR), mandated at-the-tap lead monitoring is conducted at selected households located throughout the City. Based on the results of this monitoring, in 2007, the 90th percentile did not exceed 15 µg/L, the established standard or Action Level (AL) for lead. The at-the-tap monitoring results are also presented in a separate table.

In 2004, NYSDOH issued a NOV asserting violations of the LCR. This NOV was in relation to DEP's reporting of past data collected under the LCR, specifically a failure to report all results, a failure to utilize all results to determine the 90th percentile concentrations, and a failure to collect samples during the period of June 1 to September 2004. In 2005, under the NOV, DEP re-instituted a lead public education program, returned to semi-annual at-the-tap monitoring in the distribution system, began monitoring the surface and groundwater systems separately for lead, and established a program to replace City-owned lead service lines (LSLs). Working with other City agencies through an inter-Agency Task Force, 55 LSLs were replaced in 2005, and 1 was replaced in 2006.

DEP is currently in discussions with NYSDOH and NYC Department of Health and Mental Hygiene (DOHMH) to assess the necessity of further activities under the NOV. DEP has an active corrosion control program aimed at reducing lead absorption from service lines and internal plumbing. The data reported by DEP under the LCR reflect that since the program began in 1992, the 90th percentile values for lead levels at the tap, at locations sampled for Rule compliance, have decreased from levels as high as 55 µg/L to approximately 15 µg/L in the surface water systems. Because the results in 2005 and 2006 met the Action Level for lead of 15 µg/L, NYSDOH has given DEP permission to monitor at-the-tap lead and copper levels annually.

DEP offers a Free Residential Lead Testing Program which 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: Over 73,000 sample collection kits have been distributed since the start of the program in 1992.

It is a New York State requirement that we make the following statement: *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.*

Infants and young children are typically more vulnerable to lead in drinking water than the general population. 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, and also flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the EPA's Safe Drinking Water Hotline (800) 426-4791. To request a free kit to test for lead in your drinking water, call the City of New York's 24-hour helpline at 311 or (212) NEW-YORK.

Monitoring for Cryptosporidium and Giardia

In 1992, the City started a comprehensive program to monitor its source waters and watersheds for the presence of *Cryptosporidium* and *Giardia*. Since then, samples have been collected weekly from the outflows of the Kensico and New Croton Reservoirs, before water is first chlorinated in the Catskill/Delaware and Croton Systems, respectively. Since 1992, DEP has modified its laboratory protocols twice to improve the Department's ability to detect both *Cryptosporidium* oocysts and *Giardia* cysts. These test methods, however, are limited in that they do not allow DEP to determine if organisms identified are alive or capable of causing disease.

In 2007, from January 1 to December 31, a total of 106 routine samples at the Kensico Reservoir effluents and 53 routine samples at the New Croton Reservoir effluent were

collected and analyzed for *Cryptosporidium* oocysts and *Giardia* cysts using Method 1623 HV (US EPA). Of the 106 routine Kensico Reservoir samples, five were positive for *Cryptosporidium* (0 to 1 oocysts $50L^{-1}$), and 84 were positive for *Giardia* (0 to 10 cysts $50L^{-1}$). Of the 53 routine New Croton Reservoir samples, three were positive for *Cryptosporidium* (0 to 1 oocysts $50L^{-1}$), and 28 were positive for *Giardia* (0 to 9 cysts $50L^{-1}$). Enhanced samples were collected at the Kensico effluents on six occasions in 2007 to monitor protozoa in response to changes in water quality data. Of these six samples, one was positive for *Cryptosporidium* (0 to 1 oocysts $50L^{-1}$), and five were positive for *Giardia* (0 to 5 cysts $50L^{-1}$). No enhanced samples were collected for the New Croton Reservoir effluent. DEP's *Cryptosporidium* and *Giardia* data from 1992 to the present, along with weekly updates, can be viewed on our web site at: www.nyc.gov/html/dep/html/drinking_water/pathogen.shtml. As stated above, detecting the presence of *Cryptosporidium* oocysts and *Giardia* cysts does not indicate whether these organisms are alive or potentially infectious.

While there is no evidence of the illnesses cryptosporidiosis or giardiasis 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 both of these diseases within a few weeks. DEP's Waterborne Disease Risk Assessment Program conducts active surveillance for cryptosporidiosis and giardiasis to track the incidence of illness and determine all possible causes, including tap water consumption. No cryptosporidiosis or giardiasis outbreaks have been attributed to tap water consumption in New York City.

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

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

Additional Water Quality Information

On May 1, 2007, as part of DEP's routine water sampling program, a minute amount of tetrachloroethylene (also known as perchloroethylene or more commonly "PERC"), was detected in southeastern Queens within the Groundwater Service Area. PERC is a chemical used primarily in dry cleaning and as an industrial solvent.

Although the levels did not result in a violation of regulations, DEP responded quickly to the PERC contamination. Between May 1 and June 4, DEP collected a total of 556 distribution samples from the affected area; inspected more than 1,000 local businesses for potential faulty backflow prevention and cross-connection control devices; distributed informational flyers to nearly all of the 12,000 residences in the contaminated area; set up an onsite community resource center; and flushed hydrants to drain the contaminated water from the local distribution network. Flushing of the water mains successfully cleared the PERC out of the distribution system, and five days after the initial flushing began, PERC concentrations were well below the detection limit.

City and State health officials determined that no known long or short-term health problems would be expected from the PERC concentrations detected in southeastern Queens for people drinking, cooking, or bathing in the water during the short period of time when PERC was present in the water supply.

DEP developed and continues to implement an enhanced water quality strategy for the area that included more frequent inspections and sampling.

New York City Drinking Water Quality
Testing Results 2007

Detected Parameters

PARAMETERS	NYSDOH MCL	USEPA MCLG	CATSKILL/DELAWARE SYSTEM			CROTON SYSTEM			GROUNDWATER SYSTEM			SOURCES IN DRINKING WATER
			# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	
CONVENTIONAL PHYSICAL AND CHEMICAL PARAMETERS												
Alkalinity (mg/L $CaCO_3$)	-		334	8.4 - 20.2	13.1	4	55.1 - 58	56.2	2	23 - 55	39	Erosion of natural deposits
Aluminum (µg/L)	50 - 200 [1]		332	11 - 63	23	4	2 - 13	6	-	-	-	Erosion of natural deposits
Barium (mg/L)	2	2	332	0.002 - 0.07	0.017	4	0.025 - 0.033	0.029	-	-	-	Erosion of natural deposits
Calcium (mg/L)	-		342	4.1 - 8.1	5.4	4	21.1 - 23.4	22	2	11.9 - 33.7	22.8	Erosion of natural deposits
Chloride (mg/L)	250		324	6 - 18	9	4	54 - 59	56	1	-	97	Naturally occurring; road salt
Chlorine Residual, free (mg/L)	4 [2]		11149	0.01 - 2.20	0.68	98	0.57 - 1.23	0.95	18	0.29 - 1.23	0.73	Water additive for disinfection
Color - distribution system (color units - apparent)	-		10062	4 - 100	6	-	-	-	9	3 - 8	6	Presence of iron, manganese, and organics in water
Color - entry points (color units - apparent)	15 [3]		1095	4 - 12	6	98	**5 - 23**	9	9	1 - 6	2	Iron and manganese; or organic sources, such as algal growth
Copper (mg/L)	1.3 [4]	1.3	342	0.003 - 0.137	0.01	4	0.088 - 0.124	0.105	2	0.004 - 0.005	0.005	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Corrosivity (Langelier index)	0 [1, 5]		324	-3.2 to -1.64	-2.42	4	-1.42 to -1.21	-1.32	-	-	-	
Fluoride (mg/L)	2.2 [3]	4.0	1405	ND - 1.3	0.56	94	ND - 0.44	<0.30	18	ND - 1.1	0.7	Erosion of natural deposits; water additive which promotes strong teeth; runoff from fertilizer
Foaming Agents (mg/L linear alkyl sulfonate)			60	ND - 0.02	ND	-	-	-	-	-	-	Household and industrial detergents
Hardness (mg/L $CaCO_3$)	-		332	14 - 30	19	4	82 - 90	85	1	-	158.2	Erosion of natural deposits
Hardness (grains/gallon[US]$CaCO_3$)[6]	-		332	0.8 - 1.7	1.1	4	4.7 - 5.2	4.9	1	-	9.1	Erosion of natural deposits
Iron (µg/L)	300 [7]		333	**20 - 1120**	40	4	40 - 70	50	.	.	.	Naturally occurring
Lead (µg/L)	15 [4]	0	342	ND - 12	0.6	4	ND - 2	0.9	2	ND	ND	Corrosion of household plumbing systems; erosion of natural deposits
Magnesium (mg/L)	-		332	0.9 - 2.2	1.2	4	7.1 - 7.7	7.3	1	-	18	Erosion of natural deposits
Manganese (µg/L)	300 [7]		333	8 - 150	20	4	33 - 57	44	-	-	-	Naturally occurring
Nitrate (mg/L nitrogen)	10	10	324	0.2 - 0.59	0.30	4	0.57 - 0.6	0.59	1	-	5.81	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (mg/L nitrogen)	1	1	324	ND - 0.002	<0.001	4	ND	ND	1	-	ND	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
pH (pH units)[8]	6.5 - 8.5 [1]		10901	**6.6 - 9.1**	7.3	94	6.8 - 7.4	7.1	18	7.2 - 8.2	7.8	
Phosphate, Ortho- (mg/L)	-		11151	0.12 - 2.75	2.0	94	0.01 - 2.11	0.19	18	1.67 - 2.65	2.0	Water additive for corrosion control
Potassium (mg/L)	-		332	0.5 - 0.8	0.6	4	2.1 - 2.2	2.1	-	-	-	Erosion of natural deposits
Silica [silicon oxide] (mg/L)	-		324	1.5 - 4.1	2.6	4	5.8 - 6.4	6.1	-	-	-	Erosion of natural deposits
Sodium (mg/L)	NDL[9]		332	4 - 11	8	4	27 - 30	28	-	-	-	Naturally occurring; road salt; water softeners; animal waste
Specific Conductance (µS/cm)	-		11156	54 - 151	79	94	308 - 348	330	18	131 - 578	385	
Strontium (µg/L)	-		332	20 - 30	20	4	70	70	-	-	-	Erosion of natural deposits
Sulfate (mg/L)	250		324	4.7 - 6.2	5.0	4	10.7 - 11.9	11.3	1	-	42.1	Naturally occurring
Temperature (°F)	-		11147	33 - 78	54	95	46 - 65	53	18	42 - 61	52	
Total Dissolved Solids (mg/L)	500 [1]		324	33 - 69	48	4	180 - 195	188	-	-	-	Metals and salts naturally occurring in the soil; organic matter
Total Organic Carbon (mg/L carbon)	-		324	1.3 - 2.0	1.6	4	2.5 - 2.7	2.6	-	-	-	Organic matter naturally present in the environment
Turbidity[10] - distribution system (NTU)	5 [11]		10061	0.8 - 1.4	1	.	.	.	9	0.8 - 1.0	1	Soil runoff
Turbidity[10] - entry points (NTU)	1 [12]		-	-	-	98	-	1	-	-	-	Soil runoff
UV 254 Absorbency (cm^{-1})	-		324	0.02 - 0.042	0.031	4	0.058 - 0.062	0.06	-	-	-	Organic matter naturally present in the environment
Zinc (mg/L)	5		332	ND - 0.024	0.004	4	0.016 - 0.047	0.031	-	-	-	Naturally occurring

PARAMETERS	NYSDOH MCL	USEPA MCLG	CATSKILL-DELAWARE SYSTEM			CROTON SYSTEM			GROUNDWATER SYSTEM			SOURCES IN DRINKING WATER
			# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	
ORGANIC CONTAMINANTS												
Disinfection Byproducts detected:												
Bromochloroacetic acid (µg/L)	50		253	ND - 2	1	1	-	3	-	-	-	Byproduct of drinking water chlorination
Chloral Hydrate (µg/L)	50		12	2.8 - 8.6	6	-	-	-	-	-	-	Byproduct of drinking water chlorination
Chloropicrin (µg/L)	50		12	0.3 - 0.6	0.5	-	-	-	-	-	-	Byproduct of drinking water chlorination
Haloacetonitriles (HANs) (µg/L)	50		12	1.7 - 3.6	2.6	-	-	-	-	-	-	Byproduct of drinking water chlorination
Halogenated ketones (HKs) (µg/L)	50		12	1.5 - 3.7	2.3	-	-	-	-	-	-	Byproduct of drinking water chlorination
Total Organic Halogen (µg/L)	-		311	115 - 451	211	4	333 - 415	367	-	-	-	Byproduct of drinking water chlorination
Principal Organic Contaminants detected:												
Tetrachloroethylene (µg/L)	5[13]	0	972	ND - 13	< 0.5	4	-	ND	3	-	ND	Discharge from dry cleaners
Specified Organic Chemicals detected:												
Dalapon (µg/L)	50		3	ND	ND	1	-	1	-	-	-	Herbicide used on rights of way
Hexachlorocyclopentadiene (µg/L)	50		3	0.1	0.1	1	-	0.1	-	-	-	Discharge from chemical factories
Unspecified Organic Chemicals detected:												
Acetone (µg/L)	50		938	ND - 13	< 10	4	-	ND	3	-	ND	Occurs naturally and is used in the production of paints, varnishes, plastics, adhesives, organic chemicals and alcohol. Also used to clean and dry parts of precision equipment
Caffeine (µg/L)	50		3	ND	ND	1	-	0.1	-	-	-	Residue from caffeinated food and drinks

PARAMETERS	NYSDOH MCL	USEPA MCLG	CATSKILL-DELAWARE SERVICE AREA			CROTON SERVICE AREA			GROUNDWATER SERVICE AREA			SOURCES IN DRINKING WATER
			# SAMPLES	RANGE	RAA	# SAMPLES	RANGE	RAA	# SAMPLES	RANGE	RAA	
Disinfection Byproducts detected:												
Haloacetic acid 5 (HAA5) (µg/L)	60 [14]		218	19 - 62	46	15	31 - 59	52	20	15 - 48	41	Byproduct of drinking water chlorination
Total Trihalomethanes (µg/L)	80 [14]		220	12 - 76	46	50	23 - 76	56	705	15 - 60	39	Byproduct of drinking water chlorination

MICROBIAL PARAMETERS

PARAMETERS	NYSDOH MCL	USEPA MCLG	CITYWIDE DISTRIBUTION					SOURCES IN DRINKING WATER
			# SAMPLES	RANGE	# SAMPLES POSITIVE	AVERAGE	HIGHEST MONTH % POSITIVE	
Total Coliform Bacteria (% of samples positive/month)	5%	0	10070	-	23	-	1.2%	Naturally present in the environment
E. coli (CFU/100mL)	[15]	0	10070	-	2	-	0.1%	Human and animal fecal waste
Heterotrophic Plate Count (CFU/mL)	TT	-	4430	ND - 57	368	2	-	Naturally present in the environment

LEAD AND COPPER RULE SAMPLING AT RESIDENTIAL WATER TAPS: JANUARY TO DECEMBER 2007

PARAMETERS	NYSDOH AL	US EPA MCLG	Surface Water Service Area				Groundwater Service Area				SOURCES IN DRINKING WATER
			# SAMPLES	RANGE	90th PERCENTILE VALUES	# SAMPLES EXCEEDING AL	# SAMPLES	RANGE	90th PERCENTILE VALUES	# SAMPLES EXCEEDING AL	
Copper (mg/L)	1.3	1.3	126	ND - 0.320	0.206	0	65	0.010 - 0.299	0.219	0	Corrosion of household plumbing systems
Lead (µg/L)	15	0	126	ND - 122.3	15	12	65	ND - 156	9	3	Corrosion of household plumbing systems

RADIONUCLIDE PARAMETERS

PARAMETERS	NYSDOH MCL	USEPA MCLG	CATSKILL/DELAWARE SYSTEM			CROTON SYSTEM			GROUNDWATER WELLS			SOURCES IN DRINKING WATER
			# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	# SAMPLES	RANGE	AVERAGE	
Radionuclide Rule Initial Monitoring Results [16]												
Gross Alpha (pCi/L)	15	0	-	-	-	-	-	-	28	ND - 3.6	0.6	Erosion of natural deposits
Radium 226 (pCi/L)	5	0	6		ND	2		ND	28	ND - 1.7	0.6	Erosion of natural deposits
Radium 228 (pCi/l)	5	0	6		ND	2		ND	28	ND - 1.2	1.1	Erosion of natural deposits
Uranium (µg/L)	30	0	-	-	-	-	-	-	28	ND - 5.1	0.6	Naturally occurring

New York City Drinking Water Quality

Testing Results 2007 *(Continued)*

Undetected Parameters

UNDETECTED CONVENTIONAL PHYSICAL AND CHEMICAL PARAMETERS
Antimony, Arsenic, Asbestos [17], Beryllium, Cadmium, Chromium, Cyanide, Lithium, Mercury, Nickel, Selenium, Silver, Thallium
UNDETECTED ORGANIC CONTAMINANTS
Principal Organic Contaminants not detected:
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, 1,1,2,2-Tetrachloroethane, 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 not detected:
Alachlor, Aldicarb (Temik), Aldicarb sulfone, Aldicarb sulfoxide, Aldrin, Atrazine, Benzo(a)pyrene, Butachlor, Carbaryl, Carbofuran (Furadan), Chlordane, 2,4-D, 1,2-Dibromo-3-chloropropane, Dicamba, Dieldrin, Di(2-ethylhexyl)adipate, Di(2-ethylhexyl)phthalate, Dinoseb, Diquat, Endothall, Endrin, Ethylene dibromide (EDB), Glyphosate, Heptachlor, Heptachlor epoxide, Hexachlorobenzene, 3-Hydroxycarbofuran, Lindane, Methomyl, Methoxychlor, Methy-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 Chemicals not detected:
Acenaphthene, Acenaphthylene, Acetochlor, Acifluorfen, Anthracene, Bentazon, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[g,h,i]perylene, a-BHC, b-BHC, d-BHC, Bromacil, Butylbenzylphthalate, a-Chlordane, g-Chlordane, Chlorobenzilate, Chloroneb, Chlorothalonil (Draconil, Bravo), Chlorpyrifos (Dursban), Chrysene, 2,4-DB, DCPA (total mono & diacid degradate), p,p'DDD, p,p'DDE, p,p'DDT, Diazinon, Dibenz[a,h]anthracene, Di-n-Butylphthalate, 3,5-Dichlorobenzoic acid, Dichlorprop, Dichlorvos (DDVP), Diethylphthalate, Dimethoate, Dimethylphthalate, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Di-N-octylphthalate, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin aldehyde, EPTC, Fluoranthene, Fluorene, Indeno[1,2,3-cd] pyrene, Isophorone, Malathion, Methiocarb, Molinate, Naphthalene, cis-Nonachlor, trans-Nonachlor, Paraquat, Parathion, Pendimethalin, Permethrin, Phenanthrene, Propoxur (Baygon), Pyrene, 2,4,5-T, Terbacil, Terbuthylazine, Thiobencarb, Trifluralin

Footnotes

(1) USEPA Secondary MCL: NYSDOH has not set an MCL for this parameter.

(2) 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.

(3) Determination of MCL violation: If a sample exceeds the MCL, a second sample must be collected from the same location within 2 weeks. If the average of the two results exceeds the MCL, then an MCL violation has occurred.

(4) 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 table on page 13.

(5) A Langelier Index of less than zero indicates corrosive tendencies.

(6) Hardness of up to 3 grains per gallon is considered soft water; between 3 and 9 is moderately hard water.

(7) If iron and manganese are present, the total concentration of both should not exceed 500 µg/L.

(8) The average for pH is the median value.

(9) 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.

(10) Turbidity is a measure of cloudiness of the water. Turbidity is monitored because it is a good indicator of water quality and can hinder the effectiveness of disinfection.

(11) This MCL for turbidity is the monthly average rounded off to the nearest whole number. Data presented are the range and average of monthly averages.

(12) This MCL only applies to the Croton System. The value presented is the highest monthly average for 2007.

(13) Determination of MCL violation: If a sample exceeds the MCL, one to three more samples must be collected from the same location within 30 days. If one of the confirming samples is positive and the average of all results exceeds the MCL, then an MCL violation has occurred. No MCL violation occurred in 2007.

(14) USEPA MCLs for HAA5 and TTHMs are the calculated quarterly running average. Data presented are the range of individual sampling results and the highest running quarterly average.

(15) 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.

(16) Radionuclide data collected to meet the initial monitoring requirements of the Radionuclide Rule to be used to set the future required monitoring frequencies for each system. Croton System samples were collected from Croton Lake, source water, as the system was off-line at the time of sampling. Groundwater samples were all from wells not in service and does not represent water provided to consumers.

(17) NYSDOH has issued a waiver for asbestos monitoring in the Groundwater System since no asbestos cement pipes are used anywhere in the distribution system.

Highlighted and **bolded** value indicates a violation or exceedence occurred.

Exceedences of MCLs

Iron and Manganese:

In the Catskill/Delaware System, the MCL of 300 µg/L for iron and the MCL of 500 µg/L for the combined concentration of iron and manganese was exceeded on 9/11/07 at site 33950 (Upper East Side Manhattan, 10029) with a value of 1120 µg/L for iron and 125 µg/L for manganese.

Iron has no health effect. At 1,000 µg/L, a substantial number of people will note the bitter astringent taste of iron. Also, at this concentration, it imparts a brownish color to laundered clothing and stains plumbing fixtures with a characteristic rust color. Staining can result at levels of 50 µg/L, lower than those detectable to taste buds. Therefore, the MCL of 300 µg/L represents a reasonable compromise as adverse effects are minimized at this level. Many multivitamins may contain 3,000 to 4,000 µg/L of iron per capsule.

The Food and Nutrition Board of the National Research Council determined an estimated safe and adequate daily dietary intake of manganese to be 2,000-5,000 µg/L for adults. However, many people's diets lead them to consume even higher amounts of manganese, especially those who consume high amounts of vegetables or are vegetarian. The infant population is of greatest concern. It would be better if the drinking water were not used to make infant formula, since it already contains iron and manganese.

Excess manganese produces a brownish color in laundered goods and impairs the taste of tea, coffee, and other beverages. Concentrations may cause a dark brown or black stain on porcelain plumbing fixtures. As with iron, manganese may form a coating on distribution pipes. These may slough off, causing brown blotches on laundered clothing or black particles in the water.

pH:

In the Catskill/Delaware System, pH was elevated at site 51850 (Clifton, 10304) on 10/31/07 at 9.1, and on 11/10/07 at 9.0, and also at site 50050 (Rosebank, 10305) on 11/19/07 at 8.6. These elevated pH readings may be attributed to a large water main replacement project which involved the installation of a concrete lined water main in the vicinity. In addition, pH was elevated at site 1S03A (Wakefield, 10466) on 11/23/07 at 9.1. This elevated pH was the result of a slight over feed of caustic soda. Subsequent samples from these locations reflected pH in the expected range.

Definitions

Action Level (AL):

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

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 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 Residual Disinfectant Level (MRDL):

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

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% of the lead and copper values detected at your water system.

Abbreviations

CFU/mL = colony forming units per milliliter

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

NA = Not Applicable

ND = Lab analysis indicates parameter is not present

NDL = No Designated Limit

NTU = Nephelometric Turbidity Units

µS/cm = microsiemens per centimeter

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

µmho/cm = micromhos per centimeter

pCi/L = picocuries per liter

Frequently Asked Questions

Is New York City's water "hard"?

Hardness is a measure of dissolved calcium and magnesium in the water. The less calcium and magnesium in the water ("soft" water), the easier it is to create lather and suds. Depending upon location, the hardness can be 1.0 grain/gallon ($CaCO_3$) for the Catskill/ Delaware System, and 5 grains/gallon for the Croton System. New York City's water is predominantly "soft."

At times, my drinking water looks "milky" when first taken from a faucet, but then clears up. Why?

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 the water is drawn from the tap and the excess air is released.

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 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.

Does my drinking water contain fluoride?

Yes, all New York City tap water contains fluoride. In accordance with Article 141.08 of the New York City Health Code, DEP, as the New York City water supplier, adds a fluoride compound that provides our water supply with a concentration of approximately 1.0 part per million (ppm) fluoride. Fluoridation began in 1966.

The aerators in my home are clogging with pieces of a small, whitish material. What is causing this to occur?

This problem may be accompanied by a significant drop in water pressure at the affected faucet in addition to a decrease in your hot water supply. The culprit is the hot water heater's "dip-tube." This is a long internal tube that delivers cold water to the bottom of the hot water heater tank. The tube, which is composed of polypropylene, may disintegrate. The problem affects approximately 16 million water heaters manufactured between 1993 and 1996.

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

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. Brown water can also result from 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 will vary, depending on the size of the water main.

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. Also, bottled water costs up to 1,000 times more per year than the City's drinking water. When purchasing bottled water, consumers should look for the NYSHD CERT#. Consumers can access additional information on New York State certified bottled water facilities within the entire United States that can be sold 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.

Ongoing Customer Service Improvements

Improving customer service to its water and wastewater customers has been a top priority for DEP. The agency's commitment to customer service in compliance, payment collections and timely resolution of account inconsistencies has been strengthened with the establishment of programs and procedures designed to ease transactions between DEP and its 828,000 account holders.

The agency recently launched a toll free "pay-by-phone" water and wastewater bill payment service. The Interactive Voice Response (IVR) feature is convenient for customers and builds on previous service enhancements by the Bureau of Customer Services. The toll free number (866) 622-8292 is available 24 hours a day, 7 days a week and will allow for partial, full, and advanced bill payments without a transaction fee. The account number, a checking or savings account number and the bank routing number are required.

Customers may also pay water and wastewater bills by mail, online or in person.

Online

Pay online at www.nyc.gov/dep and make partial, full and advanced bill payments without a transaction fee using Electronic Funds Transfer or pay by using e-check or a credit card (user fees apply).

By Mail

Use the return envelope sent along with your bill. Simply enclose your bill stub and check or money order, put a stamp on the envelope and mail to:

NYC Water Board
P.O. Box 410
Church Street Station
New York, N.Y. 10008-0410

In Person

- Visit a Department of Finance Business Center to pay by cash, check or money order. Call 311 for locations.
- Bring your payment (check or money order only) to one of the DEP/Bureau of Customer Services offices located in each of the boroughs. Call 311 for locations.

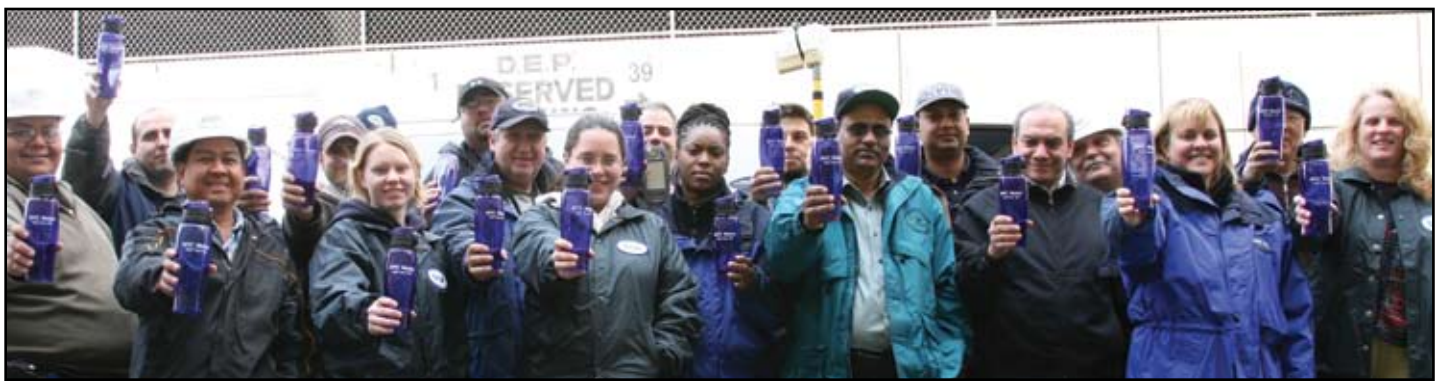
To avoid late charges, DEP must receive payment in full before the due date printed on the bill. Also, to ensure that payment is applied correctly to the account, the account number should be written on the face of the check or money order, which should be made payable to the NYC WATER BOARD.

In the event of a dispute, DEP's Bureau of Customer Services has opened the Office of Ombuds, a newly-established unit within the bureau that is responsible for hearing dispute cases as part of DEP's expanded dispute resolution process and for providing special assistance to all water and wastewater account holders facing a lien sale or undergoing the lien sale process. Under the system now being rolled out, call center representatives will be able to resolve many billing disputes, with others referred to the Dispute Resolution Form posted on the DEP website. More complex disputes will be resolved by a Dispute Resolution Group, including the Ombuds. This process will allow for more prompt settlement of customer complaints and avoidance of large arrearages in the future.

Improvements in frequency and accuracy in the meter reading process is the goal behind DEP's plan to procure a citywide Automatic Meter Reading system (AMR). This technology is widely known in the metering industry as the "Advanced Meter Infrastructure system, or "AMI." Partnering with DoITT and its NYCWiN citywide wireless system, the AMR project will involve installing a low-power radio transmitter on each water meter. A transmitter will normally read each meter four times a day and transmit the readings to a network of rooftop laptop-sized receivers, co-located with NYCWiN rooftop stations throughout the City. The NYCWiN system in turn will route the data to DEP.

The AMR project will have several benefits:

- Improve the percentage of actual meter readings from roughly 85 percent to 95 percent or better, virtually eliminating estimated bills and improving collections.
- Provide DEP with a low-cost route to monthly billing from the current practice of quarterly billing.
- Provide the technology for customers to get an "early warning" of leaks or other signs of increased consumption before a billing problem occurs.
- Provide eventual availability of meter readings through DEP's website.
- Reduce meter reading costs.



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 311, or from outside NYC, call (212) New-York. TTY services are available by calling (212) 504-4115.

For more information on *Cryptosporidium* and *Giardia*, please contact the Bureau of Communicable Diseases of the New York City Department of Health and Mental Hygiene (DOHMH) at (212) 788-9830 or call 311.

To contact DOHMH about other water supply health-related questions, call 311, or call the New York State Department of Health, Metropolitan Area Regional Office at (212) 417-5550, or NYSDOH Bureau of Water Supply Protection at (518) 402-7650.

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

To view this 2007 Statement, announcements of public hearings, or other information, visit DEP's Web site at:

www.nyc.gov/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.

Please share this information with all the other people who drink NYC water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

New York City
Department of Environmental Protection
59-17 Junction Boulevard
Flushing, New York 11373-5108

PRSRT STD
US POSTAGE PAID
City of New York
Department of
Environmental Protection