

MASSACHUSETTS WATER RESOURCES AUTHORITY



Fiscal Year 2018 CURRENT EXPENSE BUDGET

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MASSACHUSETTS WATER RESOURCES AUTHORITY

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September 2017

Louis M. Taverna, Chairman
MWRA Advisory Board
100 First Avenue
Boston, MA 02129

Dear Chairman Taverna:

This letter transmits to the Advisory Board MWRA's Current Expense Budget (CEB) for Fiscal Year 2018. The CEB was approved by the MWRA's Board of Directors on June 27, 2017.

The Final FY2018 budget resulted in a 3.2% combined assessment increase, which is lower than the 3.8% increase projected for FY18 last year. This increase is in line with Board of Directors and Advisory Board's directives.

The FY2018 total expenses are \$743.6 million, of which 63.5% or \$472.2 million is for capital financing costs, \$232.6 million for direct expenses, and \$38.9 million for indirect expenses. The overall expenses increased \$24.0 million or 3.3% from the FY2017 budget.

When establishing expense projections, the main emphasis was on the FY18 budget, but with the goal of continuing to utilize MWRA's multi-year rate management strategy to provide sustainable and predictable assessment increases to our member communities for the long term. To achieve this goal again this year, MWRA has continued to employ conservative budgeting and fiscal discipline which includes controlled spending, capital project prioritization, and use of historical variable rate assumptions. The combination of these measures resulted in assessment increase projections at 3.8% for the next four years. This goal of 3.8% assessment increase is in agreement with the Advisory Board's recommendations.

The FY18 budget continues to address the smoothing of rate revenue changes at the water and sewer utility level.

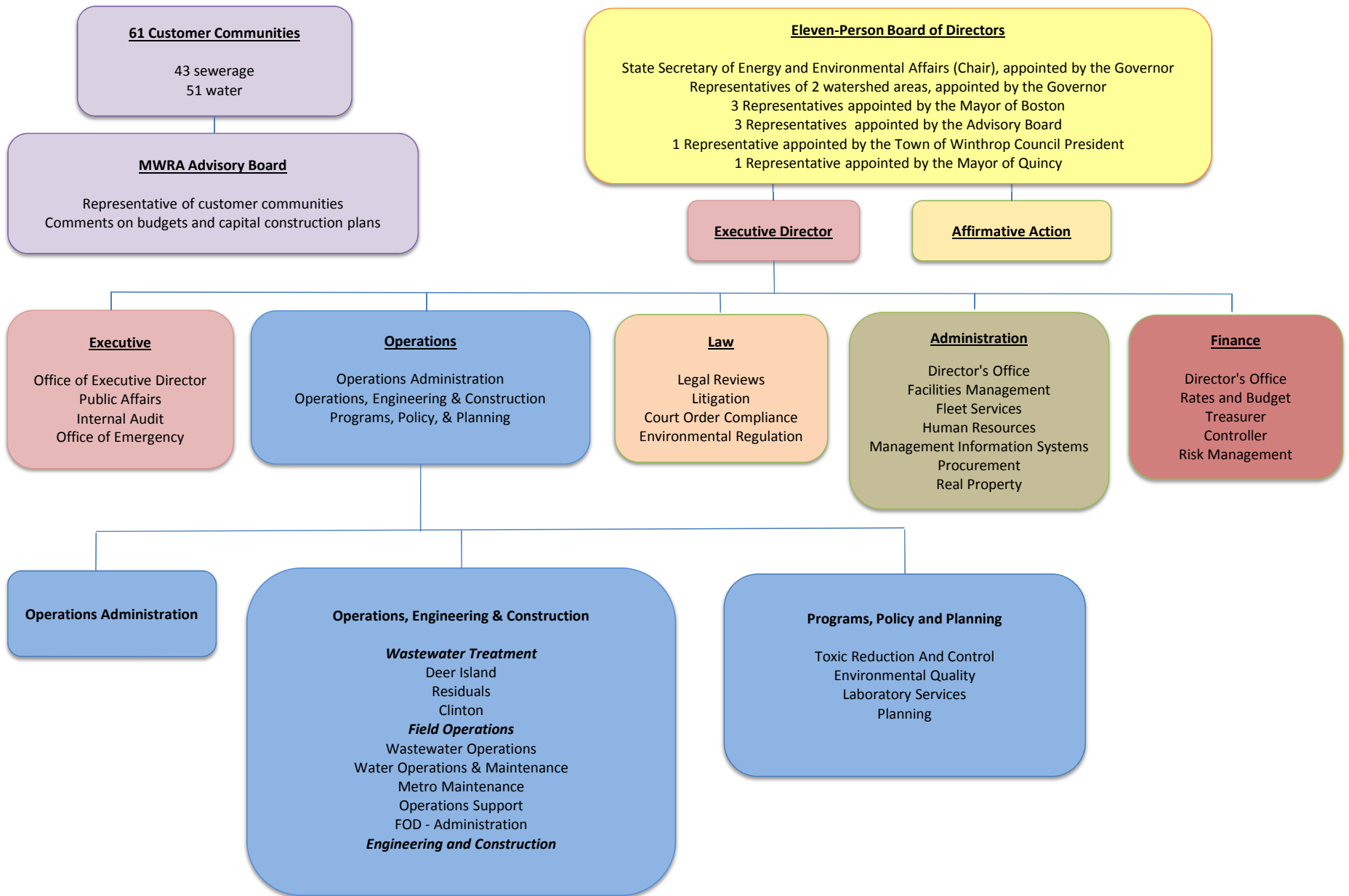
Additional budget information and a copy of this document are available online at www.mwra.com. Questions or comments on this document should be directed to the MWRA Budget Department at (617) 788-2268.

Thank you for your continued support.

Sincerely,

Frederick A. Laskey
Executive Director

MWRA Organizational Chart



Note: The underlined section titles are links to sections of the document.

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MWRA AT A GLANCE

Purpose

Provide wholesale water and sewer services to customer communities, funded primarily through rates and charges

Legal Status

Massachusetts public authority established by an enabling act in 1984 – Chapter 372 of the Acts of 1984 as most recently amended January 2017

Management

- 11-member Board of Directors (3 Governor appointees, 3 Mayor of Boston appointees, 1 Quincy and 1 Winthrop appointee, and 3 Advisory Board appointees)
- 1 Executive Director (5 divisions: Office of the Executive Director, Operations, Finance, Administration, Law)

Advisory Board

Established by the enabling act to make recommendations to the MWRA on the MWRA budget and programs and to serve as liaison to the customer communities

Service Area

- 61 customer communities (43 sewerage, 51 water)
- 2.8 million people (43% of MA population)
- 5,500 businesses

FY18 Operating Budget (\$ in millions)

Direct Expenses	\$232.6
Indirect Expenses	\$38.9
<u>Capital Finance</u>	<u>\$472.2</u>
Total Operating Budget	\$743.6
Revenues*	\$743.6

*96.4% of Revenues raised from rate assessments

Bond Ratings - General Revenue Bonds

Moody's -	Aa1
S&P -	AA+
Fitch -	AA+

Capital Improvement Program

- Total CIP spending: \$8.3 billion since 1984
- Total Current Indebtedness \$5.2 billion
- FY18 CIP Budget: \$174.9 million

Water System

- 2 protected reservoirs
 - Quabbin
 - Wachusett
- 2 water treatment facilities
 - John J. Carroll
 - William A. Brutsch
- 350 miles of distribution infrastructure including aqueducts, deep rock tunnels, and pipeline
- 12 active storage reservoirs and standpipes
- 11 active pumping stations
- Average Daily flow: 200 mgd
- Safe yield: 300 mgd
- Treatment Capacity: 405 mgd
- Percentage of capacity utilized: 67%*
**based on safe yield*

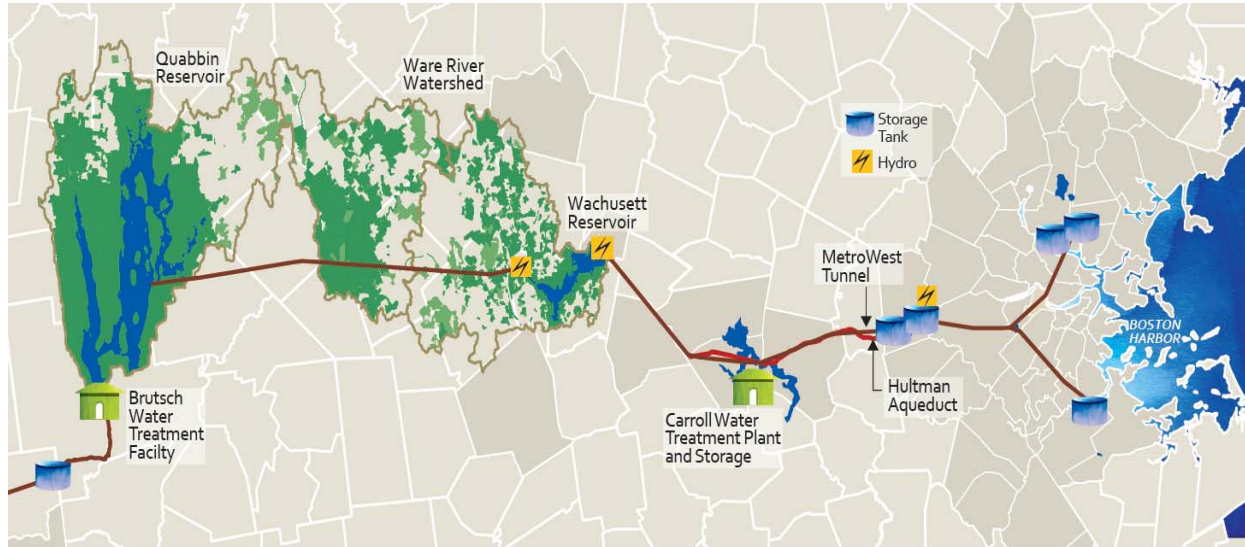
Wastewater System

- 240 miles of sewer pipelines and cross-harbor tunnels
- 11 pump stations
- 1 screening facility
- 4 CSO treatment/storage facilities
- 2 wastewater treatment plants
 - Deer Island Treatment Plant
 - Clinton Advanced Wastewater Treatment Plant
- 5 remote headworks
- 1 Pellet Plant residuals processing
- Average daily flow: 365 mgd
- Peak wet weather capacity: 1,270 mgd
- Percentage of capacity utilized on average: 30%

Renewable Energy

31% of MWRA's energy requirement is self-generated from renewable sources (biomass, hydro, wind, & solar assets)

MWRA AT A GLANCE



MWRA's water comes from the Quabbin Reservoir, 65 miles west of Boston, and the Wachusett Reservoir, 35 miles west of Boston. The Quabbin alone holds a 4-year supply of water.

The reservoirs are filled naturally. Rain and snow fall onto watersheds (protected land around the reservoirs) and eventually turn into streams that flow into the reservoirs. This water comes into contact with soil, rock, plants and other material as it follows its path. This process helps to clean the water.

The Quabbin and Wachusett Reservoirs are protected. Over 85% of the watershed lands that surround the reservoirs are covered in forest and wetlands. About 75% of the total watershed land cannot be built on. The natural undeveloped watersheds help to keep MWRA water clean and clear. Because they are well-protected, the water in the Quabbin and Wachusett Reservoirs is of very high quality. The MWRA has won numerous awards for quality, taste, and sustainability.

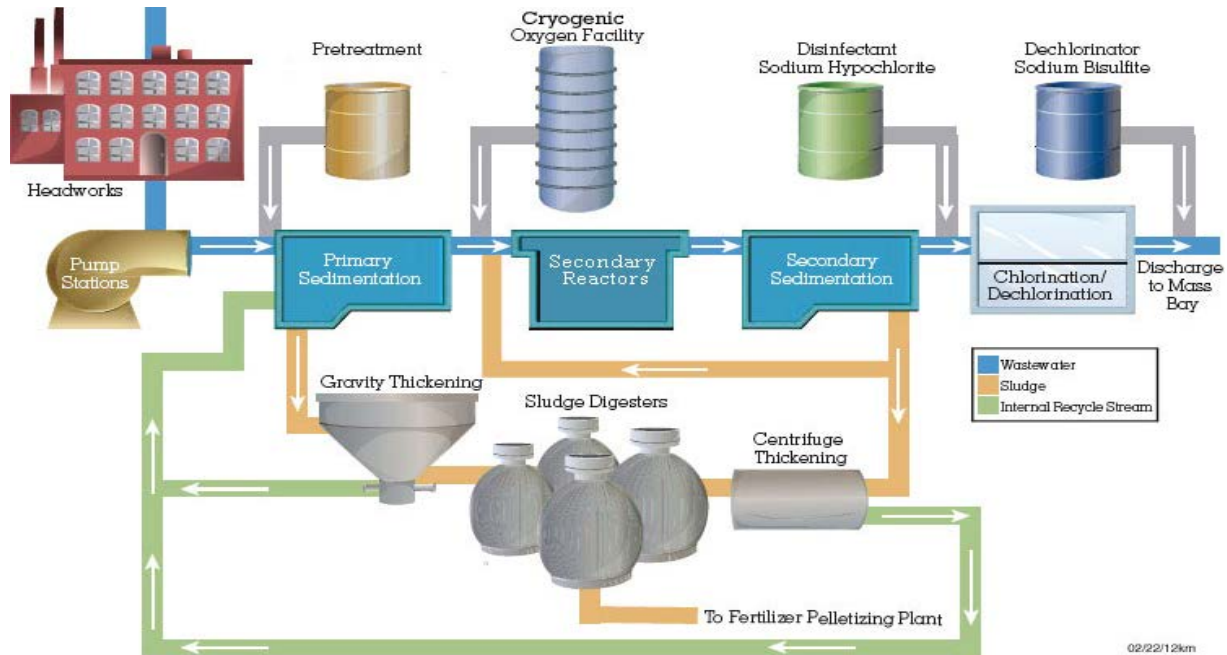
Water for most MWRA communities is treated at the Carroll Water Treatment Plant in Marlborough, Massachusetts. Water from the Quabbin and Wachusett Reservoirs enters the plant through the Cosgrove or Wachusett Aqueduct. The treated water leaves the plant through the MetroWest Water Supply Tunnel and the Hultman Aqueduct. Water from the Quabbin Reservoir for Chicopee, South Hadley Fire District #1 and Wilbraham is treated at the Brutsch Water Treatment Facility in Ware, Massachusetts, and leaves the plant through the Chicopee Valley Aqueduct.

For MetroWest and Metro Boston communities, treated water is sent through the MetroWest Water Supply Tunnel and the Hultman Aqueduct and is stored in covered tanks. From there it is drawn into distribution mains and many smaller community pipes. For Chicopee Valley Area Communities, treated water is sent through the Chicopee Valley Aqueduct to the local distribution mains and smaller community pipes. Water meters log the water entering each community.

Local pipes serve each street in the customer communities and eventually carry water into buildings. Meters installed by the local communities measure the amount of water delivered to each home or business.

To maintain and measure water quality, MWRA tests over 1,600 water samples per month, from the reservoirs all the way to household taps.

MWRA AT A GLANCE – Wastewater System



Water is flushed through a building's pipes into customer community sewers. These 5,100 miles of local sewers transport the wastewater into 227 miles of MWRA interceptor sewers. The interceptor sewers, ranging from 8 inches to 11 feet in diameter, carry the region's wastewater to two MWRA treatment plants. Most communities' wastewater flows to the Deer Island Treatment Plant with the Clinton Wastewater Treatment Plant serving the town of Clinton and the Lancaster Sewer District.

The following describes the Deer Island treatment process:

Collection and Pumping: Sewage is piped to headworks where bricks, logs and other large objects are screened out. Pumps draw the screened sewage through deep-rock tunnels under Boston Harbor to Deer Island.

Preliminary Treatment: Mud and sand settle in a tank called a grit chamber. This material, known as grit and screenings, is taken to a landfill for environmentally safe disposal.

Primary Treatment: The sewage then flows to primary settling tanks where up to 60% of the solids in the waste stream settle out as a mixture of sludge and water.

Secondary Treatment: Plant oxygen is added to the wastewater to speed up the growth of microorganisms. These microbes then consume the wastes and settle to the bottom of the secondary settling tanks. After secondary treatment, 80-90% of human waste and other solids have been removed.

The treated wastewater is disinfected before it is discharged to the Massachusetts Bay. The treated wastewater, known as effluent, travels through a 9.5-mile Outfall Tunnel bored through solid rock more than 250 feet below the ocean floor. The tunnel's last mile and a quarter include 55 separate release points known as "diffusers." With water depths up to 120 feet, this outfall provides a much higher rate of mixing and/or dilution than possible with discharges into the shallow waters of Boston Harbor.

Sludge from primary and secondary treatment is processed further in sludge digesters, where it is mixed and heated to reduce its volume and kill disease-causing bacteria. It is then transported through the Inter-Island Tunnel to the pelletizing plant in Quincy, Massachusetts where it is dewatered, heat-dried and converted to a pellet fertilizer for use in agriculture, forestry and land reclamation.

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Executive Summary

Executive Summary

MISSION

The Massachusetts Water Resources Authority (MWRA) is an independent public authority of the Commonwealth of Massachusetts that provides wholesale water and sewer services to its member communities and funds its operations primarily through member community assessments and charges. MWRA's mission is to provide reliable, cost-effective, high-quality water and sewer services that protect public health, promote environmental stewardship, maintain customer confidence, and support a prosperous economy.

HISTORY

Created by the Massachusetts legislature in 1985 (Chapter 372 of the Acts of 1984), MWRA assumed possession and control of the water and sewer systems, including facilities, properties, and the right to utilize water withdrawn from system reservoirs that had formerly been the Sewerage and Waterworks Divisions of the Commonwealth of Massachusetts Metropolitan District Commission (MDC). The Commonwealth, under the management of the MDC Watershed Management Division (now the Department of Conservation and Recreation – Division of Watershed Management), retained ownership of real property, including the reservoirs and watersheds, the maintenance of which are included in MWRA's operating budget.

In 1985, responsibility for water distribution for 46 municipalities and sewage collection and treatment for 43 municipalities was transferred to the MWRA. In 1987, the legislature also transferred responsibility to operate and maintain the Clinton Wastewater Treatment Plant from the Commonwealth to the MWRA. New communities have the opportunity to join the MWRA water and sewer systems, and, over the years, the number of member communities has increased. Since 1985, the MWRA has invested over \$8.2 billion to modernize and improve the wastewater and waterworks systems serving its 61 member communities. MWRA's facilities span from the Quabbin Reservoir in western Massachusetts to the Deer Island Treatment Plant in Boston Harbor. In Fiscal Year 2017, the system serves approximately 2.9 million people and more than 5,500 businesses.

The Enabling Act also established the MWRA Advisory Board to represent the cities and towns in the service area. The Advisory Board appoints three members of the MWRA Board of Directors, approves the extension of water and sewer services to additional communities, and reviews and makes recommendations on MWRA's annual Current Expense Budget and Capital Improvement Program.

MWRA ORGANIZATION

The MWRA has five separate divisions and the Affirmative Action and Compliance Unit Department (AACU). Each division provides operations or support services to carry out MWRA's activities under the direction of the Executive Office. MWRA's organizational structure is included in the document immediately preceding this page.

The **Executive Office** provides centralized MWRA management, direction, and policy development. The budget includes funds for the Office of the Executive Director, the Board of Directors, the Advisory Board, and other advisory committees. It includes the following departments: Office of Emergency Preparedness; Public Affairs; and Internal Audit.

The **Operations Division** operates the water and wastewater treatment systems; the water transmission and distribution system; the wastewater collection, transport, and combined sewer overflow (CSO) systems; and the residuals processing facility. It also provides laboratory and engineering and construction services; enforces sewer use regulations and seeks to limit the discharges of toxic materials; manages environmental studies of Boston Harbor and Massachusetts Bay; monitors water quality; and includes the Planning and Coordination Department.

The **Administration Division** is responsible for managing the support services functions of the Authority. The Administration is comprised of seven departments: Director's Office; Facilities; Fleet Services; Human Resources; Management Information Systems (MIS); Procurement; and Real Property and Environmental Management. The Administration Division performs a multitude of functions that support the daily operations and ensure the implementation of the Authority's long term goals and strategies.

The **Finance Division** is responsible for managing the finance functions of the Authority. Finance Division is comprised of five departments: Director's Office; Rates and Budget; Treasury; Controller; and Risk Management. The Finance Division ensures that a variety of fiscal management systems are in place to monitor and control the Current Expense Budget (CEB) and Capital Improvement Program (CIP).

The **Law Division** provides legal counsel to all divisions on compliance with federal and state law, real estate matters, labor and employment law, litigation, and construction issues. Division attorneys provide or supervise through outside counsel the representation of MWRA in all litigation.

The **Affirmative Action and Compliance Unit (AACU) Department** develops, administers and monitors compliance of Affirmative Action Plan programs and policies by ensuring equal opportunity and non-discrimination in employment and equitable access of Minority/Women Business Enterprises (MBE/WBE) in Authority procurement activities.

GOALS AND PERFORMANCE MEASURES

The MWRA Business Plan was first implemented in 1997 as a strategic road map to present specific steps for the organization to undertake to improve customer service, upgrade operations and maintenance and pursue aggressive rates management. In 2000, MWRA adopted a five-year Strategic Business Plan. Since then, some of the goals have been completed, and new ones have been added. MWRA's five-year Strategic Business Plan FY2016-2020 emphasizes improvements in service and systems and includes performance targets for operating the water and wastewater systems and maintaining new and existing facilities. MWRA's Water System Master Plan and Wastewater System Master Plan present to long-term vision of the capital development needs of the water and wastewater systems and the actions planned to meet those needs. Parallel to MWRA's goal of carrying out its operating programs and capital projects is its goal of providing sustainable, predictable and reasonable assessments to its customer communities. To that end, the MWRA applies a multi-year rates management strategy to provide sustainable and

predictable assessment increases to its member communities. The need to achieve and maintain a balance between these two goals is a critical issue in the development of both MWRA's operating and capital budgets.

During the year, MWRA measures actual performance on a monthly basis using various reporting tools. The monthly Financial Staff Summary reports on actual spending versus both the operating and capital budgets and provides summary explanations of the variances at the line item level. At least twice a year staff prepares projections for the fiscal year-end with a similar level of explanations. The performance indicator reports (published by MWRA as the Orange and Yellow Notebooks) capture a variety of parameters regarding performance of each major functional area of the Authority, on a monthly and quarterly basis.

BUDGET PROCESS OVERVIEW

Each year, MWRA prepares a Current Expense Budget (CEB) that reflects the best available information for anticipated expenditures and revenues. In parallel, MWRA prepares a Capital Improvement Program (CIP) Budget.

The MWRA operates on a fiscal year that runs from July 1 through June 30. The budget process for both budgets begins in the fall with formal kick-off meetings in September where MWRA staff are given guidelines and targets for their budget requests. After review by the Budget Department and MWRA senior staff, a Proposed CIP Budget is presented to the Board of Directors in December. The Capital Financing portion of the Current Expense Budget is determined based on the CIP Budget. In February, after further review with MWRA senior staff, the Budget Department presents the Proposed CEB to the Board of Directors, after which the Proposed CEB is then transmitted to the Advisory Board, with the anticipated assessment increase Authority-wide and for each customer community. The Advisory Board then has sixty days to review, comment, and provide recommendations on both budgets. MWRA also hosts a public hearing to solicit comments on the budgets and community assessments from citizens in its service area. In May, the Advisory Board transmits its comments to the MWRA to which written response are provided.

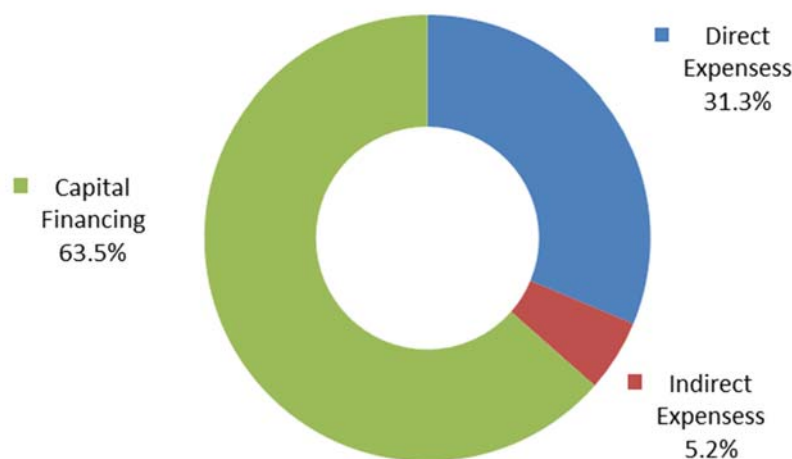
In early June, MWRA's Board of Directors holds hearings on the budget to review recommendations by the Advisory Board and new information available since the budget was developed. Staff incorporates Board decisions from the hearings and presents a final budget and final assessments for approval in late June.

FINAL FY18 BUDGET SUMMARY

Total Expenses in the Final FY18 Current Expense Budget (Budget) are \$743.6 million, an increase of \$24.0 million or 3.3% over the FY17 Budget. The Final FY18 Budget assumes an offset of \$391,580 for the Debt Service Assistance (DSA) received from the Commonwealth of Massachusetts in May 2017.

Total expenses include \$472.2 million for Capital Financing costs and \$271.4 million for operating expenses, of which \$232.6 million is for Direct Expenses and \$38.9 million is for Indirect Expenses. The \$24.0 million increase over FY17 budget is due to higher Capital Financing expenses of \$17.1 million which is mainly due to a higher debt service requirement of \$9.0 million and inclusion of a HEEC Cable Capacity Reserve Fund to offset the anticipated increases in capacity charges for FY21 and FY22 resulting from construction of a new cross harbor electrical cable to serve the Deer Island Wastewater Treatment Plant; higher Direct Expenses of \$6.0 million due to Cost of Living Adjustments (COLA) for staff, higher chemical costs, higher healthcare costs and higher projected maintenance expenses; and higher Indirect Expenses of \$904,000 for Additions to Reserves, and Watershed Management costs.

FY18 Final Budget



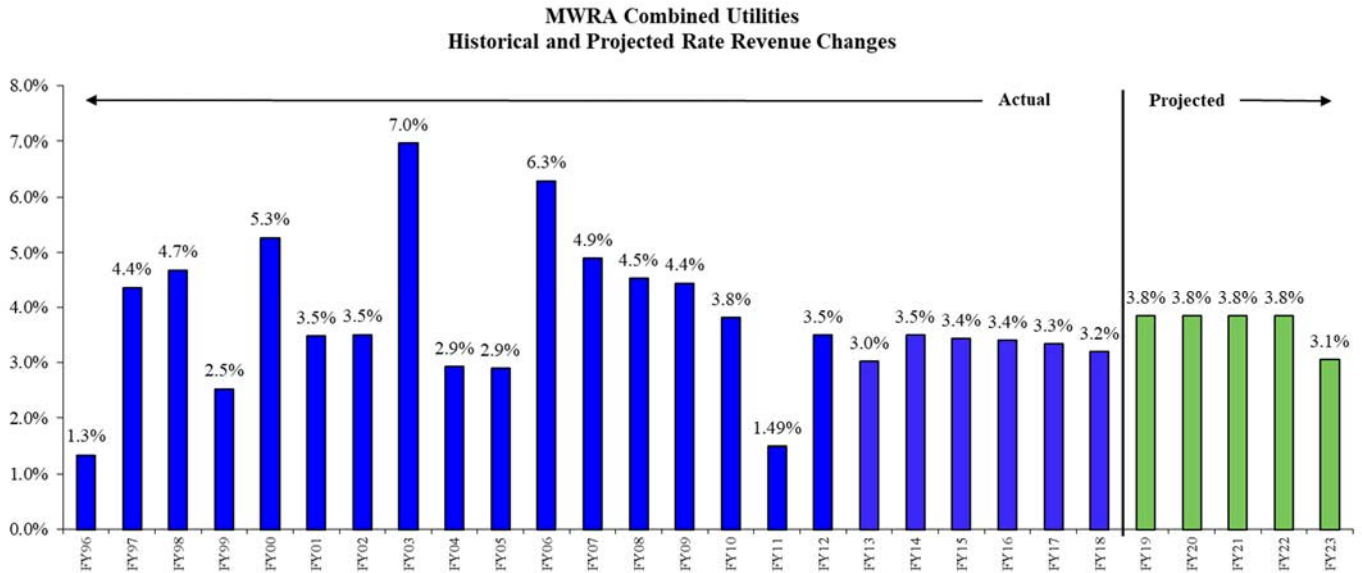
MWRA continues to pursue a rate management strategy which promotes sustainable and predictable assessments. The Final FY18 Budget has a combined utilities assessment increase of 3.19% with Rate Revenues totaling \$717.1 million. Rate Revenues account for nearly 96.4% of projected FY18 revenues. Measures taken by the Authority to achieve the 3.19% rate increase include:

- Continued practice of targeted defeasances;
- Budgeted 1,150 Full-Time Equivalent (FTE's) positions, the same as in FY17;
- Budgeted a \$10.9 million Debt Prepayment;
- Direct Expenses increased 2.7% versus FY17 budget;
- Indirect Expenses increased 2.4% versus FY17 budget.

The table below shows MWRA's Final FY18 Budget for revenue and expenses compared with the FY17 Budget and FY16 Actuals. Changes from FY17 to FY18 are described in the Revenue and Expense section of the Executive Summary.

TOTAL MWRA	FY16 Actuals	FY17 Approved Budget	FY18 Final Budget	Change	
				FY18 Final Budget vs FY17 Approved Budget	
				\$	%
EXPENSES					
WAGES AND SALARIES	\$ 96,118,427	\$ 101,858,897	\$ 104,286,370	\$ 2,427,473	2.4%
OVERTIME	4,355,586	4,192,676	4,110,637	(82,039)	-2.0%
FRINGE BENEFITS	19,131,139	20,242,324	20,997,975	755,651	3.7%
WORKERS' COMPENSATION	2,350,369	2,344,190	2,322,980	(21,210)	-0.9%
CHEMICALS	9,297,550	9,110,407	9,836,933	726,526	8.0%
ENERGY AND UTILITIES	18,744,867	21,541,078	21,735,222	194,144	0.9%
MAINTENANCE	30,978,045	31,080,642	32,200,786	1,120,144	3.6%
TRAINING AND MEETINGS	370,752	435,481	406,269	(29,212)	-6.7%
PROFESSIONAL SERVICES	5,886,717	6,531,939	7,221,622	689,683	10.6%
OTHER MATERIALS	6,186,216	6,219,630	6,692,659	473,029	7.6%
OTHER SERVICES	22,628,385	22,974,855	22,764,526	(210,329)	-0.9%
TOTAL DIRECT EXPENSES	\$ 216,048,053	\$ 226,532,117	\$ 232,575,979	\$ 6,043,862	2.7%
INSURANCE	\$ 1,953,053	\$ 1,997,898	\$ 2,013,452	15,554	0.8%
WATERSHED/PILOT/DEBT	27,469,847	24,291,268	25,164,006	872,738	3.6%
COMMONWEALTH DEBT PREPAYMENT	32,000,000	-	-	-	
HEEC PAYMENT	1,342,141	773,859	957,445	183,586	23.7%
MITIGATION	1,520,000	1,558,000	1,596,950	38,950	2.5%
ADDITIONS TO RESERVES	(34,927)	(167,742)	821,116	988,858	N/A
RETIREMENT FUND	8,159,521	3,132,624	3,277,369	144,745	4.6%
ADDITIONAL PENSION DEPOSIT	-	1,500,000	-	(1,500,000)	-100.0%
POSTEMPLOYMENT BENEFITS	5,224,848	4,876,050	5,035,422	159,372	3.3%
TOTAL INDIRECT EXPENSES	\$ 77,634,483	\$ 37,961,956	\$ 38,865,760	\$ 903,803	2.4%
STATE REVOLVING FUND	\$ 78,131,559	\$ 86,971,915	\$ 84,931,906	(2,040,009)	-2.3%
SENIOR DEBT	275,085,817	268,472,557	264,560,267	(3,912,290)	-1.5%
SUBORDINATE DEBT	49,222,442	69,997,992	85,443,447	15,445,455	22.1%
LOCAL WATER PIPELINE CP	262,498	4,149,242	3,794,944	(354,298)	-8.5%
CURRENT REVENUE/CAPITAL	11,200,000	12,200,000	13,200,000	1,000,000	8.2%
CAPITAL LEASE	3,217,060	3,217,060	3,217,060	-	0.0%
DEBT PREPAYMENT	-	10,994,960	10,900,000	(94,960)	-0.9%
VARIABLE RATE SAVINGS	(12,873,173)	-	-	-	
DEFEASANCE ACCOUNT	-	-	-	-	
DEBT SERVICE ASSISTANCE	(873,804)	(873,804)	(391,580)	482,224	-55.2%
HEEC CABLE CAPACITY RESERVE FUND	-	-	6,532,146	6,532,146	
TOTAL CAPITAL FINANCING	\$ 403,372,399	\$ 455,129,922	\$ 472,188,190	\$ 17,058,268	3.7%
TOTAL EXPENSES	\$ 697,054,934	\$ 719,623,995	\$ 743,629,929	\$ 24,005,933	3.3%
REVENUE & INCOME					
RATE REVENUE	\$ 672,440,000	\$ 694,878,500	\$ 717,054,000	22,175,500	3.19%
OTHER USER CHARGES	8,783,469	8,752,834	9,011,070	258,236	3.0%
OTHER REVENUE	15,749,464	6,519,171	7,359,078	839,907	12.9%
RATE STABILIZATION	-	-	-	-	
INVESTMENT INCOME	10,303,841	9,473,490	10,205,781	732,291	7.7%
TOTAL REVENUE & INCOME	\$ 707,276,774	\$ 719,623,995	\$ 743,629,929	\$ 24,005,934	3.3%

The graph below represents historical and projected assessment changes based on the FY18 Final Budget. The next four-year planning estimates, through FY22 (the most challenging year facing the Authority) project assessment increases at 3.8%.



The Final FY18 Budget revenues, excluding rate revenue, total \$26.6 million, an increase of \$1.8 million or 7.4% above the FY17 budget. The Final FY18 Budget non-rate revenue budget includes \$16.4 million in Other User Charges and Other Revenue and \$10.2 million for Investment Income.

FY18 GOALS AND MAJOR INITIATIVES

Ensuring a safe and reliable source of drinking water to MWRA customers, and wastewater discharges that meet all applicable regulations drives both capital and current expense budget costs. The MWRA has identified Authority-wide major initiatives to support the five strategic priorities integral to MWRA’s mission that were identified for action in MWRA’s Five-Year Strategic Business Plan FY2016-2020. At the Division and Department-level, additional and more specific goals and initiatives are identified.

I. Drinking Water Quality and System Performance

- Continue to provide technical assistance and laboratory analysis to help communities identify and reduce lead service lines, primarily in schools.
- Continue to support core operations to ensure compliance with regulatory requirements.

II. Wastewater Management and System Performance

- Plan for implementation of requirements of the new National Pollutant Discharge Elimination System (NPDES) Permits for the Clinton Wastewater Treatment Plant.

- Continue to meet or surpass environmental compliance standards for the Deer Island Treatment Plant as required by the National Pollutant Discharge Elimination System (NPDES) permit and air quality permits.

III. Infrastructure Management and Resilience

- Continue to invest in asset protection to ensure adequate availability of equipment and facilities to support core operations.
- Continue the development of long-term water service redundancy.

IV. Finance and Management

- Continue to plan and develop long-term strategies to ensure sustainable and predictable assessments to MWRA communities at the combined and the utility level.
- Develop options for mitigating the significant potential cost impacts for the sewer communities of the new Eversource cross-harbor electrical cable project.
- Secure favorable financing terms to support both the capital and current expense budgets and preserve the Authority's credit rating.
- Invest in cyber security protection.
- Continue to focus on succession planning with emphasis on training for current employees.

V. Environmental Sustainability

- Continue to aggressively pursue renewable and sustainable energy resources to reduce the environmental impacts of daily operations, increase energy efficiencies, and reduce overall operating costs.
- Continue to identify, assess, and implement initiatives to reduce energy demand and increase energy self-generation in MWRA's system.
- Enter into a new Memorandum of Understanding with Eversource for payment of energy reduction incentives.
- Pursue grant-funding and cost-sharing arrangements to defray costs of implementing new energy reduction and energy self-generation projects.

FY17 ACCOMPLISHMENTS

I. Drinking Water Quality and System Performance

- Provided water to Massachusetts communities during the summer drought providing these communities with relief from the drought and generating additional revenues of \$4.8 million, which will be used to finance a portion of the lead lines removal program.
- The Laboratory Services Department performed 20,000 tests since the beginning of 2016 in support of community efforts to identify and reduce lead service lines in schools.
- Met all water quality and treatment standards in the drinking water system during FY17, and maintained maximum turbidity results at Quabbin and Wachusett Reservoirs within MassDEP standards.

- Contaminant Monitoring System - Replaced and enhanced monitoring capabilities on the Wachusett Reservoir with new equipment and technology; installed a continuous monitoring shed over the Wachusett Reservoir to provide both routine water quality information and contaminant detection; and implemented a 24/7 monitoring and response program for CMS alarms.

II. Wastewater Management and System Performance

- The Deer Island Wastewater Treatment Plant received the Platinum Peak Performance Award for 2017 from the National Association of Clean Water Agencies (NACWA) for the 10th continuous year. The award recognizes facilities for outstanding compliance of their National Pollutant Discharge Elimination System (NPDES) permit limits. DITP has had no permit violations for ten years.
- The Environmental Quality Department carried out permit-required environmental monitoring of Boston Harbor and Massachusetts Bay water column, sediments, fish and shellfish and CSO receiving water quality. The department finalized 20 technical reports, made monitoring results available on its website, and sent reports to government regulators, the Outfall Monitoring Science Advisory Panel and interested members of the public.

III. Infrastructure Management and Resilience

- Secured MWRA Board of Directors approval for the preferred alternative for providing water service redundancy for the Metropolitan Tunnels System (City Tunnel, City Tunnel Extension and Dorchester Tunnel). The approved approach includes construction of northern and southern deep rock tunnels from the Hultman Aqueduct and MetroWest Water Supply Tunnel to the Weston Aqueduct Supply Main (WASM) 3 and to the Southern Spine water mains. The Board's approval allows staff to proceed with preliminary design, geotechnical investigations and Massachusetts Environmental Policy Act (MEPA) review of this critical project, budgeted at \$1.4 billion in the FY18 CIP. The Authority will continue with interim redundancy measures until completion of the project.
- Expanded MWRA's primary security system and participated in the planning and execution of a week-long cyber security drill defending critical infrastructure.

IV. Finance and Management

- Completed a \$104.3 million refunding bond transaction on August 2, 2016. The refunding resulted in \$9.8 million or 9.6% present value savings and \$13.2 million in gross debt savings over the life of the bonds.
- Completed a \$323.0 million refunding and new money bond transaction on May 18, 2017. The new money portion consisted of \$68.2 million in bonds which were deposited into the Construction Fund to pay for capital projects. The refunding for interest rates savings transaction totaled \$254.7 million. The refunded resulted in \$57.5 million or 20.7% present value savings and \$78.8 million in gross debt service savings over the life of the bonds. This refunding provided the second highest present value savings of any refunding since MWRA started issuing bonds in 1990.
- Executed an \$8.5 million defeasance of outstanding senior principal in September 2016. This defeasance reduces the debt service requirement between FY18 and FY20 by a total of \$9.7 million thereby reducing the rate of increase to the Rate Revenue Requirement in those years.

V. Environmental Sustainability

- Received a total of \$780,000 in revenue for energy generated at numerous facilities including the following: hydroelectric \$220,000 from Oakdale Station, \$78,000 from Cosgrove Station, and \$14,000 from the Loring Road Pump Station; wind of \$381,000 from Charlestown Pump Station; and solar of \$84,000 from Carroll Water Treatment Plant.
- Continue to leverage MWRA's self-generation assets and participation in the competitive energy market to offset operating costs. The combined impact of participation in the Independent System Operators of New England (ISO-NE) load response program, non-rate revenue from the sale of Renewable Portfolio Standards Program (RPS) credits, and receipt of utility rebates for CEB-funded efficiency projects resulted in \$2.2 million in revenue for FY17. MWRA also avoided approximately \$600,000 in capacity charges through operation of self-generation assets during peak load events as called by the regional transmission organization (ISO New England).

SOURCES AND USES OF FUNDS

Funds supporting the Current Expense Budget are not subject to appropriation with the exception of State debt service assistance. The table to the right shows MWRA's sources and uses of funds for The Final FY18 Budget.

Revenue

MWRA is required by its enabling act to balance its budget each year by establishing user assessments for water and sewer services that provide funds sufficient to recover the cost of operations (excluding depreciation), maintenance and improvements, and debt service, as well as meeting required reserve levels.

In the Final FY18 Budget, 96.4% of revenue is raised from rate revenue. The remaining 3.6% of revenue will come from interest on investments, charges to other water and sewer customers (including Chicopee Valley Aqueduct (CVA) communities), non-recurring revenue, annual charges to sewer system users with permits issued by MWRA's Toxic Reduction and Control Department (TRAC), penalties assessed to holders of sewer use permits, and other miscellaneous sources.

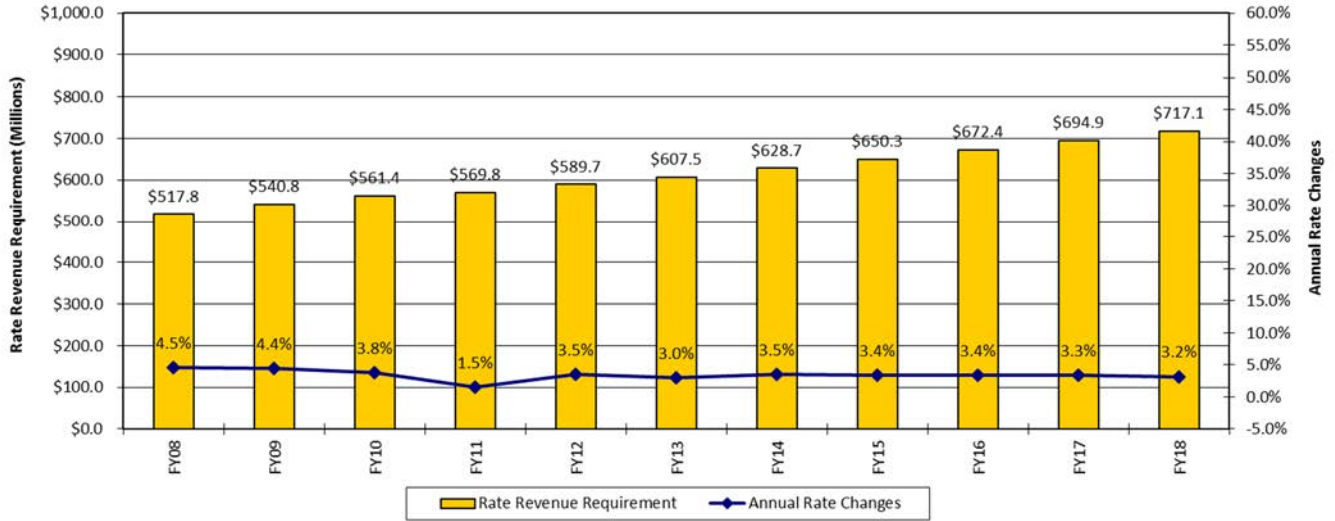
SOURCES & USES OF FUNDS*		
\$ in Millions		
<i>Sources of Funds</i>		
Other User Charges	\$9.0	1.2%
Other Revenue	7.4	1.0%
Investment Income	10.2	1.4%
Rate Revenue	717.1	96.4%
Rate Stabilization	0.0	0.0%
TOTAL REVENUE	\$743.6	100.0%
<i>Uses of Funds</i>		
Total Expenses before Debt		
Service Offsets	\$472.2	
Less:		
Debt Service Assistance	(0.4)	
Bond Redemption	-	
Sub-Total Net Expenses	471.8	
Capital Financing	471.8	63.5%
Direct Expenses	232.6	31.3%
Indirect Expenses	38.9	5.2%
TOTAL EXPENSES	\$743.2	100.0%
TOTAL EXPENSES Less Offsets	\$742.8	
<small>*May not add up due to rounding</small>		

Rate Revenue

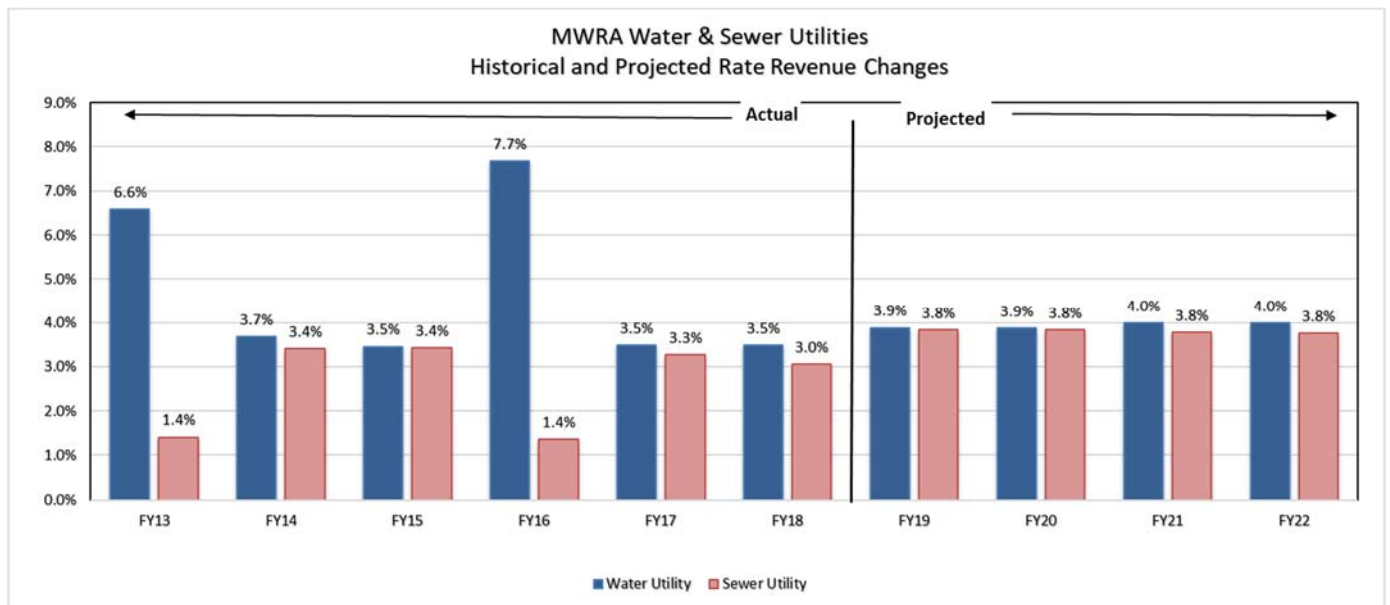
Under the Final FY18 Budget, the MWRA will raise \$717.1 million of its total revenue requirements from water and sewer assessments to member communities. Of the \$717.1 million, \$474.6 million will fund the sewerage system, an increase of 3.0% as compared to FY17; and \$242.4 million will fund the water

system, an increase of 3.5% as compared to FY17. The charts below show the historical rate revenue requirements at the combined utility level for the past ten years.

MWRA: Combined Water & Sewer Assessments



Beginning in FY17, the MWRA successfully implemented a rate increase smoothing mechanism that allows the rate revenue requirement to be smoothed between utilities eliminating annual volatility mostly driven by debt service payments for capital projects. The charts below show the historical percent increase for the last five years and the projected increases for the next five years.



Non-Rate Revenue

Other User Charges

Other User Charges include revenues derived from the provision of water and sewer services to communities and other entities under special agreements. Other User Charges in the FY18 Proposed Budget total \$9.0 million, a 3% increase over the FY17 budget and includes \$4.9 million for Chicopee Valley Aqueduct (CVA) communities, \$1.7 million for Deer Island water usage, \$727,000 for entrance fees from member communities, and \$500,000 for the Commonwealth's partial reimbursement for Clinton Wastewater Treatment Plant expenses. Other User Charges are \$212,000 or 2.4% more than the FY17 Budget which is due in part to increases for Water Treatment Plant Residuals assessments.

Other Revenue

Other Revenue is budgeted at \$7.7 million, an increase of \$1.1 million or 17.5% from the FY17 budget, due to projected revenue from the ISO New England demand response program. On an increase in the payment rate per kilowatt. Other Revenue includes \$2.2 million in permit fees and penalties, \$4.4 million for the sale of Renewable Energy Portfolio Credits, sale of generated power, and revenues for demand response programs.

Investment Income

MWRA earns interest income by investing funds in both long and short-term investments vehicles governed by Section 522 and 523 of the General Bond Resolution. The FY18 Final Budget includes \$10.2 million in investment income, an increase of \$732,000 million or 7.7% from the FY17 budget due to higher projected interest rates assumptions. The FY18 short-term interest rate assumption is 1.05% which is 45 basis points greater than FY17.

Non-Recurring Revenue

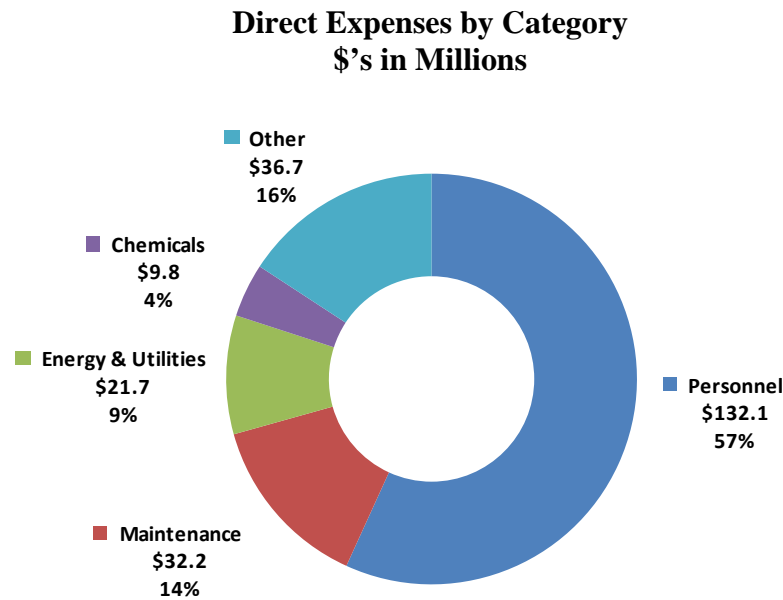
Non-Recurring Revenue is one-time revenue used in a given fiscal year to reduce assessments to member communities. In any fiscal year when annual revenues exceed expenses, MWRA may transfer the unexpended amount to the rate stabilization reserve. Within certain limits, MWRA may use this money to reduce the Rate Revenue Requirement in any subsequent year. Consistent with the requirements of its enabling act and its general bond resolution, MWRA treats transfers from the rate stabilization reserve as revenue in that fiscal year. For the Final FY18 Budget, no Rate Stabilization fund usage is projected.

DIRECT EXPENSES

The Final FY18 Direct Expense Budget is \$232.6 million, \$6.0 million or 2.7% above the FY17 budget. The primary drivers of the Direct Expenses increases are wages and salaries for cost of living adjustments (COLAs); fringe benefits for projected healthcare cost increases; chemical costs for projected prices of new contracts; and professional services for increased professional services and legal fees related to potential HEEC cable questions and potential Deer Island NPDES permit issues. MWRA continues to manage direct expenses through implementing cost improvement initiatives, such as cross-training staff,

competitive purchase of energy and chemicals, lease space reductions, and increased self-generation of electricity.

The chart below combines related direct expense line items into general cost categories. Labor costs (wages and salaries, overtime, fringe benefits, workers’ compensation, and training) are the largest component of the direct expense budget accounting for 57%, followed by other expenses (professional services, other materials, and other services) at 15%, maintenance at 14%, energy & utilities at 11%, and chemicals at 4%.

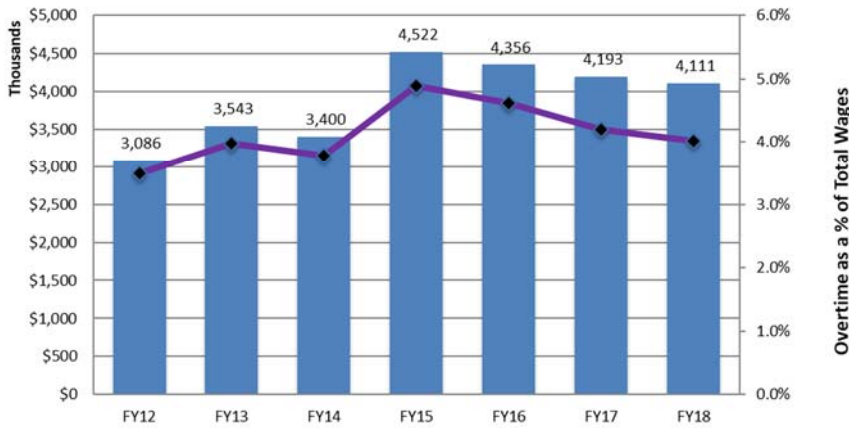


Wages and Salaries – The Final FY18 budget includes \$104.3 million for Wages and Salaries as compared to \$101.9 million in the FY17 budget, an increase of \$2.4 million or 2.4%, primarily for COLA increases. Regular Pay is 98.3% of total Wages and Salaries. On a Full-Time-Equivalent (FTE’s) basis, the Authority has budgeted 1,150 positions, the same as FY17. This position count is also consistent with the goal recommended to be achieved within a five-year time frame by Amawalk consultants in a 2012 staffing study. As always, new hires and backfilling of vacant positions will be managed at the agency level and addressed on a case-by-case basis by senior management.

**Prior to fiscal year 2017, personnel were budgeted based on position counts by division, regardless of whether they were full-time or part-time employees. Beginning in FY17, the budget is based on FTEs. Personnel who work less than full-time result in fractional counts within divisions.*

Division	FY16*	FY17	FY18
Executive	5	5	5
Emergency Preparedness	6	5.8	7.8
Affirmative Action	6	6	6
Internal Audit	8	6.7	6.8
Public Affairs	13	12.9	13
Operations	934	918.8	918.8
Law	17	15.5	15.5
Administration	142	141	142
Finance	39	38.3	35.5
Authority Total	1170	1150	1150.4

**MWRA Overtime
FY12-FY18**



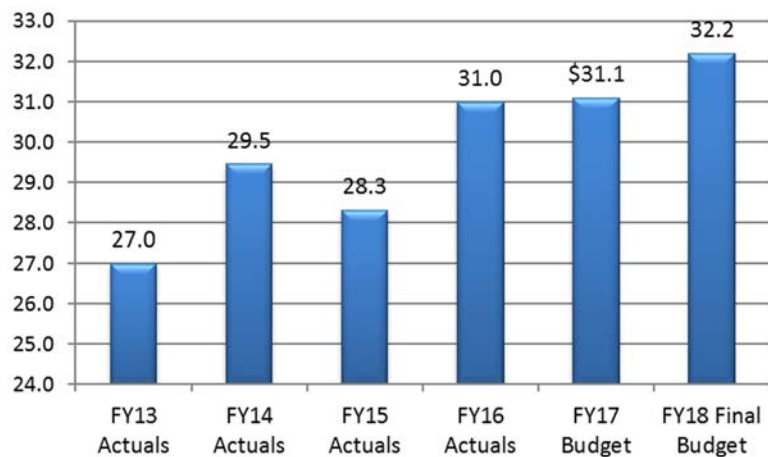
Overtime – The overtime line item is comprised of both emergency overtime and budgeted overtime for maintenance and capital projects. The Final FY18 Budget includes \$4.1 million for Overtime, a decrease of \$82,000 or 2.0% as compared to the FY17 Budget mainly for the removal of overtime in FY18 associated with the North Main Pump Station and Winthrop Terminal Facility Butterfly Valve Replacement project at Deer Island which was completed in FY17.

Fringe Benefits – The budget includes \$20.8 million for Fringe Benefits, an increase of \$755,000 or 3.7% from the FY17 budget. Every line item within the Fringe Benefits Expense category was increased by 3.7% in anticipation of cost increases, with the exception of unemployment which was level funded.

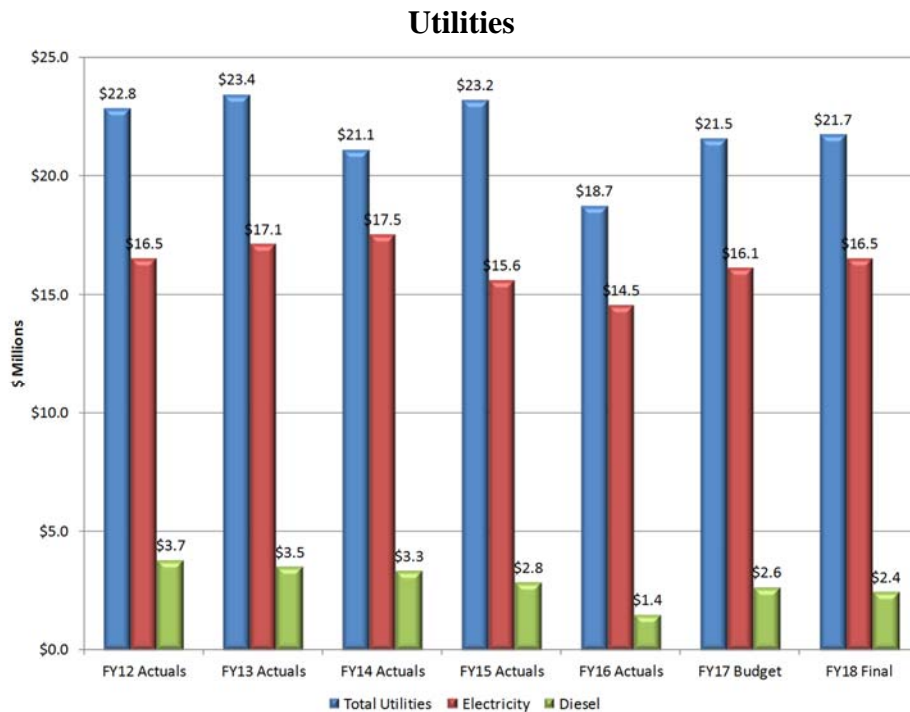
Fringe Benefits		
Line Item	FY17 Budget	Final FY18 Budget
Health Insurance	\$17,499,190	\$18,139,271
Dental Insurance	\$1,121,933	\$1,160,985
Unemployment	\$160,744	\$160,744
Medicare	\$1,344,699	\$1,387,610
Total	\$20,126,566	\$20,848,610

Maintenance – The budget includes \$32.2 million for Maintenance projects, an increase of \$1.1 million or 3.6% over the FY17 budget. The FY18 Maintenance increase is associated with project specific maintenance work. Over the past 5 years, the general trend in maintenance spending has been increasing, consistent with the Authority’s goal to adequately fund core operations and protect the Authority’s capital assets. Asset protection is a growing priority in both the current expense and capital improvement budgets.

**Maintenance
(\$s in millions)**



Utilities – The budget includes \$21.7 million for Utilities, which is an increase of \$.2 million or 0.9% from the FY17 Budget. The increase is for electricity of \$400,000 based upon a projected small increase in transmission and distribution charge for electricity to MWRA sites other than DITP. This is offset by a reduction of \$200,000 in diesel reflecting a 10 cent per gallon reduction in the budgeted cost of diesel fuel from FY17. The major utilities that the budget funds are \$16.5 million for Electricity, \$2.4 million for Diesel Fuel, \$2.1 million for Water, and \$590,000 for Natural Gas.



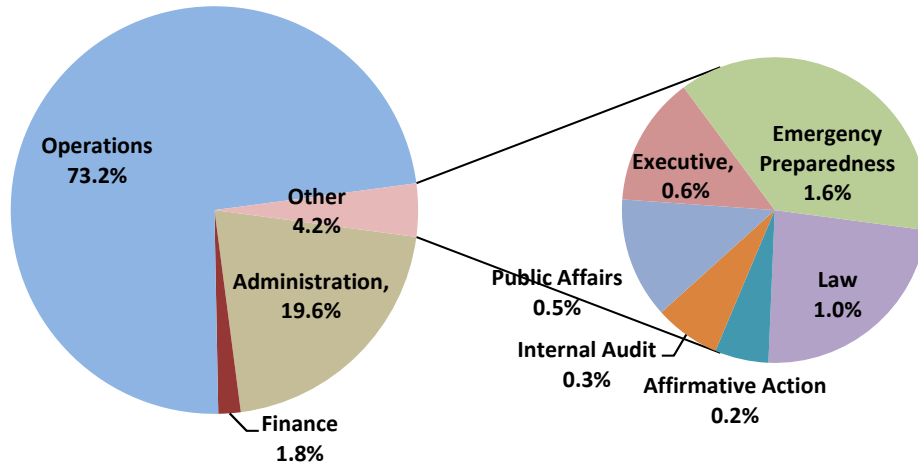
Chemicals – The budget includes \$9.8 million for Chemicals, an increase of \$727,000 or 8.0% from the FY17 Budget mainly due to increased pricing primarily for Sodium Hypochlorite and to increased quantities primarily for Soda Ash.

Other Services – The budget includes \$22.8 million for Other Services, a decrease of \$142,000 or 0.6% from the FY17 Budget. The budget includes funding of \$12.8 million for Sludge Pelletization, \$3.7 million for Space/Lease Rentals and related expenses for the Charlestown Navy Yard, and Chelsea facilities, \$2.0 million for Voice and Data costs, \$1.4 million for Other Services, and \$1.2 million for Grit & Screenings removal. The largest decrease is for Sludge Pelletization of \$298,000 due to deflation. This is offset by increases in Membership/Dues/Subscriptions, Printing & Duplicating, Space/Lease Rentals, and Other Services.

Functional Area Budget Summary

The chart below shows the breakdown of the MWRA's direct expense budget by division.

MWRA Direct Expense Budget By Division



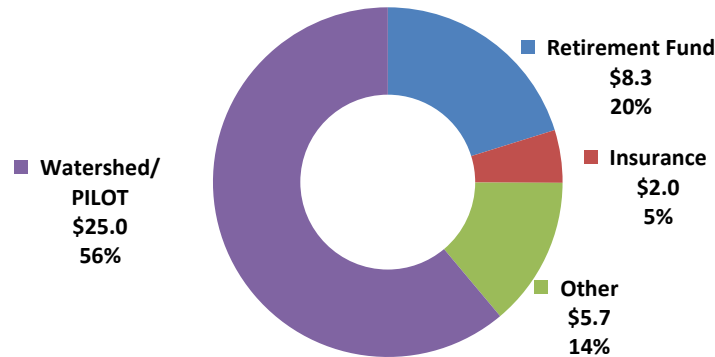
Detailed summaries for each Division budget are provided following the Executive Summary.

INDIRECT EXPENSES

The FY18 Indirect Expense Budget is \$38.9 million, \$904,000 or 2.4% above the FY17 Budget.

The following graph combines related indirect expense line items into the general cost categories and shows that Water Supply Protection Program expenses are the largest component of the indirect expense budget at 56% followed by Retirement Fund at 23%, Other (for items such as HEEC, Mitigation, and Addition to Reserves) at 16%, and Insurance at 5%.

Indirect Expenses by Category
\$s in Millions



Insurance

MWRA purchases property and casualty insurance from external insurance carriers with a self-insured retention of \$2.5 million dollars and Worker’s Compensation Excess insurance with a self-insured retention of \$500,000 per claim. The budget includes \$2.0 million for Insurance, an increase of \$16,000 or 0.8% from the FY17 Budget. The FY18 Budget was based on actual average spending for claims for the past five years, FY12-16, and favorable bids received for the premiums. MWRA mitigates the budgetary risk of self-insurance by maintaining an Insurance Reserve. The reserve, which was established as part of the Bond Resolution, requires that an independent insurance consultant review the funding level every three years and provide recommendations as to its adequacy. The Insurance Reserve Fund is currently funded at \$14.0 million which was within the acceptable range as identified in the insurance consultant review as of February 2017.

Watershed Reimbursement/PILOT

The Enabling Act directs MWRA to pay the Commonwealth of Massachusetts for several statutory obligations: Payment in Lieu of Taxes (PILOT) for Commonwealth-owned land in the watersheds and operating expenses of the Division of Water Supply Protection. The budget includes \$25.2 million for the Watershed Management budget, an increase of \$873,000 or 3.6% over the FY17 Budget. The budget includes \$16.7 million for reimbursement of operating expenses net of revenues, and \$8.4 million for Payment in Lieu of Taxes (PILOT). The largest increases are for operating expenses net of revenues of \$805,000 mainly for healthcare costs and contractual increases. In addition, there is an increase of \$68,000 for PILOT payments. The FY18 operating capital budget of the Watershed Management line item includes the Clinton crew headquarters construction, purchase of large equipment and an expansion of the Wachusett maintenance garage.

Division of Watershed Management

	FY17 Budget	FY18 Final	FY18 Final vs. FY17	%
Operating Expenses	16,024,268	16,664,006	639,738	4.0%
Phase I Projects	910,000	1,050,000	140,000	15.4%
Revenue	(1,015,000)	(990,000)	25,000	-2.5%
Net	15,919,268	16,724,006	804,738	5.1%
PILOT	8,372,000	8,440,000	68,000	0.8%
Total	24,291,268	25,164,006	872,738	3.6%

Harbor Electric Energy Company (HEEC)

The budget includes \$957,000 for the Harbor Energy Electric Company (HEEC), an increase of \$184,000 or 23.7% from the FY17 Budget to reflect updated calculations for the Operations and Maintenance component of the HEEC payment obligations for the existing cross-harbor cable.

Mitigation

MWRA disburses mitigation funds to communities affected by MWRA projects or facilities pursuant to MWRA's Statement of Mitigation Principles and/or specific agreements with communities. MWRA mitigation may include relieving the direct impacts of construction, meeting environmental and regulatory requirements, long-term operating agreements, or community compensation for impacts over and above those addressed by other mitigation. In rare situations, where the extent and duration of the impact of a project or facility on a community is such that restoring the area to its pre-project state is insufficient to relieve the stress of MWRA's presence during the project, MWRA funds or contributes to improvements to affected areas.

Mitigation expenses are funded in the capital budget and in the current expense budget. The FY18 Final Budget includes funding of \$1.6 million in community compensation for the City of Quincy and the Town of Winthrop. Both mitigation agreements expire in FY25.

Operating Reserves

Funding for the Operating Reserve for FY18 is \$821,000. The Operating Reserve balance is in compliance with MWRA General Bond Resolution which requires a balance of one-sixth of annual operating expenses. Based on the Final FY18 Budget the required balance is \$40.1 million versus the \$39.2 million required in FY17.

Retirement System Contribution

The budget includes \$3.3 million for the Retirement Fund, an increase of \$145,000 million or 4.6% over the FY17 budget. The minimum required contribution for FY18 is \$3.3 million based on the January 1, 2015 actuarial report.

GASB 45 – Accounting and Reporting by Employers for Postemployment Benefits Other than Pensions

In the Final FY18 Budget the Authority funds its OPEB liability at \$5.0 million, continuing the Authority's long-term commitment to address its liabilities. The Authority has complied with the GASB 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other than Pensions (OPEB)*, by disclosing this liability in the year-end Financial Statements. As part of the multi-year strategy to address its unfunded liabilities for OPEB and pension holistically, the Board approved a plan to pay down the pension liability and upon reaching full funding, move to address the OPEB obligation. To maximize the benefits in terms of returns and accounting treatment, an irrevocable OPEB Trust was established after Board approval and funding started on April 23rd, 2015. The current Trust balance is \$17.5 million which represent approximately a 12% funding level. The \$5.0 million contribution is 50% of the Annual Required Contribution (ARC) after the reduction of the pay-as-you-go portion budgeted under the Fringe line item, based on the January 1, 2014 actuarial report.

CAPITAL FINANCING

The Final FY18 Budget capital financing costs increased by \$17.0 million or 3.7% compared to the FY17 Budget. This increase in the MWRA's debt service is the result of projected FY18 borrowings and the structure of the existing debt, the addition of the HEEC cable capacity reserve fund, and increased current revenue for capital partially offset by the impact of the defeasance. The FY18 capital financing budget includes:

- \$264.6 million in principal and interest payments on MWRA's senior fixed rate bonds. This amount includes \$3.5 million to support issuance of \$100 million in May 2018 and a reduction of \$1,847,500 for the effect of the FY17 defeasance;
- \$85.4 million in principal and interest payments on subordinate bonds;
- \$84.9 million in principal and interest payments on SRF loans. This amount includes \$4.3 million to support issuances of \$50.0 million of replacement loans during 2018;
- \$13.2 million to fund ongoing capital projects with current revenue;
- \$6.5 million for the new HEEC cable capacity reserve fund. As stated earlier, MWRA has agreed with Eversource to construct a new long-term submarine electric cable to replace the existing cable instead of protecting the existing cable with an expensive short-term fix. Based on current estimates of costs and timing for commissioning of the new cable, MWRA anticipates that payments for the capacity charges for the new HEEC cable will begin in FY20. By agreement with the Advisory Board, the \$4.4 million of avoided expenses in FY18, as a result of building a new cable instead of protecting the existing cable, are being added to a new HEEC cable capacity reserve fund totaling \$6.5 million to use in FY21 and FY22 to absorb and level the increase in costs beginning that year.

- \$3.8 million to fund the interest expense related to the Local Water Pipeline Assistance Program; and
- \$3.2 million for the Chelsea Lease.

The budget also includes \$391,580 offset to Debt Service for the Debt Service Assistance received in FY17.

Outstanding Debt and Debt Management

The \$8.3 billion spent on MWRA’s modernization efforts since the Authority was established in 1986, has relied heavily on debt financing. Total debt as of December 31, 2016 was \$5.2 billion consisting of senior and subordinated debt, as well as Tax-Exempt Commercial Paper. The MWRA enjoys strong unenhanced senior debt ratings of Aa1, AA+, and AA+ from Moody’s, Standard & Poor, and Fitch, respectively.

Type	Principal Outstanding December 31, 2016	% of Total
Senior General Revenue Bonds	\$ 3,181,950,000	61.1%
Massachusetts Clean Water Trust	\$ 980,095,379	18.8%
Subordinate General Revenue Bonds	\$ 895,460,000	17.2%
Tax-Exempt Commercial Paper/Revolving Line of Credit	\$ 149,000,000	2.9%
Total	\$ 5,206,505,379	100.0%

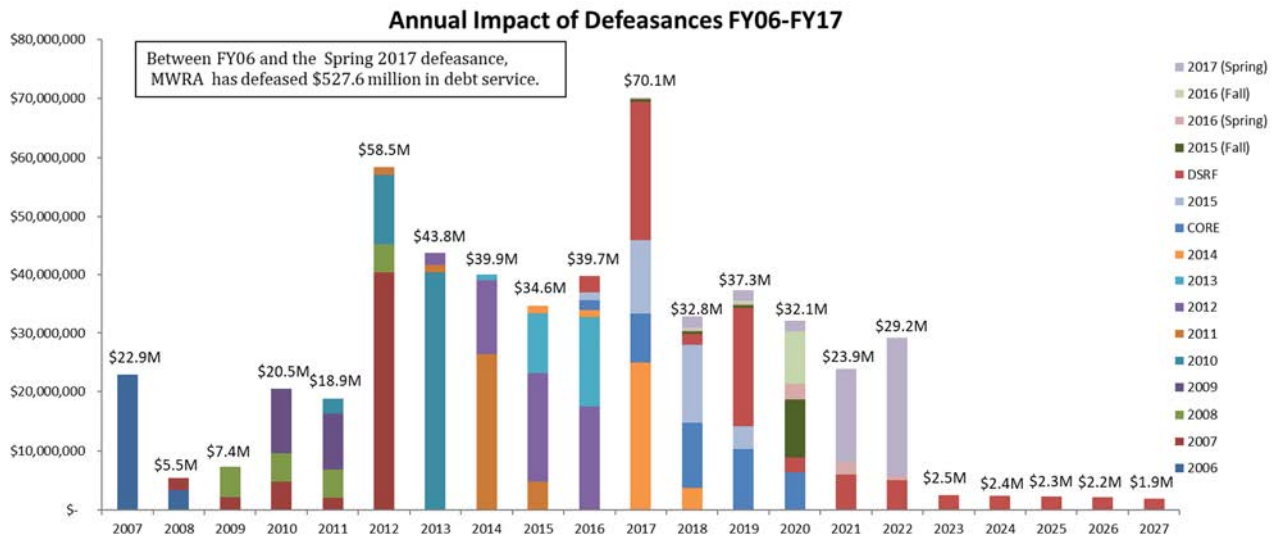
79.9% of MWRA's Debt is Fixed Rate

As a result of the Authority’s Capital Improvement Program, capital financing as a percent of total expenses (before offsets) has increased steadily from 36% in 1990 to 63.5% in the FY18 Current Expense Budget. Much of this debt service is for completed projects, primarily the Boston Harbor Project and the Integrated Water Supply Improvement Program. The MWRA’s capital spending, from its inception, had been dominated by projects mandated by court ordered or regulatory requirements, which in total have accounted for ~80% of capital spending to date. Going forward, and as the Combined Sewer Overflow (CSO) projects reached substantial completion in December 2015, the majority of spending will be focused on asset protection and water redundancy initiatives. The projected capital spending scheduled for FY18 is less than scheduled principal payments which will contribute to decrease MWRA’s outstanding indebtedness. A summary of the FY18 Capital Improvement Program is included as Attachment G.

The Authority has actively managed its debt structure to take advantage of favorable interest rates. Tools used by the MWRA to lower borrowing costs and manage rates include current and advanced refunding of outstanding debt, maximizing the use of the subsidized State Revolving Fund (SRF) debt, issuance of variable rate debt, swap agreements, and the use of surplus revenues to defease debt. The MWRA also uses tax exempt commercial paper to minimize the financing cost of construction in process.

The FY18 Final Budget capital financing costs total \$472.2 million and remain the largest portion of the MWRA’s budget, accounting for 63.5% of total expenses.

The FY18 Budget includes a defeasance of \$36.2 million which will reduce debt service by \$15.9 million in FY21, \$23.4 million in FY22 and \$1,847,500 in years FY18-20.



The FY18 Budget assumes a 3.25% interest rate for variable rate debt which equal to the rate in FY17. The Authority’s variable rate debt assumption is comprised of three separate elements: the interest rate for the daily and weekly series; liquidity fees for the Standby Bond Purchase Agreement, Letter of Credit, and Direct Purchase providers; and remarketing fees. While MWRA continues to experience unusually low interest rates, they are not reflective of historical averages and there are anticipated increases in the future.

Grant Revenues

In the past, MWRA has been able to finance approximately 20 percent of its capital spending with grant receipts, totaling approximately \$1.1 billion through FY03. However, since FY03, the MWRA has only received \$4.9 million in capital grants. In addition to participating in federal and state grant programs, the MWRA benefitted from the American Recovery and Reinvestment Act of 2009 which is projected to forgive approximately \$33.0 million in State Revolving Fund loan principal. The Authority continues to pursue grant funding and take advantage of any possible program available to maximize grant funding opportunities.

MWRA expects to borrow the majority of funds necessary for future capital spending. Borrowing will include the issuance of fixed and variable rate revenue bonds; borrowing from the Massachusetts Clean Water Trust (also known as the State Revolving Loan Fund or SRF), and a Tax-Exempt Commercial Paper program. The table below details the FY18 budget capital financing line item. It also shows how upgrading the sewerage system has dominated the capital program to date. Current and future borrowings increasingly support improvements to the water system. A complete list of the Authority’s indebtedness by series is presented in Appendix F.

FY18 Final Current Expense Budget - Capital Financing Detail (as of 6/30/17)				
\$ in millions				
	Amount Outstanding	Total FY16 Capital Costs	Sewer	Water
Total SRF ¹ Debt	\$1,007.0	\$84.9	\$65.3	\$19.6
Total Senior Debt	\$3,191.3	264.6	167.9	96.7
Total Subordinate Debt	\$866.7	85.4	58.7	26.7
Total SRF and Debt Service²	\$5,065.0	\$434.9	\$291.9	\$143.0
Water Pipeline Commercial Paper	128.0	3.8	0.0	3.8
Current Revenue/Capital ³		13.2	12.3	0.9
Capital Lease		3.2	1.9	1.3
Debt Prepayment ⁴		10.9	10.6	0.3
Harbor Cable Prepayment		6.5	6.5	0.0
	128.0	\$37.6	\$31.4	\$6.3
Total Capital Financing (before Debt Service Offsets)	5,193.0	\$472.6	\$323.3	\$149.3
Debt Service Offsets:				
Debt Service Assistance		(0.4)	(0.4)	(0.0)
Bond Redemption		0.0	0.0	0.0
Total Capital Financing	5,193.0	\$472.2	\$322.9	\$149.3

¹ SRF debt service payments reflect net MWRA obligations after state and federal subsidies.

² Numbers may not add due to rounding.

³ Current Revenue/Capital is revenue used to fund ongoing capital projects.

⁴ Debt Prepayment will be used defeasance of bonds at end of fiscal year.

CIP Impact on Current Expense Budget

In addition to the annual financing costs included in the Current Expense Budget, the Capital Improvement Program affects the annual operating budget when capital facilities come on-line and require adjustments to operating budgets. In prior years, completion of the Deer Island Treatment Plant, the Carroll Water Treatment Plant, and the residuals processing facility in Quincy resulted in significant increases in operating expenses. Operating costs will be reduced by approximately \$611,000 through FY28, primarily due to Asset Protection projects at the Deer Island Treatment Plant. These reductions will be offset by Information System program related maintenance initiatives that are projected to increase operating costs by \$313,000 by FY18. The following table summarizes the projected CIP impact on the operating budget by project over the next ten years.

Fiscal Year	CEB Impacts (\$ in thousands)										
	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	Total
DI Treatment Plant Asset Protection (not including Co-Digestion or Combined Heat and Power Plant)	\$0	\$212	(\$251)	\$0	(\$116)	(\$131)	(\$61)	\$0	\$0	\$0	(\$348)
DI Treatment Plant Asset Protection - Co-Digestion ONLY	0	0	0	0	0	0	0	0	0	0	0
Clinton Phosphorous Removal Project	31	0	0	0	0	0	0	0	0	0	31
Wastewater Alternative Energy Projects	0	0	0	0	0	0	0	0	0	0	0
South Boston CSO Tunnel Inspection/Cleaning and Outfalls Inspection (previously named North Dorchester Bay project)	(361)	0	0	0	869	(896)	0	0	0	0	(387)
Total Wastewater (inflated)	(\$330)	\$212	(\$251)	\$0	\$754	(\$1,027)	(\$61)	\$0	\$0	\$0	(\$704)
Empty	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Empty	0	0	0	0	0	0	0	0	0	0	0
Wachusett Algae Treatment Facility	0	0	0	0	0	0	0	0	46	47	93
Empty	0	0	0	0	0	0	0	0	0	0	0
Water Energy Projects	0	0	0	0	0	0	0	0	0	0	0
Total Water (inflated)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$46	\$47	\$93
Maximo Upgrades & Lawson Enhancements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Storage Upgrades	103	0	0	0	0	0	0	0	0	0	103
Telecommunications	26	0	0	0	0	0	0	0	0	0	26
NET 2020 DITP & Southborough	0	0	0	0	0	0	0	0	0	0	0
Information Security Program	0	0	0	0	0	0	0	0	0	0	0
Information Technology Management Program	0	0	0	0	0	0	0	0	0	0	0
Application Improvement Program	0	80	0	0	0	0	0	0	0	0	80
IT Infrastructure Program	104	0	0	0	0	0	0	0	0	0	104
Total Business and Operations Support (inflated)	\$233	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$313
TOTAL MWRA	(\$97)	\$292	(\$251)	\$0	\$754	(\$1,027)	(\$61)	\$0	\$46	\$47	(\$298)

RATE ASSESSMENT AND METHODOLOGY

Community Profile and Assessments

MWRA provides wholesale water and sewer services to 61 communities or local bodies. Fifty-one local bodies purchase water supply services, and 45 local bodies purchase wastewater transport and treatment services. Thirty-five local bodies purchase both. Approximately 2.8 million people, or 43% of the population of Massachusetts, live and work in the communities that purchase water and/or wastewater services from MWRA.

MWRA's largest single customer is the Boston Water and Sewer Commission (BWSC), which provides retail services in the City of Boston. In the Final FY18 Budget, rate revenue from BWSC will account for 31% of MWRA's total rate revenue. The table on page I-20, lists MWRA communities, the services received, and the MWRA assessments for FY18.

Each year MWRA determines preliminary wholesale water and sewer assessments in February and final assessments in June before the beginning of the new fiscal year. These assessments must satisfy the statutory requirement that MWRA fully recover its budgeted water and sewer costs by apportioning net costs among its wholesale water and sewer customers.

The table on the following page presents the calculation of MWRA's FY18 Rate Revenue Requirement. The table shows that most of MWRA's current expenses are directly attributable to either water or sewer service costs, or to investment in the water or sewer systems. Expenses that support both systems are allocated to water or sewer assessments based on generally accepted cost allocation principles. Investment

Income and Other Revenues offset water and sewer expenses. The resulting net cost of water and sewer services is the amount MWRA recovers through water and sewer assessments.

Calculation of the PFY18 Rate Revenue Requirement
(\$s in thousands)

	Sewer	Water	Total
Allocated Direct Expenses	\$160,412	\$77,999	\$238,411
Allocated Indirect Expenses	\$11,779	\$29,802	\$41,581
PLUS			
Capital Expenses:			
Debt Service (less offsets)	\$294,122	\$143,598	\$437,720
Current Revenue for Capital	\$12,540	\$660	\$13,200
Other Capital Expenses	\$12,328	\$5,875	\$18,204
PLUS			
Non-Rate Revenue:			
Investment Income	-\$6,458	-\$4,797	-\$11,255
Fees and Other Revenue	-\$6,880	-\$9,743	-\$16,623
Rate Stabilization	\$0	\$0	\$0
EQUALS			
Rate Revenue Requirement	\$477,844	\$243,394	\$721,238

Wholesale Assessment Methodology

MWRA calculates separate user assessments for water and sewer services. Budgeted water operating and capital costs are allocated based on each community’s share of total water use for the most recent calendar year. The sewer assessment methodology allocates budgeted operating and maintenance costs based on share of wastewater flow and strength parameters, and capital costs based on proportion of maximum flow, strength, and population. MWRA uses three-year averaging of wastewater flows to calculate the flow-related components of wholesale sewer assessments. Flow averaging moderates the short-term impact of year-to-year changes in community flow, but does not eliminate the long-term impact of changes in each community’s relative contribution to the total flow.

Massachusetts Water Resources Authority
Final FY18 Water and Sewer Assessments

MWRA Fully Served Water and Sewer Customers	Final FY17 Water Assessment	Final FY18 Water Assessment	Percent Change from FY17	Final FY17 Sewer Assessment	Final FY18 Sewer Assessment	Percent Change from FY17	Final FY17 Combined Assessment	Final FY18 Combined Assessment	Dollar Change from FY17	Percent Change from FY17
ARLINGTON	\$4,976,564	\$5,218,727	4.9%	\$7,993,120	\$8,338,483	4.3%	\$12,969,684	\$13,557,210	\$587,526	4.5%
BELMONT	2,828,456	2,906,748	2.8%	4,825,479	4,923,065	2.0%	7,653,935	7,829,813	175,878	2.3%
BOSTON (BWSC)	82,771,709	85,905,357	3.8%	132,271,845	135,974,820	2.8%	215,043,554	221,880,177	6,836,623	3.2%
BROOKLINE	7,046,691	6,806,844	-3.4%	12,894,419	12,978,537	0.7%	19,941,110	19,785,381	(155,729)	-0.8%
CHELSEA	4,215,080	4,277,382	1.5%	7,663,315	7,717,861	0.7%	11,878,395	11,995,243	116,848	1.0%
EVERETT	4,948,191	5,182,465	4.7%	8,124,101	8,378,885	3.1%	13,072,292	13,561,350	489,058	3.7%
FRAMINGHAM	8,159,808	8,003,044	-1.9%	12,824,962	13,063,056	1.9%	20,984,770	21,066,100	81,330	0.4%
LEXINGTON	7,349,661	7,246,531	-1.4%	7,265,870	7,402,979	1.9%	14,615,531	14,649,510	33,979	0.2%
MALDEN	6,950,768	6,762,968	-2.7%	12,941,073	13,307,655	2.8%	19,891,841	20,070,623	178,782	0.9%
MEDFORD	6,432,219	6,383,291	-0.8%	11,878,789	12,118,702	2.0%	18,311,008	18,501,993	190,985	1.0%
MELROSE	2,915,635	2,854,570	-2.1%	6,251,952	6,387,893	2.2%	9,167,587	9,242,463	74,876	0.8%
MILTON	3,360,396	3,495,641	4.0%	5,362,055	5,450,348	1.6%	8,722,451	8,945,989	223,538	2.6%
NEWTON	12,950,552	12,891,560	-0.5%	20,518,241	21,760,724	6.1%	33,468,793	34,652,284	1,183,491	3.5%
NORWOOD	3,652,867	3,703,392	1.4%	7,023,166	7,436,847	5.9%	10,676,033	11,140,239	464,206	4.3%
QUINCY	11,776,311	12,199,555	3.6%	19,971,978	20,574,282	3.0%	31,748,289	32,773,837	1,025,548	3.2%
READING	2,109,549	2,211,234	4.8%	4,769,928	4,939,434	3.6%	6,879,477	7,150,668	271,191	3.9%
REVERE	4,943,964	4,896,715	-1.0%	10,611,549	10,775,969	1.5%	15,555,513	15,672,684	117,171	0.8%
SOMERVILLE	7,658,290	7,928,695	3.5%	15,918,035	16,508,256	3.7%	23,576,325	24,436,951	860,626	3.7%
STONEHAM	3,174,690	3,027,480	-4.6%	4,542,049	4,600,334	1.3%	7,716,739	7,627,814	(88,925)	-1.2%
WALTHAM	9,384,159	9,038,537	-3.7%	13,122,122	13,521,664	3.0%	22,506,281	22,560,201	53,920	0.2%
WATERTOWN	3,290,986	3,388,389	3.0%	5,971,377	6,103,914	2.2%	9,262,363	9,492,303	229,940	2.5%
WINTHROP	1,643,615	1,615,822	-1.7%	3,320,069	3,395,228	2.3%	4,963,684	5,011,050	47,366	1.0%
TOTAL	\$202,540,161	\$205,944,947	1.7%	\$336,065,494	\$345,658,936	2.9%	\$538,605,655	\$551,603,883	\$12,998,228	2.4%

MWRA Sewer and Partial Water Customers	Final FY17 Water Assessment	Final FY18 Water Assessment	Percent Change from FY17	Final FY17 Sewer Assessment	Final FY18 Sewer Assessment	Percent Change from FY17	Final FY17 Combined Assessment	Final FY18 Combined Assessment	Dollar Change from FY17	Percent Change from FY17
CANTON	\$1,673,754	\$2,538,303	51.7%	\$4,137,162	\$4,210,854	1.8%	\$5,810,916	\$6,749,157	\$938,241	16.1%
NEEDHAM	1,039,372	1,109,794	6.8%	5,683,915	5,889,796	3.6%	6,723,287	6,999,590	276,303	4.1%
STOUGHTON	1,144,245	253,810	-77.8%	4,747,341	5,031,822	6.0%	5,891,586	5,285,632	(605,954)	-10.3%
WAKEFIELD	1,852,218	2,169,915	17.2%	5,813,697	6,075,836	4.5%	7,665,915	8,245,751	579,836	7.6%
WELLESLEY	1,056,294	1,742,278	64.9%	5,459,750	5,601,602	2.6%	6,516,044	7,343,880	827,836	12.7%
WILMINGTON	703,075	776,226	10.4%	2,595,601	2,804,912	8.1%	3,298,676	3,581,138	282,462	8.6%
WINCHESTER	1,544,349	2,121,826	37.4%	4,033,770	4,144,555	2.7%	5,578,119	6,266,381	688,262	12.3%
WOBURN	3,355,306	3,636,173	8.4%	9,324,662	9,449,446	1.3%	12,679,968	13,085,619	405,651	3.2%
TOTAL	\$12,368,613	\$14,348,325	16.0%	\$41,795,898	\$43,208,823	3.4%	\$54,164,511	\$57,557,148	\$3,392,637	6.3%

MWRA Sewer-only Customers	Final FY17 Water Assessment	Final FY18 Water Assessment	Percent Change from FY17	Final FY17 Sewer Assessment	Final FY18 Sewer Assessment	Percent Change from FY17	Final FY17 Combined Assessment	Final FY18 Combined Assessment	Dollar Change from FY17	Percent Change from FY17
ASHLAND				\$2,485,174	\$2,592,423	4.3%	\$2,485,174	\$2,592,423	\$107,249	4.3%
BEDFORD				3,368,331	3,546,882	5.3%	3,368,331	3,546,882	178,551	5.3%
BRAINTREE				9,100,270	9,599,185	5.5%	9,100,270	9,599,185	498,915	5.5%
BURLINGTON				5,078,461	5,286,375	4.1%	5,078,461	5,286,375	207,914	4.1%
CAMBRIDGE				23,745,695	24,713,139	4.1%	23,745,695	24,713,139	967,444	4.1%
DEDHAM				5,311,572	5,482,446	3.2%	5,311,572	5,482,446	170,874	3.2%
HINGHAM SEWER DISTRICT				1,798,028	1,846,255	2.7%	1,798,028	1,846,255	48,227	2.7%
HOLBROOK				1,759,996	1,804,666	2.5%	1,759,996	1,804,666	44,670	2.5%
NATICK				5,756,705	5,924,062	2.9%	5,756,705	5,924,062	167,357	2.9%
RANDOLPH				6,272,186	6,339,800	1.1%	6,272,186	6,339,800	67,614	1.1%
WALPOLE				3,713,877	3,821,880	2.9%	3,713,877	3,821,880	108,003	2.9%
WESTWOOD				2,598,265	2,777,442	6.9%	2,598,265	2,777,442	179,177	6.9%
WEYMOUTH				11,765,811	12,036,129	2.3%	11,765,811	12,036,129	270,318	2.3%
TOTAL				\$82,754,371	\$85,770,684	3.6%	\$82,754,371	\$85,770,684	\$3,016,313	3.6%

MWRA Water-only Customers	Final FY17 Water Assessment	Final FY18 Water Assessment	Percent Change from FY17	Final FY17 Sewer Assessment	Final FY18 Sewer Assessment	Percent Change from FY17	Final FY17 Combined Assessment	Final FY18 Combined Assessment	Dollar Change from FY17	Percent Change from FY17
LYNNFIELD WATER DISTRICT	\$643,348	\$748,610	16.4%				\$643,348	\$748,610	\$105,262	16.4%
MARBLEHEAD	2,341,415	2,469,760	5.5%				2,341,415	2,469,760	128,345	5.5%
NAHANT	476,532	537,696	12.8%				476,532	537,696	61,164	12.8%
SAUGUS	3,692,889	3,953,935	7.1%				3,692,889	3,953,935	261,046	7.1%
SOUTHBOROUGH	948,422	997,207	5.1%				948,422	997,207	48,785	5.1%
SWAMPSCOTT	1,834,151	1,892,557	3.2%				1,834,151	1,892,557	58,406	3.2%
WESTON	2,445,970	2,818,905	15.2%				2,445,970	2,818,905	372,935	15.2%
TOTAL	\$12,382,727	\$13,418,670	8.4%				\$12,382,727	\$13,418,670	\$1,035,943	8.4%

MWRA Partial Water-only Customers	Final FY17 Water Assessment	Final FY18 Water Assessment	Percent Change from FY17	Final FY17 Sewer Assessment	Final FY18 Sewer Assessment	Percent Change from FY17	Final FY17 Combined Assessment	Final FY18 Combined Assessment	Dollar Change from FY17	Percent Change from FY17
DEDHAM-WESTWOOD WATER DISTRICT	\$196,381	\$295,794	50.6%				\$196,381	\$295,794	\$99,413	50.6%
LYNN (LWSC)	243,938	326,368	33.8%				243,938	326,368	82,430	33.8%
MARLBOROUGH	3,887,876	4,902,062	26.1%				3,887,876	4,902,062	1,014,186	26.1%
NORTHBOROUGH	1,135,772	1,240,294	9.2%				1,135,772	1,240,294	104,522	9.2%
PEABODY	1,507,269	1,939,097	28.6%				1,507,269	1,939,097	431,828	28.6%
TOTAL	\$6,971,236	\$8,703,615	24.9%				\$6,971,236	\$8,703,615	\$1,732,379	24.9%
SYSTEMS TOTAL	\$234,262,737	\$242,415,557	3.48%	\$460,615,763	\$474,638,443	3.04%	\$694,878,500	\$717,054,000	\$22,175,500	3.19%

Retail Charges

As noted above, MWRA provides water and sewer services to communities on a wholesale basis. Each community then re-sells services on a retail basis. As a result, household water and sewer charges include each household's share of the community's MWRA water and sewer assessments, plus the community's own charges for the provision of local water and sewer services.

Each community independently establishes retail rates. When establishing local rates, community officials consider issues related to the pricing of services, level of cost recovery, and the local rate structure or methodology. Several factors contribute to a broad range of local rate structures in the MWRA service area:

- Differences in the extent to which water and sewer costs are supported through property taxes and other sources of revenue;
- Differences in the means by which communities finance investments in their own water and sewer systems; and
- Differences in communities' retail rate methodologies.

Some communities have flat unit rates, while others have inclining block rates. Local rates may also provide for differentials among classes of users, such as higher rates for commercial or industrial users, abatements to low-income or elderly residents, and adjusted sewer rates for customers with second meters used for lawn irrigation.

Additional information on rate structure within the member communities is available on the MWRA Advisory Board website as part of its annual retail rate survey.

Revenue and Expenditure Trends

Because MWRA is required by its enabling act to balance its budget and to establish annual assessments to cover all expenses, revenue must change as expenses are changing each year. The Rate Revenue Requirement in any year is the difference between MWRA expenses and other revenue sources, most notably non-rate revenue, investment income, and debt service assistance from the Commonwealth (which directly reduces debt service expense). For FY18, community assessments are projected to represent 96.4% of total revenue.

MWRA's planning estimates are projections based on a series of assumptions about future spending (operating and capital), interest rates, inflation, and other factors. MWRA uses the planning estimates to model and project what future rate increases might be based upon these assumptions, as well as to test the impact of changes to assumptions on future rate increases. The planning estimates are not predictions of what rate increases will be but rather they provide the context and framework for guiding MWRA financial policy and management decision making that ultimately determine the level of actual rate increases on an annual basis. Conservative projections of future rate increases benefit the MWRA by providing assurance to the rating agencies that MWRA anticipates to raise revenues sufficient to pay for its operations and outstanding debt obligations now and over the long-term. Additionally, conservative forecasts of rate revenue increases enable member communities to adequately plan and budget for future payments to MWRA.

MWRA also updates its estimates of anticipated revenues and expenses over a multi-year planning horizon. These estimates provide a context for budget discussions and allow MWRA to consider multiple-year rates management implications and strategies as it evaluates alternative capital and operating budget options, the ultimate goal being sustainable and predictable assessment increases.

The table below and Appendix D (in more detail) present the combined estimated future rate revenue requirements for FY18 through FY27. The planning estimates assume no Debt Service Assistance and use of Rate Stabilization and Bond Redemption reserves through FY2027 to manage the rate increases. These projections also include the release of cash and debt service reserves starting in FY16 as a result of Bond Indenture changes.

Rates & Budget Projections											
Final FY18 CEB	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027
Total Rate Revenue (\$000)	\$ 694,879	\$ 717,054	\$ 744,621	\$ 773,254	\$ 802,986	\$ 833,780	\$ 859,234	\$ 854,454	\$ 864,779	\$ 878,266	\$ 892,982
Rate Revenue Change from Prior Year (\$000)	\$ 22,438	\$ 22,175	\$ 27,567	\$ 28,633	\$ 29,731	\$ 30,794	\$ 25,454	\$ (4,780)	\$ 10,325	\$ 13,487	\$ 14,716
Rate Revenue Increase	3.4%	3.19%	3.8%	3.8%	3.8%	3.8%	3.1%	-0.6%	1.2%	1.6%	1.7%
Use of Reserves (\$000)	\$ -	\$ -	\$ -	\$ 500	\$ 250	\$ 4,383	\$ -	\$ -	\$ -	\$ 37,235	\$ 20,252

Estimated Household Bill

Based on annual water usage of 61,000 gallons	\$1,093	\$1,140	\$1,191	\$1,245	\$1,301	\$1,360	\$1,418	\$1,460	\$1,514	\$1,572	\$1,632
Based on annual water usage of 90,000 gallons	\$1,613	\$1,682	\$1,757	\$1,837	\$1,920	\$2,007	\$2,092	\$2,155	\$2,234	\$2,319	\$2,409

Increasing debt service to pay down and finance the capital improvement program is the most important factor driving estimates of future budget increases. Over the past several years MWRA’s Tax-Exempt Commercial Paper program, debt refinancing, federal grants, SRF loans, and Commonwealth debt service assistance have mitigated the impact on ratepayers of new capital spending. However, new water system improvements, for which there are fewer non-ratepayer sources of funding, and the impact of new financing will increase MWRA capital financing costs over the next several years.

MWRA employs rates management tools where available (e.g. refunding for savings, extended maturities on future borrowings, variable rate debt, and increased use of Tax-Exempt Commercial Paper) to help cushion and smooth the growth in capital financing expenses. Despite these initiatives, the size of the capital program will unavoidably continue to drive increases in community assessments.

The second largest budget factor is projected growth of base operating costs. The estimated \$61.9 million increase in direct expenses from FY18 to FY27 is primarily the result of an assumed annual inflation rate.

MWRA’s planning estimates are projections based on a series of assumptions about future spending (operating and capital), interest rates, inflation, and other factors. The assumptions include:

- Direct expense inflation rate of 2.5% for salaries and 3.0% for other direct expenses starting in FY18;
- CIP inflation rate of 2.5%;
- Capital spending based on the latest CIP expenditure forecast.
- Long-term fixed rate debt issues with 30-year terms and 5.0% interest rates in FY18, 5.25% rates in FY19, 5.5% rates in FY20, 5.75% rates in FY21 and 6.0% rates from FY22 and beyond;
- Variable rate interest projected at 3.25% in FY18, 3.5% in FY19, 3.75% in FY20, and 4.0% starting in FY21.

The planning estimates generally use conservative assumptions to help communities plan for future payments to MWRA.

There are several areas where differences from planning estimate assumptions may alter projected increases:

- Changes in anticipated borrowing rates or expected investment income rates;
- The planning estimates do not factor in any positive year-end variances which may be used to defease debt or reserved to offset Rate Revenue Requirements in future years;
- Fewer opportunities for SRF borrowing than expected due to Federal Budget cuts; a dollar borrowed through the SRF at 2% replaces the need to borrow a dollar long-term at an assumed 5% rate;
- Overall inflationary pressures;
- Debt refinancing opportunities;
- Capital spending; and
- Growth in direct expenses, greater than current assumptions.

MWRA Rates Management

Planning estimates for 2019 through 2027 forecast rate revenue requirement increases of 3.8% annually from FY19 through FY22, 3.1% in FY23, -0.6% in FY24, 1.2% in FY25, 1.6% in FY26, and 1.7% in FY27.

The FY18 Budget:

- Continues to refine planning estimates assumptions to provide greater predictability of future assessments;
- Judiciously uses reserves to lower rate increases, but maintain adequate balances;
- Continues the Authority's multi-year rates management strategy of providing sustainable and predictable assessment increases to our member communities; and
- For the second year, continues the smoothing strategy to even out the rate revenue requirement and rate changes caused by fluctuations in debt service at the utility level.

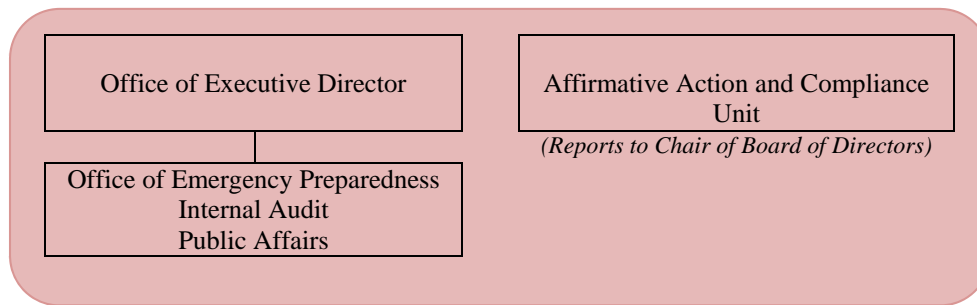
STATEMENT OF FINANCIAL POSITION

In accordance with its enabling act, each year MWRA submits annual reports to the Governor, the President of the State Senate, the House of Representatives, the Advisory Board, and the Chairs of the State Senate and House Committees on Ways and Means containing financial statements relating to its operations maintained in accordance with Generally Accepted Accounting Principles in the United States of America (GAAP) and, commencing with the annual reports for 1986, audited by independent certified public accountants. MWRA's audited financial statements at June 30, 2017 are available online at www.mwra.com.



Executive Office
Budget

EXECUTIVE DIVISION



The **Executive Division** provides executive management and guides the implementation of MWRA policies established by the Board of Directors. It is responsible for developing and implementing specific goals and programs to achieve MWRA's primary mission of providing reliable and efficient water and sewer services, improving water quality, and for creating a framework within which all divisions can operate effectively. The Executive Division also oversees a centralized MWRA-wide security program to preserve and protect MWRA facilities, systems and employees.

The Executive Division includes the Office of Executive Director, Office of Emergency Preparedness, Internal Audit, Public Affairs, and the Affirmative Action and Compliance Unit (AACU). Each of these Departments is accounted for separately in the MWRA budget.

The **Office of the Executive Director** includes the Board of Directors' cost center as well as the MWRA Advisory Board and Advisory Committees' cost centers. The Board of Directors formulates policies to guide MWRA actions and is responsible for major policy and fiscal decision-making. The MWRA Advisory Board was established by the Enabling Act to serve as "fiscal watchdog" for MWRA's customer communities. The Advisory Board makes recommendations to MWRA on annual expense budgets and capital improvement programs. In addition, the Advisory Board reviews and comments on MWRA reports, holds hearings on related matters, and makes recommendations to the Governor and the Legislature. The other advisory committees supported by this budget are the Water Supply Citizens' Advisory Committee (WSCAC) and the Wastewater Advisory Committee (WAC). (A description of the Advisory Board, WSCAC and WAC is set forth in Appendix E). The Executive Office budget accounts for less than 1% of the MWRA FY18 Final Approved Direct Expense Budget.

FY18 Final Current Expense Budget						
OFFICE OF THE EXECUTIVE DIRECTOR						
DEPARTMENT	FY15 Actual	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
EXECUTIVE OFFICE	\$ 506,811	\$ 537,059	\$ 524,168	\$ 536,635	\$ 12,467	2.4%
BOARD OF DIRECTORS	78,863	77,379	82,662	83,593	931	1.1%
ADVISORY BOARD / OTHER COMMITTEES	650,150	686,464	708,366	722,805	14,439	2.0%
TOTAL	\$ 1,235,824	\$ 1,300,902	\$ 1,315,196	\$ 1,343,033	\$ 27,837	2.1%

FY18 Goals and Initiatives:

Ensuring a safe and reliable source of drinking water to MWRA customers, and wastewater discharges that meet all applicable regulations drives both capital and current expense budget costs. Five strategic priorities integral to MWRA’s mission were identified for action in MWRA’s Five-Year Strategic Business Plan FY 2016-2020:

- I. **Drinking Water Quality and System Performance;**
- II. **Wastewater Management & System Performance;**
- III. **Infrastructure Management & Resilience;**
- IV. **Finance & Management;**
- V. **Environmental Sustainability.**

Under each of these priorities, MWRA identified goals and initiatives to guide the Authority’s action. The Executive Department uses the Business Plan to provide the framework for MWRA staff to manage and measure performance. The Office of the Executive Director has also identified core initiatives that support MWRA’s mission and strategic priorities.

- Ensure delivery of reliable and cost-effective water and sewer services to customer communities.
- Ensure that water supply and wastewater collection and treatment preserve public health and protect natural resources.
- Provide overall management of the agency and ensure adherence to all applicable policies and regulations.
- Continue to aggressively pursue renewable and sustainable energy resources to reduce the environmental impacts of daily operations, increase energy efficiencies, and reduce overall operating costs.
- Manage communication and garner support from key constituents for MWRA programs.

FY18 Final Current Expense Budget OFFICE OF THE EXECUTIVE DIRECTOR							
DEPARTMENT	FY15 Actual	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18		
EXECUTIVE OFFICE	\$ 506,811	\$ 537,059	\$ 524,168	\$ 536,635	\$ 12,467	2.4%	
BOARD OF DIRECTORS	78,863	77,379	82,662	83,593	931	1.1%	
ADVISORY BOARD / OTHER COMMITTEES	650,150	686,464	708,366	722,805	14,439	2.0%	
TOTAL	\$ 1,235,824	\$ 1,300,902	\$ 1,315,196	\$ 1,343,033	\$ 27,837	2.1%	

Budget Highlights:

The FY18 Final Budget is \$1.3 million, an increase of \$28,000 or 2.1%, as compared to the FY17 Budget.

- \$612,000 for **Wages and Salaries**, an increase of \$14,000 or 2.4%, as compared to the FY17 Budget. The FY18 Final Budget includes funding for five FTEs, the same as the FY17 Budget.

OFFICE OF THE EXECUTIVE DIRECTOR	FY17 FTEs	FY18 FTEs
EXECUTIVE OFFICE	5	5
TOTAL	5	5

- \$176,000 for **Professional Services**, an increase of \$5,000 or 3.0%, as compared to the FY17 Budget, mainly due to increases in the Advisory Committees’ operating expenses. This budget funds the Water Supply Citizens’ Advisory Committee (WSCAC) and the Wastewater Advisory Committee (WAC) budgets and includes a 2.5% increase in salaries, level funding of miscellaneous operating expenses and the balance in health insurance increases.
- \$550,000 for **Other Services**, an increase of \$9,000 or 1.7%, as compared to the FY17 Budget. The primary component of this line item is MWRA Advisory Board operating expenses which increased 2.2% over the FY17 Budget and include wages and salaries, space rental, and general administrative office expenses.

OFFICE OF EMERGENCY PREPAREDNESS

The **Office of Emergency Preparedness (OEP)** was created in November 2005 to consolidate Authority-wide security and emergency response functions. It is responsible for oversight of the MWRA’s security and emergency response plans, policies, and procedures; implementation and training for the Emergency Response Plan; and management, training, and outfitting of the Emergency Service Unit (ESU), which will respond to any intentional or accidental contamination of the water supply. The Director of Emergency Planning and Preparedness reports directly to the Executive Director.

FY18 Final Current Expense Budget						
OFFICE OF EMERGENCY PREPAREDNESS						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 554,860	\$ 509,627	\$ 603,837	\$ 858,294	\$ 254,457	42.1%
OVERTIME	797	-	-	-	-	-
MAINTENANCE	553,878	598,220	499,651	651,900	152,249	30.5%
TRAINING & MEETINGS	3,915	6,808	17,000	15,500	(1,500)	-8.8%
PROFESSIONAL SERVICES	1,804,732	1,845,169	1,920,000	1,981,000	61,000	3.2%
OTHER MATERIALS	12,849	44,999	18,967	19,042	75	0.4%
OTHER SERVICES	110,950	111,395	121,124	121,772	648	0.5%
TOTAL	\$ 3,041,980	\$ 3,116,218	\$ 3,180,579	\$ 3,647,508	\$ 466,929	14.7%

FY18 Goals and Initiatives:

I. Drinking Water Quality and System Performance

- **Goal#1 – Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations**
 - Develop and implement policies and programs to provide security, critical infrastructure protection, and emergency planning for the MWRA’s water systems.
 - Continue to enhance Emergency Response Plans for all water and wastewater facilities. Update Emergency Action Plans (EAPs) as needed, including the Western Section Dam EAPs and spill control EAPs.
 - Continue ensuring that new construction and rehabilitation of facilities include an integrated security and surveillance system improvement component. Continue task order security enhancement designs for selected water and wastewater critical sites, fencing installation, and other facility hardening initiatives.
 - Establish a backup security monitoring center and communications head end at Norumbega.
 - Complete facility security audits and implement the resulting enhancement and remedial work recommendations.
 - Improve the cyber security of the MWRA’s physical Security System.

II. Wastewater Management & System Performance

- Develop and implement policies and programs to provide security, critical infrastructure protection, and emergency planning for the MWRA's wastewater systems. While this initiative is not specifically addressed under the goals of the Wastewater Management & System Performance Strategic Priority, security of the system is a key objective of the Office of Emergency Preparedness. All initiatives set forth in Section I above for MWRA's water systems apply to MWRA's wastewater systems as well unless they address a specific water system location.

III. Infrastructure Management & Resilience

- ***Goal #10 – Prepare for catastrophic events that could affect the water and wastewater delivery systems***
 - Expand, equip, train, and lead the Emergency Service Unit (ESU).
 - Develop and exercise emergency plans and procedures.
 - Manage and direct security guard, security monitoring, and security maintenance contracts.
 - Hold a major Inter-Agency Consequence Management drill.
 - Expand the number of facilities that MWRA can fly its drones, through individual Part 107 waiver requests and/or a Jurisdictional Certificate of Waiver or Authorization (COA) request.

V. Environmental Sustainability

- ***Goal #16 – Continue to monitor climate change research and move forward with plans to reduce impacts of projected sea level rise and storm surge events on MWRA infrastructure***
 - Plan and install flood protection barriers at water and wastewater sites which fall below expected elevations of flood waters under condition of a FEMA 100-year storm plus 2 ½ feet to minimize damage and still provide service.

FY17 Accomplishments:

- Established a small Unmanned Aircraft System (drone) program with certified pilots.
- Established a relationship with the Boston Regional Intelligence Center (BRIC) and built on our cyber relationship with the Massachusetts National Guard.
- Completed physical security audits at 50 facilities.
- Completed transition away from the old video monitoring system to a new one.
- Signed new three-year contract for the maintenance of the hardware and software of the MWRA's security system.
- Began and made progress on the new Security Center in Chelsea. Completion is anticipated in October, 2017.
- Integrated new Chelsea Screen House security systems into the MWRA's security system.

- Completed a total of 73 training events or drills.
- Continued to provide an emergency response training program and a tabletop exercise series for MWRA staff and community water system staff. A total of 146 people attended from 23 community systems.

Budget Highlights:

The FY18 Final Budget is \$3.6 million, an increase of \$467,000 or 14.7%, as compared to the FY17 Budget.

- \$858,000 for **Wages and Salaries**, an increase of \$254,000 or 42.1%, as compared to the FY17 Budget, mainly due to the transfer of two FTEs from Human Resources which have been supporting security functions. The FY18 Final Budget includes funding for eight FTEs, two higher than the FY17 Budget.

OFFICE OF EMERGENCY PREPAREDNESS	FY17 FTEs	FY18 FTEs
EMERGENCY PREPAREDNESS	5.8	7.8
TOTAL	5.8	7.8

- \$652,000 for **Ongoing Maintenance**, an increase of \$152,000 or 30.5%, as compared to the FY17 Budget, mainly due to the higher cost associated with the new security equipment maintenance contract. This budget includes funding of \$515,000 to cover the MWRA-wide security systems preventative maintenance and repair service, \$110,000 for MWRA-wide security systems maintenance materials and equipment, including cameras, intrusion detection, card readers, and \$27,000 for the intrusion alarm annual and semi-annual monitoring services contracts.
- \$2.0 million for **Professional Services**, an increase of \$61,000 or 3.2%, as compared to the FY17 Budget, primarily to include EAP work on Western Reservoirs, thereby covering over 30 communities. The budget includes \$655,000 for security services at the Deer Island Treatment Plant facility, \$610,000 for the Chelsea facility, \$417,000 for the Carroll Water Treatment Plant, \$86,000 for the Account Manager, \$48,000 for the Training Officer, \$10,000 for vehicle maintenance and emergency allowance, and \$22,000 for Charlestown Navy Yard (CNY) facility. Also included under Professional Services is \$133,000 for updating the Dam EAPs to match the regulatory change to FEMA’s PD-64 and annual updates.
- \$19,000 for **Other Materials**, basically unchanged from the FY17 Budget. This line item mainly funds purchase of Health and Safety materials for the ESU Team.
- \$122,000 for **Other Services**, basically unchanged from the FY17 Budget. This budget includes funding for licensing cost for two-way radios with Department of Conservation and Recreation (DCR) and for mandatory monthly testing and inspection of the Self-Contained Breathing Apparatus (SCBA).

AFFIRMATIVE ACTION AND COMPLIANCE UNIT

Under section 7(g) of MWRA’s enabling act, the **Affirmative Action and Compliance Unit (AACU)** is established to “report directly to the chairman of the Authority and provide for the enforcement of affirmative action plans for employment, procurement and contracting activities of the Authority.” The AACU develops, administers, and monitors compliance of Affirmative Action Plan programs and policies by ensuring equal opportunity and non-discrimination in employment and equitable access of Minority Business Enterprises (MBE), Women Business Enterprises (WBE), and Disadvantaged Business Enterprises (DBE) in Authority procurement activities.

FY18 Final Current Expense Budget						
AFFIRMATIVE ACTION & COMPLIANCE UNIT						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 510,897	\$ 520,186	\$ 547,871	\$ 544,514	\$ (3,357)	-0.6%
OVERTIME	137	-	-	-	-	-
TRAINING & MEETINGS	1,250	4,964	4,800	7,500	2,700	56.3%
OTHER MATERIALS	1,703	1,763	1,664	2,139	475	28.5%
OTHER SERVICES	312	1,416	924	924	-	0.0%
TOTAL	\$ 514,298	\$ 528,329	\$ 555,259	\$ 555,077	\$ (182)	0.0%

FY18 Goals and Initiatives:

In performing its core goals, the AACU undertakes the following initiatives on an on-going basis:

- Assist divisions and departments in the implementation of MWRA’s affirmative action program and promote MWRA’s policy of non-discrimination for all persons in or recruited into its workforce.
- Maintain adequate internal audit and reporting systems to monitor MWRA’s accomplishments of goal attainment in identified underutilized job groups for female and minority representation.
- Communicate to managers and supervisors MWRA's commitment to its equal opportunity policies and affirmative action programs.
- Assist the Human Resources Department in the coordination and oversight of all external/internal recruitment and selection activities including interviewing, hiring, transfers, and promotions of all candidates, including those who are members of a protected class.
- Provide for the equitable participation of minority/women and disadvantaged-owned businesses in procurement opportunities, ensure that minorities and women are represented in the labor force on construction contracts, and coordinate with other public entities regarding state and federal requirements.
- Assist divisions and departments in the understanding and implementation of MBE/WBE/DBE program policies and practices as well as monitor and report on contractor compliance and expenditures.

FY17 Accomplishments:

- Provided management assistance to the Human Resources Department in the overall recruitment and selection process for qualified candidates for thirty-eight (38) new hires and fifty-seven (57) promotions.
- Conducted oversight of 161 construction and professional projects, including 5 site visits monitoring the minority and women workforce as well as MBE/WBE/DBE compliance. With the exception of MBE Professional Services, the other procurement targets remain.

Budget Highlights:

The FY18 Final Budget is \$555,000, unchanged from the FY17 Budget.

- \$544,000 for **Wages and Salaries** is level funded with the FY17 Budget, due to filling of vacated positions at lower salaries with more junior personnel. The FY18 Final Budget includes funding for six FTEs, the same as FY17 Budget.

AFFIRMATIVE ACTION & COMPLIANCE UNIT	FY17 FTEs	FY18 FTEs
AACU	6	6
TOTAL	6	6

INTERNAL AUDIT

The **Internal Audit Department** is prescribed under section 7(h) of the MWRA’s enabling act to “monitor the quality, efficiency and integrity of the Authority’s operating and capital programs and make periodic recommends and reports to the executive director and the board of directors.” **The Internal Audit Department** monitors the efficiency and integrity of MWRA operations by auditing financial and program operations; reviewing compliance with accounting and management control systems, laws and regulations; and coordinating the formulation and revisions to MWRA policies and procedures. Internal Audit also monitors MWRA contracts through its contract audit program, including approval of provisional consultant indirect cost rates and subsequent audit of consultant billings; performs labor burden reviews, construction change orders and claim audits, and vendor and other contract audits.

FY18 Final Current Expense Budget						
INTERNAL AUDIT						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 692,181	\$ 652,455	\$ 644,414	\$ 672,628	\$ 28,214	4.4%
MAINTENANCE	5	-	-	-	-	-
TRAINING & MEETINGS	6,249	3,069	6,700	6,650	(50)	-0.7%
OTHER MATERIALS	1,309	2,258	2,020	2,150	130	6.4%
OTHER SERVICES	2,820	2,109	1,691	1,700	9	0.5%
TOTAL	\$ 702,564	\$ 659,891	\$ 654,825	\$ 683,128	\$ 28,303	4.3%

FY18 Goals and Initiatives:

In addition to its statutory core functions, the Department has set the following goals for FY18:

- Encourage more economical and efficient operations, adhere to sound management procedures, and use controls designed to safeguard MWRA assets.
- Assure that automated and supporting manual management information systems have secure data control environments and provide accurate and useful management information.
- Assure that contractors, consultants and vendors doing business with MWRA have adequate accounting and billing systems to provide current, complete and accurate cost and price information and project invoicing.

FY17 Accomplishments:

- Identified \$3,534,321 in savings related to: internal audits, management advisory services, consultant audits, construction labor burden reviews, vendor reviews, facility lease agreements, and on-going savings from the lease of the engine house by the Fore River Railroad Corporation.
- Issued final audit reports on Deer Island Wastewater Treatment Plant Purchase Card Usage and Fuel Card Usage. Performed a review of the implementation of various vulnerability assessments conducted

by outside entities. Issued eight incurred cost audits, eleven preliminary consultant and seventeen preliminary construction reviews.

- Provided management advisory and data analysis services dealing with MWRA overhead rates, domicile vehicle policy comparison, Management Information Systems asset accountability, sole source awards, labor rates on professional services contracts, financial reviews, unemployment compensation, Affirmative Action and Compliance Unit data visualization, overtime rate analysis, age demographics, Family Medical Leave Act time analysis and various contract negotiations.
- Fifty audit recommendations have been closed during the period.

Budget Highlights:

The FY18 Final Budget is \$683,000, an increase of \$28,000 or 4.3%, as compared to the FY17 Budget.

- \$672,000 for **Wages and Salaries**, an increase of \$28,000 or 4.4%, as compared to the FY17 Budget, primarily as a result of increased work hours for a part-time employee, a promotion and COLA.

INTERNAL AUDIT DEPARTMENT	FY17 FTEs	FY18 FTEs
INTERNAL AUDIT	6.7	6.8
TOTAL	6.7	6.8

PUBLIC AFFAIRS

The **Public Affairs Department** is the institutional link to the public and government. The Department’s responsibilities are spread over five separate sections.

The **Legislative Section** of the Department works for passage of legislation necessary to carry out MWRA’s mission, monitors legislation, responds to inquiries by elected and appointed officials, and pursues funding from the state legislature for MWRA projects. MWRA’s highest legislative priority continues to focus on the need for a robust “Commonwealth Rate Relief Package” to help offset anticipated rate increases over the next several years.

The **Community Relations Section** deals directly with cities and towns in the MWRA service area, responds to inquiries about MWRA, proactively incorporates community concerns into MWRA project work, coordinates outreach and education initiatives to highlight MWRA programs, and provides technical expertise for specific projects and initiatives. Community Relations staff also work in conjunction with Planning Department staff to ensure compliance with state and local regulations and restrictions.

The **Environmental Review and Compliance Section** is responsible for directing Authority-wide MEPA environmental review to ensure that MWRA facilities are protected and private development projects do not negatively impact MWRA facilities. The section is the lead to implement the Public Access Aqueduct Program, a program approved by the Board in April 2012, that authorizes public access along MWRA emergency back-up Aqueducts located in 14 cities and towns in the MetroWest area.

The **Communications Section** manages media relations, issues press releases and responds to information requests, oversees the design and distribution of MWRA publications, manages the internal and external web sites and social media platforms, and provides design, editorial, and graphics services for other sections of MWRA.

The **Education Section** is responsible for curriculum development, teacher training workshops, as well as providing school education materials on water quality, water conservation, wastewater topics, and environmental issues.

The Communications and Education Sections are led by the Special Assistant to the Executive Director, located in the Executive Office.

FY18 Final Current Expense Budget						
PUBLIC AFFAIRS						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 1,060,003	\$ 1,089,986	\$ 1,139,183	\$ 1,170,903	\$ 31,720	2.8%
OVERTIME	852	767	900	923	23	2.6%
TRAINING & MEETINGS	(572)	4,044	4,415	4,503	88	2.0%
PROFESSIONAL SERVICES	1,175	0	1,300	1,300	-	0.0%
OTHER MATERIALS	25,199	18,195	26,175	26,544	369	1.4%
OTHER SERVICES	31,903	30,140	48,816	48,816	-	0.0%
TOTAL	\$ 1,118,560	\$ 1,143,133	\$ 1,220,789	\$ 1,252,989	\$ 32,200	2.6%

FY18 Goals and Initiatives:

The core function of the Public Affairs Department is to support the MWRA's achievement of all five key strategic priorities set forth in the FY16-FY20 Five-Year Strategic Business Plan. To that end, the Department has set the following initiatives:

- Work with the Massachusetts Legislature to advocate on behalf of member communities regarding issues that are crucial to the Authority's core mission. The Executive Director and Director of Intergovernmental Affairs routinely meet with House and Senate leaders to discuss issues that are crucial to the Authority and its customers. All newly filed legislation and regulations that could impact the Authority from an operational and administrative perspective are analyzed and monitored, and appropriate responses are formulated in concert with the Office of the Executive Director (OED).
- Enhance overall public understanding of MWRA's mission, goals, and benefits to the public through extensive outreach and effective communication.
 - Develop and implement proactive strategies for educating and informing key MWRA constituencies and the public at large about MWRA's mission, projects and progress, and promote understanding for associated costs.
 - Gain public support for MWRA programs and projects while responding to the needs and concerns of elected, appointed public officials, and the public.
 - Continue to grow the user population of MWRA's Everbridge communication platform in order to reach as many residents as possible, keeping them up to date on meetings, reports, and infrastructure projects.
 - Continue expand the presence of MWRA's portable water fountain at public events in service communities.
- Maintain and update MWRA's Community Contact Database. This Community Contacts tracking application is used to notify MWRA's communities of any operational issues or emergencies affecting them or surrounding communities.
- Continue to provide accurate and timely information to the public through the MWRA's website and social media accounts, e.g., Twitter, Flickr and Instagram.
- Continue to respond to media requests in a timely and accurate fashion.
- Continue to develop presentations and graphics for use in a wide range of MWRA programs.
- Continue to design and produce Annual Water Quality Report for every household within the MWRA service area.
- Continue to provide educational support through classroom visits, teacher training, educational material development, and facility tours.
- Provide technical support to 14 cities and towns that host MWRA's emergency back-up aqueducts as part of the Public Access Aqueduct Program.

- Continue to work with cities and towns to implement the Public Access Initiative on the Wachusett, Weston, Sudbury, and Cochituate Aqueducts.
- Provide support to MWRA staff to ensure that MWRA projects meet regulatory requirements, and provide input to regulatory agencies in order to ensure MWRA interests are recognized during the development of regulations.

FY17 Accomplishments:

- Successfully advocated for the funding of the Sewer Rate Relief Fund. The FY17 General Appropriations Act (GAA) was reduced to \$500,000 due to budgetary reductions. Of that, MWRA received \$391,580, or 78%.
- Oversaw the review of 102 projects filed with the Massachusetts Environmental Policy Act Office. MWRA in-house review resulted in the preparation and submittal of 70 comment letters.
- Successfully grew the Everbridge communication platform to over 400 public opt-in subscription in an effort keep community members informed of construction project updates, service notices, and public meetings. Sent out daily traffic alerts related to Northern Intermediate High and Southern Extra High Construction projects as well as Monthly Water Quality Updates and Board Meeting notifications. Continued efforts will be made to increase public opt-in subscriptions and expand MWRA utilization of this platform.
- Conducted several public meetings to update public officials and residents of MWRA’s upcoming and ongoing infrastructure investments and their potential impacts on local communities. These included, among others, meeting with Stoneham regarding the Northern Intermediate High Water Transmission Redundancy and Storage Project as well as meeting with Dedham regarding the Southern Extra High Redundancy.
- Aqueduct Trails: To date, MWRA staff has issued Section 8 (m) Permits to most communities hosting the Wachusett, Wachusett Open Channel, Weston, Sudbury, and Cochituate Aqueducts as part of the Public Access Aqueducts Program. To date, MWRA has authorized approximately 25 miles of Aqueduct Trails. MWRA estimates that approximately 17.9 miles are currently open including new sections in the Town of Wayland. In addition, MWRA has permitted .5 miles to the Bay Circuit trails group in Southborough and Framingham not yet open to the public. MWRA expects to install interpretive signage in late 2017 – 2018.

Wachusett Aqueduct and Open Channel

Northborough: 4.7 miles authorized (2.0 miles opened)
Southborough: 2.2 miles authorized (2.2 miles opened along the Open Channel)

Bay Circuit Trail Connector

Framingham: 0.1 mile authorized
Southborough: 0.4 miles authorized

Weston Aqueduct

Framingham:

4.3 miles authorized (3.0 miles opened)

Weston^[1]:

1.5 miles authorized (1.5 miles opened) (500' alternative trail opened on private Pine Brook Country Club property to link public trail)

Wayland:

4.3 miles authorized (4.3 miles opened)

Sudbury Aqueduct

Framingham:

.6 miles authorized (.6 miles opened)

Natick:

2.1 miles authorized (1.5 miles opened)

Wellesley:

1.4 miles authorized (1.4 miles opened)

(waiting for Wellesley to sign permit for remaining 600-foot stretch at end of Country Club at Babson College)

Needham:

1.4 miles authorized (1.4 miles opened) an additional .5-mile trail opened on private Olin/Babson College property to link public trail)

Cochituate Aqueduct

Natick:

2.6 miles authorized (0 miles opened)

Bay Circuit Trail Connector

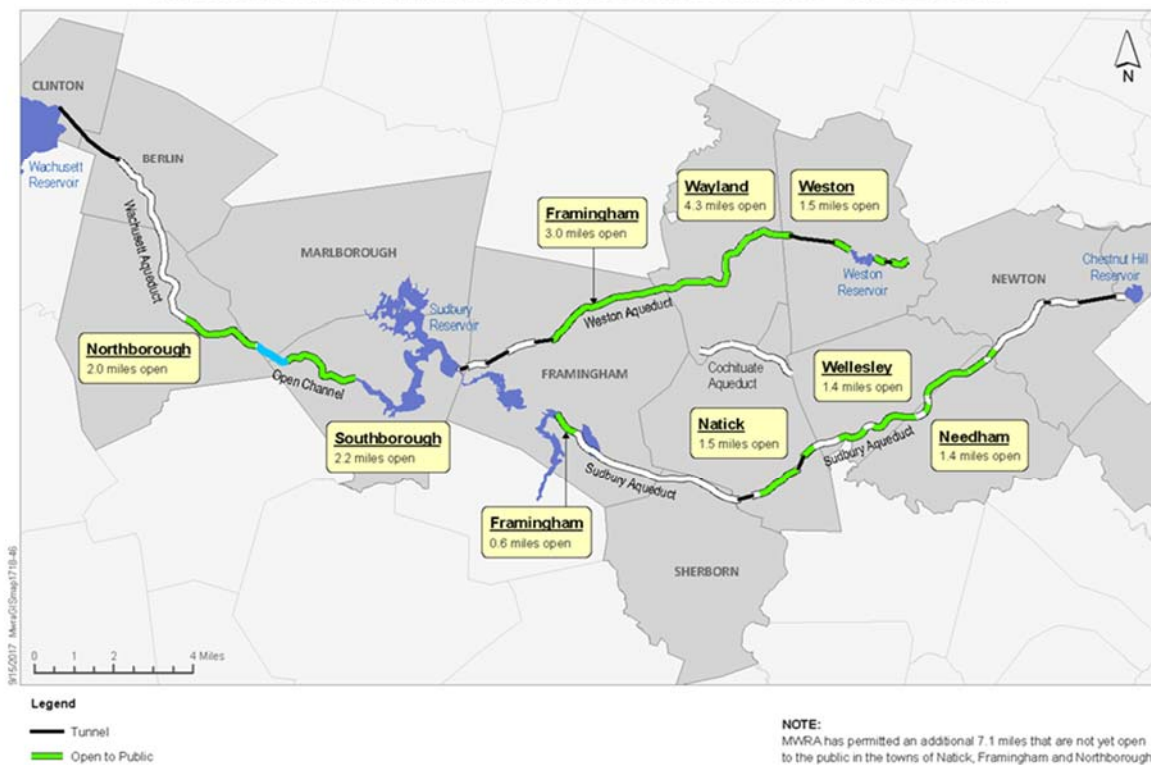
Framingham:

0.1 mile authorized

Southborough:

0.4 miles authorized

MWRA Public Access Aqueduct Trails Open to Public: 17.9 miles - September 2017



^[1] Approximately 3.3 miles of additional trails were authorized surrounding the Loring Road Storage Tank and Weston Reservoir as part of previous MWRA commitments included in Memorandum of Agreements with the Town of Weston.

- In FY2017, work continued on construction photo books to document projects that have been completed by the MWRA over the past 30 years to provide a physical record for the projects to compliment the digital photo collection. To date, construction photo books for the following projects have been completed:
 - Boston Harbor Project
 - South Boston CSO Storage Tunnel
 - East Boston Sewer Relief
 - John J. Carroll Water Treatment Plant
 - Spot Pond Covered Storage Tank

In addition, the following books are currently in production:

- MetroWest Water Supply Tunnel and Hultman Aqueduct Rehabilitation
- Braintree-Weymouth Relief Facilities

- The Annual Water Quality Report was mailed out to all households in MWRA water service communities in June in accordance with the EPA mandate.
- Through FY2017, communications staff continued to focus on the on-going drought. Efforts included posting additional information on MWRA’s website, design of educational materials, response to numerous media inquiries and outreach through social media. In addition, lead in drinking water issue continues to generate interest.
- The School Education staff continues to conduct daily classroom visits within the MWRA service area to educate elementary school children on the importance of water and sewer infrastructure on their daily lives. The annual poster, essay and video contest for FY17 focused on the impact weather has on MWRA’s system. This program provides an important opportunity for the students, teachers and parents to learn together about MWRA’s mission.

Budget Highlights:

The FY18 Final Budget is \$1.3 million, an increase of \$32,000 or 2.6%, as compared to the FY17 Budget.

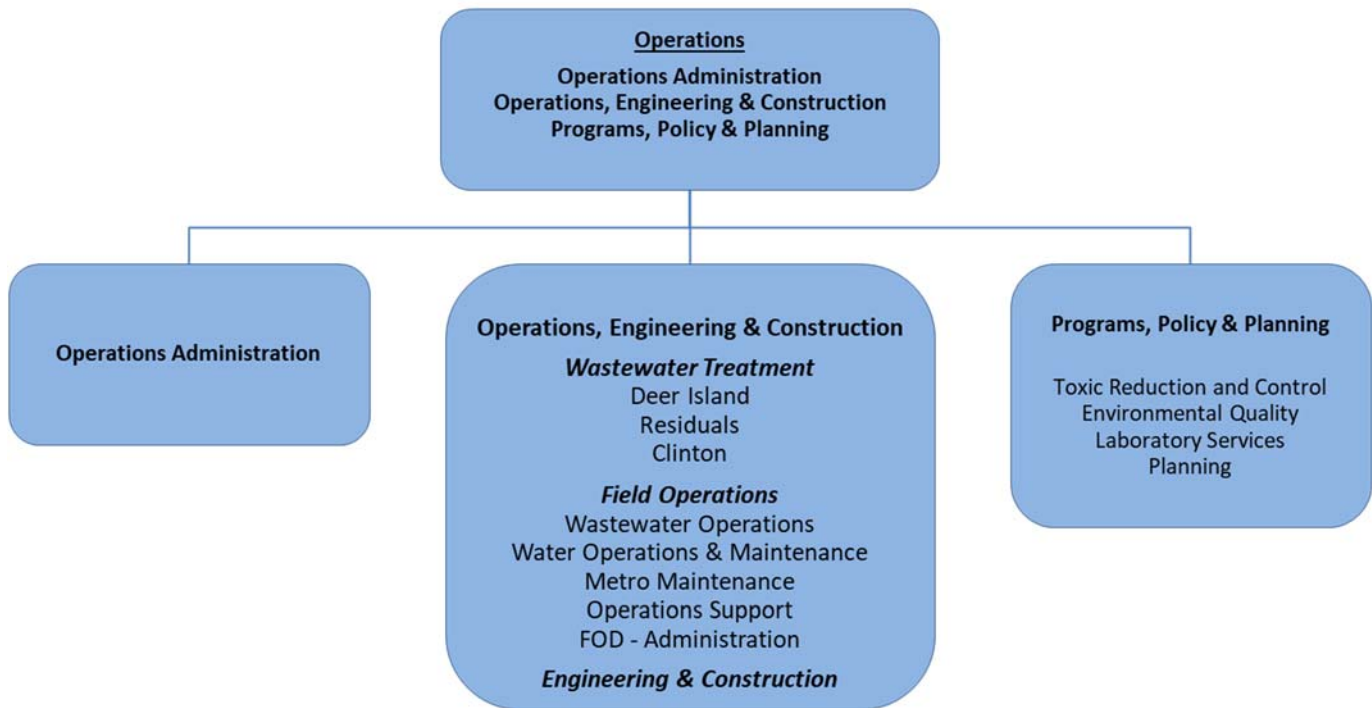
- \$1.2 million for **Wages and Salaries**, an increase of \$32,000 or 2.8%, as compared to the FY17 Budget. The FY18 Final Budget includes funding for 13 FTEs, the same as the FY17 Budget.

PUBLIC AFFAIRS DEPARTMENT	FY17 FTEs	FY18 FTEs
PUBLIC AFFAIRS	12.9	13
TOTAL	12.9	13



Operations Division Budget

OPERATIONS DIVISION



The **Operations Division** provides MWRA’s wastewater and water system services including operations, maintenance, and treatment; environmental monitoring and laboratory testing and analyses; and engineering, construction, planning, and administration. MWRA’s Chief Operating Officer (COO) leads this division.

FY18 Final Current Expense Budget						
OPERATIONS DIVISION						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 73,730,111	\$ 75,417,179	\$ 79,571,615	\$ 81,494,645	\$ 1,923,030	2.4%
OVERTIME	4,388,800	4,250,176	4,128,812	4,027,743	(101,069)	-2.4%
FRINGE BENEFITS	80,606	83,741	75,207	78,815	3,608	4.8%
CHEMICALS	9,749,142	9,297,550	9,110,407	9,836,932	726,525	8.0%
UTILITIES	20,974,683	18,628,196	21,426,848	21,615,987	189,139	0.9%
ONGOING MAINTENANCE	23,826,321	26,256,252	25,712,792	26,842,989	1,130,198	4.4%
TRAINING & MEETINGS	130,079	165,127	195,725	200,725	5,000	2.6%
PROFESSIONAL SERVICES	1,871,719	2,240,903	2,677,277	2,662,645	(14,632)	-0.5%
OTHER MATERIALS	4,930,576	5,012,352	4,937,519	4,970,649	33,130	0.7%
OTHER SERVICES	18,395,102	18,767,824	18,897,162	18,503,305	(393,857)	-2.1%
TOTAL	\$ 158,077,138	\$ 160,119,301	\$ 166,733,363	\$ 170,234,435	\$ 3,501,073	2.1%

The Operations Division is composed of the Operations Administration Department and two operating sections, each led by one Deputy Chief Operating Officer (DCOO): Programs, Policy and Planning (P,P&P) and Operations, Engineering, & Construction (O,E&C). In addition to managing the operating sections, the

DCOOs provide support to the Chief Operating Officer on key MWRA operations, technical, policy, community coordination, permitting and public constituency matters.

The **Operations Administration Department** provides division-level oversight and general management support in the areas of finance, contract administration, and personnel. The Operations Administration Department budget represents 2.9% of the Operations Division budget and includes funds for MWRA vehicle purchases and division-wide professional memberships.

The **Programs, Policy & Planning Section** is composed of the Toxic Reduction and Control, Environmental Quality, Laboratory Services, and Planning departments. In total, the budgets for these departments represent 12.0% of the Operations Division's budget. Brief descriptions of the departments in this section are as follows:

- The **Toxic Reduction and Control (TRAC) Department** operates a multi-faceted program to minimize and control the inflow of hazardous or toxic materials into the MWRA sewer system. TRAC operates MWRA's Environmental Protection Agency (EPA-approved) Industrial Pretreatment Program and also oversees implementation of MWRA's 8-M Permits processes.
- The **Environmental Quality Department (EnQual)** has two units: EnQual-Water and EnQual-Wastewater. EnQual-Water manages compliance with the reporting requirements of the MassDEP Drinking Water Regulations, as well as conducts and oversees the drinking water quality monitoring program. EnQual-Wastewater manages compliance with the reporting requirements of MWRA's National Pollutant Discharge Elimination System (NPDES) permits. This unit analyzes environmental data and prepares reports on the quality of sewage influent and effluent and the water quality of Boston Harbor and its tributary rivers and Massachusetts Bay.
- The **Laboratory Services Department** supports various client groups in the Operations Division, the Massachusetts Department of Conservation and Recreation (DCR), and the MWRA member communities; providing field sampling, laboratory testing, and reporting services. Most of the testing is required to meet the strict guidelines of regulatory programs and permits including the Safe Drinking Water Act (SDWA) and MWRA's NPDES permits.
- The **Planning Department** provides planning, advocacy, and decision support services on policy, public health, regulatory, and operations matters regarding MWRA's potable water and wastewater systems.

The **Operations, Engineering & Construction Section** is composed of the Wastewater Treatment, Field Operations, and Engineering & Construction departments. In total, the budgets for these departments represent 86% of the Operations Division's budget. Brief descriptions of the departments in this section are as follows:

- The **Wastewater Treatment Department** operates and maintains the Deer Island Treatment Plant (DITP), Clinton Wastewater Treatment Plant, and Residuals Processing Facility (pelletization plant) at Fore River Staging Area (FRSA).
- The **Field Operations Department (FOD)** manages the wastewater pretreatment, water treatment, wastewater collection and water distribution functions, including the Carroll Water Treatment Plant

(CWTP). This department is responsible for operating, maintaining, and metering both the water and wastewater systems.

- The **Engineering and Construction Department** supports the maintenance, repair, and rehabilitation of the wastewater and water systems by providing in-house engineering, drafting, surveying, consultant management, construction management, and other technical assistance. The department is also responsible for the implementation and monitoring of the Combined Sewer Overflow (CSO) plan.

FY18 Final Current Expense Budget						
OPERATIONS DIVISION by OPERATING SECTION						
OPERATING SECTION	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
OPERATIONS ADMINISTRATION	\$ 4,455,415	\$ 4,561,932	\$ 4,881,995	\$ 4,909,440	\$ 27,445	0.6%
OPERATIONS, ENGINEERING & CONSTRUCTION	136,314,899	137,210,798	142,628,866	144,914,696	2,285,830	1.6%
PROGRAMS, POLICY & PLANNING	17,306,823	18,346,571	19,222,502	20,410,299	1,187,797	6.2%
TOTAL	\$ 158,077,138	\$ 160,119,301	\$ 166,733,363	\$ 170,234,435	\$ 3,501,073	2.1%

FY18 Goals and Initiatives:

The Operations Division core function is to plan, develop, implement, and operate efficient, reliable, and economical water treatment/delivery and wastewater transport/treatment systems in an environmentally sound manner. Accordingly, the Division takes the lead on the following MWRA goals included in the Board-approved FY16 - FY20 Five-Year Strategic Business Plan:

I. Drinking Water Quality and System Performance

- **Goal #1- Compliance with Regulatory Requirements and Public Health Standards:** Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations. Continue to optimize ultraviolet disinfection treatment process for MWRA's potable water system at the Carroll Water Treatment Plant and Brutsch Treatment Facility while meeting or exceeding all water quality standards.
 - Continue to develop and implement contaminant monitoring plans in the water system.
 - Conduct invasive species removal and monitoring at water reservoirs.
- **Goal #2 – Water Quality Public Communications:** Continue to effectively report and communicate water quality information to our customers and public officials.
- **Goal #3 – Technical Assistance for Water Communities:** Assist member communities to improve local water distribution systems through ongoing financial, technical and operational support programs to maximize long-term water quality benefits.
 - Continue to distribute interest-free loans to member water communities including under the Lead Service Line Replacement Loan Program.
 - Continue to provide technical assistance and laboratory analysis to help communities identify and reduce lead service lines, primarily in schools.

II. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.

- Meet all NPDES and other regulatory effluent quality, treatment, monitoring, and pre-treatment requirements.
- Commence use of new phosphorous treatment system and natural gas lines at the Clinton Wastewater Treatment Plant.
- Implement new NPDES permit requirements for Clinton Wastewater Treatment Plant (permit issued March 2017).
- Continue work on harbor and outfall monitoring initiatives including: calculating revised thresholds, continuing work with Department of Conservation and Recreation implementation of appropriate beach management practices in South Boston, and improving instrumentation on National Oceanic and Atmospheric Administration's (NOAA's) weather buoy.
- **Goal #5 – Regulatory Changes:** Continue to initiate plans and studies to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality.
 - Plan for implementation of requirements of the new National Pollutant Discharge Elimination System (NPDES) Permits for DITP (assume new permit is issued after FY18).
 - Plan for the new round of NPDES-required Local Limit testing in TRAC to reassess industrial discharge limits and commence the work after the Environmental Protection Agency (EPA) issues the new NPDES permits.
- **Goal #6 – CSO Plan Compliance:** Complete all CSO milestones by 2020 and demonstrate that the CSO Plan meets its performance objectives at all outfalls. Ensure compliance with CSO NPDES permit requirements.
 - Develop an intensified level of data analysis bringing together disparate datasets such as localized rainfall data, metered and modeled CSO discharges, and receiving water quality to meet future water quality assessments expected in the CSO variance areas of the Mystic and Charles Rivers.
- **Goal #7 – Technical Assistance for Wastewater Communities:** Assist member communities to improve their wastewater collection systems through ongoing technical, financial, and operational support programs.
 - Continue distribution of interest-free loans and grants to member sewer communities.

III. Infrastructure Management and Resilience

- **Goal #8 – System Maintenance:** Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk, consistent with customer, community, and regulatory support levels.
 - Optimize staff resources, overtime, service contracts, and as-needed design contracts to complete routine and major maintenance projects.
 - Work on numerous projects in Field Operations including meter inspection and repairs; manhole rehabilitation; pipeline repair and replacement; invasives control in the water reservoirs; dam inspections and tree clearing; and water tank inspections and cleaning.
 - Commence and complete periodic facility painting and coating projects at Deer Island and Clinton.
 - Continue work on numerous major projects at Deer Island including facility repainting and coating repairs; Zurn boiler maintenance and repairs; electrical system maintenance; motor overhauls; HVAC unit replacement; PLC replacements; and critical equipment maintenance.
- **Goal #9 – Capital Improvements:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.

- The FY18 Capital Improvement Program forecasts \$174.9 million in spending in FY18, of which \$84.3 million supports Wastewater System Improvements, \$82.7 million supports Waterworks System Improvements.
- There are 171 active contracts in FY18 of which 55 are for design of Wastewater and Waterworks Systems Improvements and 47 are for construction, with projected spending of \$23.7 million for design and \$110.8 million for construction.
- **Goal #10 – Emergency Preparedness:** Prepare for catastrophic events that could affect the water and wastewater delivery systems.

IV. *Environmental Sustainability*

- **Goal #15 – Energy Optimization:** Continue to examine energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA’s energy assets.
 - Continue to identify, assess, and implement initiatives to reduce energy demand and increase energy self-generation in MWRA’s facilities through grant-funding and cost-sharing if available.
 - Self-generate ~30% of the Deer Island Treatment Plant’s (DITP) required power through optimization of power generation assets, including the wind turbines, Steam Turbine Generation (STG) back pressure system, photovoltaic panels, and Combustion Turbine Generators (CTGs).
 - Contribute ~ \$4.2 million in energy revenue to MWRA’s ratepayers through optimization of power generation assets and participation in energy revenue programs such as demand response, energy credits, power sales, and utility rebates. Also, avoid ~ \$600,000 in capacity charges through operation of self-generation assets during peak load events.
 - Establish multi-year Memorandums of Understanding with Eversource and NGrid including lists of eligible projects and rebates for energy savings.
- **Goal #16 – Climate Change Adaptation:** Continue to monitor climate change research and move forward with plans to reduce impacts of projected sea level rise and storm surge events on MWRA infrastructure.
- **Goal #17 – Water System Expansion:** Advance reasonable water system expansion.



The strategic priorities and goals that apply to each department within the Operations Division are presented in each department’s budget section.

FY17 Major Accomplishments:

I. Drinking Water Quality and System Performance

- Met all water quality and treatment standards in the drinking water system during FY17, and maintained maximum turbidity results at Quabbin and Wachusett Reservoirs within MassDEP standards.
- Contaminant Monitoring System - Replaced and enhanced monitoring capabilities on the Wachusett Reservoir with new equipment and technology; installed a continuous monitoring shed over the Wachusett Reservoir to provide both routine water quality information and

contaminant detection; and implemented a 24/7 monitoring and response program for CMS alarms.

- Continued invasive species removal work in the Stillwater Basin, Sudbury Reservoir, and Chestnut Hill Reservoir among others, as well as identified and responded to new colonizing invasive plants across the reservoir system.
- The Laboratory Services Department performed 173,000 tests (including data entry of field tests) related to drinking water quality including the annual Lead and Copper Rule testing.
- Distributed \$28.7 million in interest-free loans to member water communities including \$6 million for lead service line replacement.
- The Laboratory Services Department performed 20,000 tests since the beginning of 2016 in support of community efforts to identify and reduce lead service lines in schools.

II. Wastewater Quality and System Performance

- Deer Island received the Platinum Peak Performance Award for 2017 from the National Association of Clean Water Agencies (NACWA) for the 10th continuous year. The award recognizes facilities for outstanding compliance of their National Pollutant Discharge Elimination System (NPDES) permit limits. DITP has had no permit violations for ten years.
- DITP met secondary permit limits at all times, treating on average more than 99% of flows with full secondary treatment.
- In March 2017, EPA issued new NPDES Permit for the Clinton Wastewater Treatment Plant.
- Processed 97.2 average tons per day of sludge at the Pelletization Plant and disposed of 5,877 tons of grit and screenings through a contracted vendor.
- The TRAC Department completed the following Environmental Protection Agency (EPA)-required work for significant industrial users: 202 inspections, 181 monitoring events, and 403 sampling of connections. This department also issued or renewed 287 permits to Significant Industrial Users (SIUs) and non-SIUs.
- During FY17, the Department of Laboratory Services performed 398,000 tests (including data entry of field tests) including the Massachusetts Bay water column testing for the Harbor and Outfall Monitoring program.
- EnQual carried out permit-required environmental monitoring of Boston Harbor and Massachusetts Bay water column, sediments, fish and shellfish and CSO receiving water quality. The department finalized 20 technical reports, made monitoring results available on its website, and sent reports to government regulators, the Outfall Monitoring Science Advisory Panel and interested members of the public.
- Distributed \$22.3 million in grants and interest-free loans to member sewer communities to rehabilitate their collection systems with the goal of structurally reducing infiltration and inflow.

III. Infrastructure Management and Resilience

Maintenance

- The Operations Division spent \$25.4 million on maintenance of which \$12 million was for materials and \$13.4 million was for services.
- Procured and implemented numerous contracts for maintenance services, including the following:
 - Instrumentation services for 28 facilities on an emergency and non-emergency basis
 - Ongoing Maximo maintenance and support contract

- Overhead doors maintenance services
 - SCADA software maintenance contract for DITP and Wachusett.
 - Prison Point CSO suction and discharge piping rehab contract
 - Water and wastewater facilities grounds keeping
 - DITP thermo and hydropower plant maintenance
 - Electrical testing services
- Procured and implemented numerous contracts for maintenance projects including:
 - DI Lighting Exterior Lighting Phases 5, 8 and 9.
 - DI Wind Turbine maintenance service contract
 - DI muffin monster grinder rebuilds
 - Repair contract for DITP's Thermal Power Plant
 - Metro Ops as-needed paving contract
 - Diver assisted suction harvesting of aquatic invasives at the Wachusett Reservoir Stillwater Basin
 - Invasive plant control at the Ware River/Shaft 8 intake pool
 - Invasive plant control at the Chestnut Hill Reservoir
- Completed numerous maintenance projects including the following:
 - Plumbing Maintenance staff completed the annual Check Valve Replacement Program on all chemical feed systems, Facility Maintenance Staff inspected caulking and pipe joints, staff cleaned the Sodium Hypo Chlorite Injectors.
 - Dam Safety: Final Phase I Dam Safety Reports now completed for all dams on the required Regulatory Schedule.
 - Hype Park Avenue valve replacements and piping removal was completed, the excavation backfilled, paved, and the overall site cleaned up.
 - The deep anode work was completed on Section 57 at Winthrop Avenue at Tufts Avenue in Everett for the Cathodic Protection System.
 - Permanent paving of previous pipeline worksites continues. Several sites in Everett, Chelsea, Boston and Quincy, including Nut Island, have been completed.
 - Repaired and Replaced Scrubber #4 at Nut Island
 - Performed annual turnaround maintenance at DITP on train #2 at the Cryogenic Oxygen Facility in April. This turnaround maintenance is performed on roughly half of the components and systems in the Cryo Facility and allows the remaining half of the facility to continue to operate and produce oxygen uninterrupted. The same turnaround maintenance will be performed on Train #1 in the fall.
 - Changed out activated carbon in carbon absorber (CAD) units #1 and #3 in the Residuals Odor Control (ROC) Facility in May as part of routine practice to replace spent carbon.
- Continued to procure and implement service contracts for demolition and clean-up at the Nut Island Headworks in the aftermath of a January 2016 fire in the lower part of the facility. Substantially completed the rehabilitation work by year-end.
- In water system, exercised 811 and replaced 17 mainline valves; exercised 473 and replaced 7 blow-off valves.

- In the wastewater system, inspected 33.17 miles and cleaned 35.78 miles of MWRA pipeline. Inspected 719 structures and rehabilitated 115 manholes. Also inspected 49 and cleaned 81 inverted siphon barrels.

Capital Improvements

- The FY17 Capital Improvement Program budget was \$155.3 million. The FY17 capital spending totaled \$133.2 million, \$22.1 million or 14.3% lower than budget. In terms of overall spending, FY17 has improved from previous year's underspending trends which are driven by a multitude of factors that impact both design and construction projects, such as: delays in awards, changes in schedules, scope and priorities; removal of projects from the CIP due to work being done in-house; permitting issues; and revision or deletion of projects after further re-evaluation.
- Major contracts awarded by MWRA in FY17 with the following Notice to Proceed dates include:
 - Southern Extra High Redundancy Pipeline Section 111 Phase 1 Construction – July 2016
 - Prison Point Rehabilitation Design/Construction Administration/Resident Inspection – August 2016
 - Chelsea Creek Headworks Upgrades Construction – November 2016.
 - Section 80 Replacement – December 2016
 - Northern Intermediate High Section 89 & 29 Redundancy Phase 1C Construction – January 2017
 - Commonwealth Avenue Pump Station Improvements Design/Construction Administration/Resident Inspection – January 2017
 - Chicopee Valley Aqueduct Motorized Screens Replacement Construction – January 2017
 - Deer Island Personnel Dock Rehabilitation – February 2017
 - Nut Island Odor Control and HVAC Design/Construction Administration/Resident Inspection – March 2017
 - Interceptor Renewal 1 Reading Extension Sewer Construction – May 2017
 - Marlborough Maintenance Facility Construction – May 2017
- Projects that were completed or reached substantial completion in FY17 included:
 - Deer Island Scum Skimmer replacement - \$20.4
 - Section 36/W11/S 9-A11 Water Valve - \$11.4 million
 - Chelsea Screenhouse Upgrades - \$5.0
 - Deer Island Fuel Oil System Upgrades - \$4.8 million
 - Section 4 Webster Avenue Bridge Water Pipeline Replacement - \$3.8 million
 - Quabbin Power, Communications & Security - \$3.6 million
 - Southborough Water Quality Laboratory Upgrades - \$3.4 million
 - Deer Island Cryogenics Chillers Replacement - \$3.2 million
 - Rosemary Brook Siphon Building Repair - \$1.8 million
 - Deer Island Secondary Reactors VFDs - \$3.2 million
 - Thermal Power Plant Boiler Control Replacement - \$1.6 million
 - Beacon Street Water Line Repair - \$1.5 million

Emergency Preparedness

- Secured MWRA Board of Directors approval for the preferred alternative for providing water service redundancy for the Metropolitan Tunnels System (City Tunnel, City Tunnel Extension and Dorchester Tunnel). The approved approach includes construction of northern and southern deep rock tunnels from the Hultman Aqueduct and MetroWest Water Supply Tunnel to the Weston Aqueduct Supply Main (WASM) 3 and to the Southern Spine water mains. The Board’s approval allows staff to proceed with preliminary design, geotechnical investigations and Massachusetts Environmental Policy Act (MEPA) review of this critical project, budgeted at \$1.4 billion in the FY18 CIP.

V. Environmental Sustainability

- Received a total of \$780,000 in revenue for energy generated at numerous facilities including the following: hydroelectric \$220,000 from Oakdale Station, \$78,000 from Cosgrove Station, and \$14,000 from the Loring Road Pump Station; wind of \$381,000 from Charlestown Pump Station; and solar of \$84,000 from Carroll Water Treatment Plant.
- Continue to leverage MWRA’s self-generation assets and participation in the competitive energy market to offset operating costs. The combined impact of participation in the Independent System Operators of New England (ISO-NE) load response program, non-rate revenue from the sale of Renewable Portfolio Standards Program (RPS) credits, and receipt of utility rebates for CEB-funded efficiency projects resulted in \$2.2 million in revenue for FY17. MWRA also avoided approximately \$600,000 in capacity charges through operation of self-generation assets during peak load events as called by the regional transmission organization (ISO New England).
- Deer Island also self-generated 34% of the plant’s total required power during that time period.
- Commence use of new phosphorous treatment system and natural gas lines at the Clinton Wastewater Treatment Plant.

Budget Highlights:

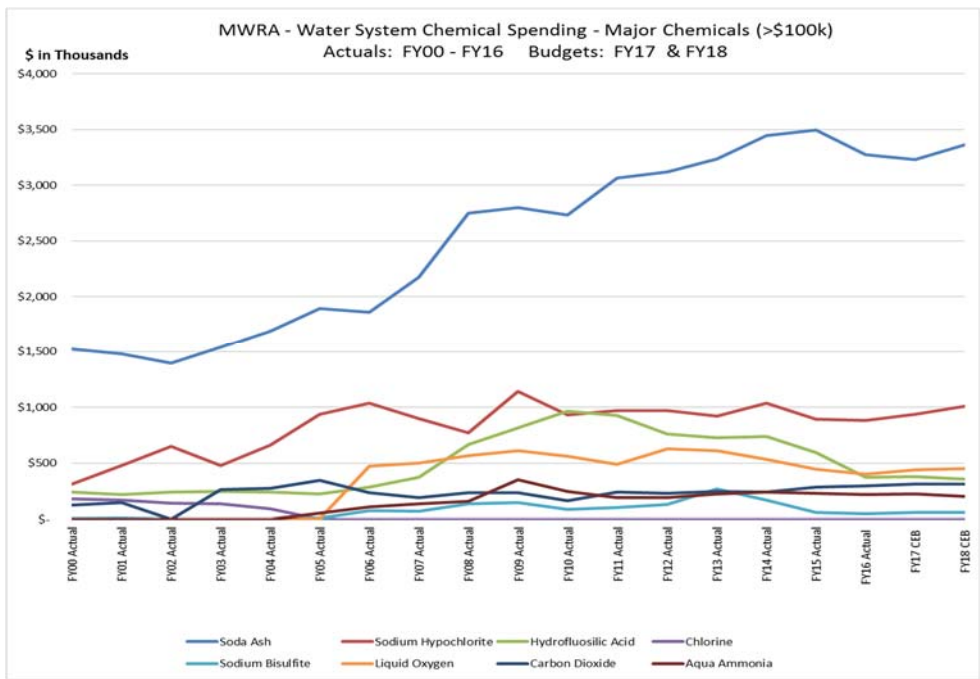
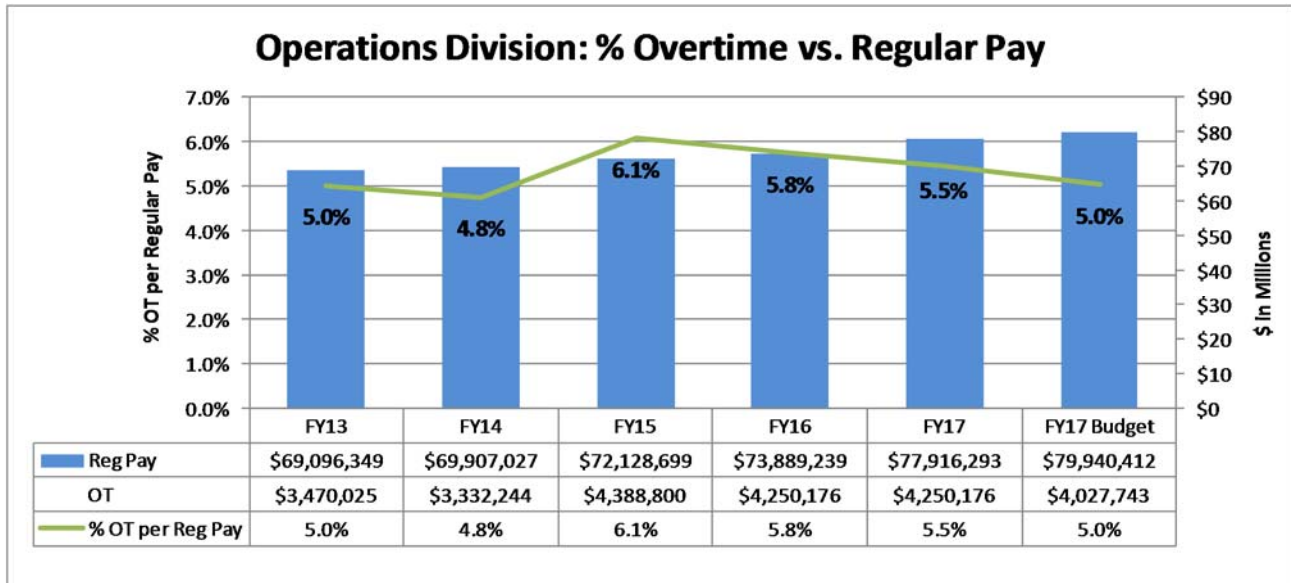
The FY18 Final Budget is \$170.2 million, which is \$9.4 million or 2.1%, more than the FY17 Budget.

Line items that increase from the FY17 Budget include:

- The FY18 Proposed Budget of \$81.5 million for **Wages and Salaries** is an increase of \$1.9 million or 2.4% from the FY17 Budget primarily due to wage increases associated with collective bargaining agreements. The FY18 Final Budget funds 919 full-time equivalent positions, and also includes \$791,000 for Stand-by Pay to ensure staffing availability and response during emergencies, \$183,000 for Interns, and \$80,000 for Temporary Employees to assist lead testing in schools.

FTEs		
Operations by Department		
DEPARTMENT	FY17 FTEs	FY18 FTEs
OPERATIONS ADMINISTRATION	26.4	23.6
OPERATIONS, ENGINEERING & CONSTRUCTION	732.0	730.4
PROGRAMS, POLICY & PLANNING	159.8	164.8
TOTAL	918.2	918.8

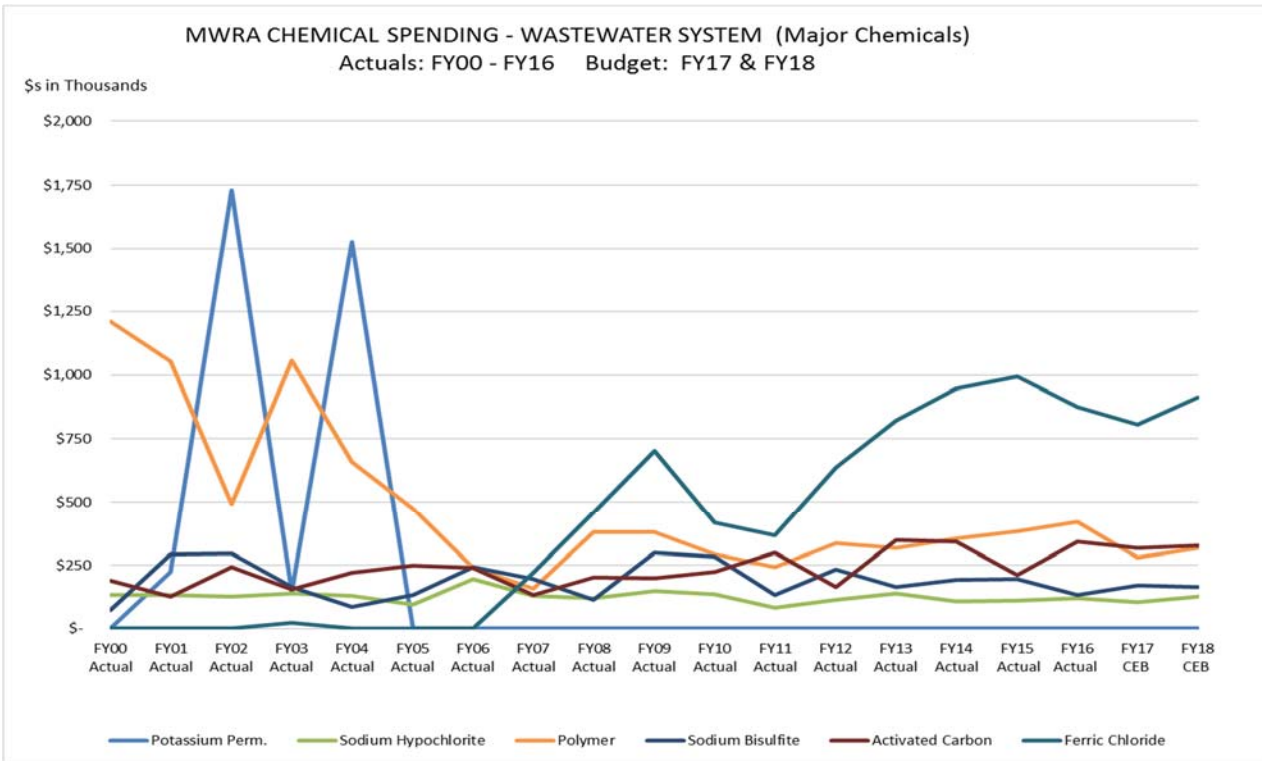
- The FY18 Budget of \$4.0 million for **Overtime** is a net decrease of \$101,000 or 2.4% from the FY17 Budget primarily due to a decrease in overtime associated with the North Main Pump Station (NMPS) project due to fewer planned shutdowns in FY18 as the project nears completion. The budget includes \$1.9 million for emergencies and storms; \$1.2 million for planned work required on off-shifts and during periods of lower flows; \$964,000 for routine coverage of operations per prevailing collective bargaining agreements; and \$20,000 for training.



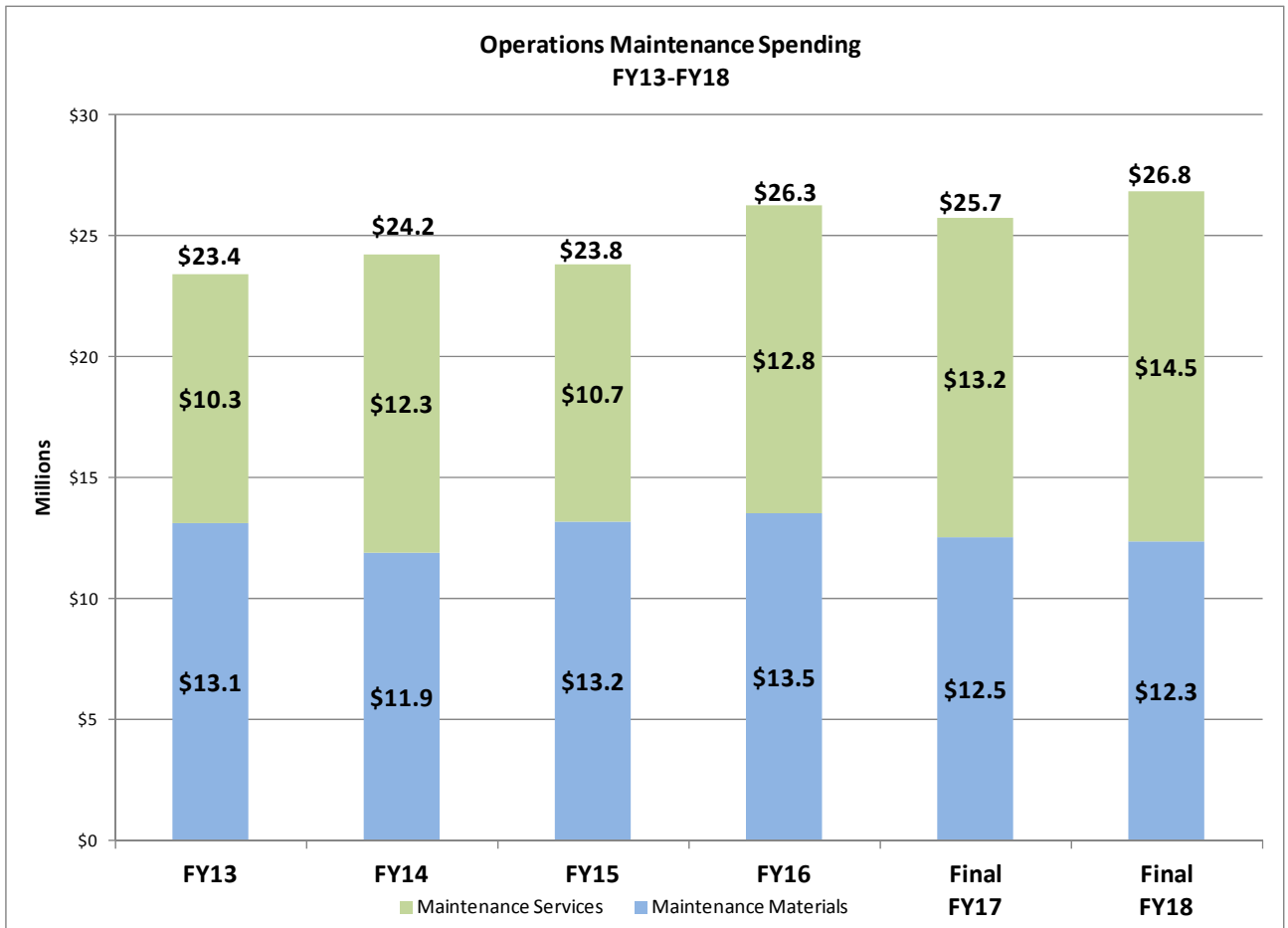
- The FY18 Final Budget of \$9.8 million for Chemicals includes \$5.7 million for disinfection and treatment in the water system and \$4.1 million for disinfection, treatment, and odor control in the wastewater system. The budget includes \$3.6 million for soda ash; \$2.4 million for sodium hypochlorite; \$914,000 for ferric chloride; \$450,000 for liquid oxygen; \$361,000 for hydrofluosilicic acid;

\$328,000 for activated carbon; \$315,000 for carbon dioxide; \$403,000 for hydrogen peroxide; \$317,000 for polymer; \$223,000 for sodium bisulfite; and \$204,000 for aqua ammonia. The

FY18 Final Budget is \$727,000 million or 8.0% more than the FY17 Budget due to the net effect of price and usage adjustments based on recent trends, contracts, and market projections.



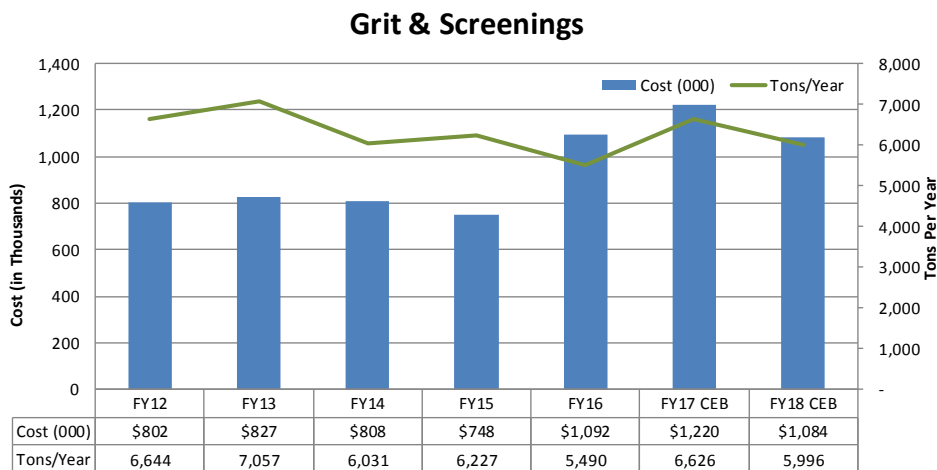
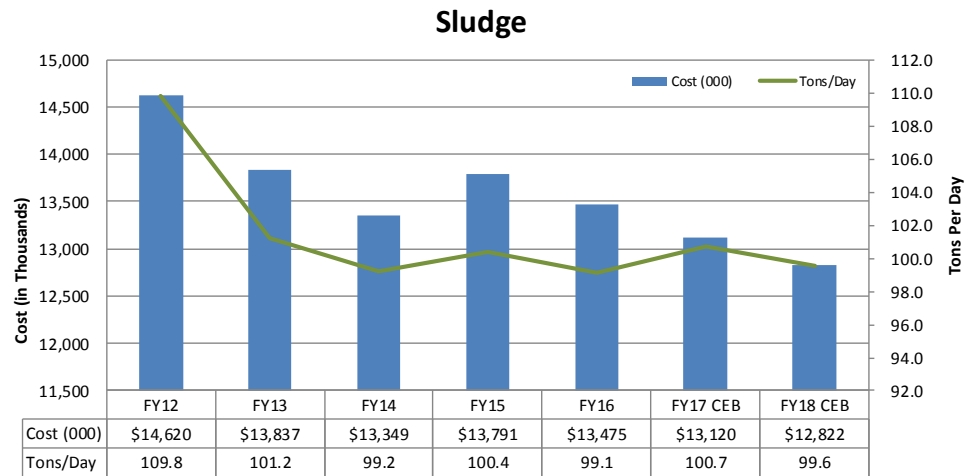
- The FY18 Final Budget of \$21.6 million for **Utilities** includes \$14.0 million for electricity, \$2.4 million for diesel fuel, \$2.1 million for water, \$590,000 for natural gas, and \$200,000 for propane and other utilities. The utility budget by department is \$11.4 million for Deer Island Treatment Plant, \$4.9 million for Wastewater Operations, \$4.6 million for Water Operations, \$510,000 for the Chelsea office and maintenance facilities, and \$229,000 for the Clinton Wastewater Treatment Plant. The utilities budget is essentially level funded with the FY17 budget of \$21.4 million.
- The FY18 Final Budget for **Maintenance** is \$26.8 million, a net increase of \$1.1 million or 4.4% from the FY17 Budget primarily due to changes in project priorities from year to year. The FY18 Final Budget includes \$14.5 million for services and \$12.4 million for materials. By maintenance area, the largest categories of spending for materials and services include \$12.2 million for plant and machinery; \$4.8 million for building and grounds; \$3.8 million for specialized equipment; \$2.6 million for electrical; \$1.7 million for HVAC systems; and \$1.6 million for pipeline. The budget also funds special initiatives such as energy conservation projects at DITP and in the Field Operations Department facilities; invasive plant control in the water reservoirs; painting and coating upkeep at DITP and the Clinton Wastewater Treatment Plant; and easement clearing on MWRA’s aqueducts. As shown below, Maintenance spending has been fairly consistent over the last few fiscal years.



- The FY18 Final Budget of \$201,000 for **Training and Meetings** covers specialized training, attendance at industry conferences, and site visits as required to vendors and other plants. It specifically funds training for topics such as spill response and boom deployment; spill prevention and control; belt laser alignment; cyber security; and electrical voltage. The FY18 Final Budget is \$5,000 or 2.6% more than the FY17 Budget primarily due to increased need for workforce development associated with succession planning and the impacts of expected retirements.
- The FY18 Final Budget of \$5.0 million for **Other Materials** includes \$1.9 million for Vehicle Replacements; \$908,000 for Lab and Testing Supplies; \$199,000 for Vehicle Expenses (gas, mileage reimbursement); \$432,000 for Health and Safety Supplies; \$585,000 for Equipment and Furniture; and \$429,000 for Work Clothes. The increase of \$43,000 or 1% from the FY17 Budget is primarily due to additional equipment purchases for the emerging reservoir contaminant monitoring program and more laboratory and testing supplies for a required water quality test (UCMR4), offset by a decrease for vehicle expenses associated with lower gas prices and the consolidation of toll expenses in the Fleet Service Department’s budget in the Administrative Division.

Line items that decrease from the FY17 Budget include:

- The FY18 Final Budget for **Professional Services** is \$2.6 million, including \$1.7 million for lab and testing services; \$609,000 for engineering services and \$266,000 for other services. Major items in the budget include \$1.4 million for Harbor and Outfall Monitoring; \$233,000 for as-needed engineering services to support CEB-funded projects; \$310,000 for Dam Safety Services; \$253,000 for outsourced testing by the Central Laboratory; \$60,000 for MWRA’s FY18 contribution to the Mystic River Modeling project; \$66,000 for comprehensive reservoir-wide plant survey in the water system; and \$75,000 for invasive species control services in the reservoirs. The FY18 Final Budget is \$15,000 less than the FY17 Budget due to deletion of funds for initiatives that will finish in FY17 including the assessments of MWRA’s SCADA directory and cathodic protection programs, offset by increases for some services based on needs.
- The FY18 Final Budget for **Other Services** is \$18.5 million, including \$12.8 million for sludge pelletization; \$1.9 million for space leases and rentals, including the Chelsea office facility; \$1.2 million for grit and screenings removal and disposal; \$975,000 for telecommunications services; \$467,000 for police details; \$262,000 for other services; and \$465,000 for memberships, dues, and subscriptions. The FY18 Final Budget is \$394,000 less than the FY17 Budget primarily due to reductions for contractual inflation for sludge pelletization services, lower grit and screenings quantities based on recent trends, and a decreased budget for technical assistance to communities to reduce lead in water pipes based on expected needs.



OPERATIONS ADMINISTRATION

The **Operations Administration Department** is composed of the Office of the Chief Operating Officer (COO); the Office of the Deputy Chief Operating Officer (DCOO) of Program, Policy and Planning; and division-level support staff. The department's primary goal is to oversee, manage, and implement MWRA policies and procedures pertaining to the following functions: administration, labor relations, finance, contract administration, and general management.

FY18 Final Current Expense Budget OPERATIONS ADMINISTRATION						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 2,307,256	\$ 2,388,095	\$ 2,555,869	\$ 2,463,659	\$ (92,210)	-3.6%
OVERTIME	282	508	-	-	-	-
TRAINING & MEETINGS	10,288	22,098	23,800	22,800	(1,000)	-4.2%
PROFESSIONAL SERVICES	78,738	64,483	105,001	95,001	(10,000)	-9.5%
OTHER MATERIALS	1,811,438	1,741,007	1,902,500	1,932,400	29,900	1.6%
OTHER SERVICES	247,413	345,742	294,825	395,580	100,755	34.2%
TOTAL	\$ 4,455,415	\$ 4,561,932	\$ 4,881,995	\$ 4,909,440	\$ 27,445	0.6%

FY18 Goals and Initiatives:

The Operations Administration Department's purview and function supports all the goals of the Operations Division set forth in the department budgets in the Operations, Engineering & Construction section and the Program, Policy and Planning section.

Budget Highlights:

The FY18 Final Budget is \$4.9 million, an increase of \$27,000 or 0.6%, compared to the FY17 Budget.

- \$2.5 million for **Wages and Salaries**, a decrease of \$92,000 or 3.6%, as compared to the FY17 Budget. The FY18 Final Budget supports 23.6 full-time equivalents (FTEs), a reduction of 2.8 FTEs compared to 26.4 FTEs in the FY17 Budget. The reduction is the result of a reevaluation of the positions in the Department following one retirement and other staff shifts. The salary savings are offset by position changes as well as step and COLA increases.
- \$23,000 for **Training & Meetings**, a decrease of \$1,000 based on anticipated actual spending. This line item funds attendance at conferences for the COO, DCOO, finance staff as well as division-wide attendance at major industry professional conferences held annually.
- \$95,000 for **Professional Services**, a decrease of \$10,000 or 9.5% as compared to FY17 Budget. The decrease is primarily due to reduced funding for the Mystic River Modeling Project/USGS program to reflect anticipated levels of spending. This budget line also includes \$35,000 for Energy Advisory Services to provide expert advice on energy matters to support staff with energy procurements, pricing analyses and other energy projects.

- \$1.9 million for **Other Materials**, which is an increase of \$30,000 or 1.6% as compared to FY17 Budget primarily due to the consolidation of division-wide funding for safety glasses and rain gear. The major item in this budget line is \$1.9 million for fleet vehicle replacements. Each of these vehicles are all valued at less than \$100,000, the minimum value to be included in the Capital Improvement Program (CIP). At an average cost of \$30k to \$35k per vehicle, the FY 18 budget supports replacement of 54-63 vehicles which is approximately 11%-12% of the active fleet of ~525 vehicles.
- \$393,000 for **Other Services**, an increase of \$98,000 or 33.3% as compared to FY17 Budget. The increase is due primarily to additional funding for the membership to the Water Research Foundation and the continuation of funding for the Mystic River Invasive Species Control Water Chestnut Education Program. Operations Administration will also continue funding annual memberships to the National Association of Clean Water Agencies (NACWA), Association of Metropolitan Water Agencies (AMWA), American Water Works Association (AWWA), and Boston NOW (formerly the Boston Harbor Association (BHA)).

OPERATIONS, ENGINEERING & CONSTRUCTION

Operations, Engineering & Construction

Wastewater Treatment

Deer Island
Residuals
Clinton

Field Operations

Wastewater Operations
Water Operations & Maintenance
Metro Maintenance
Operations Support
FOD - Administration

Engineering & Construction

The Deputy Chief Operating Officer of Operations, Engineering and Construction oversees this section, which focuses on the following:

- operations and maintenance of MWRA's wastewater treatment facilities including Deer Island Wastewater Treatment Plant, Clinton Wastewater Treatment Plant, Residuals Pelletizing Facility, Combined Sewer Overflow facilities, and screenhouses;
- operations and maintenance of MWRA's wastewater distribution system including pipelines, pump stations, and other appurtenances;
- operations and maintenance of MWRA's water treatment facilities including the Carroll Water Treatment Plant serving communities in the Boston metropolitan area and the Brutsch Water Treatment Plant serving communities in the Chicopee Valley Aqueduct (CVA) Water System communities;
- operations and maintenance of the water distribution system including pipelines, pump stations, and valves;
- operations and maintenance of the wastewater and water metering system, Operations Control Centers, and Supervisory Control and Data Acquisition (SCADA) system;
- engineering and construction functions for the Operations Division; and
- energy conservation, capacity, and efficiency maintenance and capital projects.

FY18 Final Current Expense Budget						
OPERATIONS, ENGINEERING & CONSTRUCTION						
LINE ITEM	FY15	FY16	FY17	FY18	Change	
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18	
WAGES & SALARIES	\$ 58,134,027	\$ 59,064,518	\$ 62,296,146	\$ 63,547,546	\$ 1,251,400	2.0%
OVERTIME	4,222,642	4,061,318	3,946,827	3,826,794	(120,033)	-3.0%
FRINGE BENEFITS	78,482	81,089	72,882	76,269	3,387	4.6%
CHEMICALS	9,749,142	9,297,550	9,110,407	9,836,932	726,525	8.0%
UTILITIES	20,951,802	18,604,355	21,402,348	21,591,487	189,139	0.9%
ONGOING MAINTENANCE	23,269,390	25,825,070	25,100,448	26,036,883	936,435	3.7%
TRAINING & MEETINGS	100,706	112,363	134,525	137,925	3,400	2.5%
PROFESSIONAL SERVICES	329,896	577,363	906,233	804,076	(102,157)	-11.3%
OTHER MATERIALS	1,722,903	1,584,675	1,615,484	1,451,207	(164,277)	-10.2%
OTHER SERVICES	17,755,909	18,002,497	18,043,566	17,605,577	(437,989)	-2.4%
TOTAL	\$ 136,314,899	\$ 137,210,798	\$ 142,628,866	\$ 144,914,696	\$ 2,285,830	1.6%

The Operations, Engineering & Construction Section is composed of the Wastewater Treatment, Field Operations, and Engineering and Construction departments. In total, the budgets for these programs represent 85.1% of the Operations Division's FY18 Final Budget.

FY18 Final Current Expense Budget						
OPERATIONS, ENGINEERING & CONSTRUCTION by Programs						
PROGRAM	FY15	FY16	FY17	FY18	Change	
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18	
WASTEWATER TREATMENT	\$ 63,852,040	\$ 62,673,573	\$ 65,381,119	\$ 66,165,406	\$ 784,287	1.2%
FIELD OPERATIONS	65,308,951	67,189,014	69,213,696	70,577,279	1,363,583	2.0%
ENGINEERING & CONSTRUCTION	7,153,909	7,348,211	8,034,051	8,172,012	137,960	1.7%
TOTAL	\$ 136,314,899	\$ 137,210,798	\$ 142,628,866	\$ 144,914,696	\$ 2,285,830	1.6%

The Deputy Chief Operating Officer of Operations, Engineering and Construction also provides support to the Chief Operating Officer on key MWRA operations, technical, policy, community coordination, permitting and public constituency matters.

WASTEWATER TREATMENT

The primary function of the Wastewater Treatment Department is to collect and treat community wastewater so that it can be discharged either into the Massachusetts Bay or the South Nashua River in compliance with federal and state environmental standards. The second function of the Department is to recycle sludge to produce fertilizer and provide for the proper disposal of any materials not suitable for treatment or fertilizer.

FY18 Final Current Expense Budget						
WASTEWATER TREATMENT						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 18,914,089	\$ 19,445,011	\$ 19,931,717	\$ 20,611,057	\$ 679,340	3.4%
OVERTIME	1,257,123	1,096,446	1,176,082	1,232,667	56,585	4.8%
FRINGE BENEFITS	26,236	24,511	18,343	25,795	7,452	40.6%
CHEMICALS	3,481,612	3,582,519	3,277,843	3,778,312	500,469	15.3%
UTILITIES	11,697,399	10,227,294	11,886,677	11,635,650	(251,028)	-2.1%
ONGOING MAINTENANCE	12,976,875	12,729,618	13,707,179	13,887,884	180,705	1.3%
TRAINING & MEETINGS	12,213	14,470	26,500	41,100	14,600	55.1%
PROFESSIONAL SERVICES	171,644	105,470	146,401	171,701	25,300	17.3%
OTHER MATERIALS	599,711	666,760	606,925	647,525	40,600	6.7%
OTHER SERVICES	14,715,139	14,781,473	14,603,452	14,133,715	(469,737)	-3.2%
TOTAL	\$ 63,852,040	\$ 62,673,573	\$ 65,381,119	\$ 66,165,406	\$ 784,287	1.2%

The **Deer Island Treatment Plant**, the **Residuals Management Program**, and the **Clinton Treatment Plant** comprise the Wastewater Treatment Department. Together, the budgets for these programs represent 38.9% of the Operations Division's FY18 Final Budget.

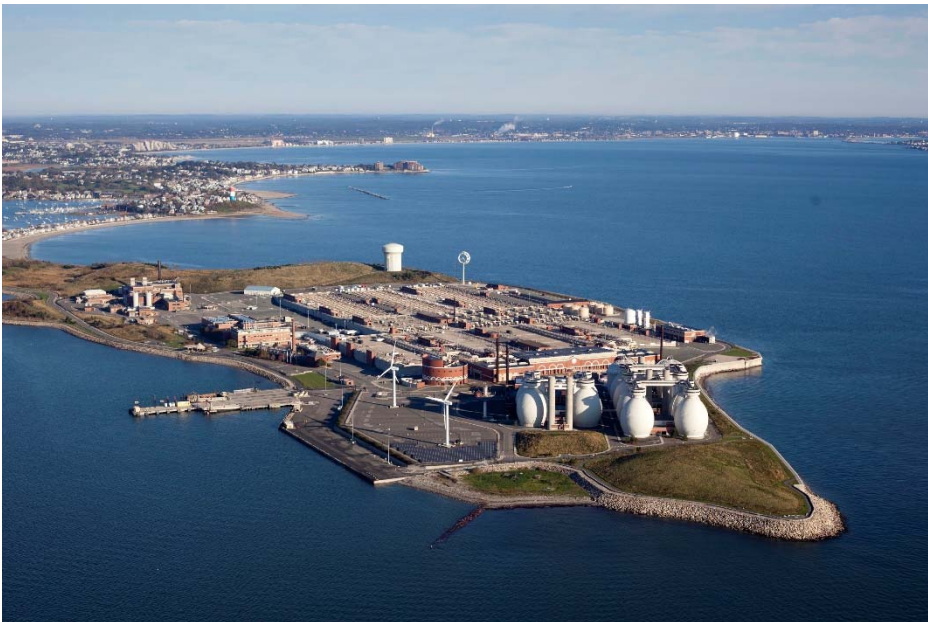
FY18 Final Current Expense Budget						
WASTEWATER TREATMENT by Program						
PROGRAM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
DEER ISLAND	\$ 46,817,125	\$ 45,563,018	\$ 48,931,257	\$ 50,010,450	\$ 1,079,193	2.2%
RESIDUALS	15,375,189	15,158,205	14,529,501	14,079,640	(449,861)	-3.1%
CLINTON	1,659,726	1,952,350	1,920,361	2,075,315	154,955	8.1%
TOTAL	\$ 63,852,040	\$ 62,673,573	\$ 65,381,119	\$ 66,165,406	\$ 784,287	1.2%

DEER ISLAND

The **Deer Island Wastewater Treatment Plant** (Deer Island or DITP) budget accounts for 29.4% of the Operations Division's FY18 Current Expense Final Budget. DITP has a peak capacity of 1.27 billion gallons per day (bgd) and peak secondary treatment capacity of 700 million gallons per day (mgd).

Wastewater influent from MWRA customer communities arrives at the plant through four underground tunnels. Pumps then lift the influent 80 to 150 feet, depending on the tunnel, to the head of the plant.

North system flows pass through grit channels and bar screens at the headworks that remove grit and screenings for disposal in an off-island landfill. South system flows are pre-treated for grit at Nut Island and the Braintree-Weymouth Intermediate Pump Station. Flow is routed to primary treatment clarifiers, which remove about half of the pollutants brought to the plant in typical wastewater (removes 50% of total suspended solids and up to 50% of pathogens and toxic contaminants). In the clarifiers, gravity separates sludge and scum from the wastewater.



In secondary treatment, reactors and clarifiers remove non-settleable solids through biological and gravity treatment. The biological process is a pure oxygen-activated sludge system, using aerobic microorganisms to consume organic matter that remain in the primary effluent flow. Secondary treatment raises the level of pollution removal to over 85%. More than 100 tons of pure oxygen is manufactured each day at Deer Island's cryogenic oxygen facility to support the aerobic biological treatment process.

Sludge from primary and scum from both primary and secondary treatment is thickened in gravity thickeners. Sludge from secondary treatment is thickened in centrifuges. Polymer is used in the secondary sludge thickening process to increase its efficiency. Digestion occurs in the egg-shaped anaerobic digesters at the Deer Island Treatment Plant. There are a total of 12 digesters, each 90 feet in diameter at their widest point and approximately 140 feet tall (128 ft liquid level). Microorganisms naturally present in the sludge work to break sludge and scum down into methane gas, carbon dioxide, solid organic byproducts, and water. Digestion significantly reduces sludge quantity for later recycling. The methane gas produced in the digesters is used in the plant's on-site power generating facility to save operating costs by reducing consumption of fuel oil for heating and purchased electricity. The remaining digested sludge is pumped through pipes the side wall of the Nut Island inter-island tunnel and Braintree-Weymouth extension tunnel directly to the MWRA's Pelletizing Facility at Fore River, where it is further processed into a fertilizer product.

**FY18 Final Current Expense Budget
DEER ISLAND TREATMENT PLANT**

LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 18,188,028	\$ 18,646,944	\$ 19,123,441	\$ 19,752,873	\$ 629,432	3.3%
OVERTIME	1,200,367	1,038,987	1,121,082	1,176,017	54,935	4.9%
FRINGE BENEFITS	25,501	23,620	17,343	24,795	7,452	43.0%
CHEMICALS	3,171,902	3,244,071	2,951,471	3,443,309	491,838	16.7%
UTILITIES	11,463,089	10,043,480	11,660,311	11,406,647	(253,664)	-2.2%
ONGOING MAINTENANCE	12,004,627	11,787,238	13,236,665	13,363,665	127,000	1.0%
TRAINING & MEETINGS	12,213	14,470	23,000	37,600	14,600	63.5%
PROFESSIONAL SERVICES	122,390	65,149	130,000	130,000	-	0.0%
OTHER MATERIALS	451,412	518,679	444,800	484,900	40,100	9.0%
OTHER SERVICES	177,596	180,380	223,145	190,645	(32,500)	-14.6%
TOTAL	\$ 46,817,125	\$ 45,563,018	\$ 48,931,257	\$ 50,010,450	\$ 1,079,193	2.2%

Organizational Structure:

The Deer Island Treatment Plant has six major functional areas: Operations, Thermal Power Plant, Process Control, Maintenance, Capital Engineering, and Operations and Maintenance (O&M) Support.

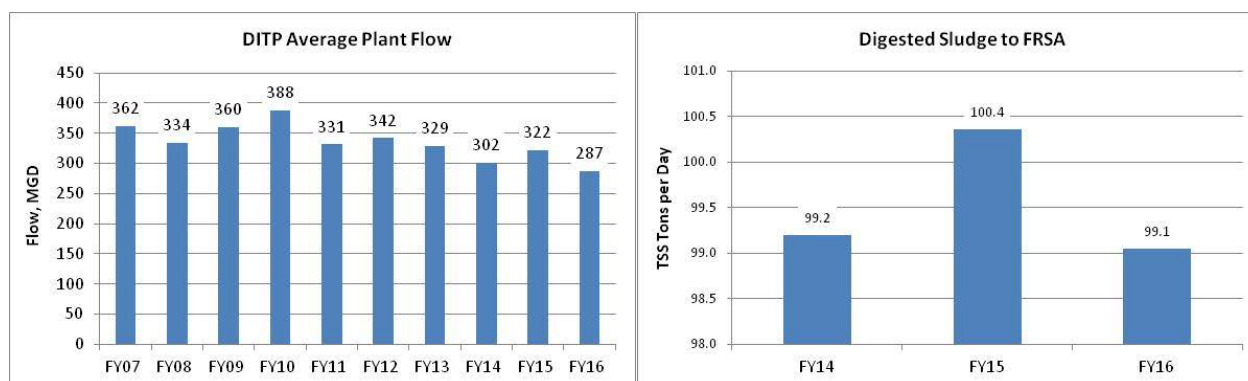
- Operations manages the day-to-day treatment operation of plant processing units, performs minor preventative maintenance activities, and oversees plant functions 24 hours per day, seven days per week.
- Thermal Power Plant manages and operates the Deer Island generation and thermal systems. Power Plant personnel provide 24 hour operation of the high-pressure, high temperature steam power plant. This facility is capable of producing up to 75 megawatts of electrical power including green energy assets with hydro-electric power, wind and solar.
- Process Control manages and maintains the following programs in support of plant operations; real-time process instrumentation and control system (PICS), operational data system (OMS), plant performance monitoring and reporting programs, and regulatory compliance programs including all plant permits, water quality, and air quality. Process Control provides the technical expertise for plant unit operations and routinely performs process optimization studies to help increase performance and reduce operating costs.
- Maintenance performs preventive, predictive, and corrective maintenance repairs on all equipment, utilizing a computerized maintenance management system (CMMS) to coordinate scheduling and document all work completed. Staff has developed the Reliability Centered Maintenance (RCM) program, which has improved plant performance by applying maintenance resources where they are most effective. RCM analyzes the operating systems with the objective of ensuring critical functions perform as required. Implementation of a preventive maintenance program using RCM helps reduce the cost of maintaining the plant and improves the efficiency by anticipating when maintenance will be required. An on-island warehouse, managed by Procurement Department staff, ensures there is adequate stock for maintenance repairs and plant operations.

- **Capital Engineering** provides technical support services for both Operations and Maintenance. Staff is responsible for all aspects of plant engineering including developing, procuring, and implementing all service contracts, consultant designs, and capital improvement projects at Deer Island. This group also manages the on-island Technical Information Center, which provides services to the DITP community and external clients, and ensures quick access to plant drawings and technical information for operational and maintenance needs.
- **O&M Support** is responsible for supporting the business needs of the plant. The Administration and Finance Unit provides financial and administrative support to meet daily operational needs of the plant. The Safety/Security Unit is responsible for ensuring a safe and healthful work environment for employees and minimizing MWRA’s exposure to liability and property loss or damage.

The Deer Island Director’s Office provides overall management for the plant plus policy direction and support in the areas of public access and community agreements.

Operating Assumptions:

Deer Island’s FY18 Final Budget assumes treatment of an average flow of 336 mgd based on ten years of historical data. The projected quantity of digested sludge to be pumped to FRSA (TSS basis) is 99.6 TPD. This is based on 3-years of recent operating data.



Deer Island’s FY18 Final Budget accounts for the impact of self-generation of electricity from the steam turbine generators (STG), combustion turbine generators (CTG), hydroelectric generators, wind turbine generators, and photovoltaic panels. These assets will provide approximately 30% of the total energy requirements.

Deer Island continues to comply with the conditions of the current National Pollutant Discharge Elimination System (NPDES) Permit, which has administratively continued since expiring in FY05. Given the uncertainty regarding the timing of the permit renewal from the Environmental Protection Agency (EPA), Deer Island’s FY18 Final Budget does not assume that a new permit will be in effect for FY18. When the new permit is issued, it is anticipated that Deer Island’s treatment process will be required to kill enterococcus in addition to fecal coliform to comply with the new regulations at a substantial increase in chemical quantities and cost.

FY18 Goals and Initiatives:

I. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.

- **Key Regulatory Performance Measurements:**

NPDES Permit Compliance					
Effluent Characteristic	Permit Limits	FY15 Actual	FY16 Actual	FY17 Actual	FY18 Goal
Dry Day Flow (mgd)	436	273.9	261.1	270.6	100%
cBOD (mg/L)	25	5.8	5.6	6.3	100%
TSS (mg/L)	45	9.0	8.0	13.4	100%
TCR (ug/L)	631	<40	<40	<40	100%
Fecal Coliform	14,000	6	6	6	100%
pH (S.U.)	6 to 9	6.8	6.7	6.7	100%
Acute Toxicity	Pass	Pass	Pass	Pass	100%
Chronic Toxicity	Pass	Pass	Pass	Pass	100%

II. Infrastructure Management and Resilience

- **Goal #8 – System Maintenance:** Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk, consistent with customer, community, and regulatory support levels.

- **Key Maintenance Measurements:**

Indicator	FY15 Actual	FY16 Actual	FY17 Actual	FY18 Goal
Critical Equipment Availability	99.7%	99.7%	99.7%	100%
Predictive Maintenance Completion	90%	99.9%	99.9%	100%
Predictive Maintenance - % of work orders	22%	22%	22%	24%
Maintenance Backlog	17,454 Within	11,119 Industry	16,666 Standard	Within industry standard
Preventive Maintenance Completion	99.9%	99.9%	99.9%	100%
Maintenance Kitting - % of work orders	48%	51%	51%	55%

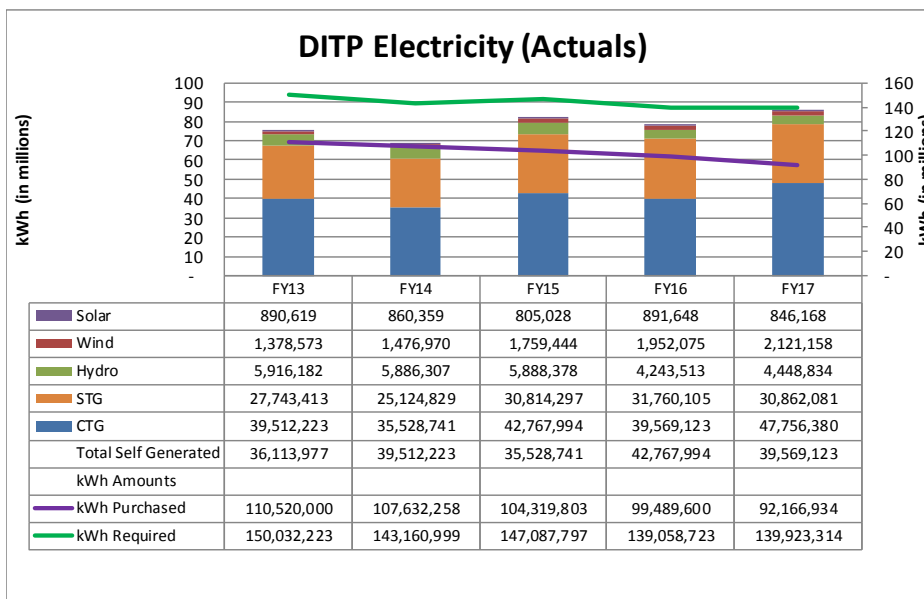
- **Goal #9 – Capital Improvements:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.
 - Issue Notice to Proceed for numerous contracts including the following major asset protection projects:
 - Clarifier Rehabilitation Phase 2 – Construction
 - HVAC Equipment Replacement – Construction
 - Gravity Thickener Rehabilitation - Construction

- Miscellaneous Variable Frequency Drive Replacement - Construction
- Sodium Hypochlorite and Bisulfite Tanks Rehabilitation - Construction
- Substantially complete CIP construction phases for asset protection including the following:
 - Digested Sludge Pump Replacement – Phase 2
 - Butterfly valve & plug valve replacement
 - Personnel Dock Rehabilitation
- Make substantial progress according to FY18 CIP schedule for other near-term major projects including Fire Alarm System Replacement - Design; MCC and Switchback Replacement Construction; Digester and Storage Tank Rehabilitation and Design; and Clarifier Rehabilitation Phase 2.

V. Environmental Sustainability

- **Goal #15 – Energy Optimization:** Continue to examine energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA’s energy assets.
 - **Key Performance Measurements and Accomplishments:**

Indicator	FY15 Actual	FY16 Actual	FY17 Actual	FY18 Goal
% Required Power Self-Generated - Total	29.3%	28.6%	34.1%	30.0%
% Required Power Self-Generated - Renewables	26.9%	28.0%	27.3%	28.4%
Thermal/Power Plant Digester Gas Utilization	98.4%	98.8%	97.5%	98.0%
Avoided capacity costs	\$389,208	\$568,509	\$959,726	~ \$500,000
Generate revenue from energy programs (RPS credits, demand response)	\$1,322,370	\$1,674,534	\$1,763,606	\$2,938,776



- Continue to implement projects to reduce energy use, increase energy revenue, decrease greenhouse gas emissions, and increase self-generation capacity, particularly via renewable energy.

FY 17 Accomplishments:

- Deer Island received the Platinum Peak Performance Award in 2017 from the National Association of Clean Water Agencies (NACWA) for the 10th continuous year. The award recognizes facilities for outstanding compliance of their National Pollutant Discharge Elimination System (NPDES) permit limits. DITP has had no permit violations for ten years.
- Deer Island met secondary permit limits at all times, treating on average more than 99% of flows with full secondary treatment.
- More detailed information about DITP's NPDES Permit compliance is available on the Transparency/Performance Indicator section of MWRA's website.
- Completed numerous major maintenance projects including replacement of all ten variable frequency drives (VFD) in North Main Pump Station, replacement of scum pumps and motors, and the overhaul of four disinfection gearboxes in Liquid Train, and overhauled large odor control fans in Residuals.
- Issued Notice to Proceeds for six Asset Protection Program contracts with a total value of \$8.2 million, including the following:
 - Motor Control Center Switchgear Replacement- Design
 - As-Needed Design (three contracts)
 - Personnel Dock Rehabilitation
- Substantially completed six Asset Protection Program design and construction phases totaling \$39.5 million including the following:
 - Scum Skimmer Replacement
 - Power System Improvements – Construction
 - Secondary Reactor VFDs
 - Cryogenics Chillers Replacement
 - Thermal Power Plant Boiler Controls Replacement

Budget Highlights:

The FY18 Final Budget is \$50.0 million, an increase of \$1.1million or 2.2% compared to the FY17 Budget.

- \$19.8 million for **Wages and Salaries**, an increase of \$629,000 or 3.3%, compared to the FY17 Budget primarily due to wage increases associated with collective bargaining agreements. The FY18 Final Budget also includes \$196,000 for stand-by pay to support operational and maintenance needs primarily during storms and emergencies.
- \$1.2 million for **Overtime**, an increase of \$55,000 or 4.9%, compared to the FY17 Budget. The FY18 Final Budget is based on multi-year historical trends and supports overtime required for operational coverage, critical maintenance projects, and regulatory requirements (i.e. inspections).
- \$3.4 million for **Chemicals**, an increase of \$492,000 or 16.7% compared to the FY17 Budget. The increase is due to the net effect of usage and price adjustments. The FY18 Final Budget, which is based on multi-year historical usage trends and projected market prices, includes \$1.3 million for sodium

hypochlorite, \$873,000 for ferrous chloride, \$396,000 for hydrogen peroxide, \$328,000 for activated carbon, \$299,000 for polymer, and \$90,000 for sodium hydroxide.

- \$11.4 million for **Utilities**, a decrease of \$254,000 primarily due to a \$376,000 decrease in diesel fuel due to lower amount of fuel purchased offset in part by an increase in water of \$156,000 resulting for a higher rate. The Budget also incorporates usage reductions associated with implemented and planned energy efficiency projects such as the optimized steam turbine generators, secondary optimization and lighting retrofits throughout the plant.
- \$13.4 million for **Maintenance**, an increase of \$127,000 or 1% as compared to FY17 Budget. The FY18 Final Budget includes \$5.8 million for materials and \$7.5 million for services. Of the total, \$8.2 million or 61% is for plant and machinery services and materials, \$1.9 million is for electrical system maintenance, and \$1.6 million is for building and grounds work. The budget reflects project priorities with a particular emphasis on maintenance of critical equipment.
- \$130,000 for **Professional Services**, which is level funded with the FY17 Budget. The budget includes \$105,000 for as-needed engineering services to support priority maintenance projects and \$25,000 for environmental testing required as part of MWRA's air quality permit.
- \$485,000 for **Other Materials**, an increase of \$40,000 or 9.0% from the FY17 Budget primarily due to increases in health and safety equipment and office furniture and equipment replacements. The FY18 Final Budget includes \$192,000 for health and safety materials, \$98,000 for work clothes, \$58,000 for vehicles expenses (mileage and gas), and \$37,000 for office supplies.
- \$191,000 for **Other Services**, a decrease of \$33,000 or 14.6%, from the FY17 Budget. The FY18 Final Budget includes \$44,000 for permit fees, \$54,000 for health and safety hazardous safety services, \$36,000 for telephones, \$34,000 for membership dues and subscriptions, \$20,000 for freight charges, and \$6,000 for printing services. The budget is based on historical averages for most items in this category.

RESIDUALS

The **Residuals Management Program** manages the processing and disposal of approximately 100-105 dry tons per day (on average per year) total suspended solids (TSS) of sludge from the anaerobic digestion process at the Deer Island Wastewater Treatment Plant, as well as the disposal of grit and screenings from all MWRA facilities. MWRA pumps liquid sludge from Deer Island through the Braintree-Weymouth cross-harbor tunnel to the Fore River processing facility where the sludge is dewatered, dried, and shipped by either rail or truck for use as fertilizer or to other appropriate disposal. MWRA is committed to the beneficial reuse of biosolids to the greatest extent practicable. MWRA seeks to dispose of all sludge and grit and screenings in a reliable, economical, and environmentally sensitive manner.

- MWRA contracts with the New England Fertilizer Company (NEFCo) to operate the sludge processing facility, and to market and distribute sludge products. A 15-year contract with NEFCo became effective March 1, 2001 and continued to December 31, 2015. After negotiations with NEFCo, MWRA approved a revised, five-year contract extension that commenced in January 2016.
- The FY18 Final Budget is based on the assumption of 99.6 average tons per day (TPD; TSS basis), consistent with historical averages from recent years.
- Grit and screenings (minor residuals) from MWRA's headworks and certain pump stations are collected and disposed of in landfills. MWRA contracts with a third party operator for this service. Minor residuals are by-products of wastewater pre-treatment and primary/secondary treatment processes and include grit, screenings, and scum screenings.

FY18 Final Current Expense Budget							
RESIDUALS MANAGEMENT PROGRAM							
LINE ITEM	FY15	FY16	FY17	FY18	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18		
WAGES & SALARIES	\$ 130,260	\$ 137,835	\$ 141,273	\$ 144,699	\$ 3,426		2.4%
ONGOING MAINTENANCE	699,035	444,885	-	-	-		-
TRAINING & MEETINGS	-	-	3,200	3,200	-		0.0%
PROFESSIONAL SERVICES	19,144	(2,775)	15,001	1	(15,000)		-100.0%
OTHER MATERIALS	15,844	2,390	15,125	15,125	-		0.0%
OTHER SERVICES	14,510,907	14,575,870	14,354,902	13,916,615	(438,287)		-3.1%
TOTAL	\$ 15,375,189	\$ 15,158,205	\$ 14,529,501	\$ 14,079,640	\$ (449,861)		-3.1%

FY18 Goals and Initiatives:

II. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.
 - Continue marketing efforts for Bay State Fertilizer.
 - Maintain and expand local (within Massachusetts) beneficial use of MWRA's processed pellets.

○ **Key Performance Measurements:**

Indicator	FY15 Actual	FY16 Actual	FY17 Actual	FY18 Goal
Pelletize all sludge received from DITP	100%	100%	100%	100%
Average Tons Per Day Sludge (TSS basis)	100.4	99.1	97.2	99.6
Monthly Ave % Capture – Processed Sludge (goal per contract with NEFCo)	92%	92%	92%	90%
Properly dispose of grit & screenings	100%	100%	100%	100%
Annual grit and screenings tonnage	6,227	5,460	5,877	5,996

III. Infrastructure Management and Resilience

- **Goal #9 – Capital Improvements:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.
 - Issue Notices to Proceed for the following Residuals Asset Protection Program contracts:
 - Pellet Piping Relocation from Deer Island to Fore River
 - Electrical Improvements
 - Mechanical Improvements
 - Sludge Tank and Silo Coating
 - Substantially complete the following Residuals Asset Protection Program contracts:
 - Sludge Tank and Silo Coating

FY17 Accomplishments:

- With support from DITP engineering staff, developed biddable specifications for the four renovation projects in the FY18 Capital Improvement Program.

Budget Highlights:

The FY18 Final Budget is \$14.1 million, a decrease of \$450,000 or 3.1%, from the FY17 Budget.

- \$145,000 for **Wages and Salaries**, which funds one permanent position and stand-by pay to provide coverage for emergencies during off-shifts. This department also receives on-going management oversight and staff support from other departments of the MWRA including Deer Island, Treasury, and Operations Administration.
- No funding for **Professional Services** in FY18 which is a decrease of \$15,000 from the FY17 Budget due to the exclusion of funding for bi-annual stack testing which will not be required in FY18 per regulatory requirements.
- \$13.9 million for **Other Services**, a decrease of \$438,000 or 3.1% from the FY17 Budget primarily due to lower projected inflation rates for components of the sludge processing contract based on market indices. The two major items funded in the FY18 Proposed Budget include \$1.2 million for grit and screenings disposal and \$12.8 million for sludge pelletization services, both provided through contracts with private vendors. Projected FY18 budget quantities, which are based on recent historical averages, include sludge tonnage of 99.6 average tons per day (TPD) and 5,996 tons for grit and screenings.

CLINTON

The Clinton Wastewater Treatment Plant provides advanced wastewater treatment services to the Town of Clinton and the Lancaster Sewer District. MWRA assumed formal operational responsibility for the Clinton plant in 1987. Since then MWRA has designed and constructed new primary, secondary, and advanced treatment facilities which incorporated rehabilitated portions of the existing plant with new construction. The new facilities, designed to meet all current and projected National Pollutant Discharge Elimination System (NPDES) discharge standards, were completed in 1992. A new NPDES permit issued March 1, 2017 imposes additional requirements on phosphorus removal. As such, additional facilities are being added to meet more stringent phosphorus removal requirements and lower discharge limits.

The plant provides secondary treatment using an activated sludge process in combination with advanced nutrient removal and dechlorination. The major facilities include headworks, primary settling tanks, digesters, sludge processes, trickling filters, aeration tanks, secondary tanks, and a chemical addition building. The plant discharges its effluent into the South Nashua River in accordance with the discharge limits of the facility's NPDES permit which limits effluent flow to 3.01 mgd. The plant has a potential peak flow rate of 12 mgd. Residual materials are pressed and transported to an MWRA-owned landfill for disposal. Staff also performs regular monitoring of the landfill site.

FY18 Final Current Expense Budget						
CLINTON WASTEWATER TREATMENT PROGRAM						
LINE ITEM	FY15	FY16	FY17	FY18	Change	
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18	
WAGES & SALARIES	\$ 595,801	\$ 660,232	\$ 667,003	\$ 713,485	\$ 46,482	7.0%
OVERTIME	56,756	57,460	55,000	56,650	1,650	3.0%
FRINGE BENEFITS	735	891	1,000	1,000	0	0.0%
CHEMICALS	309,710	338,448	326,372	335,004	8,632	2.6%
UTILITIES	234,310	183,814	226,367	229,003	2,636	1.2%
ONGOING MAINTENANCE	273,213	497,495	470,514	524,219	53,705	11.4%
TRAINING & MEETINGS	-	-	300	300	-	0.0%
PROFESSIONAL SERVICES	30,110	43,096	1,400	41,700	40,300	2878.6%
OTHER MATERIALS	132,454	145,692	147,000	147,500	500	0.3%
OTHER SERVICES	26,637	25,223	25,405	26,455	1,050	4.1%
TOTAL	\$ 1,659,726	\$ 1,952,350	\$ 1,920,361	\$ 2,075,315	\$ 154,955	8.1%

The FY18 Final Budget reflects the fifth full fiscal year of operation of the Clinton aeration system efficiency improvements and redundant pumping at the influent and intermediate lift stations. These improvements were completed in 2013. Staff commenced the projects based on a consultant study that recommended installing fine bubble diffusers in three of the six secondary aeration tanks and removing the existing mechanical mixers to obtain a better oxygen transfer rate while reducing electricity consumption. In FY12, the project scope was expanded to include the installation of four permanent submersible auxiliary pumps to increase pumping capacity during high flow conditions in the plant. It also included the installation of SCADA to control the system, collect data for storage, and reporting on select processes. The redundant pumps enable MWRA to avoid the cost of renting additional pumps which were required four times in the past. Further, the new submersible pumps are energy efficient and significantly reduce the plant's energy

consumption. National Grid, in early 2013, allotted a grant for \$177,000 for this work which became available at completion.

FY18 Goals and Initiatives:

II. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.
 - Commence operation of new phosphorous removal facility as of October 2017 to comply with new NPDES Permit.
 - **Key Regulatory Performance Measurements:**

Effluent Characteristic	NPDES Permit Compliance				
	Permit Limit	FY15 Actual	FY16 Actual	FY17 Actual	FY18 Goal
Dry Day Flow (mgd)	3.01 mgd	2.59 mgd	2.54 mgd	2.38 mgd	100%
cBOD (mg/L)	20 mg/L	3.30 mg/L	2.82 mg/l	3.39 mg/l	100%
TSS (mg/L)	20 mg/L	3.73 mg/L	4.20 mg/l	4.29 mg/l	100%
TCR (mg/L)	17.6 mg/L	<0.02	<0.02	<0.02	100%
Fecal Coliform (#/100mL) *E.Coli 3/1/ 17	126/100mL	3.60/100mL	4.31/100ml	5.96/100mL *4.07/100mL	100%
pH (S.U.)	6.5-8.3	7.4	7.4	7.32	100%
Acute Toxicity	>100%	>100%	>100%	>100%	100%
Chronic Toxicity	62.5%	>62.5%	>62.5%	25%	100%
Phosphorus (mg/L)	150 ug/L 1,000 ug/L	0.23	0.26	0.29	100%
Nitrogen (mg/L)	10 mg/L	0.824	0.626	0.663	100%

III. Infrastructure Management and Resilience

- **Goal #8 – System Maintenance:** Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk, consistent with customer, community, and regulatory support levels.
 - Make substantial progress or complete major maintenance projects including:
 - Phase 1 of painting and coating will take place in FY18.
- **Goal #9 – Capital Improvements:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects. DITP Capital Engineering, per Rick Adams, will provide engineering and construction oversight for the Clinton CIP Projects identified for FY18.
 - Issue Notices to Proceed for two CIP contracts:
 - Valves and Screw Pumps Replacement
 - Roofing Rehabilitation

- Substantially complete the design and construction phases of the new phosphorous removal facility.

V. Environmental Sustainability

- **Goal #15 – Energy Optimization:** Continue to examine energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA’s energy assets.
 - Commence operations of recently installed natural gas line to replace use of fuel oil in the facility.

FY17 Accomplishments:

- Clinton received the Gold Peak Performance Award in 2017 from the National Association of Clean Water Agencies (NACWA) for the second continuous year. The award recognizes facilities for outstanding compliance of their National Pollutant Discharge Elimination System (NPDES) permit limits.
- Completed numerous projects which include the following:
 - Rebuild of the trickling filter distributor column.
 - Painted the column and distributor arms.
 - Rebuild of the isolation gates.
 - Replaced wear strips and shoes on primary clarifier.
 - Replaced broken skimmer and structural support in gravity thickener
 - Replaced support brackets for skimmer box and replaced a section of weir overflow baffle on final clarifier.
 - Installed a new final effluent sampling shed and samplers.
- Substantially completed Digester Cleaning and Rehabilitation
- Completed installation of a natural gas line to offer a cleaner source of power than fuel oil.

Budget Highlights:

The FY18 Final Budget for Clinton is \$2,075,215, an increase of \$154,966 or 8.1% from the FY17 Budget.

- \$713,000 for **Wages and Salaries** is an increase of \$46,000 or 7.0%, from the FY17 Budget due to wage increases per collective bargaining agreements.
- \$57,000 for **Overtime** is based on historical trends. Overtime is used for critical maintenance work and to meet the 24 hour, 7 days per week emergency coverage requirement.
- \$335,000 for **Chemicals**, an increase of \$8,600 or 2.6% from the FY17 Budget. The FY18 Final Budget assumes the requirements of the new NPDES permit will be in effect for the entire year. The new permit requires year around limits for phosphorus discharge, which impacts the use of Ferric Chloride. Ferric Chloride and Polymer will be utilized along with a disc filter operation as part of the new phosphorus reduction facility currently under construction.

- \$229,000 for **Utilities**, an increase of \$2,000 or 1.0% from the FY17 Budget. The budget includes \$188,000 for electricity, \$26,000 for natural gas, \$10,000 for water, and \$4,500 for fuel. The budget also assumes the plant will phase in use of the new natural gas line and phase out fuel use for the boilers.
- \$524,000 for **Maintenance**, an increase of \$54,000 or 11.4% from the FY17 Budget due to project priorities. The increase is mainly due to the addition of new HVAC and Electrical Service contracts.
- \$42,000 for **Professional Services**, an increase of \$40,000 over the FY17 Budget due to the addition of funding for engineering services for numerous maintenance projects.
- \$148,000 for **Other Materials** is level funded with the FY17 Budget, which includes \$135,000 for clean fill for the landfill operation.
- \$26,000 for **Other Services**, an increase of \$1,000 over the FY17 Budget, which includes \$13,000 for permit fees, \$5,000 for telephones, and \$3,300 for railroad easement expenses.

FIELD OPERATIONS

The primary function of the **Field Operations Department (FOD)** is to provide high quality, uninterrupted water delivery and wastewater collection services to MWRA communities. The Department is responsible for the treatment, transmission, and distribution of water from the Quabbin and Wachusett reservoirs to community water systems. It also manages the collection, transport, and screening of wastewater flow from MWRA communities to the Deer Island Wastewater Treatment Plant.

FY18 Final Current Expense Budget						
FIELD OPERATIONS						
LINE ITEM	FY15	FY16	FY17	FY18	Change	
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18	
WAGES & SALARIES	\$ 32,197,907	\$ 32,407,304	\$ 34,470,507	\$ 34,899,189	\$ 428,682	1.2%
OVERTIME	2,906,531	2,900,372	2,704,780	2,528,165	(176,615)	-6.5%
FRINGE BENEFITS	52,103	56,426	54,039	50,224	(3,815)	-7.1%
CHEMICALS	6,267,530	5,715,031	5,832,564	6,058,620	226,056	3.9%
UTILITIES	9,254,403	8,377,061	9,515,671	9,955,837	440,166	4.6%
ONGOING MAINTENANCE	10,292,373	13,094,776	11,393,270	12,149,000	755,730	6.6%
TRAINING & MEETINGS	73,028	86,282	99,025	87,025	(12,000)	-12.1%
PROFESSIONAL SERVICES	158,251	471,893	759,832	632,375	(127,457)	-16.8%
OTHER MATERIALS	1,091,844	892,777	975,509	780,397	(195,112)	-20.0%
OTHER SERVICES	3,014,980	3,187,092	3,408,499	3,436,447	27,948	0.8%
TOTAL	\$ 65,308,951	\$ 67,189,014	\$ 69,213,696	\$ 70,577,279	\$ 1,363,583	2.0%

FOD consists of five operating units: Wastewater Operations, Metropolitan Maintenance, Water Operations and Maintenance, Operations Support, and Administration.

FY18 Final Current Expense Budget						
FIELD OPERATIONS by Programs						
Program	FY15	FY16	FY17	FY18	Change	
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18	
WASTEWATER OPERATIONS	\$ 11,752,934	\$ 13,823,886	\$ 12,356,293	\$ 12,451,202	\$ 94,909	0.8%
WATER OPERATIONS & MAINT	27,560,341	26,896,291	29,237,034	29,937,967	700,933	2.4%
METRO MAINTENANCE	16,140,065	16,763,160	16,425,078	17,546,244	1,121,166	6.8%
OPERATIONS SUPPORT	4,793,945	4,924,451	5,802,773	5,480,729	(322,044)	-5.5%
FOD ADMIN	5,061,666	4,781,225	5,392,518	5,161,137	(231,380)	-4.3%
TOTAL	\$ 65,308,951	\$ 67,189,014	\$ 69,213,696	\$ 70,577,279	\$ 1,363,583	2.0%

Wastewater Operations operates MWRA's wastewater transport facilities, including four continuously staffed headworks facilities; twelve fully automated pumping stations; and six Combined Sewer Overflow (CSO) facilities which are similarly unstaffed. The wastewater system is monitored and controlled from the operations control center (OCC) in MWRA's Chelsea facility. Wastewater Operations aims to meet all operational and regulatory performance standards and requirements efficiently and cost-effectively.

**FY18 Final Current Expense Budget
WASTEWATER OPERATIONS**

LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 5,643,962	\$ 5,926,369	\$ 6,168,840	\$ 6,199,220	\$ 30,380	0.5%
OVERTIME	846,343	863,997	999,138	821,515	(177,623)	-17.8%
FRINGE BENEFITS	12,504	14,840	14,950	13,000	(1,950)	-13.0%
CHEMICALS	251,654	209,671	236,274	295,608	59,334	25.1%
UTILITIES	4,720,283	3,970,430	4,745,631	4,935,114	189,484	4.0%
ONGOING MAINTENANCE	78,553	2,586,587	-	-	-	-
PROFESSIONAL SERVICES	-	38,510	-	-	-	-
OTHER MATERIALS	68,444	70,482	30,228	53,499	23,271	77.0%
OTHER SERVICES	131,191	142,999	161,232	133,245	(27,987)	-17.4%
TOTAL	\$ 11,752,934	\$ 13,823,886	\$ 12,356,293	\$ 12,451,202	\$ 94,909	0.8%

Water Operations and Maintenance operates and maintains the water supply and treatment facilities to provide an adequate supply of properly treated drinking water to meet all operational and regulatory performance requirements. The Unit is responsible for the treatment and delivery of approximately 198 million gallons per day (FY14-FY16 three-year average mgd) of water from the Quabbin and Wachusett reservoirs to the community water systems.



Water must be supplied to customer communities at the expected pressure. The water system encompasses a service area from Chicopee in the western part of the state to Lynnfield, Wakefield, Marblehead, Norwood and Canton in the metropolitan area. This unit operates and maintains MWRA’s western waterworks facilities, including the Carroll Water Treatment Plant, the Metro West Tunnel, the Brutsch Water Treatment Plant, the Cosgrove Intake Facility, the Norumbega Reservoir, and the covered storage facilities. There are two operations centers that provide for monitoring and control of the water system on a 24-hour per day basis. The Metropolitan Operations and Control Center (OCC) is located at MWRA’s Chelsea office acility and the Western Operations Center is located at the Carroll Water Treatment Plant.

**FY18 Final Current Expense Budget
WATER OPERATIONS & MAINTENANCE**

LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 11,996,167	\$ 12,274,313	\$ 12,922,266	\$ 13,226,922	\$ 304,656	2.4%
OVERTIME	1,215,677	1,173,244	988,002	1,035,333	47,331	4.8%
FRINGE BENEFITS	23,406	24,875	23,901	22,524	(1,377)	-5.8%
CHEMICALS	6,015,486	5,505,361	5,596,290	5,763,012	166,722	3.0%
UTILITIES	4,001,331	3,909,903	4,209,724	4,461,934	252,210	6.0%
ONGOING MAINTENANCE	3,522,682	3,095,252	4,507,767	4,279,792	(227,975)	-5.1%
PROFESSIONAL SERVICES	118,187	267,474	343,714	518,500	174,786	50.9%
OTHER MATERIALS	291,752	223,490	280,818	208,170	(72,648)	-25.9%
OTHER SERVICES	375,652	422,381	364,553	421,780	57,227	15.7%
TOTAL	\$ 27,560,341	\$ 26,896,291	\$ 29,237,034	\$ 29,937,967	\$ 700,933	2.4%

**FY18 Final Current Expense Budget
METRO MAINTENANCE**

LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 9,349,224	\$ 9,047,558	\$ 9,720,765	\$ 10,001,991	\$ 281,226	2.9%
OVERTIME	698,754	736,601	576,009	541,781	(34,228)	-5.9%
FRINGE BENEFITS	15,140	15,602	13,929	13,698	(231)	-1.7%
CHEMICALS	64	-	-	-	-	-
UTILITIES	40,813	40,475	35,625	38,503	2,878	8.1%
ONGOING MAINTENANCE	5,526,628	6,153,042	5,400,976	6,326,781	925,805	17.1%
PROFESSIONAL SERVICES	15,816	165,909	133,118	90,875	(42,243)	-31.7%
OTHER MATERIALS	274,428	316,423	290,280	290,672	392	0.1%
OTHER SERVICES	219,197	287,550	254,376	241,943	(12,433)	-4.9%
TOTAL	\$ 16,140,065	\$ 16,763,160	\$ 16,425,078	\$ 17,546,244	\$ 1,121,166	6.8%

Operations Support provides technical support to the FOD in two key areas. Engineering staff coordinate all engineering issues related to the operation of the water and wastewater systems. The SCADA unit is responsible for the maintenance of the water and wastewater Supervisory Control and Data Acquisition (SCADA) systems.

**FY18 Final Current Expense Budget
OPERATIONS SUPPORT**

LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 3,477,261	\$ 3,489,418	\$ 3,721,129	\$ 3,627,991	\$ (93,138)	-2.5%
OVERTIME	86,123	79,316	75,729	82,339	6,610	8.7%
FRINGE BENEFITS	1,049	1,085	1,259	1,002	(257)	-20.4%
CHEMICALS	326	-	-	-	-	-
UTILITIES	11,443	11,208	9,498	10,281	783	8.2%
ONGOING MAINTENANCE	776,476	830,262	886,300	919,200	32,900	3.7%
PROFESSIONAL SERVICES	-	-	250,000	-	(250,000)	-100.0%
OTHER MATERIALS	99,611	86,114	172,717	153,919	(18,798)	-10.9%
OTHER SERVICES	341,656	427,049	686,141	685,997	(144)	0.0%
TOTAL	\$ 4,793,945	\$ 4,924,451	\$ 5,802,773	\$ 5,480,729	\$ (322,044)	-5.5%

FOD Administration provides financial, administrative, planning, and policy oversight functions for the entire Department.

FY18 Final Current Expense Budget							
FOD ADMIN							
LINE ITEM	FY15	FY16	FY17	FY18	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18		
WAGES & SALARIES	\$ 1,731,292	\$ 1,669,647	\$ 1,937,508	\$ 1,843,065	\$ (94,443)	-4.9%	
OVERTIME	59,634	47,212	65,902	47,197	(18,705)	-28.4%	
FRINGE BENEFITS	4	24	-	-	-	-	
UTILITIES	480,534	445,045	515,193	510,004	(5,189)	-1.0%	
ONGOING MAINTENANCE	388,033	429,633	598,227	623,227	25,000	4.2%	
TRAINING & MEETINGS	73,028	86,282	99,025	87,025	(12,000)	-12.1%	
PROFESSIONAL SERVICES	24,249	-	33,000	23,000	(10,000)	-30.3%	
OTHER MATERIALS	357,608	196,268	201,466	74,137	(127,329)	-63.2%	
OTHER SERVICES	1,947,284	1,907,114	1,942,197	1,953,482	11,285	0.6%	
TOTAL	\$ 5,061,666	\$ 4,781,225	\$ 5,392,518	\$ 5,161,137	\$ (231,380)	-4.3%	

FY18 Goals and Initiatives:

I. Drinking Water Quality and System Performance

- **Goal #1 – Compliance with Regulatory Requirement and Public Health Standards:** Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations.
 - Operate and maintain the water supply and treatment facilities to provide an adequate supply of properly treated drinking water to meet all operational and regulatory performance requirements.
 - Supply water to customer communities at the expected pressure.

○ **Key Regulatory Performance Measurements:**

Compliance with Source and Treated Water Parameters				
Indicator	FY15 Actual	FY16 Actual	FY17 Actual	FY18 Goal
Turbidity < 5NTU	100%	100%	100%	100%
pH >9.1 & Alkalinity >37 mg/l	100%	100%	100%	100%
Disinfection Effectiveness	100%	100%	100%	100%

II. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.

○ **Key Regulatory Performance Measurements:**

Regulatory Compliance and Operational Capacity				
Indicator	FY15 Actual	FY16 Actual	FY17 Actual	FY18 Goal
Total annual flow (billion gallons based on DITP mgd) – Process all flow at headworks within system parameters	119.574	105,861	116,681	122.5k
Minimize choking at headworks (# of incidents/highly dependent on weather):				
Nut Island	0	0	0	0
Columbus Park	55.9	36.3	28.3	0
Ward Street	26.6	20.4	17	0
Chelsea Creek	43.1	10.0	12.9	0

III. Infrastructure Management and Resilience

- **Goal #8 – System Maintenance:** Maintain and enhance water and wastewater system assets over the long term at the lowest possible life cycle cost and acceptable risk, consistent with customer, community, and regulatory support levels.
 - Complete numerous major maintenance projects including:
 - Pump Overhauls IPS, Quincy PS, Hayes PS, Hingham PS
 - Suction and Discharge Valve replacement Hingham PS
 - VFD Upgrades Hingham, and IPS
 - Motor replacement/overhaul IPS
 - Air Handling Unit replacement Squantum PS, Quincy PS and DeLauri PS
 - Boilers replacement Chelsea Screen House and Hayes Pump Station
 - Wash down piping replacement at Prison Point CSO
 - Install generator docking station at IPS

○ **Key Maintenance Measurements:**

Indicator	FY15 Actual	FY16 Actual	FY17 Actual	FY18 Goal
% Total Revenue Calculated Using Meters				
Water	96.93%	99.95%	97.87	100%
Wastewater	98.5%	97.9%	98.73	95%
Water System:				
Leak Detection - miles surveyed)	162	175	140	210
Main Line Valves - # exercised	767	524	811	1,100
Main Line Valves - # replaced	24	11	17	20
Blow-off Valves - # exercised	391	318	473	500
Blow-off Valves - # maintained	10	10	7	10
Wastewater System:				
Pipeline Inspections – miles	29	36	33	32
Pipeline Cleaning – miles	22	39	36	36
Structure Inspections - # structures	1072	818	719	650
Manhole Rehabilitation - # manholes	25	105	115	105
Inverted Siphon Inspections - # siphons	52	48	49	48
Inverted Siphon Cleaning - # siphons	57	72	81	36
Metro Maintenance – Equipment and Facilities:				
Ops Light Preventive Maint (PM) - % maint hours	13%	14%	15%	10%-15%
Preventive Maintenance Completion	100%	100%	100%	100%
Maintenance Kitting – ave # items/month	76	234	267	50
Ops Light Maint % PM Completion	100%	100%	100%	100%
Maintenance Backlog – crew hours	11,644	19,003 10,815		Within industry standard 6.5k to 12.9k hours

V. Environmental Sustainability

- **Goal #15 – Energy Optimization:** Continue to examine energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA’s energy assets.
 - Continue to implement projects to reduce energy use, increase energy revenue, decrease greenhouse gas emissions, and increase self-generation capacity, particularly via renewable energy.
 - Audits planned for six Western Ops facilities and 12-15 underground vaults in Western Ops. Also, energy efficient lighting projects scheduled for Clinton WWTP and Nut Island. A review of previously audited facilities will also be undertaken to identify potential energy efficiency projects.

○ **Key Performance Measurements:**

Indicator	FY15 Actual	FY16 Actual	FY17 Actual	FY18 Goal
Energy programs - Generate revenue from FOD-managed facilities:				
Power Sales	\$287,000	\$254,000	\$557,000	\$677,000
Demand Response	\$46,000	\$46,000	\$42,000	\$105,000
Renewable Portfolio Standard Credits	\$515,000	\$263,000	\$391,000	\$352,000

FY17 Accomplishments:

Water System

- Continued invasives removal work in the Stillwater Basin, Sudbury Reservoir, and Chestnut Hill Reservoir among others, as well as identify and respond to new colonizing invasive plants across the reservoir system.
- Recipient in FY17 of DEP Public Water System Award for Outstanding Performance and Achievement.

Wastewater Pumping

- The #1 screen was repaired at the Alewife Pump Station.
- The carbon odor control system was replaced with Virgin Carbon at both the Braintree-Weymouth Pump Station and the Nut Island Headworks.
- Braintree-Weymouth raw wastewater pump #3 was removed and replaced with the spare pump.
- An upgraded UPS system was installed at the Caruso, DeLauri and Intermediate Pump Stations.
- At Hayes Pump Station, Pump #1’s rotating assembly was removed, replaced, and a waterless mechanical seal was installed.
- An upgraded gas detection system as well as an overhauled screen conveyor was installed at the Intermediate Pump Station.

CSO

- In Channels 1 and 2, Vaughn Chopper Pumps were installed at the Somerville Marginal CSO.
- An upgraded gas detection system was installed at the Prison Point CSO. Staff also removed and replaced the river water strainer.
- At the BOS019 station, the raw wastewater (“RWW”) pumps 1 and 2 were replaced.
- The entry hatches of the South Boston CSO Vent Building were repaired.

Headworks

- There was a complete overhaul of the #1 channel grit collection system at Chelsea Creek.
- At Columbus Park and Ward Street, staff installed a split Air Conditioning System in the office, as well as acid washed scrubbers.

- Extensive work was performed by maintenance staff at the Nut Island Headworks including installing a radio repeater, an upgraded UPS Odor Control and gas detection system. All non-explosion proof emergency lighting was upgraded to LED by staff, who also replaced ten Emergency Eye Washing Units. Activated Carbon was installed on the shaft inlet, discharge structure vents, and the building ventilation exhaust. Maintenance staff conjointly installed and tested the facility Emergency Generator Load Bank. Building and Grounds staff pruned over 30 trees throughout the fiscal year.

Water Facilities

- New access hatches were fabricated and installed at the Bellevue Tank.
- At the Spring Street Pump Station, the rotating assembly and seals of pump #2 and #4 were removed and replaced.
- New heating boilers were commissioned at both the Gillis and Newton Street Pump Stations.
- At the Gillis Pump Station, staff replaced pump #6's drive shaft, additionally removing and replacing the rotating assembly. Staff also replaced pump #5's actuator.
- The motor of pump #1 was removed and replaced at the Newton Street Pump Station.
- The air conditioning compressor was replaced at the Lexington Street Pump Station.
- Maintenance staff replaced the o-rings of surge control valve #2 and installed a new VFD for Pump # 1 of the Belmont Pump Station.
- At the Chestnut Hill Underground Pump Station, an electrical cable tray and cable upgrade was installed and commissioned.
- At the Reservoir Road Pump Station, a new MCC was installed.
- Mixer in the Turkey Hill tank was installed.

Grounds/Facilities

- Grounds crews cleared Section 80 in Needham for Water Pipeline. They also replaced over 140 manhole frames and covers in FY17.

Energy Conservation

- Completed energy efficient LED lighting replacements at four facilities for a total of approximately 300,000 kWh annually.

Budget Highlights:

The FY18 Final Budget is \$70.6 million, an increase of \$1.4 million or 2.0% from the FY17 Budget.

- \$34.9 million for **Wages and Salaries**, an increase of \$427,000 million or 1.2%, from the FY17 Budget mainly due to wage increases associated with collective bargaining agreements. The FY18 Final Budget also includes \$446,000 for stand-by pay to ensure support for operational and maintenance needs during wet weather and emergencies and \$43,000 for interns to provide support in several areas including Operations Engineering and SCADA.
- \$2.5 million for **Overtime**, a decrease of (\$177,000) or 6.5% from the FY17 Budget. The FY18 Final Budget for overtime, which incorporates collective bargaining increases, includes \$1.3 million for

emergency related overtime; \$636,000 for planned overtime; and \$592,000 for operational coverage needs. The budget for planned overtime is decreasing significantly due to completion in FY17 of the North Main Pump Station (NMPS)/ Winthrop Terminal Facility Valve Replacement project.

- The FY18 Final Budget includes \$6.1 million for **Chemicals**, which is \$226,000 or 3.9% higher than the FY17 Budget. The budget includes \$5.8 million for water treatment and \$297,000 for wastewater treatment and is based on multi-year historical usage trends and projected market prices. The Budget includes \$3.4 million for Soda Ash, \$1.1 million for Sodium Hypochlorite, \$450,000 for Liquid Oxygen, \$361,000 for Hydrofluosilic Acid, \$315,000 for Carbon Dioxide, \$204,000 for Aqua Ammonia, \$92,000 for Sodium Bisulfite, \$78,000 for Other Oxidizers, and \$49,000 for Sodium Hydroxide.
- \$10 million is included for **Utilities**, which is \$440,000 or 4.6% higher than FY17 Budget. The FY18 Final Budget includes \$7.6 million for electricity, \$1.3 million for diesel fuel, \$564,000 for natural gas, \$477,000 for water and \$63,000 for propane. The largest change is in electricity which increases 6.9% due to approved utility rate increases and updated estimates of usage at the Spot Pond Water Storage Facility based on actual trends during its first year in service.
- \$12.1 million for **Maintenance**, an increase of \$756,000 or 6.6% from the FY17 Budget due to project priorities and projected needs. The FY18 Final Budget includes \$4.9 million in day-to-day needs, \$3.6 million for services, \$3.2 million in major projects, and \$450,000 for energy initiatives. Some of the major projects included for the FY18 Final Budget are:

BW/IPS and Chelsea Admin Building Air Handler Upgrades	\$400,000
Manhole Rehabilitation Contract	\$360,000
South Boston CSO - Inspection and Cleaning	\$350,000
Invasives Control - Stillwater Basin - DASH	\$203,250
Annual tank cleaning	\$100,000
Prison Point - Replace wash down piping at detention tanks	\$80,000

- \$87,000 for **Training and Meetings**, a decrease of (\$12,000) or 12.1% from the FY17 Budget. The budget covers training required for work duties, health and safety compliance, cyber-security and SCADA technical training, and job-related licensures and certifications.
- \$632,000 for **Professional Services**, a decrease of (\$127,000) or 16.77% from the FY17 Budget primarily due to the expected completion of several projects in FY17. The FY18 Final Budget includes \$464,000 for engineering services, which is made up of \$141,000 for as-needed engineering services to support CEB-funded maintenance projects; \$311,000 for a multi-year dam safety contract; and \$13,000 for evaluation of spill prevention, control, and countermeasure plans. Additionally, the Professional Services budget also includes \$66,000 for an annual macrophyte survey at the reservoirs; \$89,000 for quality assurance services for macrophyte harvesting; and \$10,000 for energy audits at various facilities.
- \$780,000 for **Other Materials**, a decrease of (\$195,000) or 20% from the FY17 Budget primarily due to lower gas prices for vehicles and the shift of transponder costs to the Fleet Services budget. The FY18 Final Budget includes \$114,000 for vehicle expenses for gas, mileage reimbursements, and tolls; \$268,000 for work clothes; and \$210,000 for health and safety supplies.

- \$3.4 million for **Other Services**, an increase of \$28,000 or 0.8%, from the FY17 Budget. The FY18 Proposed Budget includes \$1.9 million for annual lease payments for the Chelsea office building; \$852,000 for telephones, and \$458,000 for police details.



ENGINEERING AND CONSTRUCTION

The **Engineering and Construction Department (ECD)** manages and coordinates the planning, design, and construction of system improvements that ensure a safe and adequate water supply and a reliable wastewater collection and treatment. Staff is organized into three units: Wastewater Engineering, Water Engineering, and Construction.

The Department provides in-house engineering, consultant management (during the facilities planning, environmental review, design, and engineering services during construction stages of capital projects), drafting, surveying, construction management, and other technical assistance required for the maintenance, repair, and rehabilitation of wastewater and waterworks systems. In accordance with the CIP, the Department plans and implements the rehabilitation of existing facilities and construction of new facilities including pipelines, pump stations, storage facilities, and treatment facilities on schedules that allow for sufficient system capacity and performance.

The **Wastewater Engineering Unit** manages all wastewater design and engineering projects including Combined Sewer Overflow (CSO) engineering activities as well as specialized technical services in electrical, structural, mechanical, and civil engineering disciplines.

The **Water Engineering Unit** manages all water design and engineering projects. The unit also maintains the Design Information Services Center (DISC), which provides computer-aided design and drafting (CADD) services.

The **Construction Unit** provides contract management and resident inspection on all MWRA water and wastewater construction and rehabilitation projects, with the exception of Deer Island Treatment Plant.

FY18 Final Current Expense Budget ENGINEERING AND CONSTRUCTION						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 7,022,031	\$ 7,212,203	\$ 7,893,921	\$ 8,037,300	\$ 143,378	1.8%
OVERTIME	58,989	64,500	65,965	65,962	(3)	0.0%
FRINGE BENEFITS	143	152	500	250	(250)	-50.0%
ONGOING MAINTENANCE	142	676	-	-	-	-
TRAINING & MEETINGS	15,466	11,610	9,000	9,800	800	8.9%
OTHER MATERIALS	31,349	25,138	33,050	23,285	(9,765)	-29.5%
OTHER SERVICES	25,790	33,932	31,615	35,415	3,800	12.0%
TOTAL	\$ 7,153,909	\$ 7,348,211	\$ 8,034,051	\$ 8,172,012	\$ 137,960	1.7%

FY18 Goals and Initiatives:

The Engineering and Construction Department has significant responsibility for the following MWRA goals included in the Board-approved FY16 - FY20 Five-Year Strategic Business Plan.

I. Wastewater Quality and System Performance

• **Goal #6 – CSO Plan Compliance:**

- Complete all CSO milestones by 2020 and demonstrate that the CSO Plan meets its performance objectives. Ensure compliance with CSO NPDES permit requirements.
- Finalize scope, procure consultant contract and issue notice to proceed for court-ordered CSO post-construction monitoring and performance assessment (January 2018 and December 2020 milestones).

III. Infrastructure Management and Resilience

• **Goal #9 – Capital Improvements:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.

- Issue Notices to Proceed for numerous contracts including the following major projects (contract value \geq \$3 million):

- Water Transmission: Metropolitan Tunnel Redundancy: Conceptual Design/Environmental Impact Review
- Water Transmission: Winsor Station Pipeline Improvements: Final Design
- Water Distribution: Southern Extra High Redundancy & Storage: Pipeline Section 111 – Construction Phases 2 and 3
- Water Distribution: Northern Low Service Rehabilitation: Section 57 Water & 21/20/19 Sewer Design/ESDC/REI
- Water Distribution: Northern High Service: Revere and Malden Pipeline: Sections 53 & 99 Connections – Design
- Water Distribution: Northern Intermediate High: Redundancy & Storage: Sections 89 & 29 Rehabilitation – Design
- Water Distribution: New Connecting Mains – Shaft 7 to WASM 3: Replace Sections 25, 75, 59, & 60 Design
- Interception and Pumping Wastewater Central Monitoring: Design & Programming Services
- Interception & Pumping Facility Asset Protection: Pump Stations & CSOs Condition Assessment

- Substantially complete CIP design and construction phases including the following (contract value \geq \$3 million):

- Water Distribution Northern Intermediate High Redundancy and Storage: Sections 89 & 29 Phase 1B Construction
- Water Transmission: Winsor Pump Station Pipeline Improvements: Hatchery Pipeline – Construction
- Wastewater Interception and Pumping Facility Asset Protection: Alewife Brook Pump Station Rehabilitation – Construction

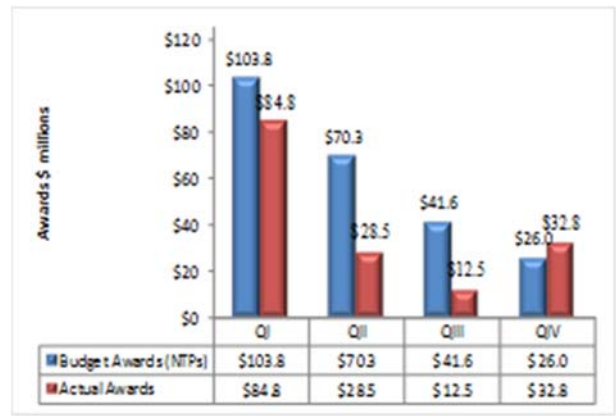
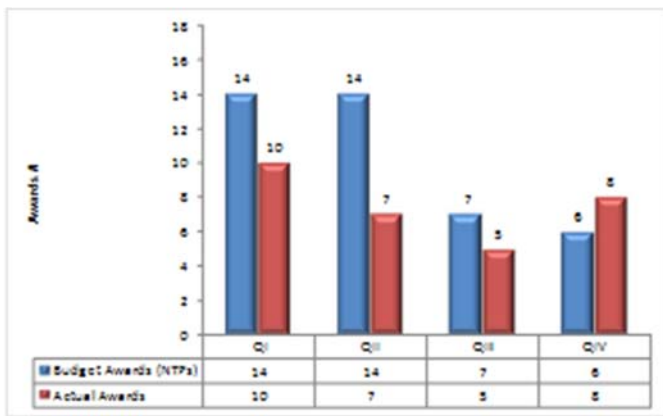
• **Goal #10 – Emergency Preparedness:** Prepare for catastrophic events that could affect the water and wastewater delivery systems.

- Continue to improve and incorporate redundancy in the water system to ensure uninterrupted service by developing and implementing plans to eliminate or mitigate single points of failure within MWRA's water transmission and distribution system, including the Northern Intermediate High, the Southern Extra High, and the Metro Tunnels System.

- Determine and implement the organizational structure for management of this mega- program.
- Make substantial progress on interim work on Wachusett Aqueduct Pump Station, Northern Intermediate High Section 110, and Southern Extra High Section 111 Boston pipeline project.

FY17 Accomplishments

- Developed and submitted draft scope of CSO post-construction monitoring and performance assessment to EPA.
- Managed 52 design and construction contracts and awarded 30 new contracts valued at \$158.7 million.



- Issued Notices to Proceed for numerous contracts including the following major contracts (contract value => \$3 million):
 - Water Distribution Northern Intermediate High Redundancy and Storage: Section 89 & 29 Redundancy Construction Phases IC & 2
 - Water Distribution Southern Extra High Redundancy & Storage: Redundancy Pipeline Section 111 Phase 1 Construction
 - Water Distribution New Connecting Mains – Shaft 7 to WASM 3: CP3 (Sec 23, 24, 47) Final Design
 - Water Distribution Peabody Pipeline Project: Design
 - Wastewater Interception and Pumping: Corrosion and Odor Control – Nut Island Headworks Odor Control & HVAC Design
 - Wastewater Interception and Pumping: Wastewater Meter System Equipment Replacement: Planning, Study, Design



- Wastewater Interception and Pumping: Facility Asset Protection - Chelsea Creek Headworks Upgrades Construction
- Substantially completed numerous design and construction phases including the following (contract value => \$3 million):
 - Water Distribution Weston Aqueduct Supply Mains: Section 36/W11/S 9-A11 Valve
 - Water Distribution Spot Pond Supply Mains Rehab: Section 4 Webster Avenue Bridge Pipe Rehabilitation Construction
 - Other Waterworks Central Monitoring System: Quabbin Power, Communications, and Security Construction
 - Transmission Metro Tunnels Redundancy: Sudbury Aqueduct MEPA Review
 - Wastewater Interception and Pumping Facility Asset Protection: Chelsea Screenhouse Upgrades
 - Wastewater Interception and Pumping Facility Asset Protection: Caruso Pump Station Improvements – Construction
 - CSO Community Managed: Cambridge Sewer Separation - Construction
 - CSO Community Managed: Dorchester Bay Sewer Separation/Commercial Point – Design & Construction
- Made substantial progress toward MWRA water service redundancy goals.
 - Board of Directors approved a plan in February 2017 for construction of two new water supply tunnels to provide redundancy for the Metropolitan Tunnel system.
 - Completed approximately half of construction on Wachusett Aqueduct Pump Station construction.
 - Awarded contract in June 2017 for NIH Stoneham section of Northern Intermediate High pipeline.



For an in-depth update of the progress of projects in the Capital Improvement Program, please refer to the Capital Program Spending Report for Fiscal Year 2017 located on the Budget page of the MWRA's website at mwra.com.

Budget Highlights:

The FY18 Final Budget is \$8.2 million, an increase of \$138,000 or 1.7%, as compared to the FY17 Budget.

- \$8.0 million for **Wages and Salaries**, an increase of \$143,000 or 1.8% compared to the FY17 Budget primarily due to collective bargaining raises, internal promotions, and new hires.
- \$66,000 for **Overtime**, which is based on planned projects for FY18 and is level funded with the FY17 Budget. Overtime covers resident inspection at construction sites after regular work hours to ensure monitoring of construction projects. Overtime is also used for unplanned design or survey needs, attendance at evening public meetings, and meeting deadlines.

- \$10,000 for **Training & Meetings** to cover attendance at conferences and technical seminars.
- \$23,000 for **Other Materials**, a decrease of \$10,000 or 29.6%, compared to the FY17 Budget. The FY18 Final Budget is based on historical spending. The FY18 Final Budget decrease is due to the move of payment for the Fast Lane transponder fees to the Fleet Services budget beginning in FY18. The remaining budget covers office supplies, health and safety supplies, and survey equipment.
- \$35,000 for **Other Services**, an increase of \$3,800 or 12.0% compared to the FY17 Budget. The FY18 Final Budget increase is due to historical actual spending running higher than budgeted. Funding is based on historical spending and supports printing/duplicating, telephone expenses, specialized copier services, memberships and dues, and police details.

PROGRAMS, POLICY, & PLANNING

Programs, Policy & Planning

Toxic Reduction and Control
Environmental Quality
Laboratory Services
Planning

The Deputy Chief Operating Officer of Programs, Policy, and Planning oversees this section, which focuses on the following:

- Master planning, business planning, and strategic initiatives (such as system expansion);
- Environmental programs and regulatory coordination;
- Water and wastewater quality testing and reporting;
- Divisional budget preparation and monitoring;
- Financial planning and analysis;
- Accounts payable and contract administration;
- Human resources management functions; and
- Energy audits, reporting, program evaluation, and analysis.

FY18 Final Current Expense Budget PROGRAMS, POLICY & PLANNING						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 13,288,828	\$ 13,964,566	\$ 14,719,600	\$ 15,483,440	\$ 763,840	5.2%
OVERTIME	165,876	188,350	181,985	200,949	18,964	10.4%
FRINGE BENEFITS	2,124	2,652	2,325	2,546	221	9.5%
UTILITIES	22,881	23,842	24,500	24,500	-	0.0%
ONGOING MAINTENANCE	556,931	431,182	612,343	806,106	193,763	31.6%
TRAINING & MEETINGS	19,085	30,666	37,400	40,000	2,600	7.0%
PROFESSIONAL SERVICES	1,463,086	1,599,057	1,666,043	1,763,568	97,525	5.9%
OTHER MATERIALS	1,396,234	1,686,670	1,419,535	1,587,042	167,507	11.8%
OTHER SERVICES	391,779	419,585	558,771	502,148	(56,623)	-10.1%
TOTAL	\$ 17,306,823	\$ 18,346,571	\$ 19,222,502	\$ 20,410,299	\$ 1,187,797	6.2%

The Programs, Policy & Planning Section is composed of the Toxic Reduction and Control, Environmental Quality (EnQual), Laboratory Services, and Planning departments. The Environmental Quality Department has two units; EnQual-Wastewater and EnQual-Water Quality Assurance. The Planning Department also has two units; Planning and Meter Data. In total, the budgets for these programs represent 12.0% of the Operations Division's FY18 Final Budget.

**FY18 Final Current Expense Budget
PROGRAMS, POLICY & PLANNING by Program**

PROGRAM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
TOXIC REDUCTION & CONTROL	\$ 3,764,566	\$ 3,929,956	\$ 3,975,931	\$ 4,588,633	\$ 612,702	15.4%
ENVIRONMENTAL QUALITY	4,275,976	4,837,375	4,915,414	5,122,514	207,100	4.2%
LABORATORY SERVICES	5,932,398	6,264,136	6,584,524	6,988,758	404,234	6.1%
PLANNING	3,333,883	3,315,104	3,746,634	3,710,394	(36,240)	-1.0%
TOTAL	\$ 17,306,823	\$ 18,346,571	\$ 19,222,502	\$ 20,410,299	\$ 1,187,797	6.2%

The Deputy Chief Operating Officer of Programs, Policy, and Planning also provides support to the Chief Operating Officer on key MWRA operations, technical, policy, community coordination, permitting, and public constituency matters.

TOXIC REDUCTION AND CONTROL

The **Toxic Reduction and Control (TRAC) Department** operates a multi-faceted program to minimize and control the inflow of hazardous or toxic materials into the MWRA sewer system. TRAC operates MWRA’s Environmental Protection Agency (EPA) approved Industrial Pretreatment Program and is responsible for all associated activities which include conducting inspections (approximately 700 annually), issuing permits (300 annually), conducting sampling (more than 2,000 events annually), and carrying out enforcement activities (approximately 400 annually). The program tracks more than 1,400 permitted facilities and 4,000 gas/oil separators. TRAC uses a software application to manage an extensive amount of industrial data on analytical test results, compliance status, and facility sampling and permitting requirements.

FY18 Final Current Expense Budget TOXIC REDUCTION AND CONTROL						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 3,582,311	\$ 3,719,990	\$ 3,764,568	\$ 4,372,270	\$ 607,702	16.1%
OVERTIME	62,997	69,228	73,185	73,185	-	0.0%
FRINGE BENEFITS	1,221	1,419	1,200	1,200	-	0.0%
ONGOING MAINTENANCE	3,034	16,438	11,500	11,500	-	0.0%
TRAINING & MEETINGS	-	-	1,500	1,500	-	0.0%
OTHER MATERIALS	109,971	114,810	115,978	115,978	-	0.0%
OTHER SERVICES	5,032	8,070	8,000	13,000	5,000	62.5%
TOTAL	\$ 3,764,566	\$ 3,929,956	\$ 3,975,931	\$ 4,588,633	\$ 612,702	15.4%

FY18 Goals and Initiatives:

II. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.
 - Continue to carry out the Pretreatment Program to protect receiving water quality, maximize the beneficial reuse of wastewater residuals, and protect workers and MWRA’s wastewater treatment plants.
 - Ensure compliance with MWRA and Federal regulations by issuing appropriate enforcement actions as outlined in the Enforcement Response Plan.
 - Finalize the physical move of the 8M and Direct Connection permit process and personnel into TRAC.
 - Staff will implement the approved local limits applicable to the industrial users in the Clinton service area under the requirements of the new National Pollution Discharge Elimination System (NPDES) permit for the Clinton Wastewater Treatment Plant.
 - TRAC staff will utilize the Pre-treatment Information Management System (PIMS) software to schedule and track work, as well as to draft permits and track permit requirements. Sampling required by permits is entered into the PIMS system by permittees’ contract laboratories. This electronic reporting system is subject to EPA’s Cross Media Electronic Reporting Rule

(CROMERR) and as such, needs to be upgraded to meet the requirements of the rule. TRAC staff are working with MWRA’s MIS staff to ensure that the PIMS system meets these requirements. TRAC and MIS are on schedule to complete this requirement for FY18.

- TRAC staff will comply and implement the new EPA mandated final rule regarding dental amalgam regulations.
- **Goal #5 – Regulatory Changes:** Continue to initiate plans and studies to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality.
 - **Local Limits:**
 - Prepare updated Local Limits Studies for Clinton and Deer Island in accordance with EPA guidelines to confirm appropriate discharge limits from industries.
 - Continue to collect samples for use in update of DITP local limits when new DITP NPDES permit is issued in future.

FY17 Accomplishments:

During FY17, TRAC implemented a revised procedure for scheduling industrial user inspections. The goals of the revised procedure were to increase staff field presence, strengthen TRAC’s industrial survey and keep information on industrial users current. The changes increased the number of industrial inspections by over 100% during FY17. The increased inspections identified changes in industry’s discharges to the sewer system and companies that have gone out of business since their last inspections which helped make TRAC permits and industrial database more accurate.

TRAC assessed over \$122,000 in penalties and fines in FY 17. The amounts were for discharge violations, missed reporting deadlines, non-payment of permit fees, and construction dewatering violations.

Local Limits: Submitted reassessment for new Clinton permit local limits in August, 2017.

Indicators	FY15 Actual	FY16 Actual	FY17 Actual	FY18 Goal
EPA Required SIU Monitoring Events	189	179	181	184
Non-SIU Monitoring Events	88	139	96	36
SIU Connections to be Sampled	381	381	403	397
EPA Required SIU Inspections	253	204	202	199
SIU Permits due to Expire	75	92	56	56
Non-SIU Permits due to Expire	225	235	231	152
Issue Annual Industrial Pretreatment Program Report	Oct 2014	Oct 2015	Oct 2016	Oct 2017

Budget Highlights:

The FY18 Proposed Budget is \$4.6 million, an increase of \$630,000 or 15.84%, from the FY17 Budget.

- \$4.4 million for **Wages & Salaries**, an increase of \$625,000 or 16.59% from the FY17 Budget due to the transfer of 5.0 FTEs related to the 8-M permitting process from FOD to TRAC, as well as collective bargaining increases. The budget also includes \$40,000 for stand-by pay for wet weather sampling events.

- \$73,000 for **Overtime** to cover sampling and monitoring during off-hours, emergencies, and wet weather events.
- \$12,000 for **Ongoing Maintenance**, level funded with the FY17 Budget. This funds sampling equipment, materials, and maintenance of equipment used in sampling industrial discharges at permitted industries.
- \$116,000 for **Other Materials**, level funded with the FY17 Budget. Funding in this line item mainly supports lab and testing supplies, health and safety materials, and work clothes.
- \$13,000 for **Other Services**, an increase of \$5,000, or 62.5% from the FY17 Budget, due to the shift of cell phone service costs from MIS to TRAC. This line item also funds printing costs for regulations, public advertising of industrial users in Significant Noncompliance, and police details for sampling work done in public streets.

ENVIRONMENTAL QUALITY

The core functions of the Environmental Quality Department are to monitor and report on the quality of drinking water and to ensure compliance with regulatory reporting requirements governing drinking water; to monitor wastewater and the receiving water environment as laid out in the Ambient Monitoring Plan; and to ensure compliance with regulatory reporting requirements governing wastewater treatment and discharges.

FY18 Final Current Expense Budget ENVIRONMENTAL QUALITY						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 2,734,691	\$ 2,865,105	\$ 3,149,351	\$ 3,126,582	\$ (22,769)	-0.7%
OVERTIME	3,708	9,780	4,800	8,564	3,764	78.4%
FRINGE BENEFITS	25	129	200	196	(4)	-2.0%
ONGOING MAINTENANCE	97,896	81,982	50,000	130,000	80,000	160.0%
TRAINING & MEETINGS	4,709	16,202	19,400	22,000	2,600	13.4%
PROFESSIONAL SERVICES	1,290,537	1,432,258	1,510,863	1,509,768	(1,095)	-0.1%
OTHER MATERIALS	35,065	311,952	60,330	211,330	151,000	250.3%
OTHER SERVICES	109,346	119,966	120,470	114,074	(6,396)	-5.3%
TOTAL	\$ 4,275,976	\$ 4,837,375	\$ 4,915,414	\$ 5,122,514	\$ 207,100	4.2%

The **Environmental Quality Department** (EnQual) has two units: EnQual-Water and EnQual-Wastewater (WW). EnQual-Water manages compliance with the reporting requirements of the Massachusetts Department of Environmental Protection Drinking Water Regulations, as well as conducts and oversees the drinking water quality monitoring program. Activities include maintaining the Contaminant Monitoring System (CMS) and a mobile (S::CAN) unit for as-needed sampling and monitoring in customer communities and quick deployment where needed to obtain real-time water quality data, including emergency response situations. The group also conducts an algae monitoring program, responds to customer complaints, and reviews system water quality data. EnQual-WW manages compliance with the reporting requirements of MWRA's National Pollutant Discharge Elimination System (NPDES) permits. The group must submit permit reports to state and federal regulators, the science advisory panel and its subcommittees, and post many of these reports on its Harbor and Bay web pages. EnQual-WW manages environmental data and monitors and reports on the quality of sewage influent and effluent; Boston Harbor and its tributary rivers, and Massachusetts Bay. EnQual-WW also keeps current with upcoming and draft regulations, providing comments and evaluating potential impacts on MWRA operations.

FY18 Final Current Expense Budget ENVIRONMENTAL QUALITY by Program						
PROGRAM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
ENQUAL	\$ 2,715,087	\$ 2,770,877	\$ 2,951,353	\$ 2,990,576	\$ 39,223	1.3%
WATER QUALITY ASSURANCE	1,560,889	2,066,498	1,964,061	2,131,938	167,877	8.5%
TOTAL	\$ 4,275,976	\$ 4,837,375	\$ 4,915,414	\$ 5,122,514	\$ 207,100	4.2%

The Environmental Quality Department has significant responsibility for the following MWRA goals included in the Board-approved FY16-FY20 Five-Year Strategic Business Plan.

FY18 Goals and Initiatives:

I. Drinking Water Quality and System Performance

- **Goal #1 – Compliance with Regulatory Requirement and Public Health Standards:** Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations.
- **Goal #2 –Effective Public Communications:** Continue to report on and communicate water quality information to our customers and public officials.
 - As part of an Authority Consequence Management Plan, operate a comprehensive CMS, a network of water quality monitoring stations; maintain a mobile water quality trailer to provide field monitoring capabilities; and oversee a quality monitoring program for emergency standby reservoirs, including a plan to ensure readiness of emergency supplies.
 - Develop and train staff on emergency response procedures and contaminant response procedures for reservoir or distribution system events. Also train staff in Incident Command System protocols, procedures, and practices in the case of an emergency event.
 - Collect samples and evaluate data to develop a program for the emergency standby reservoirs, including management goals to ensure these are ready, from a water quality perspective, in the event of an emergency.
 - Respond to the Massachusetts Department of Environmental Protection (MADEP) and the U.S. Environmental Protection Agency (EPA) regarding regulatory changes for drinking water quality monitoring
 - Monitor algal toxins in drinking water and adapt the program to the rapidly changing regulatory landscape of this issue.
 - Develop and train staff in preparation for EPA’s Unregulated Contaminant Monitoring Rule 4 program which commences in 2018 and continues into 2020.
 - Continue to work with UMass Amherst, under an Interdepartmental Service Agreement, to assess potential impacts from a chemical spill, and how treatment can mitigate those effects.
 - Participate in training programs with communities to support response to drinking water quality complaints, improve compliance with regulations, and support overall coordination.

II. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.
 - In FY18, EnQual-WW will procure services for the next three years of permit-required Massachusetts Bay water quality modeling.
 - To respond to public interest and improve timeliness of accurate reporting, finish development of a system to more quickly gather accurate sanitary sewer overflow location and volume data.
 - Continue to implement the reporting requirements of DITP and Clinton NPDES permits. Respond to EPA and MADEP NPDES regulatory changes and program initiatives, including electronic reporting requirements and any new permits.
 - Continue to produce scientific reports and manage environmental monitoring data; make data and analysis available in-house and online; keep up-to-date data available for presentations to regulators, environmental groups and other interested parties.

- **Goal #5 – Regulatory Changes:** Continue to initiate plans and studies to prepare for regulatory changes; identify opportunities to refine monitoring requirements; and improve effluent quality.
 - Prepare materials and meet with EPA and MADEP staff regarding an updated DITP NPDES Permit.
 - Report against the new, stricter limits in the 2017 Clinton NPDES Permit.
 - Explore modification of the Ambient Monitoring Plan to better address issues of emerging concern involving potential impacts of the outfall. This involves working with regulators and the Outfall Monitoring Science Advisory Panel (OMSAP) to review the goals and monitoring questions underlying the Ambient Monitoring Plan, which is required by DITP’s NPDES permit.
 - Continue to develop and manage a monitoring program for Boston Harbor and its tributary rivers, and Massachusetts Bay, reflecting permit and variance requirements, relevant current concerns, and long-term interests of the area.
 - Provide on-call staffing for off-hour required regulatory notifications and public right-to-know reporting on sanitary sewer overflows and Combined Sewer Overflow (CSO) facility activations.
- **Goal # 6 – CSO Plan Compliance:** Complete all Combined Sewer Overflow milestones by 2020 and demonstrate that the CSO Plan meets its performance objectives at all outfalls. Ensure compliance with CSO NPDES permit requirements.
 - Provide technical and scientific support for the development of the EPA-required CSO Program performance assessment.
 - Working with staff from Planning, Engineering and Construction, and Operations, continue work on the CSO performance assessment, including ongoing water quality monitoring. This is the next phase of the Long-Term CSO Control Plan, which calls for three years of assessment before 2020 to ensure that the goals of the plan are met.
 - To meet future water quality assessments expected in the CSO variance areas of the Mystic and Charles Rivers, develop an intensified level of data analysis bringing together disparate datasets such as localized rainfall data, metered and modeled CSO discharges, and receiving water quality.

Joint EnQual Water / Wastewater FY18 Initiatives

- Develop improved database for monitoring CMS maintenance activities.
- More fully utilize Maximo as appropriate for preventive and corrective job tasks for equipment, as well as scheduling and tracking of inspections and filing requirements.
- Apply for a new permit for the Carroll Water Treatment Plant maintenance discharges, which expires in FY18. The permit application, which is due in October 2017, will also include cooling water discharges from the new Wachusett Aqueduct Pump Station, so that MWRA will have applied for coverage under the permit before that facility begins operation.

FY17 accomplishments:

- EnQual-WW published 20 technical reports during FY17.
- EnQual-WW procured services for the next three years of ambient monitoring. Monitoring carried out by environmental consultants is supported by laboratory analyses of many of the samples by the Department of Laboratory Services. This core monitoring is supplemented with special studies, co-funded by other agencies including the Provincetown Center for Coastal Studies, NOAA Sea Grant, and

others. These special studies extend MWRA's core monitoring to Cape Cod Bay, or explore monitoring technology development or other topics related to MWRA's activities.

- EnQual-WW staff have developed procedures to meet the new reporting requirements for the new permit issued for the Clinton Wastewater Treatment Plant in FY17.
- EnQual-WW staff submitted the following permit-related information:
 - Permit renewals for applying pesticides or alum to reservoirs for algae control.
 - Routine monthly, quarterly, and annual reports, and required notifications under Part II of permits, Contingency Plan, DITP blending order, and Clinton copper order.
 - Successful applications for National Association of Clean Water Agencies Peak Performance awards for Deer Island and Clinton treatment plants.
 - Annual interpretive report summarizing ambient monitoring studies in CY15 as required in the DITP NPDES permit.
- EnQual-WW reviewed and analyzed impacts on MWRA of several new draft or final DEP and EPA regulations. These included CSO variances for the Charles and Alewife/Mystic, and a proposed mandatory survey of nutrient removal, general updates to the NPDES regulations, and proposed new water quality criteria for copper and for an indicator of viruses. Analyzed historical wastewater and receiving water bacteria data to identify potential issues in complying with possible future permit limits.
- EnQual-WW created and launched new web page with near-real-time reporting of combined sewer overflow (CSO) facility discharges.
- EnQual-Water replaced and enhanced monitoring capabilities on the Wachusett Reservoir with new profiling buoys with water quality and petroleum sensor technology, and both towable and handheld sondes.
- EnQual-Water staff designed and installed a year-round, continuous monitoring shed at the Route 12 Bridge over the Wachusett Reservoir, which will provide both routine water quality information and contaminant detection.
- EnQual-Water implemented a 24/7 monitoring and response program for CMS alarms.
- Assessed potential water quality changes if drought-impacted communities blended MWRA water with their local supplies.
- EnQual-Water successfully completed all MADEP-required drinking water sampling and reporting in FY17.

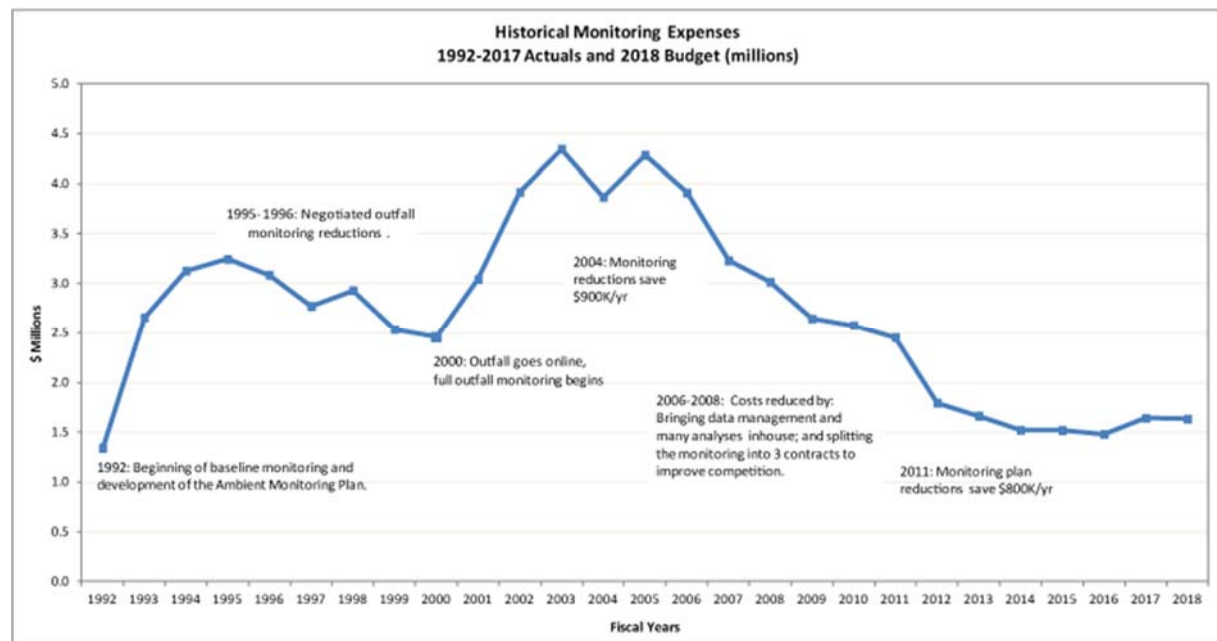


Budget Highlights:

The FY18 Final Budget is \$5.1 million, an increase of \$207,000 or 4.2%, from the FY17 Budget.

- \$3.1 million for **Wages and Salaries**, including \$3 million for 31.7 FTEs. The budget also includes \$68,000 for interns to assist with data analysis, water quality sampling, and technical support and \$43,000 for stand-by pay associated with wet weather and water quality monitoring programs.
- \$9,000 for **Overtime** to support wet weather and water quality monitoring programs.
- \$130,000 for **Maintenance**, an increase of \$80,000 or 160% from the FY17 Budget primarily due to the addition of equipment at MWRA’s reservoirs for water quality contamination monitoring. MWRA is establishing maintenance schedules for this relatively new equipment inventory valued at approximately \$1.5M.
- \$22,000 for **Training and Meetings** to cover staff participation in professional conferences and technical and software training.
- \$1.5 million for **Professional Services**, level funded with the FY17 Budget. The budget supports laboratory testing for MWRA’s Harbor and Outfall Monitoring (HOM) Program, including Cape Cod Bay monitoring and \$300,000 for contracts for the following activities which are co-funded through cost-sharing or cost-reduction agreements:
 - o UMass Amherst special study on railroad contaminants in the Wachusett Reservoir
 - o University of Maine’s buoy off Cape Ann; instruments measuring algae and other water-quality indicators
 - o UMass Dartmouth Bays Eutrophication Model maintenance
 - o UMass Boston study of satellite imaging to measure water quality.

The FY18 Final Budget continues to reflect approximately \$840,000 in annual savings due to the reduction in scope of HOM monitoring that took place in 2011 through 2013 based on favorable findings of many years of monitoring data and regulatory approval (see figure below).



- \$211,000 for **Other Materials** which is a \$151,000 or 250% increase from the FY17 Budget primarily to support the Contaminant Monitoring System and reservoir monitoring. The budget includes \$55,000 for lab and testing supplies for reservoir water quality monitoring. It also includes \$148,000 for equipment to continue funding parts and replacements for the drinking water CMS and S::CAN drinking water analysis equipment. The equipment budget also funds two pilot projects: monitoring for radiological contamination in water (\$50,000) and using a Telog system as backup to the CMS system (\$20,000).
- \$114,000 for **Other Services**, a decrease of \$6,000 or 5% from the FY17 Budget. The major items in the budget include \$90,000 for Verizon fees associated with operating the CMS at the reservoirs and \$11,000 for memberships in EnQual–WW, primarily for MWRA’s sustaining membership in the Northeastern Regional Association of Coastal Ocean Observing Systems (**NERACOOS**) which operates coastal monitoring buoys including the one in the Gulf of Maine used for MWRA monitoring.



LABORATORY SERVICES

The core function of the **Department of Laboratory Services** is to provide high quality and responsive laboratory services to MWRA’s water and wastewater treatment programs, including the Watershed Division of the Department of Conservation and Recreation (DCR) and the MWRA member water and wastewater communities. This involves timely and cost-effective laboratory tests to meet the strict testing guidelines required by all regulatory programs and permits, including the Safe Drinking Water Act (SDWA), Clean Water Act, and National Pollutant Discharge Elimination System (NPDES) permits. The Department supports these functions at five locations: Chelsea, Southborough, Quabbin, the Central Laboratory at the Deer Island, and Clinton. Testing supports drinking water transmission and treatment processes, wastewater operations and process control at Deer Island and Clinton, NPDES compliance, Massachusetts Bay outfall monitoring, Toxic Reduction and Control, and wastewater residuals. The Department also conducts the Boston Harbor monitoring program that involves regular sampling for nutrients, bacteria, and water quality parameters throughout Boston Harbor. Laboratory staff track and analyze results for submission to the Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP).

Most MWRA laboratory testing is done in-house. Certain highly specialized or low volume tests are outsourced, such as tests for cryptosporidium, giardia and radioactivity.

FY18 Final Current Expense Budget						
LABORATORY SERVICES						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 4,249,159	\$ 4,483,094	\$ 4,827,198	\$ 4,904,294	\$ 77,096	1.6%
OVERTIME	99,170	107,890	104,000	119,200	15,200	14.6%
FRINGE BENEFITS	873	1,099	875	1,100	225	25.7%
UTILITIES	22,881	23,842	24,500	24,500	-	0.0%
ONGOING MAINTENANCE	201,737	291,458	312,350	491,405	179,055	57.3%
TRAINING & MEETINGS	3,679	2,909	7,000	7,000	-	0.0%
PROFESSIONAL SERVICES	169,449	162,123	152,080	253,000	100,920	66.4%
OTHER MATERIALS	1,097,396	1,104,836	1,067,452	1,096,109	28,657	2.7%
OTHER SERVICES	88,054	86,886	89,069	92,150	3,081	3.5%
TOTAL	\$ 5,932,398	\$ 6,264,136	\$ 6,584,524	\$ 6,988,758	\$ 404,234	6.1%

FY18 Goals and Initiatives:

The Laboratory Services Department has significant responsibility for the following MWRA goals included in the Board-approved FY16 - FY20 Five-Year Strategic Business Plan.

I. Drinking Water Quality and System Performance

- **Goal #1 – Compliance with Regulatory Requirement and Public Health Standards:** Maintain drinking water quality to protect public health, and continue to ensure that MWRA water meets all applicable regulations.
- **Goal #3 – Technical Assistance for Water Communities:** Assist member communities to improve local water distribution systems through ongoing financial, technical, and operational support programs to maximize long-term water quality benefits.

II. Wastewater Quality and System Performance

- **Goal #4 – Compliance with Regulatory Requirements:** Meet or surpass environmental compliance standards at both MWRA treatment facilities and throughout the wastewater collection system.
 - CSO Assessment: Continue to perform weekend CSO receiving water sampling during/after significant wet weather events.
 - UCMR4: Provide EPA-required testing and analysis via contract laboratories to comply with the Unregulated Contaminant Monitoring Rule 4 (UCMR4).
 - Decision support: Provide as-needed laboratory services to support assessment of regulatory and operational issues.

In addition, the Laboratory Services Department provides support functions for other MWRA Departments. FY18 Major Initiatives in support of those functions include:

- **Ethics Training** - Expand laboratory ethics and data integrity training to meet upcoming MassDEP laboratory certification requirements.
- **NPDES Permits** - Provide laboratory data and consulting to wastewater operations and EnQual on Clinton or Deer Island draft and final NPDES permits.
- **Electronic Laboratory Notebook (ELN)** - Implement ELN software on wireless tablet computers at three of the water quality laboratory locations.
- **Laboratory Renovation Projects** - Two major projects continue in FY17. The renovation of the roof and the HVAC system at Southboro Lab is nearing completion. Replacement of the HVAC system and fume hoods at the Central Lab is in the design phase with construction expected to commence in late FY17.
- **School Lead Testing Initiative** – This special project began in FY16 and is continuing into FY17. Thousands of samples have been tested.

FY17 Accomplishments:

- CSO Assessment: Performed CSO receiving water sampling in the Charles and Mystic Rivers during/after significant wet weather events to document the recovery of the rivers after rain events. MWRA will use this information as part of the court-ordered CSO Assessment.
- Decision support: Provided testing and analytical services to support assessment of numerous issues including School Lead testing, the next DITP NPDES Permit, the new Clinton NPDES Permit, obtaining DEP certification for the Clinton Lab, testing for an algae bloom in the Chestnut Hills Emergency Distribution Reservoir, and red tide testing in Massachusetts Bay.
- DLS continued to provide high-quality, responsive, timely, and cost-effective laboratory services to our clients in compliance with strict testing guidelines required by all regulatory programs and permits, including the Safe Drinking Water Act and NPDES permits. DLS's performance versus key goals in the FY17 was as follows:

- 89% of lab results were completed on time versus goal of > 95%. The goal was missed due to the high backlog of school lead samples.
- Turnaround time averaged 7.6 days versus goal of < 9 days
- 98% of quality control tests were within specifications versus goal > 98%
- Completed 128% of targeted laboratory work (goal 100% of budget). This goal was exceeded due to the high volume of School Lead samples.

Key Department Performance Measurements and Accomplishments:

Indicator	FY15 Actual	FY16 Actual	FY17 Actual	FY18 Goal
Total # of Tests Performed	256,284	265,346	314,270	270,000
Percent On-Time Results	97.0	97.0	91.3	95%
Average Turnaround Time (days)	5.91	5.72	6.58	9 days
Percent Quality Control Within Specifications	98.1	98.2	97.6	98%
Special Project: School Lead Project # Samples	N/A	N/A	12,390	As-needed

Several projects and activities not part of the normal annual operations of the Department are noteworthy in FY17:

- **School Lead Testing Initiative** – As of mid-FY17, this department completed 20,000 lead and copper tests on school samples since the beginning of 2016.
- **Southboro Laboratory Renovation.** In December 2016, the Southboro laboratory operation restarted when the renovation was completed. For about a year during renovation the Southboro Laboratory operated out of the Interim Corrosion Control Facility in Marlboro.

Budget Highlights:

The FY18 Final Budget is \$7.0 million, an increase of \$404,000 or 6.1% compared to the FY17 Budget, primarily due to Maintenance and Professional Services.

- \$4.9 million for **Wages and Salaries**, an increase of \$77,000 or 1.6% compared to the FY17 Budget.
- \$119,000 for **Overtime** to cover work associated with peak periods, emergencies, and special initiatives.
- \$25,000 for **Utilities**, which covers the purchase of gases and cryogenic liquids used for various laboratory instruments.

- \$491,000 for **Maintenance**, an increase of \$179,000 or 53% compared to the FY17 Budget due to projected needs. This includes Lab equipment maintenance, repairs, and calibration for major lab instruments and once a year preventive maintenance for all ovens, water baths, incubators, refrigerators, freezers, chillers, meters, sensors, microscopes, thermometers, and balances.
- \$7,000 for **Training and Meetings** which funds attendance at the EPA Environmental Laboratory Advisory Board (ELAB) Forum on Lab Accreditation/National Environmental Monitoring Conference and the Association of Public Health Laboratories (APHL) annual meeting. Also included are several new conferences and seminars to keep staff technically knowledgeable.
- \$253,000 for **Professional Services**, an increase of \$101,000 or 66.4% compared to the FY17 Budget. The increase is due to the start of the UCMR4 water quality project. Funding in this line item supports laboratory and testing analysis services the department uses to contract out a variety of complex and/or low volume tests. Outside laboratories are used for emergencies, second opinions, capacity constraints, and unavailability of specialized equipment or economic justification.
- \$1.1 million for **Other Materials**, an increase of \$29,000 or 2.7% compared to the FY17 Budget primarily due to projected needs. This includes laboratory supplies and laboratory instrument replacements.
- \$92,000 for **Other Services**, an increase of \$3,000 or 3.5% compared to FY17. This covers boat rental service on an as-needed basis, boat dockage for two boats, removal of hazardous waste, and courier service for shipping samples between laboratories.

PLANNING

The **Planning Department** provides regulatory, public policy, and public health advocacy for MWRA's drinking water and wastewater programs. It provides decision support on planning, policy and operations matters, using a range of technical and analytical tools. Staff administers financial assistance programs to improve the infrastructure of member communities and to promote water conservation, and manages the wholesale meter data necessary for water and sewer billing. The Department integrates staff efforts and coordinates MWRA activities related to system and capital planning, infrastructure renewal, and watershed management (in conjunction with the Commonwealth's Department of Conservation and Recreation; DCR); strategic business planning; agency-wide performance measurement; and industry research.

FY18 Final Current Expense Budget						
PLANNING						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 2,722,668	\$ 2,896,378	\$ 2,978,483	\$ 3,080,294	\$ 101,811	3.4%
OVERTIME	-	1,451	-	-	-	-
FRINGE BENEFITS	5	5	50	50	-	0.0%
ONGOING MAINTENANCE	254,264	41,304	238,493	173,201	(65,292)	-27.4%
TRAINING & MEETINGS	10,697	11,555	9,500	9,500	-	0.0%
PROFESSIONAL SERVICES	3,100	4,677	3,100	800	(2,300)	-74.2%
OTHER MATERIALS	153,802	155,073	175,775	163,625	(12,150)	-6.9%
OTHER SERVICES	189,348	204,662	341,232	282,924	(58,308)	-17.1%
TOTAL	\$ 3,333,883	\$ 3,315,104	\$ 3,746,634	\$ 3,710,394	\$ (36,240)	-1.0%

The Department has two units, the **Planning Unit** and the **Meter Data Unit**.

FY18 Final Current Expense Budget						
PLANNING by Program						
PROGRAM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
PLANNING	\$ 2,350,379	\$ 2,404,530	\$ 2,640,890	\$ 2,644,307	\$ 3,417	0.1%
METER DATA	983,504	910,574	1,105,743	1,066,087	(39,656)	-3.6%
TOTAL	\$ 3,333,883	\$ 3,315,104	\$ 3,746,634	\$ 3,710,394	\$ (36,240)	-1.0%

The functions of the **Planning Unit** are:

- **Mapping, Modeling, and Data Analysis** - Technical staff develops and maintains the Geographic Information Systems (GIS) for the water and wastewater systems, including integration of field and engineering records into GIS for access by planning, engineering, and operations staff. Provides demand analysis and forecasting of water and wastewater flows for master planning and system operations; models reservoir operations and performs drought forecasting and planning; evaluates system expansion requests; and develops and maintains water and wastewater system models in support of master planning, system operations, and optimization. Staff assists in developing agency wide summaries of energy and greenhouse gas emission efficiency improvements.

- **System Planning and Renewal** - Staff with expertise in engineering and planning are responsible for water and wastewater system master planning, infrastructure needs assessment, and capital project development. This work is done in coordination with staff across MWRA. Key work includes:
 - Reviews water and wastewater system expansion requests, water supply agreements, and emergency water withdrawal requests;
 - Assists with project siting decisions, environmental reviews, and permitting, including assessing impacts on MWRA facilities from other agencies' projects;
 - Develops strategies for reducing long-term emergency risks; and
 - Prepares plans for mitigating the risk of a range of hazards (i.e. climate change and sea level rise) on MWRA facilities and systems.

- **Regulatory and Policy Matters** - Staff work with various regulatory entities to advocate for cost-effective rule setting that protects the environment and promotes public health. Senior staff members also actively work with industry associations and other groups with agendas consistent with MWRA's to advance regulations that make environmental and economic sense. Senior staff conduct strategic policy research on a broad range of topics. Staff also conduct public health research and reports on potable water quality through production of the annual regulatory-required Consumer Confidence Report (CCR). Staff also coordinates with DCR on watershed protection initiatives. In conjunction with the Office of the Executive Director and Public Affairs, this unit serves as the Operations Division's lead on regulatory and policy matters potentially affecting MWRA's water and wastewater systems.

- **Community Support Program** – This unit oversees and manages MWRA's financial assistance and technical community support programs. Staff are responsible for the development, implementation, and reporting on Inflow/Infiltration (I/I) reduction policy; oversight of and reporting on MWRA leak detection and demand management programs; and reporting on the portions of MWRA's NPDES permit related to demand management and flow limitation activities. Staff administers community assistance programs including sewer Inflow/Infiltration financial and technical assistance, water pipeline rehabilitation financial assistance, lead service line replacement funding, water distribution systems technical assistance, water leak detection technical assistance, and water conservation programs.

The functions of the **Meter Data Unit** are:

- **Meter Data** – This unit collects meter data for operational and revenue generating purposes from the water and wastewater systems. Staff maintains 179 revenue water meters, 26 master water meters, 187 revenue wastewater meters and 35 other wastewater monitoring sites. The water metering data collection and analysis supports Rates and Budget Department's allocation of MWRA rate revenue requirements.

FY18 Goals and Initiatives:

I. Drinking Water Quality and System Performance - The Planning Department's purview and function supports all the goals associated with this strategic priority.

- Provide cost-effective and timely mapping, modeling, data analysis, and regulatory review services to support decision-making on operational, planning, environmental, and regulatory issues.
- Continue coordination with member communities for distribution of grants and loans for local sewer, water, and lead service line removal projects.
- Continue to manage the Community Leak Detection Task Order Contract and work with Procurement to solicit bids for new contracts for spring 2018.
- Continue outreach and coordination to schools and child care facilities on lead testing and remediation. Evaluate and revise as necessary the joint MWRA/MDPH lead testing project for homes with children with elevated blood lead levels.
- Continue to advocate for responsible and reasonable revised drinking water regulations.
- Distribute the federally-required annual water quality report, the Consumer Confidence Report (CCR), to all households.

II. Wastewater Quality and System Performance - The Planning Department's purview and function supports all the goals associated with this strategic priority.

- Provide cost-effective and timely mapping, modeling, data analysis, and regulatory review services to support decision-making on operational, planning, environmental, and regulatory issues
- Oversee implementation of the wastewater meter upgrade project.
- Update the MWRA wastewater maps, and produce an updated atlas. Participate in efforts to update selected water record plans and real estate records.
- Comply with I/I mapping and planning requirements in state environmental regulations and NPDES permits; submit I/I control plan for MWRA collection system by 12/31/17.
- Continue coordination with member communities for distribution of grants and loans for local sewer, water, and lead service line removal projects.

III. Infrastructure Management and Resilience

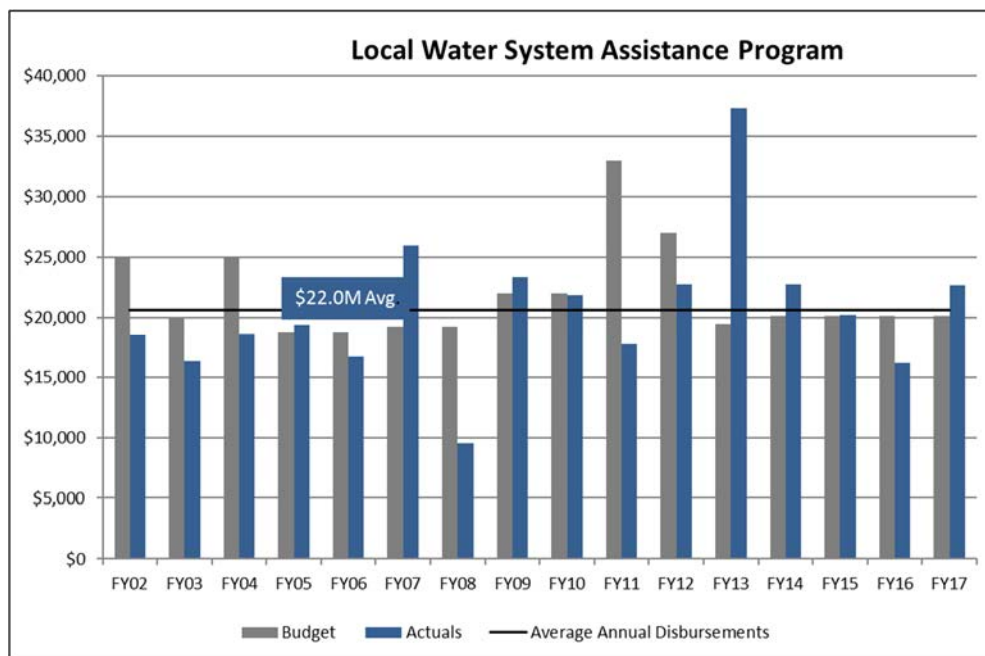
- **Goal #9 – Capital Improvements:** Move forward with design and construction of major wastewater infrastructure rehabilitation and renewal projects.
- **Goal #10 – Emergency Preparedness:** Prepare for catastrophic events that could affect the water and wastewater delivery systems.
 - Update the Water and Wastewater Master Plan with extensive coordination across all MWRA Departments.
 - Provide cost-effective and timely mapping, modeling, data analysis, and regulatory review services to support decision-making on planning, regulatory, and infrastructure issues

V. Environmental Sustainability - The Planning Department's purview and function supports all the goals associated with this strategic priority by directing and managing MWRA's planning processes including water system expansion planning, and climate change adaptation and mitigation efforts.

- Provide cost-effective and timely mapping, modeling, data analysis, and regulatory review services to support decision-making on sustainability issues.
- Update reports on greenhouse gas tracking and energy efficiency efforts and maintain a sustainability section on MWRA's web page.
- Work with state and regional organizations and academic institutions to identify how MWRA's existing long-term environmental data sets can be used to help assess and project impacts of climate change.
- Continue to provide assistance to communities seeking admission to the MWRA's water system or seeking emergency withdrawals.

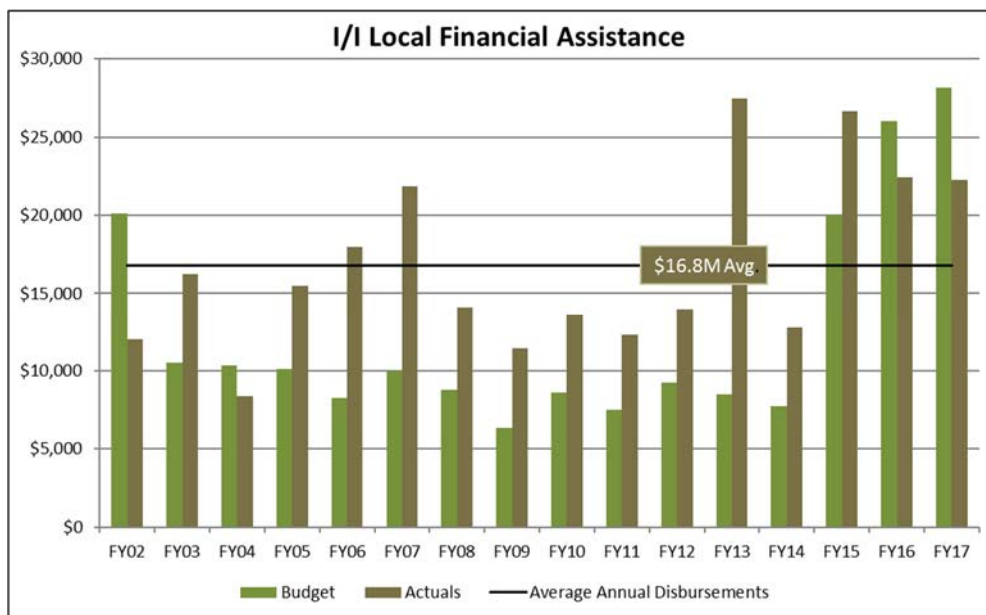
FY17 Accomplishments:

- Distributed \$28.7 million in Local Water System Assistance Program interest-free loans to member water communities including \$6 million under the Lead Service Line Replacement Loan Program. In total, MWRA has distributed \$351 million in loans to 39 of the 45 eligible water communities. Since 1998, 511 miles of local water main have been replaced or cleaned and lined (about 8% of the regional system) via projects funded by MWRA's financial assistance.



- Assisted more than 15 municipalities in the MWRA's service area with leak detection in their systems in FY17.
- Kicked off and coordinated outreach and reporting for new 'lead-in-schools' sampling program.
- Conducted major community briefings on lead issues.
- Planning Department staff have been active in state and federal review of the Total Coliform rule and Lead and Copper Rule as well as other proposed rule changes.

- Completed the Annual Water Quality report in June; distributed to homes and posted on MWRA’s website. Additional focus this year on lead-related issues and last year’s drought.
- Awarded design and installation contract for upgrade of ~ 225 permanent wastewater meter sites.
- Distributed \$22.3 million in grants and interest-free loans to member sewer communities. In total, MWRA has distributed a total of \$333 million in grants and loans to sewer communities with participation from all 43 municipalities.



- Provide computer modeling support for major capital programs including the Metropolitan Tunnel Redundancy Project and the CSO Program performance evaluation.
- Completed MWRA’s Greenhouse Gas Inventory and published the report on MWRA’s website. In FY17, MWRA reduced its Greenhouse Gas emissions by ~4,357 metric tons by implementing over 16 energy conservation projects.
- Staff participated with regional regulators and scientists on development of an Integrated Sentinel Monitoring Network (ISMN) identifying key datasets and parameters that can be used to identify climate change impacts.
- Provided assistance with the Water System Admission process to the following communities: North Reading, Ashland, and the Weymouth Naval Air Station Redevelopment (now called Union Point).

Budget Highlights:

- The FY18 Final Budget is \$3.7 million, a decrease of \$40,000 or 1.0% as compared to the FY17 Budget. The Planning Department includes funding for two sub cost centers: the Planning Unit and the Meter Data Unit.
- \$3.1 million for **Wages and Salaries**, an increase of \$102,000 or 3.4% as compared to the FY17 Budget primarily due to wage increases. The FY18 Final Budget also includes \$6,300 for summer interns to assist with preparation of the temporary metering contract.
- \$173,000 for **Maintenance**, a decrease of \$65,000 or 27.4% as compared to the FY17 Budget. Reduced funding is primarily due to the wastewater community testing temporary metering which is transitioning to a new contract during FY18.
- \$9,500 for **Training and Meetings**, which is level funded as compared to the FY17 Budget. The budget covers participation in training and conferences primarily focused on water quality regulations and geographic information systems.
- \$800 for **Professional Services** costs associated with the translation of the Consumer Confidence Report (CCR) and also programming of the GIS user interface.
- \$164,000 for **Other Materials** which includes funding of \$140,000 for postage and mailing of the CCR, \$15,000 for water conservation kits, \$5,000 for mapping supplies, \$2,000 for office supplies, \$1,000 for vehicle expenses, and \$750 for work clothes for employees in the Meter Data section.
- \$283,000 for **Other Services**, a decrease of \$58,000 or 17.1% as compared to the FY17 Budget. The budget reduction is primarily due to telephones for meters which continue to be half the cost than in previous years due to the transitioning to one service for all telephone lines for meters in the Meter Data Unit. The also includes \$100,000 for printing of the CCR, \$10,000 for printing water conservation and other informational brochures, and \$2,300 for Memberships and Dues for department employees.



Law Division
Budget

LAW DIVISION

Law

Legal Reviews
Litigation
Court Order Compliance
Environmental Regulation

The Law Division provides legal counsel to the Board of Directors, the Executive Director, and staff on compliance with federal and state laws, regulations, court cases, and administrative orders. Staff also handle and provide assistance with respect to litigation matters, real estate matters, labor/employment issues, procurement, and construction issues. The General Counsel interprets the MWRA Enabling Act and provides advice on conflict of interest and Code of Conduct issues. Division attorneys monitor the work of outside counsel when it is necessary to retain such services.

Law Division staff, though usually representing MWRA in a defensive posture, also work with Operations Division staff to effectuate cost recovery claims for design errors and omissions. In addition, the Law Division assists in the early resolution of contractor and vendor claims prior to litigation so as to resolve them as favorably and early as possible thereby reducing or eliminating litigation costs and interest payable.

FY18 Final Current Expense Budget						
LAW DIVISION						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 1,642,863	\$ 1,647,085	\$ 1,734,478	\$ 1,763,935	\$ 29,457	1.7%
OVERTIME	572	4,945	-	-	-	-
TRAINING & MEETINGS	787	1,622	1,000	1,000	-	0.0%
PROFESSIONAL SERVICES	88,186	366,643	200,000	508,000	308,000	154.0%
OTHER MATERIALS	4,892	4,160	5,984	5,984	-	0.0%
OTHER SERVICES	26,653	20,479	25,947	27,947	2,000	7.7%
TOTAL	\$ 1,763,952	\$ 2,044,933	\$ 1,967,409	\$ 2,306,866	\$ 339,457	17.3%

FY18 Goals and Initiatives:

The Law Division supports the MWRA’s achievement of all five key strategic priorities set forth in the FY16-FY20 Five-Year Strategic Business Plan. For FY18, the Division has identified the following goals and initiatives:

- Provide timely and cost effective resolution of legal disputes involving MWRA, through litigation or alternative means of dispute resolution.
- Provide high quality legal services to support the business and operational needs of MWRA in the areas of real estate, labor and employment, regulatory compliance, litigation, construction, and business law.

- Advocate for MWRA interests in new and developing regulatory issues.
 - Provide legal support, and retain outside counsel as necessary to address co-permittee concerns with the anticipated new Deer Island NPDES permit.
- Exhaust all opportunities to shift costs of legal representation to insurers and indemnitors and to litigate insurance coverage disputes as they arise, all in the interest of cost savings.

FY17 Accomplishments:

At its meeting of May 8, 2017, the Board of Directors approved the filing of a Stipulation and Order in Federal Court and the signing of an agreement with NSTAR and HEEC regarding replacement of the existing Deer Island Cross Harbor electrical cable. The Federal litigation, stipulation and agreement are described below.

- Cross-Harbor Power Cable Litigation: Army Corps of Engineers v. NSTAR, HEEC and MWRA, C.A No. 16-11470-RGS: MWRA has been named as a defendant, along with NSTAR Electric Company, formerly known as the Boston Edison Company (“NSTAR”) and its subsidiary Harbor Electric Energy Company (“HEEC”), in a civil action brought in July 2016 (the “Federal Action”) by the United States of America, at the request of the United States Army Corps of Engineers (the “Corps”). The Federal Action seeks injunctive relief and civil penalties for alleged violations of the federal Rivers and Harbors Act of 1899 and the Clean Water Act, in connection with a permit issued to the defendants in September 1989 (the “1989 permit”) that authorized the installation of a submarine electric power cable that runs under the channel beds of the Reserved Channel and Boston Harbor and provides the primary source of electric power to the Deer Island Treatment Plant. NSTAR designed, constructed and installed the power cable, and it is an asset of HEEC under HEEC’s sole control, although the cost of the design, construction and installation was paid for by the Authority as part of the Boston Harbor Project. MWRA had become a co-permittee under the 1989 permit solely to facilitate the timely issuance of the 1989 permit to allow MWRA to meet the scheduling deadlines imposed in the Clean Water Act Case. The Corps asserted that NSTAR, HEEC and MWRA are in violation of the 1989 permit because the power cable, in places, was installed at depths less than those required by the 1989 permit. The failure of the power cable to be installed at the depths required by the 1989 permit would have prevented a proposed project involving the deep-draft vessel dredging of Boston Harbor to move forward. The federal action seeks injunctive relief ordering the defendants to comply with all terms of the 1989 permit, including the depth requirements, or ordering the defendants to remove the power cable. MWRA consistently maintained that the Authority had no responsibility for the design, construction or installation of the power cable and therefore has no responsibility for the costs of remediating the 1989 permit violations.

On May 24, 2017, a Stipulation agreed to among all parties to the lawsuit was “lodged” with the federal court. The Stipulation includes the substance of the resolution of all claims of all parties concerning the Army Corps allegations that the installed position of the existing power cable is not in conformance with the provisions of the Corps’ 1989 permit. The Stipulation includes a schedule calling for the placement of a new cable through which electric power will be provided to MWRA’s Deer Island facilities along a new route in Boston Harbor, but outside the Reserved Channel, and for the removal of portions of the existing cable to make way for upcoming dredging operations of Massport and the Army Corps. Just prior to the submission of the Stipulation, MWRA entered into an agreement with HEEC regarding MWRA’s obligations regarding payment for the new cable following discounts for: (i) the lack of full use of the existing cable by MWRA

for its expected remaining useful life, and (ii) for an over-payment made by MWRA to HEEC of the incentive payment for the successful “completion” of the placement of the existing cable allegedly “under budget” per the terms of the 1990 Interconnection Agreement among MWRA, HEEC and NSTAR. The Stipulation must remain “lodged” with the federal court for a thirty day public comment period to allow any non-party to pose objections to the agreement, after which the Stipulation will be formally accepted by and entered as an Order of the Court which will result in a general stay of the claims of all parties pending full performance of HEEC’s obligations with respect to installation of the new cable and removal of portions of the existing cable. MWRA will not be a permittee under a new Army Corps permit for the new cable and will have no responsibility with respect to permitting for or placement or construction of the new cable.

Budget Highlights:

The FY18 Final Budget is \$2.3 million, an increase of \$339,000 or 17.3%, as compared to the FY17 Budget. The increase to the Law budget occurs in two line items:

- \$1.8 million for **Wages and Salaries**, an increase of \$29,000 or 1.7%, as compared to the FY17 Budget, mainly due to contractual increases. The FY18 Final Budget includes funding for 16 positions, the same as the FY17 Budget.

LAW DEPARTMENT	FY17 FTEs	FY18 FTEs
LAW	15.5	15.5
TOTAL	15.5	15.5

- \$508,000 for **Professional Services**, an increase of \$308,000 or 154%, as compared to the FY17 Budget, based on anticipated spending in FY18 for outside legal counsel related to potential HEEC cable questions and potential Deer Island NPDES permit issues.



Administration Division Budget

ADMINISTRATION DIVISION

Administration

Director's Office
 Facilities Management
 Fleet Services
 Human Resources
 MIS
 Procurement
 Real Property and Environmental Management

The **Administration Division** is responsible for managing the support service functions of the Authority. Its departments support daily operations and maintenance and ensure the implementation of the Authority's long-term goals and strategies.

FY18 Final Current Expense Budget							
ADMINISTRATION							
LINE ITEM	FY15	FY16	FY17	FY18	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18		
WAGES & SALARIES	\$ 11,939,698	\$ 12,346,277	\$ 13,357,147	\$ 13,653,153	\$ 296,006	2.2%	
OVERTIME	130,645	99,637	62,964	81,971	19,007	30.2%	
FRINGE BENEFITS	18,244,973	19,047,398	20,167,117	20,919,160	752,043	3.7%	
WORKERS' COMPENSATION	2,307,123	2,350,369	2,344,190	2,322,980	(21,210)	-0.9%	
UTILITIES	98,846	116,670	114,229	119,237	5,008	4.4%	
ONGOING MAINTENANCE	3,942,483	4,123,573	4,868,199	4,705,896	(162,302)	-3.3%	
TRAINING & MEETINGS	226,456	183,744	201,991	166,541	(35,450)	-17.6%	
PROFESSIONAL SERVICES	491,663	696,524	971,922	1,302,153	330,231	34.0%	
OTHER MATERIALS	1,074,880	1,089,384	1,217,717	1,652,301	434,584	35.7%	
OTHER SERVICES	3,304,073	3,163,677	3,331,442	3,503,208	171,766	5.2%	
TOTAL	\$ 41,760,840	\$ 43,217,254	\$ 46,636,917	\$ 48,426,600	\$ 1,789,683	3.8%	

The Administration Division is comprised of seven departments: Director's Office; Facilities Management; Fleet Services; Human Resources; Management Information Systems (MIS); Procurement; and Real Property and Environmental Management.

FY18 Final Current Expense Budget							
ADMINISTRATION by Department							
DEPARTMENT	FY15	FY16	FY17	FY18	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18		
ADMIN DIRECTOR'S OFFICE	-	153,254	154,402	234,148	79,746	51.6%	
HUMAN RESOURCES	22,797,542	23,638,247	24,862,437	25,597,088	734,650	3.0%	
MIS	10,162,225	10,345,574	12,359,507	13,015,038	655,531	5.3%	
FACILITIES MANAGEMENT	2,312,496	2,321,285	2,488,673	2,511,723	23,049	0.9%	
FLEET SERVICES	1,775,292	1,620,246	2,002,630	2,171,000	168,370	8.4%	
PROCUREMENT	4,064,066	4,470,678	4,126,009	4,097,546	(28,463)	-0.7%	
REAL PROPERTY / ENVIRONMENTAL MGMT	649,218	667,971	643,258	800,058	156,800	24.4%	
TOTAL	\$ 41,760,840	\$ 43,217,254	\$ 46,636,917	\$ 48,426,600	\$ 1,789,683	3.8%	

FY18 Goals and Initiatives:

Consistent with MWRA's Board approved FY16-FY20 Five-Year Strategic Business Plan, the Administration Division's FY18 goals are as follows:

IV. Finance and Management

- ***Goal #13 – Maintain an Excellent Workforce:***
 - Continue to expand on MWRA's in-house job shadowing and career development training programs in anticipation of critical retirements over the next several years
 - Continue to provide programs and procedures to ensure employee safety
 - Provide effective training necessary for employees to obtain and maintain required licenses and certifications to ensure a highly skilled workforce
 - Continue MWRA's efforts to develop new recruitment and retention strategies to foster diversity, including traditionally underrepresented categories, people with disabilities and veterans
- ***Goal #14 – Leverage Information Technology to Improve Organizational Effectiveness:***
 - Deliver Information Technology (IT) services and solutions efficiently and effectively
 - Provide IT solutions to streamline work processes while ensuring the security and integrity of MWRA data by leveraging the use of existing or emerging technologies
 - Maintain current technology hardware, software, and network infrastructure.
 - Maintain a secure technology environment.
- ***Goal # 12 Ensure Cost-Effective Operational and Resource Management:***
 - Maintain and expand MWRA-wide recycling efforts
 - Work with staff MWRA-wide to improve specifications development and documentation

V. Environmental Sustainability

- ***Goal #15 – Continue to maximize energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA's energy assets:***
 - Look for opportunities to incorporate energy efficiency measures into specifications for new construction, rehabilitation, and equipment replacement

In addition to these initiatives, the Administrative Division will begin procurement of the first phase of design services for the Metropolitan Tunnels Water Service Redundancy Project.

FY17 Accomplishments:

- Successfully negotiated and executed four successor Collective Bargaining Agreements.
- Successfully upgraded Maximo Asset Management, an enterprise asset management software platform used to track the operation and maintenance of MWRA's operating assets.
- Continued use of fuel diesel powered vehicles/equipment with bio-diesel. The MWRA is rated as one of the largest bio-fuel users by the Massachusetts Alternative Fuel Coalition (MAFC).

- Completed a variety of professional and technical trainings including trench safety offered to MWRA employees and employees of member communities in light of fatal construction related accidents in the Boston area.
- Competitively bid Class II Renewable Energy Portfolio Standard (RPS) certificates resulting in FY17 revenues of \$241,688.76. In addition, received FY17 revenues of \$893,388 from forward marketing of Class I and Solar Carve-Out RPS certificates.
- Awarded major Capital Improvement Program Contracts including engineering services for the design of the Nut Island Headworks Odor Control and HVAC Improvements and construction for Chelsea Creek Headworks Upgrade.

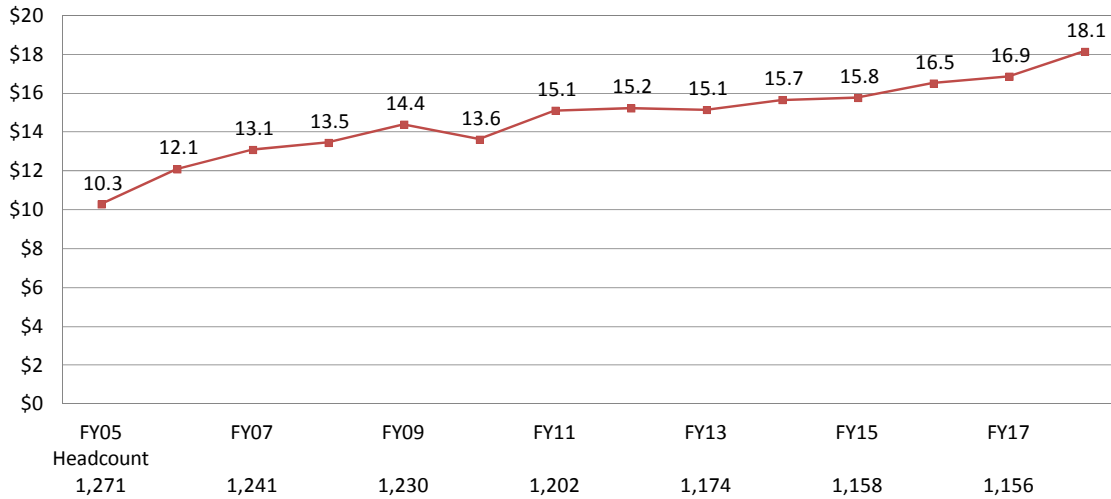
Budget Highlights:

The FY18 Final Budget is \$48.4 million, an increase of \$1.8 million or 3.8% as compared to the FY17 Budget.

- \$13.7 million for **Wages and Salaries**, an increase of \$296,000 or 2.2% as compared to the FY17 Budget. The FY18 Final Budget funds 143 positions accounting for 142 FTEs, one more than the FY17 Budget. The net increase in 1 FTE is the result of transferring one position from the Treasury Department to Fleet Services whose functions were more properly funded in Fleet Services.
- \$82,000 for **Overtime**, an increase of \$19,000 or 30.2% as compared to the FY17 Budget. The increase is primarily for snow emergency coverage.
- \$20.9 million for **Fringe Benefits**, an increase of \$752,000 or 3.7% as compared to the FY17 Budget. The main reason for the increase is the continuing rise in health insurance costs.

FTEs		
ADMINISTRATION by Department		
DEPARTMENT	FY17 FTEs	FY18 FTEs
ADMIN DIR OFFICE	1	2
HUMAN RESOURCES	18	17
MIS	55	57
FACILITIES MGMT	8	7
FLEET SERVICES	11	12
PROCUREMENT	44	43
REAL PROPERTY/ ENVIRONMENTAL MGMT	4	4
TOTAL	141	142

**Health Insurance Spending
(in millions)**



- \$2.3 million for **Workers' Compensation**, a decrease of \$21,000 or 0.9% as compared to the FY17 Budget. The Workers' Compensation budget is determined by using a three-year average of actual spending.

	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Budget	3 Year Average *
Worker's Compensation					
Compensation Payments	1,233,115	1,285,809	1,257,703	1,234,308	1,258,876
Medical Payments	863,294	851,280	850,170	922,191	854,915
Other	215,038	170,034	242,496	187,691	209,189
Total Worker's Comp.	2,311,447	2,307,123	2,350,369	2,344,190	2,322,980

* Three year average of FY14 Actuals, FY15 Actuals, FY16 Actuals

- \$119,000 for **Utilities**, an increase of \$5,000 or 4.4%, as compared to the FY17 Budget, due to higher budgeted electricity prices.
- \$4.7 million for **Maintenance**, a decrease of \$162,000 or 3.3% as compared to the FY17 Budget, due to decreased computer software licenses and upgrades costs following an FY17 Authority-wide upgrade of Microsoft Office suite.
- \$167,000 for **Training and Meetings**, a decrease of \$35,000 or 17.6% as compared to the FY17 Budget, primarily due to the transfer of Fleet Services training expenses to Professional Services where they are more appropriately budgeted.
- \$1.3 million for **Professional Services**, an increase of \$330,000 or 4.1% as compared to the FY17

Budget, primarily for MIS services.

- \$1.7 million for **Other Materials**, an increase of \$435,000 or 35.7% as compared to the FY17 Budget, primarily for computer hardware replacement.
- \$3.5 million for **Other Services**, an increase of \$172,000 or 5.2% as compared to the FY17 Budget. Included in the Other Services funding is \$1.8 million for Space/Lease Rentals for the Charlestown Navy Yard Headquarters and Marlboro warehouse, \$1.0 million for Telecommunications expenses for all facilities, and MIS and security data lines.

DIRECTOR'S OFFICE

The **Administration Division Director's Office** is responsible for the centralized support functions of procurement, human resources, management information systems, fleet services, facilities management, and real property and environmental management. Additionally, the Director's Office ensures compliance with applicable statutes, regulations, Authority policies and procedures, and contract terms.

FY18 Final Current Expense Budget							
ADMINISTRATION DIVISION DIRECTOR'S OFFICE							
LINE ITEM	FY15	FY16	FY17	FY18	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18		
WAGES & SALARIES	\$ -	\$ 152,939	\$ 154,078	\$ 233,824	\$ 79,746	51.8%	
OTHER SERVICES	-	315	324	324	-	0.0%	
TOTAL	\$ -	\$ 153,254	\$ 154,402	\$ 234,148	\$ 79,746	51.6%	

The Director's Office core functions are to:

- Manage and coordinate the Authority's support service functions
- Guide and coordinate division activities to support MWRA's goals and objectives
- Continuously improve processes and performance for greater efficiency

Budget Highlights:

The FY18 Final Budget is \$234,000, an increase of \$80,000 or 51.7% as compared to the FY17 Budget.

- \$234,000 for **Wages and Salaries**, an increase of \$80,000 or 51.8% as compared to the FY17 Budget, due to the transfer from the Procurement budget of the staff person supporting the Director of Administration. The FY18 Proposed Budget supports two positions, one more than the FY17 Budget.

FACILITIES MANAGEMENT

The **Facilities Management Department** provides a range of support services to MWRA staff located at the Charlestown Navy Yard (CNY).

Facilities Management is responsible for coordinating site management activities at CNY. Staff institute maintenance procedures, respond to facilities requests from building occupants, coordinate workspace planning, provide office furnishings, and develop and implement appropriate measures to ensure the safety of MWRA staff and protect and preserve MWRA assets.

In addition, staff provides administrative and office support services that facilitate the efficient use of MWRA resources. These responsibilities include providing and managing the motor pools at both the Chelsea Facility and CNY, general office equipment repairs, transportation, mail, and courier services. Staff coordinates MWRA parking programs and corporate Massachusetts Bay Transportation Authority (MBTA) pass programs.

FY18 Final Current Expense Budget							
FACILITIES MANAGEMENT							
LINE ITEM	FY15	FY16	FY17	FY18	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18		
WAGES & SALARIES	\$ 426,512	\$ 442,395	\$ 489,639	\$ 461,311	\$ (28,329)	-5.8%	
OVERTIME	44,493	37,842	24,154	40,000	\$ 15,846	65.6%	
FRINGE BENEFITS	85	-	-	-	\$ -	-	
UTILITIES	96,780	113,608	111,729	116,737	\$ 5,008	4.5%	
ONGOING MAINTENANCE	11,618	15,242	30,900	18,600	\$ (12,300)	-39.8%	
PROFESSIONAL SERVICES	-	-	7,500	4,000	\$ (3,500)	-46.7%	
OTHER MATERIALS	57,118	65,810	55,750	67,250	\$ 11,500	20.6%	
OTHER SERVICES	1,675,890	1,646,387	1,769,001	1,803,825	\$ 34,824	2.0%	
TOTAL	\$ 2,312,496	\$ 2,321,285	\$ 2,488,673	\$ 2,511,723	\$ 23,049	1.0%	

FY18 Goals and Initiatives:

IV Finance and Management

- **Goal #12 – Ensure Cost-Effective Operational and Resource Management:**
 - Assure a safe and well-maintained working environment for all MWRA staff at CNY and appropriate space for staff by coordinating workspace planning, design, and furniture acquisitions
 - Continue to coordinate with the CNY landlord on building improvements, including the replacement of windows on the 2nd floor, and staff to minimize the operational impact.

FY17 Accomplishments:

- Implemented facility improvements as provided in our lease agreement for CNY headquarters. FY17 included the replacement of half the windows in MWRA leased space.

- In conjunction with MIS, continued to look at ways to maximize efficiency of day-to-day office equipment such as printers, copiers, and facsimile machines.

Budget Highlights:

The FY18 Final Budget is \$2.5 million, an increase of \$23,000 or 1.0% as compared to the FY17 Budget.

- \$461,000 for **Wages and Salaries**, a decrease of \$28,000 or 5.8% as compared to the FY17 Budget, due to one less FTE, offset by contractual increases. The FY18 Final Budget funds seven FTEs, one fewer than the FY17 Budget.
- \$40,000 for Overtime, an increase of \$16,000 or 65.6%, based on actual spending for overtime in the past three years.
- \$19,000 for **Ongoing Maintenance**, a decrease of \$12,000 or 39.8% as compared to the FY17 Budget based on recent spending trends.
- \$1.8 million for **Other Services**, an increase of \$35,000 or 2.0%, as compared to the FY17 Budget, primarily for rental and operating costs for CNY headquarters facility.

FLEET SERVICES

The **Fleet Services Department** manages and maintains MWRA's motor vehicle and equipment fleet. The goal of the Fleet Services Department is to maintain MWRA's vehicle and equipment fleet to minimize downtime and extend the life of the assets. Fleet Services also manages the Chelsea fuel facility, the gas card program and the development and processing of specifications for new vehicles and equipment.

FY18 Final Current Expense Budget							
FLEET SERVICES							
LINE ITEM	FY15	FY16	FY17	FY18	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18		
WAGES & SALARIES	\$ 735,492	\$ 768,510	\$ 817,956	\$ 900,492	\$ 82,536	10.1%	
OVERTIME	8,728	3,918	11,000	11,000	-	0.0%	
FRINGE BENEFITS	120	28	250	250	-	0.0%	
UTILITIES	2,066	3,062	2,500	2,500	-	0.0%	
ONGOING MAINTENANCE	559,977	552,102	701,500	701,500	-	0.0%	
TRAINING & MEETINGS	38,850	17,500	42,000	-	(42,000)	-100.0%	
OTHER MATERIALS	429,160	273,609	425,825	553,659	127,834	30.0%	
OTHER SERVICES	900	1,516	1,600	1,600	-	0.0%	
TOTAL	\$ 1,775,292	\$ 1,620,246	\$ 2,002,630	\$ 2,171,000	\$ 168,370	8.4%	

FY18 Goals and Initiatives:

IV. Finance and Management

- **Goal #12 – Ensure Cost-Effective Operational and Resource Management:**
 - Continue to cost effectively maintain the Authority's fleet of vehicles and equipment.
- **Goal #13 – Maintain a Safe Workforce:**
 - Install rear safety reflective tape (Chevrons) on all Authority vehicles.

V. Environmental Sustainability

- **Goal #15 – Continue to maximize energy efficiency of MWRA operations, renewable energy production, and revenue generation opportunities using MWRA's energy assets:**
 - Integrate more alternative fueled vehicles into the Authority's fleet. Continue to install idle reduction devices in all Authority vehicles to comply with state and federal regulations.

FY17 Accomplishments:

- Developed specifications for new replacement vehicles and equipment the majority of which will utilize alternative fuel, consistent with the Authority's goal of purchasing environmentally friendly products.
- MWRA was once again rated as one of the largest bio-fuel users by the Massachusetts Alternative Fuel Coalition (MAFC) for its use of bio-diesel to fuel diesel powered vehicles/equipment with bio-diesel.
- Prepared documentation for the surplus sale of vehicles and equipment and worked with the Procurement Department for the auction and disposal of the vehicles/equipment.

- Awarded the replacement Automated Vehicle Locator (AVL) Tracking System contract for MWRA vehicles.
- Continued to work with MIS and Operations staff on the implementation of the Maximo asset management software system upgrade which includes a transportation module specifically designed for a fleet environment.

Budget Highlights:

The FY18 Final Budget is \$2.2 million, an increase of \$168,000 or 8.4% as compared to the FY17 Budget.

- \$900,000 for **Wages & Salaries**, an increase of \$83,000 or 10.1% as compared to the FY17 Budget, mainly for the transfer of one position from Treasury to Fleet Services whose functions were more properly funded in Fleet Services, and contractual increases, offset by the filling of a vacant position at a lower salary. The FY18 Final Budget funds 12 positions, one more than the FY17 Budget.
- **Training and Meeting** monies were moved to Human Resources budget under the Technical Training Professional Services budget. Human Resources manages and administers the contract for this training.
- \$554,000 for **Other Materials**, an increase of \$128,000 or 30.0% as compared to the FY17 Budget, due to consolidation of the EZ Pass transponders under Fleet Services. The FY17 Proposed Budget includes funds for vehicle/equipment fueling which is based on historical fuel usage and current pricing. Fleet Services procures bulk fuels from state contracts while continuing to meet all governmental alternative fuel directives. It should be noted that the volatility of fuel pricing could impact this line item.

HUMAN RESOURCES

The **Human Resources Department** is responsible for the overall management of MWRA employees. The Department enables employees to contribute successfully to MWRA's goals and objectives through effective recruitment, labor management, training, and employee benefits management.

FY18 Final Current Expense Budget						
HUMAN RESOURCES						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 1,784,493	\$ 1,686,914	\$ 1,755,894	\$ 1,668,055	\$ (87,839)	-5.0%
OVERTIME	209	17	-	-	-	-
FRINGE BENEFITS	18,243,431	19,046,856	20,166,567	20,918,610	752,043	3.7%
WORKERS' COMPENSATION	2,307,123	2,350,369	2,344,190	2,322,980	(21,210)	-0.9%
TRAINING & MEETINGS	4,119	9,583	3,263	3,263	-	0.0%
PROFESSIONAL SERVICES	435,440	516,642	559,422	642,153	82,731	14.8%
OTHER MATERIALS	11,095	18,264	20,820	25,820	5,000	24.0%
OTHER SERVICES	11,632	9,603	12,282	16,207	3,925	32.0%
TOTAL	\$ 22,797,542	\$ 23,638,247	\$ 24,862,437	\$ 25,597,088	\$ 734,650	3.0%

The Human Resources Department is comprised of 3 units:

- The **Employment, Compensation, Benefits and HRIS Unit** coordinates and oversees all external recruitment and selection activities including hiring, lateral transfers, and promotions to meet the business needs of MWRA; develops and coordinates MWRA compensation and benefits strategies and programs; and ensures the proper processing and recording of personnel actions. The compensation unit also ensures that all MWRA employees possess the necessary licenses and certifications required for their positions.
- The **Labor Relations Unit** is responsible for fulfilling MWRA's collective bargaining and contract administration obligations under Massachusetts' public sector collective bargaining law, and its workers' compensation responsibilities.
- The **Training Unit** develops, coordinates, delivers, and evaluates MWRA technical and professional development training programs and other programs designed to improve employee knowledge, skills, productivity, and the quality of workplace interaction and safety.

In addition, the Human Resources Department includes the Centralized Fringe Benefits cost center, which carries the budget for fringe benefits for all MWRA employees as well as for mandatory payments for unemployment expenses and Medicare.

FY18 Final Current Expense Budget

HUMAN RESOURCES by Unit

UNIT	FY15	FY16	FY17	FY18	Change	
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18	
EMPLOYEE/COMP/BEN	\$ 665,525	\$ 733,798	\$ 730,379	\$ 1,061,018	\$ 330,639	45.3%
LABOR RELATIONS	1,022,949	878,031	930,662	543,432	(387,230)	-41.6%
TRAINING	516,642	5,667,779	645,377	705,785	60,408	9.4%
CENTRALIZED FRINGE BENEFITS	20,592,426	21,458,638	22,556,020	23,286,853	730,833	3.2%
TOTAL	\$ 22,797,542	\$ 28,738,247	\$ 24,862,437	\$ 25,597,088	\$ 734,651	3.0%

FY18 Goals & Initiatives:

IV. Finance & Management

• **Goal #13 - Maintain an Excellent Workforce:**

- Attract and retain a qualified high-performance workforce, hire and promote qualified minority, female, and veteran employees, and offer a competitive total compensation package (salary and benefits) to all employees
- Maintain effective relationships with the unions representing the MWRA workforce while protecting and enhancing management flexibility. Ensure that collective bargaining objectives are met, support MWRA initiatives by designing and implementing appropriate labor relations strategies, and create an environment that fosters safety consciousness and productive work
- Design online employment on-boarding program
- Develop and implement an expanded orientation program
- Continue to provide programs and procedures to ensure employee safety
- Provide effective training necessary for employees to obtain and maintain required licenses and certification to ensure a highly skilled workforce
- Continue to expand on MWRA's in-house job shadowing and career development training programs
- Create programs with a focus on professional and leadership development

FY17 Accomplishments:

- Continued to support the agency's efforts in developing and implementing succession planning activities in anticipation of an increase in retirements over the next several years.
- Selected a vendor, designed and implemented online employment application program to expedite critical hiring.
- Expanded supervisory, professional, and career development training programs necessary to support succession planning initiatives including developing additional job shadowing training programs (Maintenance and Operations and Medium Voltage Programs).
- Redesigned and implemented updated employee orientation program for newly hired employees.
- Established Employee Recognition Program including Extraordinary Service Awards and Length of Service Award programs.

- Developed additional specialized recruitment sources to attract women, minorities, and veterans for difficult to fill positions including expanding social network recruiting capabilities.
- Completed a variety of professional and technical training to MWRA employees including Confined Space Entry, Hoisting License Mandatory Refresher Training, Wastewater & Water Operator Exam Prep, Wastewater OJT, OSHA 10-Hour Construction Safety, OSHA 8-Hour Annual Refresher, Supervisory Development, Business Writing, Vehicle Maintenance, , Workzone Safety, Spot Pond Start-up, Lockout/Tagout, Electrical Safety, CPR First Aid, Advance First Aid, Underground Storage Tanks, Hands-on Microbiology, Chemistry for Water & Wastewater, Harassment Prevention, Project Management Professional Exam Preparation, Excavation Safety Competent Person, Keolis & MBTA Track Safety, and Sampling for NPDES Permits & Process Control. Recertified 70 employees as Flaggers.
- Researched, selected and implemented Leadership Development Program.
- Provided training and guidance to MWRA managers in the areas of leave management, sick time use, time and attendance issues, and matters of employee conduct issues.
- Reduced future MWRA exposure on Workers Comp cases by 1.1 million through claim management and continued utilization of light duty work.
- Investigated complaints of violations of MWRA policies and Code of Conduct as necessary.
- Negotiated a new contract for Drug and Alcohol testing and contract amendment for dental insurance and the Employee Assistance Program (EAP).
- Successfully concluded three successor collective bargaining agreements for four bargaining units.

Budget Highlights:

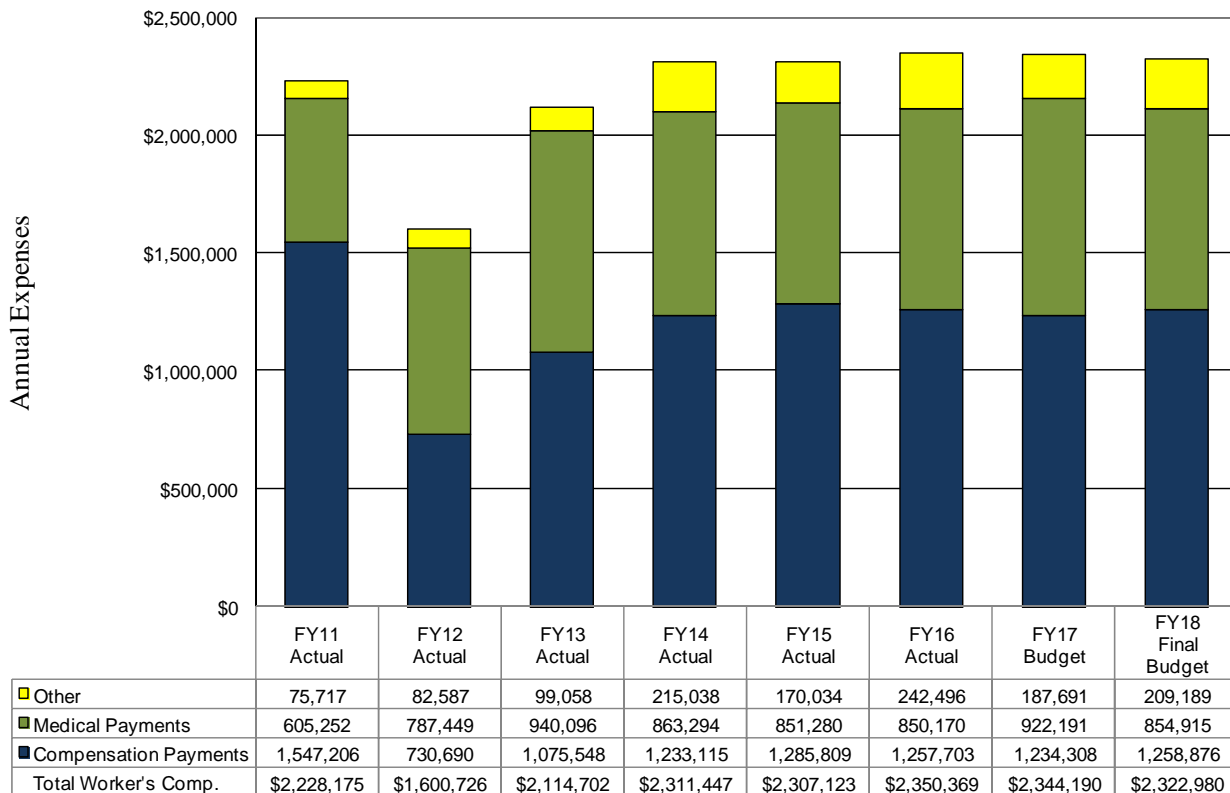
The FY18 Final Budget is \$25.6 million, an increase of \$735,000 or 3.0% as compared to the FY17 Budget.

- \$1.7 million for **Wages and Salaries**, a decrease of \$88,000 or 5.0%, as compared to the FY17 Budget, due to the transfer of two positions to Office of Emergency Preparedness in the Executive Division that had been supporting security functions, offset by contractual increases and the addition of one position in Employee Compensation. The FY18 Final Budget includes funding for 17 positions, one fewer than the FY17 Budget.
- \$20.9 million for **Fringe Benefits**, an increase of \$752,000 or 3.7%, as compared to the FY17 Budget, mainly for increases in health insurance costs. The FY18 Final Budget includes \$18.1 million for health insurance, \$1.4 million for Medicare, \$1.2 million for dental insurance, \$161,000 for unemployment insurance, and \$70,000 for tuition reimbursement.

	FY17 Budget	FY18 Budget	Difference
Fringe Benefits			
Overtime Meals	\$ 75,757	\$ 79,365	\$ 3,608
Health Insurance	17,499,190	18,139,271	640,081
Dental Insurance	1,121,933	1,160,985	39,052
Unemployment Insurance	160,744	160,744	-
Medicare	1,344,699	1,387,610	42,911
Tuition Reimbursement	40,000	70,000	30,000
Pension Expense			
Total Fringe Benefits	\$ 20,242,324	\$ 20,997,975	\$ 755,651

- \$2.3 million for **Workers' Compensation**, a decrease of \$21,000 or 0.9% as compared to the FY17 Budget. The Workers' Compensation expenses can be difficult to predict and the budget is based on an average of the prior three years of expenditures. Below is a graph showing actual expenditures beginning in FY11 and budgeted amounts for FY17 and FY18. The Human Resources Department is responsible for the management of this program and the coordination with the third-party administrator and legal counsel.

FY11-FY18 Workers' Compensation Trend



- \$642,000 for **Professional Services**, an increase of \$83,000 or 14.8% as compared to the FY17 Budget. The increase includes the transfer of \$40,000 previously budgeted in Fleet Services for training. The FY18 Final Budget includes \$358,000 for Professional Development and Technical Training, \$145,000 for Workers' Compensation Claims Administration and Legal Services, \$56,000 for Arbitrators and Arbitration Expenses, \$45,000 for Medical Evaluation Services, \$25,000 for the Employee Assistance Program, and \$13,000 for Specialized Investigation Services.

MANAGEMENT INFORMATION SYSTEMS (MIS)

The **MIS Department** provides MWRA with the secure information processing services necessary to carry out the Authority's mission. Applications in use range from financial to operational, and enhance MWRA's ability to access data and improve internal controls, reporting, and management performance. In addition to computing and telephone systems, the department also provides library and records management services. The MIS department supports more than 1,150 MWRA users, including those at the Charlestown Navy Yard (CNY), Chelsea Facility, Deer Island Wastewater Treatment Plant, Southborough Facility, Carroll Water Treatment Plant, and other remote sites.

FY18 Final Current Expense Budget MANAGEMENT INFORMATION SYSTEM							
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18		
WAGES & SALARIES	\$ 5,048,011	\$ 5,210,551	\$ 5,781,333	\$ 6,049,426	\$ 268,093	4.6%	
OVERTIME	45,758	46,020	2,810	6,000	3,190	113.5%	
FRINGE BENEFITS	893	200	-	-	-	-	
ONGOING MAINTENANCE	3,078,530	2,918,266	4,135,799	3,985,797	(150,002)	-3.6%	
TRAINING & MEETINGS	179,569	152,823	146,528	146,528	-	0.0%	
PROFESSIONAL SERVICES	56,223	164,162	400,000	650,000	250,000	62.5%	
OTHER MATERIALS	453,031	594,297	577,972	868,222	290,250	50.2%	
OTHER SERVICES	1,300,210	1,259,255	1,315,065	1,309,065	(6,000)	-0.5%	
TOTAL	\$ 10,162,225	\$ 10,345,574	\$ 12,359,507	\$ 13,015,038	\$ 655,531	5.3%	

FY18 Goals and Initiatives:

IV. Finance and Management

- **Goal #14 – Leverage Information Technology to Improve Organizational Effectiveness:**
 - Deliver Information Technology (IT) services and solutions efficiently and effectively
 - Provide IT solutions to streamline work processes by leveraging the use of existing or emerging technologies
 - Maintain current technology hardware, software, and network infrastructures.
 - Maintain a secure technological environment by ensuring the confidentiality, availability, and integrity of MWRA data.

The MIS Department divides the IT services that it provides into 4 programs. A description of each program and the specific initiatives in each are detailed below:

Information Technology Management Program

This program is intended to improve the Information Technology (IT) organization and the oversight processes for selecting, implementing and operating IT solutions throughout the MWRA. The FY18 initiatives are as follows:

- Establish a MWRA Software Development Life Cycle (SDLC) with the appropriate policies, procedures, standards, tools, and techniques to efficiently and transparently deliver development efforts on time and within budget.

- Implement a set of policies, procedures, standards, tools, and techniques which employ the best practices for Information Technology Service Management (ITSM).
- Complete the transition of application responsibilities to the appropriate team which matches the new organizational structure for the department.

Application Improvement Program

This program, along with associated projects, continues MWRA's efforts to update and enhance a wide range of applications to improve efficiencies of business processes and effectiveness of the staff while ensuring the availability and integrity of the MWRA's data resources. This program relates to 136 applications with 242 modules that support various business functions across the Authority. Sixty-six percent of these modules are commercially available off the shelf packages.

Administration and Finance Initiatives

- ***e-Discovery:*** A component of Enterprise Content Management (ECM) is underway with the pilot design and implementation of both the Enterprise Vault system archiving application and the Clearwell identification and collection electronic discovery application. These applications will provide the MWRA with rigorous and efficient electronic archiving, disposal processes that will improve the ability to meet the requirements associated with public records requests and litigation document/discovery production, and the accessibility of documents throughout the Authority.
- ***e-Construction:*** A component of ECM with a "proof of concept" being conducted with the Chelsea Creek Headworks Rehabilitation Project, the MWRA will initiate an e-Construction project to improve communication and make construction management practices more efficient. e-Construction is a paperless construction administration delivery process that includes electronic submission of all construction documentation by all stakeholders, electronic document routing/approvals (e-signature), and digital management of all construction documentation in a secure environment allowing distribution to all project stakeholders through mobile devices.
- ***Enterprise Resource Planning (ERP) System Upgrades:*** upgrades are scheduled for the e-procurement applications infrastructure, Mobile Supply Chain Management (MSCM), and the Business Software, Inc. Tax Factory application. In addition, a comprehensive version 10 ERP Upgrade will be undertaken. New include selecting new Time Entry system, , planning the replacement of the existing hardware platform to support a future upgrade to version 11, and choosing a replacement for the Budgeting Application to ensure vendor support.

Compliance Management Initiatives

- ***Electronic Laboratory Notebook (ELN):*** replace all paper log books with ELN.
- ***PIMS CROMERR Compliance:*** CROMERR provides the legal framework for electronic reporting under EPA's regulatory programs. MWRA must modify its Pretreatment Information Management System (PIMS) to transition to electronic reporting.

- ***Buoy Data Collection and Visualization Project:*** This effort will stream line the buoy data collection and management processes, to better meet MWRA needs related to data manipulation and export the data in a format matching DCR expectations.
- ***HOML Upgrade:*** Upgrade the the Harbor Outfall Monitoring and Loading database
- ***Oracle Discoverer Migration to SAP Business Objects (BO):*** Oracle is planning to end support of the Oracle Discoverer product and MWRA wants to switch to SAP BO technology. SAP BO has technical/functional capabilities similar to Oracle Discoverer. There are approximately 500-600 Oracle Discoverer Workbooks that need to be migrated to SAP BO.
- ***Real Property Upgrade:*** The Authority has over 800 real property records in PDF and/or TIF formats. Many of these real property records contain a legal description of the property and recorded plan(s) showing the property boundaries. The goal is to have the boundaries of these real property takings drawn and the corresponding data and map stored in MWRA's GIS database and be ESRI compliant.
- ***Contaminate Warning System (CWS) Upgrades:*** Upgrade the CWS operating systems, add new data storage and visualization capabilities and provide a more reliable collection and storage system.

System Integration and Data Warehousing Initiatives

- ***Geographic Information System (GIS) Integration:*** integrate the GIS spatial technology into business and operational applications and determine an overall strategy for delivering spatial real-time dashboards for managing the MWRA infrastructure.
- ***Management Dashboards & Reporting:*** These projects consolidate administrative management dashboards and reporting tools to assist in management of the day-to-day operations and to provide data to assist in Authority-wide decision making.

Operations Management Initiatives

- ***PI:*** Upgrade the current system which is running on “end-of-life” hardware and server operating system (OS).
- ***Telog:*** The Enterprise Telog system currently communicates over the internet. The communication infrastructure will be moved to a private wireless network as is done with the Contaminate Warning System.
- ***Water Quality Reporting System (WQRS)/AQUARIUS Upgrade:*** The Application vendor support is expiring and this initiative is to upgrade the system to maintain vendor support and enhance WQRS application.

Information Security Program

This program focuses on the strength, resiliency, and sustainability of MWRA's cyber security practices for its data and computing-related assets. The program also monitors for and protects against penetrations,

intrusions, and malicious actions from both internal and external threats. The projects associated with this program continue to assess, implement, and improve MWRA's information security protections, including recommendations to improve each IT system's security profile. The following are the FY18 projects under this program:

- ***Phase 2 of the Information Security Program Implementation:*** Phase 2 of this program focuses on the review and formalization of draft information security policies, standards and procedures into daily operations.
- ***Secure Media Destruction Program Improvements:*** With the changes in technology and business processes, there has been a decrease in the volume of requests for digital media destruction. It is anticipated that the number of requests will continue to decline, however the need to standardize this program still exists.
- ***Branch Office VPN Replacement:*** The hardware appliance providing network connectivity from the smaller branch offices is approaching end of support and product life. This initiative will explore VPN technologies to replace the existing solution.

Technology Infrastructure Improvement Program

The MWRA currently owns and operates 1,450 desktops, 184 laptops, 235 servers, 20 Wide Area Network Circuits and associated equipment. It also manages in excess of 23 Terabytes (TB) of data of which 8 TBs are stored in 148 database schemes and an additional 15 TB of unstructured data are stored on file shares. This program will assess and implement consolidated and optimized versions of these core IT infrastructure elements as utility-like services and commodities. Furthermore, it will look to improve and optimize data management practices including: storage, backup, and archive and purge processes and technologies. The following projects are currently under way:

- ***Server Consolidation and Virtualization:*** Continuation of "Green Data Center" initiatives, including virtualizing more physical servers and reducing the variety of application infrastructure component versions and manufacturers (like web servers, application servers, and database servers). The major focus for FY18 will be on the restructuring of existing VM hosts to support vision for same Dev/Test/DR and Prod for all functional areas. This will be an ongoing effort as new technologies are introduced and business tools are developed.
- ***Network Convergence:*** Explore new technologies for future implementation considerations including new networking technologies for upcoming network upgrade, web and mobile platforms for business and information services, and Voice-Over-IP (VOIP) for communications.
- ***Network Storage Improvements:*** Plan for the migration and implementation for consolidation of new storage requirements for archiving, and implement e-discovery services.
- ***Office Automation Refresh Program:*** Desktop, mobile, printers, MFD etc. FY18 is targeted for a complete hardware and operating system upgrade for PCs.

- **Workforce Mobilization:** Continue to explore new technologies and hardware platforms to improve efficiencies in business process. Target business units for this initiative are Engineering and Construction, Water and Wastewater Operations, Maintenance, Warehouse and Property Pass.
- **Central Data Repository:** Begin to develop a comprehensive Data Model that can act as a single central data repository for all MWRA applications.
- **Enterprise Application Integration (EAI):** Establish a dynamically scaling Enterprise Service Bus (ESB) technology product, implemented as an Integration Platform for select MWRA applications. This will standardize data flow/data exchange format and integrate disparate MWRA applications to the ESB and hence to the Central Data Repository.

FY17 Accomplishments:

Information Technology Management Program

- **MIS Reorganization:** With the hiring of a Manager of Application & System Development, other PCR amendments being approved by the Board, and the reassignment of business units to the appropriate managers, MIS has completed the organizational transformation recommended in the 5-year Strategic Plan. The transition of responsibilities for all applications is under way.

Application Improvement Program

- **Miscellaneous Lawson Support:** Successfully ran payroll at DITP Disaster Recovery Site using Bottomline and Century Bank, and tested and updated all three Infor/Lawson servers with mandatory BSI Tax software updates. Several staff attended two day NELUG (New England Lawson User Group) Conference. Installed/tested a new Disaster Recovery micro check printer for the Payroll and AP check applications on Deer Island. Upgraded the MUNEASE Bond Tracking application and SQL Server database. Scheduled and held six days of training and configuration workshops with the Portia vendor and users.
- **Talent Acquisition Application:** Implemented ApplicantPro, a 3rd party Talent Acquisition (Job Application) solution. Created training materials and provided training to agency-wide Hiring Managers.
- **Library Upgrade Project:** The new Library Resources Portal went live in December and staff ran brown bag user training sessions at various locations. The new Inmagic Presto and Genie system replaced several legacy MWRA Library applications with one commercial-off-the-shelf (COTS) application. Inmagic supports integrated management of print and electronic resources and provides a single web interface for searching across multiple internal and third party information assets.
- **Telog:** An update to the Telog Enterprise system is underway. This update will move the existing environment in DEV and Production to a newer virtualized hardware environment. Additionally, the Telog system will be moved into a MWRA hosted Private Network Subnet. A Web Telog module was implemented in March 2017 that displays meter report data to MWRA staff via the MWRA intranet Pipeline Home Page.

- ***Computerized Maintenance Management System (CMMS) Enhancements:*** The Maximo Upgrade from 5.2 to 7.6 was initiated in Q1 of FY16 and the project was expected to be completed in Q4 of FY17. Phase 1, Asset Management (for non IT Operations maintenance and support) went live in January 2017. The upgrade included the development and implementation of 19 Infor/Lawson - Maximo Interfaces significantly increasing the functionality of the original 4 interfaces and allowing the tracking of assets from cradle-to-grave and eliminating numerous standalone side systems (e.g. Property Pass database, Surplus database, Vehicle database). Phase 2, Maximo Anywhere and Maximo Spatial application implementation was completed in May 2017. Phase 1 and 2 are considered complete with only punch list items remaining. The project team also conducted combinations of basic, intermediate and advanced training classes to over 400 users. 90% of Maximo Crystal reports have been converted successfully to the new version. Phase 3, IBM Control Desk (ICD) will replace the existing IT Helpdesk application Support Magic, and workshops for end users have been completed. Implementation is scheduled for Q4 FY18.
- ***Electronic Laboratory Notebook (ELN):*** Deployed 15 ELN logs in production for Chelsea Laboratory Experiment. Began work on ELN logs for the Quabbin Laboratory. Phase 1 Drinking Water Labs, is 80% complete. The remainder 10% would involve deployment of the remaining 4 logs of the total of 20 ELN logs
- ***LIMS:*** Prepared responses for LIMS Data Reliability Assessment conducted by State Auditor's office.

Information Security Program

- ***End User Security Awareness:*** Computer Based Training was launched in Q3 of FY16 and ran through the end of the calendar year. In Nov2016 a second phishing drill was conducted to assess the effectiveness of the training. The drill results demonstrated 30% fewer employees took the bait when compared to the initial drill, validating the effectiveness of the training and the need to continue user awareness training. As a result, End User Security Awareness Computer Based Training was renewed in FY17.
- ***Authority Mobile Application Delivery Implementation:*** The Proof of Concept for the Mobile Application Delivery platform was completed successfully and a full production environment was implemented. 75 iPads and 208 iPhones are being managed with the associated Mobile Device Management platform and eighteen applications are being delivered through this platform.
- ***Secure File Delivery Implementation:*** The Proof of Concept in support of Secure File Delivery was completed successfully and a full production environment was implemented. 254 employees have been setup to use the Secure File Delivery software from desktops, laptops, and mobile devices. A job aid and a quick reference guide have been posted on the intranet (Pipeline).
- ***Managed Security Services:*** All "End of Life" Information Security technologies on the MIS network have been replaced. NWN Corporation in conjunction with Symantec will provide monitoring services for the aforementioned technologies through FY19.

Technology Infrastructure Improvement Program

- ***Distributed Antenna System (DAS):*** The design and implementation to improve external cellular coverage on DITP was completed in November 2016.
- ***Workforce Mobilization:*** 78 Mobile devices have been deployed to Engineering and Construction, Laboratory Services, Water and Wastewater Operations, and Maintenance. Leveraging the Mobile Device Management and Application Delivery platform, staff are able to access business applications while in the field.
- ***WiFi upgrades***This project upgraded and replaced all existing MWRA wireless access points in Vehicle Maintenance, Warehouse, and Laboratory Services. These systems had limited access, were administered independently, and had no redundancy. The design approach provided a resilient wireless network at all of the MWRA locations where WiFi was replaced, is centrally managed, and provides redundancy. The implementation of the WiFi network for these location is complete
- ***Office Automation Refresh Program:*** Desktop, mobile, printers, MFD etc. FY18 will replace 24 Multi-function devices at multiple location where the current 3 year leases are coming to an end. Also, in FY18 the engineering and planning for the desktop refresh will be completed with a role out of new PCs starting in Q1 of FY19.
- ***Desktop Microsoft Office Application Suite Upgrade:*** This project upgrades the version of Microsoft Office Applications on the desktop to Office 2016 and will target all desktops and laptops. This initiative started in March 2017 was completed in FY18
- ***Server Backup Software Replacement:*** The current server backup solution is complex, prone to issues and was not designed for highly virtualized environments. This initiative will implement a backup solution that will support all current server platforms, is intuitive and will provide a cost savings of more than \$300,000 over five years. Hardware, software and installation services are being procured for implementation. The effort will be in FY18.

Budget Highlights:

The FY18 Final Budget is \$13.0 million, an increase of \$656,000 or 5.3% as compared to the FY17 Budget.

- \$6.0 million for **Wages and Salaries**, an increase of \$268,000 or 4.6% as compared to the FY17 Budget. The FY18 Final Budget includes funding for two positions more than the FY17 Budget and contractual increases.
- \$4.0 million for **Ongoing Maintenance**, a decrease of \$150,000 or 3.6%, as compared to the FY17 Budget. The FY17 budget included \$424,000 for the Authority-wide upgrade of the Microsoft Office suite. That amount is eliminated from the FY18 budget. However, a number of software licenses and equipment are coming off warranty and will be requiring maintenance contracts offsetting a portion of the budget reduction.

- \$650,000 for **Professional Services**, an increase of \$250,000 or 62.5% the same as the FY17 Budget. Funding will support the improvement efforts for Water Quality Reporting System upgrade, CROMERR Implementation, and security system monitoring services.
- \$868,000 for **Other Materials**, an increase of \$290,000 or 50.2%, as compared to the FY17 Budget. The increase is to begin replacing the MWRA's PC's and Laptops as part of the five year MIS strategic plan.
- \$1.3 million for **Other Services**, a decrease of \$6,000 or 0.5%, as compared to the FY17 Budget. Funding of \$1.0 million for facility and security data lines, leases for multi-purpose copiers, faxes, and scanners, and Automatic Vehicle Locator (AVL) services.

PROCUREMENT

The **Procurement Department** provides timely and high quality services to all MWRA Divisions to enable MWRA programs to meet their public, production and schedule responsibilities. The Procurement Department is responsible for procuring materials, equipment, supplies, construction, professional, and non-professional services in a timely, efficient, and openly competitive process in accordance with MWRA applicable law and policies and procedures, including those related to meeting affirmative action goals. The Department also maintains a centralized, efficient, and cost-effective management of spare parts and operating supplies inventory.

FY18 Final Current Expense Budget							
PROCUREMENT							
LINE ITEM	FY15	FY16	FY17	FY18	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18		
WAGES & SALARIES	\$ 3,566,438	\$ 3,624,579	\$ 3,890,659	\$ 3,857,675	\$ (32,984)	-0.8%	
OVERTIME	31,457	11,841	25,000	24,971	(29)	-0.1%	
FRINGE BENEFITS	444	314	300	300	-	0.0%	
ONGOING MAINTENANCE	292,358	637,962	-	-	-	-	
TRAINING & MEETINGS	2,379	2,830	6,200	10,750	4,550	73.4%	
OTHER MATERIALS	124,420	137,126	136,700	136,700	-	0.0%	
OTHER SERVICES	46,570	56,026	67,150	67,150	-	0.0%	
TOTAL	\$ 4,064,066	\$ 4,470,678	\$ 4,126,009	\$ 4,097,546	\$ (28,463)	-0.7%	

The **Procurement Department** includes three operational units. The **Purchasing Unit** operates a competitive purchasing system for the procurement of materials, goods, and non-professional services in accordance with MWRA policies and procedures. The **Contract Management Unit** reviews, drafts, and negotiates contracts, amendments, and change orders for all professional, non-professional, and construction services contracts. Staff directs the bid, review, and selection process, and maintains a contracts database. The **Materials Management Unit** manages an Authority-wide inventory control and management system for better control, storage, distribution, and accounting of MWRA's inventory. The unit manages three regional warehouses/distribution centers that support all MWRA activities.

FY18 Goals & Initiatives:

IV. Finance & Management

- **Goal #11 - Ensure Financial Sustainability, Integrity, and Transparency:**
 - Continue to conduct strategic energy procurements for both the purchase of energy and sale of energy credits generated from MWRA energy production
- **Goal #12 – Ensure Cost-Effective Operational and Resource Management:**
 - Maintain a recycling program in order to contain MWRA operating costs by removing recyclable materials from the waste stream
 - Continue implementing electronic procurement for contract bids, with a focus on electronic bidding for professional services contracts and Massachusetts General Laws Chapter 149 construction projects with filed sub-bids.
 - Review and update policies and procedures for procurement of professional services, non-professional services and goods and materials

- Provide training to MWRA staff on various procurement policies and procedures including purchasing of goods and materials and consultant selection committee service
- Update construction contract documents

FY17 Accomplishments:

- Competitively bid Class II Renewable Energy Portfolio Standard (RPS) certificates resulting in FY17 revenues of \$241,688.76. In addition, received FY17 revenues of \$893,388 from forward marketing of Class I and Solar Carve-Out RPS certificates.
- Awarded major Capital Improvement Program Contracts including:
 - Engineering Services for
 - Prison Point CSO Facility Improvements;
 - Rehabilitation of Sections 23, 24 and 47 Water Mains;
 - Sewer Sections 4, 5, 6 and 186 Study;
 - DITP Motor Control Center and Switchgear Replacement;
 - Nut Island Headworks Odor Control and HVAC Improvements;
 - Shaft 12 Isolation Gate;
 - Dorchester Interceptor Sewer (Sections 240/241/242) Rehabilitation;
 - Cambridge Branch Sewer Study.
 - Commonwealth Ave Pump Station Improvements;
 - Emergency Action Plan Updates for Western Dams and Dikes;
 - Peabody Water Pipeline, Section 109 Extension;
 - Medford Water Section 57/50 and Sewer Sections 19, 20 and 21 Rehabilitation;
 - Wastewater Metering System Replacement.
 - Construction for
 - Chelsea Creek Headworks Upgrade;
 - Northern Intermediate High Sections 110 and 112 – Stoneham and Wakefield;
 - Section 80 Water Main Repair – Weston;
 - Chicopee Valley Aqueduct Intake Traveling Screen Replacement.
 - Personnel Dock Rehabilitation – DITP;
 - Reading Extension Sewer and Metropolitan Sewer Rehabilitation;
 - Western Operations Maintenance Facility – Marlborough
 - Section 14 Water Pipeline Relocation – Malden;
 - Northern Intermediate High Section 110 – Stoneham.
- Awarded Other Contracts Necessary for Operations and Maintenance, including:
 - Struvite, Scum, Sludge and Grit Removal Services at the DITP;
 - Purchase and Supply of Electric Power for MWRA's Profile Accounts;
 - Supply and Delivery of Sodium Hypochlorite to DITP;
 - Supply and Delivery of Sodium Hypochlorite to JJCWTP and Brutsch Facility;
 - Harbor and Outfall Monitoring 2017-2020;
 - Cooperative Research Project to Conduct Water Quality Monitoring in Cape Cod Bay;
 - Supply and Delivery of Ferrous Chloride to DITP;

- Management, Operation and Maintenance of the Union Park Pump Station/CSO Facility and Unmanned Stations;
 - Janitorial Services at the DITP; Chelsea Facility and Western Facilities;
 - Financial Audit Services;
 - Drug and Alcohol Testing Program;
 - Oxygen Generation Services – DITP;
 - Combustion Turbine Generator Maintenance – DITP.
 - Automated Vehicle Locator Tracking System;
 - Security Equipment Maintenance and Repair Services;
 - Electrical Equipment Testing Services – DITP;
 - Grit and Screenings Hauling and Disposal – DITP;
 - Surveying Services;
 - Electrical Testing and Technical Services – Metropolitan Boston;
 - Revenue Bond Consulting Engineer Services;
 - Insurance Policies, Bonds and Related Broker Services;
 - Appraisal Services.
- Continued to work with Deer Island Treatment Plant (DITP), Field Operations (FOD), and utility companies to establish energy conservation programs at DITP and FOD facilities utilizing various programs including the Green Communities Act and the utilities’ municipal programs. Continued to dispose of surplus scrap metal materials in an environmentally responsible manner.
 - Continued development of an electronic procurement bidding process.
 - Processed 8,128 purchase orders in FY17 for a total of \$40,276,058.
 - Procured 32 vehicles through the use of a “reverse auction” format.
 - Online vehicle and equipment auction process resulted in revenue of \$528,193.
 - Recycled 26 tons of batteries, 13.87 tons of paper, 214.48 tons of scrap metal, and 11,953 pounds of stainless steel, aluminum, brass, and copper, generating 41,050 in revenue.

Budget Highlights:

The FY18 Final Budget is \$4.1 million, a decrease of \$28,000 or 0.7% as compared to the FY17 Budget.

- \$3.9 million for **Wages and Salaries**, a decrease of \$33,000 or 0.9% as compared to the FY17 Budget, primarily for one fewer position that provided supported to the Administration Division Director and was transferred to the Director’s Office budget, offset by anticipated contractual increases. The position The FY18 Final Budget funds 43 positions, one less than the FY17 Budget.
- \$11,000 for **Training and Meetings**, an increase of \$5,000 or 73.4% as compared to the FY17 Budget, primarily for one additional manager to attend the annual NIGP (the Institute for Public Procurement) conference.

REAL PROPERTY AND ENVIRONMENTAL MANAGEMENT

The **Real Property and Environmental Management Department** negotiates the purchase or lease of real estate and land necessary to support MWRA's operations and capital projects in a timely and cost-effective manner, provides staff and others with current information regarding MWRA's real property rights, and manages the disposition of surplus real property in an efficient manner. Staff participates in site selection and negotiates acquisitions or easements. In addition, staff has developed and is maintaining the Real Property database, the compilation of more than 100 years of easements and land rights for the water and sewer systems. Department staff manages environmental regulatory compliance at MWRA facilities and provide special expertise and assistance to MWRA staff regarding air quality and hazardous material issues. Assistance includes management of oil and hazardous materials site assessment and remediation, air emission permit negotiations, and preparation and submittal of quarterly/annual monitoring reports.

FY18 Final Current Expense Budget						
REAL PROPERTY / ENVIRONMENTAL MANAGEMENT						
LINE ITEM	FY15	FY16	FY17	FY18	Change	
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18	
WAGES & SALARIES	\$ 378,752	\$ 460,389	\$ 467,588	\$ 482,371	\$ 14,783	3.2%
TRAINING & MEETINGS	1,540	1,008	4,000	6,000	2,000	50.0%
PROFESSIONAL SERVICES	-	15,720	5,000	6,000	1,000	20.0%
OTHER MATERIALS	56	279	650	650	-	0.0%
OTHER SERVICES	268,871	190,575	166,020	305,037	139,017	83.7%
TOTAL	\$ 649,218	\$ 667,971	\$ 643,258	\$ 800,058	\$ 156,800	24.4%

FY18 Goals:

The Real Property and Environmental Management Department supports the MWRA's achievement of all five key strategic priorities set forth in the FY16-FY20 Five-Year Strategic Business Plan.

FY18 Major Initiatives:

- Reevaluate actual hazardous waste generation rates at all applicable MWRA facilities in order to confirm appropriate MassDEP generator status with the goal of reducing compliance fees and any unnecessary reporting requirements.
- Coordinate implementation of the anticipated air quality operating permit renewal for the Deer Island Wastewater Treatment Plant.

FY17 Accomplishments:

Real Estate

- Provided ongoing real estate planning and services to acquire additional space to support the Chelsea facility. Identified nearby Commonwealth controlled parcel, conducted title research, and began process to transfer property from Commonwealth care and control to MWRA with DCAM and DCR.
- Provided real estate services for FRSA (licenses and easements) and for surplus of MWRA property (e.g. Commercial Point).
- Managed seven (7) permit agreements (five at Turkey Hill and two at Walnut Hill). Coordinated with Operations for approval of the equipment changes and improving the invoicing system for maintenance reimbursements. Total revenue for the seven agreements is \$440,000 of which MWRA and the host community each receive half.
- Provided real estate support to Operations and Public Affairs for issuance of 8M permits to 1) private entities requesting use of MWRA controlled land and 2) cities and towns applying to the Aqueduct Trails Program. Annual revenue from long term 8m permit totals \$71,300.
- Provided real estate services (appraisal, negotiation, survey review and/or planning) for: Section 14 waterline easement, Malden, in coordination with the City and a private developer, Southern Extra High Service Pipeline, Dedham (acquisition of temporary easements from two private property owners and permanent and temporary easements from MBTA; Reading Extension Sewer, Stoneham, (easement needs assessment), Meter 10 relocation on private property, Chelsea.
- Provided deed and title research, legislative review, document review with Law Division. Responded to in-house and public regarding ongoing inquiries regarding MWRA real estate rights.
- Provided strategic and technical support in concert with MIS and Planning's GIS group to prepare scope for consultant to upgrade and streamline Real Property data base to a state-of-the-art GIS map based interface. Continued updating records and adding to database on as-needed basis.

Environmental Management

- Continued with remediation and assessment of oil contamination at the Fore River Staging Area (FRSA) facility.
- Continued with the remediation assessment of the oil contamination resulting from the February 2010 spill at the Cottage Farm Combined Sewer Overflow (CSO) facility.
- Continued to provide technical support for the planned PCB abatement at the Chelsea Creek Headworks and provided support related to PCB encapsulation pilot testing.

- Provided support and oversight during construction for PCBs, lead paint, mercury, and asbestos abatement at the abandoned Westborough State Hospital Pump Station located on the grounds of the Carroll Water Treatment Plant.
- Continued to provide technical and regulatory coordination of the fuel tank maintenance contract. Installed a new piping sump at the Caruso Pump Station, completed one-time DEP-required integrity testing of all tank piping sumps and spill buckets, and general monitoring system repair and upgrades at other facilities. Continued with the MassDEP-required monthly inspection requirement for all underground fuel storage tank systems.
- Continued to work with the MassDEP and the responsible parties as site assessment and cleanup design continues at two hazardous material waste disposal sites that have impacts on the Sudbury Aqueduct.
- Initiated the 5-year updates to the Spill Prevention, Control, and Countermeasure (SPCC) Plan for the Gillis Pump Station and Prison Point CSO Facility. Incorporated these new and revised plans into the MWRA-wide SPCC annual training program. Completed annual inspections at eleven (11) MWRA facilities where oil is used and stored in accordance with the SPCC regulations.
- Continued to prepare, coordinate and oversee the completion of annual SPCC Plan training of over 200 MWRA oil handling staff and managers.
- Provided technical and environmental regulatory support regarding environmental regulatory compliance, contaminated soil and groundwater management, as well as geotechnical issues on various design and construction projects, including:
 - Northern Intermediate High project
 - Section 36 Watertown-Waltham Connection
 - Alewife Brook Pump Station facility upgrades
 - Southern Extra High Pipeline
 - Sudbury Aqueduct Rosemary Brook Siphon and Farm Pond facility rehabilitations
 - Section 56 Water Line Replacement
 - Section 50 and 57 Water Line Rehabilitation
 - Section 23, 24, and 47 Water Line Rehabilitation
 - Reading Extension Sewer Rehabilitation
 - Metro Water Transmission System Redundancy
 - Fuel storage tank installation design at the Quincy and Hingham Pump Stations
- Continued to provide ongoing regulatory technical support to Operations staff for the diesel oxidation catalyst-equipped engines at Cottage Farm, Prison Point, and CWTP including annual accuracy audits for each engine's monitoring systems, quarterly review of data to identify any non-compliant periods of operation, timely submission of semi-annual compliance reports to EPA and ensure scheduling of the performance retesting for the 4 engines at CWTP via operating hours monitoring in accordance with EPA guidelines.

- Completed air emissions compliance testing at the DITP's Secondary Odor Control facility including submission of an official test report to MassDEP in accordance with the monitoring and testing requirements of the DITP's operating permit.
- Completed a relative accuracy test audit of the Zurn Boilers 101 and 102 continuous emission monitoring system in accordance with the monitoring and testing requirements of the DITP's operating permit.
- Coordinate, schedule and complete emissions compliance testing program at the Biosolids Processing facility as required by the facilities air quality permit.
- Conduct an extensive review of the discussion draft of MassDEP's proposed regulations for greenhouse gas emissions including the submission of comments and questions via the MassDEP's on-line portal.
- Conducted an extensive review of new amendments to 112(r) of the Clean Air Act including a historical review of the original applicability determination by MWRA staff, to assess potential impacts to MWRA.
- Continued to prepare and submit quarterly, semi-annual and annual air monitoring and emissions compliance reports to EPA and DEP for DITP, Biosolids Processing Facility, Nut Island Treatment Plant, CWTP, Prison Point CSO and Cottage Farm CSO.
- Continued to provide technical and regulatory support in response to the Nut Island Headworks odor control system fire including continuous review of emissions data while the facility operates on carbon alone as the sole pollution control device.

Budget Highlights:

The FY18 Final Budget is \$800,000, an increase of \$157,000 or 24.4% as compared to the FY17 Budget.

- \$482,000 for **Wages and Salaries**, an increase of \$15,000 or 3.2% as compared to the FY17 Budget, for contractual increases. The FY18 Final Budget includes funding for four positions, the same as the FY17 Budget.
- \$6,000 for **Training and Meetings**, an increase of \$2,000 or 50.0% as compared to the FY17 Budget.
- \$305,000 for **Other Services**, an increase of \$139,000 or 83.7% as compared to the FY17 Budget. The increase is due to the estimate for the new environmental remediation contract.



Finance Division Budget

FINANCE DIVISION

Finance

Director's Office
Rates and Budget
Treasury
Controller
Risk Management

The **Finance Division** is responsible for managing the finance functions of the Authority. It performs a multitude of functions that support the daily operations and ensure the implementation of the Authority's long term goals and strategies. The Finance Division also ensures that a variety of fiscal management systems are in place to monitor and control the Current Expense Budget (CEB) and Capital Improvement Program (CIP).

FY18 Final Current Expense Budget						
FINANCE DIVISION						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 3,641,446	\$ 3,327,444	\$ 3,662,005	\$ 3,515,819	\$ (146,186)	-4.0%
TRAINING & MEETINGS	1,451	1,276	3,000	3,000	-	0.0%
PROFESSIONAL SERVICES	538,383	572,658	590,060	590,060	-	0.0%
OTHER MATERIALS	5,566	11,016	6,100	11,100	5,000	82.0%
OTHER SERVICES	7,283	5,696	6,615	6,365	(250)	-3.8%
TOTAL	\$ 4,194,129	\$ 3,918,090	\$ 4,267,780	\$ 4,126,344	\$ (141,436)	-3.3%

The Finance Division is comprised of five departments: Director's Office; Rates and Budget; Treasury; Controller; and Risk Management.

FY18 Final Current Expense Budget						
FINANCE by Department						
DEPARTMENT	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
DIR OFFICE (FINANCE)	\$ 378,113	\$ 250,203	\$ 244,575	\$ 271,722	\$ 27,147	11.1%
CONTROLLER	1,496,244	1,366,086	1,599,366	1,491,952	(107,414)	-6.7%
RATES AND BUDGET	830,770	820,478	880,037	902,959	22,922	2.6%
TREASURY	1,056,582	1,034,017	1,070,055	973,132	(96,923)	-9.1%
RISK MANAGEMENT	432,420	447,307	473,746	486,579	12,833	2.7%
TOTAL	\$ 4,194,129	\$ 3,918,090	\$ 4,267,780	\$ 4,126,344	\$ (141,436)	-3.3%

FY18 Goals & Initiatives:

The Finance Division supports the fourth key strategic priority set forth in the Authority’s FY 2016-2020 Strategic Business Plan.

IV. Finance & Management

- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**
 - Develop and implement long-term strategies to ensure assessment increases to MWRA’s communities are sustainable and predictable, both at the combined and at the water and wastewater utility level.
 - Continue to fund the pension at appropriate levels and address the Other Post-Employment Benefits.
 - Manage MWRA’s debt portfolio to contribute to the achievement of sustainable and predictable utility assessment increases.
 - Manage diversification strategy to insulate against overexposure and promote resiliency to changing market conditions.
 - Continue assessment and evaluation of sustainable cost savings opportunities throughout the organization.

FY17 Accomplishments:

- Developed the FY18 Final Budget consistent with the FY17 planning estimates, for both the Current Expense Budget and the Capital Improvement Program.
- Maintained MWRA’s strong credit ratings, Aa1, AA+, AA+ from Moody’s, Standard & Poor’s and Fitch respectively. MWRA’s credit ratings from all three major agencies are only one ratings step below the highest rating of AAA. These high credit ratings enable MWRA to borrow at very advantageous interest rates helping to minimize debt service expenses.
- Continued the Authority’s practice of using surplus funds to defease debt in future years as part of the long-term rate control strategy.

Budget Highlights:

The FY18 Final Budget for the Finance Department is \$4.1 million, a decrease of \$141,000 or 3.3% as compared to the FY17 Budget.

- \$3.5 million for **Wages and Salaries**, a decrease of \$146,000 or 4.0% as compared to the FY17 Budget, mainly due to two fewer FTEs, offset by wage increases. The FY18 Final Budget funds 36 FTEs, with one fewer FTE in each of the Controller and Treasury Department.

FTEs		
FINANCE by Department		
DEPARTMENT	FY17 FTEs	FY18 FTEs
DIR OFFICE (FINANCE)	2.0	2.0
CONTROLLER	16.3	15.0
RATES AND BUDGET	8.0	8.0
TREASURY	8.0	6.5
RISK MANAGEMENT	4.0	4.0
TOTAL	38.3	35.5

DIRECTOR'S OFFICE

The **Finance Division Director's Office** oversees a multitude of functions that support the daily operations and ensure the implementation of the Authority's long-term goals and strategies.

The Director's Office is responsible for the centralized financial functions of rates development, revenue collection, budgeting, capital financing, debt and investment management, accounting, payroll processing, and risk management. Additionally, the Director's Office ensures that transactions comply with all rules, regulations, Authority policies and procedures, and contract terms. The Director's Office manages the development and implementation of policies to uphold the efficient utilization of resources and control of all monies. The Director's Office provides advice and analysis to the Executive Director and the Board of Directors on all financial issues.

The division's continuing challenge in FY18 will be maintaining an agency-wide focus on balancing competing needs to minimize assessment increases while ensuring the provision of critical MWRA services.

FY18 Final Current Expense Budget FINANCE DIVISION DIRECTOR'S OFFICE							
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18		
WAGES & SALARIES	\$ 369,655	\$ 241,578	\$ 235,135	\$ 256,832	\$ 21,697	9.2%	
TRAINING & MEETINGS	1,361	635	3,000	3,000	-	0.0%	
OTHER MATERIALS	4,616	7,442	5,100	10,100	5,000	98.0%	
OTHER SERVICES	2,481	547	1,340	1,790	450	33.6%	
TOTAL	\$ 378,113	\$ 250,203	\$ 244,575	\$ 271,722	\$ 27,147	11.1%	

FY18 Goals and Initiatives:

IV. Finance & Management

- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**
 - Manage and coordinate the Authority's finance functions.
 - Identify and pursue optimization in all aspects of MWRA's financial operations.
 - Continue to fund the Pension Fund at the annual required contribution level and to develop strategies to address the growing Other Post-Employment Benefits.
 - Guide and coordinate division activities to support MWRA's goals and objectives.
 - Continuously improve processes and performance for greater efficiency.
 - Develop and implement long-term strategies to ensure sustainable and predictable assessments and charges to our communities at both the water and wastewater utility level.

Budget Highlights:

The FY18 Final Budget is \$272,000, an increase of \$27,000 or 11.1% as compared to the FY17 Budget.

- \$258,000 for **Wages and Salaries**, an increase of \$23,000 or 9.8% as compared to the FY17 Budget, reflecting mainly the addition of funding for interns/co-ops previously included at the Department level. The FY18 Final Budget funds two FTEs, the same as in FY17 Budget.

- \$10,000 for **Other Materials**, an increase of \$5,000 or 98.0% as compared to the FY17 Budget, mainly for an increase in office supplies based on actual spending and consolidating expenses in the Director's Office.

RATES AND BUDGET

The **Rates & Budget Department** provides the financial analysis that allows MWRA to translate its goals, and legal and financial commitments into cost-effective annual and multi-year programs and budgets. Department staff works closely with divisional staff to coordinate development of the long-term Capital Improvement Program (CIP) and monitor the progress of capital projects compared to projected schedules and budgeted spending. Staff also coordinates the development of MWRA’s annual Current Expense Budget (CEB) and monitors spending compared to the budget throughout the year. The Budget Department also manages the annual process of establishing water and sewer assessments to be paid by MWRA’s member communities and develops planning estimates of rate projections.

FY18 Final Current Expense Budget							
RATES AND BUDGET							
LINE ITEM	FY15	FY16	FY17	FY18	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18		
WAGES & SALARIES	\$ 829,846	\$ 818,871	\$ 878,912	\$ 901,534	\$ 22,622	2.6%	
OTHER MATERIALS	615	305	500	500	-	0.0%	
OTHER SERVICES	310	713	625	925	300	48.0%	
TOTAL	\$ 830,770	\$ 820,478	\$ 880,037	\$ 902,959	\$ 22,922	2.6%	

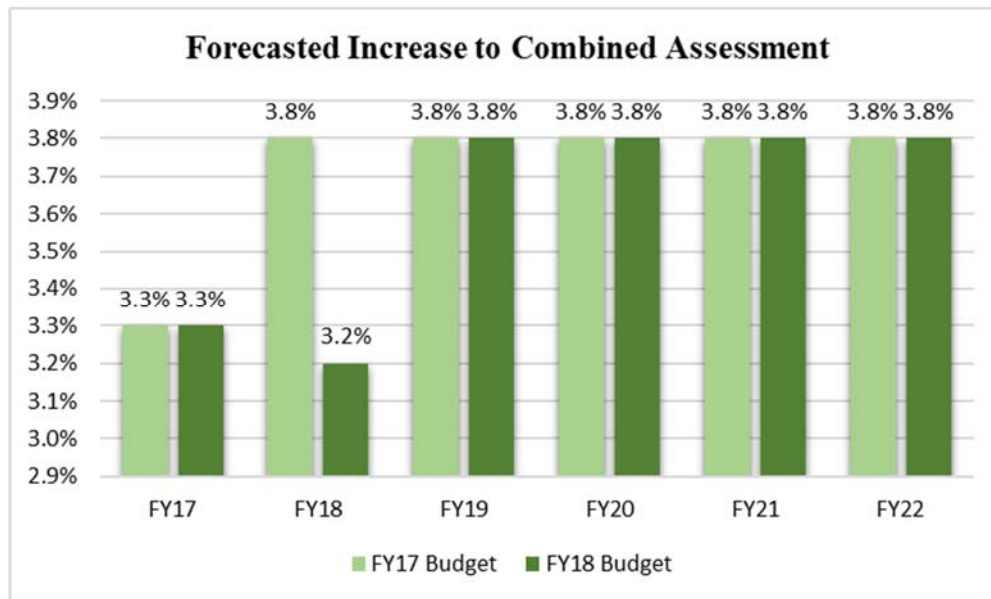
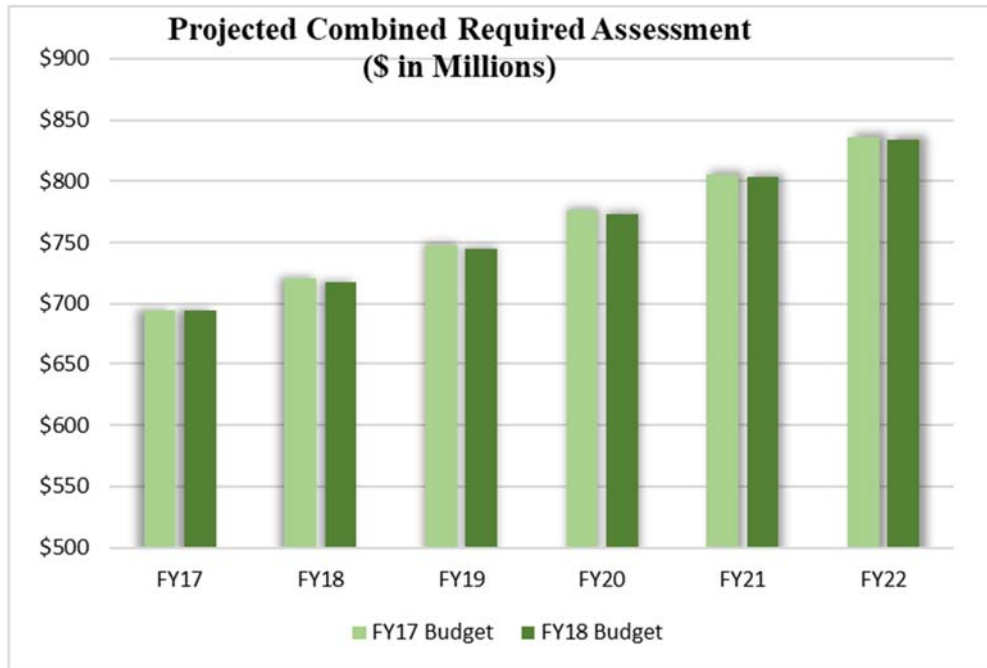
FY18 Goals and Initiatives:

I. Finance & Management

- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**
 - Continue long-term strategic budgeting practices to ensure predictable and sustainable sewer and water assessments and charges to our member communities at both the combined and the water and wastewater utility level.
 - Continue to employ budget and expense control practices to manage expenses.
 - Continue to enhance processes and the management of resources to deliver the final CIP and CEB timely and accurately.
 - Adhere to all MWRA policies, procedures, and administrative practices as well as all relevant statutory and regulatory authority, accounting, and budgeting principles.
 - Provide financial analysis as required.
 - Start the process of evaluating and selecting software applications to replace the CIP program.
 - Improve the quality and presentation of budget documents and regularly required reports while working to develop new reports that will aid the Authority’s Board of Directors, Management, and the MWRA Advisory Board.

FY17 Accomplishments:

- Developed the FY18 Final Budgets consistent with the FY17 planning estimates for both the Current Expense Budget and the Capital Improvement Program.



- Provided financial analysis for system expansion initiatives and preliminary long-term water redundancy options and for the new Deer Island cross-harbor electric cable negotiations with Eversource.
- Instituted monthly coordination meetings with Engineering and Procurement to review status of award and variances for on-going contracts for the CIP program.

Budget Highlights:

The FY18 Final Budget is \$903,000, an increase of \$23,000 or 2.6% as compared to the FY17 Budget.

- \$902,000 for **Wages and Salaries**, an increase of \$23,000 or 2.6% as compared to the FY17 Budget, for anticipated contractual increases. The FY18 Final Budget funds eight FTEs, the same as in the FY17 Budget.

TREASURY

The **Treasury Department** secures funds for ongoing operations and capital programs in addition to processing cash disbursements. Department staff collects revenue, disburses funds, and manages grant and loan programs in addition to debt issuance and investments.

FY18 Final Current Expense Budget						
TREASURY						
LINE ITEM	FY15	FY16	FY17	FY18	Change	
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18	
WAGES & SALARIES	\$ 705,338	\$ 609,604	\$ 674,195	\$ 577,422	\$ (96,773)	-14.4%
PROFESSIONAL SERVICES	348,072	418,966	394,060	394,060	-	0.0%
OTHER MATERIALS	183	2,050	300	300	-	0.0%
OTHER SERVICES	2,899	3,345	1,500	1,350	(150)	-10.0%
TOTAL	\$ 1,056,582	\$ 1,034,017	\$ 1,070,055	\$ 973,132	\$ (96,923)	-9.1%

FY18 Goals and Initiatives:

IV. Finance & Management

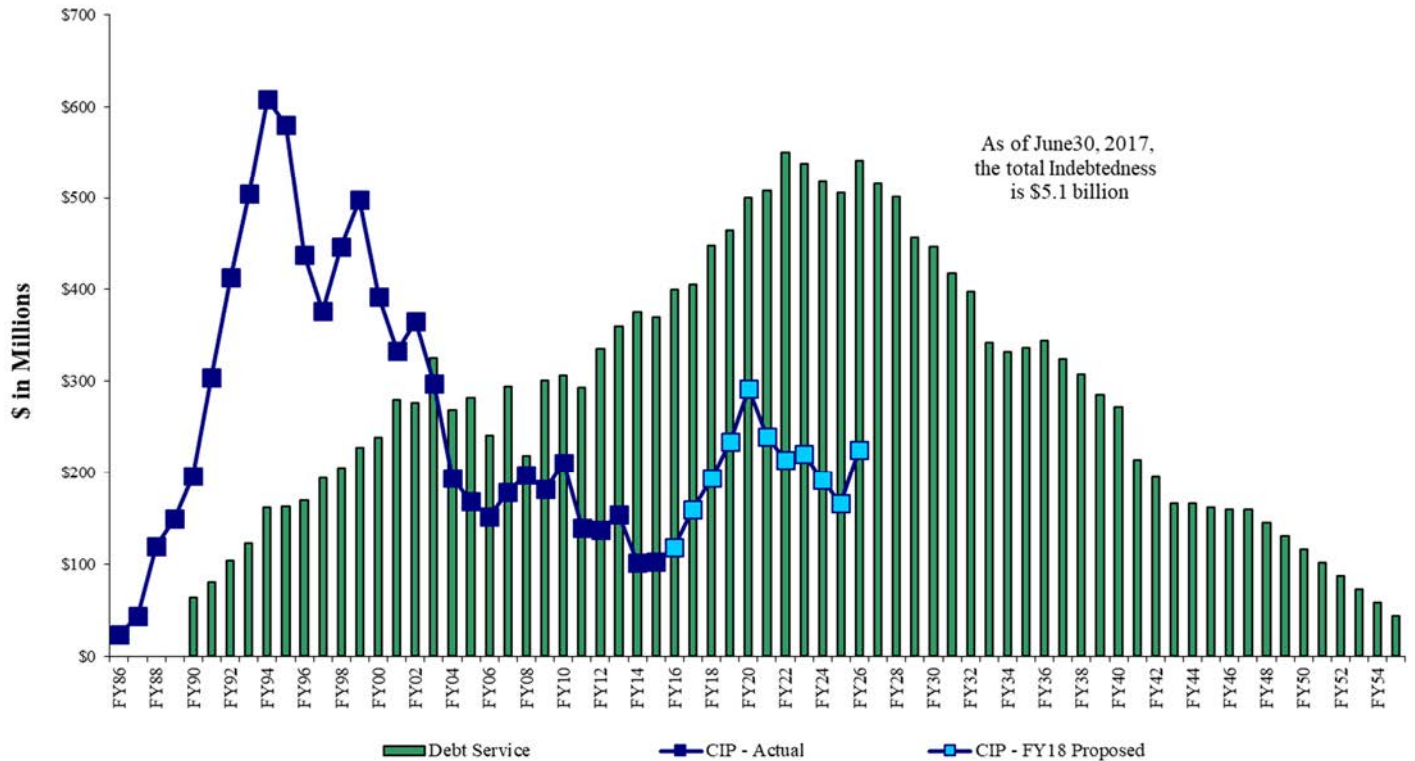
- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**
 - Manage debt and investment portfolio to maximize savings/returns in compliance with all applicable rules and regulations while maintaining compliance with the General Revenue Bond Resolution requirements regarding security and liquidity and contributing to the achievement of sustainable and predictable assessment increases.
 - Continue diversification strategy to insulate against overexposure and promote resiliency to changing market conditions.

FY17 Accomplishments:

- Completed a \$104.3 million refunding bond transaction on August 2, 2016. The refunding resulted in \$9.8 million or 9.6% present value savings and \$13.2 million in gross debt service savings over the life of the bonds.
- Executed an \$8.5 million defeasance of outstanding senior principal in September 2016. This defeasance reduced the debt service requirement between FY18 and FY20 by a total of \$9.7 million reducing the rate of increase to the Rate Revenue Requirement in those years.
- Completed a \$323.0 million refunding and new money bond transaction on May 18, 2017. The new money portion consisted of \$68.2 million in bonds which were deposited into the Construction Fund to pay for capital projects. The refunding for interest rates savings transaction totaled \$254.7 million. The refunded resulted in \$57.5 million or 20.7% present value savings and \$78.8 million in gross debt service savings over the life of the bonds. This refunding provided the second highest present value savings of any refunding since MWRA started issuing bonds in 1990
- Maintained MWRA's strong credit ratings, Aa1, AA+, AA+ from Moody's, Standard & Poor's and Fitch respectively. MWRA's credit ratings from all three major agencies are only one ratings step

below the highest rating of AAA. These high credit ratings enable MWRA to borrow at very advantageous interest rates which helps minimize debt service expenses.

MWRA Capital Improvement Spending & Debt Service



Budget Highlights:

The FY18 Final Budget is \$973,000, a decrease of \$97,000 or 9.1% as compared to the FY17 Budget.

- \$577,000 for **Wages and Salaries**, a decrease of \$97,000 or 14.4% as compared to the FY17 Budget, mainly due to the filling of vacant positions at lower salaries and funding seven FTEs in the FY18 Final Budget, one fewer than the FY17 Budget. The position, which is no longer funded in the Treasury Department was a position with shared duties with the Fleet Department within the Administration Division. The functions of the position were reviewed and the position has been moved to and is funded in the Fleet Department.

CONTROLLER

The **Controller Department** consists of the Accounting, Accounts Payable, Accounts Receivable, and Payroll units. The department has the responsibility for ensuring integrity within the financial accounting system and integration among the four functions. The department is also responsible for the appropriate treatment, classification, and reporting of the MWRA's assets, liabilities, revenues and expenditures in accordance with accounting principles generally accepted in the United States of America.

FY18 Final Current Expense Budget						
CONTROLLER						
LINE ITEM	FY15	FY16	FY17	FY18	Change	
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18	
WAGES & SALARIES	\$ 1,334,187	\$ 1,246,698	\$ 1,440,816	\$ 1,333,452	\$ (107,364)	-7.5%
PROFESSIONAL SERVICES	160,975	117,615	156,000	156,000	-	0.0%
OTHER MATERIALS	152	982	200	200	-	0.0%
OTHER SERVICES	930	791	2,350	2,300	(50)	-2.1%
TOTAL	\$ 1,496,244	\$ 1,366,086	\$ 1,599,366	\$ 1,491,952	\$ (107,414)	-6.7%

FY18 Goals and Initiatives:

IV. Finance & Management

- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**
 - Implement process efficiencies in all department units.
 - Enhance controls to safeguard Authority assets and ensure accurate and timely reporting.
 - Implement new cash management tool for recording cash transactions to General Ledger.
 - Continue to support management initiatives with underlying documentation and detail.
 - Implement any new or changed GASB standards as appropriate.
 - Manage the certification of Financial Statements by Independent Auditors.

FY17 Accomplishments:

- Successfully completed certified financial statement audit with no audit findings.
- Completed automation of multiple Payroll Department documents.

Budget Highlights:

The FY18 Final Budget is \$1.5 million, a decrease \$107,000 or 6.7% as compared to the FY17 Budget.

- \$1.3 million for **Wages and Salaries**, a decrease of \$107,000 or 7.5%, as compared to the FY17 Budget. Following a number of retirements in the last few years, the Controller Department reviewed the duties and functions of its employees. As a result, the FY18 Final Budget funds 15 FTEs, one fewer than the FY17 Budget.

RISK MANAGEMENT

The **Risk Management Department** is responsible for all MWRA insurance programs and risk management functions. Department staff manages all administrative functions relating to the initial reporting, processing, and resolution of construction contract claims and self-insured auto, general liability, and property damage claims. Department staff members are responsible for the annual procurement, renewals, and maintenance of all Authority-wide insurance policies and programs and for managing all aspects of MWRA’s contractor/vendor insurance certificate program. Department staff serves as liaisons to insurance industry participants including brokers, insurers, insurance consultants, and attorneys as well as providing support to all MWRA departments.

FY18 Final Current Expense Budget							
RISK MANAGEMENT							
LINE ITEM	FY15	FY16	FY17	FY18	Change		
	Actuals	Actuals	Final Budget	Final Budget	FY17 to FY18		
WAGES & SALARIES	\$ 402,420	\$ 410,693	\$ 432,946	\$ 446,579	\$ 13,633	3.1%	
PROFESSIONAL SERVICES	29,336	36,077	40,000	40,000	-	0.0%	
OTHER SERVICES	664	300	800	-	(800)	-100.0%	
TOTAL	\$ 432,420	\$ 447,307	\$ 473,746	\$ 486,579	\$ 12,833	2.7%	

FY18 Goals and Initiatives:

IV. Finance & Management

- **Goal #11- Ensure Financial Sustainability, Integrity, and Transparency:**
 - Secure the timely, cost effective renewal of Authority-wide insurance policies and contracts.
 - Minimize MWRA’s exposure to financial loss stemming from contractor and vendor activities by reviewing risk exposures and establishing contract insurance requirements and monitoring contractors/vendors for compliance.
 - Process self-insured automobile, general liability, property damage, and construction contract claims in an efficient and timely manner.
 - Provide support to all MWRA Departments on all insurance, claims, litigation and risk management issues.

FY17 Accomplishments:

- Successfully procured MWRA’s Insurance Program through a competitive bid process for all lines of coverage at a 1.4% reduction in program cost compared to the FY16 program.
- Staff renewed MWRA’s license to operate as a self-insured entity for workers’ compensation claims by completing the annual application process with the Division of Insurance.
- Received, investigated and processed more than 70 self-insured Automobile, General Liability and Property damage claims.

- Provided timely support to MWRA managers on all insurance, claims, litigation and risk management issues.

Budget Highlights:

The FY18 Final Budget is \$487,000, an increase \$13,000 or 2.7% as compared to the FY17 Budget.

- \$447,000 for **Wages & Salaries**, an increase of \$14,000 or 3.2% as compared to the FY17 Budget, for contractual increases. The FY18 Final Budget funds four FTEs, the same as in the FY17 Budget.



Appendices

APPENDIX A

DIRECT EXPENSES BUDGET LINE ITEM DESCRIPTIONS

MWRA's direct expenses budget funds the annual expenses of its operating and support divisions. Though the direct expenses budget is approximately 31% of MWRA's total budget, it is these expenses which directly support the provision of water and sewer services to MWRA's customers. The direct expense budget includes the annual costs of operating the water and sewer systems, and funds the policy direction, administrative, financial, and legal support services for MWRA's ongoing operations. The direct expenses budget also includes the personnel costs for management and oversight of MWRA's extensive capital programs.

There are 11 line items in the division budgets. The line items are:

Wages and Salaries - This line item includes funds for regular pay, shift differential, holiday pay, and standby pay for MWRA staff, as well as funds for interns and temporary staff.

Overtime - This line item includes funds for overtime related to operations, maintenance, emergencies, and training.

Fringe Benefits - This line item includes funds for health and dental insurance, unemployment compensation, Medicare, overtime meals, tuition reimbursement.

Workers' Compensation - This line item includes funds for compensation payments, medical payments, and settlements of compensation claims.

Chemicals - This line item includes funds for the chemicals used in water and wastewater treatment, such as sodium hypochlorite, soda ash, sodium bisulfite, and hydrofluosilicic acid.

Utilities - This line item includes funds for electricity, diesel fuel, and other utilities such as water and sewer services paid by MWRA to the towns in which it operates facilities.

Maintenance - This line item includes funds to purchase materials and services for the maintenance of MWRA's plants and machinery, water and sewer pipelines, grounds, and buildings.

Training and Meetings - This line item covers the costs of staff training, meetings, and professional seminars.

Professional Services - This line item funds outside consultants supporting MWRA activities, including engineering and construction services, laboratory and testing contracts, computer system consultants, and legal and audit services.

Other Materials - This line item includes funds for office materials, equipment, postage, laboratory supplies, MWRA vehicles, work clothes, and computer hardware and software.

Other Services - This line item includes funds for space leasing, health and safety initiatives, removal of grit and screenings from the sewerage system, and the contracted operation of MWRA's residuals processing plant.

FY18 Final Current Expense Budget MWRA Direct Expenses by Line Item						
LINE ITEM	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
WAGES & SALARIES	\$ 94,350,655	\$ 96,118,427	\$ 101,858,896	\$ 104,286,371	\$ 2,427,475	2.4%
OVERTIME	4,521,867	4,355,586	4,192,676	4,110,637	(82,039)	-2.0%
FRINGE BENEFITS	18,325,579	19,131,139	20,242,324	20,997,975	755,651	3.7%
WORKERS' COMPENSATION	2,307,123	2,350,369	2,344,190	2,322,980	(21,210)	-0.9%
CHEMICALS	9,749,142	9,297,550	9,110,407	9,836,932	726,525	8.0%
UTILITIES	21,073,529	18,744,867	21,541,077	21,735,224	194,146	0.9%
ONGOING MAINTENANCE	28,322,686	30,978,045	31,080,641	32,200,785	1,120,144	3.6%
TRAINING & MEETINGS	369,657	370,752	435,481	406,269	(29,212)	-6.7%
PROFESSIONAL SERVICES	4,950,866	5,886,715	6,531,939	7,221,622	689,683	10.6%
OTHER MATERIALS	6,060,042	6,186,216	6,219,630	6,692,659	473,028	7.6%
OTHER SERVICES	22,378,137	22,628,385	22,974,855	22,764,526	(210,329)	-0.9%
TOTAL	\$ 212,409,284	\$ 216,048,051	\$ 226,532,116	\$ 232,575,980	\$ 6,043,865	2.7%

FY18 Final Current Expense Budget MWRA Direct Expenses by Division						
DIVISION	FY15 Actuals	FY16 Actuals	FY17 Final Budget	FY18 Final Budget	Change FY17 to FY18	
EXECUTIVE	\$ 6,613,226	\$ 6,748,473	\$ 6,926,648	\$ 7,481,735	\$ 555,087	8.0%
OPERATIONS	158,077,138	160,119,301	166,733,363	170,234,435	3,501,073	2.1%
LAW	1,763,952	2,044,933	1,967,409	2,306,866	339,457	17.3%
ADMINISTRATION	41,760,840	43,217,254	46,636,917	48,426,600	1,789,683	3.8%
FINANCE	4,194,129	3,918,090	4,267,780	4,126,344	(141,436)	-3.3%
TOTAL	\$ 212,409,285	\$ 216,048,051	\$ 226,532,116	\$ 232,575,980	\$ 6,043,865	2.7%

Performance measures for all MWRA Divisions and Departments are published monthly in the MWRA “Yellow Notebook” and quarterly in the MWRA “Orange Notebook.” In addition, monthly financial staff summaries are presented to the Board of Directors reviewing monthly budget performance and explaining variances. All documents are available on-line at mwra.com.

APPENDIX B

BUDGET PROCESS AND TIMETABLE

MWRA operates on a fiscal year that starts July 1. The Current Expense Budget development process begins in September and, as described below, continues through a series of interactive reviews and revisions until June, when the Board of Directors approves the final budget. Throughout the formal budget process, MWRA staff maintains an ongoing dialogue with the Board of Directors and Advisory Board to discuss issues, the status of budget development, and other concerns.

MONTH	ACTIVITY
September	Divisions receive budget targets, guidelines, and manuals for the development of budget requests, and can begin to access MWRA's interactive budgeting system. For the CIP, Finance staff and the database administrator add new information to the budgeting system, review the data and develop a list of outstanding issues. Prepare budget packages for project managers. Finance managers and staff conduct general kick-off meeting and schedule meetings with specific project management teams to provide guidance and assistance with budget structure and updates.
October	All new projects being considered for inclusion in the CIP are reviewed by the COO and other senior management. Finance staff input all project updates received from managers to the budgeting system and prepare updated CIP budget packages for review and second-round edits by project managers.
November	Database administrator coordinates with the MIS department to produce a detailed incremental cash flow report. Finance managers and staff prepare budget overview materials including project budgets, schedules, and forecasted spending including 5-year CAP for senior management review. Incorporate final edits from this review into the budgeting system and close the system to any further input.
December	After the divisions return their budget requests, the Rates and Budget Department consolidates the authority-wide budgets, develops briefing materials for senior management, and identifies major budget issues. Draft the CIP staff summary and circulate for management review. Transmit staff summary and accompanying attachments to each member of the Board of Directors. Formally request approval from the Board of Directors to transmit the Proposed CIP to the MWRA Advisory Board for their 60-day review.

January	The Executive Director determines proposed funding levels required to meet operational and financial objectives. Staff may seek appropriate policy direction from the Board.
February	MWRA transmits the Proposed Current Expense Budget to the Advisory Board for a 60-day review, during which time MWRA staff meet with Advisory Board staff, respond to questions, and provide updated information on plans and prices.
March – May	MWRA hosts public hearings to solicit comments on the proposed budget and community assessments from citizens in its service area. The Advisory Board reviews the proposed budgets and transmits comments and recommendations to the MWRA. For the CIP, update the budgeting system with new information as received from project managers and sourced from other internal financial systems. Prepare responses to the Advisory Board’s post review comments and recommendations.
June	The Board of Directors holds a hearing on the proposed budget and the Advisory Board’s comments and recommendations. The Board of Directors adopts a final Current Expense Budget and a schedule of final wholesale water and sewer assessments. Present the Final CIP to the Board of Directors for approval for the following fiscal year’s spending plan. Every five years, obtain the Board’s approval for the newly-established 5-year spending CAP.

APPENDIX B
BUDGET PROCESS AND TIMETABLE

MWRA operates on a fiscal year that starts July 1. The budget development process begins in August and, as described below, continues through a series of interactive reviews and revisions until June, when the Board of Directors approves the final budget. Throughout the formal budget process, MWRA staff maintains an ongoing dialogue with the Board of Directors and Advisory Board to discuss issues, the status of budget development, and other concerns.

	Current Expense Budget (CEB)	Capital Improvement Program (CIP)
Date	Activity	Activity
8/14/16	Prepare budget guidelines and materials	Update database with annual estimated inflation factor
9/11/16	Kick-off meeting - Release database files to all departments	Kick-off meeting
9/11/16	All departments enter budget requests	Project Managers update project schedules and costs
10/13/16		Deadline for new project requests
10/16/16		Senior Staff reviews new project requests
10/23/16		Draft Proposed CIP finalized
10/30/16		Project Managers review Draft Proposed CIP
11/6/16	Budget staff prepare capital financing requirements and indirect expenses	Review of Proposed CIP with Senior Management
11/13/16	Update CEB impacts from CIP	
11/20/16		Draft Proposed CIP Staff Summary and prepare Board of Directors presentation
12/1/16	Draft Preliminary Proposed CEB, Rate Revenue Requirement and planning projections	
12/4/16	Review of Proposed CEB with Senior Management	
12/18/16	Draft Proposed CEB Staff Summary and prepare Board of Directors presentation	
12/20/16		Present Proposed CIP at Board Of Directors Meeting
1/17/17	Present Proposed CEB at Board of Directors Meeting	
1/22/17	Advisory Board Review and Comments begins	Advisory Board Review and Comments begins
2/15/17	Spring Revisit - Distribute Proposed FY database files to all departments	
3/30/17	Receive Advisory Board Comments	Receive Advisory Board Comments
4/1/17	Public hearings with Board of Directors, WSCAC, WAC, Advisory Board	Public hearings with Board of Directors, WSCAC, WAC, Advisory Board
4/2/17	Prepare MWRA's response to Advisory Board Comments	Prepare MWRA's response to Advisory Board Comments
4/16/17	Prepare Draft Final CEB presentation for Board of Directors	Prepare Draft Final CIP presentation for Board of Directors
5/17/17	Draft Final CEB Staff Summary	Draft Final CIP Staff Summary
6/7/17	Advisory Board consultation with Board of Directors	Advisory Board consultation with Board of Directors
6/7/17	Presentation - Draft Final CEB to Board of Directors	Presentation - Draft Final CIP to Board of Directors
6/28/17	Board of Directors Meeting - Vote on Final CEB	Board of Directors Meeting - Vote on Final CIP

APPENDIX C

MASSACHUSETTS WATER RESOURCES AUTHORITY BUDGET AND ASSESSMENT POLICIES AND PROCEDURES

(Revised August 2003 to incorporate changes to capital budget section of Management Policies adopted by the Board of Directors June 11, 2003)

These policies and procedures govern certain budget, assessment, and rates management practices at the Massachusetts Water Resources Authority (MWRA). Policies and procedures may be amended from time to time, provided that changes in provisions governing reporting to or approvals by the Board of Directors or the Advisory Board must be approved by the Board of Directors. If any sections of these policies and procedures are at variance with requirements of MWRA's financing agreements, the latter shall govern.

ASSESSMENT POLICIES AND PROCEDURES

Basis of MWRA Assessments

MWRA is required by its Enabling Act to establish assessments which, with other revenues, provide sufficient funds each year to pay all current expenses, debt service, and obligations to the Commonwealth; to pay all costs of maintenance, replacement, improvements, extension, and enlargement of the sewer and waterworks systems; to create and maintain reserve funds; and to provide amounts required by financing agreements. These assessments are adopted by MWRA based on the rate revenue requirements set forth in the Current Expense Budget.

Costs Recovered

MWRA capitalizes certain of its asset costs in accordance with its capitalization policy. Capital expenditures are planned as set forth in the Capital Improvement Program and are recovered through assessments in accordance with MWRA financing agreements. The Current Expense Budget provides detailed information on capital and debt costs, additions to reserves, and all operations and maintenance costs to be recovered with current revenue.

Sources of Current Revenue

MWRA recovers most of its current expenses from users of the services it provides. In addition to rate revenue requirements, budgeted current revenue includes anticipated fines, fees, investment income on certain fund balances, and payments for contracted services. MWRA is committed to seeking additional sources of current revenue.

Coverage Requirements

MWRA's financing agreements include coverage requirements which provide that each year revenue less operating expenses (net revenue) must be more than the amount required for debt service payments on outstanding bonds. The primary bond coverage requirement is that net

revenue must be 120 percent of required debt service fund deposits for bonds outstanding excluding subordinated bonds. The secondary coverage requirement is that net revenue must be 110 percent of required debt service fund deposits for all bonds outstanding, including subordinated bonds. Revenue must be raised annually to meet the primary and secondary bond coverage requirements and may be used for additions to reserves or for payment of obligations to the Commonwealth. Amounts remaining after these uses are used to pay capital costs in order to reduce the need for future borrowing or to reduce current debt service costs. In addition, MWRA has a supplemental bond coverage requirement that amounts contained in its Community Obligation and Revenue Enhancement (CORE) Fund shall equal 10 percent of required debt service fund deposits for bonds outstanding, excluding subordinated bonds. Amounts required to be on deposit in the CORE Fund are recovered through assessments as necessary.

Basis of Budgeting

The Authority is required by the Enabling Act to establish user rates for its water and sewer services which provide sufficient funds to recover the costs of operations (excluding depreciation), debt service, maintenance, replacements, improvements to its facilities, and appropriate reserves. MWRA budgets on the accrual basis, its financial statements are reported on the accrual basis of accounting and the economic measurement focus as specified by the Governmental Accounting Standards Board's (GASB) requirements for an enterprise fund.

The MWRA distinguishes operating revenues and expenses from nonoperation items. Operating revenues and expenses generally result from providing water and sewer services to its member communities. All revenues and expenses not meeting this definition are reported as nonoperating revenues and expenses. All operating revenues are pledged for repayment of outstanding debt service.

In addition, MWRA applies the provisions of GASB Statement No. 62, Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 FASB and AICPA Pronouncements, to provide a better matching of revenues and expenses. The effect of this policy has been to defer certain outflows of resources, which will be recovered through future revenues in accordance with MWRA's rate model, and to record deferred inflows of resources for revenue collected through current rates for costs expected to be incurred in the future.

Budget Surpluses

In any year in which current revenue exceeds both current expenses on a budget basis and amounts required to meet bond coverage tests, the amount of over-recovery is deposited first to reserve funds, if any, which are below the level specified in any financing agreements, and second into MWRA's rate stabilization fund or bond redemption fund. Amounts deposited in these funds are used to offset rate requirements in subsequent years and such, to provide rate relief for our communities. With Board approval, surplus funds can also be used for targeted defeasance in future years and/or to reduce future liabilities, as part of a multi-year rate strategy. MWRA consults with the Advisory Board regarding the yearly use of these funds.

Budgeting and Assessment Objectives

MWRA follows conservative budgeting practices, and has the following objectives in developing budgets and community assessments:

1. To minimize total costs, consistent with MWRA's statutory responsibilities to provide effective, environmentally sound wholesale water delivery and wastewater collection and treatment services;
2. To minimize the cost of debt;
3. To avoid single year assessment spikes by prudent management of cost and assessment increases, and
4. To support inter-generational equity by avoiding unfair assessment burdens on either current or future ratepayers.

Allocation of Costs and Revenue to Systems

Most of MWRA's current expenses are directly attributable to either water or sewerage service costs or to investment in either the water or sewerage systems. Expenses which support both systems (indirect system costs) are allocated to the water or sewer system based on generally accepted cost allocation principles. Investment, contract, and other income offsets water and sewerage expenses on either a direct or allocated, indirect basis. The resulting net cost of water and sewerage services is the amount to be recovered through water and sewer assessments.

Allocation of Rate Revenue Requirements to User Assessments

Users of MWRA wholesale water and sewerage services are assessed for those services according to MWRA's water and sewer assessment methodologies. Assessments for water services are computed by MWRA based on metered water use for the preceding calendar year. The total assessment is allocated based on each community's share of water delivered in the immediately preceding calendar year.

Assessments for sewer services are computed on the basis of a combination of metered wastewater flow and loads, and population.

- Operations and Maintenance (O&M) costs are allocated based on total annual metered wastewater flow, and total annual average strength, septage, and high strength flow loads.
- Capital (or debt service) costs are allocated based on a combination of metered wastewater flow and loads, and population. One-quarter of capital costs are allocated based on maximum month flow, and total annual average strength, septage, and high strength flow loads. The remaining three-quarters of capital costs are allocated based on population. Half of the population allocation is based on census population and half is based on contributing population.

Schedule and Procedure for Adoption of Assessments

During the preparation of the proposed Current Expense Budget, required water and sewer rate revenue is determined, and a preliminary calculation of the allocation of costs to user-specific assessments is made. This information is provided to MWRA customers to assist them in their own fiscal planning. As provided in the Enabling Act, the proposed Current Expense Budget and preliminary assessments undergo statutory review, including public hearings and review by MWRA's Advisory Board. Further refinements of projected expenses and revenues also occur during this period. If review and analysis of the proposed Current Expense Budget results in lower projected expenses or higher projected revenue, some or all of such savings from preliminary estimates of assessments can be included in the adopted budget as additions to the rate stabilization fund and used to reduce rate revenue requirements in subsequent years. Alternatively, some or all of such savings can be used to reduce final assessments to customers below preliminary estimates.

The Current Expense Budget and final water and sewer assessments are adopted in June for the fiscal year beginning in July. The budget adopted in June may differ from the proposed budget as a result of review and further refinement of the proposed budget, although final assessments adopted by MWRA must be sufficient to recover water and sewer rate revenue requirements specified in the adopted budget. Final water and sewer rate requirements and their allocation to users may thus change from preliminary estimates. In addition, any individual community's final assessment may be higher or lower than the preliminary estimate, both because of changes in the factors which affect the allocation of assessments among wholesale customers, and because of differences between MWRA's proposed and final budgets as approved by the Board of Directors.

Review and Dispute Resolution Process

MWRA annually determines preliminary and final assessments for water and sewer services in February and June prior to the beginning of the new fiscal year. These assessments must satisfy the requirement that MWRA fully recover its water and sewer costs by apportioning total costs as assessments among its wholesale water and sewer customers pursuant to its water and sewer rate methodologies and to certain specified data including:

- Calendar year metered water volume and metered wastewater flow obtained from MWRA's water and wastewater metering systems;
- Federal and state community census statistics, and sewer population estimates and other information supplied on Customer Service Update forms and Municipal Discharge Permits; and
- High strength user monitoring data and estimates of community septage volumes as obtained by MWRA 's Toxic Reduction and Control Department.

The review and dispute resolution process provides MWRA's wholesale customers with the opportunity to review and comment on the reasonableness of the data used to calculate preliminary water and sewer assessments. During the year, MWRA provides its customers with monthly summaries of water and wastewater flow data distributed, at a minimum, on a bimonthly basis. Because annual metered water and wastewater flows are major components for establishing water and sewer charges for each community, customers are strongly encouraged to review this data closely upon receipt and raise questions with MWRA staff concerning the data. MWRA expects that prompt customer review and comment on meter data will result in the resolution of most water and wastewater metering questions and assure the most consistency between preliminary assessments in February and final assessments announced in June. Community contributions of high strength flow and septage, and population data are made available with the release of preliminary assessments in February.

If after an initial review a community believes that specific data used to calculate assessments should be reevaluated, a community may submit a written objection to the Executive Director with a copy to the Rates Manager or their designee. The objection must be signed by the local official on record with MWRA as responsible for water or sewer services in the city, town, or district. The objection should state the community's concern with the data used to calculate community assessments, and should also include information and technical data to support the community's objection.

In order for any data adjustments to be incorporated into the allocation of final fiscal year assessments, all objections to data used to calculate preliminary assessments must be received no later than the date of the final public hearing on the proposed budget and preliminary assessments, held pursuant to Section 10 of the MWRA Enabling Act. MWRA staff will review and evaluate the merits of all written objections. Customers are notified in writing of the results of this review prior to the release of final assessments.

Adjustments to preliminary data, if any, are not retroactive beyond the applicable calendar year for proposed assessments. Final fiscal year assessments are calculated incorporating adjustments, if any, resulting from the review and objection process, and final rate revenue requirements as adopted by the Board of Directors.

Written objection(s) may also be submitted following the adoption of final fiscal year assessments, but no later than the end of the fiscal year for which the assessments are applicable. Objections submitted in this manner must also be directed to the Executive Director with a copy to the Rates Manager or their designee.

Following MWRA staff review, adjustments to assessments resulting from the challenge of rate basis data that are submitted following the adoption of final fiscal year assessments will be applied to the subsequent year's assessments. Customers are notified in writing of the results of this review and any assessment adjustments prior to the release of the subsequent year's assessments.

Water and Sewer Assessment Payment Schedule

MWRA adopts a schedule of assessments and a schedule of payments annually. Any adjustments for prior years resulting from the review and objection process are apportioned to each of the scheduled payment amounts. No interest is paid or billed by MWRA for previous year's adjustments.

Assessments are payable to MWRA in ten equal installments due on the first day of August, September, October, November, December, February, March, April, May, and June.

Interest Charge on Delinquent Payments

For payments received after a payment due date MWRA levies an interest charge of one percent per month or 0.033 percent per day. Interest charges do not accrue until 30 days after the bills are mailed to MWRA's customer communities. Interest charges are added to subsequent regular billings.

Retail Rates

MWRA assessments are for MWRA's provision of wholesale services. Local bodies which receive wholesale services in turn provide retail services to their users at the local level.

MWRA encourages its customers to establish retail rates which:

1. Recover the full cost of providing local water and/or sewerage services, including both direct costs and an allocation or estimate of indirect costs,
2. Charge users of local water and/or sewerage services in a manner which demonstrates to customers that increased use of services results in increased user costs,
3. Comply with MWRA policies directed to conservation of water; elimination of infiltration and inflow of surface water and ground water into the sewage collection, treatment, and disposal system; and removal or pretreatment of industrial wastes, and
4. To the extent consistent with #1 and #2, provide assistance to low income users through lifeline rates.

CAPITALIZATION POLICY

It is the policy of the MWRA that capitalization of expenditures conforms to generally accepted accounting principles. Under such guidelines, MWRA has adopted the provisions of the Financial Accounting Standards Board's Statement No. 71, "Accounting for the Effects of Certain Types of Regulation," which is intended to assure that utility revenues are appropriately matched with incurred costs. Capital expenditures create assets or extend their useful lives. Assets are valued at their cost and provide benefits over an extended period of time. Sources of funds for capital expenditures include grants, proceeds of MWRA borrowing, loans, and current revenue.

Asset value created by MWRA is of two kinds. One is the value of tangible assets either created or increased through MWRA capital investments. Such assets include land, buildings, plant, equipment, and the system infrastructure for water and wastewater. The cost of such fixed asset investment includes not only purchase, rehabilitation, and construction cost, but also ancillary expenses necessary to make productive use of the asset. Ancillary costs can include, but are not limited to, costs for planning studies, professional fees, transportation charges, site preparation expenditures, and legal fees and claims directly attributable to the asset.

The second kind of asset value created by MWRA investment is the value of intangible assets. While such investment does not result in tangible MWRA assets, it does create a benefit to MWRA and its users over several years. Such assets include the cost of MWRA efforts to establish base-line leak detection information for the water systems of MWRA customers. The cost of providing water consumption-limiting devices to households is another example.

Expenditures for tangible assets are included in the Capital Improvement Program and Budget if the expected cost of the individual asset or capital project is \$100,000 or more and if the expected useful life is more than one year. Expenditures for intangible assets are capitalized if the expected cost is \$100,000 or more and if the expected benefit period is three years or more. Annually recurring costs and expenditures for maintenance of assets are not capitalized, even though their cost may exceed \$100,000. Examples of such maintenance expenditures include replacement of vehicles or computers, replacement of inoperable valves or other equipment before the anticipated useful life has been reached, and pipeline or interceptor repairs that do not add significant life to the underlying asset.

RESERVES FUNDED FROM CURRENT REVENUE

Operating Reserve

The Operating Reserve has been established to provide a source of funds to be used to pay operating expenses of the sewer or water systems should there not be sufficient funds otherwise available for that purpose. Bond agreements specify that the fund level shall not be less than one-sixth of MWRA's annual operating expenses.

Insurance Reserve

The Insurance Reserve has been established to provide funds to restore, replace, or reconstruct lost or damaged property or facilities of the water or sewer system. It provides funds reserved against risks for which MWRA does not currently maintain insurance. This self-insurance reduces the cost MWRA might otherwise incur for purchased insurance policies. MWRA periodically evaluates the level of its insurance reserve and every three years a consulting engineer or an insurance consultant recommends an appropriate insurance reserve fund requirement. The current funding level of \$14.0 million has been determined to be adequate based on a FY17 Insurance Reserve Fund review performed by an outside insurance consultant who estimated an acceptable fund level in the range of \$12 to \$16 million. The next Insurance Reserve Fund review is expected in February 2020.

Renewal and Replacement Reserve

The Renewal and Replacement Reserve has been established to pay the costs of emergency repairs or capital improvements to the system when funds are not available in either the Construction Fund or the Operating Fund. Amounts may not be withdrawn until MWRA has specified the project to which the amount will be applied, its estimated cost, and estimated completion date. It must also certify that such expenditures are reasonably required for the continued operation of the systems, or for maintenance of revenues, or that other provisions have not been made for funding such expenditures. The requirement of the Bond Resolution, every three years, MWRA receives recommendations from a Consulting Engineer as to the adequacy of the renewal and replacement reserve fund requirement. The Renewal and Replacement Reserve Fund requirement is presently established at \$35 million. The adequacy of the funding requirements for the Operating Reserve Fund and the Replacement Reserve Fund have been confirmed by the Consulting Engineer in its most recent triennial report dated October 2014, prepared and delivered in accordance with the General Resolution. The next Triennial Report is scheduled for October 2017. The Consulting Engineer also provides an opinion as to the adequacy of the Authority rates, rentals, and other charges.

CURRENT EXPENSE BUDGET MANAGEMENT POLICIES AND PROCEDURES

A. Budget Allocations

Budget Contingency Holdbacks

After the Board of Directors adopts the Current Expense Budget each year, the Executive Director, the Chief Operating Officer, or a division director may reserve between two percent and four percent of a division's approved budget as a budget contingency to be expended only upon approval of the Executive Director. The contingency holdback may be from any line item or cost center or combinations thereof, and any amount reserved as a budget contingency is not to be included in the monthly budget allocation process described below. The Administration, Finance, and Audit Committee will be notified of all budget contingency holdback amounts.

Monthly Allocation of the Annual Current Expense Budget

Initial monthly allocations are made for purposes of adopting and filing an operating budget in accordance with MWRA's financing agreements. Before the end of the first reporting period of the fiscal year, divisions, with the assistance of the Rates and Budget Department, allocate the approved budget, less any holdbacks, by month. The allocations set forth planned expenditures and accruals for each of the 12 months of the year to be compared to actual expenditures and accruals as reported in MWRA's monthly variance reports.

B. Budget Variance Monitoring and Analysis

At the close of each monthly accounting period, the Controller Department prepares MWRA financial statements. The Rates and Budget Department then prepares monthly variance reports that compare budgeted to actual revenues and expenses.

Variance Analysis

Division directors and staff review variance reports and explain variances between budgeted and actual expenditures as requested by the Rates and Budget Department. Variance explanations are prepared as needed, usually at the first quarter of the year, and following monthly for the rest of the year. At least twice each year MWRA staff prepares forecasts of year-end expenditures and revenue. Barring extraordinary circumstances, division directors are responsible for controlling spending within the overall division budget. The Rates and Budget Department reviews all variances and projections so that appropriate measures may be taken to ensure that overall spending is within the MWRA's budget.

Variance explanations are submitted to the Rates and Budget Department in accordance with the schedule developed by the Rates and Budget Department. Each month the Rates and Budget Department prepares a summary of budget variances for inclusion in the Management Indicators Report (Yellow Notebook). The Rates and Budget Department also prepares a monthly staff summary (except for July and August) to the Board of Directors describing major budget

variances and a quarterly budget variance report for inclusion in the Board of Directors Report on Key Indicators of MWRA Performance (Orange Notebook). At least twice a year, the Rates and Budget Department prepares a staff summary to the Board of Directors on year-end projections of revenue and expenses.

C. Budget Amendments

An amendment to an MWRA Current Expense Budget is defined as follows:

A proposed change in an adopted budget or a proposed budget transmitted to the MWRA Advisory Board in accordance with Section 8(b) of Chapter 372 of the Acts of 1984 which meets any of the following criteria:

1. Any increase in total current expenses.
2. An increase of five percent or more in total division expenses.
3. An increase in any expense line item (subsidiary account) of 15 percent or more if that line item is at least 2.5 percent of total current expenses.
4. An addition or deletion of a specific new program or initiative, the cost of which is greater than one percent of total current expenses, unless the addition or deletion has been specifically recommended by the Advisory Board.

The Executive Director, with the concurrence of the Chairman of the Board of Directors and the Chairman of the Administration, Finance, & Audit Committee of the Board of Directors, submits proposed amendments to the Advisory Board for comment and recommendation. At the end of the Advisory Board 30-day review period, the Board of Directors may take action on the amendment.

CAPITAL BUDGET MANAGEMENT POLICIES AND PROCEDURES

General Guidelines

The Authority shall periodically adopt and revise capital facility programs for the Waterworks and Sewer Systems and capital budgets based on these programs. The Authority shall consult in the preparation of its capital facility programs for the Sewer and Waterworks Systems with the Authority's Advisory Board and the Executive Office of Environmental Affairs, and may consult with other agencies of federal, state and local government concerned with the programs of the Authority. Proposed capital facility programs and capital expenditure budgets for said systems shall be submitted to the Advisory Board for such consultation no less than sixty days prior to adoption or revision by the Authority. The Authority shall prepare a written response to reports submitted to it by the Advisory Board, which response shall state the basis for any substantial divergence between the actions of the Authority and the recommendations contained in such reports of the Advisory Board. The Authority shall capitalize expenditures in accordance with generally accepted accounting principles. Capital expenditures will be planned in accordance with Authority financing agreements and policies for amortization of capital costs.

Capital Budget Contingency

A contingency for each fiscal year is incorporated into the Capital Improvement Program for the purpose of providing for unanticipated or unpredictable expenditures under the CIP spending cap.

Capital Budget Monitoring and Reporting

The Authority continually monitors the progress of capital projects for purposes of managerial control and decision-making and for financial planning and management. Two capital budget variance analysis reports are provided to the Board of Directors, one for the first six months of a year and one at year-end. The reports include a comparison between planned project schedules to actual performance. The reports highlight any major changes, either in scope or budget, of any project. Based on these reports, staff may recommend to the Board of Directors revisions, if appropriate, to the annual and five-year caps based upon said changes. In addition, capital budget progress reports are provided to the Board of Directors on a regular basis, both as project specific updates and in Quarterly Orange Notebook reports that shall include discussions of project progress compared to schedules. Monthly Financial Summary reports shall include discussions of capital expenditures compared to budget.

Capital Budget Spending Cap

Beginning in June 2003, the Board of Directors established a five-year Capital Budget Spending cap and annual caps for each year within the cap period. Spending for any year in the cap period may vary within plus or minus 20% of the annual cap, as long as total spending for the five-year period does not exceed the five-year cap. Before the end of each five-year cap period, the Board will adopt a cap for the next five-year period and annual caps for each year in the period. The Board established the third five-year cap for the FY14-18 period at its June 2013 meeting.

Expenditures in Excess of the Spending Cap

In the event of unanticipated spending requirements, the Executive Director may recommend to the Board of Directors that annual expenditures exceed an annual cap by more than 20% or that five-year expenditures exceed the current five-year CIP spending cap. In such an event, a proposed plan to adjust the five-year cap or any of the annual caps will be presented to the Board. Any such proposed plan will be submitted to the MWRA Advisory Board for review and comment for a period of thirty days. At the end of the thirty-day period, the Board of Directors may take action on the proposed plan.

Debt Limit

The Authority's statutory debt limit is \$6,450,000,000. The current debt is well below the debt limit. The Authority's debt limit was most recently amended by Chapter 312 of the Acts of 2008 of the Commonwealth of Massachusetts.

APPENDIX E

GLOSSARY OF FINANCIAL AND OPERATING TERMS

8M permit: Permission granted by MWRA to persons who wish to construct property improvements on land either adjoining or overlapping MWRA property interests. Permission may be conditioned on various operational and/or engineering concerns.

Accrued Costs: Adjustments to paid expenditures to account for materials or services received but for which payment has not been made.

Activated Sludge: The sludge that results when primary effluent is mixed with bacteria-laden sludge and then agitated and aerated to promote biological treatment.

Advanced Waste Treatment: Wastewater treatment beyond the secondary or biological stage that includes the removal of nutrients such as phosphorus and nitrogen and the removal of a higher percentage of suspended solids and organic matter than primary treatment.

Advisory Board: The agency that represents the interests of MWRA's 61 user communities to the Board of Directors in an advisory capacity in accordance with the provisions of MWRA's Enabling Act. The Advisory Board elects three members of the Board of Directors, reviews and comments on MWRA's CIP and CEB, and approves the addition of new communities to the wastewater and water systems.

Aerobic: In the presence of free oxygen.

Anaerobic: Life or processes such as bacteria that digest sludge that require, or are not destroyed by, the absence of free oxygen.

AOOC: Assimilable Organic Carbon - One measure of the "food" available to bacteria within a water system. More complex carbon compounds can become assimilable when oxidized by strong disinfectants.

ARRA: American Recovery and Reinvestment Act of 2009 – principal forgiveness loans distributed based on the Department of Environmental Protection's Intended Use Plan.

Ash: The inert material remaining after the combustion of wastewater sludge. Ash is either wet or dry depending on combustion system design.

Bacteria: One-celled microscopic organisms commonly found in the environment. Bacteria can be harmful, such as pathogens, or helpful and perform a variety of biological treatment processes.

BDOC: Biologically Degradable Organic Carbon - Another, more precise, measure of the "food" available to bacteria within a water system.

BGD: Billion gallons per day.

Biofilm: Growth of various bacteria within a water distribution system on the pipe walls. Biofilm growth can contribute to iron corrosion, colored water, poor taste, excessive chlorine demand, and complications with coliform testing.

Blow-off valves: Valves operated during pipeline repair to de-water (drain) a portion of a pipeline.

BOD: Biochemical Oxygen Demand - An indicator of the amount of biodegradable contaminants in wastewater.

Board of Directors: The 11-member governing board of MWRA.

Bond Resolution: A document adopted by the Board of Directors that governs MWRA's issuance of revenue bonds and sets forth its obligations to bondholders.

Boston Harbor Project: An extensive plan of activities which MWRA developed and implemented to construct new wastewater treatment facilities in response to a federal court order to comply with the provisions of the U.S. Clean Water Act.

Business Systems Plan (BSP): The strategic planning framework for MWRA's management information systems. The BSP is updated annually to reflect ongoing business requirements, new opportunities identified by ongoing MWRA strategic planning efforts, technology changes, and user requests.

BWSC: Boston Water and Sewer Commission - The agency responsible for providing water and sewer services to the City of Boston, MWRA's largest customer.

BWTF: William A. Brutsch Water Treatment Facility – Water treatment plant for the Chicopee Valley Aqueduct communities of Chicopee, South Hadley Fire District #1, and Wilbraham. The facility has a capacity of 24 mgd, and disinfects the water using a combination of UV light and chlorine.

CADD: Computer aided drafting and design.

Capital Improvement Program (CIP): A plan which identifies and estimates the nature, schedule, cost, and financing of long-term assets that MWRA intends to build or acquire during a specific period.

Capital Investment: Development of a facility or other asset that adds to the long-term value of an organization.

Carroll Water Treatment Plant (CWTP): Water treatment facility for waters from Quabbin and Wachusett Reservoirs with capacity of 405 mgd using ozonation as a primary disinfectant and UV as a secondary disinfectant beginning in February 2014.

CDF: Cosgrove Disinfection Facility

Cathodic Protection: A form of corrosion protection that is particularly effective against galvanic corrosion. Galvanic corrosion occurs when pipe metal is in the presence of other metals while immersed in water. The interaction of these elements causes an electric current to flow away from the pipe, taking electrons with it and pitting the pipe as a result. Cathodic protection reverses the current, thereby stopping the corrosion.

Centrifuge: A machine that uses centrifugal force to separate substances of different densities and remove moisture. MWRA uses centrifuges at the Deer Island Wastewater Treatment Plant to de-water sludge.

CFM: Cubic Feet per Minute - A measure of the quantity of a material flowing through a pipe.

Chloramination: The process of adding chloramine to drinking water. Chloramine, a form of chlorine and ammonia, is used as a residual disinfectant because it lasts longer in the water distribution system than primary disinfectants.

Chloramine: A long lasting residual disinfectant created by combining measured amounts of chlorine and ammonia. Chloramine forms fewer disinfection by-products than chlorine.

Chlorination: The process of adding chlorine to drinking water to inactivate pathogens.

Chlorine: A relatively strong primary disinfectant, effective against bacteria, *giardia*, and viruses, but not *cryptosporidium*. Concerns exist about the health effects of its by-products, some of which are or will be regulated.

Clarifiers: Settling tanks or basins in which wastewater is held for a period of time, during which heavier solids settle to the bottom and lighter materials float to the surface.

Clean Water Act: A law passed by Congress in 1972, and subsequently amended, which sets national standards for pollution reduction, permits discharges from wastewater treatment plants, and promotes achievement of the national goal that all surface waters be "fishable and swimmable."

Cleaning and Lining: Cleaning and cement lining of unlined cast iron water mains to improve hydraulic capacity and extend useful life.

CMMS (Computerized Maintenance Management System): *Maximo* is the computerized maintenance management system which is an essential component of successful asset management. This system is an important tool used in refining the long-term maintenance strategy to ensure proper maintenance and replacement of plant assets.

Co-Digestion Process: Introduction of non-wastewater derived organic waste material into the wastewater anaerobic digestion process. Co-digestion could potentially increase digester gas production which would be utilized for heating and electricity generation at Deer Island.

Coliform bacteria: A group of lactose fermenting bacteria, which while not of direct health concern, are used as a first line indicator of potential problems. See fecal coliform and *E.coli*.

Combined Sewer and Combined Sewer Overflow: While modern systems transport rainwater and sewage from homes and businesses through separate pipes, some older systems like Boston's have "combined" sewers that carry both flows together. During normal conditions flows are delivered to treatment plants. During very heavy rains, these systems become overloaded. Built-in overflows (called combined sewer overflows or "CSOs") must then act as relief points by releasing excess flows into the nearest body of water. This prevents sewage backups into homes and onto area streets, but the discharges can impact water quality.

Comminutor - A machine or process that pulverizes and reduces solids to minute particles.

Commonwealth Debt Service Assistance (DSA): Funds appropriated by the Commonwealth to offset MWRA capital financing expenses.

Community Obligation and Revenue Enhancement (CORE) Fund: A fund established by MWRA's bond resolution that is used to provide insurance against delays by communities in paying charges due to MWRA.

Composting: The process of converting wastewater treatment residuals to a soil-like humus material often used in the horticultural industry. The process involves the aerobic breakdown of the residuals and the addition of sawdust or wood chips.

Corrosion Control: Adjustments to the chemistry of treated water to reduce its ability to dissolve lead, copper, other metals, or form hydrogen sulfide. Corrosion control can include adjustments to pH and alkalinity, as well as the addition of corrosion inhibitors such as phosphates or oxidizers.

Coverage Requirement: Requirement of MWRA's bond resolution which provides that each year, revenue less operating expenses (net revenue) must be more than the amount required for debt service payments on outstanding bonds.

CP (Construction Package): Major construction projects such as the Carroll Water Treatment Plant or the North Dorchester Bay CSO project will group areas of work into individual construction contracts.

Cross-Connection: A point at which potable water piping is connected to a non-potable water source creating an opportunity for the introduction of pollutants into the potable water.

Cryogenic oxygen plant: MWRA operates a cryogenic oxygen-based facility as part of its secondary wastewater treatment program at Deer Island.

Cryptosporidium: A protozoan parasite that can cause severe gastrointestinal disease in healthy individuals, and may be fatal to people with compromised immune systems. Cryptosporidia exist in the environment as hard walled oocysts that are very resistant to chlorination, but can be inactivated by disinfection with ozone or ultraviolet light.

CSO: Combined Sewer Overflow – An overflow point and the discharged flow from a combined sewer system intended to provide hydraulic relief to avoid system flooding and backups during large wet weather events. During large rainstorms, systems can become overloaded, with the excess discharged directly into surface waters. The discharged flow and the discharge location are called CSOs. In the metropolitan Boston area there are approximately 46 active, permitted CSOs that currently discharge into rivers or Boston Harbor.

CSO Facilities: MWRA has six facilities that intercept the flow from CSO pipes. Four of these facilities provide treatment and two provide storage prior to discharge. The CSO facilities have some capacity to store flow and pump it to the Deer Island plant after rainstorms end.

CT: Concentration x Contact Time - A measure of disinfection effectiveness established under the Surface Water Treatment Rule. CT is the product of the concentration of disinfectant [C] and the time it has been in contact with the water [T]. Required CT varies by type of disinfectant, organism, temperature, and pH.

CTG (Combustion Turbine Generator): CTGs are used to generate electricity during planned cable outages, wet weather operations and for participation in price response events.

Current Expense Budget: A financial plan that estimates the revenues and expenses associated with MWRA's operations for a fiscal year.

C-Value: The carrying capacity of a water main for a specified length and pressure drop that is determined by its diameter and resistance to flow. The friction coefficient "C" of the main is often used as a measure of flow resistance. C-values for new pipe are about 120 for water mains that are 6 to 16-inches in diameter, and 130 and 140 for larger diameter mains.

DAF: Dissolved Air Flotation - A process of adding super saturated air into water to cause coagulated solids to rise to the top to be skimmed off. DAF replaces conventional gravity sedimentation (clarification) and is particularly cost-effective for low turbidity waters subject to periodic algae blooms.

DBP: Disinfection By-products - Complex compounds formed by the use of oxidizing agents such as chlorine or ozone in waters containing organic matter.

D/DBP Stage 1: Disinfectants/Disinfection By-products, Stage 1 Rule - Promulgated 11/1998, and effective 1/2002, this rule set DBP limits at 80 parts per billion for Trihalomethanes and 60 parts per billion for Haloacetic Acids, averaging all samples over four quarters.

D/DBP Stage 2: Disinfectants/Disinfection By-products Stage 2 Rule - The rule further regulates the amount of DBPs allowed in water. The 80/60 values set in Stage 1 will now apply to each individual sample location in a "Locational Running Annual Average".

Debt Service: In a given fiscal year, the amount of money necessary to pay interest and principal on outstanding notes and revenue bonds.

DEP: Department of Environmental Protection - The Massachusetts agency that regulates water pollution control, water supplies, and waterways and dispenses federal and state grant funds to support these activities.

Department: A sub-unit of an MWRA division.

Department of Conservation and Recreation (DCR): Created in 2003 through the merger of the Metropolitan District Commission and the Department of Environmental Management, DCR manages the Commonwealth's diverse parks system and protects and enhances natural resources and outdoor recreational opportunities throughout Massachusetts.

De-watering: The process of removing water from wastewater treatment residuals. De-watered sludge has the appearance of mud or wet soil material.

Diffusers: A system of shafts, rising from the end of MWRA's effluent outfall tunnel to the seabed, which disperses treated wastewater over a large area. Technically, the diffusers are the "sprinkler heads" mounted on top of the riser shafts that lead from the outfall tunnel and disperse wastewater into Massachusetts Bay.

Digesters: Tanks for the storage and anaerobic or aerobic decomposition of organic matter present in sludge.

Direct Program Expenses: Costs directly associated with providing services or performing activities.

Disinfection, Primary: The inactivation (killing) of pathogenic organisms in a water system by the use of chemical or other disinfection agents.

Disinfection, Residual: The presence of a measurable residual of disinfectant within a water distribution system to help control bacterial re-growth and guard against contamination.

Dissolved Oxygen (DO): A measure of the amount of oxygen in a given amount of water. Adequate levels of DO are needed to support aquatic life. Low dissolved oxygen concentrations can result from inadequate wastewater treatment.

Division: A major organizational unit within MWRA, encompassing the activities and resources for providing a major service or function.

DLS (Department of Laboratory Services): Laboratory Services is a full service analytical testing and consulting group within the MWRA that primarily serves client groups primarily within the Operations Division. The analytical services that Laboratory Services provides include wet chemistry, metals, organics, and microbiology testing. Related services include field sampling, technical consultation, and contract laboratory management.

DMR (Discharge Monitoring Report): Monthly reports that are submitted to federal and state regulators. MWRA monitors the effluent (treated sewage) that is discharged into Massachusetts Bay, to ensure that it meets the standards set out in the NPDES permit. Analytical support to the effluent monitoring program is provided by the Department of Laboratory Services.

E.coli: A normal inhabitant of the digestive tract of mammals. The presence of *E.coli* indicates probable contamination by fecal matter.

Effluent: Treated wastewater discharged from a treatment plant.

EIR: Environmental Impact Report – A document prepared in adherence with the Massachusetts Environmental Policy Act (MEPA) to review the environmental impact of projects and ensure opportunities for public review and comment.

EIS: Environmental Impact Statement – A document prepared in adherence with the National Environmental Policy Act to review the environmental impact of projects and ensure opportunities for public review and comment.

Enabling Act: Legislation (Chapter 372 of the Acts of 1984) that established MWRA and define its purpose and authority as of January 1, 1985.

ENF: Environmental Notification Form - The first step in the MEPA process.

EOEEA: Executive Office of Energy and Environmental Affairs - The Massachusetts cabinet office that oversees state environmental agencies.

EOC: Emergency Operations Center

EOEA: Executive Office of Environmental Affairs - The Massachusetts cabinet office that oversees state environmental agencies.

EPA: Environmental Protection Agency - The federal government agency responsible for environmental enforcement and investigation.

ESWTR: Enhanced Surface Water Treatment Rule - A federal rule that is promulgated in three stages:

1) Interim Enhanced Surface Water Treatment Rule (IESWTR): The IESWTR was promulgated in 1998 and tightened the requirements for the operation of water filtration plants in large systems to take a first step toward controlling *cryptosporidium* in source waters. IESWTR also added *cryptosporidium* to the list of issues considered within watershed protection plans for unfiltered systems.

2) LT1ESWTR primarily extends the IESWTR to smaller systems

3) LT2ESWTR: further tightens the standards for the operation of filtration plants and adds requirements for 99% inactivation of *cryptosporidium* and the use of two primary disinfectants for unfiltered systems. The concept of proportional treatment, with less treatment required for cleaner sources, was implemented as part of the rule.

Enterococcus: A pathogen indicator, similar to fecal coliform, that is used in the Massachusetts Water Quality Standards for marine waters, consistent with the Federal Clean Water Act requirements, which indicates potential contamination from human or animal waste.

Eutrophication: Nutrient enrichment of a lake or other water body typically characterized by increased growth of planktonic algae and rooted plants. Eutrophication can be accelerated by wastewater discharges and polluted runoff.

Eversource: Formerly NStar, formerly Boston Edison Company, is a publicly traded, Fortune 500 energy company headquartered in Hartford, Connecticut and Boston, Massachusetts, with several regulated subsidiaries offering retail electricity and natural gas service to more than 3.6 million customers in Connecticut, Massachusetts and New Hampshire.

Expenditures: Payments for goods and services received.

Expenses: Costs associated with the operating activities of a period, including expenditures and accrued costs.

Facility Information System (FIS): The management information system at the Deer Island Treatment Plant.

Fecal coliform bacteria: A group of bacteria used as a primary indicator organism for potential contamination from human or animal waste. Also called thermo-tolerant bacteria. Specific organisms in the group may or may not be of health concern (see *E.coli*).

Filtration: A water treatment process involving the removal of suspended particulate matter by passing the water through a porous medium such as sand or carbon.

Fiscal Year: The 12-month financial period used by MWRA that begins July 1 and ends June 30 of the following calendar year. MWRA's fiscal year is numbered according to the calendar year in which it ends.

Flash coat: A light coat of shotcrete used to cover minor blemishes on a concrete surface.

FOD (Field Operations Department): Department within the Operations Division created to provide high quality, uninterrupted water delivery and wastewater collection services to MWRA communities. The department is responsible for the treatment, transmission, and distribution of water from the Quabbin and Wachusett reservoirs to community water systems. It also manages the collection, transport, and screening of wastewater flow from MWRA communities to the Deer Island Treatment Plant.

Force Main: A pressure pipe joining the pump discharge at a water or wastewater pumping station with a point of gravity flow.

FRSA (Fore River Staging Area): The site of the Sludge Pelletization Plant.

FTE (Full Time Equivalent): An FTE is the hours worked by one employee on a full-time basis. The concept is used to convert the hours worked by several part-time employees into the hours worked by full-time employees.

Giardia: A protozoan parasite that can cause severe gastrointestinal disease, although there is medical treatment available. *Giardia* exist in the environment as hard-walled cysts, and are moderately resistant to chlorine disinfection.

Geographic Information System (GIS) -- A geographic information system is a system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.

Green Energy: Energy that comes from natural sources such as sunlight, wind, rain, tides, plants, algae and geothermal heat. These energy resources are renewable, meaning they're naturally replenished.

Goal: A statement in general terms of a desired condition, state of affairs, or situation. Goals, which are long-term in nature and not usually directly measurable, provide general direction for the activities of operating units.

Global Positioning System (GPS): Also known as an Automatic Vehicle Location system (GPS/AVL), this tool provides real-time transmission alerts utilizing a cell phone/satellite communication system and a web-based mapping system to track vehicles and operator-driven mobile equipment in MWRA's service area. The system allows MWRA to respond more quickly to emergencies, enhance driver and vehicle safety, reduce fuel costs, track mileage electronically, monitor unauthorized vehicle usage, and improve efficiency.

Graphitization: A corrosion mechanism that alters the molecular structure of the carbon/iron matrix of cast iron pipe. During the process, iron atoms are forced away from the metal leaving behind an unstable carbon matrix. The result is a weakened pipe, easily susceptible to ruptures. High frequency in the number of breaks causes leakage to be a major problem of graphitized pipe.

Grit: Sand-like materials that quickly settle out of wastewater.

Groundwater: A body of water beneath the surface of the ground. Groundwater is made up primarily of water that has seeped down from the surface.

HAA: Haloacetic Acids - A class of disinfection by-products related to chlorine disinfection. HAAs are regulated under D/DBP Stage 1 and 2 Rules at 60 ppb.

Harbor Electric Energy Company (HEEC): A subsidiary of Eversource which installed a cross harbor power cable and built a sub-station to provide power for construction and operation of the Deer Island Wastewater Treatment Plant.

Head House: A structure containing the control gates to a conduit such as a sewer pipeline.

Headworks: A preliminary treatment structure or device, usually including a screening and de-gritting operation, that removes large or heavy materials such as logs and sand from wastewater prior to primary treatment.

Heavy Metals: Metals such as lead, silver, gold, mercury, bismuth, and copper that can be precipitated by hydrogen sulfide in an acid solution.

HOM (Harbor and Outfall Monitoring): A comprehensive program to provide environmental data that helps to predict and measure the effect of Deer Island outfall discharge on the marine ecosystem.

Incentives and Other Charges: A fee system designed to help recover permitting, inspecting, and monitoring costs incurred by MWRA's TRAC Program and provide incentives to permitted users to reduce discharges.

Indirect Expenses: Costs not directly associated with providing services or performing activities.

Infiltration/Inflow (I/I): The problem of clean water flows entering sewers resulting in diminished pipe capacity for sanitary flows and in costly pumping and treatment of unnecessarily large wastewater volumes. Infiltration is groundwater that leaks into the sewerage system through pipe joints and defects. Inflow, primarily a wet-weather phenomenon, refers to water that enters sewers from improperly connected catch basins, sump pumps, land and basement drains, and defective manholes. Inflow also enters through improperly closed or defective tidegates during high tides.

Influent: The flow of water that enters the wastewater treatment process.

Insurance Reserve: A fund established to adequately reserve against risks for which MWRA does not currently maintain insurance.

Interceptors: The large pipes that convey wastewater from collection systems to treatment plants.

Investment Income: Income derived by investing certain operating and reserve fund balances in interest-yielding securities in accordance with the provisions of MWRA's bond resolution.

ISO - NE (Independent System Operator of New England): Non-profit wholesale operator of the regional grid system. The MWRA receives payment from ISO-NE when Deer Island, Carroll Water Treatment Plant, and the four Remote Headworks remove themselves from the grid. All

six facilities participate in load response programs offered by ISO-NE which pays larger commercial and industrial electricity consumers to “shed load” during grid peaks. There are several programs available such as price, demand response and load response. MWRA constantly evaluates the options and participates in the most advantageous program.

Labor Costs: Direct costs of employing permanent and temporary personnel, including wages, salaries, overtime pay, fringe benefits, and workers' compensation.

Land Application: The use of wastewater treatment residuals on land for agricultural benefits.

Landfilling: The disposal of residuals by burial. Modern landfills have double liners, leachate collection systems, and other design features to protect against groundwater contamination.

LCR: Lead and Copper Rule – A federal rule that set an action level for lead and copper at “worst case” consumer taps. Optimized corrosion control, notification, education, and lead service replacements are all components of compliance plans.

Leachate: Water that drains from a landfill after having been in contact with, and potentially contaminated by, buried residuals. Modern landfills are designed to collect leachate for subsequent treatment.

Limnology: The scientific study of physical, chemical, meteorological, and biological conditions in fresh waters.

LIMS: Laboratory Information and Management System – An automated database system used to transfer information between MWRA’s Central Laboratory to its client groups and to process information obtained by the Central Laboratory to monitor substances that enter and leave the MWRA wastewater system. Use of LIMS removes the potential for human error in the sampling process by bar coding samples, eliminating the need to transcribe sample data, producing pre-printed project-specific sample check-off forms for field crews, and automating testing through pre-set test codes and project-specific parameters.

LOX (Liquid Oxygen): Liquid oxygen is used together with electrical energy to generate ozone at the Carroll Water Treatment Plant.

Mapping Protocols: Sets of specifications defining the content and format of data to be collected.

MCL: Maximum Contaminant Level - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available control technology.

MCLG: Maximum Contaminant Level Goal - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Massachusetts Environmental Policy Act (MEPA) Unit: A unit of the Commonwealth's Executive Office of Environmental Affairs responsible for implementation of the state environmental review process.

Methane: A colorless, nonpoisonous, flammable gas produced as a by-product of anaerobic sludge processing. At Deer Island, MWRA uses methane as fuel to provide heat and hot water and to generate electricity.

MGD: Million gallons per day.

MIS: Management Information Systems

Mission: A description of the fundamental purposes and major activities of an operating unit or program.

Mitigation: Financial remuneration or non-financial considerations that MWRA provides to communities to alleviate the negative effects of major construction projects.

Molybdenum (Mo): A metallic element that resembles chromium and tungsten in many properties, and is used in strengthening and hardening steel. Mo is a trace element in plant and animal metabolism. The concentration of molybdenum in sludge products is strictly regulated.

NACWA (Nation Association of Clean Water Agencies): NACWA represents the interests of publicly owned wastewater treatment plants. NACWA is involved in all areas of water quality protection including the development of environmental legislation and assisting federal regulatory agencies in the implementation of environmental programs.

NEFCo: New England Fertilizer Company - The contractor responsible for the operation of processing sludge into fertilizer pellets at MWRA's residuals processing plant located in Quincy. NEFCo is also responsible for marketing and distributing the pellets and disposing of any product that is not marketable.

National Pollutant Discharge Elimination System (NPDES) Permit: A permit issued by EPA in conjunction with DEP that governs wastewater discharges into surface waters.

NHS (Northern High Service): Project that involves a series of water system pipeline improvements in the MWRA's Northern High Service Area.

Nitrification: An aerobic process in which bacteria changes the ammonia and organic nitrogen in wastewater into oxidized nitrogen (usually nitrate). Second-stage BOD is sometimes referred to as the nitrification stage (first-stage BOD is called the carbonaceous stage). Also, a similar process in the water distribution system, where ammonia from chloramine can be used by nitrifying bacteria, resulting in a reduced chlorine residual, and the potential for additional bacteria growth.

OCC: Metropolitan Operations Control Center, located at MWRA's Chelsea Facility.

OEP (Office of Emergency Preparedness): The Office of Emergency Preparedness has oversight over security, exercises, emergency operations, planning, the Emergency Services Unit and critical infrastructure protection.

OMS (Operations Management Systems): OMS correlates PICS data with laboratory analysis to track and analyze DITP's process performance with regard to the plant's discharge permit from EPA and DEP and with respect to cost effective operation.

Operating Reserve: A fund established to adequately reserve for operating contingencies, required by MWRA's bond resolution to be not less than one-sixth of its annual operating expenses.

Organic Matter: Material containing carbon, the cornerstone of plant and animal life. It originates from domestic and industrial sources.

Other User Charges: Revenue received per agreements MWRA has for provision of water, sewer, and other services to entities other than communities which are charged assessments.

Outfall: The pipe or structure where effluent is discharged into receiving waters.

Ozonation: The application of ozone to water, wastewater, or air, generally for the purposes of disinfection or odor control. The Carroll Water Treatment Plant (CWTP) employs the ozonation process to inactivate pathogens, including *cryptosporidium*, with lower levels of DBPs.

Ozone: A strong disinfectant made from oxygen and electrical energy. Ozone is effective against *cryptosporidium*.

Pathogens: Harmful organisms, often called germs that can cause disease. Waterborne pathogens (or the diseases they cause) include *giardia*, *cryptosporidium*, cholera, typhoid, *E.coli*, Hepatitis A, *legionella*, and MAC.

Payments in Lieu of Taxes (PILOT): Amounts which MWRA pays each fiscal year to cities and towns for land owned by the Commonwealth in the Quabbin, Ware River, Wachusett, and Sudbury watersheds. Consistent with the provisions of MWRA's Enabling Act, these payments are based on the past commitments of the Commonwealth of Massachusetts.

Penalty Revenue: Revenue derived from penalties assessed by MWRA to violators of its sewer use regulations.

Performance Measure: An indicator of the work and/or service provided, defined by output, work or service quality, efficiency, effectiveness, or productivity.

Performance Objective: A statement of proposed accomplishments or attainments that is short-term in nature and measurable.

PICS (Process Instrumentation and Control System): PICS provides real-time operations data from systems throughout Deer Island (including system status, flow, etc.).

Plume: The rising discharge of treated wastewater effluent from a treatment plant outfall pipe.

Preliminary Treatment: The process of removing large solid objects, sticks, gravel, and grit from wastewater.

Pretreatment: The reduction or elimination of pollutant properties in wastewater prior to discharge into a sewer system.

Primacy: Primary enforcement authority for Federal Safe Drinking Water Act regulations delegated to a state by the Environmental Protection Agency (EPA).

Primary Treatment: A wastewater treatment process that takes place in a rectangular or circular tank and allows substances in wastewater that readily settle or float to be separated from the water being treated. Primary treatment results in 50-60% removal of suspended solids and 30-34% removal of BOD.

Program: An organized group of activities and the resources to carry them out aimed at achieving one or more related objectives.

Rate Revenue: Revenue received from annual assessments of communities within MWRA's service area for water and sewer services.

Rate Stabilization Reserve: A fund established by the Board of Directors that is used to reduce rate revenue requirements. MWRA finances this reserve with unexpended or surplus funds available from the Current Expense Budget at the end of each fiscal year.

RCM (Reliability Centered Maintenance): A maintenance strategy adopted at Deer Island in FY00 for critical systems. RCM is a failure modes and effects process that involves maintenance, operations and engineering staff in the development of preventative maintenance and operation plans for plant systems.

Relief Sewer: A sewer built to carry flows in excess of the capacity of an existing sewer.

Renewable Energy: Energy from a source that is not depleted when used, such as wind or solar power

RGGI: The Regional Greenhouse Gas Initiative is a mandatory, market-based program in the United States to reduce greenhouse gas emissions. The program involves selling emission allowances through auctions and investing the proceeds in demand-side management and clean energy technology projects.

Remote Headworks: The initial structures and devices of a treatment plant set apart by some distance from the plant site.

Renewal and Replacement Reserve: A fund established to adequately reserve for the cost of capital improvements not provided for by funds available through the Capital Improvement Program or the Current Expense Budget.

Residuals: The by-products of the wastewater treatment process, including scum (floatables), grit and screenings, primary sludge, and secondary sludge.

Revenue Bonds: Bonds payable from a specific source of revenue and which do not pledge the full faith and credit of the issuer.

RPS (Renewable Portfolio Standards): State policies which mandate a state to generate a percent of its electricity from renewable resources. Qualified renewable generation facilities for the MWRA include: the Steam Turbine Generator (STG) and a variety of Hydroelectric, Wind and Solar units. The MWRA is issued electronic certificates for each megawatt hour of electricity produced from the digester gas, which is considered renewable energy. RPS credits are a source of revenue for the MWRA.

Safe Yield Model: The equation used to determine the maximum dependable draft that can be made continuously on a water supply source during a period of years during which the probable driest period or period of greatest deficiency in water supply is likely to occur.

SAMS: Sewerage Analysis and Management System – A database which contains specifications of the location, size, and condition of MWRA wastewater interceptors and appurtenances and which produces maps for use by MWRA and outside parties. Now referred to as Wastewater GIS.

Sanitary Sewers: In a separate system, pipes that carry only domestic wastewater.

SCADA: Supervisory Control and Data Acquisition - Equipment for monitoring and controlling water or wastewater facilities remotely.

SCBA: Self-contained breathing apparatus.

Screenings: Large items such as wood and rags that are collected from wastewater in coarse screens prior to primary treatment.

Scum: Floatable materials such as grease, oil, and plastics that are skimmed from the surface of wastewater as it flows through large settling tanks.

SDWA: Safe Drinking Water Act - A Federal law enacted in 1986 and amended in 1996 that requires EPA to establish national primary drinking water regulations for water suppliers which consist of MCLs or treatment techniques.

Secondary Treatment: Usually following primary treatment, secondary treatment employs microorganisms to reduce the level of BOD and suspended solids in wastewater.

Sedimentation Tanks: Settling tanks where solids are removed from sewage. Wastewater is pumped to the tanks where the solids settle to the bottom or float on the top as scum. The scum is skimmed off the top, and solids on the bottom are pumped out for further treatment and/or final disposal.

Seeding: The initial filling of sludge into digesters.

Sensitive user: A member of a group within the general population likely to be at greater risk than the general population of adverse health effects due to exposure to contaminants in drinking water. Sensitive users include infants, children, pregnant women, the elderly, and individuals with histories of serious illness.

Septic Tanks: Tanks used for domestic wastes when a sewer line is not available to carry them to a treatment plant. Periodically, the septage is pumped out of the tanks, usually by commercial firms, and released into a wastewater treatment system.

Shotcrete: Mortar or concrete conveyed through a hose and projected at high velocity onto a surface; also known as air-blown mortar, pneumatically applied sprayed mortar, or gunned concrete.

Siphon: A closed conduit, a portion of which lies above the hydraulic grade line, resulting in a pressure less than atmospheric and requiring a vacuum within the conduit to start flow. A siphon utilizes atmospheric pressure to effect or increase the flow of water through the conduit.

Slip Lining: Insertion by pushing or pulling of lines fabricated of plastic, concrete cylinder pipe, reinforced concrete, or steel through existing conduits from access pits.

Sludge: Material removed by sedimentation during primary and secondary treatment. Sludge includes both settled particulate matter and microorganisms and is the single largest component of wastewater residuals. At the time sludge is removed during the treatment process, it contains only 0.5% to 5% solid content by weight. It has the appearance of muddy water.

Sodium Hypochlorite (NaOCl): A liquid form of chlorine that MWRA uses in the disinfection and/or odor processes at the Deer Island Treatment Plant, various other Wastewater facilities, and the Carroll Water Treatment Plant (CWTP).

Storm Sewers: Separate systems of pipes that carry only water runoffs from roofs, streets, and parking lots during storms.

Surcharging: Loads on a system beyond those normally anticipated; also, the height of wastewater in a sewer manhole above the crown of the sewer when the sewer is flowing completely full.

Suspended Solids: The particulate matter contained in wastewater.

SWTR: Surface Water Treatment Rule – A Federal rule promulgated in 1989 that affects all utilities using surface waters or waters under the influence of surface waters. SWTR requires filtration unless certain criteria on source water quality, watershed control, and disinfection effectiveness can be met (see also ESWTR).

Telemetry: Remote measuring or monitoring devices connected to a central monitoring station via telephone lines.

TCR: Total Coliform Rule – A federal rule that requires monitoring of water distribution systems for coliform bacteria and chlorine residual. No more than 5% of the coliform samples in a month can be positive.

TOC: Total Organic Carbon - A measure of the amount of organic material in water. Often used as a surrogate for disinfectant demand or DBP precursors.

Transition: A short section of conduit used as a conversion section to unite two conduits having different hydraulic elements.

TTHM: Total Trihalomethanes - A class of disinfection by-products, related to primarily chlorine disinfection (see D/DBP Rule).

TRAC: Toxic Reduction and Control – The department responsible for MWRA’s industrial pretreatment program.

TSS (Total Suspended Solids): A measure of the settleable solids and non-settleable solids in wastewater. During the primary treatment process, flows are routed to primary treatment clarifiers that remove about half of the pollutants brought to the plant in typical wastewater (50-60% of total suspended solids and up to 50% of pathogens and toxic contaminants are removed).

Ultraviolet (UV) Treatment: Ultraviolet light is an effective method of disinfection in drinking and wastewater applications. UV light damages the DNA of microbes, and is particularly effective against cryptosporidium. Federal regulations require two primary disinfectants for unfiltered water systems. The Carroll Water Treatment Plant added UV as a second disinfectant (in addition to ozonation) in February 2014 and the Quabbin Disinfection Facility (now named the William A. Brutsch Water Treatment Facility) in Ware added UV (as a second disinfection in addition to chlorine) in October 2014.

United States Geological Survey (USGS): The federal agency that collects Geographic Information System (GIS) data for developing mapping protocols.

Vector Jet Truck: A vehicle used to clean and/or remove blockages from sewer lines by pushing and/or pulling fluids in the sewer.

VMM: Vehicle Management and Maintenance – The program responsible for management and maintenance of MWRA’s vehicles and heavy equipment.

WASM (Weston Aqueduct Supply Mains): Project involving the rehabilitation of the four Weston Aqueduct Supply Mains that carry potable water to MWRA's service area. When complete, they will transmit about one-third of the water to MWRA's service area and the City tunnel will carry the remaining two-thirds.

Wastewater: The water carried by sewers serving residences and businesses that enters wastewater facilities for treatment. Wastewater is any water that has been adversely affected in quality by anthropogenic influence. It comprises liquid waste discharged by domestic residences, commercial properties, and/or agricultural and can encompass a wide range of potential contaminants and concentrations.

Wastewater Treatment Plant (WTP): A facility containing a series of tanks, screens, filters, and other equipment and processes for removing pollutants from wastewater.

Water Supply Trust: The legislature further enhanced the ability of the Department of Conservation and Recreation (DCR) Office of Watershed Management to protect the source waters of the MWRA drinking water supply by establishing a Water Supply Protection Trust in 2004. The trust provides a more efficient mechanism for MWRA's direct funding of the Office of Watershed Management. The Water Supply Protection Trust has a five person board of trustees responsible for approving the Annual Work Plan and Budget each spring for the following fiscal year.

Watershed Reimbursement: An amount that MWRA pays to the Department of Conservation and Recreation (DCR) each fiscal year for maintaining and managing the primary sources of MWRA's water supply (watersheds) in accordance with the laws of the Commonwealth of Massachusetts. The amount of the reimbursement is determined by prevailing legislation.

Wholesale Water and Sewer Services: Potable water and wastewater collection, transport, delivery, and treatment services that MWRA provides to communities. Communities provide the same services directly to retail customers or end users.

WOCC: Western Operations Control Center, located at the Carroll Water Treatment Plant.

APPENDIX F
FY18 Final Current Expense Budget - Capital Financing Detail (as of 6/30/17)

	Outstanding as of 6/30/17	Total	Sewer	Water
SRF ¹				
Unrefunded (93A, 93D, 95A,98C)	\$ 835,000	\$ 2,810	\$ 2,810	\$ -
1999E Sewer		395,614	395,614	-
1999E Water	8,288,730	577,000	-	577,000
1999F	198,475,000	20,289,146	20,289,146	-
2000E Sewer		2,829,941	2,829,941	-
2000E Water	49,160,590	573,028	-	573,028
2001C Water	1,720,000	247,022	-	247,022
2001D Sewer		386,553	386,553	-
2001D Water	2,041,232	82,299	-	82,299
2002H Sewer		2,959,589	2,959,589	-
2002H Water	72,250,000	1,434,685	-	1,434,685
2002I Sewer		100,645	100,645	-
2002I Water	1,637,769	1,489	-	1,489
2003A	560,529	70,353	-	70,353
2003B	1,264,760	220,994	-	220,994
2003C Sewer		1,371,780	1,371,780	-
2003C Water	31,013,529	963,285	-	963,285
2004C Sewer		541,084	541,084	-
2004C Water	7,987,818	91,744	-	91,744
2004D Sewer		2,691,210	2,691,210	-
2004D Water	46,790,000	641,541	-	641,541
2005C Sewer		419,322	419,322	-
2005C Water	5,175,456	68,279	-	68,279
2005D Sewer		3,042,758	3,042,758	-
2005D Water	52,374,416	800,529	-	800,529
2005E Sewer		24,961	24,961	-
2005E Water	248,461	5,479	-	5,479
2006C Sewer		483,917	483,917	-
2006D Sewer		2,805,822	2,805,822	-
2006D Water	58,828,491	1,605,297	-	1,605,297
2006E Sewer		22,883	22,883	-
2006E Water	297,899	10,281	-	10,281
2007C Sewer		306,169	306,169	-
2007C Water	3,940,135	178,215	-	178,215
2007D Sewer		1,147,310	1,147,310	-
2007E Sewer		2,738,920	2,738,920	-
2007E Water	55,677,334	1,258,497	-	1,258,497
2008G Sewer		401,368	401,368	-
2008G Water	4,143,467	82,031	-	82,031
2009C Sewer		5,578,532	5,578,532	-
2009C Water	80,359,176	1,883,318	-	1,883,318
2009D Sewer		645,881	645,881	-
2009D Water	8,906,978	85,531	-	85,531
2010 D Sewer		1,422,030	1,422,030	-
2010 D Water	38,511,577	1,435,461	-	1,435,461
2011A Sewer		381,594	381,594	-
2011A Water	8,198,849	366,805	-	366,805
2012C Sewer		524,404	524,404	-
2012C Water	9,273,596	254,789	-	254,789
2012D Sewer		2,857,902	2,857,902	-
2012D Water	43,667,361	532,505	-	532,505
2013B Sewer		2,214,838	2,214,838	-
2013B Water	33,033,586	533,809	-	533,809
2014C Sewer		283,428	283,428	-
2014C Water	9,354,687	385,186	-	385,186
2015A Sewer		2,646,943	2,646,943	-
2015A Water	59,462,569	979,653	-	979,653
2015B Sewer		260,388	260,388	-
2015B Water	4,956,047	152,123	-	152,123
2016A Sewer		2,128,970	2,128,970	-
2016A Water	51,256,563	847,924	-	847,924
2017A Sewer		615,345	615,345	-
2017A Water	33,559,004	1,746,661	-	1,746,661
Pool 21 Sewer		2,784,035	2,784,035	-
Pool 21 Water		1,510,000	-	1,510,000

APPENDIX F
FY18 Final Current Expense Budget - Capital Financing Detail (as of 6/30/17)

	Outstanding as of 6/30/17	Total	Sewer	Water
Total SRF Debt	\$ 1,007,016,000	\$ 84,931,906	\$ 65,306,092	\$ 19,625,814
MWRA Senior Debt				
2002J Refunding (Fixed)	241,340,000	52,942,075	47,647,868	5,294,208
2005A Refunding	-	-	-	-
2005B Refunding	-	-	-	-
2006B Refunding	30,430,000	1,521,500	1,141,125	380,375
2007B Refunding	647,950,000	34,017,375	28,574,595	5,442,780
2009B Refunding	145,225,000	15,306,250	11,020,500	4,285,750
2010A New	1,390,000	55,600	38,920	16,680
2010B Refunding	98,645,000	15,117,250	8,768,005	6,349,245
2011B New	8,360,000	1,995,450	1,396,815	598,635
2011C Refunding	321,160,000	45,824,275	17,871,467	27,952,808
2012A New	74,590,000	5,639,700	2,819,850	2,819,850
2012B Refunding	86,775,000	4,240,325	890,468	3,349,857
2013A Refunding	142,030,000	4,934,850	2,763,516	2,171,334
2014D New	61,545,000	3,077,250	2,092,530	984,720
2014E Refunding	15,605,000	7,686,917	6,726,052	960,865
2014F Refunding	141,410,000	6,396,700	1,982,977	4,413,723
2016B New	65,970,000	4,406,850	2,203,425	2,203,425
2016C Refunding	681,615,000	32,224,400	16,434,444	15,789,956
2016D	104,260,000	4,524,000	2,940,600	1,583,400
2017B	68,240,000	4,672,000	2,336,000	2,336,000
2017C	254,745,000	16,477,500	7,414,875	9,062,625
FY18 New Money		3,500,000	2,801,210	698,789
Total Senior	\$ 3,191,285,000	264,560,267	\$ 167,865,242	\$ 96,695,025
Subordinate Debt				
1999B	\$ 58,600,000	\$ 5,788,313	\$ 3,472,988	\$ 2,315,325
2002C Refunding	35,120,000	1,141,400	380,429	760,971
2008A Refunding	212,890,000	15,635,015	13,758,813	1,876,202
2008C Refunding	101,300,000	19,654,597	18,868,413	786,184
2008E Refunding	133,640,000	8,253,606	7,593,318	660,289
2008F Refunding	50,000,000	1,625,000	146,250	1,478,750
2012E Refunding	61,415,000	3,467,343	728,142	2,739,201
2012F Refunding	52,075,000	3,163,793	664,396	2,499,396
2012G Refunding	46,900,000	12,324,843	11,831,849	492,994
2014A Refunding	50,000,000	1,625,000	146,250	1,478,750
2014B Refunding	64,755,000	12,764,538	1,148,808	11,615,729
Total Subordinate Debt	\$ 866,695,000	85,443,447	\$ 58,739,657	\$ 26,703,790
Total SRF & MWRA Debt Service²	\$ 5,064,996,000	434,935,620	\$ 291,910,991	\$ 143,024,629
Other Capital				
Water Pipeline Commercial Paper	\$ 128,000,000	3,794,944	-	3,794,944
Current Revenue/Capital ³		13,200,000	12,335,778	864,222
Capital Lease		3,217,060	1,933,347	1,283,713
Debt Prepayment ⁴		10,900,000	10,559,222	340,778
Harbor Cable Prepayment		6,532,146	6,532,146	-
Total Other Capital	\$ 128,000,000	\$ 37,644,150	\$ 31,360,493	\$ 6,283,657
Total Capital Financing (before Debt Service Offsets)	\$ 5,192,996,000	472,579,770	\$ 323,271,483	\$ 149,308,286
Debt Service Offsets				
Debt Service Assistance		(391,580)	(367,196)	(24,384)
Bond Redemption			-	-
Total Debt Service Offsets		(391,580)	(367,196)	(24,384)
Total Capital Financing	\$ 5,192,996,000	472,188,190	\$ 322,904,287	\$ 149,283,902

¹ SRF debt service payments reflect net MWRA obligations after state and federal subsidies.

² Numbers may not add due to rounding.

³ Current Revenue/Capital is revenue used to fund ongoing capital projects.

⁴ Debt Prepayment will be used defeasance of bonds at end of fiscal year.

APPENDIX G

Advisory Boards and Committees

The Advisory Board

The Advisory Board is established by section 23 of the MWRA Enabling Act. The Advisory Board's primary purposes are as follows:

1. To appoints 3 members of the Board of Directors, with staggered 6-year terms.
2. To review and comment on the current expense and capital improvement budgets.
3. To approve expansion of the MWRA's service area, whether permanent or temporary.
4. To make recommendations to the governor and the legislature with respect to matters that affect the Authority.

The Authority's proposed annual current expenses budget and its capital improvement program budget must be submitted to the Advisory Board at least sixty days prior to the adoption of each budget by the Board of Directors. Amendments to the current expenses budget must be submitted to the Advisory Board at least thirty days prior to adoption, except in the event of emergencies. The Authority is required to provide a written response to any reports of the Advisory Board regarding its finances. The Advisory Board has provided the Authority with written comments to both the current expenses and the capital improvement budgets.

The Advisory Board's budget for personnel and expenses is included in the Executive Division's budget.

Water Supply Citizens Advisory Committee to MWRA (WSCAC)

Originally formed in 1977 to review a proposed diversion of the Connecticut River for water supply to the metropolitan Boston area, WSCAC represents an unusual approach for engaging citizen participation in water resource policy decisions.

WSCAC advises the MWRA and the Department of Conservation and Recreation on water conservation and watershed protection strategies. The MWRA has implemented leak repair and demand management programs, avoiding the need for river diversion.

WSCAC's current focus is water quality - source protection and management of the watersheds, reservoirs and distribution system.

WSCAC worked with the New England Safe Drinking Water Task Force on the Safe Drinking Water Act reauthorization. WSCAC helped secure passage of state legislation - the Interbasin Transfer Act of 1983, the Water Management Act of 1985, and the Watershed Protection Act of 1992. State officials have tapped WSCAC for other statewide advisory groups.

The Wastewater Advisory Committee (WAC)

The MWRA Board of Directors created WAC in 1990 to offer independent recommendations on wastewater policies and programs. WAC's mission is to be an independent public forum for holistic discussion of wastewater issues. Membership is designed to reflect the knowledge and interest of major affected constituencies: engineering and construction, environmental advocacy, planning, academic research, and business.

WAC's contractual duties are as follows:

1. Provide independent advice to the MWRA Board and staff on wastewater programs and policies directly related to the MWRA
2. Review and comment to the Authority on wastewater reports and proposed documents; offer independent advice on current and proposed wastewater program and policy directions to further MWRA objectives
3. Reflect the knowledge and interest of major affected constituencies, including
 - a. Engineering
 - b. Construction
 - c. Business/industry
 - d. Planning
 - e. Academic research
 - f. Environmental advocacy
4. Advise MWRA on wastewater planning
5. Increase citizen participation and education by providing MWRA with assistance in outreach. Review programs and explain plans & policies to citizens
6. Attend Authority working groups related to wastewater programs and policy, including the Advisory Board and WSCAC
7. Propose to the Authority ways to continue effective and efficient long-term public involvement in wastewater programs.

WAC's focus for 2017-2018 includes:

- Protecting the ratepayer's massive investment in clean water remains one of WAC's primary interests, and it will continue to monitor maintenance as well as progress on the CSO project.
- WAC is interested in the possibilities of further energy efficiency and renewable energy production at all MWRA facilities.
- Other areas of interest:
 - Co-digestion as it expands across New England
 - Marketability of Bay State Fertilizer
 - Climate Change impacts
 - Regulatory changes that might affect MWRA

APPENDIX H

MWRA Capital Improvement Program Overview

In 1984, legislation was enacted to create the Massachusetts Water Resources Authority, an independent agency with the ability to raise its revenues from ratepayers, bond sales and grants. The primary mission was to modernize the area's water and sewer systems and clean up Boston Harbor. Since its establishment, the MWRA has invested over \$8.2 billion to improve the wastewater and waterworks systems serving its 61 customer communities. The system serves 2.8 million people and more than 5,500 businesses.

Since 1985, MWRA has been subject to a Clean Water Act enforcement action to end years of wastewater pollution of Boston Harbor and its tributaries from the old Deer Island and Nut Island treatment plants and combined sewer overflows (CSOs).

The enforcement case was initiated by the Conservation Law Foundation in 1983 and taken up by the U.S. Environmental Protection Agency in 1985. The Commonwealth of Massachusetts, the Boston Water and Sewer Commission, the City of Quincy and the Town of Winthrop are also parties to the case.

The Orders of the Court set forth the schedules of activities to be undertaken to achieve compliance with the law. Since 1985, MWRA has complied with 420 milestones which include the completion of extensive new wastewater treatment facilities at Deer Island in Boston and Nut Island in Quincy, a residuals facility in Quincy, and 35 CSO control projects in Boston, Cambridge, Chelsea and Somerville which comprise the long-term CSO control plan, the last of which were completed in December 2015.

As part of compliance with the Court's Orders, MWRA was required to file monthly compliance and progress reports on its ongoing activities thru December 15, 2000 and quarterly compliance and progress reports thru December 2016. MWRA is currently required to submit bi-annual compliance and progress reports through December 2020.

During the same time, MWRA also complied with regulatory mandates to improve waterworks facilities. The mandated waterworks projects included the MetroWest Water Supply Tunnel, the Carroll Water Treatment Plant, and several covered water storage facilities.

The mandated projects account for most of the Capital Improvement Program (CIP) spending. The five initiatives below account for over \$6.0 billion or 74% of spending to date:

- Boston Harbor Project - \$3.8 billion
- Combined Sewer Overflow - \$908 million
- MetroWest Tunnel - \$697 million
- Carroll Water Treatment Plant - \$419 million
- Covered Storage Facilities - \$239 million

As the MWRA reaches maturity as an agency, the infrastructure modernization and new facilities construction phase is nearing completion, and, barring new mandates, most of the Authority's future capital budget will be designated for Asset Protection, Water System Redundancy, Pipeline Replacement and Rehabilitation, and Business System Support.

Asset Protection focuses on the preservation of the Authority's capital assets. Water System Redundancy aims to reduce the risks of service interruption and allow for planned maintenance of the water system assets. Long-term water redundancy will be the largest future CIP initiative with estimated spending in excess of \$1.4 billion over 17 years. Pipeline Replacement and Rehabilitation focuses on the maintenance and replacement of water and sewer pipelines. Business System Support provides for the continuing improvement and modernization of technology and security systems.

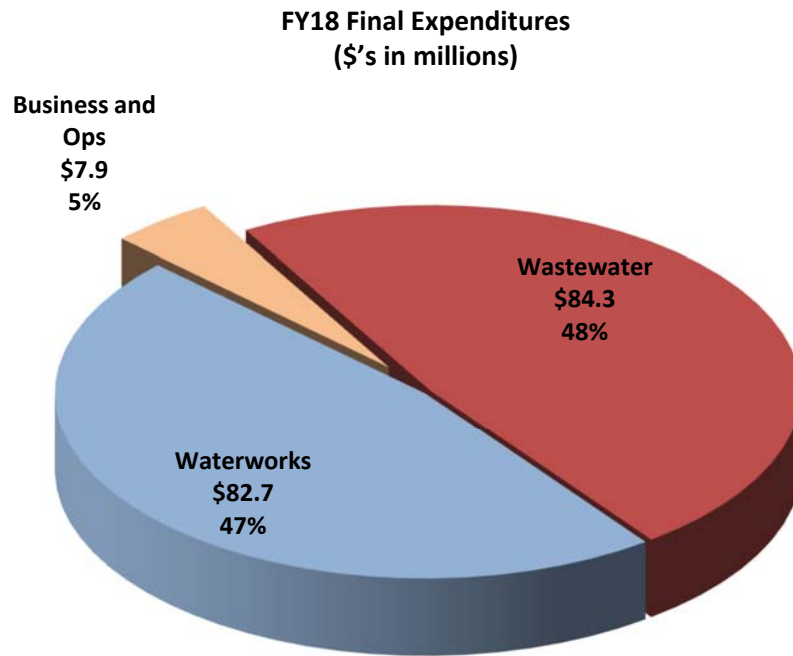
Capital initiatives to date have been primarily funded through long-term borrowings, and the debt service on these outstanding bonds represents a significant and growing portion of the Authority's operating budget. As of June 30, 2017, MWRA's total debt was \$5.2 billion. The Authority's debt service obligation as a percent of total expenses has increased from 36% in 1990 to 63.5% in the Final FY18 Current Expense Budget.

The MWRA's credit ratings of Aa1 from Moody's, AA+ from S&P, and AA+ from Fitch, reflect strong management of financial performance, application of operating surpluses to early debt defeasance, satisfactory debt service coverage ratios, well maintained facilities, comprehensive long-term planning of both operating and capital needs, and the strong credit quality of its member service communities.

To arrive at the FY18 Final CIP, the Authority identified the needs of the programs taking into account the recommendations of the Master Plan. The long-term strategy for capital work is identified in the Authority's Master Plan which was published in 2006, updated in 2013, and is currently being updated. The Master Plan serves as a road map for inclusion of projects in the CIP in every budget cycle. The CIP will be updated again in Fiscal Year 2019, as the Authority will be establishing the next five year spending cap.

The FY18 Final CIP represents an update to the program transmitted to the Board of Directors in December 2016 and later approved by the MWRA Board in June 2017 for FY18. The spending projections put forth are the result of prioritizing the projects, establishing realistic estimates based on the latest information, striking a balance between maintenance and infrastructure improvements, and ensuring that there is adequate support for MWRA's core operations to meet all regulatory operating permit requirements.

Spending For FY18



The FY18 CIP forecasts \$174.9 million in spending in FY18, of which \$84.3 million supports Wastewater System Improvements, \$82.7 million supports Waterworks System Improvements, and \$7.9 million is for Business and Operations Support. There are 171 active contracts in FY18 of which 55 are for design of Wastewater and Waterworks Systems Improvements and 47 are for construction, with projected spending of \$23.7 million for design and \$110.8 million for construction. The FY18 CIP includes \$30.8 million for community assistance programs, which are a combination of loan and partial grant programs, with net expenditures of \$19.1 million on the wastewater side for local Infiltration/Inflow programs and net expenditures of \$11.7 million for local water pipeline programs.

The FY18 Capital Program includes \$1.4 billion for the tunnel option for the Metropolitan Tunnels long-term redundancy project, approved in concept by the Board of Directors in February 2017.

The FY18 Capital Program reaffirms MWRA’s commitment to the community financing assistance programs on both the water and wastewater side. Local Water System Assistance Program Phase 3 Loans in the amount of \$292 million were added for FY18.

FY18 is the fifth and final year of the FY14-18 Cap which set baseline expenditures at \$718.0 million over five years. Based on the Final FY18 Budget, baseline expenditures for FY14-18 are estimated at \$617.0 million, which is \$101.0 million or 14.1% lower than the Base-Line Cap.

Metropolitan Tunnels Water Service Redundancy

The largest remaining challenge facing the MWRA’s infrastructure is water service redundancy for its aging metropolitan tunnels that serve Boston and several surrounding communities. The FY18 CIP includes \$1.4 billion to address critical redundancy improvements for the City Tunnel, the City Tunnel Extension and the Dorchester Tunnel. The MWRA made a series of presentations to the Board of Directors on project need, evaluation of alternatives, and affordability. The MWRA also made a presentation to the Advisory Board with community and other shareholder participation. At its February 2017 meeting, MWRA’s Board of Directors voted on the preferred alternative to construct northern and southern deep rock tunnels and approved that staff proceed with the conceptual preliminary design.

The Five-Year Spending Cap

MWRA established its first five-year Spending Cap in FY03 covering the FY04-08 period. The intent of the Cap was to create a ceiling or not-to-exceed amount for spending over a five-year period. The goal of the Cap is to control spending while still ensuring an adequate level of investment to support the core operational needs of the Authority. Each year, actual spending is compared to the Base-Line Cap.

The FY14-18 Base-Line Cap

The Final FY14 CIP established the FY14-18 Base-Line Cap budget at \$791.7 million, with projected capital expenditures of \$718.0 over five years. This is the third five-year Cap established by the Authority since FY04 and is significantly lower than the prior two five-year Cap periods which each exceeded \$1.1 billion. The following is a breakdown of the FY14-18 Cap components:

FY14-18 Base-Line Cap		FY14	FY15	FY16	FY17	FY18	Total FY14-18
		Projected Expenditures	\$142.5	\$147.6	\$149.3	\$141.8	\$136.8
	Contingency	7.6	9.5	10.1	9.8	9.3	46.1
	Inflation on Unawarded Construction	0.8	4.2	8.4	11.1	13.5	37.9
	Less: Chicopee Valley Aqueduct Projects	(5.0)	(2.2)	(1.4)	(1.3)	(0.4)	(10.3)
	FY14-18 Base-Line Cap	\$145.8	\$159.1	\$166.4	\$161.3	\$159.1	\$791.7

FY18 is the final year of the Base-Line Cap and the FY18 budget anticipates five-year Cap period expenditures of \$617.0, or 14.1% less than the five-year Base-Line Cap expenditures.

FY14-18 Base- Line FY14 Final		FY14	FY15	FY16	FY17	FY18	Total FY14-18
	Projected Expenditures	\$142.5	\$147.6	\$149.3	\$141.8	\$136.8	\$718.0
FY18 Final		FY14	FY15	FY16	FY17	FY18	Total FY14-18
	Projected Expenditures	\$102.2	\$103.6	\$95.1	\$141.2	\$174.9	\$617.0
FY18 Final vs. FY14-18 Base- Line		FY14	FY15	FY16	FY17	FY18	Total FY14-18
	Difference	(\$40.3)	(\$43.9)	(\$54.2)	(\$0.6)	\$38.1	(\$101.0)
		-28.3%	-29.8%	-36.3%	-0.4%	27.9%	-14.1%

The FY18 Final CIP budget includes in addition to FY14-18 capital expenditures of \$617.0 million, contingency of \$17.1million offset by \$82.3 million in Community Loan Program Support and \$7.9 million in Chicopee Valley Aqueduct adjustments. The total Final FY18 projected FY 14-18 Cap spending of \$543.9 million is \$174.1.0 million or 22% less than the Base-Line Cap. \$82.3 million of the underspending is due to redefining the Cap in FY15 at the recommendation of the Advisory Board by excluding the Community Financial Assistance programs.

FY18 Final		FY14	FY15	FY16	FY17	FY18	Total
							FY14-18
	Projected Expenditures	\$102.2	\$103.6	\$95.1	\$141.2	\$174.9	\$617.0
	Contingency	0.0	0.0	0.0	7.3	9.8	17.1
	Inflation on Unawarded Construction	0.0	0.0	0.0	0.0	0.0	0.0
	Less: I/I Program	0.0	(17.5)	(13.6)	(18.4)	(19.1)	(68.6)
	Less: Water Loan Program	0.0	1.4	5.3	(8.7)	(11.7)	(13.7)
	Less: Chicopee Valley Aqueduct Projects	(5.6)	(1.2)	(0.4)	(0.1)	(0.6)	(7.9)
	FY18 Proposed FY14-18 Spending	\$96.6	\$86.3	\$86.4	\$121.3	\$153.4	\$543.9

The FY18 Final CIP budget complies with the overall Base-Line Cap requirement.

FY18 CIP Spending

The top 15 programs below account for nearly 90% or \$156.8 million of projected FY18 spending. Of this \$156.8 million in spending, \$84.5 million is classified as Asset Protection and \$34.2 million is classified as Water Redundancy.

Project	FY18 Expenditures
Facility Asset Protection	\$42.9
NIH Redundancy & Storage	\$20.7
I/I Local Financial Assistance	\$19.1
Cosgrove/Wachusett Redundancy	\$18.5
Southern Extra High Redundancy & Storage	\$13.5
Local Water Pipeline Improvement Loan Program	\$11.7
DI Treatment Plant Asset Protection	\$11.1
Carroll Water Treatment Plant	\$3.7
Residuals Asset Protection	\$2.9
Equipment Purchase	\$2.8
Clinton Wastewater Treatment Plant	\$2.6
Corrosion & Odor Control	\$2.5
NHS - Revere & Malden Pipeline Improvement	\$1.8
Section 80 Rehabilitation	\$1.7
Application Improvement Program	\$1.5
Top 15 Projects	\$156.8
Total FY18 Projected Spending	\$174.9

Major spending at the contract level is listed in the table below. The top 10 contracts account for nearly 68% or \$118.4 million of projected FY18 spending and include upgrades at Chelsea Creek Headworks (\$27.0 million), construction of the new Wachusett Aqueduct Pump Station (\$17.9 million), and Section 89&29 Redundancy Phase 1C (\$12.8 million). Water Pipeline loans and I/I Local Financial Assistance are also major contributors to FY18 spending at \$18.0 million and \$11.3 million, respectively. Of the largest 10 contracts, \$34.7 million is classified as Asset Protection and \$41.4 million is classified as Water Redundancy.

Project	Contract	FY18 Expenditures
Facility Asset Protection	Chelsea Creek Upgrades - Constr	\$27.0
Local Water Pipeline Improvement	Local Water System Assistance Loans	\$18.0
Cosgrove Tunnel Redundancy	Wachusett Aqueduct Pump Station - Constr	\$17.9
NIH Redundancy & Storage	Section 89&29 Redundancy Phase 1C Constr	\$12.8
I/I Local Financial Assistance	Phase IX Grants	\$11.3
Local Water Pipeline Improvement	LWSAP Phase 3 Distributions	\$8.0
Facility Asset Protection	Alewife Brook Pump Stn Rehab - Constr	\$7.7
SEH Redundancy & Storage	Redundancy Pipeline Section III Ph 1-Constr	\$6.0
Local Water Pipeline Improvement	Lead Service Line Replace Loans	\$5.0
NIH Redundancy & Storage	Section 89 & 29 Redun Constr Phase 2	\$4.8
Top 10 Projects		\$118.4
Total FY18 Projected Spending		\$174.9

Chelsea Creek Headworks Upgrade Construction - \$27.0 million FY18 spending (\$76.1 million total construction cost). This major rehabilitation project includes replacement/upgrade to the screens, grit collection system, grit and handling systems, odor control systems, HVAC, mechanical, plumbing and instrumentation. Solids handling systems will be automated and the building's egress and fire suppressions systems will also be upgraded.





Wachusett Aqueduct Pump Station Design and Construction - \$18.5 million FY18 spending (\$54.3 million total construction cost). This is a redundancy project for construction of a 240 million gallons per day emergency pump station which will provide redundancy for the Cosgrove Tunnel by pumping raw water from the Wachusett Aqueduct to the Carroll Water Treatment Plant. This project, along with the completed Hultman Aqueduct rehabilitation and interconnections project, will provide fully treated water transmission redundancy from the Wachusett Reservoir to the beginning of the metropolitan distribution system in Weston.

Northern Intermediate High (NIH) Section 89 & 29 Redundancy Construction Phases 1B, 1C & 2 - \$19.1 million FY18 spending (\$54.3 million total construction cost). This is a redundancy project for the MWRA's Northern Intermediate High pressure water service area. Currently, this area is primarily supplied by a single 48-inch diameter pipeline, the Gillis Pump Station, and water distribution storage from the Bear Hill Tank. This project proposes a new seven mile redundant pipeline under four construction phases and will provide uninterrupted water supply to the service area in the event of a failure of the existing single supply pipe and to allow the existing pipe to be removed from service for inspection, maintenance, and repair. Phase 1A was completed; Phase 1B began in January 2016. Phase 1C was awarded in November 2016 and Phase 2 was awarded in June 2017.



Southern Extra High (SEH) Redundancy Section 111 Phase 1, 2 & 3 Construction - \$12.3 million FY18 spending (\$37.0 million total construction cost). This is a redundancy project for MWRA's Southern Extra High pressure water service area. This project will provide redundancy to Section 77 and 88 serving Boston, Norwood, Stoughton, and Dedham-Westwood, through construction of a redundant pipeline.





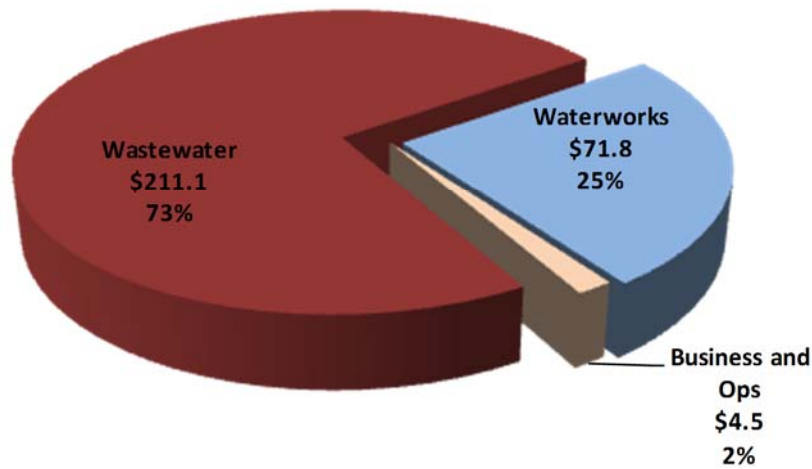
Alewife Brook Sewer Pump Station Rehabilitation - \$7.7 million FY18 spending (\$12.6 million total construction cost). This is a rehabilitation project that includes replacing the three wet weather pumps, motors, and piping, replacing the influent screens and grinders, updating the HVAC system, updating the electrical system, remediating PCB-containing paints, and modifying the building interior to meet current building codes, energy efficiency improvements, flood protection measures, and security improvements.

Planned Contract Awards

Future CIP spending is dependent on current and future contract awards. Through May FY17, 26 contracts totaling \$132.0 million were awarded. In FY18, 54 contracts totaling \$287.5 million are projected to be awarded. The largest fifteen projected contract awards are listed below and account for nearly 80% of the value of the expected awards:

FY18 Planned Contract Awards (\$s in millions)

Project	Contract #	Contract	NTP	Total Contract
DI Treatment Plant Asset Protection	7395	Clarifier Rehab Phase 2 - Constr	Jun-18	\$100.0
DI Treatment Plant Asset Protection	7110	HVAC Equipment Replacement - Constr	Jan-18	\$38.8
DI Treatment Plant Asset Protection	7428	Gravity Thickener Rehab	Apr-18	\$16.9
SEH Redundancy & Storage	7504	Redundancy Pipeline Sect 111 - Constr 2	Jul-17	\$15.2
SEH Redundancy & Storage	7505	Redundancy Pipeline Sect 111 - Constr 3	Oct-17	\$10.0
Metro Tunnel Redundancy	7159	Conceptual Design EIR	Mar-18	\$7.6
Nor Low Service Rehab Section 8	7540	Sec 57 Water & 21/20/19 Sew Des/ESDC/REI	Jul-17	\$5.8
DI Treatment Plant Asset Protection	7131	Misc. VFD Replace Constr	Jul-17	\$5.3
NHS - Revere & Malden Pipeline Impr.	7485	Sect 53 and 99 Conn-Des CA/RI	Nov-17	\$5.2
DI Treatment Plant Asset Protection	7449	Sodium Hypochlorite&Bisulfite Tanks Rehab	Oct-17	\$5.0
DI Treatment Plant Asset Protection	7126	South System PS VFD Replacement Des/ESDC	Jan-18	\$4.8
Winsor Station Pipeline	7460	Winsor Power Station Final Design/CA/RI	Jan-18	\$4.4
Applications Impr. Program	7438	Enterprise Content Mgmt	Sep-17	\$4.0
Wastewater Central Monitoring	7578	Design & Programming Services	Jan-18	\$3.5
Facility Asset Protection	7162	Pump Stns & CSOs Condition Assessment	Dec-17	\$3.3
Top 15 Awards				\$229.6
Remaining 39 Awards				\$57.8



Actual/Projected Spending By Major Categories for the FY14-18 Cap Period

The Final FY18 CIP contains future spending estimated at \$3.4 billion. The Final FY18 CIP (without contingency) includes planned expenditures of \$174.9 million for FY18 and total projected expenditures of \$617.0 million for the FY 14-18 Cap timeframe.

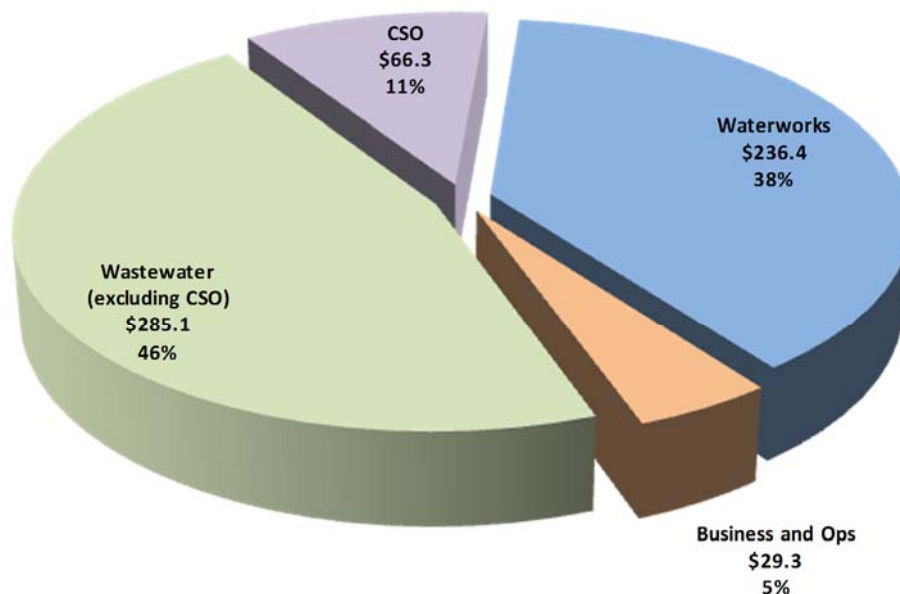
The table below represents the projected spending by major categories:

	Projected Spending after FY16	FY14	FY15	FY16	FY17	FY18	Total FY14-18
Wastewater System Improvements	\$1,310.4	\$55.7	\$75.4	\$64.2	\$71.8	\$84.3	\$351.3
Interception & Pumping	460.8	6.9	8.6	6.6	19.3	46.8	88.2
Treatment	650.3	29.1	25.7	27.3	25.5	13.7	121.2
Residuals	103.0	0.1	-	-	-	2.9	3.0
CSO	17.1	15.6	23.6	16.7	8.6	1.9	66.3
Other Wastewater	79.2	4.0	17.5	13.6	18.4	19.1	72.7
Waterworks System Improvements	\$2,045.9	\$41.0	\$22.7	\$26.7	\$63.3	\$82.7	\$236.4
Drinking Water Quality Improvements	21.8	30.2	12.4	7.1	1.4	3.9	55.0
Transmission	1,652.9	4.6	2.8	8.1	26.5	23.6	65.7
Distribution & Pumping	438.6	4.6	8.7	14.9	22.3	41.8	92.3
Other Waterworks	(67.5)	1.5	(1.1)	(3.4)	13.1	13.5	23.5
Business & Operations Support	38.3	5.5	5.5	4.2	6.1	7.9	29.3
Total MWRA	\$3,394.6	\$102.2	\$103.6	\$95.1	\$141.2	\$174.9	\$617.0

The graph on the next page illustrates the breakdown of spending by major program for the FY14-18 timeframe and highlights MWRA’s accomplishment in reaching substantial completion by December 2015 in accordance with Schedule Seven of the Federal District Court Order for the construction of the court-

mandated CSO program at a total cost since 1986 of \$904 million. During the FY14-18 Cap period, the last two components of the CSO Control Program were completed: the Boston Reserve Channel and Cambridge Sewer Separation – respectively accounting for \$10.6 million and \$54.0 million of spending during the FY14-18 Cap period. Final restoration work will continue through 2017. Going forward, MWRA will move to a monitoring, reporting, and evaluation phase for the program.

**FY18 Final FY14 – 18 Expenditures
(\$s in millions)**



Changing Nature of the Capital Program

Since 1985, nearly 80% of the Authority’s spending had been on court mandated and regulatory required projects. The MWRA is currently updating its Master Plan which will prioritize projects and provide information for establishing the next CIP five-year Cap. With the completion of the court-ordered Combined Sewer Overflow project last year, the MWRA is shifting its capital expenditures to Asset Protection and Water Redundancy projects. Some of the larger Asset Protection projects with spending in FY18 include the Chelsea Creek Headworks Upgrades and Alewife Brook Pump Station Rehabilitation. The larger Water Redundancy projects, with spending in FY18, include the Wachusett Aqueduct Pump Station, Northern Intermediate High Pipeline Section 89&29 and Southern Extra High Pipeline Section 111.

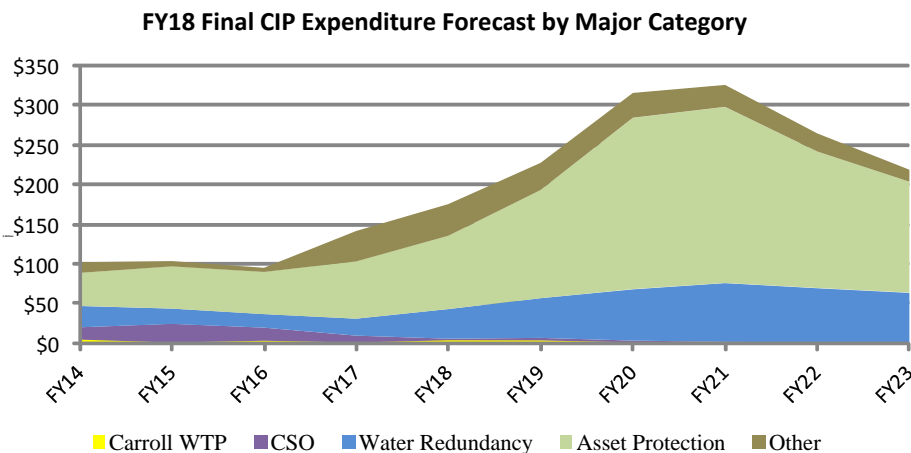
Based on the Final FY18 CIP, mandated or regulatory related projects account for approximately 25% of contract spending with the majority of expenditures supporting Asset Protection, Water System Redundancy, and continued Community Assistance programs.

The table below highlights the changing nature of the Capital Improvement Program; the transition from mandated projects, mainly the Combined Sewer Overflow Program, to Asset Protection and Water System Redundancy initiatives.

	FY09-13	FY14-18	FY19-23
Asset Protection	\$248.0	\$312.6	\$883.3
Carroll WTP	38.5	12.0	6.2
Water Redundancy	134.7	122.7	320.6
CSO	315.5	66.3	6.6
Other	88.4	103.4	130.0
Total	\$825.1	\$617.0	\$1,346.8
Asset Protection	30.1%	50.7%	65.6%
Carroll WTP	4.7%	1.9%	0.5%
Water Redundancy	16.3%	19.9%	23.8%
CSO	38.2%	10.7%	0.5%
Other	10.7%	16.8%	9.7%
Total	100.0%	100.0%	100.0%

Asset Protection and Water Redundancy initiatives accounted for 30.1% and 16.3% of FY09-13 spending, respectively. Asset Protection and Water System Redundancy spending is projected to rise and accounts for 50.7% and 19.9% of FY14-18 capital expenditures respectively, a total of \$435.3 million of the \$617.0 million, or nearly 71% projected to be spent over the 5-year period.

The graph below displays the projected trend of expenditures by major category for the FY14-23 time period.



As the Authority’s Capital Improvement Program advances over time, it is expected that Water System Redundancy will be achieved and that Asset Protection will remain a significant spending initiative.

Community Water and Sewer Assistance Programs

The Infiltration/Inflow (I/I) Local Financial Assistance Program provides funding assistance in the form of grants and loans for communities to rehabilitate their sewerage collection systems with the goal of structurally reducing I/I flow. The loan distribution portion of the program is repaid back to the MWRA interest free. Presently, \$72.7 million is forecasted to be spent in the FY14-18 CAP period which is net of all repayments during this time frame. During the FY15 CIP development, Phases 9 and 10 were added to the CIP at \$80 million each to be distributed as 75% grants and 25% interest-free loans. By comparison Phases 1 and 2 were 25% grants and 75% interest-free loans. The grant/loan ratio was revised for phases 3 through 8 to 45% grants and 55% interest-free loans. Payback periods for Phases 9 and 10 were also extended from 5 years to 10 years. Distribution of funds is authorized through FY2025.

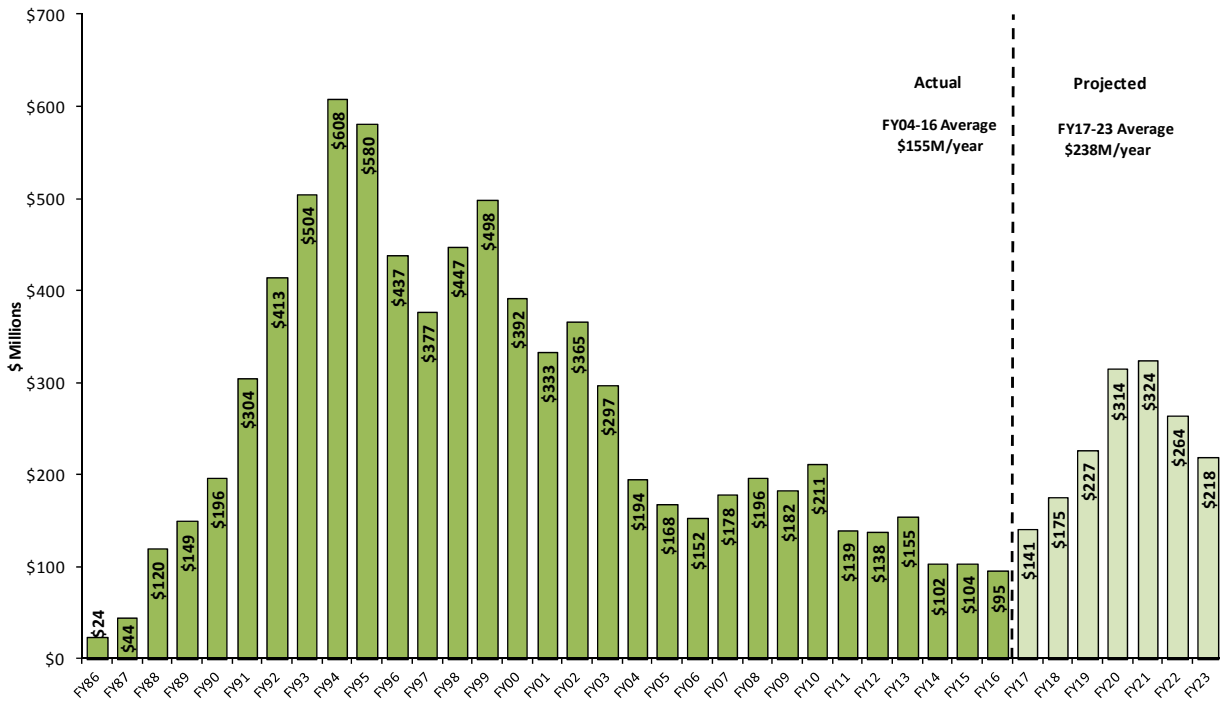
The Local Water System Assistance Program provides financial assistance in the form of 10-year, interest-free loans for communities to rehabilitate, either by relining or replacement, each community's proportional share of total unlined pipe miles. Presently, \$15.1 million is forecasted to be spent in the FY14-18 CAP period which is net of all repayments during this time frame. During the FY17 CIP development, the program was expanded to include \$100 million in interest-free loans to communities solely for efforts to fully replace lead service lines. The Lead Service Line Replacement Loan Program is budgeted over twenty years, but the pace of spending for the program will depend on the level of participation by the communities, the communities' ability to work with individual homeowners and future regulatory requirements. During the FY18 Final CIP development, the community assistance program was further expanded to include \$292 million in interest-free loans to communities for Phase 3 of the Local Water System Assistance Program. Distributions from this program are scheduled to be made from FY18 through FY30 with repayments scheduled for FY19 through FY40.

FY18 – Final Year of the 5-Year Cap

FY18 is the final year of the Authority's 5-year Cap for capital spending. The Authority has complied with the Cap and remains below the ceiling for spending. During the FY14-18 time frame, the Authority reached substantial completion of its court mandated CSO Control Plan, the last major milestone in the Clean Water Act case at an approximate total cost of \$907 million. The Authority also reached substantial completion of the Spot Pond Storage Facility, providing distribution storage for the Northern Low Service area and achieving water redundancy to the Gillis Pump Station supplying the Northern High and Northern Intermediate High service areas. Several major projects including the Carroll Ultraviolet Disinfection Water Treatment, Brutsch Water Treatment Plant, and Deer Island Wastewater Treatment Plant North Main Pump Station Variable Frequency Drives Construction projects were also completed during this period.

Historical Spending

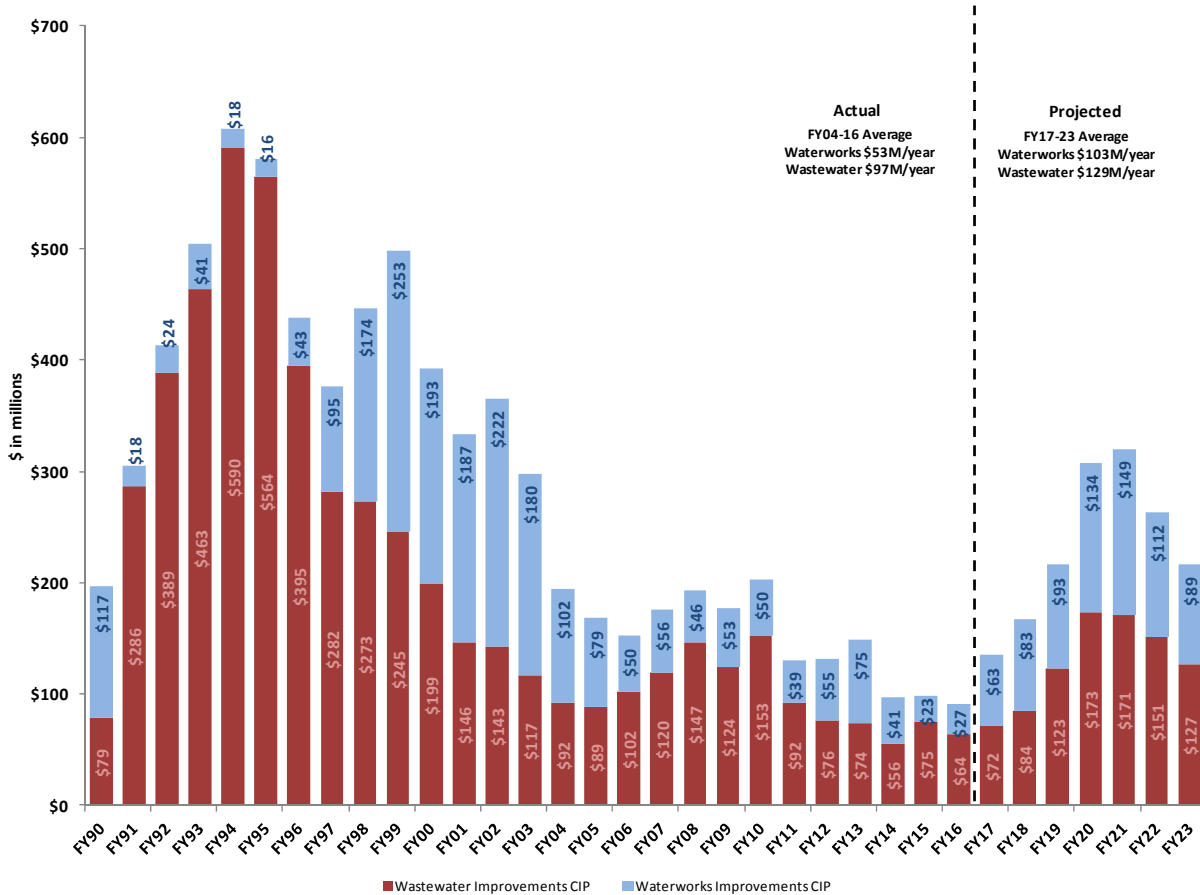
The chart on the next page captures the historical Capital Improvement Program spending through FY16 and projected spending to FY23 based on the Final FY18 CIP.



The average spending for FY04-16 timeframe was \$155 million per year. The FY18 Final CIP projects that average spending during the FY17-23 period is projected to be \$238 million per year.

Historical Capital Spending by Utility

The chart on the next page captures the historical Capital Improvement Program spending through FY16 and projected spending to FY23 by Waterworks and Wastewater utility based on the Final FY18 CIP.



The average spending for FY04-16 timeframe by utility was \$53 million and \$97 million per year for Waterworks and Wastewater respectively. Similarly, the FY18 Final CIP projects that average spending by utility over the FY17-23 period is budgeted at \$103 million and \$129 million per year for Waterworks and Wastewater respectively.

MWRA Capital Improvement Spending and Debt Service

As of June 30, 2017, MWRA’s total debt was \$5.1 billion, which is \$0.3 billion less than the MWRA’s total debt as of June 30, 2016. However, debt service obligations are projected to increase in coming years peaking in 2022. The Authority’s debt service as a percent of total expenses has increased from 36% in 1990 to 63.5% in the Final FY18 Current Expense Budget. Peak debt service is currently projected to be 64.7% of total expenses in FY22. The FY18 Final CIP reaffirms that the MWRA is reducing its total bonded indebtedness over the Cap period by paying off more principal on debt than annual CIP spending and resulting borrowing. This trend is expected to continue for the foreseeable future.

Contingency

Contingency for each fiscal year is incorporated into the CIP to fund the uncertainties inherent to construction. The contingency budget is calculated as a percentage of budgeted expenditure outlays. Specifically, contingency is 7% for non-tunnel projects and 15% for tunnel projects. The contingency budget is \$9.8 million for FY18 and \$17.1 million for the FY14-18 timeframe.

APPENDIX I

WATER SUPPLY PROTECTION TRUST				
Expenditures and Revenues Report				
FY18 Budget vs. FY17 Budget				
	FY17	FY18		
	Budget	Budget	Variance	%
A. Revenues				
OWM Revenues				
Hydro + Transmission	\$540,000	\$500,000	-\$40,000	-7.4%
Forestry	\$185,000	\$200,000	\$15,000	8.1%
Fishing & Recreation	\$240,000	\$240,000	\$0	0.0%
Misc.	\$50,000	\$50,000	\$0	0.0%
OWM Revenues Subtotal	\$1,015,000	\$990,000	-\$25,000	-2.5%
MWRA Payments to Trust *	\$15,919,268	\$16,724,006	\$804,738	94.4%
Total Revenues	\$16,934,268	\$17,714,006	\$779,738	91.9%
B. Expenditures				
AA Personnel	\$9,890,000	\$10,225,408	\$335,408	3.4%
BB Employee Expenses	\$11,150	\$11,150	\$0	0.0%
CC Contracted Services	\$85,000	\$77,000	-\$8,000	-9.4%
DD Pensions/Insurance	\$3,492,918	\$3,723,748	\$230,830	6.6%
EE Admin Expenses	\$100,000	\$100,000	\$0	0.0%
FF Facility Operational Supplies	\$148,200	\$148,200	\$0	0.0%
GG Energy Costs	\$326,000	\$336,000	\$10,000	3.1%
HH Consultant Contracts	\$216,000	\$231,000	\$15,000	6.9%
JJ Operational Services	\$44,000	\$44,000	\$0	0.0%
KK Equipment	\$498,000	\$518,000	\$20,000	4.0%
LL Leases, Rentals	\$130,000	\$127,000	-\$3,000	-2.3%
NN Construction Improvements	\$765,000	\$795,000	\$30,000	3.9%
PP Grants to Public Entities	\$0	\$0	\$0	0.0%
TT Specials Payments	\$125,000	\$125,000	\$0	0.0%
UU IT Expenses	\$193,000	\$202,500	\$9,500	4.9%
Total Baseline Costs	\$16,024,268	\$16,664,006	\$639,738	4.0%
Wachusett/Sudbury Capital Projects	\$435,000	\$900,000	\$465,000	106.9%
Quabbin/Ware Capital Projects	\$475,000	\$150,000	-\$325,000	-68.4%
Total Capital Projects	\$910,000	\$1,050,000	\$140,000	15.4%
Total Expenditures	\$16,934,268	\$17,714,006	\$779,738	4.6%

* not accounting for Fiscal Year roll-over, which is credited from the prior Fiscal Year

APPENDIX J - MWRA Reserve Summary

MWRA Rate Stabilization, Bond Redemption, and Funded Reserves (Updated based on June 30, 2017 Year End)

Under the terms of its General Bond Resolution, MWRA maintains two funds, Rate Stabilization and Bond Redemption, which are used to smooth rate increases. Monies in the funds come from year-end CEB surpluses. The amounts in the funds and the permitted and planned uses are discussed below. Amounts reflect FY17 year-end transfers.

Rate Stabilization - \$36.5 million. Under the terms of the General Bond Resolution, the annual use of Rate Stabilization monies cannot exceed 10% of the year's senior debt service. The FY14 Final CEB assumes the use of \$3.5 million in Rate Stabilization. The FY15, FY16, FY17 and FY18 Final CEB did not include the use of Rate Stabilization Funds. Planning estimates based on the FY18 Budget assume use of all of the Rate Stabilization monies between FY22 and FY27.

Bond Redemption - \$26.1 million. Monies in the Bond Redemption Fund can be used only to retire or prepay outstanding debt. There is no annual limit on the amount of Bond Redemption funds used in a year. However, there are constraints based on bond maturity dates. The FY15 Final CEB included the use of \$6.7 million of bond redemption funds. The FY16, FY17 and FY18 CEB assumed no use of Bond Redemption Planning estimates assume that the remaining funds are exhausted by FY27.

In addition to the Rate Stabilization and Bond Redemption funds, MWRA maintains five funded reserves required by the terms of the General Bond Resolution: Debt Service, Operating, Insurance, and Renewal and Replacement. The amount in each reserve, the basis for determining the funding requirement and when a reserve can be used to reduce rate revenue requirements are discussed on the right:

Debt Service Reserve - \$150.7 million. This is MWRA's largest reserve, and is funded from bond proceeds. This balance reflects the withdrawal of \$5.9 million as part of the 2014 Series D-F transaction. On August 4, 2015, MWRA released \$67.0 million from the debt service reserve fund as part of the amendments to the General Bond Resolution. The required balance is equal to the sum of the average annual debt service for outstanding issues. The fund can be used to pay debt service when the amount for a specific debt series in the reserve is greater than the remaining debt service.

Operating Reserve - \$39.2 million. The required balance is one-sixth of operating expenses for a year. Based on the FY17 Final CEB, the required balance is \$39.2 million. The balance is projected to be \$40.1 million by the end of FY18.

Insurance Reserve - \$14.0 million. MWRA mitigates the budgetary risk of self-insurance by maintaining an insurance reserve. The reserve which was established as part of the Bond Resolution requires that an independent insurance consultant review the adequacy of the funding level every three years. The \$14 million level has been determined to be acceptable and reasonable based on the February 2014. A review of this reserve was completed in 2017.

Renewal and Replacement Reserve - \$10.0 million. The required balance is set at \$10 million with the difference between the \$10 million and the required balance based on the triennial recommendation of a consulting engineer being available in short-term borrowing capacity. The current recommendation is \$35 million. MWRA's consulting engineer will complete its triennial review of this reserve balance again in 2017.

CORE Fund

The CORE Fund was eliminated as part of the amendment to the General Bond Resolution.

APPENDIX K

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