NEW YORK CITY
2005 Drinking Water Supply and Quality Report

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP

www.nyc.gov/dep

Michael R. Bloomberg, Mayor
Emily Lloyd, Commissioner

NEW YORK CITY 2005 DRINKING WATER SUPPLY AND QUALITY REPORT

The New York City Department of Environmental Protection (DEP) is pleased to present its 2005 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 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.

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. In 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 2005, 98% 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, 2% 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 operated 5 wells and supplied a daily average of 2.2 million gallons of drinking water, less than 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.

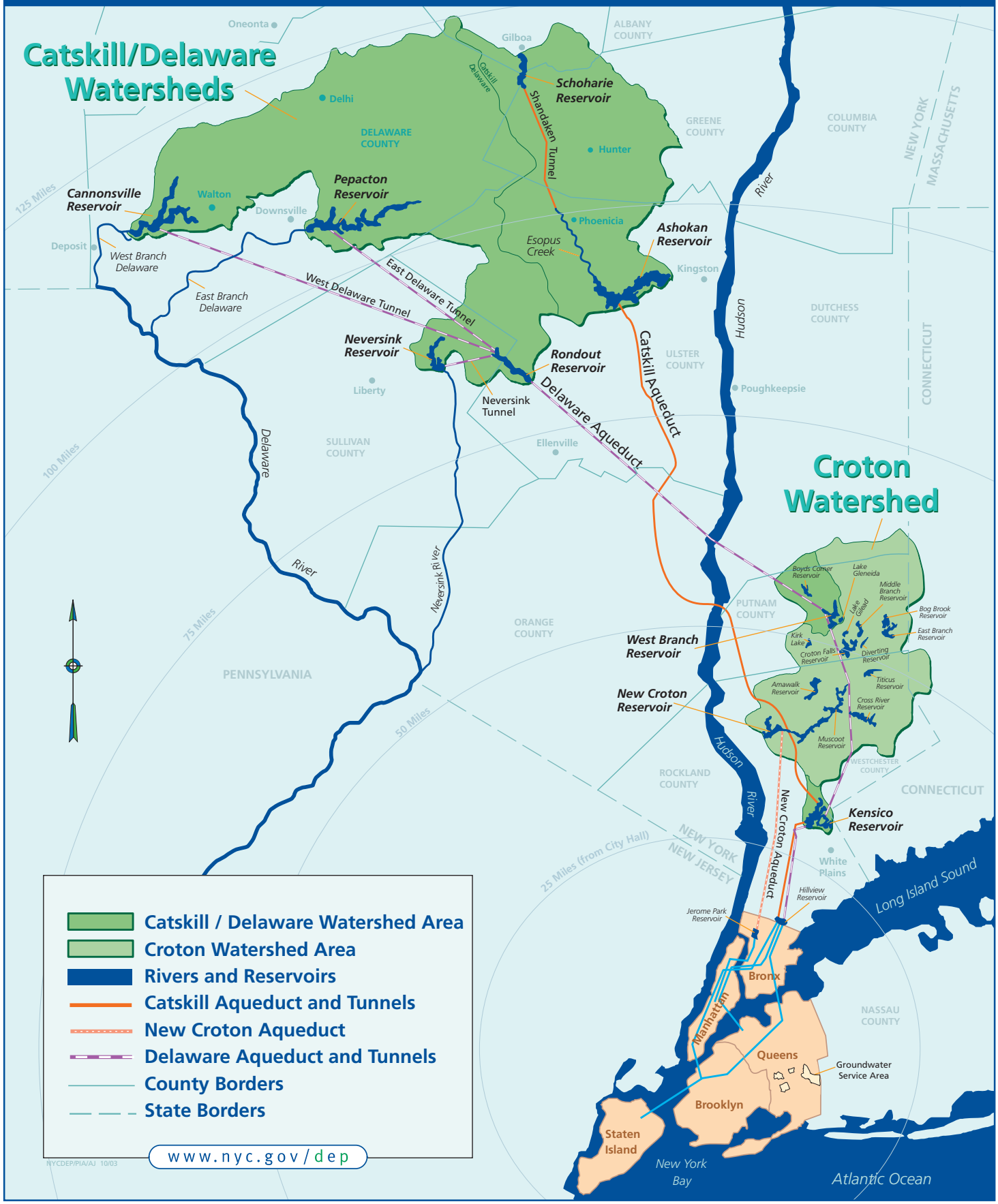
Ensuring a Safe, Reliable and Sufficient Water Supply

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.

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 USEPA. Due to the 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.

New York City's Water Supply System



Pepacton Reservoir Spillway, Delaware County, NY

Watershed Protection Programs

During 2005, New York City continued implementation of its comprehensive watershed protection programs. The purpose of these programs is to provide a safe, plentiful, and reliable drinking water supply to over 9 million New York State residents. They also benefit thousands of residents in watershed communities where the City's source waters are located by protecting the region's natural ecosystems and preserving scenic beauty. The watershed protection programs continue to focus on three key areas: acquiring additional watershed lands; enforcing Watershed Rules and Regulations; and implementing partnership programs that target specific sources of pollution in the watershed. The programs that DEP has in place clearly demonstrate our ongoing commitment to ensure rigorous water quality protection while at the same time helping to preserve the economic vitality and community character of watershed towns, villages and hamlets. More information on these programs and on other watershed issues can be found on DEP's web site at www.nyc.gov/watershed.

Land Acquisition

The City has effectively tripled its total land holdings in the watershed, with more than 105,000 acres now forever protected from development. Total lands protected by DEP and its partners since 1997 surpassed 68,000 acres. The City will only purchase lands from willing sellers. However, DEP solicits parcels for acquisition based on the presence of critical natural features – such as streams and wetlands – their proximity to reservoirs, and their potential for development. The acres acquired to date are among those DEP has determined are the most beneficial for water quality protection. During 2005, DEP continued to solicit owners of sensitive watershed lands, with the goal of acquiring key parcels to protect water quality.

Land Management

As DEP's portfolio of watershed lands has expanded in recent years, so has the task of managing City-owned properties for their long-term protection. The City has become one of the largest single landowners in the watershed region. To ensure that lands that DEP has acquired continue to protect water quality, DEP has begun to develop and implement land management plans that set overall goals and objectives for water supply lands and identify specific projects to improve water quality. For example, lands with fully mature forests are in need of attention to ensure that young, vigorous saplings can replace aging stock in a controlled manner, minimizing nutrient and sediment loss into the water supply.

Management of the City's water supply lands also includes opening lands for recreational use and enjoyment. Within the limitations dictated by the need to protect source water quality, DEP has steadily increased the quantities of lands available for recreational use each year over the past eight years. Currently 74,000 acres of water supply lands are available for recreational pursuits, including fishing, hiking, cross-country skiing, hunting and even snowmobiling in some areas. This represents nearly a 60% increase since 1997 in the amount of City watershed lands open for recreational uses. More than 100,000 people hold permits for recreational use of City-owned watershed lands.

Partnership Programs

West of the Hudson River, many of the watershed protection programs are administered by the Catskill Watershed Corporation (CWC), a non-profit corporation formed solely for this purpose. Together, CWC and DEP have implemented programs that remediated approximately over 2,000 failing septic systems, completed construction of 43 winter road de-icing materials storage facilities, and funded construction of more than 40 stormwater control measures to address existing stormwater runoff. DEP has also funded the construction of new wastewater treatment plants (WWTPs) in certain communities containing areas of failing or likely-to-fail septic systems, and it has also extended sewers from several existing plants to mitigate similar problems in other areas.

The Watershed Agricultural Program (WAP) has been in operation since 1992 as a comprehensive effort to develop and implement pollution prevention plans on watershed farms. At present, nearly 95% of the commercial farms in the City's Catskill/Delaware watersheds have joined this voluntary program, which seeks to reduce agricultural pollution while enhancing the economic viability of participating farms. Funded primarily by the City, WAP is administered by the not-for-profit Watershed Agricultural Council (WAC), whose board consists of farmers, agri-business representatives, forest landowners, and the DEP Commissioner. More than $25 million has been spent on implementation of Best Management Practices (BMPs) at over 275 farms since 1992.

The high rate of farmer participation and cooperation in the WAP is valuable for several reasons. First, and perhaps most important, through its relationship with WAC, DEP has been able to provide farmers with the technical and financial resources to develop and implement pollution prevention plans. Second, more than 275 of the largest landowners in the watershed have been empowered to serve as active managers and stewards of the landscape for water quality purposes as part of their day-to-day operations. Third, the institutional relationships between DEP, WAC and the watershed farm community have provided a mechanism to respond quickly and effectively to pollution issues on individual farms as they arise.

Wastewater Treatment Plant Upgrades

At the City's expense, more than 100 non-City-owned WWTPs in the watershed are being upgraded to provide state-of-the-art treatment to eliminate pathogens and substantially reduce nutrients in their waste streams. To date, plants accounting for 97% of the West-of-Hudson WWTP flow have been upgraded. In 2005, DEP determined that several existing east of Hudson WWTPs whose effluents had been slated to be diverted off the watershed now require on-site upgrades. These facilities were enrolled in the City's Upgrade Program. The addition of these plants caused a decrease in the percentage of flow upgraded to date and percentage of flow under construction. In the Croton watershed, plants that account for 14% of the flow have been fully upgraded and plants accounting for 36% of the flow are under construction. The remaining facilities are in the design phase.

Hunter WWTP, Hunter, NY

Improved Reliability

Upstate Capital Improvements

The City continued to implement a multi-year program to upgrade and improve its upstate water supply facilities, including gatehouses, aqueducts, water testing laboratories, and other facilities that are important to ensuring a safe and reliable supply of drinking water. Much of the water supply infrastructure is between 50 and 150 years old, and certain capital improvements are required to ensure the continuation of a reliable water supply for future generations of New Yorkers. DEP's long-term capital plan includes more than $9 billion for water supply related improvements.

The need for assessment and repair of critical water supply facilities has been highlighted by recent developments at the Gilboa Dam in Schoharie County. Constructed between 1920 and 1927, the Gilboa Dam impounds the Schoharie Creek to form the Schoharie Reservoir, which has a capacity of 19.5 billion gallons and on average provides approximately 16% of New York City's water supply. DEP has a long standing commitment to upgrading its dams to modern design criteria. DEP has initiated a comprehensive program over the past few years to assess the condition of dams at City-owned reservoirs in the Catskill/Delaware watershed and to undertake repairs and rehabilitation as required. (This is similar to a program initiated by DEP in the mid-1980s to assess and rehabilitate City-owned dams located in the east of Hudson watershed.) As part of this program, recent investigations revealed that certain safety factors associated with modern engineering practices related to dam construction are not met by the Gilboa Dam in its present state. While DEP and its consultants believe that the Gilboa Dam continues to be safe under normal operating conditions, DEP initiated a program to expedite interim structural reinforcement of the Gilboa Dam and perform associated work prior to the start of a complete rehabilitation project, currently scheduled to commence after June 2008. Measures to be undertaken will include the placement of inclined reinforcing anchors that extend into the native bedrock at the toe of the existing dam structure. Until the expedited work is completed, DEP will closely monitor the condition of the dam. DEP has been in regular contact with dam safety officials from the New York State Department of Environmental Conservation (NYSDEC) and has been working closely with emergency management and law enforcement officials in the counties and towns downstream of the dam, to inform them of progress and establish better lines of communication if an emergency should occur.

Dependability Study

The infrastructure that carries drinking water from upstate watersheds to New York City has been in operation for decades, without having been taken offline for major inspection or repair. DEP is currently leading an effort, called the Dependability Study, to determine how major components of the water supply system can be taken out of service for repair, and yet ensure that there is a sufficient supply of drinking water for the 9 million consumers in the City and upstate communities. The Dependability Study objectives are defined as the ability of the system to meet water supply demands when any component is out-of-service for an extended period of time. In the early 1990s, system dependability originally focused on conservation and demand reduction, such as low-flow toilet rebates, fire hydrant locks, and leak detection and repair. While these strategies are still employed, the City's aging infrastructure warrants a strong focus on system redundancy.

As the Dependability Study has advanced, it has come to focus on seeking solutions in both the short term and the long term. Short-term planning will ask the question, "What can be achieved quickly and cost-effectively to guarantee the sufficiency of the City's water supply?" Longer-term dependability planning will explore options that include water tunnel construction and development of alternative drinking water sources. Measures being considered include demand reduction incentives, maximizing the use of our existing reservoirs, examining the City's current infrastructure to see how it can be adapted to increase supply, interconnections with other communities, improvements to the system to prevent water from leaking, expanding the Groundwater System, banking surface water in groundwater aquifers, desalination of brackish groundwater, desalination of harbor or ocean water, and Hudson River diversion.

Automated Underwater Vehicle (AUV)

One project already undertaken related to the Dependability Study was an investigation of the Delaware Aqueduct's leak of up to approximately 35 million gallons per day between the Rondout and West Branch Reservoirs. With the help of the Woods Hole Oceanographic Institution, DEP was able to send a small robotic submarine, an Automated Underwater Vehicle (AUV), equipped with cameras through the Aqueduct to look for the sources of leaks that were first discovered in 1991. While the AUV Investigations revealed that the Aqueduct remains in relatively good condition and that the risk of failure is low, DEP recognizes that ultimately repairs will need to be made. DEP has awarded a contract to an engineering consultant to conduct further evaluations of the Aqueduct (including the use of a second robotic submarine, known as a Remotely Operated Vehicle or "ROV"), with the goal of developing appropriate repair plans. In addition, DEP intends to award a contract that will include equipment and supplies that are available on a stand-by basis should it become necessary to make emergency repairs to the Aqueduct.

While pursuing multiple solutions to reduce risk and uncertainty, DEP will also simultaneously plan multiple projects to help ensure that the Department will be able to meet projected future shortfalls during planned maintenance or repair. DEP has already allotted millions of dollars in its 10-year capital plan to begin full-scale planning for several of the facilities that will ultimately be recommended by the Study.

Catskill/Delaware UV Facility

EPA finalized new regulations in December 2005, specifically 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 has been designing an ultraviolet (UV) light disinfection plant for the Catskill/Delaware system. In November 2005, DEP produced a final design of the UV facility. The plant will be 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. When built, this plant will provide an additional barrier of microbiological protection by inactivating potentially harmful organisms such as *Cryptosporidium* or *Giardia*. This treatment will supplement DEP's existing microbial disinfection programs.

UV Validation & Research Center of New York, Johnstown, NY

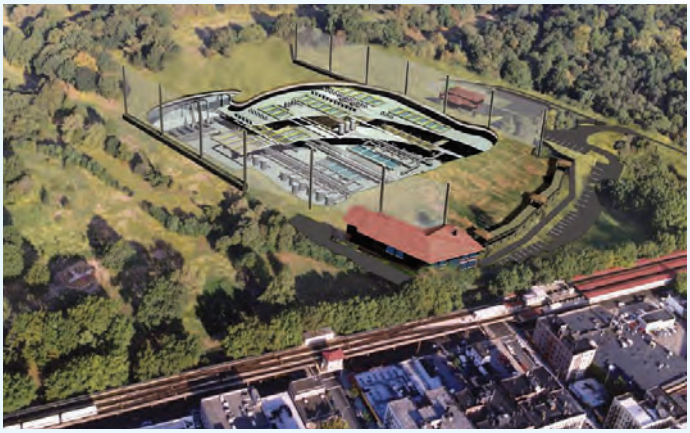
The Catskill/Delaware facility has been designed to contain fifty-six 40-million gallon per day UV Disinfection Chambers to meet a design capacity of 2.2 billion gallons of water per day. Since these units will be larger than any currently in use, DEP conducted validation testing for custom designed full-size units to confirm that units of such size are capable of meeting necessary performance standards. This testing was conducted on UV equipment from two manufacturers at the UV Validation and Research Center of New York in Johnstown, New York, using a testing protocol approved by NYSDOH and EPA. As a result of this testing, and following a life-cycle cost analysis using bids that were submitted prior to the start of testing, DEP has selected a UV System Supplier for this project. The final design and specifications for the Catskill/Delaware UV Disinfection Facility reflect this decision.

Croton Water 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 therefore proceeding with the design and 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 by-product levels in the Croton System water. The filtration plant will also ensure compliance with stricter water quality standards.

The Consent Decree, as modified in May 2002, required the City to evaluate and choose between three potential sites for the filtration plant: two in the Bronx, at the Mosholu Golf Course or along the Harlem River in the vicinity of Fordham Road; and one at Eastview in Westchester County. The Mosholu Golf Course site lies within Van Cortlandt Park, a public park in the Bronx. The City sought State legislation authorizing the alienation of the Mosholu Golf Course site for the purpose of constructing, operating and maintaining a Croton filtration plant. In July 2003, after passage by the State Legislature, the Governor approved such legislation and signed it into law. A final Supplemental Environmental Impact Statement comparing the three sites was released on June 30, 2004, which identified the Mosholu Golf Course site as the preferred site for the facility. In September 2004, the City Council approved a Memorandum of Understanding between the City and the President Pro Tempore of the State Senate and the Speaker of the State Assembly allowing the City to move forward with the construction of a water filtration plant at the Mosholu Golf Course site. During 2005, site preparation work for the plant began.

Pursuant to the Memorandum of Understanding, $200 million generated from water and sewer revenues are to be spent on improvements to Bronx parks and recreational facilities over the next five years. The projects fall into five categories and include improving neighborhood parks, renovating regional recreation facilities, developing the Bronx Greenways, improving and expanding access to the Bronx waterfront, and "greening" the borough. In May 2005 ground was broken on the renovation of St. James Park, the first of more than 70 Bronx parks' reconstruction projects related to the construction of the Croton Water Filtration Plant. The $3.8 million renovation of St. James Park will dramatically improve the park with new staircases, wall reinforcements, landscaping and pathways.



Cross-sectional Rendering of Croton Filtration Plant, Bronx, NY

In addition, DEP has opened and staffed a community office adjacent to the filtration plant project. 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.*

Tunnel No. 3, Manhattan, NY

City Water Tunnel No. 3

Construction of City Tunnel No. 3, one of the largest capital construction projects in New York City's history, began in 1970. Tunnel No. 3 is expected to enhance and improve the City's water delivery system, and allow for 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 consists of a 5.5-mile section in Brooklyn that connects to a 5-mile Queens leg. These were completed in May of 2001. Currently, supply shafts are under construction that will feed water from this new tunnel section to the distribution system. It is anticipated that the Brooklyn/Queens section, which will deliver water to Staten Island, Brooklyn and Queens, will be activated by 2009. Tunneling on the Manhattan portion of Stage 2 began in 2003, and the Manhattan leg is expected to begin water delivery by 2012. Additionally, the conceptual planning work for Stage 3, now called the Kensico-City Tunnel (KCT), was completed in October 2003. The KCT involves construction of a 16-mile long section, extending 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. Construction of Tunnel No. 3 is expected to be completed by 2020, encompass 60 miles and cost approximately $6 billion.

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 completing construction of a cover (December 31, 2005) and is currently engaged in discussions with NYSDOH about modifying the AO and extending such milestone.

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 from the City's upstate reservoirs with the groundwater supplied by the aquifer system below southeastern Queens. As part of the Brooklyn-Queens Aquifer Feasibility Study, DEP continued developing plans to build a treatment plant at Station 6 in Jamaica, and continued investigating the use of the deep aquifers for water storage. More information about the Groundwater System can be found at www.nyc.gov/dep/groundwater.

Station 6 Groundwater Treatment Plant

DEP continued developing 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. Station 6 will provide up to 10 million gallons per day of drinking water, with the potential to expand to 12 million gallons per day in the future. Construction will not commence before 2009.

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.

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 of the 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 tetrachloroethene (a.k.a. "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 NYSDEC 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 $1.65 per 100 cubic feet of water (748 gallons), or about $221.00 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 $571, consisting of $221 for water service and $350 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 on watering lawns and sidewalks from April 1 to October 31 between the hours of 11 AM and 7 PM. It is illegal to open fire hydrants at any time. Additionally, you can help save water by ordering a Home or Apartment Water Saving Kit by calling 311. If you are an apartment building owner/manager or a homeowner, you can obtain a free leak survey. Call DEP's Leak Survey contractor at (718) 326-9426 for information.

Water Treatment

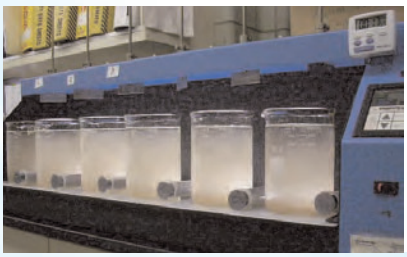
All surface water and groundwater entering New York City's distribution system is treated with chlorine, fluoride, food grade phosphoric acid and, in some cases, sodium hydroxide. New York City uses chlorine to meet the New York State Sanitary Code and federal Safe Drinking Water Act disinfection requirements. 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, a sequestering agent is applied at several wells to prevent the precipitation of naturally occurring minerals, mostly iron and manganese, in the distribution mains and customers' household piping. Air stripper facilities operate at several wells to remove volatile organic chemicals.

Chlorine

Starting on November 29, 2004 through the first three months of 2005, there were periods when a redundant (back-up) chlorine feed line at Kensico Reservoir, servicing the Catskill Water Supply System, was not operating optimally or was inoperable. However, federal and State disinfection requirements were met throughout these periods. The failure to provide ongoing, redundant components to the chlorine disinfection system serving the public constitutes a violation of the Code of Federal Regulation (40 CFR §141.71(b)(1)(ii) and 141.72(a)(2)), and is classified as a treatment technique violation requiring public notification. The purpose of the back-up line is to ensure disinfection of the water supply is not interrupted. If the back-up line had been needed during the period it was inoperable, inadequately treated water could have entered the distribution system. *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.* As of April 2005, DEP successfully repaired and/or replaced damaged sections of the existing Catskill chlorine feed lines. However, in light of the problems with this system, DEP determined that a complete replacement of the Catskill chlorination feed lines was necessary. The replacement work was completed and the back-up line was operational on October 13, 2005.

Turbidity



Testing at DEP water quality lab to determine alum dose

In the weeks following a significant storm event on April 2 and 3, 2005, water quality in the City's reservoirs experienced high turbidity levels, especially in the Catskill System. During the storm event, near-record rain fell across the Tri-State region. In the watersheds, precipitation averaged between 2 and 4 inches, with some areas receiving up to 6 inches. This event followed more than 2 inches of rain on March 27 and 28, and generally wet conditions in the preceding months which left the ground saturated and led to significant subsequent flooding. Runoff from the April 2-3 storm scoured soils and stream beds in the watershed, creating high turbidity in adjacent streams and creeks, which in turn led to high turbidity levels. DEP requested, and received permission from the State Departments of Health and Environmental Conservation (NYSDOH and NYSDEC) to add aluminum sulfate (alum) and sodium hydroxide to Catskill water as it enters Kensico Reservoir on an emergency basis to reduce turbidity levels within the reservoir. Alum is a coagulant

Flooding at Rondout Creek, High Falls, NY

that causes the suspended particles in the water to bind together; the heavier bound particles then fall through the water column and settle on the bottom of the reservoir. Sodium hydroxide helps to optimize the coagulation process. DEP made every effort to minimize the use of alum, since the NYSDEC believes that deposition of sediments on the reservoir bottom may affect biota and fish populations. Treatment began on April 5, 2005 and continued for two months.

A second significant watershed-wide rain event began on October 7, 2005, when a week of soaking rains dumped record amounts of precipitation across the Tri-State region. In the watersheds that supply New York City residents with drinking water, precipitation averaged between 4 and 10 inches, with some areas receiving in excess of 12 inches, which resulted in elevated turbidity levels. DEP again requested and received permission from NYSDOH and NYSDEC to add alum to water entering Kensico Reservoir from the Catskill Aqueduct. Alum was applied from October through the end of the year, with the exception of one week in November. Because of this emergency treatment, and operational adjustments made to the water supply system, DEP managed the Catskill turbidity events in April and October without exceeding water quality standards.

Another localized heavy and intense rain event occurred on June 29, 2005. The turbidity of the water entering the Delaware Aqueduct at the Kensico Reservoir in Valhalla, New York in Westchester County exceeded 5 nephelometric turbidity units (NTUs) at approximately 7:20 PM and stayed above 5 NTU for 45 minutes. The highest recorded turbidity value was 20 NTU. This incident constituted a treatment technique violation as specified in the federal Safe Drinking Water Act regulation (40 CFR §141.71(c)(2)(i)). The turbid runoff resulted from the breach of a nearby containment structure that held earth from a construction site in the vicinity of the Delaware Aqueduct intake. This event occurred downstream of the alum addition, and was therefore not controlled by chemical treatment. However, operational changes were made to prevent turbid water from flowing into the City. DEP expects no long-term impacts on water quality from the event, and has reviewed on-site stormwater controls of construction sites at all reservoirs to address possible sources of contamination. At the time of this event, the New York City Department of Health and Mental Hygiene (DOHMH) decided to issue a drinking water advisory for immuno-compromised New Yorkers advising them to use either boiled or bottled water as a precaution for the 24 hours following the event. The advisory was not a City-wide boil water alert.

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.

Fluoride

As previously noted, DEP treats the City's water supply with fluoride to prevent tooth decay. In 2002, DEP notified NYSDOH of eight fluoride overfeed incidents at the Kensico fluoridation facility into the Catskill and Delaware water supplies. However, the City continued to meet the Maximum Contaminant Level (MCL) for fluoride. Because of these overfeed incidents, DEP entered into a Stipulation Agreement with NYSDOH to install continuous monitoring equipment and to upgrade to a flow-paced fluoride dosing system on the Croton and Catskill/Delaware Systems. The continuous monitoring equipment has been installed, but DEP failed to award contracts to replace the flow-paced fluoride dosing equipment by March 31, 2004 as required by the Stipulation Agreement. A contract was awarded on July 15, 2005 to install the equipment in the Catskill/Delaware Systems, and a contract to install equipment for the Croton System is pending. The delay in awarding the contract has resulted in a delay of installing the equipment which was required by December 31, 2005. DEP is currently in discussions with NYSDOH to amend the completion dates set by the Stipulation Agreement, and expects the new flow-paced equipment to be installed in 2006.

During 2005, fluoride was not continuously supplied in the Catskill/Delaware System due to upgrades and repair work on the fluoride feed system. 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.

Because of a violation of the Stipulation Agreement for fluoride, DEP is required to include the following statement: *Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth.*

Operational Changes

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. Although this condition is aesthetic and not health-related, it may require the City to discontinue use of Croton System water while color levels remain elevated. As part of a multi-year program to inspect and rehabilitate the New Croton Aqueduct, the Croton System was removed from service on September 30, 2004 to conduct maintenance work, and remained off line through June 2, 2005. From June 2 to July 15, 2005 water from the Croton system was distributed into southwestern areas of the Bronx (see adjacent map) and pumped into City Tunnel No. 1, and a blend of Croton and Catskill/Delaware waters serviced Manhattan south of Central Park. On July 15, 2005, DEP ceased distribution of Croton water to the Bronx, but Manhattan continued to receive blended water until October 14, 2005. On October 14, 2005, the New Croton Aqueduct was again shut down and remained offline through the end of the calendar year. When the Croton System was offline, City residents in these areas received water from the Catskill/Delaware System.

In the Groundwater System, Wells 5, 23A, 32, 43A and 50A were online in 2005 (see adjacent map). The pumping of water at the aforementioned wells was started and stopped on a daily basis, depending upon the water demand of the service area. In addition, during January 2005, well 23A was taken out of service for pump replacement but was not returned to service due to water quality issues. Well 32 was also taken out of service in January 2005, due to water quality issues. In July 2005, well 50A was taken out of service due to mechanical failure of the VOC blower. In September 2005, Well 43A was taken out of service to replace pipe and to upgrade the operation of chemical treatment facilities. Once taken out of service, Wells 23A, 32, 50A, and 43A remained out of service for the duration of 2005. More operational information for the Groundwater System can be found at www.nyc.gov/dep/groundwater.

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 the drinking water 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 disinfection byproducts.

Amendments to the SDWA in 1996 required EPA to develop rules to balance the risks between microbial pathogens and disinfection byproducts (DBPs). 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 December 2005, EPA finalized the Stage 2 Disinfectants and Disinfection Byproducts Rule and the Long Term 2 Enhanced Surface Water Treatment Rule. These regulations build upon earlier rules to strengthen protection against microbial contaminants, especially *Cryptosporidium*, and at the same time, reduce potential health risks of DBPs. The Stage 2 Regulations will affect how DEP operates the water supply in the future, including 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 in replacing certain lead service lines (discussed in more detail below). In 2005, at-the-tap concentrations for lead and copper fell below 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 2005, DEP collected more than 33,200 samples from the City's distribution system and performed approximately 410,600 analyses.

DEP conducts most of its distribution water quality monitoring at approximately 1000 fixed sampling stations throughout the City. These stations, which you may have seen in your neighborhood, allow DEP to collect water samples throughout the distribution system in an efficient and sanitary manner. Approximate boundaries of the service areas for the Catskill/Delaware, Croton, and Groundwater Systems, and the operation of Croton and Groundwater Systems in 2005 were discussed above and displayed in the map on page 9.

Test Results

The results of the tests conducted in 2005 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 non-regulated 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 receives water from the Catskill/Delaware, Croton, or Groundwater 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 Help-line at 311 or (212) NEW-YORK.

Drinking Water Supply Sampling Station

Sampling

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During 2005, we did not complete all monitoring or testing for all parameters in the Croton System, marked with an * in the tables of this report, and therefore cannot be sure of the quality of your drinking water during that time. This is a violation of Part §5-1.50 of the New York State Sanitary Code. The impacts to health during the period in question, with respect to the parameters that were not sampled, are not known. However, historical data for the past ten years indicate that the MCLs for these missed parameters have never been exceeded.

Nitrate

In 2005, nitrate was detected in the Groundwater System at levels reaching 7.99 mg/L. Although this is not a violation of the nitrate MCL of 10 mg/L, the NYSDOH requires an educational statement about nitrate to be included when levels between 5 mg/L and 10 mg/L are detected. In both the Croton and Catskill/Delaware systems nitrate levels remained below 1 mg/L.

The required statement follows: *Nitrate in drinking water at levels above 10 mg/L is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask for advice from your health care provider.*

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 2005, 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, 50 City-owned LSLs were identified and replaced. DEP is currently in discussions with NYSDOH and 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 13 µg/L in the surface water systems. In addition, 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 70,000 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 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 Help-line 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 us to determine if organisms identified are alive or capable of causing disease.

In 2005, a total of 104 routine samples at Kensico Reservoir effluents and 52 routine samples at the New Croton Reservoir effluent were collected and analyzed for *Cryptosporidium* oocysts and *Giardia* cysts using Method 1623 HV. Of the 104 routine Kensico Reservoir samples, 11 were positive for *Cryptosporidium* (0 to 3 oocysts/50L), and 50 were positive for *Giardia* (0 to 6 cysts/50L). Of the 52 routine New Croton Reservoir samples, 3 were positive for *Cryptosporidium* (0 to 1 oocysts/50L), and 23 were positive for *Giardia* (0 to 7 cysts/50L). The year 2005 was unique in that the NYC watershed experienced two significant precipitation events (in April and October) that led to higher than usual turbidity, which resulted in the addition of alum to the water supply to settle out the turbidity particles. As a result of these and other events, 98 enhanced samples were collected at the Kensico effluents to monitor for protozoa. Of these 98 enhanced samples, 20 were positive for *Cryptosporidium* (0 to 4 oocysts/50L), and 45 were positive for *Giardia* (0 to 4 cysts/50L). Only 4 enhanced monitoring samples were collected at the New Croton Reservoir effluent this year; none were positive for *Cryptosporidium*, and all 4 samples were positive for *Giardia* (0 to 8 cysts/50L). 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/pathogen.html. As mentioned, 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.

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, microbubbles 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.

New York City
Drinking Water Quality Testing Results 2005

Detected Parameters

PARAMETERS	NYS DOH MCL	US EPA 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 $CaCO_3$)	-		318	9.5 - 35.0	13.5	1	-	56.0	29	17.6 - 189.3	96.3	Erosion of natural deposits
Aluminum (µg/L)	50 - 200 (1)		319	9 - 110	28	*	-	-	16	ND - 39	15	Erosion of natural deposits
Barium (mg/L)	2	2	319	0.01 - 0.04	0.02	*	-	-	16	0.01 - 0.05	0.03	Erosion of natural deposits
Calcium (mg/L)	-		323	4.7 - 9.4	5.7	1	-	23.8	29	8.2 - 74.0	40.0	Erosion of natural deposits
Chloride (mg/L)	250		322	7 - 24	11	6	74.3 - 75.2	74.3	25	13 - 97	60	Naturally occurring; road salt
Chlorine Residual, free (mg/L)	4 (2)		10584	0.00 - 2.09	0.68	76	0.50 - 1.38	0.87	112	0.04 - 1.14	0.59	Water additive for disinfection
Chromium (µg/L)	100	100	319	ND - 4	ND**	*	-	-	16	ND - 4	ND**	Erosion of natural deposits
Color - distribution system (color units -apparent)	-		9481	3 - 42	7	76	5 - 11	8	112	2 - 12	6	Presence of iron, manganese, and organics in water
Color - entry points (color units - apparent)	15 (3)		1105	4 - 13	7	42	6 - 15	9	93	1 - 13	5	Iron and manganese; or organic sources, such as algal growth
Copper (mg/L)	1.3 (4)	1.3	326	0.004 - 0.32	0.01	1	-	0.01	32	0.003 - 0.14	0.02	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Corrosivity (Langelier index)	0 (1, 5)		311	-2.99 to -1.64	-2.42	-	-	-	18	-1.62 to 0.01	-0.75	
Fluoride (mg/L)	2.2 (3)		2012	ND - 1.3	0.8	34	ND - 0.1	0.1	108	0.1 - 1.2	0.9	Erosion of natural deposits; water additive which promotes strong teeth; runoff from fertilizer
Hardness (mg/L $CaCO_3$)	-		323	16 - 35	20	1	-	94	29	33 - 323	178	Erosion of natural deposits
Hardness (grains/gallon[US]$CaCO_3$) (6)	-		323	0.9 - 2.0	1.2	1	-	5.4	29	1.9 - 18.8	10.3	Erosion of natural deposits
Iron (µg/L)	300 (7)		335	**20 - 1010**	60	1	-	48	25	ND - 760	270	Naturally occurring
Lead (µg/L)	15 (4)	0	326	ND - 11	0.6	1	-	ND	32	ND - 2	0.6	Corrosion of household plumbing systems; erosion of natural deposits
Magnesium (mg/L)	-		323	1.1 - 3.0	1.4	1	-	8.3	29	3.1 - 33.6	19.0	Erosion of natural deposits
Manganese (µg/L)	300 (7)		338	**10 - 978**	16	1	-	41	25	ND - 124	35	Naturally occurring
Nickel (µg/L)	-		319	ND - 2	ND**	-	-	-	16	ND - 4	<2	Erosion of natural deposits
Nitrate (mg/L nitrogen)	10	10	322	0.14 - 0.78	0.23	*	-	-	25	0.31 - 7.99	3.21	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (mg/L nitrogen)	1	1	311	ND - 0.008	<0.001	*	-	-	22	ND - 0.006	<0.001	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
pH (pH units) (8)	6.5 - 8.5 (1)		10586	**6.6 - 8.8**	7.2	76	7.1 - 7.4	7.1	112	**7.0 - 9.2**	7.5	
Phosphate, Ortho- (mg/L)	-		10584	0.1 - 3.3	2.2	76	0.4 - 2.7	1.9	112	1.3 - 2.9	2.1	Water additive for corrosion control
Phosphate, Total (mg/L)	-		-	-	-	-	-	-	6	0.4 - 5.6	3.7	Water additive for corrosion control
Potassium (mg/L)	-		316	0.5 - 1.0	0.6	*	-		13	0.8 - 2.5	1.5	Erosion of natural deposits
Selenium (µg/L)	50	50	319	ND	ND	*	-	-	16	ND - 2	<2	Erosion of natural deposits
Silica [silicon oxide] (mg/L)	-		312	2.0 - 4.6	3.1	-	-	-	15	5.4 - 23.1	12.8	Erosion of natural deposits
Sodium (mg/L)	NDL(9)		316	6 - 14	8	*	-		23	9 - 47	22	Naturally occurring; road salt; water softeners; animal waste
Specific Conductance (µmho/cm)	-		10586	71 - 228	85	76	243 - 405	376	112	141 - 754	327	
Strontium (µg/L)	-		316	20 - 30	20	1	-	80	13	30 - 140	80	Erosion of natural deposits
Sulfate (mg/L)	250		322	4.7 - 9.9	5.6	*	-	-	25	10.8 - 84.2	45.8	Naturally occurring
Temperature (°F)	-		10586	34 - 85	54	76	46 - 60	49	112	41 - 74	57	
Total Dissolved Solids (mg/L)	500 (1)		311	32 - 91	52	*	-	-	20	84 - 441	278	Metals and salts naturally occurring in the soil; organic matter
Total Organic Carbon (mg/L carbon)	-		311	1.1 - 2.1	1.5	-	-	-	13	ND - 1.4	0.9	Organic matter naturally present in the environment
Turbidity (10)- distribution system (NTU)	5 (11)		9481	0.8 - 1.7	1	76	0.8 - 0.9	1	112	0.5 - 1.5	1	Soil runoff
Turbidity (10)- entry points (NTU)	1 (12)		-	-	-	42	-	1	-	-	-	Soil runoff
Turbidity (10)- source water (NTU)	5 (13)		-	-	**11**	-	-	-	-	-	-	Soil runoff
UV 254 Absorbency (cm^{-1})	-		311	0.024 - 0.058	0.033	-	-	-	13	0.015 - 0.055	0.028	Organic matter naturally present in the environment
Zinc (mg/L)	5		326	ND - 0.137	0.003	*	-	-	25	ND - 0.385	0.126	Naturally occurring

PARAMETERS	NYS DOH MCL	US EPA MCLG	CATSKILL/DELAWARE SYSTEM			CROTON SYSTEM			GROUNDWATER SYSTEM			SOURCES IN DRINKING WATER
			#SAMPLES	RANGE	AVERAGE	#SAMPLES	RANGE	AVERAGE	#SAMPLES	RANGE	AVERAGE	
ORGANIC CONTAMINANTS												
Disinfection By-Products detected:												
Bromochloroacetic acid (µg/L)	50		246	ND - 2	1	2	3.2 - 3.4	3	5	ND - 2	1	By-product of drinking water chlorination
Chloral Hydrate (µg/L)	50		12	1.4 - 8.3	4.4	-	-	-	-	-	-	By-product of drinking water chlorination
Chloropicrin (µg/L)	50		12	0.4 - 0.8	0.6	-	-	-	-	-	-	By-product of drinking water chlorination
Haloacetonitriles (HANs) (µg/L)	50		12	1.4 - 3.9	2.6	-	-	-	-	-	-	By-product of drinking water chlorination
Halogenated ketones (HKs) (µg/L)	50		12	2.1 - 3.7	2.7	-	-	-	-	-	-	By-product of drinking water chlorination
Total Organic Halogen (µg/L)	-		309	105 - 390	172	-	-	-	13	ND - 153	91	By-product of drinking water chlorination
Principal Organic Contaminants detected:												
Carbon Tetrachloride (µg/L)	5	0	321	ND	ND	2	ND	ND	38	ND - 0.5	ND**	Discharge from chemical plants and other industrial activities
Chloroethane (µg/L)	5		321	ND - 0.6	< 0.5	2	ND	ND	38	ND	ND	Discharge from chemical plants and other industrial activities
Chloromethane (µg/L)	5		317	ND - 0.7	< 0.5	2	ND	ND	38	ND	ND	Discharge from chemical plants and other industrial activities
Dichlorodifluoromethane (µg/L)	5		321	ND	ND	2	ND	ND	38	ND - 2.4	ND**	Refrigerant; aerosol propellant; foaming agent
cis-1,2-Dichloroethylene (µg/L)	5	70	321	ND	ND	2	ND	ND	38	ND - 0.6	ND**	Discharge from chemical plants and other industrial activities
Tetrachloroethene (µg/L)	5	0	321	ND	ND	2	ND	ND	38	ND - 5.7 (14)	0.9	Discharge from dry cleaners
Trichloroethene (µg/L)	5	0	321	ND	ND	2	ND	ND	38	ND - 1.1	< 0.5	Residual of cleaning solvents and metal degreasers
Specified Organic Chemicals detected:												
Di(2-ethylhexyl) phthalate (µg/L)	6		4	ND - 1.4	ND**	*	-	-	3	ND	ND	Plastic products; inks; pesticides; cosmetics
Unspecified Organic Chemicals detected:												
Acetone (µg/L)	50		321	ND - 28	ND**	2	ND	ND	38	ND	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
Methyl tert-butyl ether (MTBE) (µg/L)	10		321	ND	ND	2	ND	ND	38	ND - 1	ND**	Formerly an additive to gasoline

PARAMETERS	NYS DOH MCL	US EPA 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 By-Products detected:												
Haloacetic acid 5 (HAA5) (µg/L)	60 (15)		215	21 - 69	46	18	25 - 63	46	20	1 - 56	33	By-product of drinking water chlorination
Total Trihalomethanes (µg/L)	80 (15)		218	11 - 55	38	53	14 - 56	49	90	ND - 44	28	By-product of drinking water chlorination

MICROBIAL PARAMETERS

PARAMETERS	NYS DOH MCL	US EPA MCLG	CITYWIDE DISTRIBUTION					SOURCES IN DRINKING WATER
			# SAMPLES	RANGE	# SAMPLES POSITIVE	AVERAGE	HIGHEST MONTH % POSITIVE	
Total Coliform Bacteria (% of samples positive/month)	5%	0	10773	-	37	-	1.2%	Naturally present in the environment
E. coli(CFU/100mL)	(16)	0	10773	-	ND	ND	-	Human and animal fecal waste
Heterotrophic Plate Count (CFU/mL)	TT	-	4106	ND - 38	321	ND	-	Naturally present in the environment

LEAD AND COPPER RULE SAMPLING AT RESIDENTIAL WATER TAPS: JULY TO DECEMBER 2005

PARAMETERS	NYS DOH AL	US EPA MCLG	SURFACE WATER				GROUNDWATER				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	117	0.013 - 0.430	0.268	0	79	0.017 - 0.547	0.326	0	Corrosion of household plumbing systems
Lead (µg/L)	15	0	117	ND - 198	13	9	79	ND - 26.9	5	2	Corrosion of household plumbing systems

Drinking Water Quality Control Distribution Laboratory

Undetected Parameters

UNDETECTED CONVENTIONAL PHYSICAL AND CHEMICAL PARAMETERS
Antimony*, Arsenic*, Asbestos [17], Beryllium*, Bromide, Cadmium*, Cyanide*, Foaming Agents, Gross Alpha [18], Gross Beta [18], Lithium, Mercury*, Silver*, ^{90}Strontium [18], Thallium*, Tritium (^{3}H) [18]
UNDETECTED ORGANIC CONTAMINANTS
Principal Organic Contaminants not detected:
Benzene, Bromobenzene, Bromochloromethane, Bromomethane, n-Butylbenzene, sec-Butylbenzene, tert-Butylbenzene, Chlorobenzene, 2-Chlorotoluene, 4-Chlorotoluene, Dibromomethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethene, 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, 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, Dalapon, 1,2-Dibromo-3-chloropropane, Dicamba, Dieldrin, Di(2-ethylhexyl)adipate, Dinoseb, Diquat, Endothall, Endrin, Ethylene dibromide (EDB), Glyphosate, Heptachlor, Heptachlor epoxide, Hexachlorobenzene, Hexachlorocyclopentadiene, 3-Hydroxycarbofuran, Lindane, Methomyl, Methoxychlor, 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 [19]
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, Caffeine, 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, trans-Nonachlor, Paraquat, Parathion, Permethrin, Phenanthrene, Prometryn, Propoxur (Baygon), Pyrene, 2,4,5-T, Terbacil, Thiobencarb, Trifluralin

Footnotes

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

(2) Value represents MRDL. The MRDL is a running annual average calculated quarterly of monthly averages. Data presented are the range of individual sampling results and the highest quarter's running annual average.

(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 residential at-the-tap monitoring, see the Lead and Copper Rule table.

(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. Values in the groundwater system above the MCL are not a violation because the water at particular wells is treated, as allowed by the State, to meet aesthetic concerns.

(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 2005.

(13) This is a TT which only applies to the Catskill/Delaware System. The value presented is the highest single turbidity measurement detected (11 NTU) which occurred on June 29, 2005. See the section on Turbidity.

(14) On July 12, 2005, one distribution sample in the Groundwater area was found to have 5.7 µg/L tetrachloroethene. The well servicing this area was immediately removed from service. The repeat sample collected was non-detect, and the average of the two samples was below the MCL, therefore no MCL violation occurred.

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

(16) 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.

(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.

(18) Radionuclide data presented were collected in 2001.

(19) Vinyl Chloride was the only Specified Organic Contaminant sampled for in the Croton system in 2005.

* In 2005 though required, no Croton water sample was analzed for the parameter(s) during the six week period from June 2 to July 15 when the Croton system was in service directly to distribution in the Bronx.

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

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

Exceedences of MCLs

Iron:

In the Catskill/Delaware System, the MCL of 300 µg/L for iron was exceeded on 1/8/2005 at site 77150 (Cambria Heights, 11411) with a value of 640 µg/L, and two times at site 78150 (Kew Gardens, 11415) on 9/13/2005 with a value of 500 µg/L, and on 10/11/2005 with a value of 1010 µg/L. 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 3000 to 4000 µg/L of iron per capsule. In New York State, the MCL is also exceeded if the combined concentration of iron and manganese exceeds 500 µg/L.

Manganese:

In the Catskill/Delaware System, the MCL for total iron and manganese of 500 µg/L was exceeded on 1/8/2005 at site 77150 (Cambria Heights, 11411) with a value of 640 µg/L for iron and 93 µg/L for manganese, and three times at site 78150 (Kew Gardens, 11415) on 9/13/2005 with a value of 500 µg/L for iron and 70 µg/L for manganese, on 10/11/2005 with a value of 1010 µg/L for iron and 978 µg/L for manganese, and on 10/31/2005 with a value of 300 µg/L for iron and 247 µg/L for manganese. The Food and Nutrition Board of the National Research Council determined an estimated safe and adequate daily dietary intake of manganese to be 2000-5000 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 Groundwater System, pH was elevated at site 76850 (St. Albans, 11412), which received water from Well 5. Elevated laboratory pH readings above 8.5 were detected on 01/03/05 at 8.7, 02/05/05 at 8.9, and 03/09/05 at 9.2. On 01/03/05 the field pH reading was below 8.5. On 02/05/05 and 03/09/05 samples were also collected from the downstream sampling station at site 76850 which had pH values of 7.5 and 7.1, respectively. The elevated pH values may have been a result of 1) the treatment process at Well 5 which increases pH, 2) stagnation of the water flow between the groundwater and surface water which mixes at this location, and/or 3) the influence from new water main construction in the area. On 03/29/05 sampling of site 76850 indicated Catskill/Delaware surface water had a pH value of 8.8 and a low chlorine residual of 0.12 mg/L. The downstream sampling station was also sampled and had a pH of 7.3. This further demonstrates the fluctuation between surface and groundwater at this location.

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

pCi/L = picocurie per liter (a measure of radioactivity)

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

µmho/cm = micromhos per centimeter

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 Parasitic Disease Surveillance Unit of the New York City DEP and New York City Department of Health and Mental Hygiene (DOHMH) at: (212) 788-4728 or call 311.

311 Dial 311 for all non-emergency City services and hotlines

To contact DOHMH about other water supply health related questions call 311 or call the New York State Department of Health Bureau of Public Water Supply Protection at (212) 417-4883 or (845) 794-2045.

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 2005 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 this 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.

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Department of Environmental Protection
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