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March 6, 2014

Mr. Thomas Paolicelli
Executive Director
New York City Municipal Water Finance Authority
255 Greenwich Street
New York, NY 10007

Re: New York City Municipal Water
Finance Authority
Fiscal Year 2014 Consulting Engineer's Report

Dear Mr. Paolicelli:

We herewith submit the Fiscal Year 2014 Consulting Engineer's Report on the operation of the Water and Sewer System of the City of New York. This Report addresses the condition and operation of the System as it presently stands, as well as the adequacy of capital and operating programs for Fiscal Years 2014 and 2015.

It is our opinion that the System condition is adequate and that it continues to be managed by the New York City Department of Environmental Protection (NYCDEP) in a professional and prudent manner. The current budget allocations for Fiscal Year 2014 and Fiscal Year 2015 are adequate for the immediate needs of the System and address all legally mandated projects.

It is important to note that much of the data utilized for the analyses conducted by AECOM has been generated by the on-going budgetary process. The budgetary planning will continue past the date of this report and revisions may be made. However, it is our opinion that meaningful observations and conclusions can be made at this time, although the final budget allocations are subject to change based on the outcome of the budgetary process. It is these observations and conclusions that are presented hereinafter.

We have no responsibility to update this report for events and circumstances occurring after the date of this Report.

Very truly yours,

William Pfrang, P.E., BCEE
Consulting Engineer for
Municipal Water Finance Authority

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THE NEW YORK CITY MUNICIPAL WATER FINANCE AUTHORITY

FISCAL YEAR 2014 CONSULTING ENGINEER'S REPORT

PREPARED BY

AECOM

March 2014

Document # 5355

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1.0 PURPOSE AND SCOPE OF THE REPORT

The purpose of this report is to provide engineering information pertinent to the condition of the Water and Sewer System (System) serving New York City (NYC) and the use of the proposed capital improvement program (CIP) funds. Since 1983, AECOM (formerly Metcalf & Eddy) has provided engineering services related to the NYC Water and Wastewater Operations Evaluation Study (Study) and has provided services to the NYC Municipal Water Finance Authority (Authority) since 1985. Certain studies and analyses were performed in anticipation of the creation of the Authority and were used in developing the information included in the Municipal Water Finance Authority Official Statements under the captions: "CAPITAL IMPROVEMENT AND FINANCING PROGRAM — Ten Year Capital Strategy, Current Capital Plan and the Capital Improvement Program", "THE SYSTEM — The Water System", and "THE SYSTEM — The Sewer System". AECOM has performed ongoing evaluations of the condition of the System, independently reviewed the capital and operating programs pertaining to water and wastewater, reviewed pertinent studies associated with the long-term development of the System, and interviewed key individuals responsible for managing the activities of the New York City Department of Environmental Protection (NYCDEP).

The report addresses the issues listed below:

- present physical condition of the System,
- Fiscal Year 2014 capital budget and Fiscal Year 2015 projected capital budget for the System,
- Fiscal Year 2014 expense budget and Fiscal Year 2015 projected expense budget relative to operation and maintenance of the System,
- overview of the Preliminary Current Capital Plan for Fiscal Years 2015 to 2017, and
- management of the System.

2.0 METHODOLOGY FOR ANALYSIS

The analyses conducted by AECOM were accomplished utilizing the following methods:

- discussions with representatives of the Authority and NYCDEP,
- selected confirmation inspections of operating facilities and major on-going construction programs,
- review of documentation relative to the ongoing budgetary process, and
- evaluation of other comparable water and wastewater systems and industries.

The budgetary process is ongoing and has not been concluded by the date of this report's publication. Observations and conclusions presented herein are therefore based on budget data as it presently stands. It is the opinion of AECOM that these observations and conclusions are meaningful with respect to the System. It should be noted, however, that these observations and conclusions are subject to change based on the outcome of the budgetary process. We understand that no significant changes are expected in the Preliminary Current Capital Plan with the release of the Executive Budget in April. However, the Executive Budget will capture updates to project schedules and some project costs.

3.0 THE CONSULTING ENGINEER

AECOM has served the water and wastewater industry for over 100 years and NYC as a consulting engineer for many decades dealing with water supply, water distribution, sewage collection, and wastewater treatment. AECOM is one of the largest consulting engineering firms in the United States and is recognized internationally as a leader in providing services to the water and wastewater industry. AECOM is a global leader in all the markets for which it provides professional technical and management support services including water/wastewater, facilities, environment, energy, government, and transportation. AECOM has approximately 45,000 employees worldwide and serves clients in more than 140 countries. In 2013, Engineering News Record (ENR) magazine ranked AECOM #1 in the top 500 overall design firm category for the fourth consecutive year.

4.0 THE CONSULTING ENGINEER'S CONCLUSIONS

- In our opinion, the System continues to be managed in a professional and prudent manner with an appropriate regard for the level of service afforded to the users within the available funding.

- NYCDEP capital and expense budget projections for Fiscal Year (FY) 2014 satisfy the immediate needs for the System including all legally mandated projects, which comprise approximately 33% of the capital budget for FY 2014.

- NYCDEP capital and expense budget projections for FY 2015 satisfy the immediate needs for the System including all legally mandated projects, which comprise approximately 20% of the capital budget for FY 2015.

- The physical condition of the System receives an adequate rating.

- Staffing levels are approximately 92% of current allocations. NYCDEP continues to maximize the efficient use of its staff through re-allocation of current positions and new hires. Strong recruitment practices, succession planning and training continue to strengthen NYCDEP staff due to the Organizational Development structure within NYCDEP.

5.0 OVERVIEW OF THE SYSTEM

Description of the System

NYCDEP is charged with the operation and maintenance of a vast system of water and wastewater infrastructure.

The NYC water supply system consists of three upstate watersheds, Delaware, Catskill and Croton that extend as far as 125 miles north of NYC, consisting of 19 storage reservoirs and three controlled lakes, as shown in Figure 1. The Delaware, Catskill and Croton watersheds are designed to supply approximately 50%, 40% and 10% of the NYC's daily water supply, respectively. The Croton system has the ability to increase delivery to 25% of the City's daily water supply if the need arises. NYCDEP also maintains wells in Queens which can provide up to 1% of the NYC's daily water supply. However, the groundwater supply system has not been used since 2007. The average daily in-city water consumption for FY 2013 was 1.013 billion gallons per day (BGD).

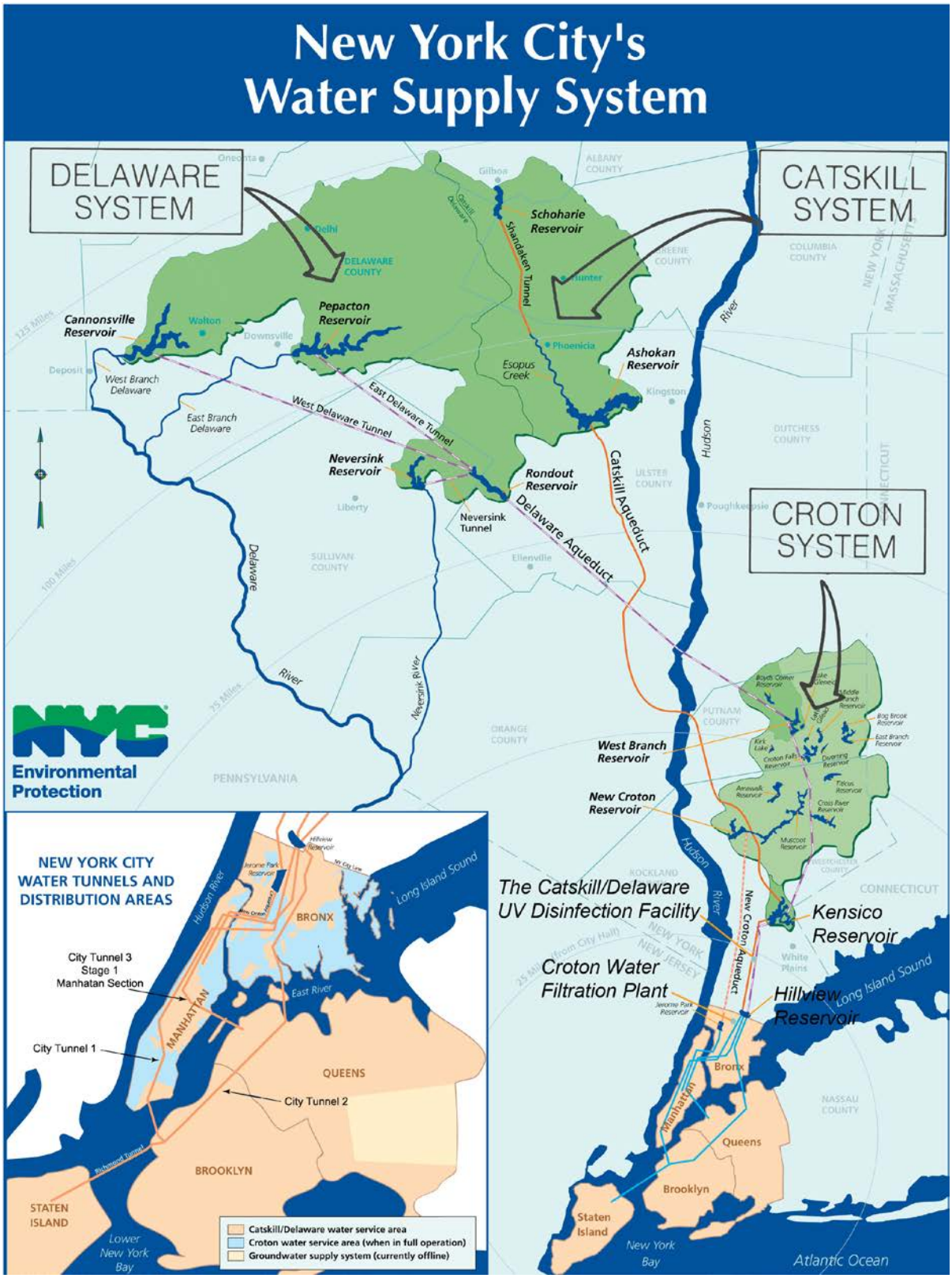


Figure 1: New York City Water Supply System

The water supply is conveyed by gravity from the upstate reservoirs through an extensive system of tunnels and aqueducts. Water supplies from the upstate watersheds are presently unfiltered. In 2015, the Croton Water Filtration Plant (WFP), which is currently undergoing start-up and testing, will come online. A UV Disinfection Facility to treat water from Kensico Reservoir, which is fed by the Delaware and Catskill watersheds, commenced operations in the fall of 2012, feeding water to the city via Hillview Reservoir. Both Kensico Reservoir and Hillview Reservoir serve as balancing reservoirs for the water system, handling the daily fluctuation and hourly fluctuations of water demand, respectively. Water from Hillview Reservoir is conveyed to the City through three tunnels, City Tunnel No. 1, City Tunnel No. 2, and City Tunnel No. 3, which is partially in operation and partially under construction. The water distribution system from the three city tunnels consists of a grid network of over 6,700 miles of pipe, as well as valves, 109,000 fire hydrants, distribution facilities, gatehouses, pump stations, water quality monitoring stations, laboratories and maintenance and repair yards.

The NYCDEP wastewater system is comprised of fourteen in-city Wastewater Treatment Plants (WWTPs) that discharge into receiving bodies surrounding NYC, as indicated in Figure 2 and operated by NYCDEP Bureau of Wastewater Treatment (BWT). There are seven upstate WWTPs and one community septic system that are operated by NYCDEP Bureau of Water Supply (BWS) to protect the NYC watersheds. The NYC WWTPs have a capacity of 1.805 BGD and they are currently treating approximately 1.3 BGD of municipal wastewater and a portion of combined sewer flow during a wet weather event. The NYC sewer system is divided into 14 drainage areas, which correspond to each of the WWTPs. The NYCDEP in-city WWTPs provide physical, chemical and biological treatment of the wastewater flows to achieve secondary treatment standards. As indicated in Figure 2, some of the WWTPs will also provide Biological Nitrogen Removal (BNR). Some of the WWTPs are currently in BNR operations, while others are in the design or construction phase for BNR. The sewer system is comprised of approximately 7,400 miles of sewer pipes of varying size and material, which are classified as sanitary, storm or combined sewers. Much like many other older cities, the NYC collection system consists primarily of combined sewers (NYC is 60% combined sewers), which means during a wet weather event wastewater, rainwater and surface water runoff is collected into the combined sewers with most flow being sent to the WWTPs while excess flow discharges to the receiving water as combined sewer overflow (CSO). There are approximately 423 combined sewer overflow (CSO) regulators and outfalls and four combined sewer overflow retention facilities (Paerdegat Facility, Alley Creek Facility, Spring Creek Facility, Flushing Bay Facility) that store some of the flow before discharging. The stored flow is then sent to the WWTP when possible. Additional NYCDEP infrastructure that supports the wastewater system includes 96 wastewater pump stations, 144,000 catch basins, laboratories, eight sludge dewatering facilities (six dewatering facilities currently active) and inner-harbor vessels which transport sludge between facilities.

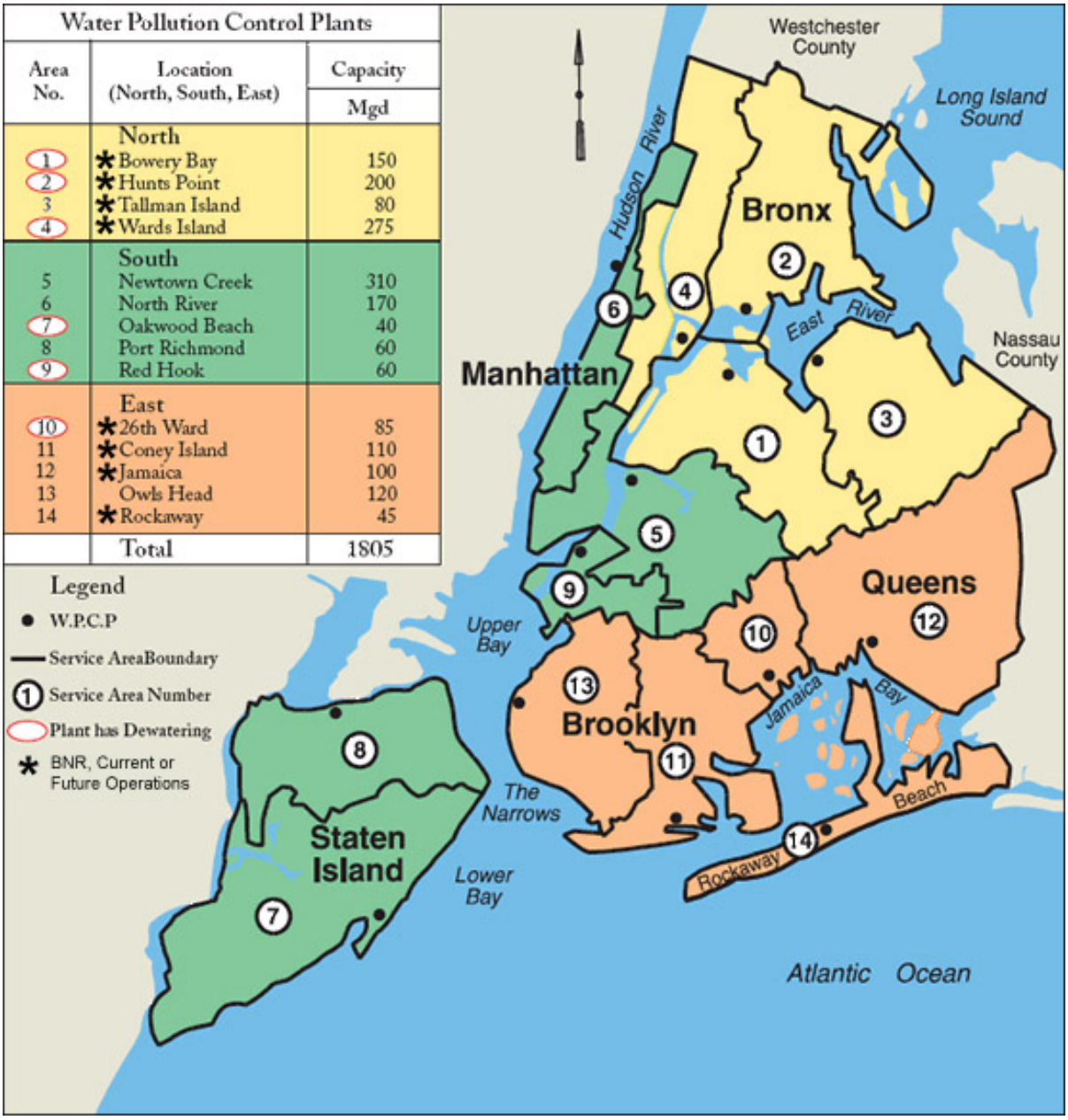


Figure 2: New York City Wastewater Treatment Plants

6.0 MANAGEMENT OF THE SYSTEM

Organizational Structure

Mayor Bill de Blasio was sworn in as Mayor of New York City on January 1, 2014. On February 18, 2014, Mayor de Blasio announced Emily Lloyd as the new Commissioner of the NYCDEP. Commissioner Carter Strickland, Jr. continues to be Commissioner of the NYCDEP until the transition is complete in March 2014.

NYCDEP continues to be managed based upon the four core functions of NYCDEP, as set out in the Strategic Plan: (1) Utility Service (water and wastewater operations), (2) Capital Program Delivery, (3) Regulatory Compliance (Air, Water, and Environment), and (4) Financial Management:

- The Utility Group consists of the three operating Bureaus: Bureau of Wastewater Treatment (BWT), Bureau of Water Supply (BWS) and Bureau of Water and Sewer Operations (BWSO). It also includes the Office of Strategic Planning (OSP) and the Office of Energy. All operating bureaus coordinate activities through the Chief Operating Officer (COO). The key responsibilities of each unit in the Utility Group are:

    - BWT is responsible for the operation and maintenance of the fourteen in-city WWTPs, the City's 96 wastewater pump stations, interceptor regulators, sludge dewatering facilities, fleet of marine vessels, laboratories, and the control of discharges from combined sewer overflows. BWT has undergone organizational restructuring to implement greater efficiencies at WWTP operations. Seven Area Facility Managers (two WWTPs per Facility Manager) have been appointed to provide senior leadership in the operation of the fourteen wastewater treatment plants. Working with the Chief Operators of the individual plants, the Area Facility Managers provide overall operational consistency. Each Area Facility Manager has an assigned Maintenance Facilitator who coordinates maintenance operations.

    - BWS is responsible for managing, operating, maintaining and protecting the City's upstate water supply system to deliver a sufficient quantity of high quality drinking water. The Bureau conducts extensive monitoring of water quality, both within the City's distribution system and throughout the upstate watersheds. BWS is also responsible for the management, operation and maintenance of the recently commissioned CAT/DEL UV Disinfection Facility. The Bureau is responsible for the overall management and implementation of the provisions of the City's Watershed Protection Program and for complying with the City's Filtration Avoidance Determination (FAD) program.

    - BWSO is responsible for the operation and maintenance of the City's drinking water distribution, wastewater collection systems, and Bluebelts, the natural alternative to storm sewers. BWSO field operations provide: (1) that residences and businesses will have an adequate supply of potable water, (2) that there will be sufficient water for fire protection, and (3) that the wastewater collection system is properly functioning. BWSO will also be responsible for the management, operation and maintenance of the Croton WFP when the new facilities are commissioned.

    - OSP is responsible for development and update of the Strategic Plan, the implementation of transparent performance metrics for each of NYCDEP's four core functions, the development and implementation of an asset management system to guide capital investment prioritization and more recently the coordination of the Operational Excellence, OpX program.

    - Office of Energy is responsible for the consolidation of energy issues and initiatives from all NYCDEP bureaus. The Office of Energy will perform planning and strategy, along with energy policy decisions and program implementation of NYCDEP energy projects.

- BEDC is the bureau responsible for managing the design and construction of capital improvement projects, including major water transmission facilities, water treatment facilities, wastewater treatment and disposal facilities, wastewater pumping stations stormwater/ CSO facilities. BEDC has implemented several significant improvements to

overall business practices, increased efficiencies and implemented standardization in cost estimating, project scheduling, project delivery, contract structure and change order procedures. The Project Management Information Systems (PMIS) continues to make project management functions more efficient by tracking cost and project schedule performance. BEDC in-house design and construction management groups continue to improve project delivery for various NYCDEP projects. A Sustainability Group has been developed within BEDC. This new group has partnered with Envision™, a new sustainability certification rating system, to perform triple bottom line evaluations on all BEDC projects. In early 2014 BEDC plans to initiate additional in-house training to provide certification of Account Project Managers.

- The Sustainability Group at NYCDEP is responsible for the development and implementation of environmental policy and strategy, including water and air quality, the noise code, and other quality of life issues. The Group includes the Office of Green Infrastructure (OGI), Bureau of Environmental Planning and Analysis (BEPA) and Bureau of Environmental Compliance (BEC). An Office of Green Infrastructure has been established to support and implement the Green Infrastructure Plan. This group continues to work closely with the NYC Department of Design and Construction (DDC). BEPA is responsible for conducting environmental reviews for NYCDEP, providing technical assistance for the preservation of natural resources, conducting long range planning (population/ employment, consumption and demand/flow), conducting strategic planning to help ensure appropriate forecasting, trend analysis, regulatory review, scientific modeling, and research. BEPA is also continuing the work of the climate change task force and resiliency studies, and helping NYCDEP plan for the new growth stimulated by rezoning throughout the City. BEC is made up of the Division of Air & Noise Policy, Permitting and Enforcement and the Asbestos Control Program. BEC is responsible for responding to air and noise code complaints, maintaining the database of facilities containing hazardous and toxic material, overseeing remediation of hazardous waste municipal landfills, managing investigation of contaminated sites and responding to hazardous material emergency incidents. The Sustainability Group is also responsible for implementing PlaNYC initiatives throughout the agency, and will also develop long-term strategies to meet the NYCDEP's water quality goals.

- The Chief Financial Officer (CFO) is responsible for financial management of NYCDEP. In this capacity, the CFO oversees the Budget Office and the Bureau of Customer Service. The CFO is also responsible for overseeing the administrative functions consisting of procurement, information technology, engineering audit and facilities.

Other key components of the NYCDEP organizational structure consist of:

- Environmental Health & Safety (EH&S) is responsible for a comprehensive EH&S compliance program, all EH&S training, audits, EH&S employee surveys and the NYCDEP internal compliance office.

- Organizational Development is responsible for human resources, training, succession planning, labor relations and discipline.

- Legal Affairs is responsible for handling NYCDEP's legal matters.

- The Bureau of Police and Security is responsible for protecting the City water supply and the associated critical infrastructure from terrorism, pollution and crime.

- Executive includes the Commissioner and Chief of Staff, as well as the Bureau of Communication and Intergovernmental Affairs.

7.0 STRATEGIC PLAN UPDATE

NYCDEP released its Strategic Plan (2011 – 2014) in February 2011 which established a plan to achieve the agency's core objectives over the long-term and to become the safest, most efficient, cost-effective, resilient and transparent water utility in the nation. The Strategic Plan established 29 goals for NYCDEP's core functions and launched 100 initiatives to reach most of these goals within the four years of the Plan. The following areas are addressed in the Strategic Plan: Strategic Planning and Performance, Customer Service, Worker Safety, Operations (water supply, water distribution, wastewater treatment), and Capital and Sustainability (Regulatory Relationships and Policy, Harbor Water Quality, Energy, Hazardous Materials, Air and Noise Pollution).

The Strategic Plan introduces several cost-effective strategies into NYCDEP's overall plan, such as: green infrastructure implementation to improve water quality and provide other sustainability benefits; energy goals of reduced electrical demand and investment in cost effective clean energy projects; and improvements in the implementation of the CIP with an improved asset management tool, better business practices and further project controls. This Strategic Plan incorporates the significant progress that has been made for the water and wastewater system along with the plans for the future of the agency to continue in a forward-thinking positive direction.

The 2013 Progress Report of *Strategy 2011-2014* was released in December 2013. It reflects the significant accomplishments and continued implementation of the NYCDEP Strategic Plan. Since 2011, 85 Strategic Plan initiatives have been fully achieved, and 13 Strategic Plan initiatives are on track to be completed on schedule. An update is also provided for the strategies in progress. The status of several projects discussed in the strategic plan progress report is also addressed later in this report.

NYCDEP has actively been engaging with their staff across the entire Department and many outside stakeholders in the development of the next strategic planning effort, *Strategy 2014-2017*. The values that NYCDEP continue to embrace include safety, service, support, transparency, innovation and sustainability. The next iteration of NYCDEP's Strategic Plan is anticipated to be released in 2014.

8.0 CAPITAL IMPROVEMENT PROGRAM (CIP)

8.1 Overview

Budgeting is a lengthy and comprehensive process, especially for an agency operating such a large and complex system as is the responsibility of the NYCDEP. NYCDEP budgeting is an ongoing iterative process that takes into account legal mandates, mayoral initiatives such as PlaNYC, state of good repair (SOGR) projects to maintain permit compliance, capacity issues, dependability, environmental, health, and safety (EH&S) compliance requirements, community drivers, climate change adaptation and resiliency, and other facility improvements. Project schedules, cost estimate updates, technical issues, regulatory updates, emergency events and legal issues may impact project prioritization and the overall budgeting process.

The NYCDEP CIP consists of the Ten-Year Capital Strategy, along with the Four Year Current Capital Plan, which is updated quarterly. The Ten Year Strategy is updated every two years. The next Preliminary Ten Year Capital Strategy update will be released in February 2015. The Preliminary Four Year Current Capital Plan for FY 2014 through FY 2017 was released in February 2014. This review includes the budget for FY 2014, which ends on June 30, 2014, and the budget for FY 2015, which begins on July 1, 2014. AECOM has reviewed the Preliminary Current Capital Plan and met with key individuals responsible for budgetary planning to provide an assessment of its adequacy. It is anticipated that the Mayor will issue the Executive Budget in April 2014. The

Executive Budget will include updates to certain project schedules and budgets. Our findings are summarized in the following paragraphs.

Regarding FY 2014

The Preliminary Plan FY 2014 budget is set at approximately $2.32 billion. Approximately 33% of FY 2014 funding supports mandated projects, consisting primarily of green infrastructure projects, filtration avoidance determination (FAD) requirements and the Croton WFP. Additional mandated projects include combined sewer overflow (CSO) work (grey infrastructure projects), the nitrogen control program and the total residual chlorine (TRC) program. NYCDEP has indicated that all legally mandated projects are fully funded in FY 2014. Significant funding is also included in FY 2014 for Water for the Future program (Rondout-West Branch tunnel by-pass, repairs and water supply augmentation), City Tunnel #3 connections, wastewater treatment plant SOGR projects, water supply infrastructure SOGR projects, water distribution system and wastewater collection sewer work, high level storm sewers and Bluebelt land acquisition and construction.

Regarding FY 2015

The Preliminary Plan FY 2015 budget is set at approximately $2.7 billion. Approximately 20% of FY 2015 funding supports legally mandated projects, such as CSO projects (grey and green infrastructure), storm sewer build out, 26th Ward WWTP wet weather stabilization upgrades, some FAD requirements, total residual chlorine (TRC) program and the nitrogen program. NYCDEP believes that all legally mandated projects will be fully funded in FY 2015. Significant funding is also included in FY 2015 for Water for the Future projects, both the bypass tunnel construction and water supply augmentation. Additional funding in FY15 is provided for City Tunnel #3 connections, Bluebelt initiatives, Gilboa Dam reconstruction, wastewater treatment plant SOGR projects, water supply infrastructure SOGR projects, water distribution system and wastewater collection sewer work.

Regarding the Preliminary Current Capital Plan for FY 2014 to FY 2017

The Preliminary Current Capital Plan for FY 2014-2017 consists of about $7.51 billion in funding. Approximately 22% of the total funding for FY 2014-2017 is dedicated to mandated projects, which is consistent with the recent trend of decreasing NYCDEP mandated projects, as shown in Figure 3. As shown in Figure 3, for FY 2008 through FY 2010, the overall budget consisted of a high percentage of mandated project costs due to the construction of the Croton WFP, UV Facility, and the Newtown Creek WWTP Upgrade projects. The majority of the mandated projects in FY 2014 consist of green infrastructure and FAD requirements. The portion of mandated projects has been decreasing in the later part of this current budget plan, in FY 2016 and FY 2017, and in the outer years of the most recent Ten Year Plan. As a consequence, the majority of the capital improvement program must be planned and budgeted based solely on its importance to the overall System and NYCDEP prioritization as determined by NYCDEP, such as the Water for the Future program. However, as discussed later in this report, the mandated CSO Program may require additional funding in the outer years of the next 10-Year Plan and beyond the ten year planning horizon. Although it is not anticipated that there will be as many large mandated projects occurring simultaneously as in FY 2008-FY2010, there is a potential for additional mandated projects in the future.

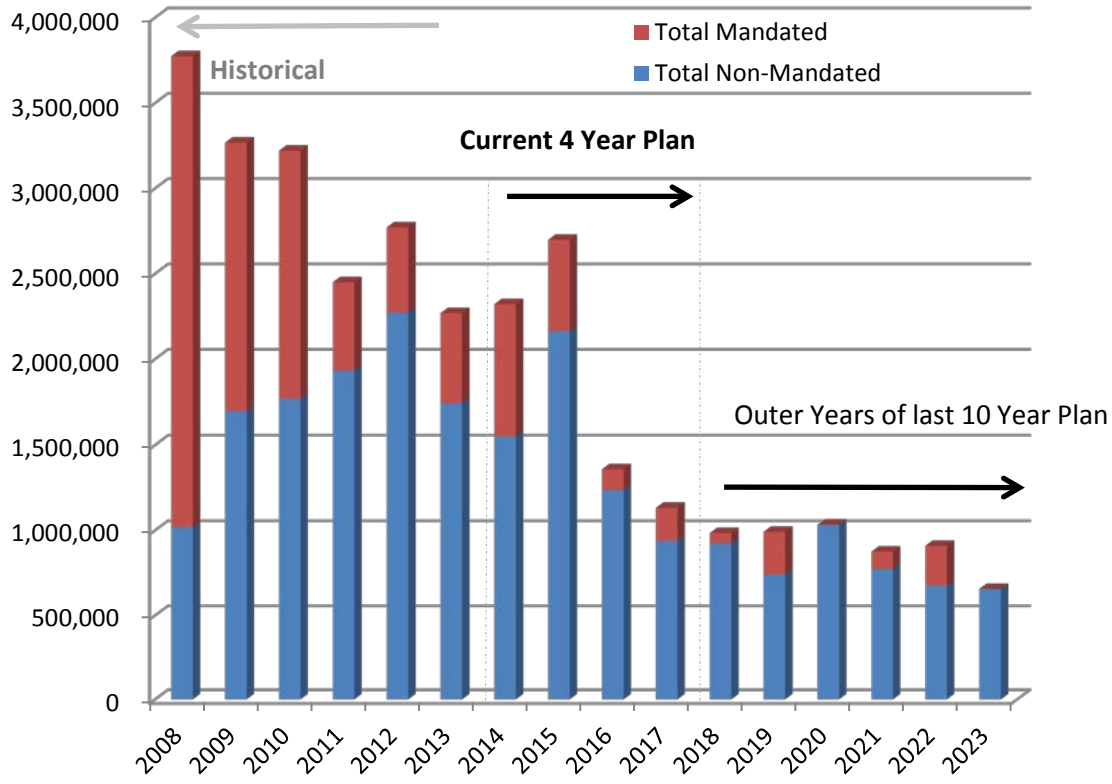


Figure 3: NYCDEP Historical and Projected Budgets

As in most US cities, the NYCDEP infrastructure is aging. Therefore, it is necessary to refurbish or replace infrastructure in a planned manner to cost effectively minimize risk of failure. The NYCDEP has refined and implemented their Asset Management program significantly in order to set priorities for the continued refurbishment of its physical assets. The Asset Management program provides a uniform methodology for a comprehensive evaluation of capital assets throughout the System and allows a systematic approach to maintain and upgrade physical assets so that capital improvements can progress in an orderly manner.

Currently, the non-mandated improvements include a significant amount of funding for the Water for the Future program, SOGR projects, and water distribution system and sewer projects. Approximately 13% of the FY 2014-2017 budget is set aside for Water for the Future program which is a significant investment in the reliability and safety of the NYC water supply and transmission. Approximately 31% of the total funding for FY 2014-2017 is dedicated to the SOGR projects which is an increase compared to previous budget cycles. NYCDEP is making significant strides in dedicating funds to the SOGR projects across all bureaus and this effort should continue.

NYCDEP will continue to be a strong advocate for prioritizing water quality projects and the affordability issue. NYCDEP is a member of the National Association of Clean Water Agencies (NACWA) Money Matters Task Force and continues aggressive discussions with regulators. NYCDEP is working collaboratively with the U.S. Conference of Mayors on affordability in utility planning and evaluating EPA's Affordability Criteria.

8.2 System-wide Programs

Climate Change Adaptation and Resiliency

NYCDEP has been planning and evaluating climate change adaptation requirements for the past several years, well before Superstorm Sandy impacted the NYC area. Adaptation refers to those actions that must be taken to allow NYCDEP facilities to meet their intended functions when considering increased sea levels and more intense storm events. In May 2008 NYCDEP released its Climate Change Program Assessment and Action Plan. Following the release of that report NYCDEP began studying the effects of climate change on the City's stormwater/wastewater collection system in more detail to determine what level of infrastructure and policy modifications are necessary to alleviate potential damage from larger, more frequent storm events and rising sea levels. In May 2010, the NYC Panel on Climate Change released a report entitled Climate Change Adaptation in New York City: Building a Risk Management Response, which among other important information it includes climate trends and projections for NYC, which NYCDEP has used for analysis and planning. In addition, BEPA completed a two-year pilot study to develop an adaptation and optimization strategy to minimize global climate change risks for NYCDEP infrastructure using one WWTP (Hunts Point) and one drainage area (Flushing Bay).

When Superstorm Sandy significantly impacted the New York City area in October 2012, NYCDEP made a clear decision to continue and strengthen its work on climate change adaptation and resiliency. In December 2012, the Mayor's Office formed the Special Initiative for Rebuilding and Resiliency (SIRR). In June 2013, NYC released a comprehensive document entitled *A Stronger, More Resilient New York* which covered citywide infrastructure impacts and community rebuilding and resiliency plans. Subsequently NYCDEP released the *NYC Wastewater Resiliency Plan, Climate Risk Assessment and Adaptation Study* in October 2013. This Plan is a comprehensive assessment of wastewater facilities at risk from future storms with proposed measures to protect critical equipment to reduce the risk of damage and loss of service. The study evaluated infrastructure at the 14 NYCDEP WWTPs and the NYCDEP 96 wastewater pump stations to identify and prioritize facilities most at risk for flood damage. The framework used for this study consisted of climate analysis, risk analysis and adaption analysis. The possible adaptation strategies ranged in varying degrees of resiliency, effectiveness and cost. The study presented a cost of $315 million to harden pump stations and wastewater treatment facilities to reduce the risk of damage in future storms.

NYCDEP has adopted a new design standard to account for the critical flood elevation with the Flood Emergency Management Agency (FEMA) 100-year flood elevation plus 30 inches to account for sea level rise. Prioritizing the resiliency capital projects is an important step in the planning process. The criteria used for prioritization of projects and needs included operational, environmental, social and financial metrics. As facilities are being upgraded the results of this study will be reassessed with detailed site analyses during the design. As part of this study, Storm Surge Guidance was developed for all 14 NYCDEP WWTPs to assist NYCDEP staff in preparations in advance of another storm.

Climate change adaptation evaluations are also taking place for other parts of the system. BWS is focused on climate change impacts on the water supply side though the use of Operation Support Tool (OST) models, the watershed protection program and improving flexibility in operations with increased water supply interconnections. NYCDEP's 2010 Green Infrastructure Plan outlined a comprehensive approach to stormwater management. The plan is based on implementing city-wide green infrastructure improvements to reduce the volume of stormwater that reaches the engineered stormwater collection system. NYCDEP maintains strong involvement with the climate change science community on the City, national and international level.

Climate change adaptation is a challenge facing all water and wastewater utilities, and should be considered in short-term and long-term utility planning. There is uncertainty inherent in climate science due to the magnitude variability, timing and frequency of localized events and their impacts

on the system. However, despite the uncertainty of climate change prediction, rational capital investments must be considered to protect NYCDEP facilities. It is anticipated that NYCDEP will continue to transition from study/planning to implementation phase for climate change adaptation and resiliency in a systematic prioritized approach in the next Ten Year Plan. Due to the implementation of revised design standards, NYCDEP is incorporating resiliency into projects that are currently in the planning or design stage. NYCDEP is also trying to secure federal and state funding for climate change adaptation and resiliency. The *NYC Wastewater Resiliency Plan, Climate Risk Assessment and Adaptation Study* has provided a framework to prioritize and package projects that are ready to be implemented with outside sources of funding.

PlaNYC: NYCDEP Sustainability Initiatives

In April 2011, Mayor Bloomberg released a PlaNYC Update Report: A Greener, Greater New York, an update on the comprehensive sustainability plan for New York City's future. In 2013, an annual PlaNYC Progress Report was issued. This plan focuses on five key target areas of the City's environment – air, land, water, energy and transportation. Along with resiliency as discussed above, greenhouse gas reduction and energy planning are being incorporated into NYCDEP's planning and design projects.

Greenhouse Gas Reduction Requirements. As part of PlaNYC, the City has committed to reducing its municipal greenhouse gas emissions by 30% below FY 2006 levels by FY 2017. NYCDEP is developing a strategic plan to meet the 30% reduction. NYCDEP continues to fully inventory its annual greenhouse gas emissions, which identifies the largest emissions sources and greatest opportunities for reductions, and continues to quantify the impact of ongoing and planned projects on the inventory. Although substantial energy consumption increases are expected over the next several years system-wide, largely driven by mandated activities, NYCDEP is diligently pursuing projects that reduce greenhouse gas emissions and improve energy efficiency. NYCDEP has completed detailed energy audits of all 14 WWTP facilities to identify additional opportunities for energy reduction and develop the strategic plan to meet the PlaNYC goal. NYCDEP is in the process of prioritizing the recommended proposals that resulted from the energy audits. Building on that effort, results of these energy audits help NYCDEP fully understand how energy is being used at its facilities, identify low and no-cost operational modifications that will meaningfully reduce on-site energy consumption and GHG emissions, and identify capital projects with favorable payback periods to further reduce energy consumption and GHG emissions. NYCDEP is implementing GHG reduction and energy management into the BEDC Project Delivery Manual. Design guidelines have also been established for energy efficiency.

Energy Planning. With new systems and facilities coming on-line, it is in the best interest of the NYCDEP to assist in the planning of reliable sources of power, both from conventional and renewable sources. NYCDEP's Office of Energy will coordinate all NYCDEP initiatives. As NYCDEP's largest WWTP, Newtown Creek produces an excess of anaerobic digester gas (ADG) that is typically flared in its flare towers. As part of a newly formed Newtown Creek/National Grid Partnership, NYCDEP will send ADG to a processing facility, where the ADG will be converted to pipe-line quality gas, which will then be added to National Grid's natural gas supply. This project will improve local air quality, reduce City-wide greenhouse gas emissions, utilize a renewable energy resource, and increase City-wide natural gas supply. NYCDEP has also formed a partnership with Waste Management whereby Newtown Creek is accepting food wastes from NYC public schools. The food waste is added to the digesters to increase the production of biogas. NYCDEP has received a grant from New York State Energy Research and Development Authority (NYSERDA) for a one-year monitoring and testing of the food waste addition to NC digesters. This study will perform a cost benefit analysis and overall impacts to dewatering and digestion.

Other energy projects that NYCDEP is pursuing are cogeneration facilities, hydropower and solar panels at NYCDEP facilities. NYCDEP holds a preliminary permit from the Federal Energy

Regulatory Commissioner (FERC) to investigate the installation of hydro-electric turbines at NYCDEP upstate dams to harness hydro power. NYCDEP's main concerns are dam safety, maintaining operational control over the dams and the ability to meet flow management agreements. NYCDEP anticipates receiving a FERC license early 2014. NYCDEP is evaluating alternative licensing arrangements for power generation without impacting water supply operations. The Current Capital Plan includes $25 million in funding for the development of hydropower at Cannonsville Reservoir and Dam.

NYCDEP has become a member of Leaders Innovation Forum for Technology (LIFT). LIFT is a joint Water Environment Federation (WEF)/Water Environment Research Foundation (WERF) initiative designed to allow for collaboration among utilities to move innovation into practice in the water quality industry. NYCDEP is also involved with other technology advisory groups with the focus of emerging technology in the industry.

Asset Management

In 2014, NYCDEP is planning to update its asset management program to include additional inspections of facilities, updating the database with current projects that are underway and current status of facilities, scoring of assets and then translating into additional business cases.

NYCDEP asset management program has expanded to include the majority of the water and wastewater infrastructure. The results of the asset management program have been used in the development of the funding needs for the state of good repair for the Current Capital Plan. This ongoing effort is based upon a collaborative approach between the operating bureaus so that all stakeholders have input throughout the process. Business case project prioritization is based upon a scoring of the following criteria: physical condition, performance/process condition, regulatory/environmental, service level/reliability, efficiency/energy, O&M and hazard, community, public image and financial. NYCDEP will perform continuous real time updating of the status of the many NYCDEP physical assets to reflect completion of improvement projects and condition survey updates for operating assets. The capital program for the state of good repair projects is determined based upon the highest numerically rated projects within the available funding. The principles of asset management have been effectively applied to many water and wastewater utilities worldwide and the NYCDEP's progress in asset management is a positive development. It is anticipated that NYCDEP will continue to build their asset management program to include operations and maintenance data to achieve a full comprehensive formalized Asset Management program for all assets. All potential projects receive a numerical rating.

8.3 Capital Program Accomplishments

There are a number of capital program accomplishments during the past year that are noteworthy. These items play an essential role in the development and advancement of the CIP, and providing for prudent and professional management of the System.

- Activation of the City Tunnel #3 Stage 2 Manhattan leg in October 2013.
- Water for Future program continues with the start of shaft construction for the by-pass tunnel on the Delaware Aqueduct and installation of dewatering equipment. Construction also initiated on the connection of the Delaware and Catskill Aqueducts at Shaft 4 which will provide operational flexibility for the conveyance of water.
- Croton WFP began start-up and testing.

8.4 Capital Improvement Program Highlights for the Water System (Supply, Treatment, and Conveyance Programs)

Water for the Future Program

The Water for Future program consists of two main components – fixing the Delaware Aqueduct in two areas where significant leaking has been noted (installing a by-pass tunnel and making repairs) and supplementing NYC water supply during the period when these water transmission elements are out-of-service for repair. The Water for the Future program is a comprehensive program that requires thorough coordination throughout the entire NYCDEP. A strong organizational structure is in place within BEDC and across all operating bureaus (with designated liaisons) and executive management, to continue with the planning, design, construction and implementation of the Water for Future due to the magnitude and complexity of the program. There is approximately $960 million in funding in the Preliminary Current Capital Plan for the Water for the Future program, which consists of $570 million for the by-pass tunnel and repairs and $390 million in water supply augmentation projects (when the Delaware Aqueduct is not in service for by-pass connection). Engineering studies conducted during the progression of the project development have identified program improvements that will result in shorter shutdown periods and less required water supply augmentation which has reduced the overall program cost.

Since the early 1990s, NYCDEP has closely monitored the Rondout-West Branch (RWB) Tunnel portion of the Delaware Aqueduct that has shown evidence of deterioration (water leaks) due to the geology in that area. NYCDEP has a series of tunnel leak investigations including geological investigations, tunnel flow monitoring, well monitoring, surface expression monitoring, automated underwater vehicle (AUV) investigations, and a series of dives and investigations at Shaft #6. NYCDEP plans to perform another AUV investigation in the spring of 2014 to continue to monitor the conditions in the tunnel. After evaluating several repair alternatives, NYCDEP decided on a comprehensive plan to build a two and a half mile bypass tunnel around the leaking (deteriorated) section in the area of Roseton, NY and to perform repairs of the concrete liner in upstream areas near Wawarsing, NY. In 2013, NYCDEP began construction of two new shafts, Shaft 5B (in the Town of Newburgh) and Shaft 6B (in the Town of Wappinger) which is required for the construction of the bypass tunnel. The bypass tunnel design is between 60% and 90% complete. NYCDEP's schedule for the repair consists of beginning tunnel construction in 2015. In late 2021, the connection of the bypass tunnel with the existing aqueduct is planned. This connection will require taking the Delaware Aqueduct out of service and dewatering the aqueduct. NYCDEP is also evaluating the effectiveness of lime addition to seal the cracks from within the tunnel. The chemical addition project, which includes building a small-scale water system that replicates full-scale water supply conditions, will help the city better determine if full-scale application of lime will be successful. NYCDEP has conducted emergency planning for the RWB tunnel involving NYC, NYS Office of Emergency Management (OEM) and surrounding County agencies.

The NYCDEP has been evaluating strategies for water supply augmentation to meet the demands of the system when water supply system components are out-of-service, either planned or unplanned. Several projects are funded in the Preliminary Current Capital Plan to provide operational flexibility for NYCDEP to provide safe, reliable additional water supply when the Delaware Aqueduct is shutdown to connect the bypass tunnel to the existing tunnel and to make the other repairs. NYCDEP is currently planning for one shutdown period of approximately five to eight months while the new bypass tunnel is being connected to the existing tunnel. Shutdown of the Delaware Aqueduct is based upon hydrological conditions which the Water for the Future program has evaluated through modeling. NYCDEP is currently planning to implement the following water supply augmentation projects which would be in place before the tunnel is taken out-of-service: conservation measures, optimization of the Catskill Aqueduct to increase its capacity and reactivation of the Queens groundwater system.

In 2013, NYCDEP completed a Water Demand Management Plan that identifies five key strategies for managing water demand, which consists of: the Municipal Water Efficiency Program, the Residential Water Efficiency Program, the Non-Residential Water Efficiency Program, Water Distribution System Optimization and Water Supply Shortage Management. NYCDEP's near term goal is to reduce demand by 50 mgd through these five strategies. NYCDEP anticipates a 5% overall reduction of water consumption citywide by 2020 due to planned water demand management program. NYCDEP is currently in the development phase of an Upstate Water Conservation Program, which will help lower water demand for non-New York City communities consuming city water. Conservation measures such as the replacement of large meters, water meters in city-owned buildings and conservation measures at New York City Housing Authority (NYCHA) is funded at $86.7 million in the Current Capital Plan.

Increasing groundwater supply in Jamaica Bay has been identified as a project to supplement NYC water supplies. Drilling wells and treating groundwater is funded at $84.3 million in the Current Capital Plan. The design for the groundwater wells is underway. The construction contracts for the interconnection of the Delaware Aqueduct with the Catskill Aqueduct at Shaft #4 have initiated, and an additional funding of $353,000 is included in the budget. A project to repair and rehabilitate the Upper Catskill Aqueduct is funded at $146 million in FY 2015. This project includes full inspection, implementation of mechanical and structural upgrades, and removal of the biofilm to increase the capacity to its historical flows. The upgrades at the Croton Falls Pump Station and the Cross River Pump Station provide conveyance flexibility to NYCDEP and would provide the ability for Croton water to be supplied to the Delaware Aqueduct, if required in emergencies.

Catskill/Delaware Water Supply System Filtration Avoidance

NYCDEP continues to operate under the 2007 Filtration Avoidance Determination (FAD) for the Catskill/Delaware systems. The 2007 FAD consists of a watershed protection program for 2007-2017, consisting of two five-year periods. The United States Environmental Protection Agency (USEPA) transferred primacy to the New York State Department of Health (NYSDOH) after the 2007 FAD was issued.

NYCDEP issued the 2011 Long-Term Watershed Protection Plan to the NYSDOH and the USEPA in December 2011 which provided a summary of accomplishments under the FAD and water quality results and it formed the basis of the negotiations for the continuation for the second five years of the current FAD. This report identified the plan and schedule for the second five years of the FAD. The report addressed several FAD programs (such as septic and sewer rehabilitation/replacement program, upstate wastewater treatment upgrade program, stormwater management program, waterfowl management program, land management, watershed agricultural program, and wetlands protection program) which were evaluated to determine the continuation of certain programs for the second five year period. Public comment for the second term of the current FAD ended November 15, 2013. NYCDEP anticipates NYSDOH to release this final FAD in the Spring of 2014. Although the regulators are still finalizing the second term of the FAD, the existing FAD remains in effect and NYCDEP has continued with existing programs. Based upon continued discussion with NYCDEP and NYSDOH, the revisions to the FAD pertain to the flood response in the watersheds due to Tropical Storms Irene and Lee flooding. Additional FAD programs include flood hazard mitigation for the stream management program, a new project for relocating businesses and critical community needs, and the residential flood buy-out program. Funding has been provided for these additional programs. The continuation of new and existing FAD programs is funded in the Preliminary Current Capital Plan at a level of approximately $209 million. An additional $50 million in funding for the continuation of the land acquisition program (LAP) for the FAD will be included in the Executive Plan. Funding for some of the FAD programs will be moved from the capital budget to the expense budget. Additional funding will also be required beyond FY 2017, for the anticipated next FAD program.

USEPA, NYSDEC and NYSDOH have endorsed the operational modifications that NYCDEP proposed for the Schoharie Reservoir and the Ashokan Reservoir with the implementation of an OST model. NYCDEP's OST links water quality and water quantity models, uses near real-time data for reservoir levels, stream flows entering reservoirs, snowpack and water quality in streams and reservoirs, and it includes National Weather service forecasts. NYCDEP has held workshops for technical review of the OST modeling and monitoring system by leading water supply experts, water scientists, academics and engineers. NYCDEP's OST has been rolled out in phases; however, full implementation of OST occurred in January 2014.

NYCDEP is involved in a project with the Water Research Foundation (WRF) regarding the science and cost-effectiveness of source water protection programs, which is directly related to NYCDEP successful FAD programs.

CAT/DEL UV Disinfection Facility

The FAD also includes the construction of a UV Disinfection Facility to treat water from the Catskill and Delaware (CAT/DEL) watersheds. Operations commenced at the UV Facility at the Eastview site late 2012 in advance of the UV Administrative Consent Order milestone. The order also provides a schedule for validation testing of the UV plant. DEP submitted a final validation report in October 2013 to NYSDOH, to ensure compliance with Long-Term 2 Enhanced Surface Water Treatment Rule (LT2). NYCDEP then submitted a revised Re-Validation Report for the UV Facility in January 2014. The change orders for this project are fully funded in the CIP at a level of approximately $27.4 million.

In order to improve redundancy and increase operational flexibility, a section of the Catskill Aqueduct must be pressurized to allow additional water flow to be conveyed from the Kensico Reservoir and be treated at the CAT/DEL UV Facility. The Catskill Aqueduct pressurization project is funded at a level of $40 million for the initial work in the Current Capital Plan. NYCDEP assembled an expert panel to evaluate the pressurization of Catskill Aqueduct options. Additional funding will be required for this project once NYCDEP adopts an option for implementation.

Dam Safety

The full long-term rehabilitation upgrades for the Gilboa Dam are anticipated to bring the dam into a state of good repair and in compliance with the NYSDEC dam safety guidelines. The total rehabilitation is funded at approximately $125 million in the Current Capital Plan, which includes a new low level outlet and rehabilitation of the Shandaken Tunnel intake chamber. The crest gates contract was completed in July 2011, which increased NYCDEP's ability to manage Schoharie Reservoir. Reconstruction of the Gilboa Dam and spillway is 80% complete. The Olive Bridge Dam at Ashokan Reservoir is funded in the Current Capital Plan with $14.5 million for state of good repair funding. An additional $25 million is allocated to Catskill/Delaware dam reconstruction for state of good repair upgrades. NYCDEP recently installed additional monitoring equipment at several dams to enhance the monitoring capacity during and after storms.

In addition to capital programs, BWS maintains an inspection and maintenance program to support dam safety. NYCDEP continues their dam inspection program using engineering contracts and in-house NYCDEP inspectors. NYCDEP operates and maintains a safe dam system based on capital upgrades, inspection and maintenance program, and emergency action plans.

Croton Water Filtration Plant

NYCDEP and contractors began start-up and testing of Croton Water Filtration Plant (WFP) in December 2013. The Croton WFP has a maximum capacity of 290 mgd and is divided into Plant A and Plant B. Plant A start-up and testing was initiated first. Plant B start-up and testing commenced early February 2014, and is currently ongoing. Plant A was also brought back online (mid-February)

to further test the Distributive Control System (DCS) and allow operator time at the controls to gain experience in plant operations. As part of start-up and testing, all process equipment is being used and cycled through, and all chemical systems are on and feeding chemicals, flow pacing is set on automatic. The General Contractor for the Croton Water Filtration Plant is finishing installation of equipment, instrumentation and controls, and the other contract work to meet schedule.

NYCDEP and the regulators have been negotiating the operation of the Croton WFP at full capacity, transmitting Croton water into distribution and the schedule for completion. NYCDEP and the regulators are close to a resolution on revised completion milestones and penalties. The current projected start date for operations to send treated water into distribution is May 2015.

Approximately $105.5 million is included in the CIP for the remaining facilities associated with the Croton WFP, which includes the off-site facilities, the permanent Mosholu Golf Club House and construction change orders. Funding of approximately $22.6 million is included in the CIP for payments to the Parks Department in connection with the Croton WFP. NYCDEP evaluated alternatives to provide standby power for the Croton WFP to increase dependability if there was a major power outage. The additional facilities for standby power are currently not funded in the Croton budget. Standby power is not a requirement for starting-up the Croton WFP.

NYCDEP completed inspection and rehabilitation of the New Croton Aqueduct (NCA) in 2013. A major component of the NCA work was the connection of the Aqueduct to the Croton WFP by installing a plug to redirect flows from Jerome Park Reservoir to the Croton WFP. The NCA is funded with $14.7 million in the Preliminary Current Capital Plan.

City Tunnel No. 3, Stage 2

NYCDEP achieved a significant milestone with the completion and activation of City Tunnel No. 3, Stage 2, Manhattan leg which occurred in October 2013. The activation of the Manhattan leg required very close coordination between the design engineers, contractors and many groups within DEP, including BWS Distribution Water Quality Operations and BWSO. The process included pressure testing, flushing and disinfecting the tunnel and shafts. The new tunnel leg is 8.5 miles long, 10 feet in diameter and has an average depth of 540 feet. It starts from the Shaft 13B valve chamber located under Central Park at 79th Street and feeds south along the west side of Manhattan before forking into two segments at Shaft 26B under 30th Street.

Funding of $48.6 million is included in the Current Capital Plan for City Tunnel No. 3, including completion, activation and shaft work. An additional $152.8 million is included in the budget for trunk water main connections to the City Tunnel No. 3, which is work done by DDC. Construction of two shafts, Shaft 17B and 18B is ongoing and necessary for activation of City Tunnel No. 3, Brooklyn/Queens leg. When complete it will provide a critical redundancy for Tunnel No. 2. On completion of City Tunnel No. 3, NYCDEP will have significantly increased conveyance capacity downstream of Hillview Reservoir. NYCDEP continues to evaluate future planning for the overall coordination of CT#1, CT#2 and CT#3 in order to provide critical redundancy and reliability for water conveyance to NYC.

Hillview Reservoir

The Hillview cover has been required by federal regulations administered by USEPA and an Administrative Consent Order with NYSDOH, which includes a schedule for installation. NYCDEP and USEPA executed a revised Administrative Order in May 2010, which provided an extension of time for construction of the Hillview cover. According to the current order, the site preparation construction contract is required to start by January 31, 2017, construction start for the East Basin cover is required by December 31, 2018, and construction completion of the cover by May 31, 2028. This revised Order also allowed NYCDEP to submit an additional time deferral request. In October

2010, NYCDEP requested an additional six years, due to planned water system projects that would not permit Hillview cover construction simultaneously. In February 2011, NYCDEP received a letter from the United States Department of Justice (USDOJ) indicating that this issue had been referred to them.

In August 2011, USEPA announced that it is reviewing the LT2 requirements for controlling microbial risks, including covering reservoirs, such as Hillview Reservoir. USDOJ and the City have agreed to defer negotiations over revised dates until USEPA completes its review. NYCDEP is currently in compliance with the Administrative Order; however, NYCDEP has notified the regulators that the first few milestones of the current Order will not be met. NYCDEP submitted a proposal to the USEPA in the Spring of 2012, and it is under review. NYCDEP maintains an ongoing dialogue with the regulators regarding a cover avoidance. NYCDEP continues collecting water quality data and providing the data to regulators to support NYCDEP's position that a cover is not warranted.

There is approximately $4 million for design modifications to the Hillview cover in the Current Capital Plan; there is no funding for construction of the Hillview cover. Depending upon the outcome of the USEPA review and the discussions regarding the additional time extension, funding may be required in a future budget planning period.

Funding is included in the Current Capital Plan for state of good repair upgrades planned at Hillview Reservoir. Approximately $51 million is included for the modification of chambers at Hillview Reservoir. An additional $216,000 is included in the budget for the Hillview Chlorination Building to complete chemical delivery improvements and building security. Approximately $2 million is included for seepage control and slope stability for the Hillview Dam.

8.5 Capital Improvement Program Highlights for the Wastewater and Stormwater System

Combined Sewer Overflow (CSO) Program/Green Infrastructure Plan

The 2012 CSO Consent Order Modification incorporates a hybrid approach of green and grey infrastructure control strategies. The modified Consent Order is based upon an adaptive management approach to solving the CSO water quality issues which incorporates the Green Infrastructure (GI) Plan. The CSO Order contains milestones and schedules governing the planning, design and construction of a significant number of projects for NYCDEP's Citywide CSO Program. As required by the Order, NYCDEP will develop ten waterbody-specific Long Term Control Plans (LTCPs) in addition to one citywide LTCP to reduce CSOs and improve water quality in NYC's waterbodies and waterways. The goal of each LTCP is to identify appropriate CSO controls necessary to achieve waterbody-specific water quality standards, consistent with the Federal CSO Policy and the water quality goals of the Clean Water Act (CWA).

Green infrastructure is an approach to wet weather management that is cost-effective, sustainable and environmentally friendly. Several cities across the country have implemented green infrastructure for wet weather management and water quality control issues. The overall goal of NYC's Green Infrastructure Plan, which NYCDEP released in September 2010, is to capture the first inch of rainfall on 10% of the impervious areas in combined sewer watersheds through detention or infiltration over the 20 year horizon. The Green Infrastructure Plan presents a savings of approximately $2.4 billion over twenty years with implementation of green infrastructure compared to the all-grey infrastructure strategy (tanks, tunnels and WWTP expansions). The modified CSO Consent Order calls for $187 million in green infrastructure within four years to meet the first milestone by December 31, 2015, which is capturing the equivalent of stormwater generated by one-inch of precipitation on 1.5% of impervious areas citywide. The NYCDEP is currently on track to meet this first milestone with the installation of several thousand effective right of way (ROW) bioswales throughout the City. Standard designs have been approved for the ROW bioswales. NYCDEP will release its Green Infrastructure Annual Report in April 2014. By June 30, 2016, NYCDEP is required to develop and submit to

NYSDEC CSO performance metric. Implementation of this plan requires significant coordination among several city agencies and this effort is ongoing with the Green Infrastructure Task Force. In collaboration with other city agencies NYCDEP has built several demonstration projects for a variety of land uses, such as blue roofs/green roofs, porous pavement, tree pits, street side swales, green streets, constructed wetlands, and rain barrels. In August 2014, NYCDEP is required to submit a post construction monitoring report for the three GI demonstration areas – Hutchinson, 26th Ward and Newtown Creek. The Green Infrastructure Grant Program will continue in 2014 for green infrastructure projects such as right of way bioswales, blue roofs, green roofs and porous pavement on private property and in sidewalks in combined sewered areas.

The Alley Creek LTCP was submitted to NYSDEC in July 2013, and then a revised Alley Creek LTCP was submitted in November 2013. In December 2013, NYSDEC disapproved the LTCP for Alley Creek. In February 2014 NYCDEP filed an Article 78 to petition the NYSDEC determination of disapproval. Along with filing the Article 78, NYCDEP continues to try to resolve disagreements on the Alley Creek LTCP with NYSDEC. NYCDEP is proceeding with the remaining ten LTCPs, as they have staggered submittal dates over the next few years, through June 2017.

The Current Capital Plan includes approximately $488 million is funded for green infrastructure and approximately $192 million is included for grey infrastructure for a combined funding of $680 million in capital projects for implementation of the CSO Program. Additional funding will be required in the Ten Year Plan or beyond the planning cycle depending upon the outcome of the LTCPs.

NYCDEP has implemented a CSO monitoring pilot program, with the installation of remote sensors that monitor combined sewer overflows in real time at five CSO outfall locations. The pilot objectives are to better understand the effects of combined sewer overflows and improve the public notification system for CSOs.

Cogeneration Facility at North River WWTP

A project for a Cogeneration Facility at North River WWTP was developed as a sustainability project to meet the needs of PlaNYC GHG emissions and achieving a SOGR to replace the main sewage pumps and engine blowers that are near the end of their useful life. The North River WWTP Cogeneration Facility is funded in the Current Capital Plan at a level of $181.4 million. This project is made up of several smaller projects, which are in different stages of design. Additional funding of $36 million is available from PlaNYC for the design and construction of this project. This project consists of replacing the main sewage pump drives, the aeration blowers, and the aeration blower drives. The new cogeneration facilities will provide new gas driven engines and generators which will electrically drive the main sewage pumps and the nine high speed turbo aeration blowers. The project is currently in various stages of design. Upon further completion of the design, all major facility improvements will be fully defined so that the capital improvement budget requirements can be fully confirmed. Updated project costs will be included in the Executive Budget. When completed, the cogeneration will provide all the electrical and heat energy necessary to operate the North River WTP.

Citywide Nitrogen Removal Program

The Upper East River WWTPs (Hunts Point, Bowery Bay, Tallman Island, and Wards Island WWTPs) and the 26th Ward WWTP have been undergoing BNR upgrades as required by the Nitrogen Consent Judgment for the Phase I Facility Plan. Bowery Bay WWTP completed construction for the Phase I nitrogen removal upgrades and started operation of biological nitrogen removal in June 2012. Hunts Point WWTP completed construction in the Summer of 2010. Wards Island WWTP completed construction and started operation in March 2013. The Tallman Island WWTP nitrogen upgrade has had a series of delays and is still under construction for BNR upgrades. NYCDEP continues to work

with the regulators for revisions to the Nitrogen Consent Judgment due to the Tallman Island WWTP delays.

26th Ward WWTP completed construction for the Phase I nitrogen removal upgrades and started operation of biological nitrogen removal in December 2010. NYCDEP and NYSDEC entered into an agreement to upgrade the Jamaica WWTP to reduce nitrogen discharges. A Stipulation and Order Modifying the Nitrogen Consent Judgment became effective October 2009, which added nitrogen removal upgrades at the Jamaica WWTP. NYCDEP, NYSDEC and Natural Resources Defense Council (NRDC) have entered into a Jamaica Bay Agreement which addresses nitrogen removal upgrades at Rockaway WWTP and Coney Island WWTP, construction milestones for the Jamaica Bay WWTPs interim nitrogen effluent limits for Jamaica Bay and the funding of an environmental benefits project for the saltwater marsh restoration in Jamaica Bay. Funding is currently included in the CIP for the nitrogen removal upgrades at Coney Island at a level of $31.5 million and Rockaway WWTP at a level of $22.5 million for each plant in the CIP. NYCDEP is evaluating alternatives for future use and operations at the Rockaway WWTP facility.

Glycerol has been selected as the supplemental carbon source for additional nitrogen removals. In accordance with the Nitrogen Consent Judgment, NYCDEP submitted a Basis of Design Report (BODR) for the Phase II BNR upgrades to NYSDEC in June 2011. NYSDEC issued comments to the report and upon addressing the comments, NYCDEP submitted the final BODR to NYSDEC in December 2011. The carbon addition for Hunts Point WWTP is required by August 2014 and funding of approximately $1.6 million for construction is included in FY 2014. Additional funding of $74.3 million is included in the CIP for construction of supplemental carbon facilities for the remaining UER WWTPs (Bowery Bay, Tallman Island and Wards Island WWTPs) and Jamaica Bay WWTPs (26TH Ward and Jamaica WWTPs) that require carbon addition for Phase II BNR. Construction completion for these carbon facilities is required by July 2016.

Newtown Creek WWTP Upgrade Program

In May 2011, NYCDEP certified that the Newtown Creek WWTP meets the effluent discharge requirements of the Clean Water Act, well in advance of the Consent Judgment milestone of May 2013. NYCDEP was unable to meet a construction milestone in September 2012 due to problems with faulty Main Sewage Pumps (MSP) installed as part of the contract. NYCDEP provided a notice of *force majeure* to NYSDEC since it was determined that the failures were due to errors in pump design and manufacture. NYCDEP and NYSDEC have negotiated a new milestone of March 31, 2014.

Total Residual Chlorine (TRC)

The State Permit Discharge Elimination System (SPDES) permits for each of the fourteen WWTPs calls for an interim effluent limit for total residual chlorine of 2.0 mg/l. This interim limit will stay in effect until construction completion of facilities required to achieve compliance with the final water quality based effluent limits. The SPDES permits also include a schedule of compliance for each plant to make improvements to further reduce residual chlorine. The final effluent limit has not yet been determined by NYSDEC. In May 2011, due to a number of issues NYCDEP submitted a proposal for permit modification to the TRC compliance schedule requesting additional time to complete these projects. NYSDEC issued an Administrative Complaint due to missed milestones. NYCDEP responded to the Administrative Complaint in January 2014. NYCDEP is continuing to work with NYSDEC on resolution of this matter. The draft SPDES released in June 2013 by NYSDEC included more stringent TRC limits at the plants that could result in more costly projects to achieve the TRC limits. NYCDEP provided extensive comments on the draft SPDES permit including concerns with the TRC limits in the permits.

There is $44.5 million in the Current Capital Plan for the TRC program. Additional funding is required beyond FY 2017 in the Ten Year Plan for continued implementation of the TRC Program.

Rockaway WWTP

Due to several factors including low wastewater flows at the Rockaway WWTP along with the Hurricane Sandy impacts to the plant, NYCDEP is currently evaluating alternatives for future operation of the Rockaway WWTP. This analysis will determine upgrades necessary at Rockaway WWTP, either rebuilding the plant or pumping the current flows to another NYC WWTP. A preliminary report is expected to be completed in April 2014. Funding has not yet been identified for this project.

Bluebelts

NYCDEP has been developing Bluebelt sites in Staten Island since the 1990s. Bluebelts are an innovative stormwater drainage system made up of manmade and natural wetlands, streams and ponds. NYCDEP has expanded the program to park property sites in Queens and the Bronx, and plans to build additional Bluebelts in the Mid-Island region of Staten Island. Approximately $284 million is included in the Current Capital Plan to expand the Bluebelts for stormwater management.

8.6 Potential Water and Wastewater Projects Beyond Current Capital Plan

Kensico-City Tunnel (KCT)

Due to other priority needs of the water conveyance system, KCT is not in the NYCDEP current financial planning period and therefore, there is no funding included in the CIP. The proposed tunnel would extend from the Kensico Reservoir to the interconnecting valve chamber of Tunnel 3, Stage I, south of Hillview Reservoir. Preliminary KCT construction costs are estimated between $4 and $6 billion, depending upon specific routing, shaft locations and connections.

Nitrogen Removal in the Harbor Estuary

The New York/New Jersey Harbor Estuary Program (HEP) is a National Estuary Program that has been sanctioned by the USEPA to restore the waters of the Lower Harbor Estuary and the tidally influenced portions of all rivers and streams that empty into the Estuary. The HEP was convened as a partnership of federal, state, and local governments; scientists; civic and environmental advocates; the fishing community; business and labor leaders; and educators (called the Management Conference). NYCDEP submitted a report to USEPA in 2007 last year that evaluated the capital investment cost of upgrading four WWTPs (Owls Head WWTP, Red Hook WWTP, North River WWTP, and Port Richmond WWTP) to provide nitrogen and carbon removal at four different levels of treatment. The water quality impacts on the Harbor Estuary are now being evaluated by USEPA for the various levels of treatment. Through this methodology, it is expected that USEPA and the Management Conference will determine which treatment upgrades, if any, will be required for NYC. Funding is currently not in the Capital Plan for HEP-related upgrades. Upon completion of the HEP studies and based upon negotiations with USEPA, funding may be required in a later planning period.

9.0 PERFORMANCE OVERVIEW

Water Conservation

Figure 4 presents the annual water demand for the last 20 years. Water conservation measures taken by NYCDEP in the 1990s have resulted in a steady reduction in the overall water demand. More recent declines in water consumption have been noted most likely due to conservation measures, metering, economic downturn and weather patterns.

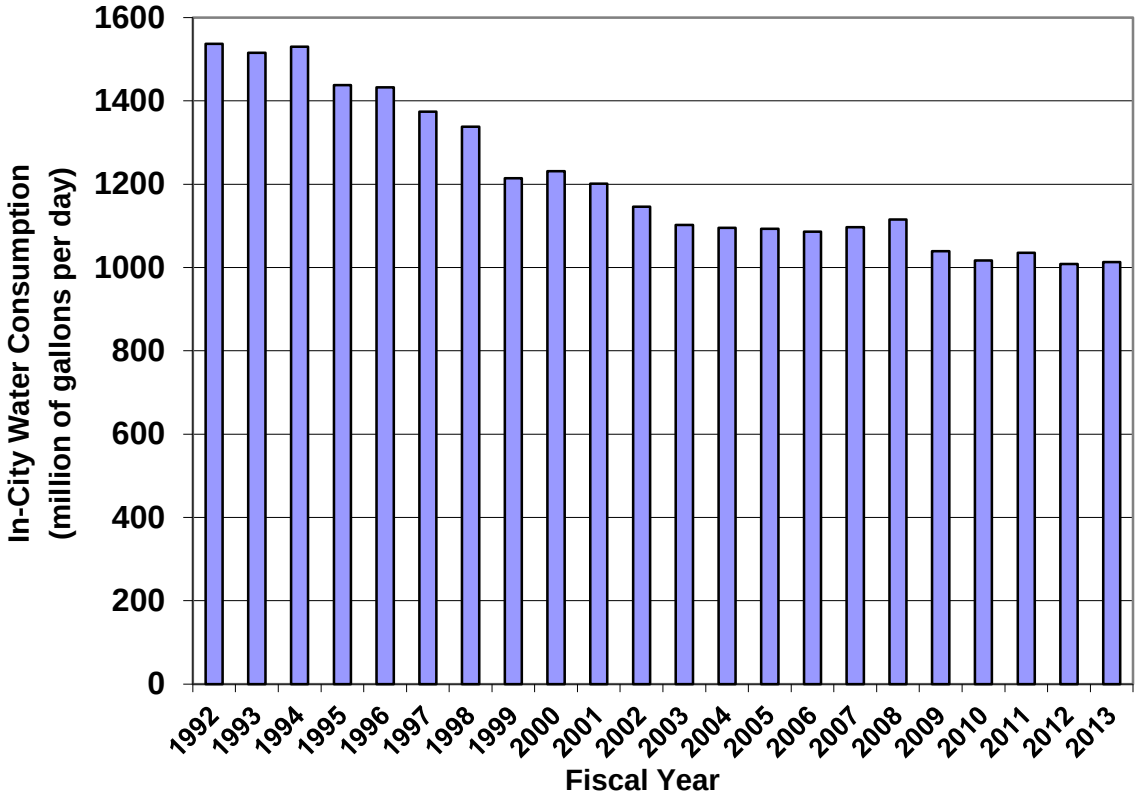
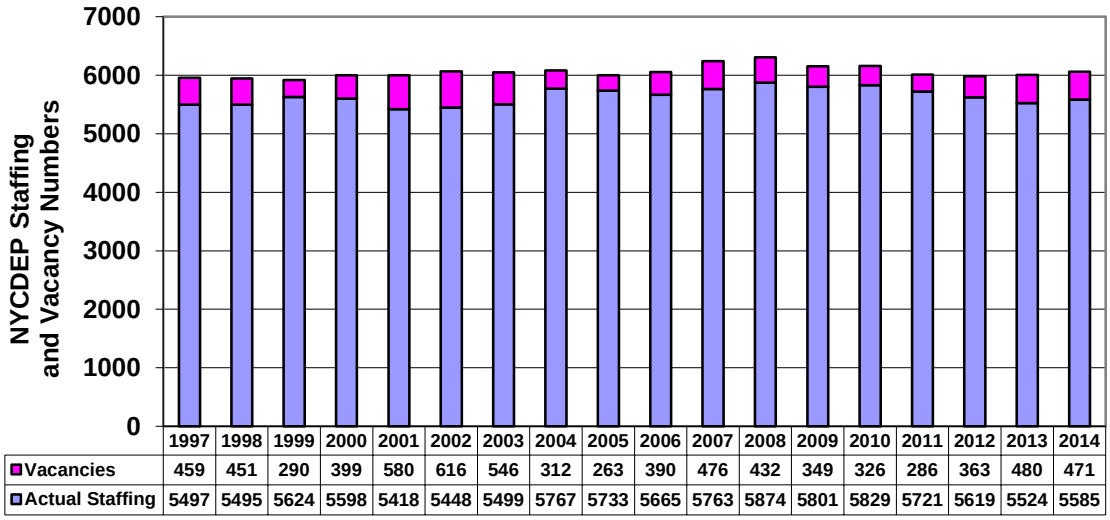


Figure 4: New York City Average Daily Water Demand in Million Gallons per Day (mgd)

System Staffing Levels

Approved positions for the System presently stand at 6,056 for FY 2014 and vacancies currently stand at 471. This reflects an increase in budgeted headcount and a decrease in vacancies compared to FY 2013, as shown in Figure 5. Additional staff have been employed to operate and maintain new facilities, to fill open position or replace staff that has left NYCDEP (primarily due to retirement).

Successful improvements for the recruitment and personnel procurement process have occurred with the creation of Organizational Development position within NYCDEP's management. NYCDEP has seen improvements in attracting highly skilled and qualified staff. NYCDEP Organizational Development is also developing and implementing succession planning.



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Vacancies	459	451	290	399	580	616	546	312	263	390	476	432	349	326	286	363	480	471
Actual Staffing	5497	5495	5624	5598	5418	5448	5499	5767	5733	5665	5763	5874	5801	5829	5721	5619	5524	5585

Figure 5: NYCDEP – Staffing and Vacancy Levels 1997-2014

Operational Performance Indicators

There are many operational parameters that can be reviewed to assess the effectiveness of operating programs. NYCDEP continues to use H2OStat metrics to improve operational efficiencies, drive performance management and increase accountability across the agency. Since the inception of the H2OStat program, NYCDEP continues to experience positive results with improved performance. Several performance indicators for water and sewer operations are summarized below.

There were 403 water main breaks reported in FY 2013, which reflects a slight increase from last year but a decrease in reported water main breaks compared to the previous several years (see Figure 6). This decrease can be a function of NYCDEP operations on regulators maintenance and pressure management in the distribution system, as well as additional training at the new BWSO training facility. NYCDEP has expanded its preventative maintenance program to target pressure reducing valves by exercising valves and inspecting regulators to help prevent the occurrence of water main break, costly repairs, leaks and disruption of service. On average, NYCDEP restored water to residents within 4.4 hours after confirming the break, which is less than the previous four years. In FY 2013, the number of NYC water main breaks per 100 miles of mains is 5.8. The range of water main breaks that NYC has recently experienced is below that of other municipalities in the United States.

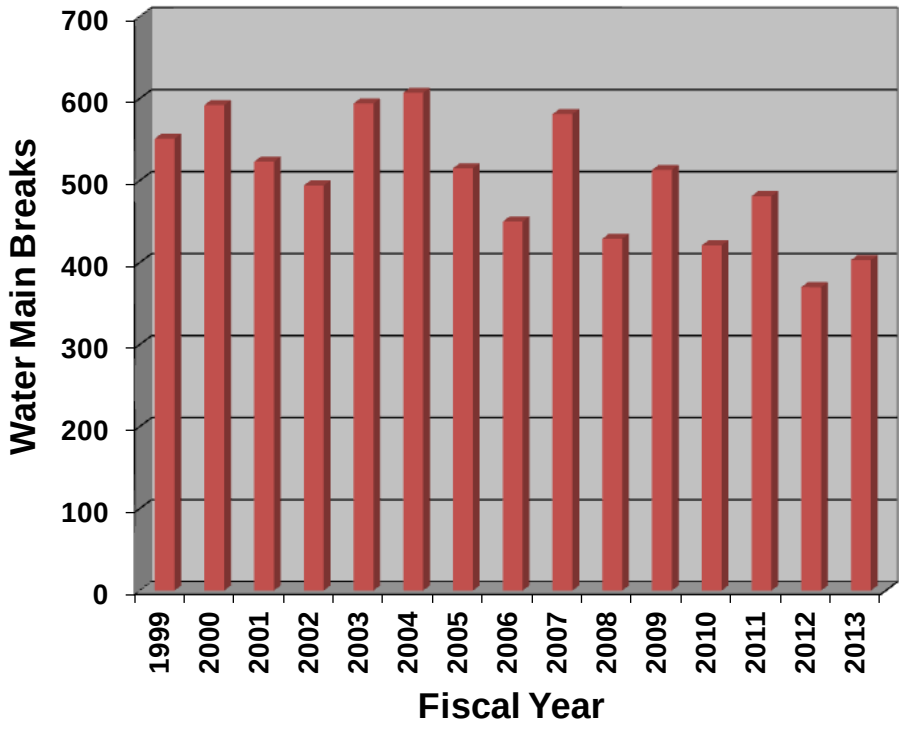


Figure 6: Total NYCDEP Water Main Breaks per Fiscal Year

Approximately 31% of total fire hydrants were broken and inoperative in FY 2013, less than previous years. The average time to repair or replace high priority broken or inoperative hydrants (as determined by the Fire Department) by NYCDEP was 2.7 days in FY 2013, which is less than the previous few years. Approximately 30% of catch basins were surveyed and inspected in FY 2013, which is slightly less than the target that NYCDEP had established. The total number of catch basins that were cleaned by NYCDEP in FY 2013 is 31,097.

As shown in Figure 7 Sewer backup (SBU) complaints received by NYCDEP in FY 2013 were 14,911, which reflects a significant decrease from 2009 levels. Response time for SBUs was 4.4 hours on average, which is lower than the past several years and well below the target of 7 hours. In addition, DEP launched a pilot to evaluate sewer manhole sensors. The sensors measure the elevation of wastewater in the sewer and transmit that information to NYCDEP's computer systems wirelessly. This technology will assist NYCDEP in preventing SBUs by quickly dispatching crews and fixing the problem. NYCDEP has found that approximately 60% of confirmed sewer backups can be attributed to fats, oils and grease (FOG) buildup in the sewers. NYCDEP has continued to implement and expand aggressive operational and public outreach initiatives to address this problem.

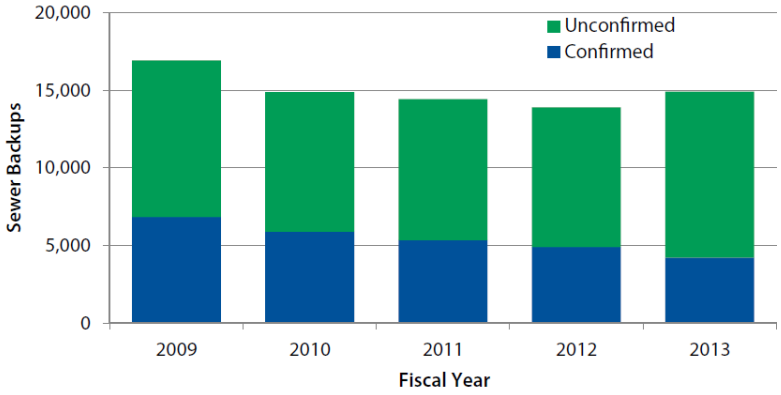


Figure 7: Sewer Backup (SBU) Complaints

The second annual State of Sewers report was issued by NYCDEP BWSO in December 2013, which provides a comprehensive update of innovative programs NYCDEP has implemented and a summary of key performance indicators for sewer maintenance. NYCDEP uses a data-driven risk management approach to operate and maintain the sewer system, targeting specific locations with reoccurring problems. A group within BWSO addresses the Capacity, Management, Operations, and Maintenance (CMOM) program and related issues with specific Standard Operating Procedures (SOPs) in place. The Sewer Operations and Analysis Program (SOAP) at NYCDEP allows for a more proactive rather than reactive approach. This group analyzes areas with reoccurring problems to determine the cause of the problem and then determines a remediation plan (degreasing, cleaning, repair, replacement). BWSO's top priority remains their core work which consists of televising of sewers, sewer cleaning, catch basin reconstruction and cleaning, hydrant repair, installation of new water mains. NYCDEP BWSO continues training with the hands-on water and sewer training facility with a full-scale model street including sewer, catch basins and hydrants. This facility continues to be used for new staff to train water repair, sewer repair, water maintenance and sewer maintenance, as well as continuing education and further training for existing staff.

Operational and Maintenance Program Significant Accomplishments

UV Operations. Operation of the Cat/Del UV Facility initiated in December 2012 with the collaborative effort of NYCDEP staff, contractors, consultants. NYCDEP BWS Operations staff successfully took over 100% control of the facility on June 15, 2013. This marked the end of the commissioning period. The facility is operated and maintained with approximately 52 NYCDEP BWS staff. The UV facility is the largest UV water disinfection facility in the world and consists of fifty-six 40 mgd UV disinfection units. It is currently receiving all Cat Del waters and it is designed to disinfect 2.4 billion gallons per day. NYCDEP is required to provide a monthly water supply operations and treatment report for the UV Facility to USEPA, NYSDOH and New York City Department of Health and Mental Hygiene (DOHMH).

Operational Excellence. Operational Excellence, also known as OpX, continues to find efficiencies in overall NYCDEP operations and maintenance that provides recurring cost savings to the NYCDEP. This program addresses all aspects of O&M, such as procurement, chemical usage, fleet management, energy usage, staffing/organizational changes and plant operations. It was initiated by NYCDEP in November 2011 and it will be implemented in two phases over the next four years. Phase 1 report, issued in June 2012, summarized the six-month diagnostic phase involving all aspects of NYCDEP operations. Phase 2 consists of the implementation phase over a four year period. A total of $59 million in annualized savings have been implemented based upon the of OpX program.

Drinking Water Quality. NYCDEP conducts significant monitoring of the source water and in-city water quality. In calendar year 2012, NYCDEP collected more than 30,200 samples from the in-city distribution system and performed approximately 355,700 analyses, meeting all state and federal monitoring requirements. In addition, NYCDEP collected 19,929 samples and performed 223,813 analyses from the upstate watersheds. Microbiologists, chemists and other scientists with the BWS test water from key locations across the watershed and the City at five laboratories in Brewster, Grahamsville, Kensico, Kingston and Queens. The 2013 Annual Water Supply and Quality Report will be available at the end of May 2014.

Harbor Water Quality. NYC has been collecting and record keeping water quality data for over 100 years. The New York Harbor Water Quality Survey currently consists of 72 sampling station harborwide. The number of water quality parameters measured has also increased from five in 1909 to over 20 at present. NYCDEP will increase the number of monitoring sites throughout the harbor and at the mouth of key tributaries to 85 sites in order to assess the effectiveness of the Green Infrastructure Plan.

The water quality in the harbor has continued to improve as a result of the maintenance and operation of the wastewater treatment plants and the combined sewer overflow floatables program. Figures 8 and 9 below demonstrate the improvements in water quality over the past 35 years as indicated by the increased dissolved oxygen concentrations and reduced Fecal Coliform counts. The current information indicates that the harbor waters have achieved the standard set for fishable and swimmable quality.

The percentage of wastewater treatment plant effluent that met federal standards in FY 2013 was 99.5 %.

Permit Updates. NYSDEC issued draft SPDES permits to the 14 WWTPs for public review on June 26, 2013. NYCDEP provided extensive comments on October 3, 2013 addressing several significant issues that NYCDEP has with the draft SPDES permits.

NYSDEC issued a draft municipal separate storm sewer system (MS4) permit for NYC for public review and comment on February 5, 2014. Public comment period has been extended until April 2014. A portion of New York City has separate sanitary sewer systems. Until now the provisions for separate sanitary sewers were included in the SPDES permits; however, NYSDEC has decided to issue a new citywide MS4 permit to NYC. NYC is the permit holder since the MS4 requirements covers many City agencies. However, NYCDEP coordinates all required activities under the permit. In October 2013, an Executive Order was signed addressing coordination and implementation of stormwater controls and MS4 permit requirements for NYCDEP and other NYC agencies. The MS4 permit requires the NYC to submit a Stormwater Management Program (SWMP) Plan within three years of the effective date of the permit. Among other requirements, NYC must also submit a fiscal analysis of the capital, operating and maintenance costs necessary to meet the requirements of the permit within three years.

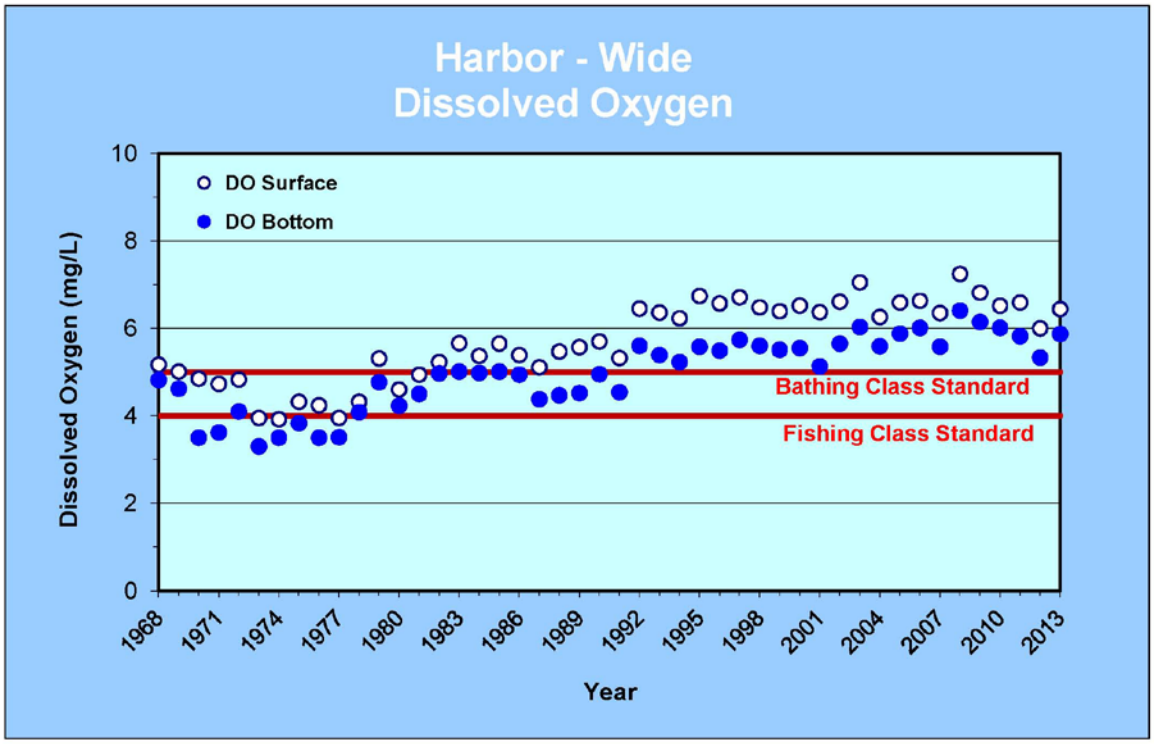


Figure 8: Dissolved Oxygen for Harbor Survey Key Stations (1968-2013)

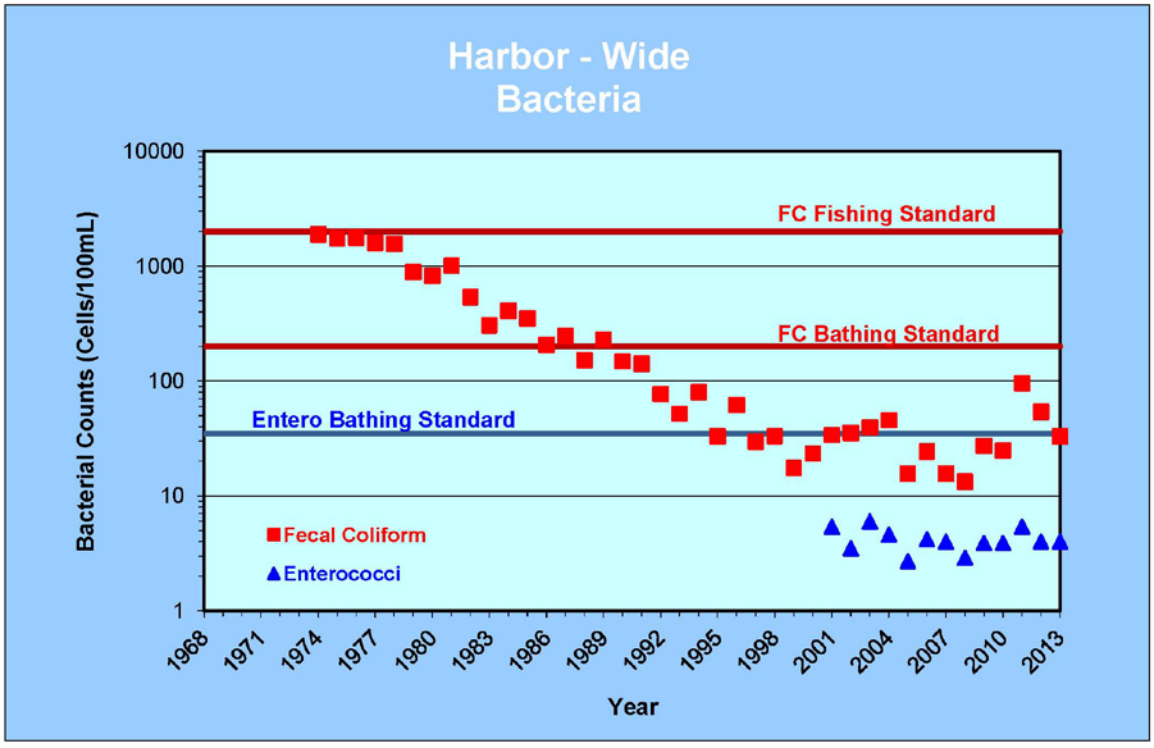


Figure 9: Fecal Coliform Counts for Harbor Survey Key Stations (1974-2013)

Sludge Vessels. In 2014, NYCDEP will be commissioning a new sludge vessel, the Motor Vessel Hunts Point. The M/V Hunts Point will join the fleet of sludge vessels.

Environmental Health & Safety (EH&S). NYCDEP continues to maintain a robust and comprehensive EH&S program across all bureaus throughout the NYCDEP. NYCDEP provide consistent EH&S training so that staff can carry out their work responsibilities safely and in compliance with the many local, state and federal regulations.

Operations and Maintenance Program Summary

Staffing levels for the System, when combined with capital and operating programs are sufficient to provide for adequate operation of the current System. NYCDEP has continued to increase staff and/or redirect staff for the CAT/DEL treatment facilities and the future operations for the Croton WFP. BWS is managing and operating the Cat/Del UV facility. BWSO will manage/operate the Croton treatment facility when it comes on-line and when commissioning is complete.

The operating bureaus continue to evaluate and find effective means to operate more efficiently with reduced expense budgets projections for FY 2014 without impacting the overall operation and maintenance (O&M) of the System. NYCDEP has implemented alternative chemical procurement opportunities and reduction of nonessential expense items without impacting the system-wide water supply, water distribution and wastewater treatment processes. NYCDEP and the OpX contract will continue to evaluate reductions in the O&M expense budget for without impacting the integrity of their operations.

10.0 OTHER NOTEWORTHY ISSUES AND COMMENTS

Fire at the North River Wastewater Treatment Plant

As a result of the fire in the engine room at the North River WWTP in July 2011, NYSDEC issued a Notice of Violation (NOV) to the NYCDEP due to the bypass during the plant shutdown. NYCDEP requested a withdrawal of the NOV and NYSDEC denied the withdrawal. On July 15, 2013, a brief power failure at North River WWTP caused a discharge of untreated wastewater to the Hudson River. NYCDEP and NYSDEC continue discussing these North River WWTP events and the NOV.

Natural Gas Exploration

In 2011, NYSDEC proposed a ban on high-volume hydrofracking (HVHF) within the watersheds of unfiltered water supplies in New York State, which includes the NYC Catskill/Delaware watershed and a 4,000 foot buffer around the watershed. NYSDEC issued a Revised Draft Supplemental Generic Environmental Impact Statement (RDSGEIS) on the Oil, Gas and Solution Mining Regulatory Program in September 2011. NYCDEP hired a geophysical expert consultant to study the impacts to microseismic events caused by natural gas drilling. NYCDEP issued significant comments to the RDSGEIS on January 11, 2012. The main concern pertains to risks and the potential consequences of impacts from high volume hydrofracking near NYCDEP infrastructure that are located outside the watershed. The comments include a hybrid approach to infrastructure protection through buffer zones. In addition, NYCDEP requested that the Final Supplemental Generic Environmental Impact Statement (SGEIS) commit to further environmental review for low volume hydrofracking (LVHF).

In September 2012, the NYS Department of Health was asked to assess the SGEIS health impact analysis. NYSDEC released revised high volume hydraulic fracturing (HVHF) regulations on November 29, 2012. NYCDEP submitted comments to NYSDEC on January 7, 2013 addressing the continued concern for the protection of NYCDEP's infrastructure located outside the watershed

boundaries, concern regarding LVHF not being addressed in the SGEIS and the inclusion of rigorous seismic monitoring into the regulations.

The NYSDOH has not completed the review on health impacts due to hydrofracking by the required February 2013 date; therefore, the SGEIS cannot be issued. Due to these delays, the SGEIS will be required to undergo an additional public comment period when completed. NYSDEC has indicated that no permits will be issued to drilling companies for hydrofracking in 2014. New York City continues to diligently monitor this issue and its impact on the upstate water system.

Newtown Creek and Gowanus Creek Superfund Designations

In March 2010, the Gowanus Canal was declared a Superfund site and in September 2010, Newtown Creek was declared a Superfund site. USEPA has notified NYC that they are considered a potential responsible party (PRP) for hazardous waste under Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) for both Superfund sites.

On September 30, 2013, USEPA issued its Record of Decision (ROD) for the Gowanus Canal, establishing the dredging, capping and source control requirements. The ROD requires NYC to build two costly CSO retention tanks as part of the source control component due to the CSO contribution at Gowanus Canal. NYC and USEPA are in negotiations regarding design work set out by the ROD. NYCDEP has been communicating with USEPA the need for strong coordination between the ongoing CSO Program and the Superfund work. NYCDEP has proposed a multi-faceted approach which consists of a siting study for the USEPA proposed CSO tanks, continued coordination with the CSO program and continued re-evaluation of the technical basis of the Superfund approach. In December 2013 NYCDEP completed and reactivated the Gowanus Canal Flushing Tunnel to directly improve water quality and circulation within the canal.

NYCDEP has entered into an Administrative Settlement Agreement and Order on Consent with EPA, along with five other potential responsible parties that own or operate facilities adjacent to Newtown Creek in the investigation of conditions in Newtown Creek and the evaluation of feasible remedies. The Remedial Investigation/Feasibility Study (RI/FS) is ongoing. The cost for the investigation is approximately $32 million, of which the City is responsible for a portion of this cost. The RI/FS is expected to take approximately seven years. The settlement does not cover any remedy that may ultimately be chosen by USEPA to address the contamination identified as a result of the investigation and evaluation.

There are future potential financial impacts to NYC for both Superfund sites; however, the extent to which NYC will be responsible has not yet been determined.

Ashokan Consent Order

The Ashokan Consent Order between NYCDEP and NYSDEC became effective October 2013. This Consent Order addresses operation of the Ashokan Reservoir, Ashokan Release Channel and issues related to the Lower Esopus Creek. The Order includes revised Interim Release Protocols for the Ashokan Reservoir and a schedule of compliance. NYCDEP is in full compliance with the Order.

Awards

NYCDEP was awarded the 2013 "Wendell R. LaDue Utility Safety Award" from the American Water Works Association (AWWA). The award recognizes large utilities that have established health program best practices and maintained a top safety record over the previous five years. NYCDEP was recognized due to the strength of its Department-wide EH&S program.

NYCDEP received the 2013 "Exemplary Source Water Protection Award" from AWWA for water quality protection in the upstate watersheds through the many ongoing programs such as land acquisition, stormwater and wastewater improvements in the upstate watersheds to provide source water protection.

American Council of Engineering Companies (ACEC) awarded the Cat/Del UV Facility the Engineering Excellence Grand Award in 2013. ACEC of New York awarded the NYCDEP Nitrogen Reduction program the Engineering Excellence Empire Award in 2013.

11.0 SUMMARY AND CONCLUSIONS

Regarding System Management

In our opinion, the System continues to be managed in a professional and prudent manner with an appropriate regard for the level of service afforded to the users.

Regarding the Capital Improvement Program (CIP)

Projects that are not fully funded in the Current Capital Plan:

- *Climate Change Resiliency, Energy Efficiency, Sustainability Projects*: NYCDEP is evaluating other funding mechanisms for climate change resiliency and energy efficiency projects. There will be a need in the future for additional NYCDEP funding to pursue these projects. It might be an incremental cost added to some state of good repair projects or entirely new needs projects. Additional funding may be further identified in the next budgeting cycle.

Additional increases in funding may be necessary in the future, depending upon the outcome of ongoing evaluations and/or negotiations with regulators. The most notable projects are:

- *CSO Program*: NYCDEP will submit several LTCPs in the next few years. Depending upon the outcome of those studies, NYCDEP may be required to construct additional capital projects for the CSO program that are currently not identified in the CIP.

- *Hillview Reservoir Cover*: The cost of completely covering the Hillview Reservoir using a fixed concrete cover is currently estimated at approximately $1.6 billion; there is no funding for construction in the Current Capital Plan. The outcome of the federal review of LT2, which may take a few years, will impact the need to cover the Hillview Reservoir, and additional funding may be required.

Regarding the Physical Condition of the System

In our opinion, the NYCDEP facilities and infrastructure are in adequate condition and are similar to water and wastewater assets in other urban areas nationwide. As indicated, an Asset Management program is being utilized by NYCDEP that better identifies the needs and costs for infrastructure upgrades. These needs will have to continue to be addressed and implemented as they are identified. NYCDEP is taking a proactive approach prioritizing their needs and spending money (capital investment and operating expenses) where it will have the greatest impact to the water and wastewater system and water quality. NYCDEP has started to move from the planning stage to implementation phase of climate change adaptations based upon sound cost-effective analysis and this process will need to continue. Prioritization of greatest need is a significant factor in moving forward with implementation of climate change resiliency. Because of the extensive nature of the NYCDEP facilities, continued diligence and future capital improvements will be necessary.