New York City Water Board

Report on the Cost of Supplying Water to Upstate Customers for the 2016 Rate Year

January 4, 2016

Amawalk
Consulting Group LLC

Amawalk
Consulting Group LLC

90 Broad Street, Suite 707A, New York, NY 10004 • Tel: 212.361.0050 • Fax: 212.361.0055

January 4, 2016

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 2016 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 2012 through 2014. 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 2015 through 2019 (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
Amawalk Consulting Group LLC

Table of Contents

1.0 INTRODUCTION 1
1.1 PURPOSE 1
1.2 SCOPE 1
1.3 BACKGROUND 1
1.3.1 The Water System 2
1.3.1.1 The Croton System 3
1.3.1.2 The Catskill System 4
1.3.1.3 The Delaware System 4
1.3.1.4 The Catskill Aqueduct 4
1.3.1.5 The Delaware Aqueduct 5
1.3.1.6 The Queens Groundwater Supply 5
1.3.1.7 Long-Term System Capacity 5
1.3.1.8 System Security 6
1.3.2 Condition of the Water System 6
1.3.2.1 Rondout-West Branch Tunnel 6
1.3.2.2 The Gilboa Dam 7
1.3.2.3 The Dam Safety Program 7
1.3.3 Water Quality and Treatment 7
1.3.3.1 Filtration in the Croton System 7
1.3.3.2 Watershed Protection/Filtration Avoidance in the Catskill and Delaware Systems 8
1.3.3.3 Disinfection Requirements 9
1.3.4 Water Quality Monitoring 10
1.3.5 Governmental Regulation 10
1.3.6 Drought Management 11
1.3.7 Pending Litigation 12
1.3.8 Climate Change 12
1.3.9 Operational Excellence 13
1.4 WATER DEMAND MANAGEMENT 13
1.5 THE ROLES OF THE AUTHORITY, THE BOARD, AND THE CITY IN THE WATER SYSTEM 14
1.6 ADDITIONAL INFORMATION ON THE WATER SYSTEM, THE BOARD, AND THE AUTHORITY 15
2.0 THE SALE OF WATER TO CUSTOMERS NORTH OF THE CITY 16
2.1 BACKGROUND 16
2.2 RATES AND CHARGES FOR UPSTATE CUSTOMERS 16
3.0 COST OF SERVICE METHODOLOGY 19
3.1 OVERVIEW 19
3.2 PROCEDURES FOR CALCULATING THE COST OF SERVICE 19
3.2.1 Step A 19
3.2.2 Step B 20
3.2.3 Step C 20
3.2.4 Step D 20
3.2.5 Step E 21
3.2.6 Step F 21
3.2.7 Graphical Overview 21
3.3 COMPUTATION OF THE REGULATED RATE 23
3.4 SOURCES OF DATA AND BASIS OF PRESENTATION 23
4.0 COMPUTATION OF THE COST OF SERVICE AND THE REGULATED RATE 24
4.1 INTRODUCTION 24
4.2 BUREAU OF WATER SUPPLY COSTS RELATED TO FACILITIES LOCATED NORTH OF THE CITY - STEP A 24
4.2.1 Other Than Personal Services Costs 24
4.2.1.1 Real Estate Taxes 27
4.2.1.2 Chemicals 29

4.2.1.3 Operating Expenses Associated with Hillview Reservoir....31
4.2.1.4 Contractual Services....32
4.2.1.5 Rate Studies....32
4.2.1.6 Other OTPS Expenses....32
4.2.1.7 UV Facility....33
4.2.2 Debt Service/Capital Improvement Financing....33
4.2.2.1 Historical Investments in the Water System....33
4.2.2.2 Debt Service Related to the Water System....34
4.2.2.3 Cash Used for Capital Construction and the Defeasance of Debt....36
4.2.2.4 Ongoing and Future Capital Improvements....37
4.2.2.5 Capital Cost Summary....38
4.2.3 Judgments and Claims....38
4.2.4 Miscellaneous Revenue....38
4.2.5 Personal Service Costs....39
4.3 CALCULATION OF ALLOCATION PERCENTAGES - STEP B....40
4.4 ALLOCATION OF DEPARTMENT OF ENVIRONMENTAL PROTECTION COSTS - STEP C....41
4.5 ALLOCATION OF CITY CENTRAL SERVICE COSTS - STEP D....41
4.6 COST OF SERVICE - STEP E....41
4.7 CALCULATION OF THE REGULATED RATE - STEP F....44
4.8 ADDITIONAL ISSUES RELATING TO THE COST OF SERVICE AND THE REGULATED RATE....48
4.8.1 Operating Risks....48
4.8.2 Water Demand Management Initiatives....48
4.8.3 Upstate Wastewater Treatment Plants....49
5.0 IMPACTS ON CUSTOMERS OF THE PROPOSED REGULATED RATE....50

List of Figures and Tables

Figure 1	Map of the Water System	3
Figure 2	Diagram of Calculation	22
Figure 3	Projected 2016 Other Than Personal Services Costs	27
Figure 4	Real Estate Taxes for the Water System	29
Figure 5	Projected 2016 Cost of Service Components	43
Figure 6	Comparison of Water System Consumption	47
Figure 7	Impact of Cost of Service and Consumption on Unit Rate	51
Table 1A	Historical Cost of Service	53
Table 1B	Cost of Service Projections	54
Table 2A	Current Water Rates for Upstate New York Communities	55
Table 2B	Current Water Rates for Upstate New York Communities	56
Table 3	Summary of Impacts on Upstate Customers	57
Table 4A	Historical Upstate Other Than Personal Services Costs	58
Table 4B	Projected Upstate Other Than Personal Services Costs	59
Table 5A	Debt Service Summary	60
Table 5B	Authority Bond Proceeds	61
Table 5C	NYSEFC Bond Proceeds	62
Table 5D	Debt Service	63
Table 5E	Cash Used for Capital Construction and the Defeasance of Debt	64
Table 6	Judgments and Claims	65
Table 7	Miscellaneous Revenue	66
Table 8A	Historical Upstate Direct Personal Services Costs	67
Table 8B	Projected Upstate Direct Personal Services Costs	68
Table 9A	Historical Upstate Indirect Personal Services Costs	69
Table 9B	Projected Upstate Indirect Personal Services Costs	70
Table 10	Development of Allocation Factors	71
Table 11A	Historical Allocation of DEP Personal Services Costs	72
Table 11B	Projected Allocation of DEP Personal Services Costs	73
Table 12A	Historical Allocation of DEP Other Than Personal Services Costs	74
Table 12B	Projected Allocation of DEP Other Than Personal Services Costs	75
Table 13	Annual Water Consumption	76
Table 14	Projected Revenues From Hydroelectric Facilities	77
Table 15	Comparison of Upstate Customer Billings vs. Cost of Service	78

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 2016 to recover the cost of service. The Report also presents the calculated cost of service and rates for Fiscal Years 2012 through 2014; the anticipated cost of service and rate for 2015, the current year; and the projected cost of service and rates for 2017 through 2019. The proposed regulated rate for Fiscal Year 2016 is $1,728.99 per million gallons ("MG"), which represents an increase of $155.38 per MG from the current Fiscal Year 2015 unit rate of $1,573.61, or a 9.87% 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 2016 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 2015 through 2025.

The information presented in this Report is as of April 27, 2015. 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 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 eight 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.

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, when operating at full capacity, had provided approximately 10% of the City's daily water supply under normal conditions and up to 30% of the daily water supply during drought conditions. The Croton System has been used only on a very limited basis since 2004.

Once the Croton Filtration Plant (the "Croton Plant") is in operation, which is currently anticipated for May 2015, the Croton System will be available to supplement the Catskill and Delaware Systems as needed. DEP's decision to filter Croton System water, and to limit the use of the Croton System until the treatment plant is on line, was based on water quality issues, including past exceedances of regulations for disinfection by-products (specifically haloacetic acids), turbidity, and color. Long-term use of the Croton System will be 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 entire 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 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 decree requires the System, under certain circumstances, 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. 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, 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 and Delaware 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. DEP is currently planning improvements to the groundwater system which will augment the supply of water from 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 find additional 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 projects associated with this program include constructing a bypass tunnel around an area of significant leakage in the Roseton area in the Town of Newburgh, NY and water supply augmentation to ensure adequate water supply for the City and its upstate customers during construction of the connection between the new bypass tunnel and the Delaware Aqueduct. Water supply augmentation projects include rehabilitation of the City's groundwater system in southeast Queens, rehabilitation of the Catskill Aqueduct, and demand management measures to encourage water conservation, 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 of three categories. Nonetheless, given the age of the System, circumstances that are specific to certain components of the System, and modern perspectives on reliability, security, and other matters, DEP is pursuing a number of initiatives to enhance the long-term integrity of the Water System. An overview of several 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 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 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 6- to 10-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 $1.1 billion, $1.0 billion of which is included 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. The estimated cost to complete the rehabilitation of the dam is $286 million, $250 million of which is funded in the CIP.

1.3.2.3 The Dam Safety Program

Engineering reports sponsored by the U.S. Army Corps of Engineers indicated that the dams and reservoirs in service in the Catskill, Croton, and Delaware Systems are safe but in need of rehabilitation and reconstruction. An ongoing dam reconstruction program has been established for rehabilitation of dams within the Catskill, Croton, and Delaware watersheds and the Kensico Dam.

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

Since 1993, DEP has operated the Catskill and Delaware water supplies under a Filtration Avoidance Determination ("FAD") pursuant to which DEP is not required to filter water from those two Systems. However, pursuant to the terms of a 1998 federal court consent decree and as supplemented in 2002, 2005, and 2014, DEP is required to filter water from the Croton System (the "Croton Filter Consent Decree").

After an extensive study, 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. The Croton Filtration Plant has been undergoing testing and is expected to be fully operational in May 2015. Since the 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.

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, USEPA has been issuing 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, Delaware and Catskill 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 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 2007 FAD is fully funded 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. Under this program, the City has acquired 132,500 acres to protect 167,000 acres in total in the Catskill and Delaware watersheds. 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 midterm FAD revision, the City has allocated another $50 million for the core land acquisition program and an additional $15 million dedicated to flood buy-outs.

On December 17, 2014, Governor Cuomo announced his intention to ban natural gas drilling using high volume hydraulic fracturing ("HVHF") in New York State, including the Catskill and Delaware watersheds. NYSDEC is expected to finalize its Environmental Impact Statement ("EIS") evaluating HVHF in the near future. Once the EIS is final, New York State is expected to pass legislation banning HVHF. Low-volume hydraulic fracturing is currently allowed in the watershed, and it will not be banned based on this environmental review, but NYSDEC believes that it is not economically viable, and especially in light of the State-wide ban, it is unlikely that it 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 ultraviolet treatment facility (the "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, but it does include $20 million for design. DEP is continuing to investigate less costly alternatives to a

concrete cover, including a floating cover, which would require the consent of NYSDOH and USEPA.

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 orthophosphate to the water before it enters the distribution system, which promotes the formation of a protective coating inside pipes and plumbing.

The SDWA requires that utilities prepare and distribute to their consumers a brief annual water quality report. The most recent Drinking Water Supply and Quality Report prepared by DEP for calendar year 2014 demonstrates that the quality of the City's drinking water remains high. This report can be found at: 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 ("NYCDOH"), 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 Water Supply 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, NYCDOH, 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 April 24, 2015, the System's reservoirs were filled to 97.2% of capacity. Normal levels as of that date are approximately 98.6% 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.

1.3.8 Climate Change

On Monday, October 29, 2012 Hurricane Sandy hit the Mid-Atlantic East Coast as a tropical storm. The City, along with the State and federal governments, is engaged in a major effort to address the health and safety of its residents affected by the storm and the repair and long-term stabilization of its infrastructure and other storm-damaged property. DEP is assessing damage and planning for capital repairs to certain elements of its infrastructure. 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 study to focus on the site specific nature of climate change impacts 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. DEP's study was integrated into a report, "A Stronger, More Resilient New York" (the "Report"), which was released by the City in June 2013.

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. As background, through a Request for Proposal ("RFP") process, in November 2011, the Water Board retained Veolia Water N.A. to partner with DEP on the *OpX* program. *OpX* has been divided into two phases: a six-month evaluation phase (Phase I) and a four-year implementation phase (Phase II). Veolia issued its report on Phase I findings to the Water Board in June 2012. This report can be found on DEP's website: http://www.nyc.gov/dep/pdf/reports/opx-phase-i-report.pdf.

The Board and DEP committed to proceed to Phase II, which began in July 2012. 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 initiated 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 has been in a continuous process of transition from a flat-rate basis of annual billing to a meter-based billing system which 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 January 2015, approximately 95% 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 also promotes water audits with the objective of identifying opportunities to reduce water consumption. 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 both the metering and toilet retrofit programs.

The Board has retained a demand management consultant to work with the ten upstate customers that consume the most water from the System in the development of demand management plans. 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 continues to operate and maintain 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 20, 2015, the Authority has approximately $5.9 billion in principal outstanding for its First Resolution revenue bonds and $24.2 billion in principal outstanding for its Second Resolution revenue bonds for the water and sewer system of the City, including $397 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 5B and 5C 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.

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/nycwaterboard

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 2014 inclusive, the City provided an average of 43,296 MG per year of water to upstate customers, or 118.5 MGD. This represented approximately 8.90% 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 2014. In 2013 and 2014, the percentage of the water supply being used by upstate customers was 9.79% and 9.94%, 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 2005 through 2015 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. Section 4.7 of this Report provides information concerning the calculation of the reconciliation.

Historical Billing Rates and Computed Actual Costs Per Million Gallons

Fiscal Year	Adopted Rate Billed to Upstate Customers: Including effects of reconciliation & the stipulation in 2012	Computed Actual Unit Cost to the Board: Excluding the effects of reconciliation & the stipulation in 2012	Computed Actual Unit Cost to the Board: Including the effects of reconciliation & the stipulation in 2012
2005	591.21	591.91	N/A
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	1,612.15	1,604.35
2015 (Current)	1,573.61	N/A	N/A

(a) The computed actual cost to the Board shown above for 2005, 2006, and 2011 through 2014 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 2014 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 is also shown both including and excluding the effects of the stipulation credit of $10 million.

The cost to the Board per MG for 2014, using actual cost of service and excluding the reconciliation, is $1,612.15, which is higher than the unit rate that was adopted by the Board effective July 1, 2013 of $1,496.76. After application of the reconciliation credit, the net computed cost to the Board is $1,604.35 per MG. A combination of factors impacted the actual cost per MG:

- 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;
- Debt service costs were lower than anticipated;
- Miscellaneous revenues were higher than anticipated, which services to lower the calculated cost of service; and
- Water consumption was somewhat higher than projected, which serves to lower the unit cost per MG.

The reconciliation amount for 2012 of about $3.2 million was applied as a credit to the cost of service for 2014. The effects of the credit lowered the actual unit cost to the Board for 2014. The unit cost net of the reconciliation is still higher than the unit rate that was adopted by the Board.

As of the date of this Report, it is estimated that the 2015 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 2015 is the cash that is expected to be used in 2015 to defease debt. Debt defeasance is anticipated to result in lower projected debt service payments in 2016 through 2019, as well as subsequent years. The projected lower payments are incorporated in the estimated costs of water supply service in 2016 through 2019 as presented in this Report.

Another factor affecting the 2015 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 2015 at average interest rates that are lower than those previously assumed, which serves to reduce the projected debt service and benefit the 2015 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 2015 is based 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 January 31, 2015, 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 2015. 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 2015 will not be known until after the fall of 2015.

This Report again proposes that a cost or "true-up" be applied towards the cost of service in 2016 to reflect the calculated difference between the 2014 computed actual cost of service to the Board 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 2014 times System-wide water consumption. The reconciliation of 2014 revenues and costs results in a charge which will be added to the projected cost of service for 2016. The proposed "true-up" methodology for the 2014 reconciliation spreads the incremental cost over a four-year period. The calculations are presented in Section 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 2012 through 2014. The sixth step includes the development of the projected cost of service and regulated rates for 2015 (the current year) and 2016. In addition, this Report includes a preliminary projection of the regulated rate for water supply service for the years 2017 through 2019. 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 2015 through 2019 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.

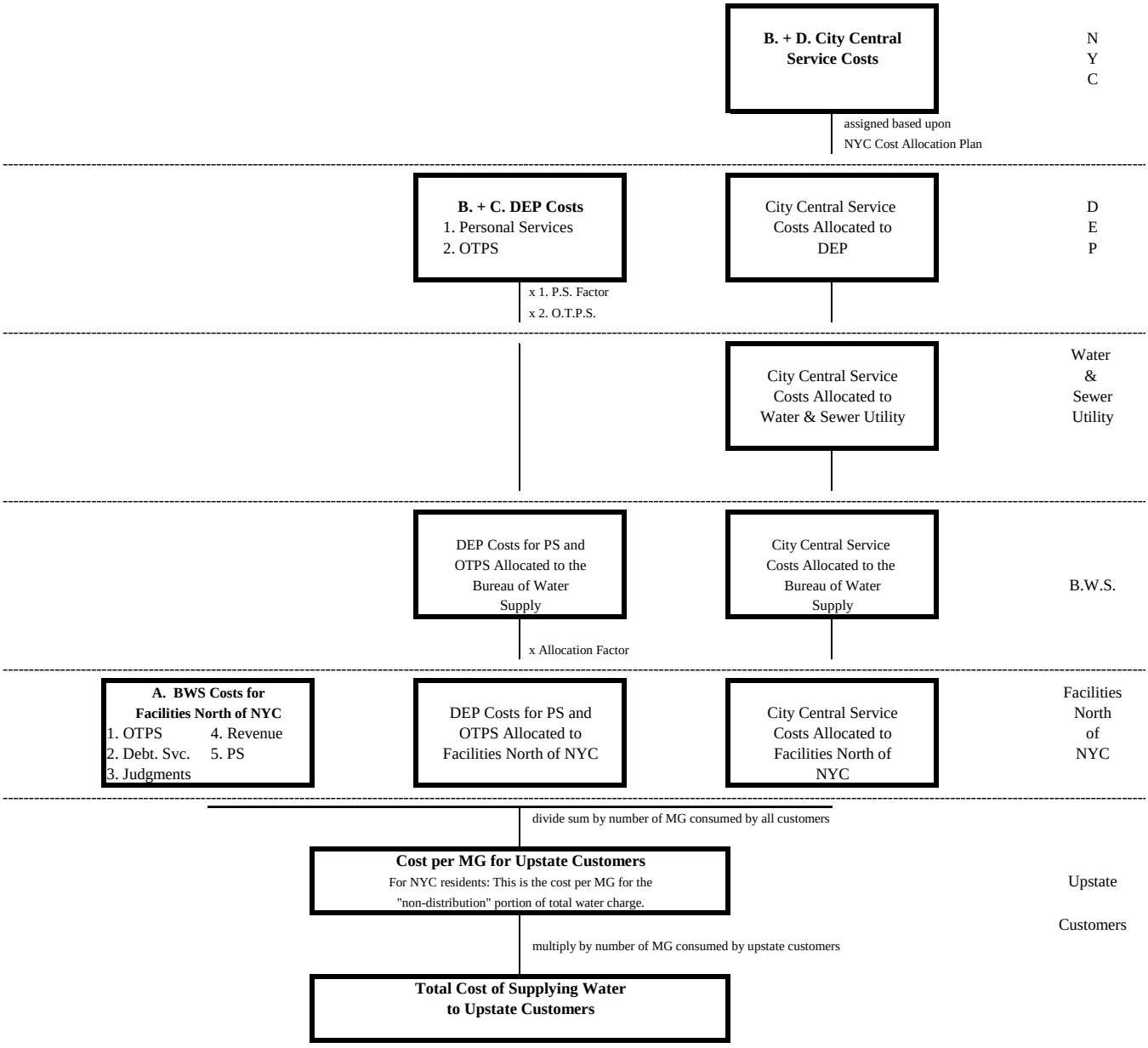
3.2.6 Step F

Steps A through E are primarily used to develop the actual cash basis cost of service for 2012 through 2014. To develop the projected cost of service for 2015 (the current year) and 2016, 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 2015 and 2016. 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 and presents the computed cost of service and regulated rate for 2012 through 2014. The most recent fiscal year for which complete information is available is 2014. The anticipated cost of service for 2015 and 2016 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 2015 and 2016 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 steadily increased over the years, as illustrated in the table shown below.

OTPS expenses in 2014 include certain costs associated with filtration avoidance and environmental health and safety in the watershed. Additional information concerning these expenses is presented in 4.2.1.6 of this Report.

Historical OTPS Expenses

Fiscal Year	OTPS Expense ($)	Annual Increase (%)
2005	118,531,353	13.6
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	242,797,072	9.7

The average annual increase from 2005 to 2014 is 8.3%. The expenses include the estimated costs associated with Hillview Reservoir, which were approved by NYSDEC for inclusion in the cost of service in April 1997. The fluctuations in expenses from year to year are primarily driven by increases in property taxes, the start-up and operation of the UV Facility, changes in FAD-related costs, and the volatility of chemical prices.

Property taxes constituted about 64% of total OTPS costs allocable to the cost of water supply and the unit rate in 2014. Annual increases in property tax rates together with property taxes on the UV Facility are the principal cause of increasing property taxes. Moreover, to protect water quality in the watershed, the City is also required to increase the number of acres of land that are either owned by the City or otherwise restricted in terms of land use. Also, 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. Section 4.2.1.7 provides additional information concerning the UV Facility.

Recent expenses and current and ongoing programs were considered in estimating the anticipated 2015 and 2016 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

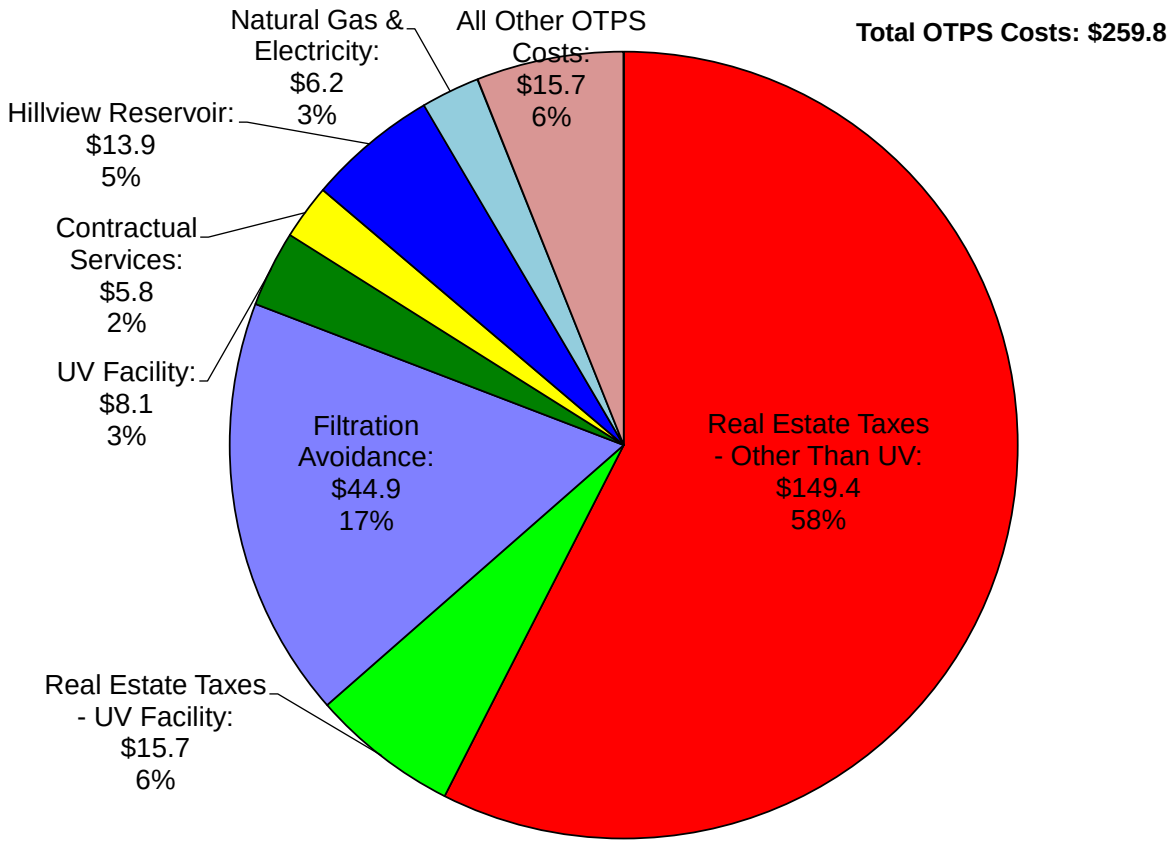
7. UV Facility

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 as operating expenses instead of capital costs also contributes to the anticipated increases in the cost of service. The major components of 2016 OTPS costs (i.e., those categories with an expected cost of $5 million or greater, or about 2% of OTPS costs) are summarized in Figure 3. Table 4B provides a detailed listing of 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.

Figure 3 Projected 2016 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 6.1% from 2005 to 2014. Excluding the taxes on the UV Facility, property taxes have increased at the average annual rate of 4.3% from 2012 through 2014. 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.

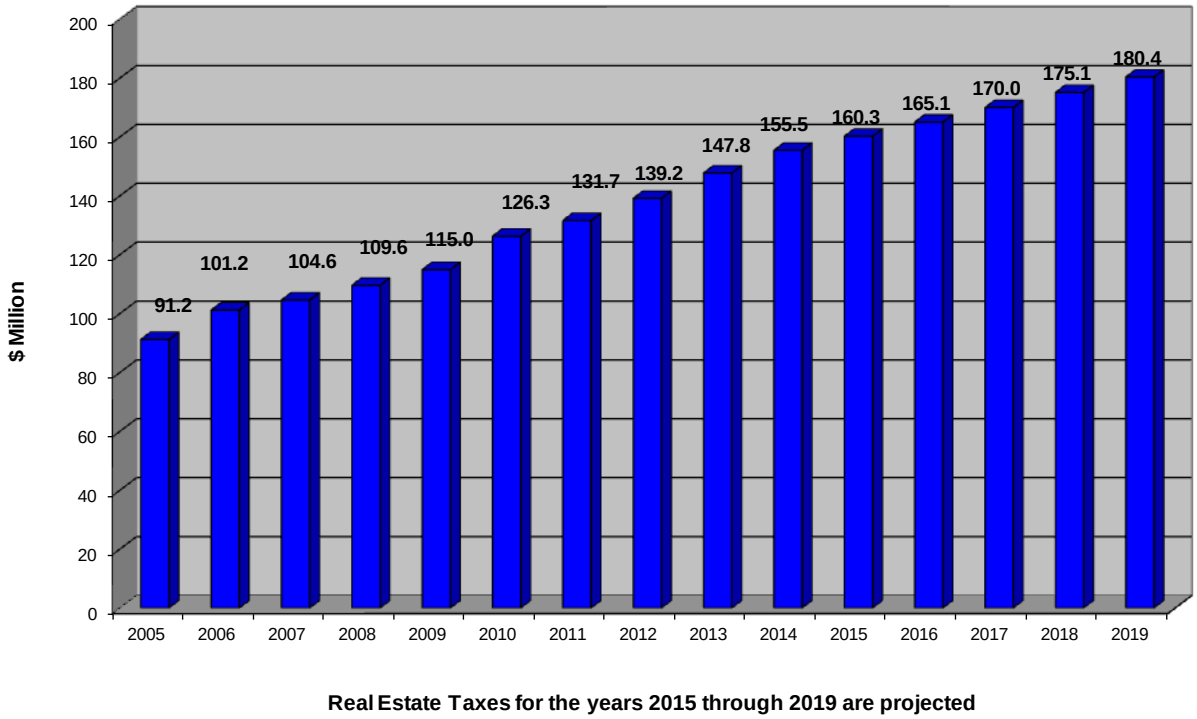
Historical Property Tax Payments

Fiscal Year	Property Tax Expense ($)	Annual Increase (%)
2005	91,223,381	8.3
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

The projected real estate taxes for 2015 and 2016 are $160.3 million and $165.1 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. A 3.0% annual rate of increase in the property taxes is assumed for 2015 through 2019 for all taxes except those for the UV Facility. This assumption reflects a decrease from four 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 $15.2 million in 2015 and then increase at the rate of 3% per year from 2016 through 2019. While the current rate adoption by the Board will only address 2016, projections for 2017 through 2019 are shown for illustrative purposes. The actual and estimated real estate taxes payable to upstate communities for watershed properties from 2005 through 2019, including the UV Facility, are summarized in Figure 4.

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
2005	2,220,258	8.4	1.9
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

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, renegotiations of chemical contracts to improve pricing have been a focus of OpX; see Section 1.3.9 for more information. Also, beginning in February 2012, DEP reduced the fluoride dosage from 1.0 milligrams per liter to 0.8 milligrams per liter pursuant to approval to do so from the New York City Department of Health and Mental Hygiene. In 2013, chemical deliveries to the System were slowed due to System repairs. 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)
2005	2,777	1,892
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

Historical Unit Prices for Chemicals

Fiscal Year	Chlorine ($)/Lb	Fluoride ($)/Ton (1)
2005	448.07	515.81
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

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

The assumed rate of increase in chemical costs in 2015 through 2019 is 3% per year, recognizing that the actual expenses in 2013 and 2014 were much lower than in recent years and such expenses could increase beyond the allowance for inflation. 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 2014, the costs for caustic soda and orthophosphate were $4.1 million and $5.7 million, respectively. These costs fluctuate due to market prices. The competitively bid unit price for orthophosphate effective June 1, 2011 and June 1, 2012 was constant at $3.10 per gallon. The unit bid price for orthophosphate effective June 1, 2013 and June 1, 2014 was $3.06 per gallon. The projected unit bid price for orthophosphate effective June 1, 2015 is $2.74 per gallon.

All OTPS expenses, including chemical costs at Hillview, are assumed to increase at the rate of 3% per year in 2015 through 2019. 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 18). Labor costs for Hillview are included in 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 most of the operating expenses were classified under the Contractual Services line item. 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 line item of the projected OTPS expenses. Contractual Services expenses are assumed to increase at the rate of 3% 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 $61,000 per year from 2015 to 2019. The actual payments for rate studies and related work for 2014 were $61,180.

4.2.1.6 Other OTPS Expenses

OTPS expenses in 2012 through 2014 and future years include DEP costs associated with filtration avoidance programs in the watershed. These are shown in lines 30 and 31 of Table 4A and lines 29 and 30 of Table 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. 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. 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 32 of Table 4A and line 31 of Table 4B.

Some program costs for filtration avoidance included in line 30 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 described in Section 4.2.2.2 of this report. In 2015 through 2019, the expenses associated with O&M and program funding of filtration avoidance and 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% per year.

As noted in Section 1.3.9, since 2011 DEP has undertaken an extensive review of its O&M processes and costs through the Operational Excellence or *OpX* program. Estimated annual savings of $5 million for the Water System have been allocated and applied as a recurring reduction in expenses starting in 2015 and are assumed to increase at the rate of 3% per year for future years. This is shown in line 32 of Table 4B.

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 28 of Table 4B with the exception of property taxes (line 19) and natural gas and electricity (included in line 24).

DEP began to pay property taxes for the UV Facility in 2010. OTPS expenses other than property taxes were incurred beginning in 2012. The operational expenses associated with the UV Facility, except for property taxes in 2015, are assumed to increase at the rate of 3% per year in 2015 through 2019.

4.2.2 Debt Service/Capital Improvement Financing

Capital improvements to the System are financed principally through proceeds from the sale of bonds. A 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 5A provides a summary of the debt service for 2012 through 2014, as well as the projected amounts for 2015 through 2019. 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 of cash used (if any) for capital construction and to defease Authority debt. The costs and benefits of defeasance are described herein.

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 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.

The methodology for allocating debt service to the System 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 5B and 5C 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., 2015). For example, the cumulative percentage to be used in 2014 for Authority debt reflects the sum of all Authority bond proceeds used for water supply projects from 1986 through 2013 divided by the sum of all proceeds from bonds issued from 1986 through 2013. The calculated percentage for Authority bond proceeds through 2014 are applied in Table 5D to the appropriate debt service, interest earnings, etc. in 2015.

The debt service allocated to water supply in 2012 and 2013 is $6,522 and $6,264, respectively, higher than the amounts presented in the prior report. This increase reflects the inclusion of some additional capital costs attributable to water supply that were not included in the proceeds of Authority bonds used for water supply as presented in the prior 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 5D 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, we use the average of the calculated percentages for 2013 and 2014 and apply the results for 2016 through 2019. The resulting percentage for 2016 through 2019 is less than if the current year (i.e., 2015) percentage 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 2015 through 2019 are preliminary and subject to change.

Table 5D illustrates the current projections of debt service on outstanding bonds and anticipated future bonds for the Projection Period as of April 27, 2015. 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 2015. Authority debt service is shown as First Resolution and Second Resolution. The Second Resolution debt is subordinate to the First Resolution debt. Table 5D 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 bonds 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 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 5D 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 2015 and subsequent years assumes that BABs subsidy payments are reduced by about $5.0 million annually from the previously expected amount during the entire Projection Period.

Interest earnings on available funds (the 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 Used for Capital Construction and the Defeasance of Debt

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. However, in 2011 through 2014, 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. See Table 5E. In 2014, the Authority also spent $225 million for cash-financed construction needs as shown in Table 5E. In 2015, the Authority expects to spend $805 million on debt defeasance, and it is anticipated that there will be a release of $252 million from the debt service reserve fund of the Authority that will be used for cash-financed construction. There are not expected to be any additional cash-financed construction deposits beyond this amount in 2015. This Report does not include any portion of the $252 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.

Since all water supply customers share in the benefit of lower future debt service due to the defeasance, the costs of the defeasance are apportioned to all water supply customers. The amounts used for defeasance in 2012, 2013, and 2014 were $239.60 million, $299.99 million, and $399.08 million, respectively. At the time of this Report, it is estimated that $805 million will be used in 2015. 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 2014) and proposed amounts for defeasance (2015) 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 2014 and the projected results for the expected 2015 defeasance.

Year	Amounts Used For Defeasance	Reduction in Debt Service
2011	260,000,000	
2012	239,600,000	17,036,009
2013	299,990,000	44,834,890
2014	399,079,000	138,138,499
2015	805,000,000	243,043,936
2016		230,396,641
2017		261,088,058
2018		250,637,845
2019		238,537,491
2020		173,913,171
	2,003,669,000	1,597,626,540
2021 and Beyond		875,917,159
Total	2,003,669,000	2,473,543,699

Note: The amounts used for defeasance in 2015 and the resulting reduction in debt service associated with the 2015 defeasance are preliminary and subject to change.

The annual revenue requirements for cash-financed construction and/or cash defeasance in future years are currently assumed to be $350 million in 2016, $225 million in 2017, and $250 million per year for 2018 and 2019. These amounts are shown as annual deposits in the Cash Used for Capital Construction/Defeasance column in Table 5E. 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 of cash used for capital construction or the defeasance of outstanding bonds. Table 5E also shows the upstate water supply share of such costs. The upstate share is based on the total cash amounts used 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, shown in Table 5E.

The projected debt service of the Authority that is used in Table 5D 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 2015.

4.2.2.4 Ongoing and Future Capital Improvements

Ongoing capital improvements in the System to be funded through the proceeds of bonds in 2015 through 2019 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 2014 and year-to-date in 2015 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 2015 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.

There will be an overall net increase in the upcoming years to reflect the debt service for capital improvements being funded through the proceeds of Authority bonds. Table 5A 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 2014 was $42,626. The cost of service analysis assumes that the fifteen-year (2000 through 2014) average of $541,818 will provide an allowance for judgments and claims 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 can include tax refunds when such refunds are made. Miscellaneous revenues have been inconsistent over the years, declining in some years and increasing in others.

Hydropower revenues are shown for 2004 through 2014. 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.

Hydropower revenues as illustrated in Table 7 represent gross revenues prior to the application of offsetting expenses, which are included in the historical and projected OTPS and personal services expenses shown in the tables of this report. Table 14 shows the anticipated gross hydropower revenues by source. In 2015 and 2016, it is expected that such revenues will be approximately $10.7 million and $10.9 million, respectively, which, together with other miscellaneous revenues, will be applied as a credit towards the cost of water supply service.

For purposes of estimating future miscellaneous revenues during the Projection Period, the fifteen-year average (2000 through 2014) of permit/services revenues has been used. DEP received tax refunds in 2009 but no refunds were received in the previous four years or in 2010 through 2012 and 2014 as illustrated in Table 7. 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 instead receive 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 2012 and 2013 and 51% in 2014 of direct salary

and wages. Based on recent analyses prepared by the City, the pension and fringe benefit rate for 2015 is expected to be 48.1%. The assumed rate for 2016 through 2019 is also 48.1% of direct salary and wages. 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 (%)
2012-2013	46
2014	51
2015-2019	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 2015 through 2019 incorporate the projected and assumed changes in the pension and fringe benefit rate and a 3% per year increase from the current base personal salary and wage costs.

There are currently outstanding collective bargaining agreements between DEP and personnel providing direct and indirect upstate services. When the settlement is reached, there may be retroactive payments for salaries and wages plus pension and fringe benefits that will likely be made in the year in which the settlement occurs and an increase in annual salaries and wages beginning in the year of the settlement. No allowance has been included in the projected cost of service for either retroactive payments or an increase in base personal service expenses.

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.

Prior reports 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 the previous methodology in Table 11A and 12A for 2012 and 2013. However, we propose to simplify the allocation process for 2014 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 2019 in Tables 11A and 11B as well as Tables 12A and 12B. The result of the simplified approach is a small reduction in the 2014 costs compared to the amounts that would be calculated using the previous method.

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 system 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 2015 through 2019 reflect the same assumptions identified in Section 4.2.5. OTPS costs are assumed to increase at an annual rate of 3%.

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 $2,425,275 in 2014. 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 $2,425,275 in 2015 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 2012 through 2014 in Table 1A and for 2015 through 2019 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 is estimated to be $691,357,830 in 2015 and $669,443,446 in 2016. Of these amounts, $581,060,675 in 2015 and $555,770,252 in 2016, or about 84% and 83% (excluding the effects of the reconciliation), respectively, is for debt service/capital costs, 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 23% of all water supply costs in 2015 and 25% in 2016.

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 17% of all costs excluding the effects of the reconciliation credits, in 2015 and in 2016, respectively.

After accounting for the reconciliation credit/cost, the net total cost of water supply as presented in Table 1B (line 19) is $695,397,989 for 2015 and $680,402,031 for 2016. These amounts include the effects of the reconciliation cost for 2013 of $4,040,159 that is charged to 2015 (line 18a) and the proposed net reconciliation cost of $10,958,585 for 2014 that is added to 2016 (line 18b). The reconciliation cost of $10,958,585 reflects the effect of a proposed four-year allocation or phase-in of the total reconciliation cost for 2014 of $43,834,341. See Section 4.7 for a description of the proposed four-year allocation.

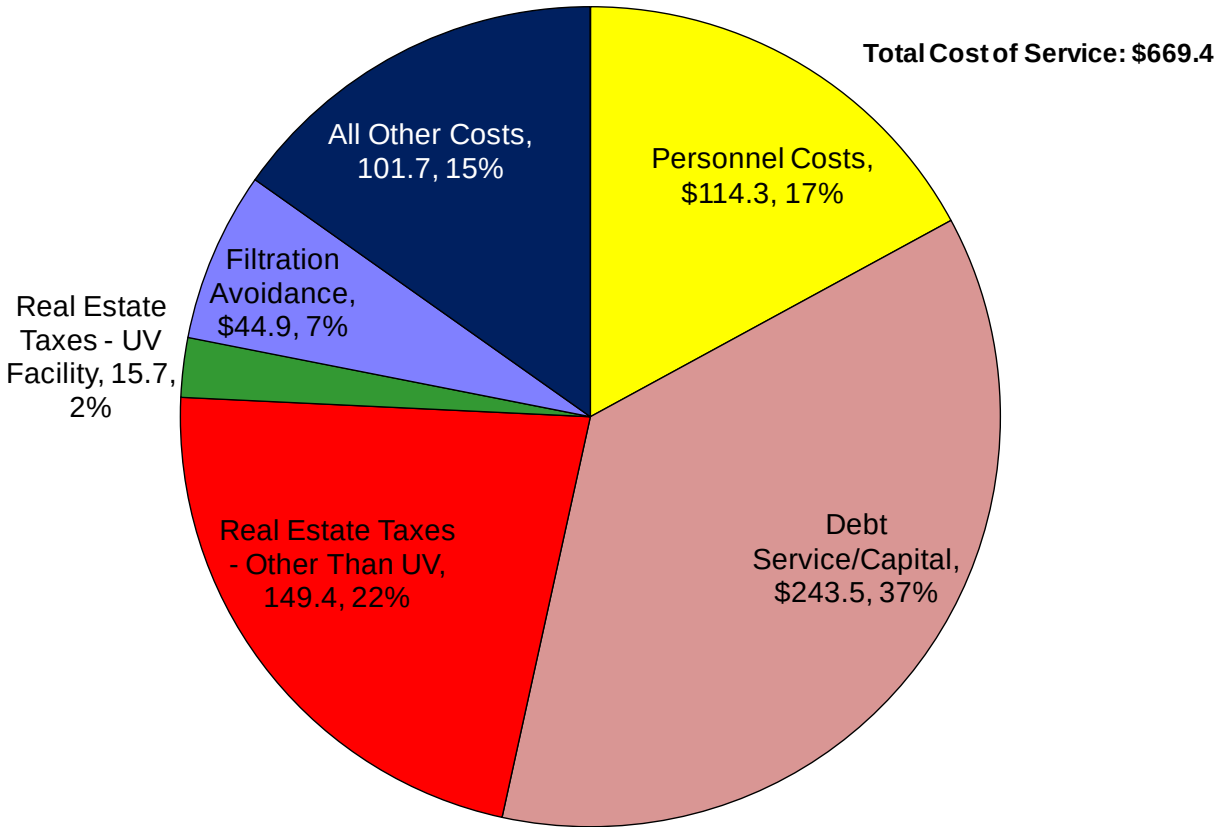
The projections show a decrease in the cost of service between 2015 and 2016, reflecting the assumption that there will be a significant reduction in the cash used for capital construction and defeasance in 2016. This assumption is subject to change.

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 2016 rate year excluding the effects of the reconciliation of prior year costs.

Figure 5 **Projected 2016 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 20) and a unit rate net of the reconciliation (line 22) for 2012 through 2014. Table 1B shows the projected cost of service for 2015 through 2019.

The 2015 rate includes a reconciliation of costs for 2013. As such, the cost of service recovered in 2013 (based on the adopted 2013 rate and the actual quantity of water consumed) was less than the actual 2013 cost of service (based on computed actual cost to the Board). Therefore, a reconciliation of the 2013 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 2015.

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 2016 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 2016 Rate

13	Total Costs Related to Facilities North of the City	$	669,443,445
14	System Usage	MG	393,525
15	Unit Rate to Recover the Total Costs (line 13 divided by 14)	$/MG	1,701.15
18a	No Phasing of 2015 Reconciliation	$	0
18b	Phasing of 2016 Reconciliation	$	10,958,585
18c	Phasing of 2017 Reconciliation (Preliminary)	$	0
19	Net Total Costs for Facilities North of the City (line 13+18)	$	680,402,031
21	Unit Rate Net of Reconciliation (line 19 / line 14)	$/MG	1,728.99
22	Upstate New York Usage	MG	38,959
23	Total Upstate Cost Including Reconciliation (line 21 x line 22)	$	67,359,765

After taking into account the reconciliation, the resulting unit rate, shown on line 21, is $1,728.99 per MG in 2016.

The cost of service attributable to upstate customers (including the cost reconciliation) is calculated by multiplying the unit rate of $1,728.99 by the annual upstate water consumption shown on line 22 of Table 1B. The resulting upstate cost is approximately $67.4 million for 2016. The remaining cost of water supply, approximately $613.0 million, would be recoverable from in-City water customers through rates and charges.

The reconciliation methodology used in this Report 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. In other words, had we followed the previous methodology, the shortfall in the recovery of water supply costs in 2014 of $43,834,341 would be applied, in full, to the cost of service for 2016. The resulting total cost of service and proposed regulated rate for 2016 would be $713,277,786 and $1,812.53 per MG, respectively. The increase in the regulated rate for 2016 would be 15.18% compared to the current 2015 rate. The size of the reconciliation from 2014 and thus the significant increase in the total cost of service and regulated rate for 2016 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 2014 and potentially for 2015, it is proposed that the reconciliation amount for these years should be recovered over a four-year period so as to moderate the resulting increase (or decrease) in the regulated rate. The Board would 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.

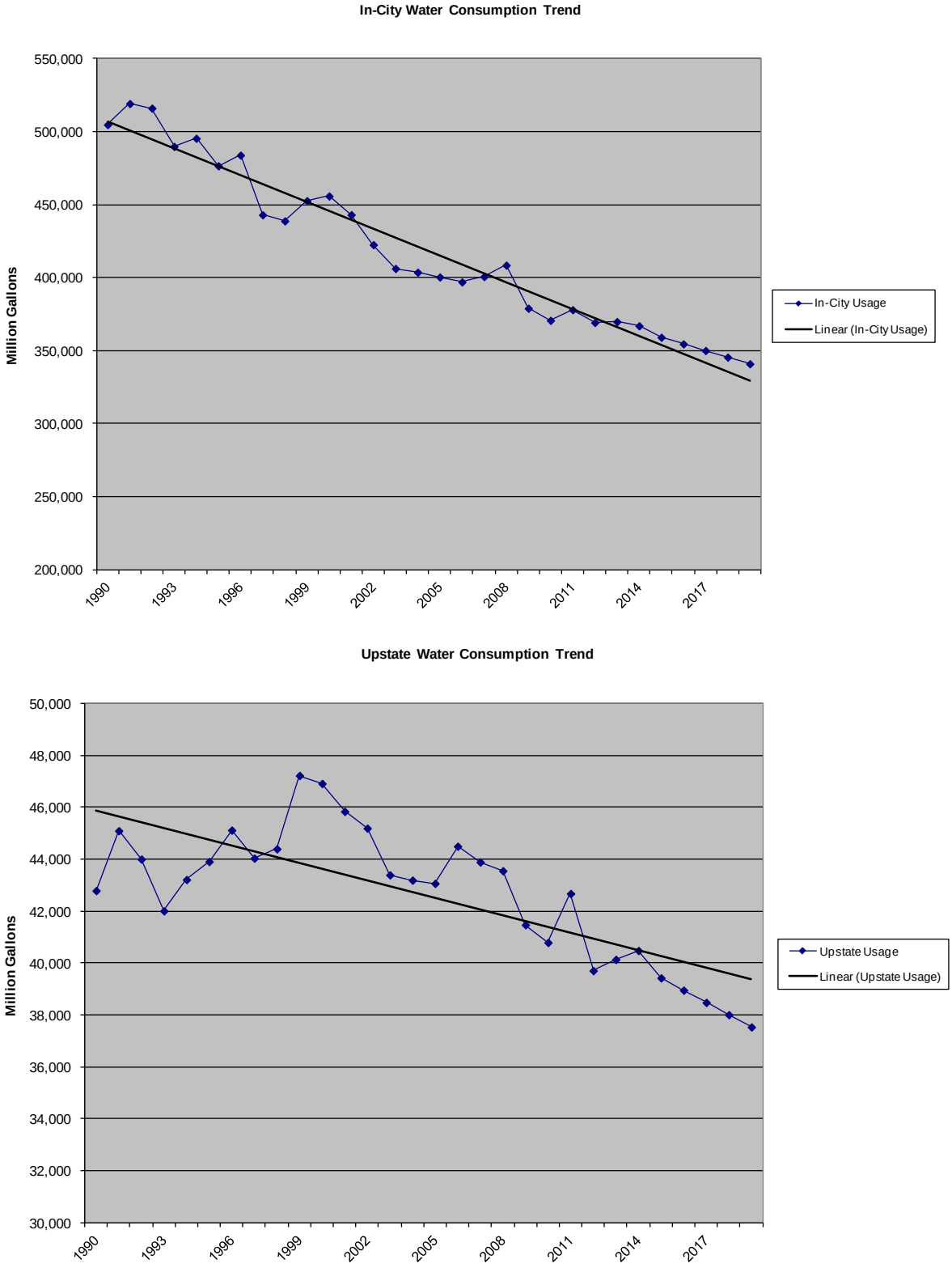
The water consumption used in calculating the regulated rate reflects a calculated decline in demand based on the results of a regression analysis. Water consumption data is presented in Table 13. The table presents water consumption data beginning in 1985. However, given the many changes that have occurred 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 398,529 MG in 2015 and 393,525 MG in 2016. The upstate share of total water consumption using the regression analysis is estimated to be 39,432 MG in 2015 and 38,959 MG in 2016. 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 2014. The 2015 year-to-date consumption is about 1.2% lower in-City through March 31, 2015 compared to the prior year and about 1.3% lower upstate through March 31, 2015 from the usage for the same time period in 2014. Thus, the actual unit rate for 2015 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 2.2% in 2015 to 1.3% in 2019. Current in-City assumptions are a 1.5% per year rate of decline from 2016 through 2019.

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 2016. 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 2016 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. The cost of service also does not consider the funding considerations presented in Section 4.6 of this report.

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.)

In 2013, DEP transitioned approximately 28,000 Tax Class 2 accounts from the in-City "frontage" system of billing to a modified Multiple-family Conservation Program ("MCP"). All accounts enrolled in the MCP either currently have meters and high-efficiency plumbing fixtures installed or have until June 30, 2016 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 will provide DEP and all metered customers with access to information on daily water use; over 431,000 new water meters of less than 2 inches in diameter and over 31,000 meters of 2 inches or more in diameter have been installed or replaced. Approximately 5,000 additional large meters are targeted for replacement by December 2015. In addition, 817,000 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 the ten upstate customers with the greatest water demand. 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 2016 is $1,728.99 per MG. The proposed regulated rate represents an increase of $155.38 per MG from the current 2015 unit rate of $1,573.61, or a 9.87% increase. (Without the effect of the spreading of the reconciliation from 2014 over a four year period, the unit rate for the cost of service would be $1,812.53 per MG, representing a 15.18% increase from the current rate.) The rate that was projected for 2016 in May 2014 was $1,705.18 per MG or an increase of 8.4% 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 $12.43 for the entire year or about three cents per day.

The current estimate of the unit cost of service for 2015 is $1,734.78 per MG, which is higher than the projected unit cost of $1,563.44 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 calculated net unit cost of service for 2015 at the time of this report is $1,744.91 per MG which is again higher than the rate in effect of $1,573.61 per MG. The current estimate of the unit cost of service for 2015 will change by the end of the fiscal year based on actual costs incurred and actual water consumption by customers.

For 2017 through 2019, 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 2015 may be higher than the unit rate being charged by the Board. If the final results for 2015 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 2017 may increase from the amounts shown in Figure 7 due to the effects of the reconciliation for both 2014 and 2015.

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

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

	2017	*2018*	*2019*
Percentage Change in the Unit Rate due to Increase in Cost of Service	0.8%	4.1%	3.8%
Percentage Change in the Unit Rate due to Fluctuations in Consumption	1.3%	1.4%	1.4%
Percentage Change in the Calculated Unit Rate for Water Supply	2.1%	5.5%	5.2%

* 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 2016.

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 2016 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 2012	FY 2013	FY 2014
	Bureau of Water Supply Direct				
	Costs for Facilities North of the City				
1	Other Than Personal Services	$	202,687,321	221,323,950	242,797,072
2	Debt Service	$	186,934,608	202,051,260	211,803,587
3a	Cash Used for Capital Construction	$	0	0	33,812,014
3b	Cash Used for the Defeasance of Debt	$	33,901,055	44,886,867	59,971,844
4	Judgment and Claims	$	240,320	526,166	42,626
5	Less Miscellaneous Revenue	$	(6,410,297)	(9,170,702)	(12,278,757)
	Personal Services				
6	Field Personnel	$	72,705,413	76,835,277	83,089,140
7	Support and Administrative Personnel	$	18,169,023	17,047,891	19,160,572
8	Total Costs Directly Related to Facilities North of the City	$	508,227,443	553,500,709	638,398,098
	Upstate Share of NYC DEP Costs				
9	Personal Services	$	7,616,886	7,640,158	7,552,944
10	Other Than Personal Services	$	7,263,199	7,268,211	8,471,962
11	Total NYC DEP Costs Allocated to Facilities North of the City	$	14,880,085	14,908,369	16,024,906
12	***Upstate Share of City Central Service Costs*** [(1)]	$	1,765,496	1,262,185	2,425,275
13	Total Costs Related to Facilities North of the City	$	524,873,024	569,671,263	656,848,279
14	System Usage	MG	408,954	410,006	407,436
15	***Unit Rate to Recover the Total Costs (line 13 divided by 14)***	$/MG	1,283.45	1,389.42	1,612.15
16	Unit Rate Charged	$	1,213.84	1,332.30	1,496.76
17	Revenue Raised (line 14 times 16)	$	496,405,035	546,251,339	609,834,207
		$			
18	Cost Reconciliation for Prior Years	$	(21,647,720)	(19,379,766)	(3,179,731)
19	Stipulation Credit	$	(10,000,000)		
20	Net Total Costs for Facilities North of the City (line 13+18+19)	$	493,225,304	550,291,497	653,668,547
21	Difference in Revenue Less Net Total Costs (line 17 minus 20)	$	3,179,731	(4,040,158)	(43,834,341)
22	***Unit Rate Net of Reconciliation & Stipulation (line 20 / line 14)***	$	1,206.06	1,342.15	1,604.35
23	Upstate New York Usage	MG	39,713	40,143	40,485
24	Total Upstate Cost Including Reconciliation/Stip (line 22 x line 23)	$	47,896,758	53,878,431	64,952,260

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 2015	FY 2016	FY 2017	FY 2018	FY 2019
				Projected Years			
	Bureau of Water Supply Direct						
	Costs for Facilities North of the City						
1	Other Than Personal Services	$	255,624,910	259,781,827	267,573,452	275,598,826	283,864,961
2	Debt Service	$	202,495,527	243,505,312	256,197,812	268,820,194	283,600,049
3	Cash Used for Capital Construction or Debt Defeasance		122,940,238	52,483,112	33,739,144	37,487,937	37,487,937
4	Judgment and Claims	$	541,818	541,818	541,818	541,818	541,818
5	Less Miscellaneous Revenue	$	(12,322,024)	(12,535,548)	(12,753,343)	(12,975,493)	(13,202,086)
	Personal Services						
6	Field Personnel	$	83,938,190	86,456,336	89,050,026	91,721,526	94,473,172
7	Support and Administrative Personnel	$	19,356,366	19,937,057	20,535,168	21,151,223	21,785,760
8	Total Costs Directly Related to Facilities North of the City	$	672,575,025	650,169,914	654,884,077	682,346,032	708,551,611
	Upstate Share of NYC DEP Costs						
9	Personal Services	$	7,630,124	7,859,028	8,094,799	8,337,643	8,587,772
10	Other Than Personal Services	$	8,727,407	8,989,229	9,258,906	9,536,673	9,822,773
11	Total NYC DEP Costs Allocated to Facilities North of the City	$	16,357,531	16,848,257	17,353,705	17,874,316	18,410,545
12	***Upstate Share of City Central Service Costs***	$	2,425,275	2,425,275	2,425,275	2,425,275	2,425,275
13	Total Costs Related to Facilities North of the City	$	691,357,830	669,443,445	674,663,057	702,645,622	729,387,432
14	System Usage	MG	398,529	393,525	388,522	383,518	378,515
15	***Unit Rate to Recover the Total Costs (line 13 divided by 14)***	$/MG	1,734.78	1,701.15	1,736.49	1,832.11	1,926.97
16	Unit Rate Charged	$/MG	1,573.61				
17	Revenue Raised (line 14 times 16)	$					
18a	No Phasing of 2015 Reconciliation	$	4,040,158				
18b	Phasing of 2016 Reconciliation	$		10,958,585	10,958,585	10,958,585	10,958,585
18c	Phasing of 2017 Reconciliation (Preliminary)	$			17,067,356	17,067,356	17,067,356
19	Net Total Costs for Facilities North of the City (line 13+18)	$	695,397,989	680,402,031	702,688,998	730,671,564	757,413,373
20	Difference in Revenue Less Net Total Costs (line 17 minus 19)	$	N/A	N/A	N/A	N/A	N/A
21	***Unit Rate Net of Reconciliation (line 19 / line 14)***	$/MG	1,744.91	1,728.99	1,808.62	1,905.18	2,001.01
22	Upstate New York Usage	MG	39,432	38,959	38,486	38,013	37,540
23	Total Upstate Cost Including Reconciliation (line 21 x line 22)	$	68,805,211	67,359,765	69,606,755	72,421,943	75,118,581

Notes:
* The rate adopted by the Board for FY 2015 is $1,573.61 per million gallons including the effects of the reconciliation from FY 2013.

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	$2.02/Ccf - 1st 50 Ccf $2.25/Ccf - Next 100 Ccf $2.54/Ccf - Next 200 Ccf (Rates are semi-annual; additional blocks for greater consumption) Plus fixed charge of $26.75 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	$271	$249

	Village of Mamaroneck	Town of Harrison
Current Water Rates	$4.60/Ccf - 1st 66 Ccf per Qtr $5.18/Ccf - Next 150 Ccf per Qtr Plus service charge based on meter size: $25.61/qtr for 5/8"; $30.56/qtr for 3/4"; etc.	$4.00/Ccf - 1st 66 Ccf per Qtr $4.82/Ccf - Next 150 Ccf per Qtr Plus service charge based on meter size: $38.32/qtr for 5/8"; $41.71/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	$604	$588

	New Rochelle United Water Company	City of Mount Vernon
Current Water Rates	Delivery charge: $3.6369 / Ccf Purchased Water Charge: $2.1472/Ccf Plus facility charge based on meter size: $9.00/mth for 5/8"; $13.41/mth for 3/4"; etc.	$3.05/Ccf - per quarter Minimum charge based on usage of 15 Ccf/qtr at $45.75
Avg. Annual Residential Use (Gal.)	80,000	80,000
Avg. Annual Residential Use (Ccf)	106.95	106.95
Avg. Residential Water Bill	$753	$326

Notes:
The above rates and charges reflect the rate schedules of each community in March 2015.

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)	$2.93 / 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	$313

	City of Newburgh	**Village of Cornwall**
Current Water Rates	$6.13 per 1,000 Gal over Minimum Water Facility Fee of $8.31 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	$524	$685

Notes:
The above rates and charges reflect the rate schedules of each community in March 2015.

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 2016 Regulated Rate	% Change to a Homeowner
City of White Plains	$271	$12.43	4.6%
Village of Scarsdale	$249	$12.43	5.0%
City of New Rochelle	$753	$12.43	1.7%
City of Yonkers	$313	$12.43	4.0%
Village of Mamaroneck	$604	$12.43	2.1%
Town of Harrison	$588	$12.43	2.1%
City of Mount Vernon	$326	$12.43	3.8%
Town of Carmel	$369 - $682	$12.43	3.4% to 1.8%
City of Newburgh	$524	$12.43	2.4%
Village of Cornwall	$685	$12.43	1.8%
New York City	$396	$12.43	3.1%

Notes:
(1) The Typical Single Family Charge for selected communities are based on 80,000 gallons of annual water use and the rate schedules of each community in March 2015.
(2) The increase in annual water charges for New York City in FY 2016 as proposed to the New York City Water Board is 3.24%. 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 2012 $	FY 2013 $	FY 2014 $
	Budget			
1	Supplies and Materials - General	2,827,269	2,690,238	3,222,812
2	Automotive Supplies and Materials	19,474	119,979	352,038
3	Fuel Oil	2,654,645	2,547,405	2,988,597
4	Equipment - General	607,066	776,101	910,953
5	Telecommunications Equipment	40,763	26,511	112,213
6	Office Equipment	50,682	56,782	142,647
7	Contractual Services - General	6,150,564	9,252,942	5,491,859
8	Telephone and Other Communications	311,541	293,495	243,704
9	Office Services	253,694	178,861	83,477
10	Maintenance and Repairs - Motor Vehicles	140,609	196,467	331,248
11	Maintenance and Repairs - General	830,140	962,240	1,626,428
12	Rentals - Miscellaneous Equipment	1,856,959	1,913,255	1,946,189
13	Advertising	5,047	86,878	103,755
14	Security Services	0	0	0
15	Cleaning Services	411,124	647,099	716,991
16	Licenses (1)	0	0	0
17	Chemicals	6,008,103	3,033,060	3,611,336
18	Real Estate Taxes - Existing Properties	129,367,391	133,866,465	140,803,187
19	Real Estate Taxes - UV Facility (3)	9,819,083	13,931,769	14,691,288
20	NYS DEC Permits (1)	0	0	0
21	Motor Maintenance Supplies (1)	29,431	0	537,054
22	Gasoline (1)	0	0	0
23	Lab and Limnology	94,939	208,962	78,445
24	Natural Gas & Electricity	1,990,946	4,599,875	5,863,994
25	Heat, Light & Power	0	0	1,049,909
26	Watershed Regulations Consulting	0	0	0
27	Upstate Cost of Service/Rate Studies	46,603	54,165	61,180
28	Hillview Reservoir (2)	14,150,836	12,362,948	13,121,487
29	UV Facility	341,363	829,463	6,248,316
30	Filtration Avoidance - O&M Payments	10,757,589	10,281,831	11,906,334
31	Filtration Avoidance - Program Funding	12,045,037	19,764,817	25,001,774
32	Water Supply Environmental Health & Safety	1,876,423	2,642,343	1,549,855
33	OpX Savings			
34	Totals	202,687,321	221,323,950	242,797,072

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 2012 through FY 2014.

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	*Projected Years* FY 2015 $	FY 2016 $	FY 2017 $	FY 2018 $	FY 2019 $
1	Supplies and Materials - General	3,319,496	3,419,081	3,521,654	3,627,303	3,736,122
2	Automotive Supplies and Materials	362,599	373,477	384,681	396,222	408,108
3	Fuel Oil	3,078,255	3,170,603	3,265,721	3,363,693	3,464,603
4	Equipment - General	938,281	966,430	995,423	1,025,285	1,056,044
5	Telecommunications Equipment	115,579	119,046	122,618	126,296	130,085
6	Office Equipment	146,926	151,334	155,874	160,550	165,367
7	Contractual Services - General	5,656,615	5,826,314	6,001,103	6,181,136	6,366,570
8	Telephone and Other Communications	251,016	258,546	266,302	274,292	282,520
9	Office Services	85,981	88,561	91,218	93,954	96,773
10	Maintenance and Repairs - Motor Vehicles	341,186	351,421	361,964	372,823	384,007
11	Maintenance and Repairs - General	1,675,221	1,725,478	1,777,242	1,830,559	1,885,476
12	Rentals - Miscellaneous Equipment	2,004,575	2,064,712	2,126,653	2,190,453	2,256,167
13	Advertising	106,868	110,074	113,376	116,778	120,281
14	Security Services	0	0	0	0	0
15	Cleaning Services	738,501	760,656	783,476	806,980	831,189
16	Licenses (1)	0	0	0	0	0
17	Chemicals	3,719,676	3,831,266	3,946,204	4,064,590	4,186,528
18	Real Estate Taxes - Existing Properties	145,027,282	149,378,101	153,859,444	158,475,227	163,229,484
19	Real Estate Taxes - UV Facility	15,240,213	15,697,419	16,168,342	16,653,392	17,152,994
20	NYS DEC Permits (1)	0	0	0	0	0
21	Motor Maintenance Supplies	553,166	569,761	586,853	604,459	622,593
22	Gasoline (1)	0	0	0	0	0
23	Lab and Limnology	80,798	83,222	85,719	88,291	90,939
24	Natural Gas & Electricity	6,039,914	6,221,111	6,407,744	6,599,977	6,797,976
25	Heat, Light & Power	1,081,406	1,113,848	1,147,264	1,181,682	1,217,132
26	Upstate Cost of Service/Rate Studies	61,000	61,000	61,000	61,000	61,000
27	Hillview Reservoir	13,515,132	13,920,586	14,338,203	14,768,350	15,211,400
28	UV Facility	7,888,873	8,125,539	8,369,305	8,620,385	8,878,996
29	Filtration Avoidance - O&M Payments	13,800,000	13,800,000	14,214,000	14,640,420	15,079,633
30	Filtration Avoidance - Program Funding	33,200,000	31,100,000	32,033,000	32,993,990	33,983,810
31	Water Supply Environmental Health & Safety	1,596,351	1,644,241	1,693,568	1,744,375	1,796,707
32	OpX Savings	(5,000,000)	(5,150,000)	(5,304,500)	(5,463,635)	(5,627,544)
33	Totals	255,624,910	259,781,827	267,573,452	275,598,826	283,864,961

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 Debt Service Summary

TABLE 5A
New York City Water Board
Cost of Supplying Water to Upstate Customers
Debt Service Summary

Line No.	Fiscal Year	Authority/NYSEFC Debt Service
1	2012	186,934,608
2	2013	202,051,260
3	2014	211,803,587
Projection Years:		
4	2015	202,495,527
5	2016	243,505,312
6	2017	256,197,812
7	2018	268,820,194
8	2019	283,600,049

Notes:

(A) The Upstate allocation of debt service shown in Table 5B of this report is slightly different than what was shown in May 2014, reflecting updated information from the Authority.

Table 5B Authority Bond Proceeds

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

Line	Bond Issue	Total Principal ($)	Total Upstate Allocation	Upstate Principal ($)
1	1986 through 2007	13,958,932,298	11.50%	1,605,359,990
2	FY 2008 Series AA	400,000,000	27.49%	109,951,398
3	FY 2008 Series BB	401,000,000	15.39%	61,708,489
4	FY 2008 Series A	446,245,000	14.91%	66,527,108
5	FY 2008 Series DD	504,905,000	12.90%	65,126,012
6	**2009 Total**	15,711,082,298	12.15%	1,908,672,996
7	FY 2009 Series BB	200,870,000	63.93%	128,419,355
8	FY 2009 Series CC	150,100,000	9.17%	13,762,275
9	FY 2009 Series A	536,030,000	21.14%	113,326,719
10	FY 2009 Series DD	325,580,000	13.36%	43,512,270
11	FY 2009 Series EE	645,455,000	31.32%	202,147,362
12	FY 2009 Series FF	270,035,000	0.44%	1,185,596
13	FY 2009 Series GG	500,000,000	32.79%	163,938,186
14	**2010 Total**	18,339,152,298	14.04%	2,574,964,758
15	FY 2010 Series AA	504,240,000	17.49%	88,192,237
16	FY 2010 Series BB	218,820,000	0.00%	-
17	FY 2010 Series CC	200,000,000	0.53%	1,060,388
18	FY 2010 Series DD	400,000,000	22.50%	89,999,107
19	FY 2010 Series EE	500,000,000	19.32%	96,596,999
20	FY 2010 Series FF	359,110,000	0.00%	-
21	FY 2010 Series GG	554,045,000	29.31%	162,377,029
22	**2011 Total**	21,075,367,298	14.30%	3,013,190,518
23	FY 2011 Series AA	750,000,000	19.20%	143,981,546
24	FY 2011 Series CC	750,000,000	16.04%	120,328,717
25	FY 2011 Series DD	275,000,000	37.68%	103,609,101
26	FY 2011 Series EE	450,000,000	28.32%	127,438,636
27	FY 2011 Series FF	200,000,000	31.20%	62,392,534
28	FY 2011 Series GG	250,000,000	33.69%	84,237,054
29	**2012 Total**	23,750,367,298	15.39%	3,655,178,106
30	FY 2012 Series A-1, A-2	200,000,000	24.25%	48,498,906
31	FY 2012 Series AA	250,000,000	22.34%	55,858,298
32	FY 2012 Series BB	450,000,000	16.56%	74,520,000
33	FY 2012 Series CC&DD	400,000,000	23.01%	92,024,345
34	FY 2012 Series EE	77,725,000	26.57%	20,650,174
35	FY 2012 Series B1-B4	325,000,000	34.13%	110,924,326
36	FY 2012 Series FF&GG	450,000,000	37.68%	169,568,242
37	**2013 Total**	25,903,092,298	16.32%	4,227,222,397
38	FY 2013 Series AA-1, AA-2	200,000,000	23.69%	47,373,605
39	FY 2013 Series BB	440,510,000	18.22%	80,256,919
40	FY 2013 Series CC	455,955,000	10.68%	48,707,107
41	FY 2013 Series EE	292,925,000	18.35%	53,742,595
42	**2014 Total**	27,292,482,298	16.33%	4,457,302,623
43	FY 2014 Series AA	650,870,000	26.13%	170,095,641
44	FY 2014 Series BB	397,085,000	13.09%	51,984,538
45	FY 2014 Series CC	351,240,000	20.91%	73,429,272
46	**2015 Total**	28,691,677,298	16.57%	4,752,812,075
47	FY 2015 Series AA	200,000,000	21.12%	42,249,215
48	FY 2015 Series BB	400,000,000	19.03%	76,115,880
49	FY 2015 Series CC	200,000,000	9.64%	19,281,713
50	FY 2015 Series EE	136,135,000	25.94%	35,317,950
		29,627,812,298	16.63%	4,925,776,833
51	**2016-2019 Total**		16.33%	

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 5C NYSEFC Bond Proceeds

Table 5C
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	**2016-2019 Total**		9.92%	

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

Table 5D Debt Service

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

Line No.	Description		Actual FY 2014 $	FY 2015 $	FY 2016 $	Projected FY 2017 $	FY 2018 $	FY 2019 $
	System Totals - Capital-Related Costs							
1	Authority Debt Service - First Resolution	A	295,530,385	175,441,000	166,529,000	204,739,000	195,477,000	227,997,000
2	Anticipated Debt Service - First Resolution	B	-	-	7,000,000	22,000,000	38,000,000	54,000,000
3	Authority Debt Service - Second Resolution	C	767,075,977	796,969,000	1,015,454,000	978,463,000	1,000,447,000	988,043,000
4	Anticipated Debt Service - Second Resolution	D	-	-	19,000,000	60,000,000	104,000,000	150,000,000
5	Interest on Short-Term Debt	E	421,092	1,500,000	18,000,000	25,500,000	25,500,000	25,500,000
6	NYS EFC Outstanding Debt Service	F	392,445,567	382,479,243	383,862,000	384,185,000	376,846,000	369,319,000
7	NYS EFC Projected Debt Service	G	-	-	19,000,000	35,000,000	50,000,000	67,000,000
	System Totals - Interest Earnings & Expenses							
8	Debt Service Fund	H	(453,344)	-	-	(1,000,000)	(1,000,000)	(1,000,000)
9	Debt Service Reserve Fund	I	(30,134,495)	(29,000,000)	(26,000,000)	(21,000,000)	(20,000,000)	(20,000,000)
10	Construction Fund	J	(26,340)	-	-	(1,000,000)	(2,000,000)	(2,000,000)
11	Subordinated Debt Service Fund	K		-	-	(2,000,000)	(5,000,000)	(5,000,000)
12	Miscellaneous Income & Expenses	L	(15,589,933)	-	-	-	-	-
13	Less: Authority Debt-Related Expenses	M	43,191,200	48,195,000	52,635,000	55,266,000	58,030,000	60,932,000
	Water Supply - Capital-Related Costs							
14	Authority Debt Service - First Resolution	A x N	48,264,879	29,062,020	27,186,681	33,424,652	31,912,585	37,221,635
15	Anticipated Debt Service - First Resolution	B x N	-	-	1,142,785	3,591,609	6,203,687	8,815,766
16	Authority Debt Service - Second Resolution	C x N	125,275,881	132,018,907	165,777,875	159,738,912	163,327,908	161,302,894
17	Anticipated Debt Service - Second Resolution	D x N	-	-	3,101,844	9,795,296	16,978,513	24,488,240
18	Interest on Short-Term Debt	E x O	63,280	229,081	2,699,131	3,823,770	3,823,770	3,823,770
19	NYS EFC Debt Service	(F+G)xP	38,915,992	38,629,026	39,948,914	41,567,548	42,327,234	43,266,603
	Water Supply - Interest Earnings							
20	Debt Service Fund	H x N	(74,038)	-	-	(163,255)	(163,255)	(163,255)
21	Debt Service Reserve Fund	I x N	(4,921,449)	(4,803,886)	(4,244,628)	(3,428,354)	(3,265,099)	(3,265,099)
22	Construction Fund	J x O	(3,958)	-	-	(149,952)	(299,903)	(299,903)
23	Subordinated Debt Service Fund	KxNxP	-	-	-	(289,647)	(726,947)	(727,462)
24	Miscellaneous Income & Expenses	LxNxP	(2,207,583)	-	-	-	-	-
25	Less: Authority Debt-Related Expenses	M x O	6,490,584	7,360,379	7,892,710	8,287,233	8,701,700	9,136,860
26	Net Water Supply Debt Service		211,803,587	202,495,527	243,505,312	256,197,812	268,820,194	283,600,049
			2014	**2015**	**2016-2019**			
27	Upstate Authority $ as a % of Total Authority CIP $	N	16.33%	16.57%	16.33%			
28	Upstate Total CIP $ as a % of Total CIP $	O	15.03%	15.27%	15.00%			
29	Upstate NYS EFC $ as a % of Total NYS EFC CIP $	P	9.92%	10.10%	9.92%			

There will be a release of $252 million in FY 2015 from the Debt Service Reserve Fund; such funds will be used for cash-financed construction.

Table 5E Cash Used for Capital Construction and the Defeasance of Debt

TABLE 5E
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
FY 2011	260,000,000	0	260,000,000	13.11%
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	805,000,000	0	805,000,000	15.27%
FY 2016	350,000,000	N/A	N/A	15.00%
FY 2017	225,000,000	N/A	N/A	15.00%
FY 2018	250,000,000	N/A	N/A	15.00%
FY 2019	250,000,000	N/A	N/A	15.00%

	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 2011	34,091,414	0	34,091,414
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	122,940,238	0	122,940,238
FY 2016	52,483,112	N/A	N/A
FY 2017	33,739,144	N/A	N/A
FY 2018	37,487,937	N/A	N/A
FY 2019	37,487,937	N/A	N/A

The amounts shown for FY 2015 through FY 2019 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 ($)
2000	109,969
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
Average (2000-2014)	541,818
Projection Years (2015-2019)	541,818

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
2000		944,043	283,436	1,227,479
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
Average		1,645,830		
Projection Years (2015-2019)				
2015	10,676,194	1,645,830	0	12,322,024
2016	10,889,718	1,645,830	0	12,535,548
2017	11,107,513	1,645,830	0	12,753,343
2018	11,329,663	1,645,830	0	12,975,493
2019	11,556,256	1,645,830	0	13,202,086

Notes:

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

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 2012 $	FY 2013 $	FY 2014 $
	Divisional and Sectional Offices			
1	Katonah Resource Protection	107,012	135,541	334,647
2	Carmel Section	4,645,416	5,052,739	4,597,914
3	Prattsville/Schoharie	3,096,196	2,181,738	1,936,688
4	Ashokan	4,325,596	7,481,827	4,844,596
5	Grahamsville	5,399,752	5,305,359	5,704,146
6	Port Jervis	671,734	570,322	564,414
7	E. Division Hudson River P/S	619,570	710,849	1,548,546
	Laboratories			
8	Kensico	1,629,160	1,711,554	1,717,520
9	Brewster	641,612	543,607	563,356
10	Grahamsville	1,153,429	1,247,113	1,317,424
	Other Services			
11	Downsville	3,669,811	3,576,821	3,688,543
12	Sutton Park (1)	7,695,683	7,787,847	10,136,219
13	Kingston	9,332,006	9,412,845	9,769,561
14	Watershed Security (2)	12,026,243	13,617,410	16,433,666
15	Watershed-East of Hudson	5,577,629	5,661,851	5,849,433
16	Downsville/Water Plan and Protect	251,155	254,139	247,549
17	Mahopac	861,958	740,052	826,479
18	Environmental Health & Safety	0	215,590	0
19	Hillview Reservoir (3)	4,612,797	4,235,366	5,864,310
20	UV Facility	3,410,433	4,244,876	4,126,419
21	Direct Personnel Overtime Costs	2,978,220	2,147,832	3,017,709
22	**Total Personal Services Costs**	**72,705,413**	**76,835,277**	**83,089,140**

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 and a fringe benefit rate of 46.0% in FY 2012, 46.0% in FY 2013, and 51.0% in FY 2014.
(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.

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	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
				Projected Years		
		$	$	$	$	$
	Divisional and Sectional Offices					
1	Katonah Resource Protection	338,066	348,208	358,655	369,414	380,497
2	Carmel Section	4,644,897	4,784,244	4,927,772	5,075,605	5,227,873
3	Prattsville/Schoharie	1,956,478	2,015,172	2,075,627	2,137,896	2,202,033
4	Ashokan	4,894,101	5,040,924	5,192,151	5,347,916	5,508,353
5	Grahamsville	5,762,434	5,935,307	6,113,366	6,296,767	6,485,670
6	Port Jervis	570,182	587,287	604,906	623,053	641,744
7	E. Division Hudson River P/S	1,564,370	1,611,301	1,659,640	1,709,429	1,760,712
	Laboratories					
8	Kensico	1,735,070	1,787,122	1,840,736	1,895,958	1,952,837
9	Brewster	569,113	586,186	603,772	621,885	640,542
10	Grahamsville	1,330,886	1,370,813	1,411,937	1,454,295	1,497,924
	Other Services					
11	Downsville	3,726,234	3,838,021	3,953,162	4,071,757	4,193,910
12	Sutton Park (1)	10,239,797	10,546,991	10,863,400	11,189,302	11,524,981
13	Kingston	9,869,392	10,165,473	10,470,438	10,784,551	11,108,087
14	Watershed Security (2)	16,601,595	17,099,642	17,612,632	18,141,011	18,685,241
15	Watershed-East of Hudson	5,909,205	6,086,482	6,269,076	6,457,148	6,650,863
16	Water Plan and Protect	250,079	257,581	265,309	273,268	281,466
17	Mahopac	834,925	859,972	885,771	912,345	939,715
18	Environmental Health & Safety	0	0	0	0	0
19	Hillview Reservoir	5,924,235	6,101,962	6,285,021	6,473,572	6,667,779
20	UV Facility	4,168,585	4,293,643	4,422,452	4,555,126	4,691,779
21	Direct Personnel Overtime Costs	3,048,546	3,140,002	3,234,202	3,331,228	3,431,165
22	**Total Personal Services Costs**	**83,938,190**	**86,456,336**	**89,050,026**	**91,721,526**	**94,473,172**

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 2015 - FY 2019.
(4) It is assumed that personal services costs will increase 3.0% per year in FY 2015 - FY 2019, 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.

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 2012 $	FY 2013 $	FY 2014 $
	Divisional and Sectional Offices			
1	Katonah Resource Protection	602,640	571,501	668,815
2	Carmel Section	418,681	301,118	69,051
3	Ashokan	285,580	523,126	325,847
4	Grahamsville	1,195,248	1,459,296	2,030,252
5	E. Division Hudson River P/S			155,313
	Laboratories			
6	Kensico	333,638	348,666	360,262
7	Brewster	68,697	75,877	85,412
8	Grahamsville	285,573	156,631	294,674
	Other Services			
9	Downsville	131,101	141,655	160,627
10	Sutton Park (1)	4,748,469	4,459,896	5,092,393
11	Kingston Office	5,901,905	5,686,340	5,713,534
12	Watershed Security (2)	1,949,017	1,436,377	1,732,301
13	Mobile Task Force	317,076	0	0
14	East of Hudson Fleet	306,644	325,606	216,007
15	Shokan Fleet Admin.	393,791	259,384	322,009
16	Downsville Fleet Admin.	102,215	104,600	203,280
17	Grahmsville Fleet Admin.	204,429	215,626	329,413
18	Watershed-East of Hudson	143,525	151,431	410,807
19	Other	81,820	107,622	0
20	UV Facility	424,270	470,189	549,886
21	Indirect Personnel Overtime Costs	274,704	252,948	440,692
22	**Total Personal Services Costs**	**18,169,023**	**17,047,891**	**19,160,572**

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 and a fringe benefit rate of 46.0% in FY 2012, 46.0% in FY 2013, and 51.0% in FY 2014.
(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 2015	FY 2016	FY 2017	FY 2018	FY 2019
				Projected Years		
		$	$	$	$	$
	Divisional and Sectional Offices					
1	Katonah Resource Protection	675,650	695,919	716,797	738,301	760,450
2	Carmel Section	69,757	71,849	74,005	76,225	78,512
3	Prattsville/Schoharie	0	0	0	0	0
4	Ashokan	329,177	339,052	349,224	359,700	370,491
5	Grahamsville	2,050,998	2,112,528	2,175,904	2,241,181	2,308,416
	Laboratories					
6	Kensico	363,943	374,861	386,107	397,690	409,621
7	Brewster	86,284	88,873	91,539	94,285	97,114
8	Grahamsville	297,685	306,616	315,814	325,288	335,047
	Other Services					
9	Downsville	162,268	167,136	172,150	177,315	182,634
10	Sutton Park (1)	5,144,429	5,298,762	5,457,725	5,621,457	5,790,101
11	Kingston Office	5,771,918	5,945,075	6,123,427	6,307,130	6,496,344
12	Watershed Security (2)	1,750,002	1,802,502	1,856,577	1,912,275	1,969,643
13	Mobile Task Force	0	0	0	0	0
14	East of Hudson Fleet	218,214	224,761	231,504	238,449	245,602
15	Ashokan Fleet Admin.	325,299	335,058	345,110	355,463	366,127
16	Downsville Fleet Admin.	205,357	211,518	217,863	224,399	231,131
17	Grahmsville Fleet Admin.	332,780	342,763	353,046	363,637	374,546
18	Watershed-East of Hudson	415,004	427,455	440,278	453,487	467,091
19	Other	0	0	0	0	0
20	UV Facility	555,505	572,170	589,335	607,015	625,226
21	Indirect Personnel Overtime Costs	445,195	458,551	472,308	486,477	501,071
22	**Total Personal Services Costs**	**19,356,366**	**19,937,057**	**20,535,168**	**21,151,223**	**21,785,760**

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 2015 - FY 2019.
(4) It is assumed that personal services costs will increase 3.0% per year in FY 2015 - FY 2019, 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.

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	2012		2013		2014		Projection Years
1	Total Salaries - Employees North of the City	83,008,714		87,247,022		92,927,001		
2		---------- =	52.08%	---------- =	54.63%	---------- =	56.41%	56.41%
3	Total Salaries - All Water Supply Employees	159,381,159		159,698,085		164,739,671		
4	Head Count - Water Supply Employees	1,653		1,623		1,580		
5		---------- =	33.94%	---------- =	32.22%	---------- =	33.03%	33.03%
6	Head Count - All NYC DEP Employees	4,870		5,038		4,784		
7	Effective Allocation of DEP Personal Services to Facilities North of the City	Line 2 * Line 5 =	17.68%	Line 2 * Line 5 =	17.60%	Line 2 * Line 5 =	18.63%	18.63%
8	Total Salaries - Employees North of the City					92,927,001		
9						---------- =	17.05%	17.05%
10	Total Salaries - All NYC DEP Employees					544,938,572		
11	Number of Vehicles - Water Supply	753		743		552		
12		---------- =	36.25%	---------- =	36.95%	---------- =	32.80%	32.80%
13	Number of Vehicles - All NYC DEP	2,078		2,011		1,684		

(1) Prior reports 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 2012 and FY 2013 and proposes to simplify the allocation process for FY 2014 and future years by using the percentage in line 9 to calculate the allocated costs for FY 2014 - FY 2019 in Tables 11A and 11B.

(2) Prior reports 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 2012 and FY 2013 and proposes to simplify the allocation process for FY 2014 and future years by using the percentage in line 9 to calculate the allocation of certain costs for FY 2014 - FY 2019 in Tables 12A and 12B.

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 2012 $	FY 2013 $	FY 2014 $
1	Executive	7,962,243	8,430,796	8,919,877
2	General Counsel	3,957,425	3,251,340	3,660,141
3	Public Affairs	1,690,502	2,899,288	2,812,416
4	Env. Health & Safety	3,267,576	3,677,515	3,575,126
5	Environ. Planning	4,360,093	4,849,879	5,293,381
6	Budget Office	2,625,271	2,563,433	2,886,776
7	Facilities Mgt & Constr	5,497,867	5,776,921	6,350,129
8	Human Res & Labor Rel	11,645,232	9,400,367	7,427,729
9	Chief Contract Office	1,743,208	1,798,178	1,936,078
10	Addt'l Exec & Support	337,641	750,757	1,430,002
11	Total DEP Executive and Support Personal Services Costs	43,087,057	43,398,473	44,291,654
12	Allocation to Water Supply	33.94%	32.22%	
13	Personal Services Costs Related to Water Supply	14,624,827	13,984,645	44,291,654
14	Allocation to Facilities North of NYC	52.08%	54.63%	
15	Allocation to Water Supply North of NYC			17.05%
16	**Personal Services Costs Related to Facilities North of the City**	**7,616,886**	**7,640,158**	**7,552,944**

Notes:
(1) Personal service costs include salary and a fringe benefit rate of 46.0% in FY 2012, 46.0% in FY 2013, and 51.0% in FY 2014.
(2) Beginning in FY 2014, the methodology for calculating the allocated upstate water supply share of DEP personal service costs (in line 16 above) is proposed to be 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 2015 $	FY 2016 $	Projected Years FY 2017 $	FY 2018 $	FY 2019 $
1	Executive	9,011,026	9,281,356	9,559,797	9,846,591	10,141,989
2	General Counsel	3,697,542	3,808,469	3,922,723	4,040,404	4,161,616
3	Public Affairs	2,841,154	2,926,389	3,014,181	3,104,606	3,197,744
4	Env. Health & Safety	3,611,659	3,720,008	3,831,609	3,946,557	4,064,954
5	Environ. Planning	5,347,472	5,507,896	5,673,133	5,843,327	6,018,627
6	Budget Office	2,916,274	3,003,763	3,093,875	3,186,692	3,282,292
7	Facilities Mgt & Constr	6,415,018	6,607,468	6,805,692	7,009,863	7,220,159
8	Human Res & Labor Rel	7,503,629	7,728,738	7,960,600	8,199,418	8,445,401
9	Chief Contract Office	1,955,862	2,014,538	2,074,974	2,137,223	2,201,340
10	Addt'l Exec & Support	1,444,614	1,487,953	1,532,591	1,578,569	1,625,926
11	Total DEP Personal Services Costs	44,744,251	46,086,578	47,469,175	48,893,251	50,360,048
12	Allocation to Water Supply North of NYC	17.05%	17.05%	17.05%	17.05%	17.05%
13	**Personal Services Costs - Facilities North of the City**	**7,630,124**	**7,859,028**	**8,094,799**	**8,337,643**	**8,587,772**

Notes:
(1) Personal service costs include a fringe benefit rate of 48.1% in FY 2015 - FY 2019.
(2) It is assumed that personal services costs will increase 3.0% per year in FY 2015 - FY 2019, 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 proposed modification as presented in Table 10.

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 2012 $	FY 2013 $	FY 2014 $
1	Accounting	103,665	73,057	70,647
2	Executive and Support	11,132	55,177	38,688
3	Fleet Administration	7,282,248	4,902,353	9,090,789
4	Public Affairs	203,689	205,837	283,973
5	Facilities Management and Construction	704,365	885,959	3,250,383
6	Management and Budget	1,383,705	1,223,819	3,345,460
7	Management Information Systems	7,173,382	8,734,013	8,663,281
8	Chief Engineer	54,697	26,626	30,902
9	Legal	44,932	37,159	36,708
10	Environmental Assessment	793,105	898,111	473,833
11	Telephone	5,211,912	6,637,828	6,848,017
12	Lefrak Administration Rents	5,345,023	4,716,903	4,783,507
13	Facility Management Rents	363,220	352,000	452,602
14	Management and Budget Environmental Health/Safety	417,913	217,736	238,887
15	Security Services	1,688,671	1,677,259	1,559,898
16	Contractual Services	63,653	0	0
17	DEP Online Store	0	0	(7,322)
18	Obesity Task Force	0	40,565	0
19	Total OTPS to be Allocated	30,845,311	30,684,402	39,160,253
20	Allocation	33.94%	32.22%	
21				17.05%
22	OTPS Allocation (line 19 X line 20 for FY 2012-FY 2013, line 19 X line 21 for FY 2014)	10,469,671	9,887,686	6,677,899
23	Rents Other Than Lefrak	1,508,422	1,683,012	1,430,603
24	Lefrak Water Supply Rents	1,507,365	1,486,880	1,675,610
25	Total Rents (line 23 + line 24)	3,015,787	3,169,892	3,106,213
26	Motor Vehicle Operating Rents	1,110,653	513,528	0
27	Allocation	36.25%	36.95%	32.80%
28	Total Motor Vehicle Operating Rents (line 26 X line 27)	402,642	189,732	0
29	Motor Vehicle Parking	345,000	345,000	396,750
30	Allocation	16.70%	16.38%	18.72%
31	Total Motor Vehicle Parking (line 29 X line 30)	57,630	56,519	74,276
32	Total OTPS Costs Allocated to Water Supply at DEP	13,945,730	13,303,829	
33	Rent & Motor Vehicles Costs Allocated to Water Supply at DEP (3)			3,180,489
34	Allocation to Facilities North of NYC	52.08%	54.63%	56.41%
35	OTPS Costs Related to Facilities North of the City	7,263,199	7,268,211	
36	Rent & Motor Vehicles Costs Related to Facilities North of the City in FY 2014 (4)			1,794,063
37	OTPS Costs Related to Facilities North of the City (line 22 + line 36 in FY 2014)			8,471,962

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 2012 and 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 2015 $	FY 2016 $	*Projected Years* FY 2017 $	FY 2018 $	FY 2019 $
1	Accounting	72,767	74,950	77,198	79,514	81,899
2	Executive and Support	39,849	41,044	42,275	43,544	44,850
3	Fleet Administration	9,363,513	9,644,418	9,933,751	10,231,763	10,538,716
4	Public Affairs	292,493	301,267	310,305	319,615	329,203
5	Facilities Management and Construction	3,347,894	3,448,331	3,551,781	3,658,335	3,768,085
6	Management and Budget	3,445,823	3,549,198	3,655,674	3,765,344	3,878,305
7	Management Information Systems	8,923,179	9,190,875	9,466,601	9,750,599	10,043,117
8	Chief Engineer	31,829	32,784	33,767	34,780	35,824
9	Legal	37,809	38,943	40,111	41,315	42,554
10	Environmental Assessment	488,048	502,690	517,770	533,304	549,303
11	Telephone	7,053,458	7,265,061	7,483,013	7,707,504	7,938,729
12	Lefrak Administration Rents	4,927,013	5,074,823	5,227,068	5,383,880	5,545,396
13	Facility Management Rents	466,180	480,165	494,570	509,407	524,689
14	Management and Budget Environmental Health/Safety	246,054	253,435	261,038	268,869	276,936
15	Security Services	1,606,695	1,654,896	1,704,543	1,755,679	1,808,350
16	Contractual Services	0	0	0	0	0
17	DEP Online Store	0	0	0	0	0
18	Obesity Task Force	0	0	0	0	0
19	Total OTPS to be Allocated	40,342,602	41,552,880	42,799,467	44,083,451	45,405,954
20						
21	Allocation	17.05%	17.05%	17.05%	17.05%	17.05%
22	OTPS Allocation (line 19 X line 21)	6,879,522	7,085,908	7,298,485	7,517,440	7,742,963
23	Rents Other Than Lefrak	1,473,521	1,517,727	1,563,259	1,610,157	1,658,461
24	Lefrak Water Supply Rents	1,725,878	1,777,655	1,830,984	1,885,914	1,942,491
25	Total Rents (line 23 + line 24)	3,199,400	3,295,382	3,394,243	3,496,070	3,600,952
26	Motor Vehicle Operating Rents	0	0	0	0	0
27	Allocation	32.80%	32.80%	32.80%	32.80%	32.80%
28	Total Motor Vehicle Operating Rents (line 26 X line 27)	0	0	0	0	0
29	Motor Vehicle Parking	408,653	420,912	433,539	446,546	459,942
30	Allocation	18.72%	18.72%	18.72%	18.72%	18.72%
31	Total Motor Vehicle Parking (line 29 X line 30)	76,504	78,799	81,163	83,598	86,106
32						
33	Rent & Motor Vehicles Costs Allocated to Water Supply at DEP (3)	3,275,904	3,374,181	3,475,406	3,579,669	3,687,059
34	Allocation to Facilities North of NYC	56.41%	56.41%	56.41%	56.41%	56.41%
35						
36	Rent & Motor Vehicles Costs Related to Facilities North of the City	1,847,885	1,903,321	1,960,421	2,019,234	2,079,811
37	OTPS Costs Related to Facilities North of the City	**8,727,407**	**8,989,229**	**9,258,906**	**9,536,673**	**9,822,773**

Notes:
(1) Changes in the allocation methodology for the above OTPS costs are proposed beginning in FY 2014, as described in Table 12A.
(2) Rent & motor vehicles costs allocated to Water Supply is equal to the sum of lines 25, 28, and 31.
(3) Rent & motor vehicles costs allocated to north of the City is equal to line 33 X line 34.
(4) OTPS costs related to facilities north of the City are equal to sum of lines 22 and 36.
(5) It is assumed that OTPS costs will increase 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%
Projections:				
30	2015	398,529	39,432	9.89%
31	2016	393,525	38,959	9.90%
32	2017	388,522	38,486	9.91%
33	2018	383,518	38,013	9.91%
34	2019	378,515	37,540	9.92%

Notes:

(1) Consumption projections are based on a regression analysis beginning in 2005.

(2) Equation used to calculate System-wide Consumption:
y=m(t)+b. Where (t) is a given year.
m= -5003.459821
b= 10480500

(3) Equation used to calculate Upstate Consumption:
y=m(t)+b. Where (t) is a given year.
m= -472.90
b= 992,333.56

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	Year 2015	2016	2017	2018	2019
Ashokan & Kensico	-	-	-	-	-
Neversink	4,950,069	5,049,071	5,150,052	5,253,053	5,358,114
West Delaware	67,308	68,654	70,027	71,428	72,856
East Delaware	5,658,817	5,771,993	5,887,433	6,005,182	6,125,286
Summary	10,676,194	10,889,718	11,107,513	11,329,663	11,556,256

Notes:

(1) All figures for Neversink and East Delaware are based on 2014 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 ($) per Million Gallons (MG) Billed to Upstate Customers	Computed Cost to the Board	Upstate Consumption (MG)	Total Billed ($)	Actual Cost ($)	Underpayment ($)
1995 (a)	174.18	229.87	43,915	7,649,115	10,094,741	2,445,626
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	1,612.15	40,485	60,596,628	65,268,216	4,671,588
				Total Underpayment 1995-2014		20,238,127
				Total Underpayment 2005-2014		6,035,960

(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.