New York City Water Board

Report on the Cost of Supplying Water to Upstate Customers for the 2017 Rate Year

Draft of May 2, 2016

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To the Members of the New York City Water Board:

The Amawalk Consulting Group LLC is pleased to submit its Report on the cost of supplying water to upstate customers of the Water System of the City of New York (the "City"). The Report presents our findings on the cost of service and identifies the unit rate for Fiscal Year 2017 that is necessary to recover the anticipated cost of water supply service.

The Report presents the actual cost of water supply service for Fiscal Years 2013 through 2015. The methodology used to develop the cost of service for these years is consistent with that used in previous years. In addition, the anticipated cost of service is presented for Fiscal Years 2016 through 2020 (the "Projection Period").

The Report shows that the cost of water supply service will increase during the Projection Period. The increase is primarily attributable to rising operating expenses, including the property taxes levied on watershed properties, together with capital investments in water supply infrastructure. Significant investments have been made in the Water System in recent years to protect the quality of the water supply, to enhance the integrity of the System, and to achieve other water supply objectives. Additional capital investments will be made during the Projection Period. In addition to the projected increases in the cost of service, the unit rate for water supply service is impacted by historical declines in both upstate and in-City consumption and the expectation that System-wide water consumption will continue to decline over the long-term.

We appreciate the opportunity to be of assistance to the Water Board and would be pleased to answer any questions you may have regarding the study methodology or findings. We also wish to acknowledge the assistance provided by representatives of the Office of Management and Budget, the Department of Environmental Protection and the Law Department of the City, as well as the New York City Water Board and the New York City Municipal Water Finance Authority in the preparation of this Report.

Should you have any questions or comments, please do not hesitate to contact the undersigned at (212) 361-0050.

Very truly yours,

Edward J. Markus
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1.0 Introduction

1.1 Purpose

The purpose of this Report is to summarize the results of the study performed by the Amawalk Consulting Group LLC ("Amawalk") of the cost of providing water supply service to communities north of New York City (hereinafter, "the City"). The Report presents the proposed regulated rate for Fiscal Year 2017 to recover the cost of service. The Report also presents the calculated cost of service and rates for Fiscal Years 2013 through 2015; the anticipated cost of service and rate for 2016, the current year; and the projected cost of service and rates for 2018 through 2020. The proposed regulated rate for Fiscal Year 2017 is $1,750.52 per million gallons ("MG"), which represents an increase of $21.53 per MG from the current Fiscal Year 2016 unit rate of $1,728.99, or a 1.25% increase.

1.2 Scope

The Report presents the findings of Amawalk regarding the revenue requirements for water supply service as well as water consumption by customers and a unit rate for calculating charges to upstate customers. The revenue requirements take into consideration the operation and maintenance expenses, principal and interest on bonds, and other financial needs related to facilities north of the City. The Fiscal Year 2017 cost of service and unit rate are based, in part, on the calculated cost of service for the current fiscal year and prior years, which is presented herein. All years referred to in the Report reflect the fiscal year of the City that begins July 1 and ends June 30.

Amawalk has reviewed, to the extent practicable, the books, records, financial reports, and statistical data of the City, the New York City Water Board (the "Board"), and the New York City Municipal Water Finance Authority (the "Authority"), and it has conducted such other investigations and analyses as deemed necessary to assemble and analyze the cost of water supply service and rates. We have performed various financial tests and analyses necessary to support our findings and conclusions.

In analyzing the projection of future operations summarized in this Report, Amawalk has reviewed certain assumptions with respect to conditions, events, and circumstances, which may occur in the future. We believe that these assumptions are reasonable and attainable, although actual results may differ from those in the forecast as influenced by the conditions, events, and circumstances, which actually occur.

1.3 Background

The City, through its Department of Environmental Protection ("DEP"), is responsible for operating and maintaining dependable sources of water supply and providing drinking water to certain communities north of the City and to in-City consumers. DEP operates and maintains the water supply system (the "Water System" or the "System") and is responsible for planning, designing and constructing capital improvements to the System. The Capital Improvement

Program (the "CIP") of DEP identifies planned commitments for design, construction, and construction-related work for the System by category of project in each year of the planning period of 2016 through 2025.

The information presented in this Report is as of March 1, 2016, unless otherwise noted. Additional information, changes in the System or events occurring after this date are not reflected in the Report. This Section 1.3 is intended to provide background information for the reader.

1.3.1 The Water System

Water for the System can be drawn from three upstate reservoir systems (Croton, Catskill, and Delaware) and a system of wells in Queens that were acquired as part of the City's acquisition of the Jamaica Water Supply Company. The three upstate water collection systems, which benefit customers north of the City, as well as in-City consumers, include 19 storage reservoirs and three controlled lakes with a total storage capacity of approximately 580 billion gallons. They were designed and built with various interconnections to increase flexibility by permitting the exchange of water from one system to another. This feature allows the City to select the best water quality to deliver to customers, mitigates localized droughts, and takes advantage of excess water in any of the three watersheds. DEP is continuing to enhance its infrastructure to increase its operational flexibility.

The Water System is currently furnishing water to users in portions of four of the eligible counties north of the City. The Water System provides approximately 85% of the water used in Westchester County and approximately 7.5% of the water used in the counties of Putnam, Orange, and Ulster.

Although all water from the Croton System must be pumped, approximately 95% of the total water supply delivered from the Catskill and Delaware Systems is delivered by gravity.

Figure 1 provides an overview of the Water System.

Figure 1 Map of the Water System

1.3.1.1 The Croton System

The Croton System consists of 12 reservoirs and three controlled lakes that are located on the Croton River, its three branches, and three other tributaries. The water in the Croton System flows from upstream reservoirs through natural streams to downstream reservoirs, terminating at the New Croton Reservoir. The watershed that supplies the Croton System has an area of 375 square miles. It lies primarily within the State of New York (the "State"), approximately 45 miles north of lower Manhattan. A small portion of the watershed is located in the State of Connecticut.

The Croton System primarily supplements the Catskill System and the Delaware System. The quantity of distribution from the Croton System is determined by DEP's operational needs.

1.3.1.2 The Catskill System

The Catskill System watersheds occupy sparsely populated areas in the central and eastern portions of the Catskill Mountains. The Catskill and Delaware Systems together currently provide the vast majority of the daily water supply for the City and customers north of the City. Water in the Catskill System comes from the Esopus and Schoharie Creek watersheds, located approximately 100 miles north of lower Manhattan and 35 miles west of the Hudson River. The Catskill System is comprised of Schoharie Reservoir (formed by the Gilboa Dam across Schoharie Creek) and Ashokan Reservoir (formed by the Olivebridge Dam across Esopus Creek) and the Catskill Aqueduct. Schoharie Reservoir water is delivered to the Esopus Creek via the Shandaken Tunnel, from which it then travels to Ashokan Reservoir.

1.3.1.3 The Delaware System

The Delaware System is located approximately 125 miles north of lower Manhattan. Three Delaware System reservoirs collect water from a sparsely populated region on the branches of the Delaware River: Cannonsville Reservoir (formed by the Cannonsville dam on the West Branch of the Delaware River), Pepacton Reservoir (formed by the Downsville Dam across the East Branch of the Delaware River), and Neversink Reservoir (formed by the Neversink Dam across the Neversink River, a tributary to the Delaware River). Water from these three reservoirs is diverted to Rondout Reservoir (formed by the Merriman Dam across Rondout Creek, a tributary to the Hudson River).

The conditions under which the System's Pepacton, Neversink, and Cannonsville Reservoirs may be operated are set forth under the terms of a 1954 decree of the Supreme Court of the United States (the "1954 Decree"). It allows the System to divert up to 800 million gallons per day ("MGD") of water from the Delaware River Basin for use by the Water System, subject to specified conditions. At the same time, a June 1, 2013 agreement with the parties to the 1954 Decree requires the System, under certain circumstances that are based on the time of year, reservoir storage, anticipated inflow and water supply demand, to release water from the three reservoirs into the tributaries of the Delaware River in support of enhanced habitat protection and flood mitigation. Enforcement of the 1954 Decree is under the jurisdiction of a River Master appointed by the Supreme Court of the United States.

1.3.1.4 The Catskill Aqueduct

The Catskill Aqueduct, which conveys water by gravity, is 92 miles long and extends from Ashokan Reservoir to Kensico and Hillview Reservoirs. The delivery capacity of the Catskill Aqueduct from Ashokan Reservoir to Kensico Reservoir is about 600 MGD. From Kensico Reservoir to Hillview Reservoir, the Catskill Aqueduct has a capacity of approximately 800 MGD; however, the portion of the Catskill Aqueduct from the Kensico Reservoir to the ultraviolet treatment facility (the "UV Facility") has been out of service since 2012. DEP is planning to construct a connection between the Kensico Reservoir and the UV Facility as described in Section 1.3.2.3 below. The Catskill Aqueduct passes under New Croton Reservoir. At this location, it is possible to transfer water from Ashokan Reservoir to New Croton Reservoir.

1.3.1.5 The Delaware Aqueduct

The Delaware Aqueduct is 85 miles long and similarly carries water by gravity from Rondout Reservoir to West Branch Reservoir, which is in the Croton System, and from West Branch Reservoir to Kensico Reservoir, and then on to Hillview Reservoir. Water enters the Delaware Aqueduct via the Rondout Reservoir, which is fed by the Neversink, Pepacton, and Cannonsville Reservoirs. The capacity of the section that delivers water from Rondout Reservoir to West Branch Reservoir is about 890 MGD. The delivery capacity of the Delaware Aqueduct from West Branch Reservoir to Kensico Reservoir is about 1,050 MGD. The Delaware Aqueduct has a capacity of approximately 2,020 MGD from Kensico Reservoir to Hillview Reservoir.

1.3.1.6 The Queens Groundwater Supply

The System also includes a number of groundwater wells in the Borough of Queens. These wells have been offline since 2007 due to the availability of higher quality water from the Catskill, Delaware, and Croton Systems. When in use, the wells are capable of providing approximately 1% of the City's daily water supply. The wells could be used to provide more of the daily supply if required to meet water supply needs. Unlike the rest of the City's water supply, which is a surface and gravity-supplied system originating in a network of upstate reservoirs, well water is pumped from extensive underground aquifers.

1.3.1.7 Long-Term System Capacity

Current demand and flow projections show that if conservation programs, including metering, toilet replacement, hydrant locking, leak detection, and public information campaigns remain effective, there will be no immediate need for the City to find additional long-term water supply sources to meet normal demand. However, with the construction of the Rondout-West Branch bypass tunnel noted in Section 1.3.2.1 below, there will be a short-term need to optimize water supply sources and/or manage demand.

The Rondout-West Branch Tunnel is a section of the Delaware Aqueduct, which can convey up to 890 MGD, and typically delivers an annual average of 600 MGD, more than 50% of the City's daily water supply. Currently, there are leaks in this section of the Delaware Aqueduct, which the City is addressing through the Water for the Future program. The program consists of repair and replacement of portions of the Rondout-West Branch Tunnel, described herein, as well as water supply augmentation projects required to ensure an adequate water supply to the City and upstate customers during the shutdown of the Rondout-West Branch Tunnel. Water supply augmentation includes rehabilitation of the Catskill Aqueduct, and demand management measures to encourage water conservation both north of the City and in-City, including retrofits on City-owned facilities.

1.3.1.8 System Security

To protect the System, including water supply structures and facilities, DEP has a police force of approximately 200 officers. DEP also secures facilities through locks, fences, and other physical barriers to prevent access by unauthorized persons.

1.3.2 Condition of the Water System

The System has reliably served the City since 1842, and many additions and improvements have been made over the years to develop the System that exists today. On an overall basis, AECOM USA, Inc., the consulting engineer to the Authority, rates the condition of the water and wastewater system of the City "Adequate", the highest rating category. Nonetheless, DEP is pursuing a number of initiatives to enhance the long-term integrity of the Water System. An overview of three of these initiatives is presented in this part of the Report.

1.3.2.1 Rondout-West Branch Tunnel

The Rondout-West Branch Tunnel is a section of the Delaware Aqueduct that carries water 45 miles from the Delaware System under the Hudson River and into West Branch Reservoir. It has the highest pressures and velocities in the Water System. In addition, a portion of the tunnel crosses a fractured rock formation, which is potentially subject to greater stress than the deep rock tunnels located in the City.

DEP regularly assesses the condition and integrity of the System's tunnels and aqueducts to determine the extent and effect of water loss, and since the early 1990s, DEP has monitored the condition of the Rondout-West Branch Tunnel. As a result of DEP's flow tests, visual observations and other analyses, and the evaluation performed by an independent professional engineering firm retained by DEP, it has been determined that approximately 15 MGD to 36 MGD of water is being lost from the Rondout-West Branch Tunnel and is surfacing in the form of springs or seeps in the area. This amounts to a loss of approximately 4% of the daily volume of water provided by the tunnel under peak flow conditions. In the opinion of the professional engineering firm associated with that investigation, there is very little immediate risk of failure of the Rondout-West Branch Tunnel.

To address the leak, DEP is undertaking its Water for the Future program, which includes construction of an approximately three-mile-long bypass tunnel. Connection of the bypass to the existing tunnel is expected to require that the tunnel be shut down for one eight month period or two or three shut downs of shorter duration, starting in 2022, during which periods supply augmentation is expected to be needed. The estimated cost to complete the design and construction of the shafts and tunnel bypass and to implement updated water supply augmentation projects and water conservation measures is estimated to be $300 million, $251 million of which is funded in the CIP.

1.3.2.2 The Gilboa Dam

Gilboa Dam, part of the Catskill Water System, is comprised of an earthen dam and a concrete gravity dam, with the concrete portion also acting as the spillway. The dam impounds the waters of Schoharie Creek, creating Schoharie Reservoir. In 2005, an engineering analysis of the dam showed that the spillway had lost some mass over time and that the dam did not meet New York State Department of Environmental Conservation ("NYSDEC") safety guidelines applicable to the reconstruction of existing dams. In December 2006, DEP completed a series of interim steps to

bring the dam into compliance with NYSDEC safety guidelines for the reconstruction of existing dams.

Although there was no evidence that the dam was facing imminent risk of failure, DEP determined that the rehabilitation of the dam should be advanced. Dam rehabilitation work was substantially completed in 2015. Additional work to construct an outlet structure at the dam is underway. The estimated cost to complete the reconstruction of the Gilboa Dam facilities is $110 million, $71 million of which is funded in the CIP.

1.3.2.3 Kensico-Eastview Connection

The Kensico-Eastview Connection will connect the Kensico Reservoir to the UV Facility, providing critical redundancy in the water supply system. The project is expected to begin in 2018 and is estimated to cost $1.2 billion, $501 million of which is included in the CIP.

1.3.3 Water Quality and Treatment

Pursuant to the Safe Drinking Water Act (the "SDWA"), the United States Environmental Protection Agency ("USEPA") has promulgated nationwide drinking water regulations which specify the maximum level of harmful contaminants allowed in drinking water and which govern the construction, operation, and maintenance of the System. USEPA has also promulgated filtration treatment regulations, known as the federal Surface Water Treatment Rule ("SWTR"), which prescribe guidelines concerning protection and treatment of surface water supplies. Enforcement of many of the related regulations promulgated under the SDWA, including the SWTR, has been delegated by USEPA to the New York State Department of Health ("NYSDOH").

1.3.3.1 Filtration in the Croton System

The City constructed a full scale water treatment facility to filter Croton System water as mandated by the terms of a 1998 federal court consent decree, as supplemented in 2002, 2005 and 2014 (the "Croton Filter Consent Decree"), and the Croton Filtration Plant commenced operation on May 7, 2015. Since the Croton Filtration Plant is located within the City and does not supply water to upstate customers, all costs of the Croton Filtration Plant after late 2004 are excluded from the cost of water supply service. (DEP identified the Mosholu Golf Course in the Bronx as its preferred site for the treatment facility and began work at the site in late 2004.)

1.3.3.2 Watershed Protection/Filtration Avoidance in the Catskill and Delaware Systems

With respect to the Catskill and Delaware Systems, the City believes that it will continue to be able to meet the criteria for non-filtered supplies under the SWTR.

Since 1993, DEP has secured Filtration Avoidance Determinations ("FADs") pursuant to which the City is not required to filter water from the Catskill and Delaware Systems. If the City were to have to filter water from the Catskill and Delaware Systems, construction costs to provide such filtration are estimated to be greater than $6 billion. To further the City's ability to comply with

the FAD, on January 21, 1997, the City entered into the Watershed Memorandum of Agreement (the "MOA") with the State, watershed communities, USEPA, and several environmental groups. The MOA supplemented the City's existing watershed protection program with approximately $400 million in additional funding for economic-environmental partnership programs with upstate communities.

In July 2007, USEPA issued a new FAD (the "2007 FAD"), which supersedes previous determinations and has a term of 10 years, divided into two five-year periods. NYSDOH issued the midterm revisions in May 2014 (the "Revised 2007 FAD"). The Revised 2007 FAD requires the City to take certain actions to protect the Catskill and Delaware water supplies. These actions include the continuation of certain environmental and economic partnership programs established under the MOA and the creation of new programs. The Revised 2007 FAD is fully funded in the CIP. The City has begun to work with NYSDOH and USEPA on developing the next FAD (the "2017 FAD"), which is expected to take effect in mid-2017. The City does not have an estimate of the cost associated with the 2017 FAD, nor are such costs included in the CIP.

Since 1997, the FAD has required that the City solicit property from owners of land in the watershed and acquire (with certain limited exceptions) title to or conservation easements on any solicited land if the owner accepts the City's purchase price. The 2007 FAD requires the City to allocate a total of $300 million for land acquisition during its ten-year term, including approximately $59 million of unspent funds remaining from moneys set aside for land acquisition under the MOA and the previous FAD and $241 million of new funding. Under the Revised 2007 FAD, the City has allocated another $50 million for the core land acquisition program and an additional $15 million dedicated to flood buy-outs.

On June 29, 2015, NYSDEC issued a findings statement, completing its eight-year environmental review of natural gas drilling using high volume hydraulic fracturing ("HVHF") in New York State, including the Catskill and Delaware watershed, concluding that the public health risks of HVHF cannot adequately be avoided or mitigated. While HVHF is now effectively banned based on the environmental review, low volume hydraulic fracturing is currently allowed Statewide, including in the watershed. However, NYSDEC believes that low volume hydraulic fracturing is not economically viable, and in light of the statewide ban on HVHF, it is unlikely that either will take place in the watershed in the foreseeable future.

1.3.3.3 Disinfection Requirements

In January, 2006, USEPA issued the Long Term 2 Surface Water Treatment Rule ("LT2"). The purpose of LT2 is to reduce the incidence of waterborne disease by mandating certain levels of inactivation and/or the removal of certain microorganisms from the Water System, including the Catskill and Delaware Systems. DEP is complying with such levels through the operation of its UV Facility, which provides treatment for Catskill and Delaware water.

LT2 also mandates that uncovered finished water storage facilities, which include Hillview Reservoir, be covered or that water from such facilities be treated. DEP has entered into an

Administrative Order with NYSDOH (the "State Hillview Administrative Order") and an Administrative Consent Order with USEPA (the "Federal Hillview Administrative Order"), which mandate that the City begin work on a cover by December 31, 2018. In late August 2011, USEPA announced that as part of a periodic review of existing regulations, it would review LT2 and its requirement to cover uncovered finished storage reservoirs such as the Hillview Reservoir.

DEP's commitments to cover Hillview Reservoir pre-date LT2. In March 1996, DEP entered into the State Hillview Administrative Order which, as modified in 1997 and 1999, required, among other things, the City to cover Hillview Reservoir by December 31, 2005 to reduce the possibility of E. coli bacteria entering the Water System. Pursuant to the Federal Hillview Administrative Order, the City's deadline to begin constructing the cover has been extended to December 31, 2018, with a construction completion date of May 31, 2028. The State Hillview Administrative Order has been modified to mirror the Federal Hillview Administrative Order schedule. The State and Federal Hillview Administrative Orders allow the City to seek a schedule modification based on DEP's on-going assessment of water supply facility construction priorities, although there is no assurance that any such modification would be granted.

DEP has requested that NYSDOH and USEPA extend the deadline to begin construction of the cover for an additional six years beyond the existing deadline. On February 9, 2011, the City was informed that USEPA referred the Federal Hillview Administrative Order and the City's extension request to the U.S. Department of Justice ("USDOJ"). In light of USEPA's announcement that it is reviewing LT2 and its requirement to cover uncovered finished water storage reservoirs such as Hillview Reservoir, USDOJ and the City have agreed to defer negotiations over revised dates until USEPA completes its review. DEP has notified USEPA and NYSDOH that it has suspended work related to the design and construction of the cover, which will impact DEP's ability to meet future milestones.

Currently, the cost of constructing a concrete cover over Hillview Reservoir, as DEP originally proposed, is expected to be approximately $1.6 billion. Under the schedule set forth in the Federal Hillview Administrative Order, most of the costs related to the cover would be incurred in the years beyond the current CIP. The CIP does not include funding to construct a cover.

1.3.4 Water Quality Monitoring

The System has multiple laboratories employing microbiologists, chemists, hydrologists, limnologists, and other scientists to monitor water quality. In addition to the monitoring program, DEP inspectors maintain surveillance of the watersheds.

To reduce the leaching of metals from internal household plumbing, DEP adds food grade orthophosphate and sodium hydroxide to the water before it enters the distribution system, which promotes the formation of a protective coating inside pipes and plumbing and minimizes corrosion.

The SDWA requires all drinking water suppliers to provide the public with an annual statement describing the sources and quality of its water supply. The most recent Drinking Water Supply and Quality Report prepared by DEP for calendar year 2015 demonstrates that the quality of the City's drinking water remains high. This report was prepared in accordance with the New York State Sanitary Code and the National Primary Drinking Water Regulations and can be found at: www.nyc.gov/dep/html/drinking_water/wsstate.shtml.

1.3.5 Governmental Regulation

The System is subject to federal, State, interstate, and municipal regulation. At the federal level regulatory jurisdiction is vested in USEPA; at the State level in NYSDEC and NYSDOH; at the interstate level in the Delaware River Basin Commission ("DRBC") and the Interstate Environmental Commission; and at the municipal level in DEP, the New York City Department of Health and Mental Hygiene ("DOHMH"), the New York City Department of Buildings ("DOB"), the New York City Department of Small Business Services, and, to a limited degree, in municipalities and districts located in eight counties directly north of the City. Water quality protection regulations are enforced within the watershed areas north of the City through a network of overlapping governmental jurisdictions, including NYSDEC, NYSDOH, DEP, and county, municipal, and district police, engineers, and inspectors. The various jurisdictions maintain physical security, take water samples, monitor construction activities and wastewater treatment in the watershed, and generally oversee the physical condition of, activity on, and operation of water supply lands and facilities. Portions of the overall legislative and regulatory framework governing the watersheds may be found in the City's Administrative Code, Health Code, and Watershed Regulations. Regulatory enforcement within City limits is almost exclusively accomplished through City personnel. Provisions incorporating and augmenting the substance of the SDWA, related regulations, and the State Sanitary Code, are contained in the Health Code, Watershed Regulations and the City's Building and Building Construction Codes. These provisions are enforced by personnel from DEP, DOHMH, and DOB.

Water Pollution Control Plants

The Water System includes six City-owned surface discharging water pollution control plants in the watershed, one City-owned subsurface discharging water pollution control plant in the watershed, and one additional City-owned surface discharging water pollution control plant in the City of Port Jervis.

Shandaken Tunnel SPDES Permit

As a result of federal litigation resulting in a determination that a State Pollution Discharge Elimination System ("SPDES") permit is required for water transfers such as the City's transfer of water through the Shandaken Tunnel, DEP applied for and obtained a SPDES permit for the Shandaken Tunnel. As a result of State court litigation challenging the terms of the SPDES permit, DEP has applied for variances with respect to the permit's temperature and turbidity limits. Depending upon the State's action with respect to the variance application, DEP could be required to undertake costly capital projects. The City continues to believe that, consistent with USEPA's

Water Transfers Rule that was adopted after the federal litigation concerning the Shandaken Tunnel was concluded, the Clean Water Act permit program does not apply to transfers of untreated water (such as the Shandaken Tunnel). Accordingly, the City will continue its efforts to defend the Water Transfers Rule and oppose the requirement for obtaining a SPDES permit for this water transfer.

1.3.6 Drought Management

From time to time the Water System experiences drought conditions caused by significantly below-normal precipitation in the watershed areas. The most recent drought was in 2002. As of March 28, 2016, the System's reservoirs were filled to 93.3% of capacity. Normal levels as of that date are approximately 93.0% of capacity.

Throughout even the most extreme droughts, the Water System has continued to supply sufficient quantities of water to the City and its water supply customers north of the City. To ensure adequate water supply during drought conditions, DEP, in conjunction with other City, State, and interstate agencies, maintains a Drought Management Plan. The Drought Management Plan defines various drought phases that trigger specific management and operational action. Three defined phases are: "Drought Watch", "Drought Warning", and "Drought Emergency". A Drought Emergency is further subdivided in four stages based on the projected severity of the drought and provides increasingly stringent and restrictive measures.

A Drought Watch is declared when there is less than a 50% probability, based on the existing record since 1927, that either the Catskill or Delaware Reservoir System will be filled by the following June 1. This phase initiates the pumping of water from the Croton System. In addition, during this phase, a public awareness program begins, and users, including upstate communities taking water from the System, are requested to initiate conservation measures. NYSDOH, NYSDEC, and the DRBC are advised of the Water System's status, and discussions are held with City agencies concerning their prospective participation in the event of a declaration of a Drought Warning.

A Drought Warning is declared when there is less than a 33% probability that either the Catskill or the Delaware Reservoir System will fill by June 1. All previous efforts are continued or expanded and additional programs are initiated, including the coordination of specific water saving measures by other City agencies.

A Drought Emergency is declared when it becomes necessary to reduce consumption by imposing even more stringent measures. In addition to the imposition of restrictions, DEP may enhance existing System management and public awareness programs, expand its inspection force, and perform additional leak and waste surveys in public and private buildings. DEP may also require communities outside of the City that are served by the System to adopt similar conservation measures.

1.3.7 Pending Litigation

The following paragraphs describe certain legal proceedings and claims against the Water System. No assurances are provided that the following information is complete or identifies all of the potential litigation against the System. The ultimate outcome of these proceedings and other claims is unpredictable and could result in substantial judgments that would have to be borne by all customers of the System.

DEP adds alum to the Catskill aqueduct upstream of Kensico Reservoir when necessary to control turbidity levels. The diversions of water containing alum into Kensico Reservoir are authorized under a SPDES permit for the Catskill Influent Chamber ("Catskill Alum SPDES Permit"). Among other things, the Catskill Alum SPDES permit requires DEP to take measures to reduce the use of alum. One such measure is the use of the Ashokan Release Channel to release water from Ashokan Reservoir into the lower Esopus Creek. This release of water from the west basin of Ashokan Reservoir helps prevent the transfer of turbid water to the east basin but can result in an increase in both flow and turbidity in the lower Esopus Creek, which some stakeholders have opposed. NYSDEC served the City with an administrative complaint in February 2011, alleging a number of violations of the Catskill Alum SPDES Permit. DEP and NYSDEC executed an administrative consent order in October 2013, which provides, among other things, that DEP will seek a modification of the Catskill Alum SPDES Permit to incorporate a protocol for operating the Ashokan Release Channel.

A number of upstate customers have notified the City of their challenge to the setting of the rate for excess usage of water as well as the entitlement rate for water supply for FY 2016.

1.3.8 Climate Change

On Monday, October 29, 2012, Hurricane Sandy hit the Mid-Atlantic East Coast as a tropical storm. The City anticipates that all of its costs relating to the storm will ultimately be paid from non-City sources, primarily the federal government. As a result of Sandy, DEP has expanded its ongoing review of the effects of climate change on the System, including interdependencies between DEP infrastructure and the electrical grid and cost-effective investments that would improve the System's resiliency. DEP also incorporated Federal Emergency Management Agency's ("FEMA") updated interim flood zone maps, which were released in January 2013, and adopted new design standards for enhancements and improvements to the System's infrastructure.

In April 2015, the City released One New York: The Plan for a Strong and Just City ("OneNYC"), a long-term plan to address the City's goals of resiliency, sustainability, equity and growth for the City. OneNYC incorporates previous proposals related to resiliency of the System in relation to climate change.

1.3.9 Operational Excellence

Since 2011, DEP has undertaken an extensive review of its operations and maintenance ("O&M") through the Operational Excellence or *OpX* program. The dual goal of *OpX* is to maintain and

improve DEP's O&M performance and service to its customers, while enhancing operational efficiencies and controlling costs for the System's ratepayers. The *OpX* initiatives implemented in the Bureau of Water Supply ("BWS") include the consolidation of approximately seven East of Hudson reporting locations into two locations, optimization of wastewater treatment plants in the watershed, a reallocation of labor in BWS's HAZMAT and SCADA functions, a reduction in fluoride dosing, and improvements in the procurement of chemical contracts to achieve better pricing.

1.4 Water Demand Management

Drought situations have necessitated measures to reduce water use by all customers and, at times, have required the use of the Hudson River as an alternative source of supply. DEP has implemented programs to reduce water use to achieve several goals, including the avoidance of the cost and implementation considerations associated with developing new sources of water supply.

Since 1988, the basis for service charges for residential properties in the City has been in a continuous process of transition from a flat-rate basis of annual billing to a meter-based billing system that relies on the actual measurement of usage. Part of this transition has included a Universal Metering Program for all properties to be metered to improve water conservation, water supply system management, and rate equity. As of February 2016, approximately 96% of total accounts are billed on a metered basis. Certain other accounts are billed on the basis of a series of flat rate charges, but water consumption is metered and monitored in most of these accounts.

DEP completed a program in the 1990s to replace older toilets in the City, as part of which over 1.3 million toilets were replaced. DEP is currently offering vouchers towards the cost of toilet replacement under a second program that began in 2014. Significant long-term reductions in water use have been achieved due to the metering and toilet retrofit programs as well as other initiatives.

The Board has retained a demand management consultant to work on the development of demand management plans with the upstate customers that consume the most water from the System. As of the date of this Report, eight upstate customers have executed agreements and are utilizing the professional services being offered by the Board. Upstate customers may be eligible to receive DEP funding for initiatives developed in their plans.

Additional information concerning water demand management initiatives is provided in Section 4.8.2 of this Report.

1.5 The Roles of the Authority, the Board, and the City in the Water System

Through mid-1985, capital improvements to the water and sewer system of the City were financed through general obligation bonds of the City. In 1984, State law authorized the creation of the Authority and the Board. The Authority's function is to issue revenue bonds, the proceeds of which are used to finance capital improvements to the water and sewer system, including the Water

System. The Board sets rates and charges to meet the annual revenue requirements of the water and sewer system. The revenue requirements include debt service (principal and interest) on outstanding bonds of the Authority as well as the operation and maintenance expenses of the City. Under an agreement between the Authority, the Board, and the City, the City operates and maintains the water and sewer system and is responsible for implementing capital improvements to the System.

The Authority issued its first revenue bonds in December 1985. As of February 19, 2016, the Authority has approximately $4.0 billion in principal outstanding for its First Resolution revenue bonds and $26.5 billion in principal outstanding for its Second Resolution revenue bonds for the water and sewer system of the City, including $677.3 million in Bond Anticipation Notes issued to the New York State Environmental Facilities Corporation ("NYSEFC"). In addition, the Authority currently has a $600 million commercial paper program. Included within the Second Resolution debt are loans obtained by the Authority at below market interest rates from the state revolving fund ("SRF"). The SRF program is administered by NYSEFC. Tables 5A and 5B in the Appendix to this Report show the original amounts of debt issued by the Authority and NYSEFC, which differ from the amounts noted above as being outstanding.

To summarize, the Authority has a total of approximately $30.5 billion in outstanding First Resolution revenue bonds and Second Resolution revenue bonds as of February 19, 2016. As of June 30, 2015 (the end of the 2015 fiscal year), the outstanding long-term principal of Authority debt was $29.4 billion; by comparison, the net value of the water and sewer system assets was $28.7 billion. The preceding figures clearly demonstrate that the Authority is amortizing the cost of the assets over the long-term life of the assets.

A portion of the proceeds of the Authority's bonds and the SRF loans has been used to finance capital improvements for water supply projects in upstate regions. Section 4.2.2 of the Report provides information concerning previous capital investments in the Water System. Under the CIP, additional capital improvements are ongoing and planned for the future to preserve the Water System for all customers.

1.6 Additional Information on the Water System, the Board, and the Authority

Information on the System and its operations and maintenance is available on DEP's website:

http://www.nyc.gov/dep

Information on the Board and past reports on the cost of service are available on the Board's website:

http://www.nyc.gov/waterboard

Information on the Authority and the outstanding debt of the System can be found in the Authority's Bond Official Statements, which are available on the Authority's website:

http://www.nyc.gov/nyw

2.0 The Sale of Water to Customers North of the City

2.1 Background

The New York State Water Supply Act of 1905 ("The Act") and subsequent amendments granted the City permission to develop the Catskill and Delaware watershed systems. In return for these development rights, the City was required, upon request, to furnish supplies of fresh water to municipalities and water districts in eight counties directly north of the City in which City water supply facilities and watersheds are located. The Act limits the quantity of water that may be taken or received to the quantity calculated by multiplying the number of inhabitants in the municipality or water district as shown by the last United States, State, or official municipal census by the daily per capita consumption in the City.

Water is supplied to customers north of the City (hereinafter, "upstate customers") on a wholesale basis, i.e., the City delivers water to one or more central locations, and the upstate customers (typically municipalities or water districts) are responsible for distributing the water to individual users such as residential buildings and commercial properties. For the period of 1985 through 2015 inclusive, the City provided an average of 43,214 MG per year of water to upstate customers, or 118.4 MGD. This represented approximately 8.93% of all water supplied to both in-City and upstate customers. The percentage of the water supply being used by upstate customers increased from 1985 to 2006. The upstate percentage of water consumption has remained relatively the same from 2006 through 2015. In 2014 and 2015, the percentage of the water supply being used by upstate customers was 9.94% and 10.02%, respectively.

Upstate consumption is affected by the continuing expansion of the areas served by City water, as well as other changes occurring within the service area.

2.2 Rates and Charges for Upstate Customers

The regulated rate for water service to upstate municipalities and water districts is determined on the basis of the actual total cost of water to the City less the capital and operating costs incurred within the City limits in connection with the distribution and delivery of water within the City. In no event may the regulated rate exceed the rate charged to customers within the City.

Prior to 2000, the rates adopted by the Board were based on historical costs and did not reflect the increasing actual cost of service. In order to utilize rates that more appropriately reflected the cost of water supply, the rates adopted by the Board since 2000 have been developed based on the anticipated cost of service in the upcoming fiscal years.

The historical water rates charged to upstate customers for the period 2006 through 2016 are provided in the table on the following page. The reconciliation of revenues and costs from prior years was used by the Board for the first time in setting the 2010 rate based on the actual revenues and costs for 2008. Sections 4.6 and 4.7 of this Report provide information concerning the calculation of the annual reconciliation.

Historical Billing Rates and Computed Actual Costs Per Million Gallons

Fiscal Year	Adopted Rate Billed to Upstate Customers	Computed Actual Unit Cost to the Board	
	Including effects of reconciliation & the stipulation in 2012	Excluding the effects of reconciliation & the stipulation in 2012	Including the effects of reconciliation & the stipulation in 2012
2006	617.79	623.47	N/A
2007	691.91	691.83	N/A
2008	798.62	703.73	N/A
2009	900.31	882.91	N/A
2010	922.23	973.86	869.62
2011	1,149.72	1,121.04	1,103.65
2012	1,213.84	1,283.45	1,206.06
2013	1,332.30	1,389.42	1,342.15
2014	1,496.76	1,604.43	1,596.62
2015	1,573.61	1,670.85	1,680.78
2016 (Current)	1,728.99	N/A	N/A

(a) The computed actual cost to the Board shown above for 2006 and 2011 through 2015 includes the upstate share of the costs of defeasance of certain Authority bonds in those years. The basis for this cost is explained in Section 4 of the Report. There were no costs for defeasance in 2007 through 2010.

(b) The rates adopted by the Board for 2010 through 2015 were based on the projected cost and consumption for each respective year and the effects of the reconciliation for the year that was two years' prior to the rate year. The computed actual cost to the Board is shown both excluding and including the effects of the cost reconciliation.

(c) The computed actual cost to the Board in 2012 takes into account the effects of the stipulation credit of $10 million in the column that includes cost reconciliation and excludes the stipulation credit in the column that excludes the cost reconciliation.

The cost to the Board per MG for 2015, using actual cost of service and excluding the reconciliation, is $1,670.85, which is higher than the unit rate that was adopted by the Board effective July 1, 2014 of $1,573.61. After application of the reconciliation cost, the net computed cost to the Board is $1,680.78 per MG. A combination of factors impacted the actual cost per MG as summarized below.

- Other Than Personal Services costs for facilities north of the City were lower than anticipated;
- Debt service costs were lower than anticipated;
- Cash was used for the defeasance of debt, which increases the cost of service in the year defeasance funds are used but serves to lower future debt service costs; and

- Water consumption was somewhat higher than projected, which serves to lower the unit cost per MG.

The reconciliation amount for 2013 of about $4.0 million was applied to the cost of service for 2015. The effects of this reconciliation increased the actual unit cost for 2015. The unit cost with and without the effects of reconciliation is higher than the unit rate that was adopted by the Board.

As of the date of this Report, it is estimated that the 2016 computed cost to the Board may be higher than the unit rate that was adopted by the Board and is currently in effect (again, prior to the effects of reconciliation). The principal factor affecting the estimated costs for 2016 is the cash that is expected to be used in 2016 to defease debt. Debt defeasance is anticipated to result in lower projected debt service payments in 2017 through 2020, as well as subsequent years. The projected lower payments are incorporated in the estimated costs of water supply service in 2017 through 2020 as presented in this Report.

Another factor affecting the 2016 cost of service is the change in the projected debt service. The Authority has successfully sold bonds and commercial paper in recent years and again in 2016 at average interest rates that are lower than those previously assumed, which serves to reduce the projected debt service and benefit the 2016 cost of service.

The estimated unit rate is also affected by projections of total water use. The current estimate of the cost per MG for 2016 is based on the estimated annual costs divided by the full-year water consumption estimate that is derived from a 10-year regression analysis. Based on year-to-date water consumption in the City through February 29, 2016, it is anticipated that the actual full-year water demand will be similar to or slightly higher than the projected usage based on the 10-year regression that was used in proposing the unit rate for 2016. If the water demand for the full year is higher than projected, the unit cost per MG will be reduced. The actual cost of service and the actual unit rate for the supply of water for 2016 will not be known until after the fall of 2016.

This Report again proposes that a cost or “true-up” be applied towards the cost of service in 2017 to reflect the calculated difference between the 2015 computed actual cost of service and the actual costs recovered through the adopted rates of the Board, which are computed by multiplying the unit rate charged by the Board in 2015 times System-wide water consumption. The reconciliation of 2015 revenues and costs results in a charge which will be added to the projected cost of service for 2017. The proposed “true-up” methodology for the 2015 reconciliation spreads the incremental cost over a four-year period. The calculations are presented in Sections 4.6 and 4.7 herein.

3.0 Cost of Service Methodology

3.1 Overview

This Section of the Report provides a summary of the steps that were followed to calculate the cost of service for water supply. The cost of service is calculated in accordance with the cash basis methodology used and approved by NYSDEC in 1972 and 1995. The methodology is also consistent with that used to calculate the regulated rates, which were adopted for 1993 through 2015. Pursuant to the Act, the cost of service methodology excludes all capital and operating costs incurred for transmission and distribution mains, repair yards, tunnels, shafts, and related facilities within the City in connection with the distribution and delivery of water within the City. The cost of service takes into account offsetting revenues from hydropower and permit fees.

3.2 Procedures for Calculating the Cost of Service

Several steps are required to calculate the total cost of providing water to upstate customers and the regulated rate. These steps account for the many types of costs incurred by the City in establishing and maintaining reliable sources of drinking water. The approach that is used in this Report, as required by the 1905 Act, specifically excludes costs incurred within the City that are associated with the transmission and distribution of water in the City.

The six steps that were followed in developing the cost of service and the proposed regulated rate for upstate water supply are outlined herein. The first five steps relate to the computation of the cost of service and regulated rate for 2013 through 2015. The sixth step includes the development of the projected cost of service and regulated rates for 2016 (the current year) and 2017. In addition, this Report includes a preliminary projection of the regulated rate for water supply service for the years 2018 through 2020. The projections are preliminary and subject to change. Reductions in System-wide water consumption as well as assumptions concerning increased costs for property taxes, watershed protection, required capital improvements, and other factors have been taken into consideration in developing the projected cost of service and rates. Nonetheless, rising commodity prices and other factors affecting operating expenses and capital costs as well as changes in consumption may result in a larger increase in the cost of water supply in future years than is currently reflected in the 2016 through 2020 projections. The Water System costs, offsetting revenues, and related information corresponding to each of the steps can be found in Section 4.0 and the Appendix of this Report.

3.2.1 Step A

The initial step includes the determination of all direct costs and offsetting revenues that relate solely to facilities located north of the City.

The components of this analysis include the following:

1. Other Than Personal Services ("OTPS")
2. Debt Service
3. Judgments and Claims
4. Miscellaneous Revenue
5. Personal Services ("PS"), which include:
    a. Field Worker Personnel
    b. Executive and Administrative Personnel

3.2.2 Step B

The second step includes the calculation of the allocation percentages to be used in Steps C and D. The allocation percentages are based upon personnel headcount, total salaries, or expenses, depending upon which allocation methodology is most appropriate to the costs being allocated. The methodologies used in the allocation process have previously been accepted by the USEPA and NYSDEC in connection with the federal and State grant program for wastewater treatment facilities. The methodology was also accepted by NYSDEC in its 1995 decision and upheld by the Appellate Division of the Third Department concerning the regulated rates for 1993 and 1994.

3.2.3 Step C

The next step in the cost of service process is to determine the costs of DEP support services and other essential functions that must be allocated to the cost of supplying water. These costs fall into two categories:

1. Personal Services
2. Other Than Personal Services

The cost of support services and related functions of DEP must be shared by all customers who benefit from its services. Therefore, the costs must be allocated to facilities located north of the City using the appropriate allocation percentage calculated in Step B.

3.2.4 Step D

The fourth step involves the identification of the City's Central Service costs that must be allocated to the cost of water supply. The City's Central Service costs are those related to general City services (e.g., accounting, budgeting, personnel, legal) that are provided to the Water System as well as to DEP as a whole and to other City agencies. Therefore, these costs are allocated first among all City departments. The DEP share (calculated using an allocation percentage developed in Step B) is then allocated to facilities located north of the City.

3.2.5 Step E

The total cost of supplying water to both in-City and upstate customers, exclusive of in-City distribution costs, is determined by adding the cost of service elements, which are calculated in Steps A, C, and D. Dividing the total cost of service by total water consumption determines the unit cost per MG related to the supply of water. The upstate water consumption times the unit cost or regulated rate per MG results in the total costs attributable to upstate customers.

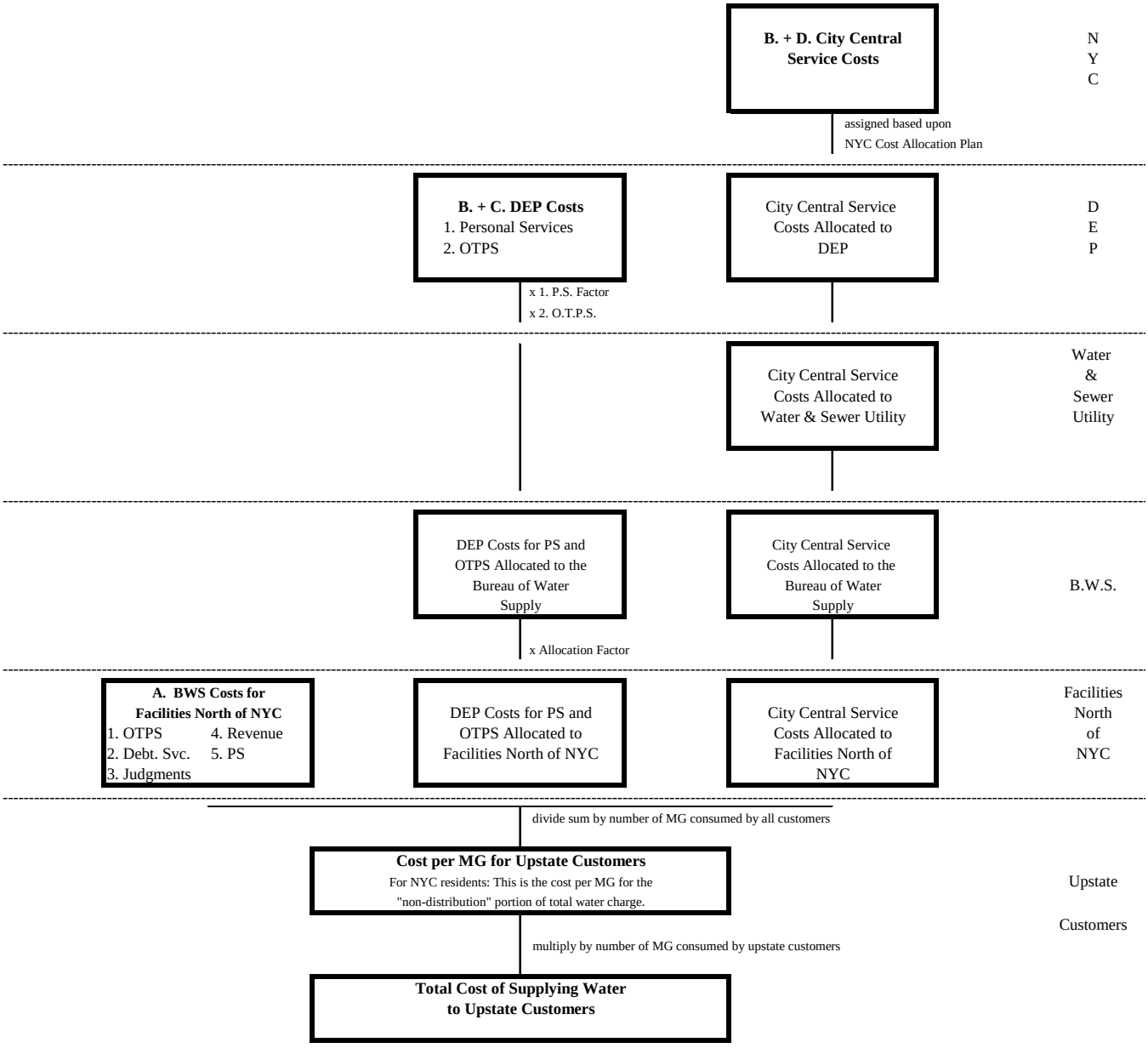
3.2.6 Step F

Steps A through E are primarily used to develop the actual cash basis cost of service for 2013 through 2015. To develop the projected cost of service for 2016 (the current year) and 2017, known debt service costs are added to anticipated future debt service plus anticipated operation and maintenance expenses, less expected offsetting revenues. Projections of future expenses and revenues are based on historical experience as well as known changes in programs and costs that are expected in 2016 and 2017. This is a standard and accepted practice in the industry and is consistent with the methodology used to develop water and sewer rates for in-City customers. The projected cost of service is divided by the estimated water consumption to determine the regulated rate. Step F is carried out simultaneously with the work performed in Steps A through E.

3.2.7 Graphical Overview

Figure 2 on the following page provides a graphical presentation of how various components of the cost of service are allocated in the development of the cost of providing water to upstate customers.

Figure 2 Diagram of Calculation



3.3 Computation of the Regulated Rate

The regulated rate per MG of water use is computed on the basis of the total cost of service divided by the total water consumption:

Total Cost of Service *divided by* Total Water Consumption = Unit Cost of Service or Regulated Rate

The costs, and thus the revenue requirements, attributable to upstate customers are computed on the basis of the total annual quantity of water used by upstate customers multiplied by the unit rate per MG:

Upstate Consumption *multiplied by* Unit Cost of Service or Regulated Rate = Upstate Cost of Service

The total cost of service for water supply, or revenue requirements, is allocated between upstate and in-City customers as follows:

Upstate: **Total Cost of Water Supply Service *multiplied by*:** $\frac{\text{Upstate Consumption}}{\text{Total System Consumption}}$

In-City: **Total Cost of Water Supply Service *multiplied by:*** $\frac{\text{In-City Consumption}}{\text{Total System Consumption}}$

3.4 Sources of Data and Basis of Presentation

Information presented in this report was obtained from records of the City. The City utilizes a modified accrual basis of accounting for its costs. Operation and maintenance expense information, including cost allocation factors, was provided by DEP. Debt service information was obtained from the Authority. Pension and fringe benefit cost factors were provided by the New York City Office of Management and Budget. Water consumption information was provided by DEP.

4.0 Computation of the Cost of Service and the Regulated Rate

4.1 Introduction

This Section of the Report describes the individual elements of the cost of service. The most recent fiscal year for which complete information is available is 2015. The anticipated cost of service for 2016 and 2017 is presented using the following components of cost: scheduled debt service payments on outstanding bonds for these years, the anticipated debt service from additional bonds of the Authority that are expected to be issued, the expected payments for cash-financed construction or defeasance, and projections of operating expenses and all other components of the cost of service. Additional bonds reflect the expected future issuance of debt by the Authority, the proceeds of which will be used, in part, to fund capital improvements in the Water System. The projected debt service reflects the expected portion of the bond proceeds that will be used for the Water System. The findings of each significant step of the analysis are presented in this Section, and the basis for projecting the cost of service for 2016 and 2017 is also provided. Where appropriate, we have normalized the cost of service to take into consideration one-time or recurring increases or decreases in costs.

Supporting tables for each step of the analysis are referenced in this Section and presented in detail in the Appendix to the Report.

4.2 Bureau of Water Supply Costs Related to Facilities Located North of the City - Step A

BWS has the responsibility to operate and maintain the Water System of the City. This responsibility also includes the development and implementation of capital improvements to the System so that a reliable supply of quality water can be maintained for customers both within the City and in upstate communities.

BWS carries out its water supply responsibilities through personnel and equipment located at facilities throughout the watershed. BWS personnel include engineers, laboratory technicians, security personnel, water quality experts, and management and support personnel. The vast majority of BWS's costs relate solely to facilities located north of the City.

4.2.1 Other Than Personal Services Costs

By definition, OTPS costs include all operating expenses other than labor including, but not limited to: supplies, equipment, contracted maintenance and repairs, power, chemicals, real estate taxes paid to upstate communities, and other purchased goods and services. Direct OTPS costs have generally increased over the years through 2014, as illustrated in the table shown herein. In 2010 and 2015, there were small decreases in expenses relative to the prior years. The average annual increase from 2006 to 2015 is 6.6%.

Property taxes constituted about 65% of total OTPS costs allocable to the cost of water supply and the unit rate in 2015. OTPS expenses in 2015 once again include certain costs associated with filtration avoidance and environmental health and safety in the watershed. The expenses also include the estimated costs associated with Hillview Reservoir, which were approved by NYSDEC for inclusion in the cost of service in April 1997. Additional information concerning these expenses is presented in 4.2.1.3 and 4.2.1.6 of this Report.

Historical OTPS Expenses

Fiscal Year	OTPS Expense ($)	Annual Increase (%)
2006	133,134,219	12.3
2007	138,068,007	3.7
2008	150,982,178	9.4
2009	171,280,256	13.4
2010	169,955,116	-0.8
2011	191,435,944	12.6
2012	202,687,321	5.9
2013	221,323,950	9.2
2014	239,487,897	8.2
2015	236,831,336	-1.1

The fluctuations in expenses from year to year are primarily driven by changes in: property taxes, the UV Facility (start-up and operation), FAD-related costs, contractual services, environmental health and safety programs, and fuels, chemicals, and utilities.

Recent expenses and current and ongoing programs were considered in estimating the anticipated 2016 and 2017 OTPS expenses. The findings of the analysis are presented in the following categories:

1. Real Estate Taxes
2. Chemicals
3. Hillview Reservoir
4. Contractual Services
5. Rate Studies
6. Other OTPS Expenses
7. UV Facility

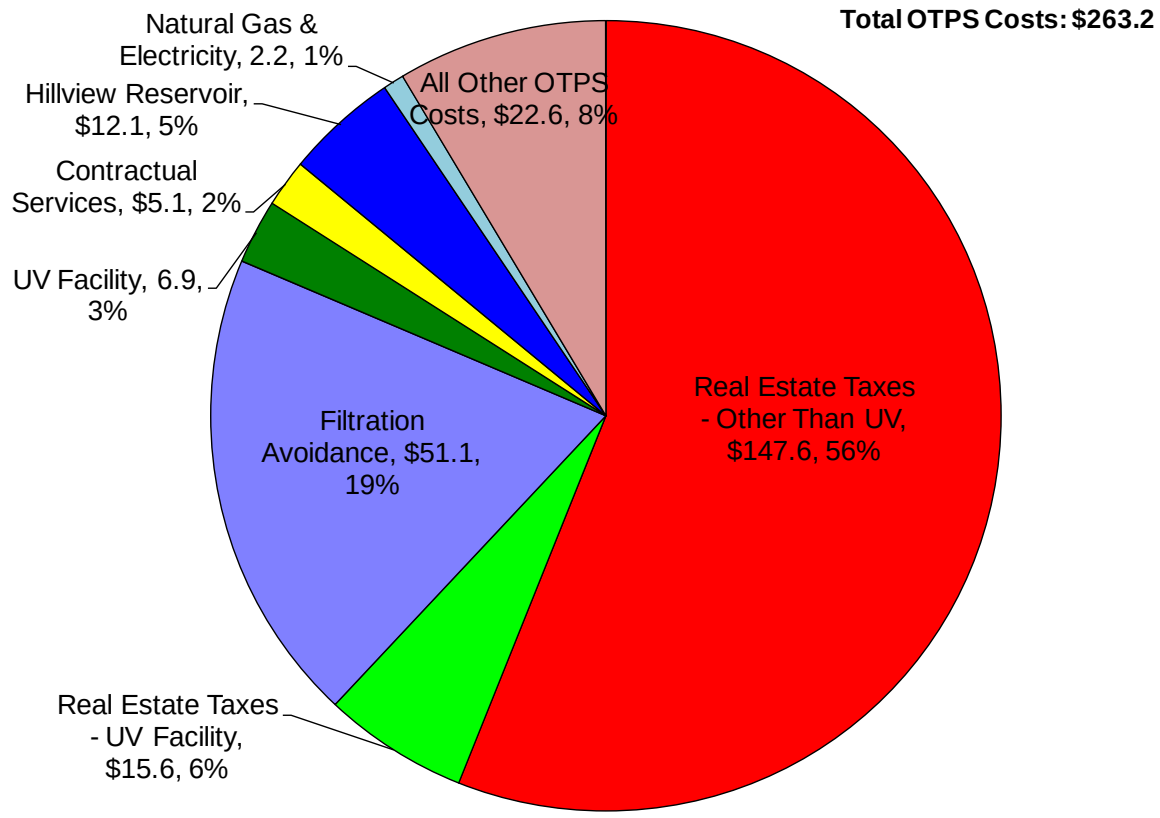
The analysis considered the historical experience in each of these categories together with current and expected future changes so that such costs are normalized, where appropriate, to exclude unusual increases or decreases that may have affected recent experience. Overall, OTPS expenses are expected to increase in future years due to rising property taxes, continuing expenses related

to FAD, the cost of operating and maintaining the UV Facility, and other factors that increase annual costs. The classification of certain filtration avoidance costs and other costs previously paid for through the proceeds of debt as operating expenses instead of capital costs also contributes to the anticipated increases in the cost of service. The major components of 2017 OTPS costs are summarized in Figure 3. Table 4A of the Appendix presents a detailed listing of historical OTPS expenses while Table 4B provides a detailed listing of the projected OTPS expenses.

It is noted that the cost of chemicals used at Hillview Reservoir is included in the total costs for Hillview and is not included in the cost category for chemicals used at all other water supply facilities.

In addition, it is recognized that natural gas and electricity costs were recorded on a centralized basis through 2013. Starting in 2014, electricity costs for the UV facility were tracked separately from other heat, light and power costs. The 2014 costs from the previous Report have been restated to reflect this change.

Figure 3 Projected 2017 Other Than Personal Services Costs
(all amounts in millions)



4.2.1.1 Real Estate Taxes

Real estate taxes for all water supply properties, including the UV Facility, have increased at the average annual rate of about 4.8% from 2006 to 2015. Excluding the taxes on the UV Facility, property taxes have increased at the average annual rate of 2.4% for the three year period from 2012 through 2015. The overall increase in recent years reflects a combination of both increases in the local tax rates applied to water supply properties as well as taxes on newly purchased properties in the watershed and the taxes on the UV Facility. Historical property tax payments, which include property taxes for the UV Facility beginning in 2010, are shown in the next table.

In 2015, the City received nearly $1.7 million in refunds from upstate taxing jurisdictions (for taxes paid in prior years). Although such refunds have occasionally been reflected in prior reports in Table 7, the tax refunds received in 2015 were used to reduce the 2015 property tax expense and are reflected instead as an offset to expenses in Table 4A. (This is the typical method of applying the proceeds of tax refunds.) Tax refunds are not expected to occur in future years.

Historical Property Tax Payments

Fiscal Year	Property Tax Expense ($)	Annual Increase (%)
2006	101,209,162	10.9
2007	104,630,050	3.4
2008	109,627,241	4.8
2009	114,958,441	4.9
2010	126,320,846	9.9
2011	131,663,054	4.2
2012	139,186,474	5.7
2013	147,798,234	6.2
2014	155,494,475	5.2
2015	153,957,580	-1.0

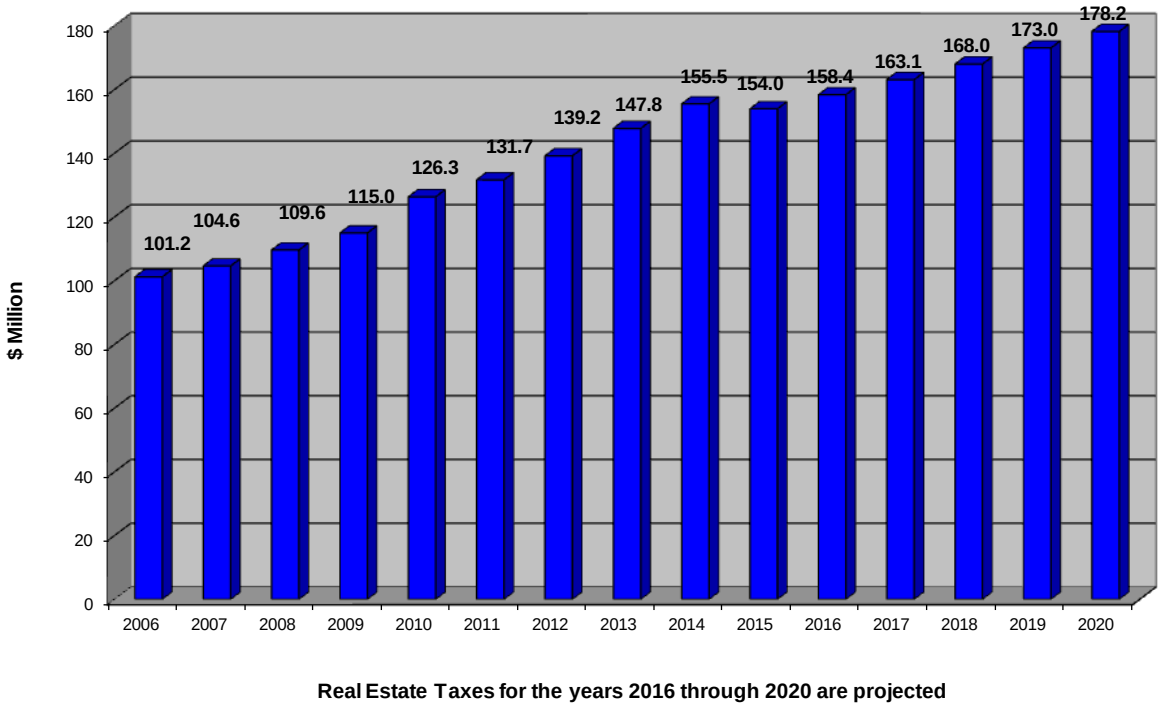
The projected real estate taxes for 2016 and 2017 are $158.4 million and $163.1 million, respectively. Both estimates reflect an allowance for the expected increases in property tax rates, the taxes on newly-purchased land, as well as taxes on the UV Facility. To protect water quality in the watershed, the City is required to increase the number of acres of land that are either owned by the City or otherwise restricted in terms of land use. Increasing the number of acres owned by the City results in increased property taxes.

A 3.0% annual rate of increase in the property taxes is assumed for 2016 through 2020 for all taxes except those for the UV Facility. This assumption reflects a decrease from five years ago when it was assumed that taxes would increase at the rate of 6.0% annually. Property taxes related to the UV Facility are assumed to be $15.1 million in 2016 and then increase at the rate of 3.0% per year from 2017 through 2020. While the current rate adoption by the Board will only address 2017,

projections for 2018 through 2020 are shown for illustrative purposes. The actual and estimated real estate taxes payable to upstate communities for watershed properties from 2006 through 2020, including the UV Facility, are summarized in Figure 4.

It is important to note that property taxes associated with the UV Facility are currently included in a separate line item for UV real estate taxes in Tables 4A and 4B. Section 4.2.1.7 provides additional information concerning the UV Facility.

Figure 4 Real Estate Taxes for the Water System
(all amounts in $ millions)



4.2.1.2 Chemicals

Several chemicals are used by the City to treat the water supply, including chlorine that is used for disinfection and other purposes. This part of the Report addresses the chemicals used in the watershed, except for those used at Hillview Reservoir, which are presented separately in Section 4.2.1.3. As illustrated by the following table, the total cost of chemicals varies from year to year.

Historical Chemical Costs

Fiscal Year	Chemical Costs ($)	Annual Rate of Change (%)	Chemical Costs as a % of Total OTPS
2006	3,290,291	48.2	2.5
2007	3,462,379	5.2	2.5
2008	5,344,146	54.3	3.5
2009	8,035,776	50.4	4.7
2010	7,813,168	-2.8	4.6
2011	6,744,998	-13.7	3.5
2012	6,008,103	-10.9	3.0
2013	3,033,060	-49.5	1.4
2014	3,611,336	19.1	1.5
2015	4,095,234	13.4	1.7

The cost of chemicals for water supply in a given year is dependent upon both the quantities of chemicals that must be used as well as the unit price per ton. There were significant increases in prices for fluoride and other chemicals for the System, excluding Hillview Reservoir, starting in 2008. However, following approvals from the DOHMH, DEP reduced the fluoride dosage from 1.0 milligrams per liter to 0.8 milligrams per liter in February 2012 and then to 0.7 milligrams per liter in May 2015. In 2013, chemical deliveries to the System were slowed due to System repairs. More recently, the renegotiation of chemical contracts to improve pricing was one area of focus of the OpX program. The quantities of chemicals used and the applicable unit prices in recent years are summarized in the following tables.

Historical Chemical Use

Fiscal Year	Chlorine (Lbs)	Fluoride (Tons)
2006	2,854	1,731
2007	3,149	1,392
2008	3,141	1,940
2009	2,859	2,203
2010	3,170	1,691
2011	3,036	1,393
2012	3,177	1,512
2013	2,058	787
2014	1,647	1,313
2015	1,567	1,531

Historical Unit Prices for Chemicals

Fiscal Year	Chlorine ($)/Lb	Fluoride ($)/Ton (1)
2006	695.05	796.16, 934.78
2007	686.30	934.78
2008	667.55	1,673.92
2009	620.05	2,934.78
2010	456.68	3,800.00
2011	474.98	3,797.88
2012	504.84	2,944.14
2013	480.00	2,600.00
2014	467.18	2,165.17
2015	459.63	2,159.67

(1) Fluoride prices for 2006 reflect two different delivery zones within the water supply system.

The assumed rate of increase in chemical costs in 2016 through 2020 is 3.0% per year. This assumption recognizes that the actual expenses in 2013 through 2015 were much lower than in the previous five years; thus, such expenses could increase beyond the 3.0% allowance for inflation (as they have in 2014 and 2015). As noted previously, certain chemical costs increased significantly in the northeast U.S. in recent years compared to the costs incurred in 2008 and earlier years. It is not certain at this time whether prices will stay the same, increase, or decline in future periods. Chemical addition that solely benefits in-City customers is excluded from this cost of service analysis.

4.2.1.3 Operating Expenses Associated with Hillview Reservoir

The principal expenses incurred in the operation of Hillview Reservoir are associated with chemical addition and security. Caustic soda is added for water quality purposes to adjust the pH of the water entering Hillview. Orthophosphate is added for lead and copper control. In 2015, the costs for caustic soda and orthophosphate were $4.3 million and $4.8 million, respectively. These costs fluctuate due to market prices. The unit bid price for orthophosphate effective June 1, 2013 and June 1, 2014 was $3.06 per gallon, four cents per gallon lower than the unit price for the period beginning June 1, 2012. The unit bid price for orthophosphate effective June 1, 2015 is $2.74 per gallon. DEP anticipates that the unit bid price for orthophosphate effective June 1, 2016 will remain at approximately $2.74 per gallon.

All OTPS expenses, including chemical costs at Hillview, are assumed to increase at the rate of 3.0% per year in 2016 through 2020. Market conditions and upcoming bid prices will dictate the actual prices for chemical costs. Future increases in expenses at Hillview could be significantly affected by fluctuations in the price of chemicals and other factors.

The non-labor expenses attributable to Hillview Reservoir in Tables 4A and 4B are exclusive of property taxes, which are included in the "Real Estate Taxes – Existing Properties" line item (line 17). Labor costs for Hillview are included in the personal services costs described in Section 4.2.5 of this Report.

4.2.1.4 Contractual Services

The City was required by the MOA to fund a number of capital projects and operating programs to support the protection of the watershed. Programs to be paid from operating funds began in 1997, and beginning in 2004, the expenses related to the MOA declined as the programs it called for ended or were scaled down. The future expenses for MOA-related programs are reflected in the "Contractual Services – General" line item of the projected OTPS expenses in Tables 4A and 4B. Contractual services expenses are assumed to increase at the rate of 3.0% annually. Other expenses related to filtration avoidance are addressed in Section 4.2.1.6.

4.2.1.5 Rate Studies

The annual costs associated with performing rate studies and related work for establishing the regulated rate for upstate customers, including, but not limited to, the distribution of documents, posting of notices, and the rate hearing, are estimated at $60,962 per year from 2016 to 2020, which is equal to the actual payments for rate studies for 2015.

4.2.1.6 Other OTPS Expenses

OTPS expenses in 2013 through 2015 and future years include DEP costs associated with filtration avoidance programs in the watershed. These are shown in lines 28 and 29 of Tables 4A and 4B. Included within the costs of filtration avoidance are payments for the operation and maintenance of certain wastewater treatment facilities that are not owned by DEP. The operation and maintenance of such facilities is intended to protect the water quality in the watershed. The operation and maintenance costs for these wastewater treatment facilities in 2016 and 2017 are estimated by DEP to be $14.7 million per year. The estimated expenses in future years are assumed to increase at the rate of 3.0% per year.

Payments from DEP to watershed communities under the MOA and the cost of other initiatives that help support the avoidance of filtration are also included within the filtration avoidance line items. Some program costs for filtration avoidance included in line 29 of Table 4B were historically funded through the proceeds of debt and then paid back through debt service on the bonds that were issued. As a result of a decision by the New York City Office of the Comptroller, such costs are assumed to be funded as operating expenses in the current year and future years. It is assumed that the percentage of debt attributable to the Water System will be affected slightly in future years as a result of this policy; an adjustment is outlined in Section 4.2.2.2 of this report. In 2016 through 2020, the expenses associated with program funding of filtration avoidance are estimated by DEP.

In recent years, DEP has undertaken a comprehensive program of environmental health and safety; the water supply-related costs of this program are included in line 30 of Tables 4A and 4B. The

expenses for environmental health and safety programs in the watershed and the costs of other categories of expense are assumed to increase at the rate of 3.0% per year.

4.2.1.7 UV Facility

The UV Facility is fully operational and provides treatment for Catskill and Delaware water. Operating expenses other than labor associated with the UV Facility are shown on line 27 of Tables 4A and 4B with the exception of property taxes (shown on line 18).

DEP began to pay property taxes for the UV Facility in 2010. OTPS expenses other than property taxes were incurred beginning in 2012. The projected operational expenses associated with the UV Facility in 2016, including property taxes, are based on DEP budgeted amounts. Expenses are then assumed to increase at the rate of 3.0% per year in 2017 through 2020.

4.2.2 Debt Service/Capital Improvement Financing

Capital improvements to the System are financed principally through proceeds from the sale of bonds. The use of long-term bonds as a source of financing spreads the cost (in the form of debt service) over the life of the facilities, which enables the long-term users of the water supply system to contribute to its cost. A relatively small portion of the capital improvements are financed on a cash basis using funds from revenues of the System. This part of the Report describes the methodology that is used to develop the annual debt service requirements (i.e., the principal and interest payments on bonds) of the Water System as well as the annual revenues raised for use in the CIP. Table 5C provides a summary of the actual debt service for 2015, as well as the projected amounts for 2016 through 2020, with the net debt service attributable to the Water System in line 26. The debt service amounts are then reflected in line 2 of Tables 1A and 1B, which summarize the annual cost of water supply service and the regulated rate. Lines 3a and 3b of Table 1A and line 3 of Table 1B present the water supply portion of the amounts used (if any) for cash-financed construction and to defease Authority bonds. The costs and benefits of defeasance are described later in this section.

4.2.2.1 Historical Investments in the Water System

Prior to the formation of the Authority, the development, expansion, and upgrading of the Water System was carried out by the City with funds that were typically provided by the proceeds of General Obligation (G.O.) bonds issued by the City. Since the formation of the Authority, significant investments have been made throughout the Water System principally through the proceeds of bonds issued by the Authority. These capital costs, which are reflected in debt service on bonds of the Authority issued both to the public ("Authority Bonds") and NYSEFC ("NYSEFC Bonds") (collectively the "Bonds"), are a component of the cost of service and regulated rate.

Investments that are either complete or in progress include improvements to: dams, reservoirs, reservoir roads and bridges, City-owned and non-City wastewater treatment plants, agricultural programs (i.e., pollution prevention for watershed protection), security, the UV Facility, and other capital needs, including the Water for the Future Program. The latter program includes

investigations, engineering design, and construction for the Rondout-West Branch Tunnel. Costs for the Croton Plant prior to the approval of the in-City site are also included in the water supply cost of service and are allocated to all water supply customers; costs incurred following the approval of the site are not included.

Land purchases, improvements to wastewater treatment plants, and other investments have been instrumental in maintaining the quality and reliability of the System including the avoidance of filtration for the Catskill and Delaware Systems.

4.2.2.2 Debt Service Related to the Water System

Debt service on the Bonds is computed based on the total net debt service payable for the water and wastewater system of the City in each year times the percentage attributable to the water supply portion of the capital improvements that have been financed with the proceeds of the Bonds. This approach incorporates the savings resulting from refundings of previously-issued Bonds. It also includes the impacts of the defeasance of certain future debt service obligations of the Authority.

The current methodology for computing debt service on outstanding Bonds was first applied in 2005. This methodology begins with the calculation of the percentage of the capital investments beginning in 1986 that are attributable to the System versus other components of the water and sewer system of the City. Since improvements have been financed with the proceeds of Authority Bonds and NYSEFC Bonds, Tables 5A and 5B were prepared to illustrate the proceeds of each bond issue and the upstate portion of such proceeds for Authority Bonds and NYSEFC Bonds, respectively. Since the percentage share for the Water System will change from year to year, a cumulative percentage (beginning with the first bonds issued in 1986) is computed in each year through the current year-to-date (i.e., 2016). For example, the cumulative percentage to be used in 2015 for Authority debt reflects the sum of all Authority bond proceeds used for water supply projects from 1986 through 2014 divided by the sum of all proceeds from bonds issued from 1986 through 2014. The calculated percentage for Authority bond proceeds through 2014 is again applied in Table 5C to the appropriate debt service, interest earnings, etc. for 2016 since not all of the proceeds of the 2015 debt had been spent at the time the data was prepared for this Report.

The water supply share of debt service and net offsets are computed by multiplying the System-wide totals for each category times the applicable percentage in each year. The three percentages shown in Table 5C are: (1) line 27, which shows water supply capital costs funded through Authority Bond proceeds as a percentage of total capital costs funded through Authority Bond proceeds; (2) line 28, which shows water supply capital costs funded through both Authority Bond proceeds and NYSEFC Bond proceeds as a percentage of total capital costs funded through both Authority Bond proceeds and NYSEFC Bond proceeds; and (3) line 29, which shows water supply capital costs funded through NYSEFC Bond proceeds as a percentage of total capital costs funded through NYSEFC Bond proceeds. In reports prior to the 2014 rate year, the current year percentages were also applied to debt service in future years. Starting in the rate report for Fiscal Year 2014, Amawalk modified the percentage for future years; instead of using the percentage only from the prior year and applying that figure to future years, we used the average of the

percentages from the two prior historical years. Thus, for 2017 through 2020, we use the average of the calculated percentages for 2014 and 2015. The resulting percentage for 2017 through 2020 is less than if the projected percentage for the current year (i.e., 2016) is used, resulting in a lower debt service amount being included in the cost of water supply service for those years. The reasons for the change include: (1) previous years included debt issued for the UV Facility, which is now in operation, so the annual amount of bond proceeds applied to this project will decline over time and then end; and (2) the classification of certain filtration avoidance programs as operating expenses instead of capital projects results in an increase in operating expenses but also a reduction in the amount of bond proceeds that will be needed for filtration avoidance expenses in the Water System. The computed percentages for 2016 through 2020 are preliminary and subject to change.

Table 5C illustrates the current projections of debt service on outstanding bonds and anticipated future bonds for the Projection Period as of January 15, 2016. The amounts shown are net of all refundings and defeasance of debt that have previously been undertaken by the Authority. The amounts also reflect the anticipated effects of additional refundings and defeasance of debt that the Authority expects to complete in 2016. Authority debt service is shown as First Resolution and Second Resolution. The Second Resolution debt is subordinate to the First Resolution debt. Table 5C also presents the estimated interest on commercial paper shown as "Interest on Short-Term Debt". The Authority initially finances capital improvements through the proceeds of short-term commercial paper sales and then redeems the commercial paper with the proceeds of long-term bonds. Interest rates on commercial paper and the variable rate debt of the Authority have been low in recent periods compared to historical conditions, resulting in actual interest costs that are lower than projections. There is no assurance that such market conditions will continue in future years. As a result, projections of future debt service payments assume that interest rates on commercial paper, variable rate debt, and future fixed rate debt will be higher than current market rates.

The debt service on Build America Bonds ("BABs") is net of the interest subsidy payments from the U.S. Treasury for those bonds. The BABs were issued on a taxable basis, and beginning in 2010, the U.S. Treasury has generally provided interest subsidy payments in each year equal to 32% to 35% of the interest payable. The figures shown for "Authority Debt Service – Second Resolution" (line 3) and "NYSEFC Outstanding Debt Service" (line 6) in Table 5C of this report reflect the application of the BABs subsidy payments. At the time of this report, federal sequestration is continuing to reduce somewhat the actual payment of BABs subsidies by the federal government. It is not known at this time how long the sequestration will last, whether reductions in BABs payments will continue or whether any reductions will be made up through payments at a later date. The projected debt service in 2016 and subsequent years assumes that BABs subsidy payments are reduced by about $5.0 million annually from the previously expected amount (which was based on a 35% rate of assistance) during the entire Projection Period.

Interest earnings on available funds (i.e., the Authority's Debt Service Fund, the Debt Service Reserve Fund, the Construction Fund, and the Subordinate Debt Service Fund), together with Authority expenses related to debt, collectively form a net offset to a portion of the debt service.

Interest earnings have generally declined in recent years due to conditions in the financial markets that have resulted in relatively low rates of interest earnings on secure investments. Authority expenses related to debt include administrative expenses charged by NYSEFC for the low-interest loan program, liquidity fees, and other expenses related to variable rate debt, swap payments, arbitrage rebate payments, and other expenses.

4.2.2.3 Cash-Financed Construction and Cash Used for the Defeasance of Bonds

Portions of the capital improvements to the Water System may be financed through cash in lieu of the proceeds of Bonds; alternatively, such cash may also be used to defease outstanding bonds. No cash-financed construction deposits were made in 2010 through 2013. In 2014, the Authority spent $225.0 million for cash-financed construction needs as shown in Table 5D. In 2015, there was a release of $253.0 million from the debt service reserve fund of the Authority that was also used for cash-financed construction. This Report does not include any portion of the $253.0 million as a cost of water supply in 2015 nor does it include the amount in calculating the anticipated unit rate for that year because these capital dollars are already accounted for in the debt service of the Authority.

In 2011 through 2015, cash from the System was used to defease Authority Bonds by paying future debt service in advance of the years in which such debt service was payable. This was done to both reduce the System's debt burden and optimize future debt service payments by stabilizing annual changes to debt service. The amounts used for defeasance in 2013, 2014, and 2015 were $299.99 million, $399.08 million, and $802.67 million, respectively. See Table 5D for the amounts used in each year and the computed water supply share.

Since all water supply customers share in the benefit of lower future debt service due to the defeasance, the costs of the defeasance are included in the cost of service just as the defeased debt service had previously been included, and these costs are apportioned to all water supply customers. At the time of this Report, it is estimated that $750.0 million will be used in 2016 for debt defeasance. While the use of moneys for defeasance results in a short-term increase in the cost of service, it produces long-term reductions in debt service that are much greater than the costs incurred. The table below summarizes the actual (2011 through 2015) and proposed (2016) amounts for defeasance together with the reduction in total debt service expected to be achieved in each year based on actual results for the defeasances in 2011 through 2015 and the projected results for the 2016 defeasance.

Debt Defeasance

Fiscal Year	Amounts Used For Defeasance ($)	Reduction in Debt Service ($)
2011	260,000,000	
2012	239,600,000	17,036,000
2013	299,990,000	44,835,000
2014	399,079,000	138,138,000
2015	802,671,000	243,044,000
2016	750,000,000	230,640,000
2017		296,749,000
2018		286,298,000
2019		274,198,000
2020		223,509,000
2021		215,985,000
	2,751,340,000	1,970,432,000
2022 and Beyond		1,877,265,000
Total	2,751,340,000	3,847,697,000

Note: The amounts used for defeasance in 2016 and the resulting reduction in debt service associated with the 2016 defeasance are preliminary and subject to change. The figures are rounded to the nearest thousand dollars.

The annual revenue requirements for cash-financed construction and/or cash defeasance in future years are currently assumed to be $225 million in 2017, $475 million in 2018, $375 million in 2019, and $325 million in 2020. These amounts are shown as annual deposits in the Cash Used for Capital Construction/Defeasance column in Table 5D. The projected amounts for each year may increase or decrease in the future, as the Board and the Authority may decide to modify the amount used for cash-financed capital contributions or the defeasance of outstanding bonds depending on financial results, market conditions, and forecasts. The water supply share of such costs in Table 5D is based on the total cash contribution in each year times the Water System capital costs as a percentage of total capital costs funded through the proceeds of both Authority Bonds and NYSEFC Bonds.

The projected debt service of the Authority that is used in Table 5C and in the calculation of the projected cost of water supply service reflects the actual impacts of the defeasance of debt that has taken place in prior years as well as the estimated effects of the planned defeasance in 2016. It is important to note that if the defeasance of debt had not taken place, debt service in each year for 2013 through 2020 would be higher than shown in this Report. In addition, the Authority's use of

defeasance is an important part of its efforts to maintain strong credit ratings, which reduce the cost of borrowing for all debt to the benefit of all customers. The Authority's current credit ratings are shown below.

NYC Municipal Water Finance Authority Bond Ratings as of 3/31/16

	First Resolution Bonds	Second Resolution Bonds
Standard & Poor's	AAA	AA+
Moody's Investors Service	Aa1	Aa1
Fitch Ratings	AA+	AA+

4.2.2.4 Ongoing and Future Capital Improvements

Ongoing capital improvements in the System to be funded through the proceeds of bonds in 2016 through 2020 include: rehabilitation of the Gilboa Dam, purchases of land, upgrades to wastewater treatment plants in the watershed, reconstruction of other water supply infrastructure, engineering work, the Water for the Future Program, filtration avoidance measures north of the City, and other projects and programs.

4.2.2.5 Capital Cost Summary

Favorable market conditions in 2015 and year-to-date in 2016 have resulted in actual debt service on bonds issued and interest on variable rate debt and commercial paper that is lower than anticipated. Based on year-to-date experience in the financial markets, preliminary changes for 2016 have been taken into consideration in the projected debt service for this year and subsequent years. There is no assurance that such conditions will continue in the future.

An overall net increase in debt service is projected in the upcoming years to reflect the debt service for capital improvements being funded through the proceeds of Authority bonds. Table 5C summarizes the historical and expected future annual costs attributable to debt service.

4.2.3 Judgments and Claims

Judgments and claims represent the amount of judgments rendered against the System or claims paid by the City for water supply-related matters in areas north of the City. Actual and projected judgments and claims are illustrated in Table 6. There are years in which no judgments or claims were paid for the Water System. Except for 2007, payments made in other years have ranged from $3,695 in 2008 to $916,350 in 2011. A payment of about $5.5 million was made in 2007 to settle litigation relating to the Shandaken Tunnel. There may be additional expenses related to this matter. The payment amount in 2015 was $126,319. The cost of service analysis assumes that the

fifteen-year (2001 through 2015) average of $542,908 will provide a reasonable allowance for judgments and claims in 2016 and in future years.

4.2.4 Miscellaneous Revenue

Miscellaneous revenues received from upstate sources are used to offset the total cost of supplying water to both in-City and upstate customers. As indicated in Table 7, miscellaneous revenues are derived from hydropower generated at upstate dams and from miscellaneous charges for permit use and related services provided in the Water System. In addition, miscellaneous revenues may include tax refunds when such refunds are made and when such refunds are not already reflected in the expense of real estate taxes paid, as was the case in 2015 and several other years. Miscellaneous revenues have been inconsistent over the years, declining in some years and increasing in others.

Hydropower revenues are shown for 2004 through 2015. Hydropower revenues in future years may differ from the historical experience. The City took ownership of the Grahamsville and Neversink hydroelectric facilities in October 2006, which resulted in an overall increase in annual revenues (compared to historical experience) as well as increased costs for capital improvements and operation and maintenance expenses, including property taxes. The City also receives a relatively small amount of revenue from the operator of the West Delaware hydroelectric facility. No revenues are considered in the calculations for the Ashokan and Kensico facilities because no revenues are actually expected to be received by the City in 2016 or any future year.

With the exception of 2015, hydropower revenues as illustrated in Table 7 represent gross revenues prior to the application of offsetting expenses, and the offsetting expenses are included in the historical OTPS and personal services expenses shown in the tables of this report. The 2015 hydropower revenue is shown net of expenses; therefore, hydropower-related expenses are not included in the OTPS and personal services expenses tables for 2015. Table 14 shows the anticipated gross hydropower revenues by source. In 2016 and 2017, it is expected that such revenues on a gross basis will be approximately $7.9 million and $8.0 million, respectively, which, together with other miscellaneous revenues, will be applied as a credit towards the cost of water supply service. It is noted that this Report does not include an estimate for hydropower-related expenses in 2016 or in future years.

For purposes of estimating future miscellaneous revenues during the Projection Period, the fifteen-year average (2001 through 2015) of permit/services revenues has been used. With the exception of 2013, DEP has recently used tax refunds received to reduce real estate taxes, as shown in the $0 for tax refunds in 2010 through 2012 and again in 2014 and 2015. In 2013, DEP paid the tax bill in full prior to settlement, resulting in a $209,232 tax refund. At this time, the projections assume no refunds in future years. In lieu of tax refunds, DEP has advised that it may continue to apply credits against property taxes due in future years.

4.2.5 Personal Service Costs

Personal services expenses directly allocable to water supply services are shown in Tables 8A, 8B, 9A, and 9B. These expenses represent salary, pension, and fringe benefit costs associated with all BWS field personnel working in water supply facilities located north of the City as well as support and administrative personnel. Field personnel, for purposes of this report, are defined as DEP personnel with non-supervisory or non-management titles, working directly with the Water System. Field personnel thus do not include personnel classified as management and/or administrative support. Irrespective of the "field" or "administrative support" designation, these costs are all entirely related to water supply. The methodology for classifying personnel between field personnel and support/administrative categories of cost is consistent with the City's indirect cost plan for federal and State grant programs. Prior indirect cost plans of the City that use this methodology have been approved by the federal government. Personal Services costs in Tables 8A, 8B, 9A, and 9B are categorized based on location. The categories can vary somewhat from previous year reports as locations have been consolidated or eliminated from a budgetary perspective. This does not necessarily indicate a physical change in location of the associated salaries.

Labor expenses for Hillview Reservoir include day-to-day operations, maintenance, and security. Security costs, in terms of both labor and non-labor expenses, have risen significantly in recent years as initiatives to protect the Water System have been implemented. Pension and fringe benefit rates that are applied to salaries and wages are expected to change in each year as summarized herein.

The source documents for the above referenced costs are DEP records, which identify salary and related costs by employee name and work location. Pension and fringe benefit factors reflect City-wide percentages and were computed at 46% in 2013, 51% in 2014, and 48.1% in 2015 of direct salary and wages. Based on recent analyses prepared by the City, the pension and fringe benefit rate for 2016 is expected to be 48.1%. The assumed rate for 2017 through 2020 is also 48.1% of direct salary and wages. The rates for 2016 through 2020 are subject to change. Pension and fringe benefit rates, which are applied to salary and wage expenses, are summarized below.

Pension/Fringe Benefit Rates (as a % of Salary & Wage $)

Year	Rate (%)
2013	46
2014	51
2015	48.1
2016-2020	48.1

The preceding pension and fringe benefit rates are applied to all projected labor costs related to the supply of water. The projected labor costs for 2016 through 2020 incorporate the projected and assumed changes in the pension and fringe benefit rate and a 3.0% per year increase from the current base personal salary and wage costs.

Approximately 95% of DEP's employees are members of labor unions which represent such employees in collective bargaining with the City. The majority of DEP employees who are members of unions are members of District Council 37 of the American Federation of State, County and Municipal Employees ("DC 37"). On August 5, 2014, the City reached a collective bargaining agreement with DC 37 for the collective bargaining round covering the period of 2010 through 2017 (the "DC 37 Settlement"). Those DEP employees who are not members of labor unions have generally received salary and benefit increases consistent with DC 37.

Projected operation and maintenance expenses assume that settlements with approximately 800 unsettled DEP employees will be consistent with the DC 37 Settlement; however, there can be no assurance to this expectation.

4.3 Calculation of Allocation Percentages - Step B

The remaining elements of the cost of service, i.e., those not directly or fully allocable to facilities north of the City, must undergo one or a series of allocations before an appropriate assignment of costs can be made. Accordingly, allocation percentages are developed for the purpose of apportioning a fair share of costs incurred by one bureau, unit, or location to the benefiting entity. For example, DEP incurs many costs in support of BWS. The DEP cost burden must then be shared by BWS through the use of an allocation percentage. The computation of the allocation percentages used in this report is based on data provided by DEP as presented in Table 10. The allocation factors presented in Table 10 specifically exclude employees working within the City in the wastewater system or the water distribution system.

Reports for the years prior to 2014 used the ratios of salaries and headcount in Table 10 (lines 2 and 5) to allocate DEP Personal Services Costs to Facilities North of the City. This Report continues to use that previous methodology in Table 11A and 12A only for 2013. A simplified allocation process is used for 2014 and 2015 and future years by using salary-based percentages only, in lieu of also using headcount (Table 10, line 9), to calculate the allocated costs for 2014 through 2020 in Tables 11A and 11B as well as Tables 12A and 12B.

4.4 Allocation of Department of Environmental Protection Costs - Step C

Expenses of DEP that are covered by Step C represent personnel and other expenditures of DEP that are allocable to management, administration, and support services needed to operate and maintain the water supply facilities located north of the City. Again, City water distribution costs are specifically excluded.

Tables 11A and 11B illustrate allocated personal services costs, while Tables 12A and 12B present the allocation of a portion of DEP OTPS costs to facilities north of the City. Examples of the services provided include fleet administration, data processing, and personnel recruiting and

management. The total costs to be allocated are multiplied by allocation percentages to obtain the costs for facilities located north of the City.

Allocated DEP personal services costs in 2016 through 2020 reflect the same assumptions identified in Section 4.2.5. OTPS costs are assumed to increase at an annual rate of 3.0%.

4.5 Allocation of City Central Service Costs - Step D

The City incurs costs that must be distributed among all of its operating entities. Such costs include planning, budgeting, accounting, purchasing, legal services, and other related activities. A cost allocation plan is developed to distribute the City-wide costs. The plan is approved by the federal government in connection with federal aid received by the City. After the City-wide allocation process, the DEP portion of the City's costs is divided further between non-utility and water and sewer utility components. The water and sewer utility-related costs are then distributed among the various DEP water and sewer functions using headcount allocation percentages. BWS is one of the functions to which costs are allocated. This cost is then further allocated to relate to facilities located north of the City. The allocated Central Service costs were $2,430,408 in 2015. Overall City support service costs to DEP are expected to be relatively stable in future years. Thus, such costs attributable to water supply are assumed to be $2,430,408 in 2016 and each year thereafter.

4.6 Cost of Service - Step E

The calculations of the total cost of water supply and the cost of water supply attributable to upstate customers are presented for 2013 through 2015 in Table 1A and for 2016 through 2020 in Table 1B. Additional tables are referenced to support the various categories of costs and offsetting revenues. These additional tables provide a detailed breakdown of the components of each step of the cost of service analysis.

The total cost of service (excluding reconciliations) is estimated to be $711,244,838 in 2016 and $662,651,862 in 2017. Of these amounts, $592,256,424 in 2016 and $540,053,195 in 2017, or about 83% and 81% (excluding the effects of the reconciliation), respectively, is for debt service, defeasance, and direct out-of-pocket expenses (OTPS costs) associated with operating and maintaining the water supply facilities located north of the City. As illustrated in Table 4B, the largest item of OTPS expense for the supply of water is real estate taxes paid to upstate communities for watershed properties. Excluding the reconciliations, upstate taxes (included with OTPS expenses) will represent approximately 22% of all water supply costs in 2016 and 25% in 2017.

Direct salary, pension costs, and fringe benefits for personnel directly and indirectly related to the water supply facilities located north of the City account for about another 16% and 18% of all costs, excluding the effects of the reconciliation credits, in 2016 and in 2017, respectively.

After accounting for the reconciliation credit/cost, the net total cost of water supply as presented in Table 1B (line 19) is $721,416,877 for 2016 and $683,723,461 for 2017. These amounts include the effects of the net reconciliation charge of $10,172,039 that is added to the total cost of service for 2016 and 2017 and reflects the effect of the four-year allocation or phase-in of the total reconciliation cost for 2014 of $40,688,154. As a result, the net reconciliation cost of $10,172,039 will be added to the total cost of service in each year for 2016 through 2019. The net reconciliation charge of $10,899,560 that is added to 2017 reflects the effect of the four-year allocation or phase-in of the total reconciliation cost for 2015 of $43,598,241. The net reconciliation cost of $10,899,560 will be added to the total cost of service in each year for 2017 through 2020.

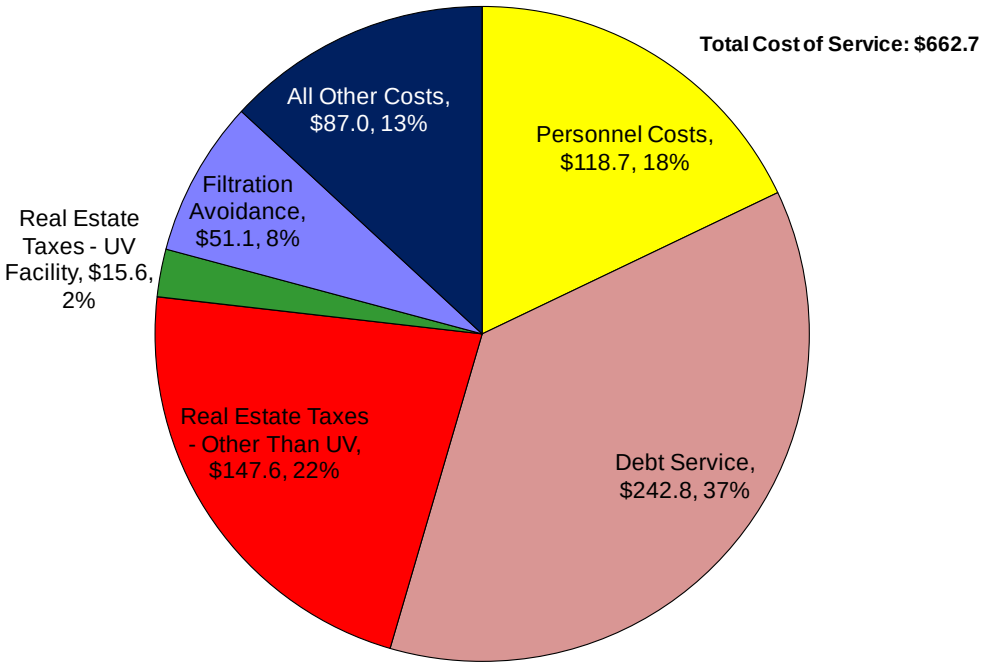
The projections currently show a decrease in the cost of service between 2016 and 2017, reflecting the assumption that there will be a significant reduction in the cash used for defeasance in 2017. This assumption is subject to change.

The cost of water supply service as presented herein does not take into consideration the need to maintain an operation and maintenance reserve fund, to provide working capital to pay construction costs before being reimbursed through the proceeds of commercial paper, or to ensure liquidity in operating funds. It also assumes that all upstate customers pay their bills for water service on a timely basis, thus avoiding the need to include an allowance in the cost of service for late payments.

The chart below illustrates the breakdown of the total cost of service for the 2017 rate year excluding the effects of the reconciliation of prior year costs.

Figure 5 **Projected 2017 Cost of Service Components**

(all amounts in $ millions)



4.7 Calculation of the Regulated Rate - Step F

Table 1A presents both a net cost of service (line 19) and a unit rate net of the reconciliation (line 21) for 2013 through 2015. Table 1B shows the projected net cost of service and a unit rate net of the reconciliation for 2016 through 2020.

The 2016 rate includes a reconciliation of costs for 2014. As such, the cost of service recovered in 2014 (based on the adopted 2014 rate and the actual quantity of water consumed) was less than the actual 2014 cost of service (based on computed actual cost to the Board). Therefore, a reconciliation of the 2014 projected and actual costs of service, consumption, and rates was prepared with the resulting cost being applied towards the cost of service for the current rate year of 2016 and the next three years as discussed in Section 4.6.

Given the potential for variations in financing and commodities costs as well as changes in water consumption, this "true-up" approach is intended to ensure that both upstate and in-City customers pay their appropriate shares of the cost of water supply service.

Table 1B summarizes the calculation of the projected 2017 regulated rate and upstate cost of service. The regulated rate per MG of water use is computed by first calculating the total cost of service in line 13 and then dividing by the total water consumption shown on line 14. An excerpt from Table 1B is provided below to show the calculation of the proposed rate.

Summary of the Calculation of the Proposed 2017 Rate

13	Total Costs Related to Facilities North of the City	$	662,651,862
14	System Usage	MG	390,582
15	Unit Rate to Recover the Total Costs (line 13 divided by 14)	$/MG	1,696.57
18a	No Phasing of 2015 Reconciliation for FY 2013	$	0
18b	Phasing of 2016 Reconciliation for FY 2014	$	10,172,039
18c	Phasing of 2017 Reconciliation for FY 2015	$	10,899,560
19	Net Total Costs for Facilities North of the City (line 13+18a,b,&c)	$	683,723,461
21	Unit Rate Net of Reconciliation (line 19 / line 14)	$/MG	1,750.52
22	Upstate New York Usage	MG	38,720
23	Total Upstate Cost Including Reconciliation (line 21 x line 22)	$	67,780,313

After taking into account the reconciliation, the resulting unit rate, shown on line 21, is $1,750.52 per MG in 2017.

The cost of service attributable to upstate customers (including the cost reconciliation) is calculated by multiplying the proposed unit rate of $1,750.52 by the projected annual upstate water consumption shown on line 22 of Table 1B. The resulting upstate cost is approximately $67.8 million for 2017. The remaining cost of water supply, approximately $615.9 million, will be recovered from in-City water customers through rates and charges.

Beginning with the report for the 2016 cost of service and rate, the reconciliation methodology used differs from past reports by using a four-year allocation of the true-up amount instead of applying the full amount to the cost of service in the proposed rate year. This was done because if we had followed the previous methodology, the shortfall in the recovery of water supply costs in 2014 and 2015 would have been applied in full to the cost of service for 2016 and 2017, respectively. For example, for the 2017 reconciliation, the 2015 shortfall of $43,598,241 would have resulted in a cost of service and proposed regulated rate for 2017 of $716,422,142 and $1,834.24 per MG, respectively, which would be a 6.1% increase from the current 2016 rate. The size of the reconciliation from 2015 and thus the significant increase in the total cost of service and regulated rate for 2017 is being driven to a large degree by the cost of defeasance of debt. The use of defeasance produces substantial debt service savings, which will reduce the cost of service in future years for both upstate and in-City ratepayers as outlined previously. However, in recognition of the short-term effects that such defeasance has on the reconciliation amount for 2015 and potentially for 2016, the calculations in this Report spread recovery of the reconciliation amount for these years over a four-year period so as to moderate the resulting increase (or decrease) in the regulated rate. The Board may consider whether or not to use this methodology in the reconciliation for the cost of service in any future year on a case-by-case basis. It is not recommended that a reconciliation period longer than four years be used since in-City ratepayers are essentially paying for the costs of defeasance in the year in which such moneys are spent. The four-year maximum period recognizes the need to recover such costs promptly while avoiding substantial fluctuations in the unit rates for water supply from year to year.

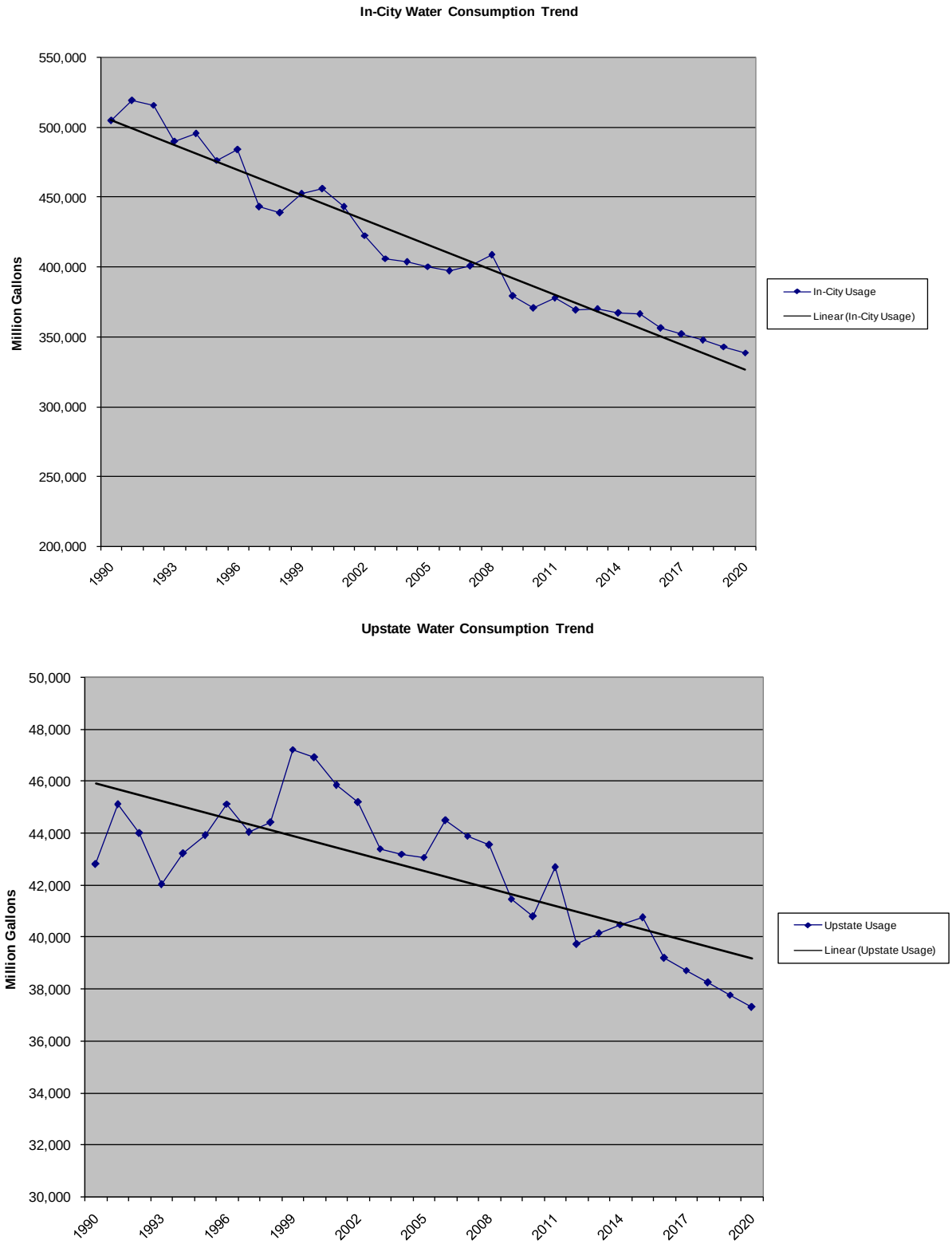
The water consumption used in calculating the regulated rate reflects a calculated decline in demand based on the results of a regression analysis. Water consumption data since 1985 is presented in Table 13. However, given the many changes that have occurred due to metering within the City, the availability of water conserving fixtures, and other factors, a 10-year regression analysis is used in estimating future water demand by both in-City and upstate customers. The results of the regression analysis show a gradually declining annual consumption by both in-City and upstate customers. The projected System-wide demand is used in developing the projected unit rate.

The results of the analyses provide an anticipated water consumption of 395,475 MG in 2016 and 390,582 MG in 2017. The upstate share of total water consumption using the regression analysis is estimated to be 39,194 MG in 2016 and 38,720 MG in 2017. In Figure 6, a line graph illustrates the projected consumption for both in-City and upstate customers. Only the total System consumption is used in computing the unit rate.

Water consumption was higher than expected in 2015. Additionally, the 2016 year-to-date consumption is about 1.0% higher in-City through February 29, 2015 compared to the prior year and about 3.1% higher in upstate communities through January 31, 2016 from the usage for the same time period in fiscal year 2015. Thus, the actual unit rate for 2016 may change from the preliminary computation in part because of the changes in water consumption.

The use of the regression analysis was previously agreed-to by the City and representatives of upstate customers as a means to estimate future consumption. The regression analysis that is used in computing the projected unit rates for purposes of this report produces somewhat different projections of a decline in consumption than the assumptions currently used for in-City usage and rate projections. The regression results show an annual pace of decline that ranges from 2.7% in 2016 to 1.3% in 2020. Current in-City assumptions are a 1.5% per year rate of decline from 2016 through 2019 and 1.0% annual rate of decline in 2020.

Figure 6 Comparison of Water System Consumption



4.8 Additional Issues Relating to the Cost of Service and the Regulated Rate

There are other issues relevant to the Board's deliberations on the establishment of a regulated rate for 2017. Certain of these issues are summarized herein.

4.8.1 Operating Risks

The cost of service computations are presented on the cash basis methodology as required by NYSDEC. The cost of service analysis and regulated rate proposed for 2017 reflect no allowance for the risks being borne by the City as the owner and operator of the Water System. Other large water systems are permitted to earn a premium over the cost of service to provide an allowance for such risks.

4.8.2 Water Demand Management Initiatives

DEP has invested and continues to invest substantial amounts of money in water demand management initiatives, and such investments will help reduce the need to develop new supplies of water in the future and ensure that the Water System has sufficient capacity during the period when the Delaware Aqueduct is shut down for repairs. (See Sections 1.3.1.7 and 1.3.2.1.)

On May 4, 2012, the Board adopted a modified Multiple-family Conservation Program ("MCP"), pursuant to which the majority of the accounts that had been billed on the frontage basis were converted to a flat rate per dwelling unit per year. Currently, approximately 26,000 accounts are billed on MCP. All accounts enrolled in the MCP either currently have meters and high-efficiency plumbing fixtures installed or have a deadline to install approved meters and high-efficiency plumbing fixtures. DEP is also continuing its universal metering program and has been installing an automated meter reading ("AMR") system that provides DEP and all metered customers with access to information on daily water use; as of January 2016, more than 431,000 new water meters of less than two inches in diameter and a total of 36,100 meters of two inches or more in diameter have been replaced. In addition, over 818,800 AMR devices have been installed in conjunction with this program. These initiatives will likely provide a significant long-term reduction in water use.

DEP is undertaking a Municipal Water Efficiency Program to install spray showers in City parks and replace plumbing fixtures in public schools. Examples of other programs being used by DEP include the following:

- Sonar Leak Detection Program
- Meter Slippage Testing
- Hydrant Locking Devices
- Residential Water Survey Program
- School Programs on Water Conservation

The cost of service and regulated rate, as presented herein, do not include the costs of the funds invested in metering in-City customers or any of the other programs listed above.

North of the City, the Board is providing demand management consulting services to analyze and make recommendations regarding water demand for the eight upstate customers that have executed agreements with the Board. These customers are:

- Village of Ossining;
- Village of Tarrytown;
- Westchester Joint Water Works;
- City of Mt. Vernon;
- Village of Scarsdale;
- Town of New Windsor;
- Town of Greenburgh; and
- SUEZ Water Westchester (formerly United Water Westchester).

Such upstate customers may be eligible to receive DEP funding for initiatives developed in their plans.

4.8.3 Upstate Wastewater Treatment Plants

In addition to non-City owned plants, the City owns and operates wastewater treatment plants in the watershed and is responsible for capital improvements in those facilities. Given the absence of a mechanism to recover the operating and capital costs of these facilities directly from the users of these systems, such costs are included within the cost of water supply service and the calculation of the regulated rate.

5.0 Impacts on Customers of the Proposed Regulated Rate

The proposed regulated rate for 2017 is $1,750.52 per MG. The proposed regulated rate represents an increase of $21.53 per MG from the current 2016 unit rate of $1,728.99 or a 1.25% increase. (Without the effect of the spreading of the reconciliation from 2015 over a four year period, the unit rate for the cost of service would be $1,834.24 per MG, representing a 6.1% increase from the current rate.) The rate that was projected for 2017 in May 2015 was $1,808.62 per MG or an increase of 4.6% from the current rate. The impact on a typical single family homeowner of the proposed increase in the unit rate would be modest. The increase in charges attributable to a single family residence using 80,000 gallons of water per year would be $1.72 for the entire year or about a half of a cent per day.

The current estimate of the unit cost of service for 2016 is $1,798.46 per MG, which is higher than the projected unit cost of $1,701.15 per MG that was calculated approximately one year ago based on information available at that time. Each of these figures is prior to the effects of the reconciliation. After the effect of the reconciliation is taken into consideration, the preliminary calculated net unit cost of service for 2016 at the time of this report is $1,824.18 per MG which is again higher than the rate in effect of $1,728.99 per MG. The current estimate of the unit cost of service for 2016 will change based on actual costs incurred and actual water consumption by customers during the remainder of fiscal year 2016.

For 2018 through 2020, Figure 7 outlines the anticipated percentage change in the unit cost of water supply and the portions of the change attributable to increases or decreases in the cost of service and water consumption. If consumption declines at a pace that is faster than expected, the unit rate for water supply will increase in order to recover the estimated cost of service. As noted above, the unit cost of service in 2016 may be higher than the unit rate being charged by the Board. If the final results for 2016 confirm this expectation, the percentage change in the unit rate due to the cost of service and the percentage change in the calculated unit rate for water supply in 2018 may increase from the amounts shown in Figure 7 due to the effects of the reconciliation for both 2015 and 2016.

Figure 7 Impact of Cost of Service and Consumption on Unit Rate

New York City Water Board
Cost of Supplying Water to Upstate Customers

	2018	*2019*	*2020*
Percentage Change in the Unit Rate due to Increase in Cost of Service (Net of Reconciliation)	12.3%	2.0%	2.4%
Percentage Change in the Unit Rate due to Fluctuations in Consumption	1.4%	1.3%	1.3%
Percentage Change in the Calculated Unit Rate for Water Supply (Net of Reconciliation)	13.7%	3.3%	3.7%

* Totals may not add due to rounding.

The potential impact of the proposed revisions to the regulated rate on the actual rate schedules for upstate customers will depend to a large extent on the upstate suppliers' cost of purchased water in relation to the total cost of service experienced by these suppliers. To illustrate the potential effects on the overall charges to customers, Tables 2A and 2B present the rate structures of several upstate communities that purchase water from the City. The annual single family residential water charge is computed for each community using an 80,000 gallon per year allowance. Table 3 illustrates the computed single family charge and the estimated percentage increase in that charge that would occur with the proposed regulated rate for 2017.

Additional rate increases are anticipated in future years based on the need to protect the water supply for all customers and to avoid the costly possibility of having to filter Catskill and Delaware System water. Future changes in rates are dependent upon whether or not the overall declining trend in consumption continues as well as changes in debt service for capital improvements and the costs of watershed protection.

Prior to 2008, the rates and charges of the Board that were assessed to upstate customers for water supply service were generally less than the actual cost to the City. Table 15 illustrates the charges to upstate customers versus the computed cost to the City of serving those customers. The figures shown in Table 15 do not consider the effects of the reconciliation of the cost of service from prior years.

Report on the Cost of Supplying Water to Upstate Customers for the 2017 Rate Year

Appendices

Supporting Calculations for the Cost of Service and the Regulated Rate

Table 1A Historical Cost of Service

TABLE 1A
New York City Water Board
Cost of Supplying Water to Upstate Customers
Historical Cost of Service

No.	Description		FY 2013	FY 2014	FY 2015
	Bureau of Water Supply Direct				
	Costs for Facilities North of the City				
1	Other Than Personal Services	$	221,323,950	239,487,897	236,831,336
2	Debt Service	$	202,051,260	211,803,587	203,942,606
3a	Cash Used for Capital Construction	$	0	33,812,014	0
3b	Cash Used for the Defeasance of Debt	$	44,886,867	59,971,844	122,584,533
4	Judgment and Claims	$	526,166	42,626	126,319
5	Less Miscellaneous Revenue	$	(9,170,702)	(12,278,757)	(8,139,564)
	Personal Services				
6	Field Personnel	$	76,835,277	83,089,140	84,417,460
7	Support and Administrative Personnel	$	17,047,891	19,160,572	19,313,007
8	Total Costs Directly Related to Facilities North of the City	$	553,500,709	635,088,923	659,075,697
	Upstate Share of NYC DEP Costs				
9	Personal Services	$	7,640,158	7,639,449	8,110,898
10	Other Than Personal Services	$	7,268,211	8,548,445	10,109,064
11	Total NYC DEP Costs Allocated to Facilities North of the City	$	14,908,369	16,187,895	18,219,962
12	***Upstate Share of City Central Service Costs*** [(1)]	$	1,262,185	2,425,275	2,430,408
13	Total Costs Related to Facilities North of the City	$	569,671,263	653,702,092	679,726,067
14	System Usage	MG	410,006	407,436	406,815
15	***Unit Rate to Recover the Total Costs (line 13 divided by 14)***	$/MG	1,389.42	1,604.43	1,670.85
16	Unit Rate Charged	$	1,332.30	1,496.76	1,573.61
17	Revenue Raised (line 14 times 16)	$	546,251,339	609,834,207	640,167,985
18	Cost Reconciliation for Prior Years	$	(19,379,766)	(3,179,731)	4,040,159
19	Net Total Costs for Facilities North of the City (line 13+18)	$	550,291,498	650,522,361	683,766,226
20	Difference in Revenue Less Net Total Costs (line 17 minus 19)	$	(4,040,159)	(40,688,154)	(43,598,241)
21	***Unit Rate Net of Reconciliation (line 19 / line 14)***	$	1,342.15	1,596.62	1,680.78
22	Upstate New York Usage	MG	40,143	40,485	40,745
23	Total Upstate Cost Including Reconciliation (line 21 x line 22)	$	53,878,431	64,639,637	68,483,191

Notes:
(1) Based on factors allocating a portion of central city service costs.

Table 1B Cost of Service Projections

TABLE 1B
New York City Water Board
Cost of Supplying Water to Upstate Customers
Cost of Service Projections

Line No.	Description		FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
	Bureau of Water Supply Direct						
	Costs for Facilities North of the City						
1	Other Than Personal Services	$	252,085,562	263,160,433	266,861,417	274,566,431	281,781,595
2	Debt Service	$	225,630,267	242,805,665	271,894,493	290,704,057	315,748,945
3	Cash Used for Capital Construction or Debt Defeasance		114,540,595	34,087,096	71,961,648	56,811,827	49,236,917
4	Judgment and Claims	$	542,908	542,908	542,908	542,908	542,908
5	Less Miscellaneous Revenue	$	(9,570,008)	(9,727,308)	(9,887,754)	(10,051,409)	(10,218,337)
	Personal Services						
6	Field Personnel	$	86,949,984	89,558,484	92,245,238	95,012,595	97,862,973
7	Support and Administrative Personnel	$	19,892,397	20,489,169	21,103,844	21,736,960	22,389,068
8	Total Costs Directly Related to Facilities North of the City	$	690,071,706	640,916,448	714,721,794	729,323,369	757,344,069
	Upstate Share of NYC DEP Costs						
9	Personal Services	$	8,354,225	8,604,852	8,862,998	9,128,887	9,402,754
10	Other Than Personal Services	$	10,388,500	10,700,155	11,021,159	11,351,794	11,692,348
11	Total NYC DEP Costs Allocated to Facilities North of the City	$	18,742,725	19,305,007	19,884,157	20,480,682	21,095,102
12	***Upstate Share of City Central Service Costs***	$	2,430,408	2,430,408	2,430,408	2,430,408	2,430,408
13	Total Costs Related to Facilities North of the City	$	711,244,838	662,651,862	737,036,359	752,234,458	780,869,579
14	System Usage	MG	395,475	390,582	385,690	380,797	375,904
15	***Unit Rate to Recover the Total Costs (line 13 divided by 14)***	$/MG	1,798.46	1,696.57	1,910.96	1,975.42	2,077.31
16	Unit Rate Charged	$/MG	1,728.99				
17	Revenue Raised (line 14 times 16)	$	683,773,190				
18a	No Phasing of 2015 Reconciliation for FY 2013	$					
18b	Phasing of 2016 Reconciliation for FY 2014		10,172,039	10,172,039	10,172,039	10,172,039	
18c	Phasing of 2017 Reconciliation for FY 2015			10,899,560	10,899,560	10,899,560	10,899,560
18d	Phasing of 2018 Reconciliation for FY 2016 (Preliminary)				9,410,922	9,410,922	9,410,922
19	Net Total Costs for Facilities North of the City (line 13+18a,b,c,&d)	$	721,416,877	683,723,461	767,518,880	782,716,979	801,180,061
20	Difference in Revenue Less Net Total Costs (line 17 minus 19)	$	(37,643,687)	N/A	N/A	N/A	N/A
21	***Unit Rate Net of Reconciliation (line 19 / line 14)***	$/MG	1,824.18	1,750.52	1,989.99	2,055.47	2,131.34
22	Upstate New York Usage	MG	39,194	38,720	38,246	37,772	37,298
23	Total Upstate Cost Including Reconciliation (line 21 x line 22)	$	71,496,638	67,780,313	76,109,527	77,639,871	79,495,697

Notes:
(1) The rate adopted by the Board for FY 2016 is $1,728.99 per million gallons including a portion of the effects of the reconciliation from FY 2014.

Table 2A Current Water Rates for Upstate New York Communities

TABLE 2A
New York City Water Board
Cost of Supplying Water to Upstate Customers
Current Water Rates for Upstate New York Communities

	City of White Plains	Village of Scarsdale
Current Water Rates	$2.18/Ccf - 1st 50 Ccf $2.43/Ccf - Next 100 Ccf $2.74/Ccf - Next 200 Ccf (Rates are semi-annual; additional blocks for greater consumption) Plus fixed charge of $29.43 for residential meters 1" or less, per 6 mths	$2.05/Ccf - 1st 50 Ccf (qtrly accts) or 500 Ccf (monthly accts); $7.18 for consumption greater than those amounts. Plus service charge based on meter size: $6.00/qtr for 5/8"; $9.00/qtr for 3/4"; etc.
Avg. Annual Residential Use (Gal.)	80,000	80,000
Avg. Annual Residential Use (Ccf)	106.95	106.95
Avg. Residential Water Bill	$294	$249

	Village of Mamaroneck	Town of Harrison
Current Water Rates	$4.83/Ccf - 1st 66 Ccf per Qtr $5.59/Ccf - Next 150 Ccf per Qtr Plus service charge based on meter size: $27.66/qtr for 5/8"; $33.00/qtr for 3/4"; etc.	$4.36/Ccf - 1st 66 Ccf per Qtr $5.25/Ccf - Next 150 Ccf per Qtr Plus service charge based on meter size: $41.77/qtr for 5/8"; $45.46/qtr for 3/4"; etc.
Avg. Annual Residential Use (Gal.)	80,000	80,000
Avg. Annual Residential Use (Ccf)	106.95	106.95
Avg. Residential Water Bill	$638	$641

	New Rochelle Suez Water Westchester	City of Mount Vernon
Current Water Rates	Delivery charge: $3.9147 / Ccf Purchased Water Charge: $2.2886/Ccf Plus facility charge based on meter size: $11.00/mth for 5/8"; $16.39/mth for 3/4"; etc.	$3.30/Ccf - per quarter Minimum charge based on usage of 15 Ccf/qtr at $49.50
Avg. Annual Residential Use (Gal.)	80,000	80,000
Avg. Annual Residential Use (Ccf)	106.95	106.95
Avg. Residential Water Bill	$828	$353

Notes:
The above rates and charges reflect the rate schedules of each community in February 2016.

Table 2B Current Water Rates for Upstate New York Communities

TABLE 2B
New York City Water Board
Cost of Supplying Water to Upstate Customers
Current Water Rates for Upstate New York Communities

	Town of Carmel	**City of Yonkers**
Current Water Rates	$63.80 per 1,000 cf (Water District #1) $34.50 per 1,000 cf (Water District #2)	$3.34 / Ccf
Avg. Annual Residential Use (Gal.)	80,000	80,000
Avg. Annual Residential Use (Ccf)	106.95	106.95
Avg. Residential Water Bill	$369 - $682	$357

	City of Newburgh	**Village of Cornwall**
Current Water Rates	$6.13 per 1,000 Gal over Minimum Water Facility Fee of $8.64 Per Quarter Minimum charge based on meter size: $36.78/qtr for 5/8" Minimum Charge up to 6,000 gals $85.82/qtr for 3/4" Minimum Charge up to 14,000 gals	$8.56 per 1,000 Gal
Avg. Annual Residential Use (Gal.)	80,000	80,000
Avg. Annual Residential Use (Ccf)	106.95	106.95
Avg. Residential Water Bill	$525	$685

Notes:
The above rates and charges reflect the rate schedules of each community in February 2016.

Table 3 Summary of Impacts on Upstate Customers

TABLE 3
New York City Water Board
Cost of Supplying Water to Upstate Customers
Summary of Impacts on Upstate Customers

Water System Customer	Typical Single Family Charges	Increase Attributable to Proposed 2017 Regulated Rate	% Change to a Homeowner
City of White Plains	$294	$1.72	0.6%
Village of Scarsdale	$249	$1.72	0.7%
City of New Rochelle	$828	$1.72	0.2%
City of Yonkers	$357	$1.72	0.5%
Village of Mamaroneck	$638	$1.72	0.3%
Town of Harrison	$641	$1.72	0.3%
City of Mount Vernon	$353	$1.72	0.5%
Town of Carmel	$369 - $682	$1.72	0.5% to 0.3%
City of Newburgh	$525	$1.72	0.3%
Village of Cornwall	$685	$1.72	0.3%
New York City	$407	$1.72	0.4%

Notes:
(1) The Typical Single Family Charge for selected communities is based on 80,000 gallons of annual water use and the rate schedules of each community in March 2016.
(2) The increase in annual water charges for New York City in FY 2017 as proposed to the New York City Water Board is 2.1%. The change within the City reflects increases in the cost of water supply and increases in water costs within the City.

Table 4A Historical Upstate Other Than Personal Services Costs

TABLE 4A
New York City Water Board
Historical Cost of Supplying Water to Upstate Customers
Upstate New York Other Than Personal Services Costs

Line No.	Description	FY 2013 $	FY 2014 $	FY 2015 $
	Budget			
1	Supplies and Materials - General	2,690,238	3,222,812	3,509,935
2	Automotive Supplies and Materials	119,979	352,038	340,310
3	Fuel Oil	2,547,405	2,988,597	2,405,134
4	Equipment - General	776,101	910,953	945,466
5	Telecommunications Equipment	26,511	112,213	116,141
6	Office Equipment	56,782	142,647	144,154
7	Contractual Services - General	9,252,942	5,491,859	4,807,999
8	Telephone and Other Communications	293,495	243,704	289,431
9	Office Services	178,861	83,477	130,141
10	Maintenance and Repairs - Motor Vehicles	196,467	331,248	258,710
11	Maintenance and Repairs - General	962,240	1,626,428	1,491,629
12	Rentals - Miscellaneous Equipment	1,913,255	1,946,189	2,882,084
13	Advertising	86,878	103,755	107,825
14	Cleaning Services	647,099	716,991	792,338
15	Licenses (1)	0	0	0
16	Chemicals	3,033,060	3,611,336	4,095,234
17	Real Estate Taxes - Existing Properties	133,866,465	140,803,187	139,084,355
18	Real Estate Taxes - UV Facility	13,931,769	14,691,288	14,873,225
19	NYS DEC Permits (1)	0	0	0
20	Motor Maintenance Supplies	0	537,054	1,512,026
21	Gasoline (1)	0	0	0
22	Lab and Limnology	208,962	78,445	120,169
23	Natural Gas & Electricity (3)	4,599,875	2,554,819	2,093,306
24	Heat, Light & Power (3)	0	1,049,909	913,546
25	Upstate Cost of Service/Rate Studies	54,165	61,180	60,962
26	Hillview Reservoir (2)	12,362,948	13,121,487	11,413,680
27	UV Facility (3)	829,463	6,248,316	4,467,390
28	Filtration Avoidance - O&M Payments	10,281,831	11,906,334	12,447,107
29	Filtration Avoidance - Program Funding	19,764,817	25,001,774	26,332,506
30	Water Supply Environmental Health & Safety	2,642,343	1,549,855	1,196,532
31	Totals	221,323,950	239,487,897	236,831,336

Notes:

(1) Actual costs were not available at the publishing of this report. The City reserves the right to include such expenses in calculating the cost of service and regulated rate at a future date.

(2) Actual costs are shown for FY 2013 through FY 2015.

(3) Natural Gas & Electricity costs were centralized until FY 2013. Starting in FY 2014, electricity costs for the UV facility and Water Supply Heat, Light & Power were separately tracked. FY 2014 costs above have been restated to reflect this change.

Table 4B Projected Upstate Other Than Personal Services Costs

TABLE 4B
New York City Water Board
Projected Cost of Supplying Water to Upstate Customers
Upstate New York Other Than Personal Services Costs

Line No.	Description	FY 2016 $	FY 2017 $	FY 2018 $	FY 2019 $	FY 2020 $
1	Supplies and Materials - General	3,615,233	3,723,690	3,835,400	3,950,462	4,068,976
2	Automotive Supplies and Materials	350,520	361,035	371,866	383,022	394,513
3	Fuel Oil	2,477,288	2,551,606	2,628,155	2,706,999	2,788,209
4	Equipment - General	973,830	1,003,045	1,033,136	1,064,130	1,096,054
5	Telecommunications Equipment	119,625	123,214	126,910	130,717	134,639
6	Office Equipment	148,479	152,933	157,521	162,247	167,114
7	Contractual Services - General	4,952,239	5,100,807	5,253,831	5,411,446	5,573,789
8	Telephone and Other Communications	298,113	307,057	316,269	325,757	335,529
9	Office Services	134,046	138,067	142,209	146,475	150,870
10	Maintenance and Repairs - Motor Vehicles	266,471	274,465	282,699	291,180	299,916
11	Maintenance and Repairs - General	1,536,378	1,582,469	1,629,943	1,678,841	1,729,207
12	Rentals - Miscellaneous Equipment	2,968,546	3,057,603	3,149,331	3,243,811	3,341,125
13	Advertising	111,060	114,392	117,824	121,358	124,999
14	Cleaning Services	816,109	840,592	865,810	891,784	918,537
15	Licenses (1)	0	0	0	0	0
16	Chemicals	4,218,091	4,344,634	4,474,973	4,609,222	4,747,499
17	Real Estate Taxes - Existing Properties	143,256,886	147,554,592	151,981,230	156,540,667	161,236,887
18	Real Estate Taxes - UV Facility	15,098,900	15,552,000	16,018,560	16,499,117	16,994,090
19	NYS DEC Permits (1)	0	0	0	0	0
20	Motor Maintenance Supplies	1,557,387	1,604,109	1,652,232	1,701,799	1,752,853
21	Gasoline (1)	0	0	0	0	0
22	Lab and Limnology	123,774	127,487	131,312	135,251	139,309
23	Natural Gas & Electricity	2,156,105	2,220,789	2,287,412	2,356,035	2,426,716
24	Heat, Light & Power	940,952	969,181	998,256	1,028,204	1,059,050
25	Upstate Cost of Service/Rate Studies	60,962	60,962	60,962	60,962	60,962
26	Hillview Reservoir	11,756,090	12,108,773	12,472,036	12,846,197	13,231,583
27	UV Facility	6,716,050	6,917,532	7,125,057	7,338,809	7,558,973
28	Filtration Avoidance - O&M Payments	14,700,000	14,700,000	15,141,000	15,595,230	16,063,087
29	Filtration Avoidance - Program Funding	31,500,000	36,400,000	33,300,000	34,000,000	34,000,000
30	Water Supply Environmental Health & Safety	1,232,428	1,269,401	1,307,483	1,346,707	1,387,108
31	Totals	252,085,562	263,160,433	266,861,417	274,566,431	281,781,595

Notes:
(1) Actual costs were not available at the publishing of this report. The City reserves the right to include such expenses at a future date.

Table 5A Authority Bond Proceeds

Proceeds of Authority Bonds Used for Upstate Projects

Line	Bond Issue	Total Principal ($)	Total Upstate Allocation	Upstate Principal ($)
1	1986 through 2010	18,339,152,298	14.04%	2,574,964,758
2	FY 2010 Series AA	504,240,000	17.49%	88,192,237
3	FY 2010 Series BB	218,820,000	0.00%	-
4	FY 2010 Series CC	200,000,000	0.53%	1,060,388
5	FY 2010 Series DD	400,000,000	22.50%	89,999,107
6	FY 2010 Series EE	500,000,000	19.32%	96,596,999
7	FY 2010 Series FF	359,110,000	0.00%	-
8	FY 2010 Series GG	554,045,000	29.31%	162,377,029
9	**2011 Total**	21,075,367,298	14.30%	3,013,190,518
10	FY 2011 Series AA	750,000,000	19.20%	143,981,546
11	FY 2011 Series CC	750,000,000	16.04%	120,328,717
12	FY 2011 Series DD	275,000,000	37.68%	103,609,101
13	FY 2011 Series EE	450,000,000	28.32%	127,438,636
14	FY 2011 Series FF	200,000,000	31.20%	62,392,534
15	FY 2011 Series GG	250,000,000	33.69%	84,237,054
16	**2012 Total**	23,750,367,298	15.39%	3,655,178,106
17	FY 2012 Series A-1, A-2	200,000,000	24.25%	48,498,906
18	FY 2012 Series AA	250,000,000	22.34%	55,858,298
19	FY 2012 Series BB	450,000,000	16.56%	74,520,000
20	FY 2012 Series CC&DD	400,000,000	23.01%	92,024,345
21	FY 2012 Series EE	77,725,000	26.57%	20,650,174
22	FY 2012 Series B1-B4	325,000,000	34.13%	110,924,326
23	FY 2012 Series FF&GG	450,000,000	37.68%	169,568,242
24	**2013 Total**	25,903,092,298	16.32%	4,227,222,397
25	FY 2013 Series AA-1, AA-2	200,000,000	23.69%	47,373,605
26	FY 2013 Series BB	440,510,000	18.22%	80,256,919
27	FY 2013 Series CC	455,955,000	10.68%	48,707,107
28	FY 2013 Series EE	292,925,000	18.35%	53,742,595
29	**2014 Total**	27,292,482,298	16.33%	4,457,302,623
30	FY 2014 Series AA	650,870,000	26.13%	170,095,641
31	FY 2014 Series BB	397,085,000	13.09%	51,984,538
32	FY 2014 Series CC	351,240,000	20.91%	73,429,272
33	**2015 Total**	28,691,677,298	16.57%	4,752,812,075
34	FY 2015 Series AA	200,000,000	21.12%	42,249,215
35	FY 2015 Series BB	400,000,000	19.03%	76,115,880
36	FY 2015 Series CC	200,000,000	9.60%	19,197,911
37	FY 2015 Series EE	136,135,000	25.94%	35,317,950
	2016 Total	29,627,812,298		4,925,693,031
38	FY 2016 AA-1, AA-2, AA-3	250,000,000	13.28%	33,193,059
39	FY 2016 BB	328,030,000	17.52%	57,466,192
		30,205,842,298		5,016,352,282
40	**2017-2020 Total**		16.45%	

Notes:

(A) The 1991 C Bonds were not included in the calculations used in the report. The total principal was $4,650,000.

(B) Figures for recent bond issues are preliminary; the upstate portion may change after all bond proceeds are spent.

Table 5B NYSEFC Bond Proceeds

Table 5B
New York City Water Board
Cost of Supplying Water to Upstate Customers
Proceeds of NYSEFC Bonds Used for Upstate Projects

Line No.	Bond Issue	Total Principal ($)	Upstate Allocation	Upstate Principal ($)
1	1986 through 2007	5,229,488,675	5.61%	293,549,848
2	FY 2008 Series 1,2	399,690,401	19.01%	75,989,525
3	**2009 Total**	5,629,179,076	6.56%	369,539,373
4	FY 2009 Series 1,2	448,435,268	27.23%	122,116,226
5	**2010 Total**	6,077,614,344	8.09%	491,655,599
6	FY 2010 Series 2,3,4	406,684,607	26.75%	108,800,028
7	**2011 Total**	6,484,298,951	9.26%	600,455,626
8	FY 2011 Series 1	478,881,733	18.80%	90,032,698
9	**2012-2014 Total**	6,963,180,684	9.92%	690,488,324
10	FY 2014 Series 2	209,380,000	16.20%	33,914,464
11	**2015 Total**	7,172,560,684	10.10%	724,402,788
12	FY 2016 Series 1,2	302,210,000	27.17%	82,100,990
		7,474,770,684		806,503,778
13	**2017-2020 Total**		10.01%	

Notes:
(A) Figures for recent bond issues are preliminary; the upstate portion may change after all bond proceeds are spent.

Table 5C Debt Service

Table 5C
New York City Water Board
Cost of Supplying Water to Upstate Customers
Debt Service

Line No.	Description		Actual FY 2015 $	FY 2016 $	FY 2017 $	Projected FY 2018 $	FY 2019 $	FY 2020 $
	System Totals - Capital-Related Costs							
1	Authority Debt Service - First Resolution (A.)	A	198,392,919	120,384,543	163,326,000	173,481,000	206,001,000	239,875,000
2	Anticipated Debt Service - First Resolution	B	-	-	12,000,000	36,000,000	61,000,000	84,000,000
3	Authority Debt Service - Second Resolution (A.)	C	790,136,739	946,377,202	951,536,854	1,011,121,854	998,716,854	1,017,199,854
4	Anticipated Debt Service - Second Resolution	D	-	15,000,000	45,000,000	113,000,000	179,000,000	244,000,000
5	Interest on Short-Term Debt	E	168,978	1,500,000	18,000,000	25,500,000	25,500,000	25,500,000
6	NYS EFC Outstanding Debt Service	F	381,829,355	396,474,907	397,082,592	389,761,633	382,255,917	374,670,009
7	NYS EFC Projected Debt Service	G	-	29,000,000	36,000,000	51,000,000	67,000,000	83,000,000
	System Totals - Interest Earnings & Expenses							
8	Debt Service Fund	H	(1,476,305)	-	-	-	(1,000,000)	(1,000,000)
9	Debt Service Reserve Fund	I	(29,390,248)	(29,000,000)	(24,000,000)	(23,000,000)	(23,000,000)	(19,000,000)
10	Construction Fund	J	(23,296)	-	(1,000,000)	(1,000,000)	(2,000,000)	(2,000,000)
11	Subordinated Debt Service Fund	K	-	-	(2,000,000)	(2,000,000)	(5,000,000)	(5,000,000)
12	Miscellaneous Income & Expenses	L	(1,385,630)	-	-	-	-	-
13	Less: Authority Debt-Related Expenses	M	45,306,374	52,635,000	55,266,000	58,030,000	60,932,000	63,979,000
	Water Supply - Capital-Related Costs							
14	Authority Debt Service - First Resolution (A.)	A x N	32,864,034	19,941,849	26,864,463	28,534,795	33,883,804	39,455,525
15	Anticipated Debt Service - First Resolution	B x N	-	-	1,973,804	5,921,413	10,033,505	13,816,630
16	Authority Debt Service - Second Resolution (B.)	C x N	130,887,135	156,768,562	156,512,291	166,313,052	164,272,632	167,312,784
17	Anticipated Debt Service - Second Resolution	D x N	-	2,484,769	7,401,766	18,586,657	29,442,580	40,134,020
18	Interest on Short-Term Debt	E x O	25,806	229,081	2,726,968	3,863,204	3,863,204	3,863,204
19	NYS EFC Debt Service	(F+G)xP	38,563,389	42,971,433	43,342,727	44,111,242	44,961,346	45,803,425
	Water Supply - Interest Earnings							
20	Debt Service Fund	H x N	(244,552)	-	-	-	(164,484)	(164,484)
21	Debt Service Reserve Fund	I x N	(4,868,531)	(4,803,886)	(3,947,609)	(3,783,125)	(3,783,125)	(3,125,190)
22	Construction Fund	J x O	(3,558)	-	(151,498)	(151,498)	(302,996)	(302,996)
23	Subordinated Debt Service Fund	KxNxP	-	-	(289,947)	(292,688)	(733,499)	(736,677)
24	Miscellaneous Income & Expenses	LxNxP	(200,343)	-	-	-	-	-
25	Less: Authority Debt-Related Expenses	M x O	6,919,225	8,038,459	8,372,700	8,791,441	9,231,089	9,692,704
26	Net Water Supply Debt Service		203,942,606	225,630,267	242,805,665	271,894,493	290,704,057	315,748,945
			FY 2015	**FY 2016 (B.)**	**FY 2017-2020(C.)**			
27	Upstate Authority $ as a % of Total Authority CIP $	N	16.57%	16.57%	16.45%			
28	Upstate Total CIP $ as a % of Total CIP $	O	15.27%	15.27%	15.15%			
29	Upstate NYS EFC $ as a % of Total NYS EFC CIP $	P	10.10%	10.10%	10.01%			

(A.) Includes the estimated effects of the proposed FY 2016 defeasance in FY 2017 through FY 2020.
(B.) Uses the same percentages as for 2015 since not all proceeds of 2015 bonds were spent as of the date of this report
(C.) Uses the average of the percentages applicable to 2014 and 2015

Table 5D Cash Used for Construction and the Defeasance of Debt

TABLE 5D
New York City Water Board
Cost of Supplying Water to Upstate Customers
Cash Used for Capital Construction and the Defeasance of Debt
All Amounts in $

	Cash Used for Capital Construction/ Defeasance	Cash Used for Capital Construction	Cash Used for the Defeasance of Debt	Upstate CIP as a % of Water/Sewer CIP (1)
FY 2012	239,600,000	0	239,600,000	14.15%
FY 2013	299,990,000	0	299,990,000	14.96%
FY 2014	624,079,000	225,000,000	399,079,000	15.03%
FY 2015	802,670,879	0	802,670,879	15.27%
FY 2016	750,000,000	0	750,000,000	15.27%
FY 2017	225,000,000	N/A	N/A	15.15%
FY 2018	475,000,000	N/A	N/A	15.15%
FY 2019	375,000,000	N/A	N/A	15.15%
FY 2020	325,000,000	N/A	N/A	15.15%

	Upstate Portion of Cash Used for Capital Construction/ Defeasance	Upstate Portion of Cash Used for Capital Construction	Upstate Portion of Cash Used for the Defeasance of Debt
FY 2012	33,901,055	0	33,901,055
FY 2013	44,886,867	0	44,886,867
FY 2014	93,783,858	33,812,014	59,971,844
FY 2015	122,584,533	0	122,584,533
FY 2016	114,540,595	0	114,540,595
FY 2017	34,087,096	N/A	N/A
FY 2018	71,961,648	N/A	N/A
FY 2019	56,811,827	N/A	N/A
FY 2020	49,236,917	N/A	N/A

(1) Upstate CIP % is from Table 5C for FY 2015 - FY 2020. FY 2012 - FY 2014 is based on historical calculations that are included in prior rate reports.
(2) The amounts shown for FY 2016 through FY 2020 are preliminary and subject to change.

Table 6 Judgments and Claims

TABLE 6
New York City Water Board
Cost of Supplying Water to Upstate Customers
Judgments and Claims

Year	Historical Costs ($)
2001	75,160
2002	4,480
2003	0
2004	0
2005	0
2006	0
2007	5,513,361
2008	3,695
2009	26,925
2010	668,221
2011	916,350
2012	240,320
2013	526,166
2014	42,626
2015	126,319
Average (2001-2015)	542,908
Projection Years (2016-2020)	542,908

Table 7 Miscellaneous Revenue

TABLE 7
New York City Water Board
Cost of Supplying Water to Upstate Customers
Miscellaneous Revenue
All Amounts in $

Year	Hydropower	Rents (Permits)	Tax Refunds	Total
2001		795,290	189,518	984,808
2002		935,023	50,686	985,709
2003		723,939	0	723,939
2004	1,105,639	1,348,358	50,686	2,504,683
2005	1,396,145	1,788,012	0	3,184,157
2006	1,321,881	2,379,307	0	3,701,188
2007	4,987,041	2,300,515	0	7,287,556
2008	7,239,859	995,209	0	10,017,035
2009	6,086,074	1,800,000	248,145	8,134,219
2010	5,117,222	1,855,183	0	6,972,405
2011	8,299,784	1,568,273	0	9,868,057
2012	4,388,471	2,021,826	0	6,410,297
2013	5,540,899	3,420,571	209,232	9,170,702
2014	10,466,857	1,811,900	0	12,278,757
2015	6,307,979	1,831,585	0	8,139,564
Average		1,704,999		
Projection Years (2016-2020)				
2016	7,865,008	1,704,999	0	9,570,008
2017	8,022,308	1,704,999	0	9,727,308
2018	8,182,755	1,704,999	0	9,887,754
2019	8,346,410	1,704,999	0	10,051,409
2020	8,513,338	1,704,999	0	10,218,337

Notes:

(1) Certain historical revenues for hydropower and rents have changed from prior reports based on updated information from the City.

(2) FY 2015 hydropower revenue is shown net of expenses. Hydropower revenue in prior years and projected hydropower revenue for FY 2016 - FY 2020 excludes expenses which are included in Tables 4A and 4B for those years.

Table 8A Historical Upstate Direct Personal Services Costs

TABLE 8A
New York City Water Board
Historical Cost of Supplying Water to Upstate Customers
Upstate New York Field Personnel Costs

Line No.	Description	FY 2013 $	FY 2014 $	FY 2015 $
	Divisional and Sectional Offices			
1	Katonah Resource Protection	135,541	334,647	559,156
2	Carmel Section	5,052,739	4,597,914	4,829,640
3	Prattsville/Schoharie	2,181,738	1,936,688	2,192,802
4	Ashokan	7,481,827	4,844,596	7,075,003
5	Grahamsville	5,305,359	5,704,146	5,975,844
6	Port Jervis	570,322	564,414	622,995
7	E. Division Hudson River P/S	710,849	1,548,546	1,846,677
	Laboratories			
8	Kensico	1,711,554	1,717,520	1,619,396
9	Brewster	543,607	563,356	601,186
10	Grahamsville	1,247,113	1,317,424	1,316,672
	Other Services			
11	Downsville	3,576,821	3,688,543	3,539,045
12	Sutton Park (1)	7,787,847	10,136,219	9,446,530
13	Kingston	9,412,845	9,769,561	9,357,983
14	Watershed Security (2)	13,617,410	16,433,666	16,644,827
15	Watershed-East of Hudson	5,661,851	5,849,433	5,190,002
16	Downsville/Water Plan and Protect	254,139	247,549	219,576
17	Mahopac	740,052	826,479	793,274
18	Environmental Health & Safety	215,590	0	0
19	Hillview Reservoir (3)	4,235,366	5,864,310	6,136,666
20	UV Facility	4,244,876	4,126,419	3,962,912
21	Direct Personnel Overtime Costs	2,147,832	3,017,709	2,487,273
22	**Total Personal Services Costs**	**76,835,277**	**83,089,140**	**84,417,460**

Notes:

(1) Sutton Park expenses include costs for laboratories.
(2) Hillview, Croton, Ashokan, Schoharie, Kingston, Downsville, Neversink, Beerston & other watershed locations.
(3) Hillview Reservoir costs include overtime expenses, which are not included in Line 21.
(4) Personal service costs include salary, wages and a fringe benefit rate of 46.0% in FY 2013, 51% in FY 2014, and 48.1% in FY 2015.
(5) Upward or downward changes from year to year in a particular category of costs may reflect shifts in classifications for accounting purposes as opposed to changes in personnel functions or responsibilities.

Table 8B Projected Upstate Direct Personal Services Costs

TABLE 8B
New York City Water Board
Cost of Supplying Water to Upstate Customers
Upstate New York Field Personnel Costs

Line No.	Description	*Projected Years* FY 2016 $	FY 2017 $	FY 2018 $	FY 2019 $	FY 2020 $
	Divisional and Sectional Offices					
1	Katonah Resource Protection	575,931	593,209	611,005	629,335	648,215
2	Carmel Section	4,974,530	5,123,766	5,277,478	5,435,803	5,598,877
3	Prattsville/Schoharie	2,258,586	2,326,343	2,396,134	2,468,018	2,542,058
4	Ashokan	7,287,253	7,505,871	7,731,047	7,962,979	8,201,868
5	Grahamsville	6,155,119	6,339,773	6,529,966	6,725,865	6,927,641
6	Port Jervis	641,685	660,936	680,764	701,187	722,222
7	E. Division Hudson River P/S	1,902,077	1,959,140	2,017,914	2,078,451	2,140,805
	Laboratories					
8	Kensico	1,667,978	1,718,017	1,769,558	1,822,645	1,877,324
9	Brewster	619,221	637,798	656,932	676,640	696,939
10	Grahamsville	1,356,172	1,396,858	1,438,763	1,481,926	1,526,384
	Other Services					
11	Downsville	3,645,216	3,754,573	3,867,210	3,983,226	4,102,723
12	Sutton Park (1)	9,729,926	10,021,824	10,322,478	10,632,153	10,951,117
13	Kingston	9,638,723	9,927,885	10,225,721	10,532,493	10,848,468
14	Watershed Security (2)	17,144,172	17,658,497	18,188,252	18,733,899	19,295,916
15	Watershed-East of Hudson	5,345,702	5,506,073	5,671,255	5,841,393	6,016,635
16	Water Plan and Protect	226,164	232,949	239,937	247,135	254,549
17	Mahopac	817,072	841,584	866,832	892,836	919,622
18	Environmental Health & Safety	0	0	0	0	0
19	Hillview Reservoir	6,320,766	6,510,389	6,705,701	6,906,872	7,114,078
20	UV Facility	4,081,799	4,204,253	4,330,381	4,460,292	4,594,101
21	Direct Personnel Overtime Costs	2,561,891	2,638,747	2,717,910	2,799,447	2,883,431
22	**Total Personal Services Costs**	**86,949,984**	**89,558,484**	**92,245,238**	**95,012,595**	**97,862,973**

Notes:

(1) Sutton Park expenses include costs for laboratories.
(2) Hillview, Croton, Ashokan, Schoharie, Kingston, Downsville, Neversink, Beerston & other watershed police locations.
(3) Personal service costs include a fringe benefit rate of 48.1% in FY 2016 - FY 2020.
(4) It is assumed that personal services costs will increase 3.0% per year in FY 2016 - FY 2020, exclusive of changes in the fringe benefit rate.
(5) Upward or downward changes from year to year in a particular category of costs may reflect shifts in classifications for accounting purposes as opposed to changes in personal functions or responsibilities.
(6) It is anticipated that the Kensico and Brewster Laboratories will be replaced by the Hawthorne Laboratory in FY 2017.

Table 9A Historical Upstate Indirect Personal Services Costs

TABLE 9A
New York City Water Board
Historical Cost of Supplying Water to Upstate Customers
Upstate New York Support & Administrative Personnel Costs

Line No.	Description	FY 2013 $	FY 2014 $	FY 2015 $
	Divisional and Sectional Offices			
1	Katonah Resource Protection	571,501	668,815	601,006
2	Carmel Section	301,118	69,051	89,579
3	Ashokan	523,126	325,847	557,365
4	Grahamsville	1,459,296	2,030,252	2,004,632
5	E. Division Hudson River P/S	0	155,313	168,161
	Laboratories			
6	Kensico	348,666	360,262	378,155
7	Brewster	75,877	85,412	88,292
8	Grahamsville	156,631	294,674	308,467
	Other Services			
9	Downsville	141,655	160,627	282,963
10	Sutton Park (1)	4,459,896	5,092,393	5,030,303
11	Kingston Office	5,686,340	5,713,534	5,726,191
12	Watershed Security (2)	1,436,377	1,732,301	1,587,179
13	Mobile Task Force	0	0	0
14	East of Hudson Fleet	325,606	216,007	210,809
15	Shokan Fleet Admin.	259,384	322,009	316,652
16	Downsville Fleet Admin.	104,600	203,280	105,064
17	Grahmsville Fleet Admin.	215,626	329,413	328,902
18	Watershed-East of Hudson	151,431	410,807	557,336
19	Other	107,622	0	0
20	UV Facility	470,189	549,886	551,278
21	Indirect Personnel Overtime Costs	252,948	440,692	420,673
22	**Total Personal Services Costs**	**17,047,891**	**19,160,572**	**19,313,007**

Notes:

(1) Sutton Park expenses include costs for laboratories.

(2) Hillview, Croton, Ashokan, Schoharie, Kingston, Downsville, Neversink, Beerston & other watershed locations.

(3) Personal service costs include salary, wages and a fringe benefit rate of 46.0% in FY 2013, 51% in FY 2014, and 48.1% in FY 2015.

(4) Upward or downward changes from year to year in a particular category of costs may reflect shifts in classifications for accounting purposes as opposed to changes in personal functions or responsibilities.

Table 9B Projected Upstate Indirect Personal Services Costs

TABLE 9B
New York City Water Board
Cost of Supplying Water to Upstate Customers
Upstate New York Support & Administrative Personnel Costs

Line No.	Description	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
				Projected Years		
		$	$	$	$	$
	Divisional and Sectional Offices					
1	Katonah Resource Protection	619,036	637,607	656,736	676,438	696,731
2	Carmel Section	92,266	95,034	97,885	100,822	103,846
3	Prattsville/Schoharie	0	0	0	0	0
4	Ashokan	574,086	591,309	609,048	627,319	646,139
5	Grahamsville	2,064,771	2,126,714	2,190,516	2,256,231	2,323,918
	Laboratories					
6	Kensico	389,500	401,185	413,220	425,617	438,385
7	Brewster	90,940	93,668	96,479	99,373	102,354
8	Grahamsville	317,722	327,253	337,071	347,183	357,598
	Other Services					
9	Downsville	291,452	300,196	309,202	318,478	328,032
10	Sutton Park (1)	5,181,212	5,336,648	5,496,747	5,661,650	5,831,499
11	Kingston Office	5,897,977	6,074,916	6,257,163	6,444,878	6,638,225
12	Watershed Security (2)	1,634,795	1,683,839	1,734,354	1,786,384	1,839,976
13	Mobile Task Force	0	0	0	0	0
14	East of Hudson Fleet	217,134	223,648	230,357	237,268	244,386
15	Ashokan Fleet Admin.	326,152	335,936	346,014	356,395	367,086
16	Downsville Fleet Admin.	108,216	111,462	114,806	118,250	121,798
17	Grahmsville Fleet Admin.	338,769	348,932	359,400	370,182	381,287
18	Watershed-East of Hudson	574,056	591,278	609,016	627,287	646,105
19	Other	0	0	0	0	0
20	UV Facility	567,816	584,851	602,396	620,468	639,082
21	Indirect Personnel Overtime Costs	433,294	446,292	459,681	473,472	487,676
22	**Total Personal Services Costs**	**19,892,397**	**20,489,169**	**21,103,844**	**21,736,960**	**22,389,068**

Notes:

(1) Sutton Park expenses include costs for laboratories.
(2) Hillview, Croton, Ashokan, Schoharie, Kingston, Downsville, Neversink, Beerston & other watershed locations.
(3) Personal service costs include a fringe benefit rate of 48.1% in FY 2016 - FY 2020.
(4) It is assumed that personal services costs will increase 3.0% per year in FY 2016 - FY 2020, exclusive of changes in the fringe benefit rate.
(5) Upward or downward changes from year to year in a particular category of costs may reflect shifts in classifications for accounting purposes as opposed to changes in personal functions or responsibilities.
(6) It is anticipated that the Kensico and Brewster Laboratories will be replaced by the Hawthorne Laboratory in FY 2017.

Table 10 Development of Allocation Factors

TABLE 10
New York City Water Board
Cost of Supplying Water to Upstate Customers
Development of Allocation Factors

Line No.	Description	2013		2014		2015		Projection Years
1	Total Salaries - Employees North of the City	87,247,022		92,927,001		94,685,855		
2		---------- =	54.63%	---------- =	56.41%	---------- =	56.36%	56.36%
3	Total Salaries - All Water Supply Employees	159,698,085		164,739,671		168,010,038		
4	Head Count - Water Supply Employees	1,623		1,580		1,589		
5		---------- =	32.22%	---------- =	33.03%	---------- =	33.14%	Not Used
6	Head Count - All NYC DEP Employees	5,038		4,784		4,795		
7	Effective Allocation of DEP Personal Services to Facilities North of the City	Line 2 * Line 5 =	17.60%	Line 2 * Line 5 =	18.63%	Line 2 * Line 5 =	18.68%	Not Used
8	Total Salaries - Employees North of the City			92,927,001		94,685,855		
9				---------- =	17.25%	---------- =	17.50%	17.50%
10	Total Salaries - All NYC DEP Employees			538,767,966		540,957,279		
11	Number of Vehicles - Water Supply	743		552		764		
12		---------- =	36.95%	---------- =	32.80%	---------- =	40.33%	40.33%
13	Number of Vehicles - All NYC DEP	2,011		1,684		1,895		

(1) Reports for the years prior to FY 2014 used the percentages in lines 2 and 5 above to allocate DEP Personal Services Costs to Facilities North of the City. This Report continues to use the previous methodology in Table 11A for FY 2013 and simplifies the allocation process for FY 2014 and subsequent years by using the percentage in line 9 to calculate the allocated costs for FY 2014 - FY 2020 in Tables 11A and 11B.
(2) Reports for the years prior to FY 2014 used the percentages in lines 2 and 5 above to allocate certain DEP OTPS Costs to Facilities North of the City. This Report continues to use the previous methodology in Table 12A for FY 2013 and simplifies the allocation process for FY 2014 and subsequent years by using the percentage in line 9 to calculate the allocation of certain costs for FY 2014 - FY 2020 in Tables 12A and 12B.
(3) The total salaries in line 10 for FY 2014 is restated to eliminate salaries, wages and fringe benefits for personnel assigned to Hurricane Sandy and Grant Programs. The line 10 amount for FY 2015 excludes such salaries, wages and fringe benefits.

Table 11A Historical Allocation of DEP Personal Services Costs

TABLE 11A
New York City Water Board
Cost of Supplying Water to Upstate Customers
Historical Allocation of DEP Personal Services
Costs to Facilities North of the City

Line No.	Description	FY 2013 $	FY 2014 $	FY 2015 $
1	Executive	8,430,796	8,919,877	9,522,727
2	General Counsel	3,251,340	3,660,141	3,596,883
3	Communications	2,899,288	2,812,416	3,058,218
4	Env. Health & Safety	3,677,515	3,575,126	3,554,030
5	Environ. Planning	4,849,879	5,293,381	5,715,688
6	Budget Office	2,563,433	2,886,776	3,162,950
7	Facilities Mgt & Constr	5,776,921	6,350,129	6,200,744
8	Human Res & Labor Rel	9,400,367	7,427,729	7,928,110
9	Chief Contract Office	1,798,178	1,936,078	2,365,934
10	Addt'l Exec & Support	750,757	1,430,002	1,233,733
11	Total DEP Executive and Support Personal Services Costs	43,398,473	44,291,654	46,339,017
12	Allocation to Water Supply	32.22%		
13	Personal Services Costs Related to Water Supply	13,984,645	44,291,654	46,339,017
14	Allocation to Facilities North of NYC	54.63%		
15	Allocation to Water Supply North of NYC		17.25%	17.50%
16	**Personal Services Costs Related to Facilities North of the City**	**7,640,158**	**7,639,449**	**8,110,898**

Notes:
(1) Personal service costs include salary and a fringe benefit rate of 46.0% in FY 2013, 51% in FY 2014, and 48.1% in FY 2015.
(2) Beginning in FY 2014, the methodology for calculating the allocated upstate water supply share of DEP personal service costs (in line 15 above) was modified as presented in Table 10.

Table 11B Projected Allocation of DEP Personal Services Costs

TABLE 11B
New York City Water Board
Cost of Supplying Water to Upstate Customers
Projected Allocation of DEP Personal Services
Costs to Facilities North of the City

Line No.	Description	FY 2016 $	FY 2017 $	Projected Years FY 2018 $	FY 2019 $	FY 2020 $
1	Executive	9,808,409	10,102,661	10,405,741	10,717,913	11,039,451
2	General Counsel	3,704,789	3,815,933	3,930,411	4,048,323	4,169,773
3	Public Affairs	3,149,965	3,244,464	3,341,798	3,442,052	3,545,313
4	Env. Health & Safety	3,660,651	3,770,471	3,883,585	4,000,093	4,120,095
5	Environ. Planning	5,887,159	6,063,773	6,245,687	6,433,057	6,626,049
6	Budget Office	3,257,839	3,355,574	3,456,241	3,559,928	3,666,726
7	Facilities Mgt & Constr	6,386,766	6,578,369	6,775,720	6,978,992	7,188,362
8	Human Res & Labor Rel	8,165,954	8,410,932	8,663,260	8,923,158	9,190,853
9	Chief Contract Office	2,436,912	2,510,019	2,585,320	2,662,879	2,742,766
10	Addt'l Exec & Support	1,270,745	1,308,867	1,348,133	1,388,577	1,430,234
11	Total DEP Personal Services Costs	47,729,188	49,161,063	50,635,895	52,154,972	53,719,621
12	Allocation to Water Supply North of NYC	17.50%	17.50%	17.50%	17.50%	17.50%
13	**Personal Services Costs - Facilities North of the City**	**8,354,225**	**8,604,852**	**8,862,998**	**9,128,887**	**9,402,754**

Notes:
(1) Personal service costs include a fringe benefit rate of 48.1% in FY 2016 - FY 2020.
(2) It is assumed that personal services costs will increase 3.0% per year in FY 2016 - FY 2020, exclusive of changes in the fringe benefit rate.
(3) Upward or downward changes from year to year in a particular category of costs may reflect shifts in classifications for accounting purposes as opposed to changes in personal functions or responsibilities.
(4) The methodology for calculating the allocated upstate water supply share of DEP personal service costs (in line 12 above) reflects the modification that was made beginning in FY 2014.

Table 12A Historical Allocation of DEP Other Than Personal Services Costs

TABLE 12A
New York City Water Board
Historical Cost of Supplying Water to Upstate Customers
Allocation of DEP Other Than Personal Services
Costs to Facilities North of the City

Line No.	Description	FY 2013 $	FY 2014 $	FY 2015 $
1	Accounting	73,057	70,647	67,468
2	Executive and Support	55,177	38,688	125,904
3	Fleet Administration	4,902,353	9,090,789	11,225,045
4	Public Affairs	205,837	283,973	320,925
5	Facilities Management and Construction	885,959	3,250,383	637,604
6	Management and Budget	1,223,819	3,345,460	3,705,194
7	Management Information Systems	8,734,013	8,663,281	12,784,368
8	Chief Engineer	26,626	30,902	28,168
9	Legal	37,159	36,708	67,230
10	Environmental Assessment	898,111	473,833	94,448
11	Telephone	6,637,828	6,848,017	6,609,557
12	Lefrak Administration Rents	4,716,903	4,783,507	5,157,483
13	Facility Management Rents	352,000	452,602	525,925
14	Management and Budget Environmental Health/Safety	217,736	238,887	553,012
15	Security Services	1,677,259	1,559,898	1,411,118
16	DEP Online Store	0	(7,322)	8,112
17	PC Purchasing Consolidation Administration	0	0	124,100
18	Obesity Task Force	40,565	0	0
19	Total OTPS to be Allocated	30,684,402	39,160,253	43,445,662
20	Allocation for FY 2013 (1)	32.22%		
21	Allocation for FY 2014 and FY 2015 (1)		17.25%	17.50%
22	OTPS Allocation (line 19 X line 20 for FY 2013, line 19 X line 21 for FY 2014 and 2015)	9,887,686	6,754,382	7,604,463
23	Rents Other Than Lefrak	1,683,012	1,430,603	2,506,698
24	Lefrak Water Supply Rents	1,486,880	1,675,610	1,853,022
25	Total Rents (line 23 + line 24)	3,169,892	3,106,213	4,359,720
26	Motor Vehicle Operating Rents	513,528	0	0
27	Allocation in Each Year	36.95%	32.80%	40.33%
28	Total Motor Vehicle Operating Rents (line 26 X line 27)	189,732	0	0
29	Motor Vehicle Parking	345,000	396,750	396,750
30	Allocation in Each Year	16.38%	18.72%	21.28%
31	Total Motor Vehicle Parking (line 29 X line 30)	56,519	74,276	84,429
32	Total OTPS Costs Allocated to Water Supply at DEP (2)	13,303,829		
33	Rent & Motor Vehicles Costs Allocated to Water Supply at DEP (3)		3,180,489	4,444,149
34	Allocation to Facilities North of NYC	54.63%	56.41%	56.36%
35	OTPS Costs Related to Facilities North of the City	7,268,211		
36	Rent & Motor Vehicles Costs Related to Facilities North of the City (4)		1,794,063	2,504,601
37	OTPS Costs Related to Facilities North of the City (5)		8,548,445	10,109,064

Notes:
(1) Beginning in FY 2014, the allocation % on line 21 incorporates the water supply and north of the City allocations in one step; based on employee salaries & wages.
(2) For FY 2013, total OTPS costs allocated to Water Supply is equal to the sum of lines 22, 25, 28, and 31.
(3) Beginning in FY 2014, rent & motor vehicles costs allocated to Water Supply is equal to the sum of lines 25, 28, and 31.
(4) Beginning in FY 2014, rent & motor vehicles costs allocated to north of the City is equal to line 33 X line 34.
(5) Beginning in FY 2014, OTPS costs related to facilities north of the City are equal to sum of lines 22 and 36.

Table 12B Projected Allocation of DEP Other Than Personal Services Costs

TABLE 12B
New York City Water Board
Cost of Supplying Water to Upstate Customers
Allocation of DEP Other Than Personal Services
Costs to Facilities North of the City

Line No.	Description	FY 2016 $	FY 2017 $	*Projected Years* FY 2018 $	FY 2019 $	FY 2020 $
1	Accounting	69,492	71,577	73,724	75,936	78,214
2	Executive and Support	129,681	133,571	137,578	141,706	145,957
3	Fleet Administration	11,561,797	11,908,650	12,265,910	12,633,887	13,012,904
4	Public Affairs	330,553	340,470	350,684	361,204	372,041
5	Facilities Management and Construction	656,732	676,434	696,727	717,629	739,158
6	Management and Budget	3,816,349	3,930,840	4,048,765	4,170,228	4,295,335
7	Management Information Systems	13,167,899	13,562,936	13,969,824	14,388,919	14,820,587
8	Chief Engineer	29,013	29,884	30,780	31,704	32,655
9	Legal	69,247	71,325	73,464	75,668	77,938
10	Environmental Assessment	97,281	100,199	103,205	106,302	109,491
11	Telephone	6,807,844	7,012,080	7,222,442	7,439,115	7,662,289
12	Lefrak Administration Rents	5,312,208	5,471,574	5,635,721	5,804,793	5,978,937
13	Facility Management Rents	541,703	557,954	574,692	591,933	609,691
14	Management and Budget Environmental Health/Safety	569,602	586,690	604,291	622,419	641,092
15	Security Services	1,453,452	1,497,055	1,541,967	1,588,226	1,635,873
16	Total OTPS to be Allocated	44,612,854	45,951,239	47,329,776	48,749,670	50,212,160
17	Allocation (1)	17.50%	17.50%	17.50%	17.50%	17.50%
18	OTPS Allocation (line 16 X line 27)	7,808,761	8,043,024	8,284,315	8,532,844	8,788,829
19	Rents Other Than Lefrak	2,581,899	2,659,356	2,739,137	2,821,311	2,905,950
20	Lefrak Water Supply Rents	1,908,612	1,965,871	2,024,847	2,085,592	2,148,160
21	Total Rents (line 19 + line 20)	4,490,512	4,625,227	4,763,984	4,906,903	5,054,110
22	Motor Vehicle Operating Rents	0	0	0	0	0
23	Allocation	40.33%	40.33%	40.33%	40.33%	40.33%
24	Total Motor Vehicle Operating Rents (line 222 X line 23)	0	0	0	0	0
25	Motor Vehicle Parking	408,653	420,912	433,539	446,546	459,942
26	Allocation	21.28%	21.28%	21.28%	21.28%	21.28%
27	Total Motor Vehicle Parking (line 25 X line 26)	86,962	89,570	92,258	95,025	97,876
28	Rent & Motor Vehicles Costs Allocated to Water Supply at DEP (2)	4,577,473	4,714,797	4,856,241	5,001,929	5,151,986
29	Allocation to Facilities North of NYC	56.36%	56.36%	56.36%	56.36%	56.36%
30	Rent & Motor Vehicles Costs Related to Facilities North of the City (3)	2,579,739	2,657,131	2,736,845	2,818,950	2,903,518
31	OTPS Costs Related to Facilities North of the City (4)	**10,388,500**	**10,700,155**	**11,021,159**	**11,351,794**	**11,692,348**

Notes:
(1) Changes in the allocation methodology for the above OTPS costs were made beginning in FY 2014, as described in Table 12A.
(2) Rent & motor vehicles costs allocated to Water Supply are equal to the sum of lines 21, 24, and 27.
(3) Rent & motor vehicles costs allocated to north of the City are equal to line 28 X line 29.
(4) OTPS costs related to facilities north of the City are equal to sum of lines 18 and 30.
(5) It is assumed that OTPS costs will increase at the rate of 3% per annum.

Table 13 Annual Water Consumption

TABLE 13
New York City Water Board
Cost of Supplying Water to Upstate Customers
Annual Water Consumption

Line No.	Fiscal Year	(A) System-Wide Consumption mg	(B) Upstate Consumption mg	Upstate as a % of Total [B]/[A]
1	1985	544,025	41,661	7.66%
2	1986	501,019	39,397	7.86%
3	1987	542,870	42,853	7.89%
4	1988	573,679	44,956	7.84%
5	1989	559,669	43,255	7.73%
6	1990	547,522	42,795	7.82%
7	1991	564,234	45,103	7.99%
8	1992	560,014	44,010	7.86%
9	1993	531,796	42,015	7.90%
10	1994	538,558	43,221	8.03%
11	1995	520,410	43,915	8.44%
12	1996	528,938	45,125	8.53%
13	1997	487,012	44,044	9.04%
14	1998	483,182	44,404	9.19%
15	1999	499,849	47,230	9.45%
16	2000	502,758	46,922	9.33%
17	2001	488,909	45,845	9.38%
18	2002	467,705	45,200	9.66%
19	2003	449,606	43,400	9.65%
20	2004	446,822	43,198	9.67%
21	2005	443,445	43,072	9.71%
22	2006	441,477	44,504	10.08%
23	2007	444,553	43,895	9.87%
24	2008	452,048	43,559	9.64%
25	2009	420,438	41,477	9.87%
26	2010	411,482	40,797	9.91%
27	2011	420,635	42,682	10.15%
28	2012	408,954	39,713	9.71%
29	2013	410,006	40,143	9.79%
30	2014	407,436	40,485	9.94%
31	2015	406,815	40,745	10.02%
Projections:				
32	2016	395,475	39,194	9.91%
33	2017	390,582	38,720	9.91%
34	2018	385,690	38,246	9.92%
35	2019	380,797	37,772	9.92%
36	2020	375,904	37,298	9.92%

Notes:

(1) Consumption projections are based on a regression analysis beginning in 2006.

(2) Equation used to calculate System-wide Consumption:
y=m(t)+b. Where (t) is a given year.
m= -4892.664716
b= 10259087

(3) Equation used to calculate Upstate Consumption:
y=m(t)+b. Where (t) is a given year.
m= -473.86
b= 994,492.93

Table 14 Projected Revenues From Hydroelectric Facilities

Table 14

NYC Department of Environmental Protection
Gross Revenue Estimates for Upstate Hydro-Electric Facilities
All Amounts in $

Revenues	Fiscal Year 2016	2017	2018	2019	2020
Ashokan & Kensico	-	-	-	-	-
Neversink	3,159,391	3,222,579	3,287,031	3,352,771	3,419,827
West Delaware	58,086	59,248	60,433	61,641	62,874
East Delaware	4,647,531	4,740,482	4,835,291	4,931,997	5,030,637
Summary	7,865,008	8,022,308	8,182,755	8,346,410	8,513,338

Notes:

(1) All figures for Neversink and East Delaware are based on 2015 results reported by the New York City Office of the Comptroller, adjusted for inflation in subsequent years at the rate of 2% per year.

(2) Calendar year revenue data is used to estimate the fiscal year revenue when the fiscal year data is not available at the time of this Report.

Table 15 Comparison of Upstate Customer Billings vs. Cost of Service

TABLE 15
New York City Water Board
Cost of Supplying Water to Upstate Customers
Cost-of-Service Reconciliation

Fiscal Year	Rate ($) per Million Gallons (MG) Billed to Upstate Customers	Rate ($) per Million Gallons (MG) Computed Cost to the Board	Upstate Consumption (MG)	Total Billed ($)	Actual Cost ($)	Underpayment ($)
1996 (a)	174.18	247.28	45,125	7,859,907	11,158,559	3,298,652
1997	227.95	309.55	44,044	10,039,830	13,633,820	3,593,990
1998	274.93	338.79	44,404	12,208,047	15,043,699	2,835,652
1999	342.97	348.31	47,230	16,198,439	16,450,646	252,208
2000	383.78	385.25	46,922	18,007,764	18,076,739	68,975
2001	414.37	414.88	45,845	18,996,834	19,020,215	23,381
2002	448.83	462.24	45,200	20,287,116	20,893,248	606,132
2003 (b)	485.71	522.99	43,400	21,079,814	22,697,766	1,617,952
2004 (b)	542.36	529.85	43,198	23,428,650	22,888,248	-540,402
2005	591.21	591.91	43,072	25,464,774	25,494,925	30,151
2006	617.79	623.47	44,504	27,494,064	27,746,847	252,782
2007	691.91	691.83	43,895	30,371,597	30,368,104	-3,493
2008	798.62	703.73	43,559	34,786,978	30,653,783	-4,133,195
2009	900.31	882.91	41,477	37,342,472	36,620,683	-721,789
2010	922.23	973.86	40,797	37,624,046	39,730,509	2,106,464
2011	1,149.72	1,121.04	42,682	49,072,562	47,848,489	-1,224,073
2012	1,213.84	1,283.45	39,713	48,205,540	50,970,046	2,764,506
2013	1,332.30	1,389.42	40,143	53,482,864	55,775,883	2,293,019
2014	1,496.76	1,604.43	40,485	60,596,628	64,955,593	4,358,965
2015	1,573.61	1,670.85	40,745	64,116,572	68,078,546	3,961,974
			Total Underpayment 1996-2015			21,441,851
			Total Underpayment 2006-2015			9,655,159

(a)The rates approved by NYSDEC were $175.69 for both 1995 and 1996.
(b)The computed cost to the Board as shown above for 2003 and 2004 does not take into consideration the upstate share of the costs of defeasance of certain Authority bonds. Including the effects of the cost of defeasance, the rate per million gallons is $549.32 in 2003 and $560.58 in 2004.
(c)The rates shown above include the costs of defeasance, where applicable.
(d) The table above does not take into account the application of credits or charges to the cost of service based on prior year reconciliations.