



Massachusetts Water Resources Authority  
**COMPREHENSIVE ANNUAL  
FINANCIAL REPORT**  
For the Fiscal Years Ended June 30, 2018 and 2017



Prepared by:  
Finance Division



# Massachusetts Water Resources Authority



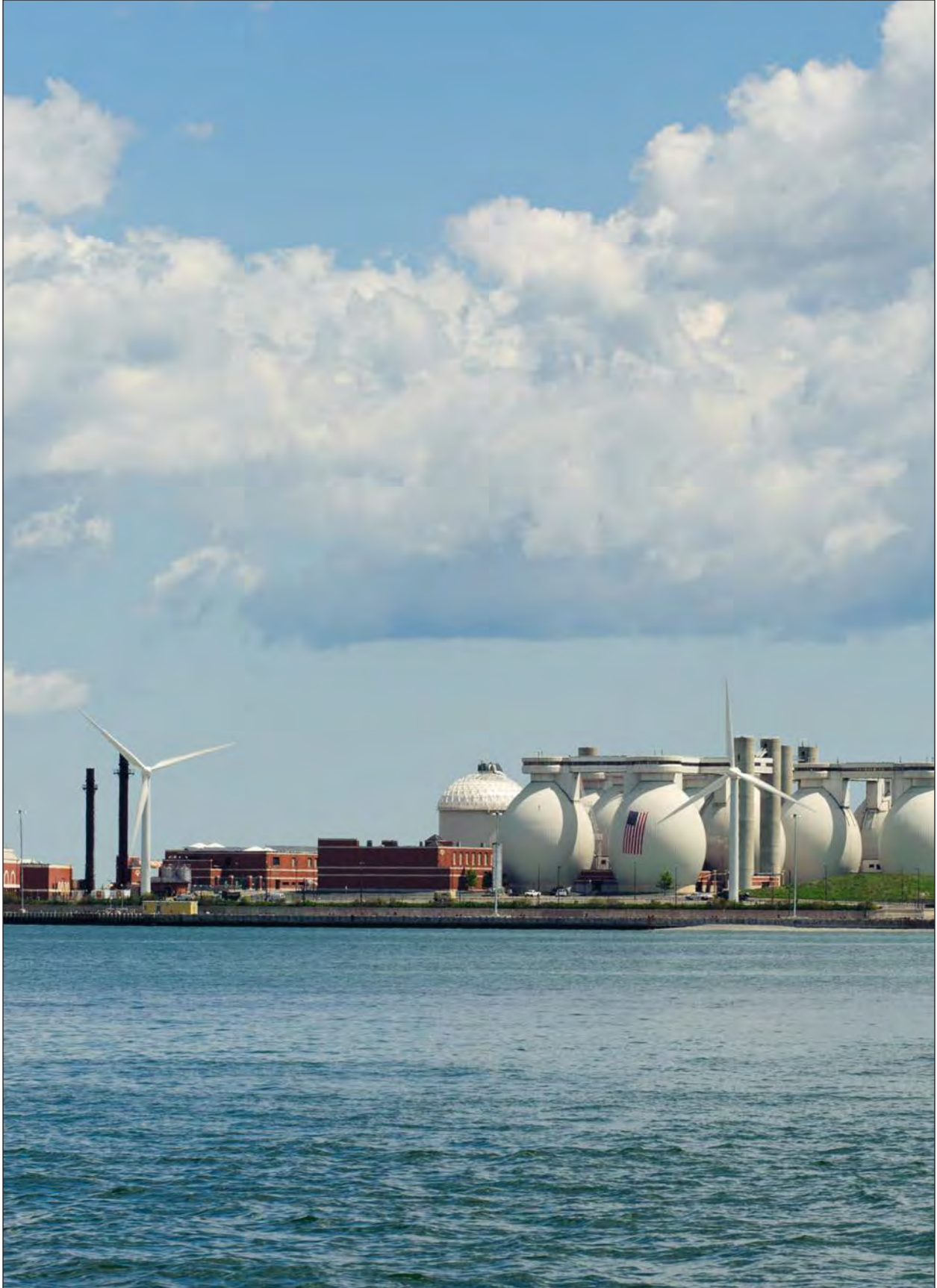
## **Comprehensive Annual Financial Report**

For the Fiscal Years Ended June 30, 2018 and 2017

Frederick A. Laskey  
Executive Director

Prepared by  
Thomas J. Durkin, Director, Finance  
Robert M. Belkin, Controller, Finance

This document is available at the MWRA website: [www.mwra.com](http://www.mwra.com)



Deer Island Wastewater Treatment Plant

# Table of Contents

## INTRODUCTORY SECTION

Letter of Transmittal	3
Organizational Chart	9
Principal Officials	10

## FINANCIAL SECTION

Independent Auditors' Report	12
Management's Discussion and Analysis (Unaudited)	15

### **Financial Statements as of and for the Years Ended June 30, 2018 and 2017** **23**

Statements of Net Position	23
Statements of Revenues, Expenses, and Changes in Net Position	24
Statements of Cash Flows	25
Notes to Financial Statements	26

### **Required Supplementary Information (Unaudited)** **66**

Schedules of Employer Contributions – Last Ten Years – GASB No. 68	66
Schedules of Changes in the Employer's Net Pension Liability and Related Ratios – Last Ten Years – GASB No. 68	67
Schedules of Changes in the Employer's Net OPEB Liability and Related Ratios – Last Ten Years – GASB No. 75	68
Schedules of Employer Contributions – Last Ten Years – GASB No. 75	69
Schedules of Funding Progress – Other Postemployment Benefits – GASB No. 45	70

### **Supplemental Statements and Schedules** **71**

Accounts Established by the General Revenue Bond Resolution	71
Combining Statements of Net Position	72
Combining Statements of Revenues, Expenses, and Changes in Net Position	74

## STATISTICAL SECTION

Contents	77
Financial Trends	78
Revenue Capacity	82
Debt Capacity	86
Demographic and Economic Information	90
Operating Information	96

# Introductory Section



Quabbin Reservoir





## MASSACHUSETTS WATER RESOURCES AUTHORITY

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Executive Director

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October 10, 2018

To the members of the MWRA Board of Directors

We are pleased to submit to you this Comprehensive Annual Financial Report (CAFR) of the Massachusetts Water Resources Authority (MWRA) for the years ended June 30, 2018 and 2017. This is the initial submission of this document to the Government Finance Officers Association to be awarded a Certificate of Achievement for Excellence in Financial Reporting. The financial section of this CAFR includes management's discussion and analysis, the basic financial statements and the combining financial statements and schedules, as well as the independent auditors' report on these financial statements.

As required by generally accepted accounting principles (GAAP), MWRA management is responsible for the accuracy, completeness, and fairness of the presentation, including all disclosures. Management's discussion and analysis provides an overview of the MWRA's financial results. This letter of transmittal is designed to complement management's discussion and analysis and should be read in conjunction with it. Management's discussion and analysis can be found immediately following the Independent Auditors' Report.

### MISSION

The Massachusetts Water Resources Authority is an independent authority 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.

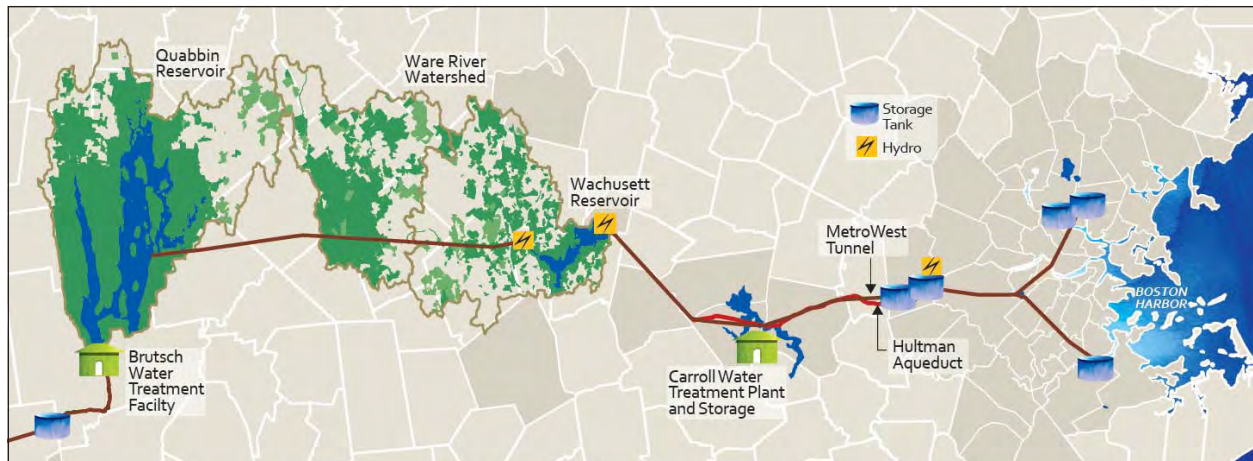
### HISTORY

Created by the Massachusetts legislature in 1985 (Chapter 372 of the Acts of 1984, as amended, "the Enabling Act"), MWRA assumed 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 ("the Commonwealth") 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 all real property comprising the water and sewer systems, 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. MWRA's facilities span from the Quabbin Reservoir in western Massachusetts to the Deer Island Treatment Plant in Boston Harbor. In Fiscal Year 2018, the systems served approximately 3.0 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.

## WATER SYSTEM



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 four-year supply of water.

The Quabbin and Wachusett Reservoirs are well 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 the watersheds are well-protected, the water in the Quabbin and Wachusett Reservoirs is of very high quality. MWRA has won numerous awards for quality, taste, and sustainability.



Ozone And UV Generators at the John J. Carroll Water Treatment Plant

Water for most MWRA communities is treated at the John J. Carroll Water Treatment Plant in Marlborough with two state-of-the-art methods – ozone and UV light. The treated water leaves the plant through the MetroWest Water Supply Tunnel and the Hultman Aqueduct. Along the way, it is stored in covered tanks. From there it is drawn into distribution mains and many smaller community pipes. Three member communities receive water directly from the Quabbin Reservoir: Chicopee, South Hadley Fire District #1 and Wilbraham. That water is treated at the Brutsch Water Treatment Facility in Ware and leaves the plant through the Chicopee Valley Aqueduct.

Meters installed by the member communities measure the amount of water delivered to each home or business.

Over 85% of the water delivered is via gravity, and, as the water travels through the system, electricity is generated at four hydroelectric facilities.

To maintain and ensure water quality, MWRA tests over 1,600 water samples per month, from the reservoirs all the way to household taps. In addition, MWRA uses real-time water quality monitoring throughout the system to immediately identify any issues with water quality.

Since its inception, MWRA has promoted water conservation among its member communities, requiring each to perform bi-annual leak detection surveys and providing educational materials to residents and students. Since 1985, the average annual water demand in the MWRA service area has decreased by over 130 million gallons.



## WASTEWATER SYSTEM



Deer Island Wastewater Treatment Plant

Wastewater is flushed through a building's pipes into the community's sewers. More than 5,300 miles of local sewers transport the flows from 43 communities into 226 miles of MWRA interceptor sewers. The interceptor sewers carry the region's wastewater to two MWRA treatment plants. Most communities' wastewater flows to the Deer Island Treatment Plant.

Before the flows reach the plant, they receive preliminary treatment at five headworks facilities that screen out larger objects, such as bricks and logs. These flows are then pumped through tunnels to the plant and receive Primary Treatment in settling tanks where up to 60% of the solids settle out as a mixture of sludge and water.

During Secondary Treatment, 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, or effluent, is disinfected and discharged through a 9.5-mile underwater tunnel into Massachusetts Bay. The effluent is dispersed over the last mile and a quarter of the tunnel through 55 "diffusers." With water depths up to 120 feet, the outfall provides a much higher rate of mixing and dilution than was possible with discharges into the shallow waters of Boston Harbor prior to construction of the new Deer Island Plant.

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

MWRA also utilizes renewable energy at the Deer Island Treatment Plant, with wind, solar, hydroelectric and biogas systems. The plant currently generates over 50% of its total heat and electricity needs.

Because of inadequate sewage treatment facilities, Boston Harbor was known as the dirtiest harbor in the country in the 1980s. The Deer Island Treatment Plant was constructed in the 1990s as part of the federal court mandated Boston Harbor Clean-up Project, which is widely recognized as a national environmental success story. The Charles River, once the inspiration for the song “Love that Dirty Water” now receives high marks for water quality, and Boston’s beaches are among the cleanest urban beaches in the nation.



Wind turbines and solar panels at the Deer Island Wastewater Treatment Plant

MWRA also operates the smaller Clinton Wastewater Treatment Plant, which serves the Town of Clinton and the Lancaster Sewer District.



## RATES AND CHARGES

Over 95% of MWRA’s budgeted revenues are derived from wholesale rates and charges assessed to member communities. The Enabling Act requires MWRA to set its rates and charges at levels sufficient to pay, among other things, its current expenses and its debt service, and to provide debt service coverage required by MWRA’s General Bond Resolution (“the Resolution”).

In accordance with the Enabling Act, MWRA’s rate setting is exercised independently by its Board of Directors without being subject to the approval of any department, agency or other instrumentality of the Commonwealth of Massachusetts or any other governing body. MWRA establishes charges of general application separately for the services provided by the Waterworks System and the Sewer System. Rates and charges are adopted annually in June, after notice and public hearing, and review of non-binding recommendations by the MWRA Advisory Board. MWRA’s charges for services are billed directly to the member communities on a wholesale basis. Member committees include cities, towns, and other governmental entities tasked with providing retail water and/or sewer services.

In setting water rates, the total amount of revenue that must be raised through water rates in a given fiscal year is identified through a budgeting process, net of other sources of anticipated revenue, such as investment income, receipts from water supply contracts and other special arrangements. Generally, charges for water services are computed on the basis of the proportioned metered water use of each member community for the immediately preceding calendar year.

Sewer charges are computed on a proportional allocation basis utilizing, among other things, total flow, contributing population and census population for each member community. Consistent with the initial step in setting water rates, MWRA first determines the total amount of revenue required to be raised from sewer charges. The total amount of required revenue for the Sewer System is allocated either to operating costs or capital costs, based on a three-year average of total flows for operating costs and total flows, census information and other factors for capital costs.

MWRA has adopted policies to enforce collection of member community assessments, including use of local aid intercept. Local aid intercept would allow MWRA, after certification to the State Treasurer of any unpaid assessment, to instruct the State Treasurer to deduct unpaid assessment amounts from any state reimbursement, grant or local aid to cities and towns that are member communities and remit that amount to the MWRA. The local aid intercept is not available, however, for any non-municipal member community. Fortunately, MWRA has not needed to use local aid intercept in more than 20 years.

## CAPITAL IMPROVEMENT PROGRAM

Since its establishment, MWRA has invested over \$8.4 billion to improve the wastewater and waterworks systems serving its 61 member communities. MWRA was created in response to and has been subject for most of its existence to a Clean Water Act enforcement action (Clean Water Act Case) 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). In 1982 and 1983, civil suits were filed against the MDC and other state agencies claiming that the Massachusetts Clean Waters Act had been violated as a result of discharges of untreated and partially treated sewage from Nut and Deer Islands. The Commonwealth, the Boston Water and Sewer Commission that provides retail water and sewer services within the city of Boston, the City of Quincy and the Town of Winthrop are also parties to the case.

The order of the federal court in the Clean Water Act Case (Court Order) set forth the schedules of activities to be undertaken to achieve compliance with the law. Since 1985, MWRA has complied with 420 milestones which included the completion of extensive new wastewater treatment facilities at Deer Island in Boston and Nut Island in Quincy, a residuals processing facility in Quincy, and 35 separate CSO control projects in Boston, Brookline, Cambridge, Chelsea and Somerville which comprise the long-term CSO control plan, the last of which was completed in December 2015, in compliance with the Court Ordered milestone.

Under the Court Order, MWRA was required to file monthly compliance and progress reports on its ongoing activities through December 15, 2000 and quarterly compliance and progress reports through 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 and modernize the waterworks facilities, including 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 to date. The five initiatives below account for over \$6.0 billion, or 74% of spending to date:

- Boston Harbor Clean-up Project - \$3.8 billion
- CSO Control Plan - \$908 million
- MetroWest Water Supply Tunnel - \$697 million
- Carroll Water Treatment Plant - \$419 million
- Covered Storage Facilities - \$239 million



Spot Pond Covered Storage

As MWRA matures as an agency, the infrastructure modernization and new facilities construction phase is nearing completion, and, barring new mandates, most of the 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 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 is expected to be the largest future CIP initiative and includes two new tunnels 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 in the form of tax-exempt bonds, and the debt service on these outstanding bonds represents a significant and growing portion of the MWRA's operating budget. As of June 30, 2018, MWRA's total debt was \$5.4 billion. The capital finance obligation as a percent of total expenses has increased from 36% in 1990 to 63.5% in the Final FY2018 Current Expense Budget.

MWRA's senior 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.

The long-term strategy for capital work is identified in the MWRA's Water and Wastewater Master Plans, which were published in 2006, updated in 2013, and are currently being updated. Spending projections 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.

## AWARDS AND ACKNOWLEDGMENTS

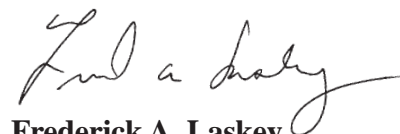
MWRA has received the Government Finance Officers Association's Distinguished Budget Presentation Award for its annual budget document dated September, 2017. To qualify for the Distinguished Budget Presentation Award, the government's budget document had to be judged proficient as a policy document, a financial plan, and operations guide, and communications devise.

The preparation of this report would not have been possible without the skill, effort, and dedication of the entire staff of MWRA's Finance Division. We wish to thank all MWRA departments for their assistance in providing the data necessary to prepare this report. Credit is also due to the MWRA Board of Directors for their unfailing support for maintaining the highest standards of professionalism in the management of the Massachusetts Water Resources Authority's finances.


## INDEPENDENT AUDIT

The Enabling Act requires that the MWRA's financial statements be audited annually by an independent certified public accounting firm. The MWRA General Bond Resolution and certain loan agreements, by reference, specify that the audit be conducted by independent accountants of nationally recognized standing and be satisfactory to the Trustee. The financial section of the 2018 Comprehensive Annual Financial Report begins with the report of our independent auditors, CliftonLarsonAllen LLP. This report expresses an unmodified opinion as to the fairness of the presentation of our financial statements.


Respectfully submitted,



**Frederick A. Laskey**  
Executive Director

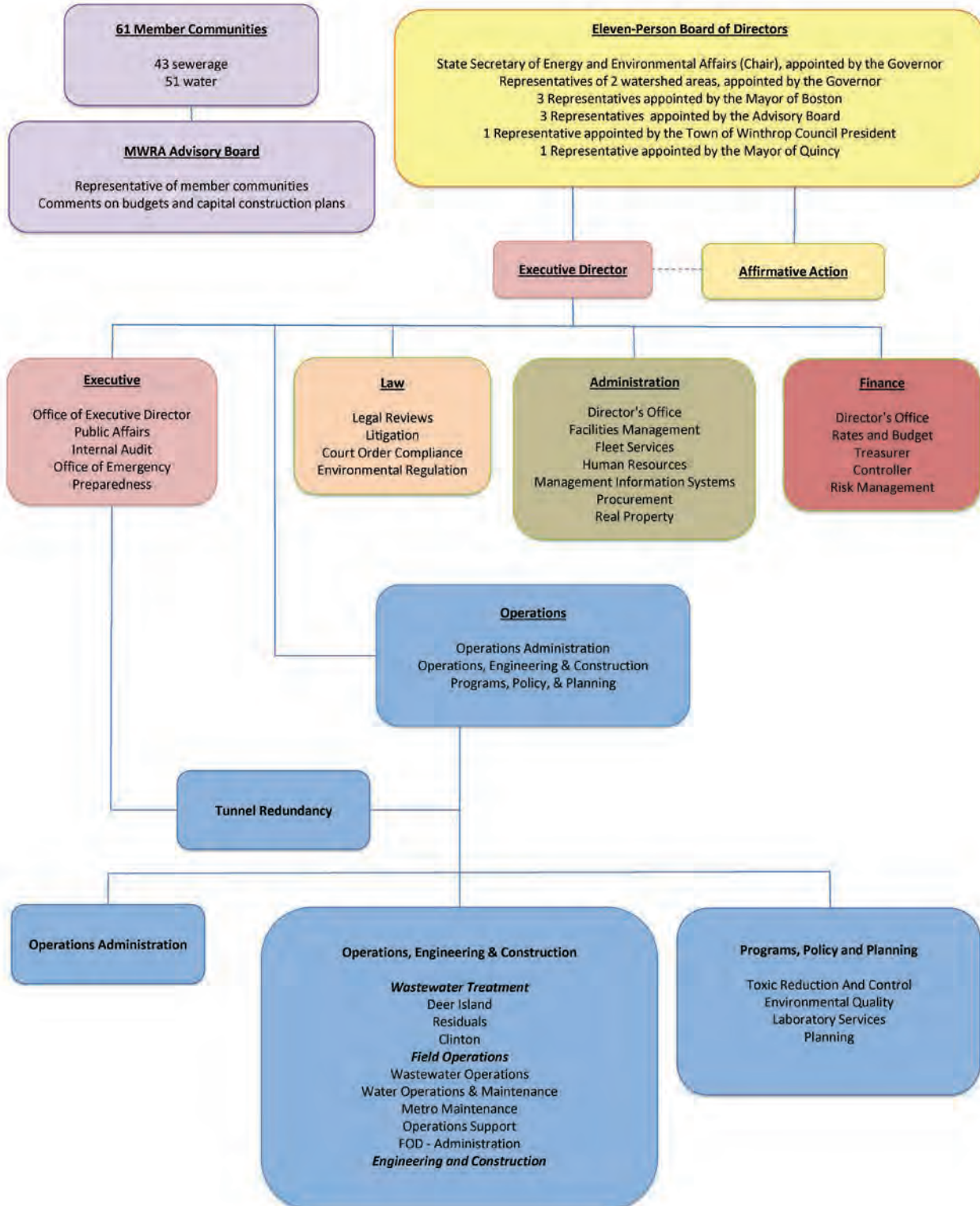


**Thomas J. Durkin**  
Director of Finance



**Robert M. Belkin, CPA**  
Controller

# MWRA Organizational Chart



# Principal Officials



## BOARD OF DIRECTORS

Matthew A. Beaton, Chairman  
John J. Carroll, Vice Chairman  
Andrew M. Pappastergion, Secretary  
Austin F. Blackmon (through June 20, 2018)  
Kevin L. Cotter  
Paul E. Flanagan  
Joseph C. Foti  
Brian Peña  
Henry F. Vitale  
John J. Walsh  
Jennifer L. Wolowicz

## Executive Officers

Frederick A. Laskey, Executive Director  
David W. Coppes, Chief Operating Officer  
Thomas J. Durkin, Director, Finance  
Michele S. Gillen, Director, Administration  
Carolyn Francisco Murphy, General Counsel

## Controller Department

Robert Belkin, CPA, Controller  
Elizabeth Feloni, CPA, Accounting Manager  
June Kwan, Senior Staff Accountant  
Gaby DeLeon, Senior Staff Accountant  
Samantha Wilson, Senior Staff Accountant

# Financial Section



Sudbury Aqueduct

The Board of Directors  
Massachusetts Water Resources Authority  
Boston, Massachusetts

### **Report on the Financial Statements**

We have audited the accompanying statements of net position of the Massachusetts Water Resources Authority (the Authority) as of June 30, 2018 and 2017, and the related statements of revenues, expenses and changes in net position and cash flows for the years then ended, and the related notes to the financial statements.

#### ***Management's Responsibility for the Financial Statements***

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

#### ***Auditor's Responsibility***

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

#### ***Opinion***

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Authority as of June 30, 2018 and 2017, and the changes in financial position and cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.



***Emphasis of Matter***

During the fiscal year ended June 30, 2018, the Authority adopted GASB Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*. As a result, the Authority reported a restatement for a change in accounting principle. Our auditors' opinion was not modified with respect to the restatement.

***Other Matters***

***Required Supplementary Information***

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis (located on pages 15 through 22) and certain pension and other post-employment benefits information (located on pages 66 through 70) be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

***Supplementary and Other Information***

Our audit was conducted for the purpose of forming an opinion on the Authority's financial statements. The schedule of Accounts Established by the General Revenue Bond Resolution, Combining Statements of Net Position and Combining Statements of Revenues, Expenses and Changes in Net Position (Supplemental Schedules), Introductory Section and Statistical Section are presented for purposes of additional analysis and are not a required part of the basic financial statements.

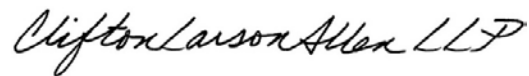
The Supplemental Schedules are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Supplemental Schedules are fairly stated, in all material respects, in relation to the basic financial statements as a whole.

The Introductory and Statistical Sections have not been subjected to the auditing procedures applied in the audit of the basic financial statements and, accordingly, we do not express an opinion or provide any assurance on them.

The Board of Directors  
Massachusetts Water Resources Authority

**Other Reporting Required by *Government Auditing Standards***

In accordance with *Government Auditing Standards*, we have also issued our report dated August 31, 2018 on our consideration of the Authority's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the Authority's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Authority's internal control over financial reporting and compliance.



**CliftonLarsonAllen LLP**

Boston, Massachusetts  
August 31, 2018

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Management's Discussion and Analysis – Required Supplementary Information

June 30, 2018 and 2017

(Unaudited)

This section of the Authority's annual financial report presents our discussion and analysis of the Authority's financial performance during the fiscal years ended June 30, 2018 and 2017. Please read it in conjunction with the Authority's financial statements, which immediately follow this section.

#### **Financial Highlights – Fiscal Year 2018**

The fiscal year 2018 customer service revenues were approximately \$728.3 million. Of this amount, rate revenues represent approximately 98.5%, or \$717.1 million, and were \$22.2 million higher than fiscal year 2017. This was due to an increase in assessments.

Total operating expenses, excluding depreciation, were approximately \$277.9 million in fiscal year 2018. The 2.9% decrease in total operating expenses over fiscal year 2017 is the result of decreases in pension and pollution remediation expenses totaling \$10.3 million, and a decrease in maintenance costs of \$1.7 million, offset by increases in personnel costs of \$2 million and utility costs of \$1.7 million.

Net nonoperating expenses decreased \$16 million, or 7.4%, primarily due to a \$14.5 million decrease in interest expense. Interest expense decreased due to a combination of principal repayments and refunding/defeasance of outstanding debt.

Total assets at June 30, 2018 were approximately \$7.5 billion, a \$160.2 million, or 2.1%, decrease over total assets at June 30, 2017.

During fiscal year 2018 the Authority issued direct-purchase General Revenue Refunding Bonds, 2018 Series A for \$50.6 million, General Revenue Bonds, 2018 Series B for \$107.6 million, General Revenue Refunding Bonds, 2018 Series C for \$21.9 million and direct-purchase General Revenue Refunding Bonds, 2018 Series D for \$50 million. The proceeds from these bonds were used to retire commercial paper notes, retire a portion of the revolving loan, refund bonds outstanding and finance new construction projects. The interest rate on these bonds range from 3% to 5%.

Total capital assets (net of depreciation) were approximately \$5.9 billion at June 30, 2018, an \$75.1 million, or 1.2%, decrease over June 30, 2017. The decrease was primarily due to the rate of depreciation being higher than the rate of capitalization.

#### **Financial Highlights – Fiscal Year 2017**

The fiscal year 2017 customer service revenues were approximately \$705.9 million. Of this amount, rate revenues represent approximately 98.4%, or \$694.9 million, and were \$22.4 million higher than fiscal year 2016. This was due to an increase in assessments.

Total operating expenses, excluding depreciation, were approximately \$286.3 million in fiscal year 2017. The 5.2% increase in total operating expenses over fiscal year 2016 is the result of increases in pension and pollution remediation expenses totaling \$11.8 million and an increase in watershed reimbursement costs of \$2 million, offset by a decrease in OPEB expenses of \$3.2 million.

Net nonoperating expenses increased \$10 million, or 4.9%, due to a \$16.2 million decrease in investment income and a decrease in debt service assistance receipts of \$0.5 million offset by a \$6.6 million decrease in interest expense. The decrease in investment income was primarily due to a decrease in the unrealized gain on investments.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Management's Discussion and Analysis – Required Supplementary Information

June 30, 2018 and 2017

(Unaudited)

Higher long-term interest rates have caused the market values of investments to decrease. Interest expense decreased due to a combination of principal repayments and refunding/defeasance of outstanding debt.

Total assets at June 30, 2017 were approximately \$7.6 billion, a \$150.7 million, or 1.9%, decrease over total assets at June 30, 2016.

During fiscal year 2017, the Authority issued General Revenue Bonds, 2017 Series B and General Revenue Refunding Bonds, 2017 Series C for a total of \$323 million. The proceeds from these bonds were used to finance new capital projects and refund \$306.2 million of the Authority's outstanding bonds. The interest rates on these bonds range from 4% to 5%.

During fiscal year 2017, the Authority also issued General Revenue Refunding Bonds, 2016 Series D for \$104.3 million. The proceeds from these bonds were used to refund \$102.5 million of the Authority's outstanding bonds. The interest rates on these bonds range from 3% to 5%.

Total capital assets (net of depreciation) were approximately \$6.0 billion at June 30, 2017, an \$84.7 million, or 1.4%, decrease over June 30, 2016. The decrease was primarily due to the rate of depreciation being higher than the rate of capitalization.

#### **Overview of the Financial Statements**

The financial section of this annual report consists of four parts: management's discussion and analysis (this section), the financial statements and related notes to the financial statements, required supplementary information, and other supplementary information.

The financial statements provide both long-term and short-term information about the Authority's overall financial status. The financial statements also include notes that explain some of the information in the financial statements and provide more detailed data. The statements are followed by a section of required supplementary information and other supplementary information that further explains and supports the information in the financial statements.

#### **Financial Analysis of the Authority**

##### ***Net Position***

The Authority's total net position at June 30, 2018 was approximately \$1.6 billion, a \$60.9 million decrease from June 30, 2017. Total assets decreased \$160.2 million, or 2.1%, to \$7.5 billion, and total liabilities decreased \$168.2 million, or 2.8%, to \$5.9 billion.

The Authority's total net position at June 30, 2017 was approximately \$1.67 billion, a \$37.8 million decrease from June 30, 2016. Total assets decreased \$150.7 million, or 1.9%, to \$7.6 billion, and total liabilities decreased \$139.4 million, or 2.2%, to \$6.1 billion.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Management's Discussion and Analysis – Required Supplementary Information

June 30, 2018 and 2017

(Unaudited)

#### Net Position

(Dollars in thousands)

	2018	2017*	2016*	Percentage change 2018–2017	Percentage change 2017–2016
Current assets	\$ 95,963	\$ 93,210	\$ 94,763	3.0%	(1.6%)
Restricted assets	727,104	707,255	691,843	2.8%	2.2
Capital assets	5,948,350	6,023,414	6,108,090	(1.2%)	(1.4)
Other assets	716,378	824,142	903,998	(13.1%)	(8.8)
<b>Total assets</b>	<b>7,487,795</b>	<b>7,648,021</b>	<b>7,798,694</b>	<b>(2.1%)</b>	<b>(1.9)</b>
Deferred outflows of resources from pension	17,154	47,910	39,153	(64.2%)	22.4
Deferred outflows of resources from derivative instruments	20,988	35,755	59,615	(41.3%)	(40.0)
Deferred outflows of resources from refunded debt	47,597	68,344	94,840	(30.4%)	(27.9)
Current liabilities	350,382	349,139	282,777	0.4%	23.5
Payable from restricted assets	157,721	154,597	148,191	2.0%	4.3
Long-term debt	5,192,316	5,337,619	5,545,040	(2.7%)	(3.7)
Long-term lease	27,219	28,261	29,223	(3.7%)	(3.3)
Other liabilities	172,784	199,032	202,770	(13.2%)	(1.8)
<b>Total liabilities</b>	<b>5,900,422</b>	<b>6,068,648</b>	<b>6,208,001</b>	<b>(2.8%)</b>	<b>(2.2)</b>
Deferred inflows of resources from pension	14,963	11,810	5,586	26.7%	111.4
Deferred inflows of resources from OPEB	10,032	-	-	100.0%	-
Deferred inflows of resources from regulated activities	42,718	53,275	74,606	(19.8%)	(28.6)
Net position:					
Net investment in capital assets	759,757	729,903	679,739	4.1%	7.4
Restricted	357,767	339,073	346,366	5.5%	(2.1)
Unrestricted	487,875	597,321	678,004	(18.3%)	(11.9)
<b>Total net position</b>	<b>\$ 1,605,399</b>	<b>\$ 1,666,297</b>	<b>\$ 1,704,109</b>	<b>(3.7%)</b>	<b>(2.2%)</b>

\*Certain amounts were reclassified to conform to the fiscal year 2018 presentation

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Management's Discussion and Analysis – Required Supplementary Information

June 30, 2018 and 2017

(Unaudited)

#### Changes in Net Position

The decrease in net position (including the restatement to comply with GASB 75) at June 30, 2018 was \$60.9 million, or 3.7%, as compared with June 30, 2017. The Authority's total operating revenues increased by 3.0% to \$738.3 million and total operating expenses decreased 2.9% to \$277.9 million.

The decrease in net position at June 30, 2017 was \$37.8 million, or 2.2%, as compared with June 30, 2016. The Authority's total operating revenues increased by 2.8% to \$716.8 million and total operating expenses increased 5.2% to \$286.3 million.

<b>Changes in Net Position</b>					
(Dollars in thousands)					
	2018	2017	2016	Percentage change 2018–2017	Percentage change 2017–2016
Operating revenues:					
Customer service revenues	\$ 728,281	\$ 705,933	\$ 683,501	3.2%	3.3%
Other revenues	10,023	10,843	13,472	(7.6)	(19.5)
Total operating revenues	<u>738,304</u>	<u>716,776</u>	<u>696,973</u>	<u>3.0</u>	<u>2.8</u>
Operating expenses:					
Operations	106,943	106,844	98,972	0.1	8.0
Maintenance	29,067	30,799	30,978	(5.6)	(0.6)
Payments in lieu of taxes	8,220	8,191	8,129	0.4	0.8
Engineering, general, and administrative	133,627	140,435	133,959	(4.8)	4.8
Total operating expenses	<u>277,857</u>	<u>286,269</u>	<u>272,038</u>	<u>(2.9)</u>	<u>5.2</u>
Depreciation and amortization	<u>202,799</u>	<u>201,481</u>	<u>197,128</u>	<u>0.7</u>	<u>2.2</u>
Operating income	<u>257,648</u>	<u>229,026</u>	<u>227,807</u>	<u>12.5</u>	<u>0.5</u>
Nonoperating items:					
Regulatory accounting provisions	(106,777)	(62,714)	(72,162)	70.3	(13.1)
Net nonoperating expenses	(198,327)	(214,288)	(204,259)	(7.4)	4.9
Capital grants and contributions	4,715	7,224	38,190	(34.7)	(81.1)
Changes in derivative related accounts	2,940	2,940	2,940	-	-
Total nonoperating items	<u>(297,449)</u>	<u>(266,838)</u>	<u>(235,291)</u>	<u>11.5</u>	<u>13.4</u>
Change in net position	(39,801)	(37,812)	(7,484)	5.3	405.2
Total net position – beginning of year	1,666,297	1,704,109	1,711,593	(2.2)	(0.4)
Restatement to comply with GASB 75	<u>(21,097)</u>	<u>-</u>	<u>-</u>	<u>(100.0)</u>	<u>-</u>
Total net position – end of year	<u>\$ 1,605,399</u>	<u>\$ 1,666,297</u>	<u>\$ 1,704,109</u>	<u>(3.7%)</u>	<u>(2.2%)</u>

During fiscal year 2018, the increases in customer service revenues were primarily due to the 3.19% increase in the rate revenue requirement (\$22.2 million).

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Management's Discussion and Analysis – Required Supplementary Information

June 30, 2018 and 2017

(Unaudited)

During fiscal year 2017, the increases in customer service revenues were primarily due to the 3.34% increase in the rate revenue requirement (\$22.4 million).

#### Operating Costs by Functionality

(Dollars in thousands)

	2018	2017	2016	Percentage change 2018–2017	Percentage change 2017–2016
Wastewater treatment and transport	\$ 98,070	\$ 95,636	\$ 96,427	2.5%	(0.8%)
Water treatment and transport	37,144	37,110	35,630	0.1	4.2
Water and wastewater quality	9,600	9,068	8,767	5.9	3.4
Metering and monitoring	5,059	5,079	4,980	(0.4)	2.0
Facilities planning, design, and construction	11,515	11,188	9,753	2.9	14.7
Management information systems	11,785	11,991	10,346	(1.7)	15.9
Administration and support	46,516	50,650	50,145	(8.2)	1.0
Total direct operating costs	<u>219,689</u>	<u>220,722</u>	<u>216,048</u>	<u>(0.5)</u>	<u>2.2</u>
Indirect operating costs	<u>58,168</u>	<u>65,547</u>	<u>55,990</u>	<u>(11.3)</u>	<u>17.1</u>
 Total operating costs	 <u>\$ 277,857</u>	 <u>\$ 286,269</u>	 <u>\$ 272,038</u>	 <u>(2.9%)</u>	 <u>5.2%</u>

Increases in wastewater treatment and transport expenses were due primarily to \$1.75 million increase in electricity costs at Deer Island and a \$0.67 million increase in sludge pelletization costs of the Residuals Operations department.

#### Other Post-Employment Benefits (OPEB) Irrevocable Trust

In April 2015, the Authority established the MWRA Other Post-Employment Benefits (OPEB) Irrevocable Trust. The Trust was established for the sole purpose of providing for the advance funding of future costs of retired employee health insurance and other benefits provided to retirees. It is intended that the Trust shall constitute a “Qualified OPEB Trust” according to the standards set forth in GASB Statement No. 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions* and the standards of GASB Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*. The Authority's Board of Directors appointed a five-member Board of Trustees, made up of Authority senior managers, to control and manage the trust.

An initial deposit of \$10.8 million was made to the trust upon establishment of the trust. The balance of the trust at June 30, 2018 and 2017 was \$29.8 million and \$22.8 million, respectively.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Management's Discussion and Analysis – Required Supplementary Information

June 30, 2018 and 2017

(Unaudited)

#### Capital Assets and Debt Administration

##### *Capital Assets*

As of June 30, 2018 and 2017, the Authority had \$5.9 billion and \$6.0 billion of capital assets (net of depreciation), respectively. This includes land, construction in progress, plant and equipment for the water and sewer systems, furniture and fixtures, leasehold improvements, and motor vehicles and equipment. The Authority's net capital assets decreased approximately \$75.1 million, or 1.2%, during fiscal year 2018, primarily due to the rate of depreciation being higher than the rate of capitalization.

<b>Capital Assets</b>					
(Net of depreciation, dollars in thousands)					
	2018	2017	2016	Percentage change 2018–2017	Percentage change 2017–2016
Land	\$ 29,878	\$ 29,873	\$ 29,868	0.0%	0.0%
Construction in progress	180,525	127,423	115,758	41.7	10.1
Plant and equipment, water, and sewer systems	5,730,797	5,859,216	5,956,351	(2.2)	(1.6)
Furniture and fixtures	132	213	274	(38.0)	(22.3)
Leasehold improvements	279	291	303	(4.1)	(4.0)
Motor vehicles and equipment	6,739	6,398	5,536	5.3	15.6
<b>Total</b>	<b><u>\$ 5,948,350</u></b>	<b><u>\$ 6,023,414</u></b>	<b><u>\$ 6,108,090</u></b>	<b><u>(1.2%)</u></b>	<b><u>(1.4%)</u></b>

##### *Debt Administration*

The Authority's bond sales must be approved by its board of directors (the Board) and must comply with rules and regulations of the United States Treasury Department. Neither the Commonwealth of Massachusetts (the Commonwealth) nor any political subdivision thereof shall be obligated to pay the principal of, or premium or interest on, any debt outstanding and neither the faith and credit nor the taxing power of the Commonwealth or any political subdivision thereof is pledged to such payment.

##### *Bond Resolutions*

Pursuant to its general bond resolution, the Authority must comply with a rate covenant that requires it to set rates to maintain revenues sufficient to pay: current expenses; debt service on indebtedness; required deposits to reserves; costs of maintenance, replacement, and/or improvements to the wastewater and water systems that are considered current expenses and any additional amounts the Authority may be required to pay by any law or contract.

In addition to the rate covenant, the Authority is required to meet two covenants with respect to debt service coverage. The primary debt service coverage requires that the Authority fix and adjust rates and charges to provide revenues available for bond debt service in an amount equal to 1.2 times that is required for debt service on all outstanding bonds, not including subordinated bonds. The subordinated debt service coverage requires that the Authority fix and adjust rates and charges to provide revenues available for bond debt service in an amount equal to 1.1 times that is required for debt service on all outstanding bonds, including subordinated bonds.



## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Management's Discussion and Analysis – Required Supplementary Information

June 30, 2018 and 2017

(Unaudited)

#### ***Credit Rating***

The Authority's \$3.2 billion Senior Lien General Revenue Bonds are rated Aa1 from Moody's Investors Service, AA+ by S&P Global Ratings and AA+ from FitchRatings. The \$831 million Subordinate Lien General Revenue Bonds are rated Aa2 from Moody's Investors Service, AA by S&P Global Ratings and AA from FitchRatings. Some of the Authority's revenue bonds are enhanced by bond insurance. The credit ratings of these bond series will be the higher rating of either the Authority or the firm providing the enhancement. In the case of bonds enhanced by a letter of credit, the rating will be the highest of the Authority's, the provider or, if available, a joint rating. The subordinated debt of \$943 million with the Massachusetts Clean Water Trust is not rated as the Authority's debt.

#### ***Economic Factors and Next Year's Budget***

In June 2018, the Board approved the fiscal year 2019 Current Expense Budget (CEB), which totals \$767.9 million in expenses.

The \$767.9 million expense total is comprised of \$482.3 million (62.8%) in capital financing costs and \$285.6 million (37.2%) in operating expenses, of which \$239.6 million (83.9%) is for direct expenses and \$46.0 million (16.1%) is for indirect expenses. The total represents an increase of \$31.1 million from fiscal year 2018 spending, which is comprised of \$22.3 million in higher operating costs and \$8.8 million in lower debt service costs.

The fiscal year 2019 rate revenue requirement approved by the Board is \$739 million; an increase of 3.07% compared with the fiscal year 2018 budget.

Fiscal year 2019 budgeted nonrate revenue totals \$28.9 million, a decrease of \$5.1 million from actual fiscal year 2018 nonrate revenue. The nonrate revenue budget is comprised of \$13.6 million in investment income, \$14.6 million in other user charges and other revenue and \$.7 million in entrance fees.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

Management's Discussion and Analysis – Required Supplementary Information

June 30, 2018 and 2017

(Unaudited)

### ***CIP 10 Year Plan***

The Authority's planned spending for capital improvements in future years reflects the Authority's ongoing efforts to upgrade and maintain the system and to align its project prioritization process with the Master Plan.

Major planned and ongoing projects include:

- Commitment to long-term redundancy plan for the metropolitan water tunnel system and an emergency pump station at the Wachusett reservoir.
- Improvement and replacement of equipment on Deer Island and at major headworks facilities to ensure continued efficient and effective operations.
- Completion of covered storage facilities to provide safe, reliable storage for water treated at John J. Carroll water treatment plant and transported through the MetroWest Tunnel and Hultman Aqueduct.
- Dedication to using resources efficiently, responding to climate change and reducing the environmental impacts of the Authority's daily operations by installing alternative energy sources and promotion of improved self-generation.
- Enhanced commitment to the community assistance programs for both the sewer and water systems to improve local infrastructure, including a new initiative to provide interest-free loans to assist communities in replacing lead service lines.
- Continued investment for the upgrade of Management Information Systems to ensure the availability, integrity and security of data.
- Continue the Residuals Asset Protection program for maintaining and improving the operations and infrastructure of the biosolids processing in the long term.

### **Contacting the Authority's Financial Management**

This report is designed to provide our bondholders, member communities and other interested parties with a general overview of the Authority's finances and to demonstrate the Authority's accountability for the revenue it receives. If you have questions about this report or need additional information, contact the Massachusetts Water Resources Authority, Finance Division, 100 First Avenue, Boston, MA 02129.

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Statements of Net Position

June 30, 2018 and 2017

(Dollars in thousands)

Assets	<u>2018</u>	<u>2017</u>
Unrestricted current assets:		
Cash and cash equivalents (note 4)	\$ 52,614	\$ 50,266
Investments (note 4)	11,252	11,606
Intergovernmental loans (note 7)	31,254	30,579
Accounts receivable	<u>843</u>	<u>759</u>
Total unrestricted current assets	<u>95,963</u>	<u>93,210</u>
Restricted assets:		
Investments (note 4)	724,428	705,593
Interest receivable	1,731	1,662
Grants receivable	<u>945</u>	<u>-</u>
Total restricted assets	<u>727,104</u>	<u>707,255</u>
Capital assets:		
Capital assets – not being depreciated (note 8)	210,403	157,296
Capital assets – being depreciated – net (note 8)	<u>5,737,947</u>	<u>5,866,118</u>
Total capital assets	5,948,350	6,023,414
Regulatory assets (note 3)	505,915	622,428
Other assets, net (note 7)	<u>210,463</u>	<u>201,714</u>
Total assets	<u>7,487,795</u>	<u>7,648,021</u>
<b>Deferred Outflows of Resources</b>		
Deferred outflows from pension (note 10)	17,154	47,910
Deferred outflows from derivative instruments (note 6)	20,988	35,755
Deferred outflows from refunding debt	<u>47,597</u>	<u>68,344</u>
<b>Liabilities</b>		
Current liabilities:		
Accounts payable and accrued expenses	49,465	56,300
Commercial paper notes (note 6)	75,000	99,000
Current portion of long-term debt (note 6)	<u>225,917</u>	<u>193,839</u>
Total current liabilities	<u>350,382</u>	<u>349,139</u>
Payable from restricted assets:		
Accounts payable for construction	19,656	18,847
Accrued interest on bonds payable	79,991	78,497
Reserves (note 5)	<u>58,074</u>	<u>57,253</u>
Total payable from restricted assets	<u>157,721</u>	<u>154,597</u>
Retainage on construction in progress	9,567	7,098
Long-term debt – less current portion (note 6)	5,192,316	5,337,619
Long-term capital lease (note 9)	27,219	28,261
Net pension liability (note 10)	21,025	45,804
Net OPEB liability (note 11)	121,204	110,375
Liability for derivative instruments (note 6)	<u>20,988</u>	<u>35,755</u>
Total liabilities	<u>5,900,422</u>	<u>6,068,648</u>
<b>Deferred Inflows of Resources</b>		
Deferred inflows from pension (note 10)	14,963	11,810
Deferred inflows from OPEB (note 11)	10,032	-
Deferred inflows from regulated activities (note 3)	<u>42,718</u>	<u>53,275</u>
<b>Net Position</b>		
Net investment in capital assets	759,757	729,903
Restricted	357,767	339,073
Unrestricted	<u>487,875</u>	<u>597,321</u>
Total net position	<u>\$ 1,605,399</u>	<u>\$ 1,666,297</u>
Commitments and contingencies (notes 9,10,11,12 and 13)		

*See accompanying Notes to Financial Statements*

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Statements of Revenues, Expenses, and Changes in Net Position

Years ended June 30, 2018 and 2017

(Dollars in thousands)

	<u>2018</u>	<u>2017</u>
Operating revenues (note 2):		
Customer services	\$ 728,281	\$ 705,933
Other	10,023	10,843
Total operating revenues	<u>738,304</u>	<u>716,776</u>
Operating Expenses:		
Operations	106,943	106,844
Maintenance	29,067	30,799
Payments in lieu of taxes	8,220	8,191
Engineering, general, and administrative	133,627	140,435
Total operating expenses	<u>277,857</u>	<u>286,269</u>
Income from operating before depreciation	460,447	430,507
Depreciation and amortization	<u>202,799</u>	<u>201,481</u>
Operating Income	257,648	229,026
Regulatory accounting provisions:		
Change in reserves (note 5)	(821)	168
Change in regulatory provisions, net (note 3)	<u>(105,956)</u>	<u>(62,882)</u>
Total regulatory accounting provisions	<u>(106,777)</u>	<u>(62,714)</u>
Nonoperating revenues (expenses):		
Debt service grant	945	391
Investment income	3,995	3,124
Interest expense	(203,267)	(217,803)
Changes in derivative related accounts	2,940	2,940
Total nonoperating expenses	<u>(195,387)</u>	<u>(211,348)</u>
Net loss before capital grants and contributions	(44,516)	(45,036)
Capital grants and contributions	<u>4,715</u>	<u>7,224</u>
Decrease in net position	(39,801)	(37,812)
Total net position - beginning of year	1,666,297	1,704,109
Restatement to comply with GASB Statement No. 75 (note 2a)	<u>(21,097)</u>	<u>-</u>
Total net position - end of year	<u>\$ 1,605,399</u>	<u>\$ 1,666,297</u>

*See accompanying Notes to Financial Statements*

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Statements of Cash Flows

Years ended June 30, 2018 and 2017

(Dollars in thousands)

	<u>2018</u>	<u>2017</u>
Cash flows from operating activities:		
Cash received from customers	\$ 728,207	\$ 705,858
Cash paid to suppliers for goods and services	(121,879)	(116,749)
Cash paid to employees for services	(131,123)	(129,500)
Cash paid in lieu of taxes	(8,220)	(8,191)
Other operating receipts	9,949	11,261
	<u>476,934</u>	<u>462,679</u>
Net cash provided by operating activities		
Cash flows from capital and related financing activities:		
Proceeds from sale of revenue bonds, loans, and notes	151,604	163,170
Capital grants for construction	4,715	7,224
Debt service grant	-	391
Capital lease principal payments	(1,041)	(963)
Capital lease interest payments	(2,175)	(2,254)
Repayment of debt	(261,177)	(289,264)
Interest paid on debt	(203,971)	(202,636)
Plant expenditures	(147,981)	(127,695)
	<u>(460,026)</u>	<u>(452,027)</u>
Net cash used for capital and related financing activities		
Cash flows from investing activities:		
Purchases of short-term investments	(9,910)	(135,579)
Sales and maturities of short-term investments	-	57,766
Changes in restricted money market investments	(17,400)	40,165
Interest received	12,750	9,551
	<u>(14,560)</u>	<u>(28,097)</u>
Net cash used for investing activities		
Net increase (decrease) in cash and cash equivalents	2,348	(17,445)
Cash and cash equivalents - beginning of year	<u>50,266</u>	<u>67,711</u>
Cash and cash equivalents - end of year	<u>\$ 52,614</u>	<u>\$ 50,266</u>
Reconciliation of operating income to net cash provided by operating activities:		
Operating income	\$ 257,648	\$ 229,026
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation and amortization	202,799	201,481
Change in net pension liability	(24,779)	17,055
Change in deferred outflows from pension	30,756	(8,757)
Change in deferred inflows from pension	3,153	6,224
Change in net OPEB liability	(10,268)	-
Change in deferred inflows from OPEB	10,032	-
Change in other accounts	5,059	5,259
Change in accounts payable	2,534	12,391
	<u>476,934</u>	<u>462,679</u>
Net cash provided by operating activities		

NONCASH CAPITAL AND RELATED FINANCING ACTIVITIES

In fiscal 2018, general revenue refunding bonds in the aggregate principal amount of \$122,510 were issued to defease \$75,545 of bonds outstanding and retire \$50,000 of commercial paper notes.

In fiscal 2017, general revenue refunding bonds in the aggregate principal amount of \$359,005 were issued to defease \$408,680 of bonds outstanding.

*See accompanying Notes to Financial Statements*

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

### (1) Organization

The Massachusetts Water Resources Authority (the Authority) was established in January 1985 pursuant to Chapter 372 (the Enabling Act) of the Act of 1984 of the Commonwealth of Massachusetts (the Commonwealth). The Authority, a successor agency to certain functions of the Metropolitan District Commission (the MDC) (which became part of the Department of Conservation and Recreation (the DCR) in July 2003), is a public instrumentality and, effective July 1, 1985, provides water supply services and sewage collection, treatment, and disposal services to areas of the Commonwealth.

The Authority is governed by an 11-member board of directors (the Board) chaired by the Secretary of Energy and Environmental Affairs for the Commonwealth. The Secretary and two other members are appointed by the Governor. Three members of the Board are appointed by the Mayor of Boston and three are appointed by the Authority's Advisory Board. One member is appointed by the Mayor of Quincy and one by the Winthrop Council President.

### (2) Summary of Significant Accounting Policies

The accounting policies of the Authority conform to U.S. generally accepted accounting principles as applicable to government enterprises. The following is a summary of the Authority's significant accounting policies:

#### (a) Basis of Presentation

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. The Authority's 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 Authority distinguishes operating revenues and expenses from nonoperating 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, the Authority 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 the Authority'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. The effects of the Authority's accounting policies are discussed further in Note 3.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

The Authority has implemented GASB Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*. This Statement requires that the net OPEB liability be reflected on the Statements of Net Position, as well as the deferred inflows and outflows of resources from OPEB activities. In accordance with the Statement, the Authority has restated Net Position at July 1, 2017. Restating the prior year was not practical.

**(b) Capital Assets**

On July 1, 1985, ownership of the MDC’s sewer and waterworks personal property was transferred to the Authority. Pursuant to the Enabling Act, ownership of the real property of the MDC sewer and waterworks systems was not transferred from the Commonwealth to the Authority; however, the Authority has the right to use, improve, maintain, and manage that property. In addition, ownership of the real and personal property of the watershed system remains with the Commonwealth; however, the Authority has the right to utilize the water therefrom for water supply purposes.

The personal property, together with the rights to the real property and watershed system, was recorded at its estimated fair value of \$2,331,465 (including certain construction projects which were in progress as of July 1, 1985), based upon an appraisal performed by valuation specialists. Property, plant, and equipment acquired or constructed since July 1, 1985, is stated at historical cost, and includes the expenditure of capital grants in aid of construction.

Betterments and major renewals are capitalized and included in capital asset accounts, while expenditures for maintenance and repairs are charged to expense when incurred. The cost of depreciable assets and related accumulated depreciation is eliminated from the accounts when such items are disposed of or otherwise retired.

**(c) Interest Cost and Principal Payments on Construction**

During fiscal years 2018 and 2017, none of the Authority’s interest expense was capitalized to construction in progress in accordance with its current policy of recovering such costs through rates as incurred. Rates collected for principal payments on debt related to assets under construction are deferred until the related asset is completed and depreciation commences.

**(d) Depreciation**

The Authority provides for depreciation by use of the straight-line method. Depreciation is intended to distribute the cost of depreciable properties, including those financed by capital grants in aid of construction, over the following estimated average useful lives:

	<u>Years</u>
Plant and Equipment, Water and Sewerage Systems	5–100
Motor Vehicles and Equipment	5
Furniture and Fixtures	7
Leasehold Improvements	3–5

**(e) Revenue Recognition**

The Authority recognizes revenue as amounts become collectible from its customers for water and sewer services provided. The majority of the Authority’s billings to cities and towns are subject to, in the event of nonpayment, the local aid intercept allowed by the Enabling Act.

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

**(f) Cash and Cash Equivalents**

The Authority's policy is to treat unrestricted investments with a maturity date of three months or less when purchased as cash equivalents for purposes of the statements of cash flows. Restricted cash and cash equivalents are combined with investments on the statements of net position, and shown separately on the statements of cash flows as an investing activity.

**(g) Payments in Lieu of Taxes**

The Enabling Act authorizes and directs the Authority to pay to the DCR (formerly the MDC) Division of Watershed Management, who in turn remits payment to each city or town in which land of the Quabbin watershed and Ware River watershed is located. Each such payment is equal to the amount which the respective city or town would receive in property taxes, based upon the fair value of such land if such land were not tax exempt.

**(h) Investments**

Investments are recorded at fair value, other than certain investments that are recorded at net asset value (NAV). The Authority uses an independent pricing source to determine the fair value of investments at quoted market prices. Changes in fair value are included in nonoperating investment income in the Statements of Revenues, Expenses, and Changes in Net Position. Investments that are measured at NAV are the investments in the Massachusetts Municipal Depository Trust (MMDT) which is a 2a7-like external investment pool that is overseen by the Massachusetts State Treasurer and whose fair value of each share is equal to the number of shares; thus NAV is equal to \$1.00 per share.

**(i) Use of Estimates**

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenditures during the reporting period. Actual results could differ from those estimates.

**(j) Compensated Absences**

Employees of the Authority may accumulate unused sick time of which 30% will be paid in cash upon retirement from the Authority. The liability for vacation leave is based on the amount earned but not used; for sick leave, it is based on a percentage of the amount accumulated at the statement of net position dates. The liability for both amounts is calculated based on the pay or salary rates in effect at the statements of net position dates.

**(k) Pensions**

For purposes of measuring the net pension liability, deferred outflows of resources and deferred inflows of resources related to pensions, and pension expense, information about the fiduciary net position of the Plan and additions to/deductions from the Plan's fiduciary net position have been determined on the same basis as they are reported by the Authority. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. Investments are reported at fair value.



**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

**(l) Postemployment Benefits Other Than Pensions (OPEB)**

For purposes of measuring the net OPEB liability, deferred outflows of resources and deferred inflows of resources related to OPEB, and OPEB expense, information about the fiduciary net position of the MWRA and additions to/deductions from the MWRA's fiduciary net position have been determined on the same basis as they are reported by the MWRA. For this purpose, the MWRA recognizes benefit payments when due and payable in accordance with the benefit terms. Investments are reported at fair value, except for money market investments and participating interest-earning investment contracts that have a maturity at the time of purchase of one year or less, which are reported at cost.

**(m) Reclassifications**

Certain reclassifications were made to the fiscal year 2017 financial statements to conform to the fiscal year 2018 presentation.

**(3) Regulatory Assets and Deferred Inflows from Regulatory Activities**

In accordance with GASB Statement No. 62, *Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 FASB and AICPA Pronouncements*, regulatory assets and deferred inflows from regulatory activities that result primarily from differences between depreciation on property, plant, and equipment not financed by grants or capital contributions, which is recovered through rates as principal payments on debt service, and from amounts determined by the Board to be utilized in a subsequent year to reduce customer billings (rate stabilization).

A summary of the activity of regulatory assets and deferred inflows for fiscal years 2018 and 2017 is as follows:

	<u>Sewer</u>	<u>Water</u>	<u>Total</u>
Balance - June 30, 2016 - net	\$ 538,600	\$ 93,435	\$ 632,035
Difference Between Depreciation of Capital Assets Not Financed by Grants or Capital Contributions, and Debt Service in Excess of Interest Expense	(59,876)	(24,337)	(84,213)
Other, Net	<u>10,897</u>	<u>10,434</u>	<u>21,331</u>
Balance - June 30, 2017 - net	489,621	79,532	569,153
Difference Between Depreciation of Capital Assets Not Financed by Grants or Capital Contributions, and Debt Service in Excess of Interest Expense	(70,597)	(37,394)	(107,991)
Rate Stabilization, Net	(6,532)	-	(6,532)
Other, Net	<u>(157)</u>	<u>8,724</u>	<u>8,567</u>
Balance - June 30, 2018 - net	<u>\$ 412,335</u>	<u>\$ 50,862</u>	<u>\$ 463,197</u>

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

The net balance at June 30, 2018 and 2017 is presented on the statements of net position as follows:

	<b>2018</b>	<b>2017</b>	<b>Current year change</b>
Regulatory Assets	\$ 505,915	\$ 622,428	\$ (116,513)
Deferred Inflows from Regulatory Activities	(42,718)	(53,275)	10,557
Net Change	\$ 463,197	\$ 569,153	\$ (105,956)

The balance in the rate stabilization reserve was \$43,044 and \$36,512 at June 30, 2018 and 2017, respectively.

**(4) Deposits and Investments**

The following represents essential risk information about the Authority's deposits and investments:

**(a) Custodial Credit Risk – Deposits**

The custodial credit risk for deposits and certificates of deposit is the risk that, in the event of a bank failure, the Authority's deposits may not be recovered.

The bank deposits at June 30, 2018 and 2017 were \$40,521 and \$40,785, respectively. Of these amounts, \$40,271 and \$40,535, were exposed to custodial credit risks as uninsured and uncollateralized.

**(b) Investments**

The Authority is authorized by its general bond resolution to invest in obligations of the U.S. Treasury, its agencies and instrumentalities, bonds, or notes of public agencies or municipalities, bank time deposits, guaranteed interest contracts, Massachusetts Municipal Depository Trust (MMDT) accounts, interest rate swap agreements, and repurchase agreements. All investments are held by a third-party in the Authority's name. These investments are recorded at fair value.

**(c) Credit Ratings**

All debt securities purchased, such as FNMA, FHLMC, and FHLB issues have historically had a credit rating of AAA or they have been collateralized to AAA. On August 8, 2011, Standard & Poor's reduced the credit rating for these agencies to AA+. The reduction in credit rating did not affect the Authority's bond covenants or escrow requirements.

The Massachusetts Municipal Depository Trust funds are not rated.

The general bond resolution limits the Authority to investing in securities that are rated in the three highest rating categories as defined by S&P and Moody's or other rating agencies.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

**(d) Concentration Risk**

At June 30, 2018 and 2017, the Authority had no investments, at fair value, which exceeded 5% of the Authority's total investments.

**(e) Interest Rate Risk**

The following is a listing of the Authority's fixed income investments and related maturity schedule as of June 30, 2018 and 2017:

<b>June 30, 2018</b>					
<b>Investment maturities (in years)</b>					
Investment Type	Fair Value	<1	1-3	4-8	>9
Mass Municipal Depository Trust	\$ 479,319	\$ 479,319	\$ -	\$ -	\$ -
U.S. Agency Obligations	246,403	17,995	23,207	197,386	7,815
U.S. Treasury Bills	9,958	9,958	-	-	-
Total	<u>\$ 735,680</u>	<u>\$ 507,272</u>	<u>\$ 23,207</u>	<u>\$ 197,386</u>	<u>\$ 7,815</u>

<b>June 30, 2017</b>					
<b>Investment maturities (in years)</b>					
Investment Type	Fair Value	<1	1-3	4-8	>9
Mass Municipal Depository Trust	\$ 461,921	\$ 461,921	\$ -	\$ -	\$ -
U.S. Agency Obligations	255,278	-	18,570	158,026	78,682
Total	<u>\$ 717,199</u>	<u>\$ 461,921</u>	<u>\$ 18,570</u>	<u>\$ 158,026</u>	<u>\$ 78,682</u>

The majority of the Authority's investments are held in short-term money market funds and long-term investments in U.S. agency obligations that are held in the debt service reserve funds where the intent is to hold until maturity.

**(f) Investment Values**

The Authority categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. Debt securities classified in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Debt securities classified in Level 2 of the fair value hierarchy are valued using a matrix pricing technique. Matrix pricing is used to value securities based on the securities' relationship to benchmark quoted prices. The Authority has no securities classified in Level 3. The investment in MMDT, an external investment pool, is measured at \$1.00 per share – the net asset value determined by the pool.

The Authority has the following recurring fair value measurements as of June 30, 2018 and 2017: U.S. Government agency obligations \$246,403 and \$255,278 (Level 2), respectively, U.S. Treasury Bills \$9,958 and \$0 (Level 2), respectively, and MMDT \$479,319 and \$461,921 (NAV), respectively. There are no withdrawal restrictions or unfunded commitments related to the MMDT investment.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

**(g) Restricted Investments by Fund**

The following summarizes restricted investments as of June 30, 2018 and 2017 by various funds and accounts established by the Authority for debt covenants and other purposes:

	<u>2018</u>	<u>2017</u>
Restricted Investments:		
Construction	\$ 105,802	\$ 117,813
Debt Service Reserves	149,933	150,250
Debt Service	302,690	273,811
Operating Reserve	40,070	39,249
Rate Stabilization Reserve	43,044	36,512
Revenue Redemption	25,075	25,911
Revenue	29,952	33,372
Renewal and Replacement Reserve	6,747	8,042
Insurance	14,000	14,000
Insurance Related Escrow Deposits	7,115	6,633
	<u>724,428</u>	<u>705,593</u>
Total Restricted Investments	<u>\$ 724,428</u>	<u>\$ 705,593</u>

**(5) Bond Resolution Reserves**

The components of the reserves funded from revenues and required by the general and supplemental bond resolutions at June 30, 2018 and 2017 are as follows:

<u>Reserves</u>	<u>Sewer</u>	<u>Water</u>	<u>Total</u>	
			<u>2018</u>	<u>2017</u>
Renewal and Replacement	\$ 2,544	\$ 1,457	\$ 4,001	\$ 4,001
Insurance	7,000	7,000	14,000	14,000
Operating	26,178	13,895	40,073	39,252
Total	<u>\$ 35,722</u>	<u>\$ 22,352</u>	<u>\$ 58,074</u>	<u>\$ 57,253</u>

A renewal and replacement reserve of \$6,000 was established through grant receipts transferred from the Commonwealth in 1985 and is included in restricted net position at June 30, 2018 and 2017.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

**(6) Notes Payable and Long-Term Debt**

Long-term debt at June 30, 2018 and 2017 consisted of the following:

	<u>2018</u>	<u>2017</u>
General Revenue Bonds:		
2002 Series J, 5 1/4% to 5 1/2%, issued December 18, 2002, due 2018 to 2022	\$ 189,020	\$ 241,340
2010 Series A, 4%, issued May 6, 2010	-	1,390
2011 Series B, 4 1/8% to 5%, issued May 19, 2011, due 2018 to 2031	7,850	8,360
2012 Series A, 3 1/4% to 5%, issued April 19, 2012, due 2018 to 2042	74,590	74,590
2014 Series D, 5%, issued November 19, 2014, due 2021 to 2044	60,165	61,545
2016 Series B, 3% to 5%, issued May 12, 2016, due 2018 to 2040	63,370	65,970
2017 Series B, 5%, issued May 18, 2017, due 2018 to 2042	68,240	68,240
2018 Series B, 3% to 5%, issued May 16, 2018, due 2019 to 2043	107,580	-
Total	<u>570,815</u>	<u>521,435</u>
General Revenue Refunding Bonds:		
2006 Series B, 5%, issued March 16, 2006	-	30,430
2007 Series B, 5 1/4%, issued February 1, 2007, due 2023 to 2038	647,950	647,950
2009 Series B, 5%, issued February 19, 2009, due 2018 to 2022	126,415	145,225
2010 Series B, 5%, issued May 6, 2010, due 2018 to 2027	95,945	98,645
2011 Series C, 3 1/8% to 5 1/4%, issued December 8, 2011, due 2018 to 2042	321,160	321,160
2012 Series B, 4 1/4% to 5%, issued April 19, 2012, due 2026 to 2029	86,775	86,775
2013 Series A, 4% to 5%, issued March 27, 2013, due 2022 to 2036	102,515	142,030
2014 Series E, 5%, issued November 19, 2014, due 2018 to 2020	15,605	15,605
2014 Series F, 4% to 5%, issued November 19, 2014, due 2021 to 2041	141,410	141,410
2016 Series C, 4% to 5%, issued May 12, 2016, due 2022 to 2040	678,185	681,615
2016 Series D, 3% to 5%, issued August 24, 2016, due 2024 to 2042	104,260	104,260
2017 Series C, 4% to 5%, issued May 18, 2017, due 2018 to 2032	249,500	254,745
2018 Series C, 5%, issued May 16, 2018, due 2023 to 2026	21,900	-
Total	<u>2,591,620</u>	<u>2,669,850</u>

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

	<b>2018</b>	<b>2017</b>
General Revenue Bonds with the Massachusetts		
Clean Water Trust:		
1998 Series C, 4 3/4%, issued July 9, 1998, due 2018	\$ 420	\$ 835
1999 Series E Sewer, 4 3/4%, issued October 6, 1999, due 2018 to 2029	5,583	5,954
1999 Series E Water, 4 3/4%, issued October 6, 1999, due 2018 to 2019	1,580	2,335
1999 Series F, 5 3/4% to 6%, issued November 3, 1999, due 2018 to 2029	181,030	198,475
2000 Series E Sewer, 5 1/4% to 5 5/8%, issued November 1, 2000, due 2018 to 2030	43,511	45,921
2000 Series E Water, 5 1/4% to 5 5/8%, issued November 1, 2000, due 2018 to 2020	2,470	3,240
2001 Series C Water, 5%, issued July 26, 2001, due 2019 to 2021	1,065	1,400
2001 Series D Sewer, 5 3/8% to 5 3/4%, issued July 26, 2001, due 2018 to 2029	1,532	2,031
2001 Series D Water, 5 1/2% to 5 3/4%, issued July 26, 2001, due 2018 to 2019	224	331
2002 Series H Sewer, 5% to 5 1/4%, issued October 31, 2002, due 2018 to 2032	57,095	59,960
2002 Series H Water, 5% to 5 1/4%, issued October 31, 2002, due 2018 to 2022	10,415	12,290
2002 Series I Sewer, 5 1/4% to 5 1/2%, issued October 31, 2002, due 2018 to 2030	1,539	1,629
2002 Series I Water, 5 1/4%, issued October 31, 2002, due 2018 to 2020	6	8
2003 Series A Water, 5%, issued October 31, 2002, due 2018 to 2022	475	561
2003 Series B Water, 5%, issued July 24, 2003, due 2019 to 2021	965	1,265
2003 Series C Sewer, 4 1/4% to 5 1/4%, issued November 6, 2003, due 2018 to 2033	21,010	21,968
2003 Series C Water, 4 3/4% to 5 1/4%, issued November 6, 2003, due 2018 to 2023	7,885	9,045
2004 Series C Sewer, 4 1/4% to 5 1/4%, issued October 26, 2004, due 2018 to 2033	7,123	7,453
2004 Series C Water, 5%, issued October 26, 2004, due 2018 to 2022	416	535
2004 Series D Sewer, 4 1/2% to 5%, issued November 29, 2004, due 2018 to 2034	38,605	40,165
2004 Series D Water, 5%, issued November 29, 2004, due 2018 to 2024	5,935	6,625
2005 Series C Sewer, 4 1/4% to 5 1/4%, issued November 3, 2005, due 2018 to 2033	4,415	4,702
2005 Series C Water, 4 1/4% to 5%, issued November 3, 2005, due 2018 to 2023	412	473

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

	<b>2018</b>	<b>2017</b>
General Revenue Bonds with the Massachusetts		
Clean Water Trust (Continued):		
2005 Series D Sewer, 2 3/10%, issued November 16, 2005, due 2018 to 2035	\$ 43,526	\$ 45,454
2005 Series D Water, 0% to 2%, issued November 16, 2005, due 2018 to 2025	6,168	6,920
2005 Series E Sewer, 2%, issued November 16, 2005, due 2018 to 2025	182	203
2005 Series E Water, 2%, issued November 16, 2005, due 2018 to 2025	41	45
2006 Series C Sewer, 5%, issued October 26, 2006, due 2018 to 2034	5,590	5,920
2006 Series D Sewer, 2 3/10%, issued December 14, 2006, due 2018 to 2036	41,745	43,469
2006 Series D Water, 0% to 2%, issued December 14, 2006, due 2018 to 2026	13,862	15,360
2006 Series E Sewer, 2%, issued December 14, 2006, due 2018 to 2026	187	206
2006 Series E Water, 2%, issued December 14, 2006, due 2018 to 2026	84	93
2007 Series C Sewer, 2% to 2 3/10%, issued November 9, 2007, due 2018 to 2035	2,311	2,560
2007 Series C Water, 2%, issued November 9, 2007, due 2018 to 2025	1,229	1,381
2007 Series D Sewer, 2 3/10%, issued November 9, 2007, due 2018 to 2036	17,134	17,845
2007 Series E Sewer, 2 2/5%, issued December 18, 2007, due 2018 to 2037	41,562	43,695
2007 Series E Water, 2%, issued December 18, 2007, due 2018 to 2027	10,998	11,982
2008 Series G Sewer, 2%, issued December 9, 2008, due 2018 to 2026	3,092	3,421
2008 Series G Water, 2%, issued December 9, 2008, due 2018 to 2026	656	723
2009 Series C Sewer, 2% to 2 2/5%, issued March 18, 2009, due 2018 to 2038	56,504	60,714
2009 Series C Water, 2%, issued March 18, 2009, due 2018 to 2028	18,181	19,645
2009 Series D Sewer, 2% to 2 2/5%, issued December 15, 2009, due 2018 to 2037	7,626	8,081
2009 Series D Water, 2%, issued December 15, 2009, due 2018 to 2027	759	826
2010 Series D Sewer, 2% to 2 2/5%, issued July 8, 2010, due 2018 to 2040	20,521	21,408
2010 Series D Water, 2%, issued July 8, 2010, due 2018 to 2030	16,034	17,103
2011 Series A Sewer, 2% to 2 2/5%, issued March 15, 2011, due 2018 to 2038	4,130	4,407

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

	<u>2018</u>	<u>2017</u>
General Revenue Bonds with the Massachusetts		
Clean Water Trust (Continued):		
2011 Series A Water, 2%, issued		
March 15, 2011, due 2018 to 2028	\$ 3,505	\$ 3,791
2012 Series C Sewer, 2% to 2 2/5%, issued		
June 6, 2012, due 2018 to 2040	5,828	6,218
2012 Series C Water, 2%, issued		
June 6, 2012, due 2018 to 2030	2,866	3,055
2012 Series D Sewer, 2% to 2 2/5%, issued		
June 13, 2012, due 2018 to 2042	34,522	36,514
2012 Series D Water, 2%, issued		
June 13, 2012, due 2018 to 2032	6,774	7,153
2013 Series B Sewer, 2% to 2 2/5%, issued		
May 22, 2013, due 2019 to 2043	24,255	25,863
2013 Series B Water, 2%, issued		
May 22, 2013, due 2019 to 2033	6,792	7,171
2014 Series C Sewer, 2% to 2 2/5%, issued		
May 30, 2014, due 2018 to 2042	4,215	4,395
2014 Series C Water, 2%, issued		
May 30, 2014, due 2018 to 2032	4,681	4,959
2015 Series A Sewer, 2% to 2 2/5%, issued		
January 7, 2015, due 2019 to 2045	43,402	44,949
2015 Series A Water, 2%, issued		
January 7, 2015, due 2019 to 2035	13,847	14,515
2015 Series B Sewer, 2% to 2 2/5%, issued		
May 14, 2015, due 2018 to 2043	2,816	3,011
2015 Series B Water, 2%, issued		
May 14, 2015, due 2018 to 2033	1,835	1,945
2016 Series A Sewer, 2% to 2 2/5%, issued		
March 11, 2016, due 2019 to 2046	36,943	38,126
2016 Series A Water, 2%, issued		
March 11, 2016, due 2019 to 2036	12,565	13,130
2017 Series A Sewer, 2%, issued		
April 13, 2017, due 2019 to 2036	8,389	8,743
2017 Series A Water, 2%, issued		
April 13, 2017, due 2019 to 2036	23,812	24,251
Total	<u>942,880</u>	<u>1,006,451</u>
General Revenue Bonds (Variable Rates):		
1999 Series B, 0.73% to 1.84%, issued		
January 29, 1999, due 2018 to 2028	54,700	58,600
Total	<u>54,700</u>	<u>58,600</u>



## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

	<b>2018</b>	<b>2017</b>
<b>General Revenue Refunding Bonds (Variable Rates):</b>		
2002 Series C, 0.55% to 1.72%, issued August 15, 2002, due 2020	\$ 35,120	\$ 35,120
2008 Series A, 0.76% to 1.80%, issued May 29, 2008, due 2018 to 2037	209,425	212,890
2008 Series C, 0.77% to 1.82%, issued May 29, 2008, due 2018 to 2026	86,300	101,300
2008 Series E, 0.76% to 1.77%, issued May 29, 2008, due 2020 to 2037	133,640	133,640
2012 Series E, 1.22% to 2.26%, issued November 15, 2012, due 2018 to 2031	59,950	61,415
2012 Series F, 1.14% to 2.08%, issued November 15, 2012	-	52,075
2012 Series G, 1.32% to 2.30%, issued November 15, 2012, due 2018 to 2023	36,900	46,900
2014 Series A, 1.08% to 1.93%, issued May 20, 2014, due 2022 to 2025	50,000	50,000
2014 Series B, 1.22% to 2.01%, issued May 20, 2014, due 2018 to 2022	64,755	64,755
2018 Series A, 1.84% to 1.92%, issued March 26, 2018, due 2018 to 2031	50,610	-
2018 Series D, 1.45% to 1.91%, issued May 31, 2018, due 2025 to 2029	50,000	-
Total	<u>776,700</u>	<u>758,095</u>
<b>Revolving Loan:</b>		
2015 Series C, issued November 1, 2015, due 2021	53,000	79,000
Total	<u>4,989,715</u>	<u>5,093,431</u>
<b>Less:</b>		
Unamortized Bond Premiums and Discounts	391,624	398,193
Current Portion of Long-Term Debt	(225,917)	(193,839)
Total	<u>165,707</u>	<u>204,354</u>
Long-Term Debt, Net	<u>\$ 5,155,422</u>	<u>\$ 5,297,785</u>

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

Long-term obligations at June 30, 2018 and 2017 consisted of the following

	<b>2018</b>			<b>2018</b>	<b>Due</b>
	<b>Beginning</b>	<b>Additions</b>	<b>Reductions</b>	<b>Ending</b>	<b>Within</b>
	<b>Balance</b>			<b>Balance</b>	<b>One Year</b>
General Revenue Bonds	\$ 580,035	\$ 107,580	\$ 62,100	\$ 625,515	\$ 52,665
General Revenue Refunding Bonds	3,427,945	122,510	182,135	3,368,320	107,765
General Revenue Bonds with the Massachusetts Clean Water Trust	1,006,451	565	64,136	942,880	65,487
Borrowings Associated with Derivative Instruments	39,834	-	2,940	36,894	-
Revolving Loan	79,000	-	26,000	53,000	-
Total	<u>\$ 5,133,265</u>	<u>\$ 230,655</u>	<u>\$ 337,311</u>	<u>\$ 5,026,609</u>	<u>\$ 225,917</u>
	<b>2017</b>			<b>2017</b>	<b>Due</b>
	<b>Beginning</b>	<b>Additions</b>	<b>Reductions</b>	<b>Ending</b>	<b>Within</b>
	<b>Balance</b>			<b>Balance</b>	<b>One Year</b>
General Revenue Bonds	\$ 650,140	\$ 68,240	\$ 138,345	\$ 580,035	\$ 55,360
General Revenue Refunding Bonds	3,552,735	359,005	483,795	3,427,945	74,340
General Revenue Bonds with the Massachusetts Clean Water Trust	1,035,797	32,994	62,340	1,006,451	64,139
Borrowings Associated with Derivative Instruments	42,774	-	2,940	39,834	-
Revolving Loan	79,000	-	-	79,000	-
Total	<u>\$ 5,360,446</u>	<u>\$ 460,239</u>	<u>\$ 687,420</u>	<u>\$ 5,133,265</u>	<u>\$ 193,839</u>

The Authority is required to establish water and sewer rates and charges at a level sufficient to provide, among other things, primary and subordinated debt service coverage ratios of 120% and 110%, respectively. For the year ended June 30, 2018, the Authority had primary and subordinated debt service coverage ratios of 192% and 120%, respectively.

Under the Authority's General Revenue Bond Resolution, all revenues, together with the investment earnings thereon, except to the extent that such earnings are required to be deposited in the Rebate Fund pursuant to a Supplemental Resolution, are pledged for payment of the Bonds.

The Act of 1984 imposes a limitation of \$600,000 on the total amount of bonds and notes which may be outstanding at any one time. The Authority has requested increases in its debt limit as necessary to allow for issuances of bonds in amounts required to finance the capital program. The state legislature increased the debt limit to \$6,450,000.

On May 31, 2018, the Authority issued direct-purchase General Revenue Refunding Bonds, 2018 Series D for \$50,000. The proceeds from these bonds were used to retire commercial paper notes.

On May 16, 2018, the Authority issued General Revenue Bonds, 2018 Series B for \$107,580 and General Revenue Refunding Bonds, 2018 Series C for \$21,900.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

The proceeds from the Series B bonds were used to finance new construction projects and to retire commercial paper notes (\$25,000) and a portion of the 2015 Series C Revolving Loan (\$26,000). The interest rate on these bonds is 3% to 5%.

The proceeds from the Series C bonds were used to refund \$24,935 of General Revenue Refunding Bonds 2006 Series B. The interest rate on these bonds is 5%. The cash flow required to make principal and interest payments on the refunding bonds is approximately \$4,426 less than the debt service requirements of the refunded bonds. The economic gain (the difference between the present values of the debt service payments on the old and new debt) obtained from this refunding is \$3,808.

On March 26, 2018, the Authority issued direct-purchase General Revenue Refunding Bonds, 2018 Series A for \$50,610. The proceeds from these bonds were used to refund in full the General Revenue Refunding Bonds, 2012 Series F.

The variable interest rate on these bonds will be based on 81.5% of LIBOR set on the first business day of each month. The monthly payment will be a combination of this variable interest and a fixed component of 37 basis points for 2018 Series A.

On May 18, 2017, the Authority issued General Revenue Bonds, 2017 Series B for \$68,240 and General Revenue Refunding Bonds, 2017 Series C for \$254,745.

The proceeds from the Series B bonds were used to finance new construction projects. The interest rate on these bonds is 5%.

The proceeds from the Series C bonds were used to refund \$202,155 of General Revenue Refunding Bonds 2005 Series A, \$75,245 of General Revenue Refunding Bonds 2005 Series B, \$21,955 of General Revenue Refunding Bonds 2008 Series A and \$6,810 of General Revenue Refunding Bonds 2012 Series F.

The interest rate on these bonds is 4% to 5%. The cash flow required to make principal and interest payments on the refunding bonds is approximately \$81,983 less than the debt service requirements of the refunded bonds. The economic gain (the difference between the present values of the debt service payments on the old and new debt) obtained from this refunding is \$60,441.

On August 24, 2016, the Authority issued General Revenue Refunding Bonds, 2016 Series D for \$104,260.

The proceeds from these bonds were used to refund \$1,000 of General Revenue Bonds 2002 Series J, \$3,795 of General Revenue Bonds 2010 Series A, \$68,625 of General Revenue Bonds 2011 Series B, \$23,495 of General Revenue Bonds 2012 Series A and \$5,600 of General Revenue Bonds 2014 Series D.

The interest rate on these bonds is 3% to 5%. The cash flow required to make principal and interest payments on the refunding bonds is approximately \$13,240 less than the debt service requirements of the refunded bonds. The economic gain (the difference between the present values of the debt service payments on the old and new debt) obtained from this refunding is \$9,796.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

On November 1, 2015, the Authority entered into a revolving credit agreement with a bank. The Authority shall repay the loan at the Commitment Termination Date, November 17, 2021, at which point the Authority can elect to convert the revolving loan into a term loan. Interest is payable at 80% of the 1 month LIBOR rate, 2.09% and 1.22% at June 30, 2018 and 2017, respectively. Initial drawdown was \$100,000, which was reduced to \$79,000 at June 30, 2016. The balance was further reduced in fiscal year 2018 to \$53,000 using the proceeds from the General Revenue Bonds, 2018 Series B.

#### *Synthetic Fixed Rate Swap Transactions*

In connection with several of its bond issues, the Authority has entered into various interest rate swap agreements to reduce the impact of changes in interest rates on its variable rate debt. Under these agreements, the Authority pays a fixed interest rate (ranging from 4.0% to 6.6%) and receives interest from the swap counterparties at a variable rate (either Securities Industry and Financial Markets Association (SIFMA) rate or a percentage of LIBOR). The SIFMA rate is based on the seven-day high-grade market index of tax-exempt variable rate demand obligations.

Item	Objective	Effective Date	Current Notional Amount	Termination Date	Fixed Payable Swap Rate	Variable Receivable Swap Rate	Fair Value at June 30,	
							2018	2017
A	Hedge changes in cash flows on the 2008 Series A Bonds	April 4, 2011	\$ 133,300	August 1, 2030	5.144%	67% LIBOR Plus 0.13%	\$ (4,764)	\$ (9,942)
B	Hedge changes in cash flows on the 2008 Series E Bonds	October 28, 2008	133,300	August 1, 2030	5.494	SIFMA	(11,284)	(17,139)
C	Hedge changes in cash flows on the 2008 Series A and 2008 Series E Bonds	August 1, 2030	70,400	August 1, 2037	6.585	67% LIBOR Plus 0.13%	(2,186)	(2,221)
D	Hedge changes in cash flows on the 2008 Series C Bonds	May 29, 2008	73,615	November 1, 2026	3.994	SIFMA	(3,380)	(6,152)
E	Hedge changes in cash flows on the 2008 Series C and 2012 Series G Bonds	May 29, 2008	49,080	November 1, 2026	4.033	SIFMA	626	(301)
Total							<u>\$ (20,988)</u>	<u>\$ (35,755)</u>

All of the above are pay-fixed interest rate swap agreements. Under these interest rate swap agreements, the Authority incurred net interest expense of \$14,676 and \$17,221 in fiscal year 2018 and fiscal year 2017, respectively.

For the swap effective on April 4, 2011, with a current notional amount of \$133,300, the fixed rate paid by the Authority is as follows: 4.120% from execution until August 2013, 5.144% from August 2013 until August 2019, and 6.585% from August 2019 until August 2030.

For the swap execution on October 28, 2008, with a current notional amount of \$133,300, the fixed rate paid by the Authority is as follows: 4.470% from execution until August 2013, 5.494% from August 2013 until August 2019, and 6.935% from August 2019 until August 2030.

The aggregate fair value balance of the derivative instruments at June 30, 2018 and 2017 is \$(20,988) and \$(35,755), respectively, and is reflected on the Authority's statements of net position as a liability for derivative instruments. This liability is offset by deferred outflows from derivative instruments. The original notional amounts of the interest rate swaps totaled \$535,895.

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

The fair values of the interest rate swaps were estimated using the zero-coupon method. This method calculates the future net settlement payments required by the swap, assuming that the current forward rates implied by the yield curve correctly anticipate future spot interest rates. These payments are then discounted using the spot rates implied by the current yield curve for hypothetical zero-coupon bonds due on the date of each future net settlement on the swaps. The interest rate swaps are classified in Level 2 of the fair value hierarchy, as outlined in Government Accounting Standards Board Statement No. 72, *Fair Value Measurement and Application*, as valued using a market approach that considers benchmark interest rates.

### ***Risk Disclosure***

*Credit Risk* - Because all of the Authority's swaps rely upon the performance of the third parties who serve as swap counterparties, the Authority is exposed to credit risk, or the risk that a swap counterparty fails to perform according to its contractual obligations. The appropriate measurement of this risk at the reporting date is the fair value of the swaps, as shown in the columns labeled Fair Value in the tables above. To mitigate credit risk, the Authority maintains strict credit standards for swap counterparties. The Authority monitors swap counterparties' credit ratings by the three rating agencies (FitchRatings, Moody's Investors Service, and S&P Global Ratings). Collateral may be obtained from any counterparty that does not maintain a set credit rating. Since all derivatives are in a liability position, there is no amount exposed to credit risk, except for item E, which is in a positive position.

The following represents the credit ratings of the counterparties as of June 30, 2018:

<b><u>Derivative instrument</u></b>	<b><u>Counterparty credit rating</u></b>
Derivative A	A
Derivative B	AA-
Derivative C	A
Derivative D	A
Derivative E	A

*Basis Risk* - The Authority is exposed to basis risk because the floating index the Authority receives on the swaps (SIFMA or 67% of LIBOR) may be different than the basis of the variable rate on the associated bonds. Should this occur, the expected savings may not be realized.

*Termination Risk* - The Authority or its counterparties may terminate a derivative instrument if the other party fails to perform under the terms of the contract. If, at the time of termination, a derivative is in a liability position, the Authority would be liable to the counterparty for a payment equal to the liability, subject to netting arrangements.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

*Rollover Risk* - The Authority can be exposed to rollover risk on hedging derivative instruments that are hedges of debt that terminate prior to the maturity of the debt. The Authority currently has no rollover risk. When Derivative instruments A and B terminate in 2030, those bond series will then be hedged by Derivative instrument C.

#### ***Swap Payments and Associated Bonds Outstanding***

Bonds outstanding include certain variable rate bonds where the Authority pays a fixed interest rate and receives interest at a variable rate from the counterparty. The table below presents the debt service requirements and related net swap payments for these bonds. As rates vary, variable rate interest payments will vary.

Using rates as of June 30, 2018, debt service requirements of the hedged variable rate bonds and net swap payments, assuming current interest rates remain constant, were as follows:

<b>Fiscal Year Ending June 30:</b>	<b>Variable-rate</b>		<b>Interest Rate</b>	<b>Total</b>
	<b>Principal</b>	<b>Interest</b>	<b>Swaps, Net</b>	
2019	\$ 26,000	\$ 4,424	\$ 12,459	\$ 42,883
2020	27,000	3,826	12,764	43,590
2021	70,400	3,081	12,212	85,693
2022	32,230	2,409	10,329	44,968
2023	67,345	1,947	8,142	77,434
2024–2028	95,920	6,338	25,142	127,400
2029–2033	5,600	3,967	15,460	25,027
2034–2038	64,800	1,603	7,732	74,135
Total	<u>\$ 389,295</u>	<u>\$ 27,595</u>	<u>\$ 104,240</u>	<u>\$ 521,130</u>

#### ***Demand Bonds***

Included in variable rate long-term debt of \$831,400 is \$519,185 of subordinated variable rate demand obligations (VRDOs). The bonds were issued on various dates from 1999 through 2008. Subordinated VRDOs are subject to purchase on the demand of the holder at a price equal to principal plus accrued interest. The ability of the Authority to purchase such bonds, if not remarketed, is secured through letters of credit and standby bond purchase agreements with various nationally recognized financial institutions that expire between May 2019 and August 2022. The VRDOs are classified as long-term debt because the liquidity agreement for each series contains term out provisions that, if demand is made to repurchase the bonds, calls for a three to five year amortization to repay the bonds.

In 2014, \$114,755 of 2014 Series A and B General Revenue Refunding Bonds were issued as direct-purchase bonds, to be held by the purchaser for a specific period of time and are not subject to purchase or remarketing at the demand of the holder and therefore do not require a letter of credit or standby bond purchase agreement. The \$50,000 of Series A and \$64,755 of Series B have been purchased through May 2020 and August 2022, respectively. These bonds, in addition to 2012 Series E, F & G General Revenue Refunding Bonds, totaling \$96,850, have two to three year term out provisions beginning at the expiration date.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

At June 30, 2018, the following bonds outstanding are considered defeased in-substance:

<b>Description</b>	<b>Redemption date</b>	<b>Redemption price</b>	<b>Outstanding principal amount</b>
1992 Series A	2018-2019	100	\$ 68,765
2002 Series J	2020	100	2,100
2006 Series A	2018	100	19,385
2006 Series B	2018	100	138,585
2009 Series A	2019	100	76,445
2009 Series B	2019	100	133,170
2010 Series A	2018-2020	100	96,530
2010 Series B	2019, 2020	100	51,095
2011 Series B	2018-2021	100	125,805
2012 Series A	2018, 2020, 2022	100	55,800
2013 Series A	2018-2022	100	4,195
2014 Series D	2018-2020, 2024	100	9,545
2014 Series E	2019	100	2,950
2014 Series F	2018, 2020	100	1,145
2016 Series B	2020	100	1,360
2017 Series C	2020	100	5,245

The proceeds and available funds were deposited in irrevocable trusts with escrow agents in an amount which will provide for payment of interest due to the redemption date and redemption of the defeased bonds outstanding on such date. The defeased portion of such debt, accrued interest thereon, and related unamortized issuance and discount costs were removed from the statements of net position in an in-substance defeasance transaction.

In June 2018, the Authority used funds on hand to defease \$2,100 of the 2002 Series J, and \$1,380 of the 2014 Series D General Revenue Bonds and \$5,495 of the 2006 Series B, \$15,200 of the 2009 Series B and \$5,245 of the 2017 Series C General Revenue Refunding Bonds outstanding.

In October 2017, the Authority used funds on hand to defease \$1,390 of the 2010 Series A, \$510 of the 2011 Series B and \$1,360 of the 2016 Series B General Revenue Bonds and \$3,610 of the 2009 Series B and \$2,700 of the 2010 Series B General Revenue Refunding Bonds outstanding.

In June 2017, the Authority used funds on hand to defease \$36,250 of the General Revenue Refunding Bonds 2005 Series A bonds outstanding.

In September 2016, the Authority used funds on hand to defease \$8,475 of the General Revenue Refunding Bonds 2009 Series B bonds outstanding.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

At June 30, 2018, outstanding bonds that are redeemable before their scheduled due dates are as follows:

<u>Description</u>	<u>Redemption date</u>	<u>Redemption price</u>	<u>Outstanding principal amount</u>
2009 Series B	August 2019	100	\$ 52,890
2010 Series B	August 2020	100	66,870
2011 Series B	August 2021	100	840
2011 Series C	August 2021	100	291,160
2012 Series A	August 2022	100	69,150
2012 Series B	August 2022	100	86,775
2013 Series A	August 2023	100	46,515
2014 Series D	August 2024	100	53,885
2014 Series F	August 2024	100	93,655
2016 Series B	August 2026	100	54,775
2016 Series C	August 2026	100	610,650
2016 Series D	August 2026	100	98,425
2017 Series B	August 2020	100	2,845
2017 Series B	August 2027	100	55,775
2017 Series C	August 2027	100	114,795
2018 Series B	August 2025	100	23,940
2018 Series B	August 2028	100	75,940

The variable rate General Revenue Bonds are subject to redemption prior to maturity at the option of the Authority in whole or in part, on any interest payment date for bond Series 1999B and 2002C and on any business day for bond Series 2008A, 2008C, 2008E, 2012G, 2014A, 2014B, 2018A and 2018D, respectively. Series 2012E is subject to redemption prior to maturity on any interest payment date after November 15, 2014.

During fiscal year 2017, the Authority executed loan agreements with the Massachusetts Clean Water Trust providing for 2017 Series A Sewer and Water loans in the principal amounts of \$8,743 and \$24,816, respectively. All proceeds for these loans were received by June 30, 2017, except for \$565 of the water loans, which was received in June 2018.

Federal and Commonwealth subsidies for purposes of offsetting principal payments aggregating \$34,317 will be recognized as capital grants in aid of construction over the term of the loans.

Interest is payable semiannually on all debt, except on the commercial paper, on which interest is payable upon maturity and the General Revenue Bonds and General Revenue Refunding Bonds with variable interest rates on which interest is payable monthly. The Senior General Revenue Bonds and the General Revenue Refunding Bonds are collateralized equally and ratably by a lien and pledge on substantially all of the Authority's cash and revenues, except the operating fund.



**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

The subordinated debt series, including the commercial paper interest are collateralized equally and ratably by a subordinated pledge on substantially all of the Authority's revenues and cash and investments, except the operating, senior debt service, and debt service reserve funds. Premiums, discounts, issuance costs, and the excess of reacquisition price over the carrying amount of the defeased debt are being amortized over the lives of the respective issues.

The amounts of long-term debt, principal, and interest payable in future fiscal years are as follows:

Year Ending June 30:	<b>Principal</b>	<b>Interest</b>	<b>Total</b>
2019	\$ 225,917	\$ 205,544	\$ 431,461
2020	235,894	204,664	440,558
2021	248,976	193,096	442,072
2022	311,255	182,975	494,230
2023	287,174	169,452	456,626
2024–2028	1,389,507	668,592	2,058,099
2029–2033	1,072,471	394,460	1,466,931
2034–2038	716,731	198,991	915,722
2039–2043	476,925	48,107	525,032
2044–2048	24,865	1,013	25,878
<b>Total</b>	<b>\$ 4,989,715</b>	<b>\$ 2,266,894</b>	<b>\$ 7,256,609</b>

In fiscal year 2018 the Authority issued commercial paper notes of \$51,000 to finance capital expenditures. In fiscal year 2017 The Authority issued commercial paper notes of \$50,000 to refund General Revenue Refunding Bonds, 2008 Series F, in addition to \$49,000 issued in fiscal year 2016 to finance capital expenditures.

These notes are secured by \$100,000 and \$150,000 irrevocable direct-pay letters of credit which expire on December 8, 2018, and April 19, 2019, respectively. These letters of credit carry a fee of 0.65% and 0.195% per annum, respectively, on the amount available. The maximum aggregate principal amount of commercial paper which may be outstanding at any one time is \$250,000.

Commercial paper at June 30, 2018 and 2017 consisted of the following:

	<b>2018 Beginning balance</b>	<b>Additions</b>	<b>Reductions</b>	<b>2018 Ending balance</b>
0.90% Commercial Paper	\$ 50,000	\$ -	\$ 50,000	\$ -
0.94% Commercial Paper	49,000	51,000	25,000	75,000
<b>Total</b>	<b>\$ 99,000</b>	<b>\$ 51,000</b>	<b>\$ 75,000</b>	<b>\$ 75,000</b>
	<b>2017 Beginning balance</b>	<b>Additions</b>	<b>Reductions</b>	<b>2017 Ending balance</b>
0.90% Commercial Paper	\$ -	\$ 50,000	\$ -	\$ 50,000
0.94% Commercial Paper	-	49,000	-	49,000
0.46% Commercial Paper	49,000	-	49,000	-
<b>Total</b>	<b>\$ 49,000</b>	<b>\$ 99,000</b>	<b>\$ 49,000</b>	<b>\$ 99,000</b>

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

**(7) Accounts Receivable/Intergovernmental Loans**

The Authority has entered into various interest-free loan agreements with certain member communities. Under these agreements, the Authority loaned these communities \$41,317 and \$35,550 in fiscal years 2018 and 2017, respectively, to be received in five or ten equal annual installments.

The long-term portion of these loans at June 30, 2018 and 2017 is \$133,871 and \$123,725, respectively, and is included in other assets. The loans due within one year total \$31,254 and \$30,579 at June 30, 2018 and 2017, respectively. This program is designed to assist member communities with sewer and water systems rehabilitation.

**(8) Capital Assets**

Capital assets at June 30, 2018 and 2017 consisted of the following:

	<u>2017</u>	<u>Additions</u>	<u>Disposals/ transfers</u>	<u>2018</u>
Capital assets not being depreciated:				
Land	\$ 29,873	\$ 5	\$ -	\$ 29,878
Construction in progress	<u>127,423</u>	<u>110,252</u>	<u>(57,150)</u>	<u>180,525</u>
Total capital assets not being depreciated	<u>157,296</u>	<u>110,257</u>	<u>(57,150)</u>	<u>210,403</u>
Capital assets being depreciated:				
Plant and equipment – water and sewage system	9,668,357	62,433	-	9,730,790
Furniture and fixtures	17,543	-	-	17,543
Leasehold improvements	2,423	-	-	2,423
Motor vehicles and equipment	<u>8,898</u>	<u>1,035</u>	<u>-</u>	<u>9,933</u>
Total capital assets being depreciated	<u>9,697,221</u>	<u>63,468</u>	<u>-</u>	<u>9,760,689</u>
Less: accumulated depreciation for:				
plant and equipment – water and sewage system	3,809,141	190,852	-	3,999,993
Furniture and fixtures	17,330	81	-	17,411
Leasehold improvements	2,132	12	-	2,144
Motor vehicles and equipment	<u>2,500</u>	<u>694</u>	<u>-</u>	<u>3,194</u>
Total accumulated depreciation	<u>3,831,103</u>	<u>191,639</u>	<u>-</u>	<u>4,022,742</u>
Total capital assets being depreciated, net	<u>5,866,118</u>	<u>(128,171)</u>	<u>-</u>	<u>5,737,947</u>
Total capital assets, net	<u>\$ 6,023,414</u>	<u>\$ (17,914)</u>	<u>\$ (57,150)</u>	<u>\$ 5,948,350</u>

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

Capital assets at June 30, 2017 and 2016 consisted of the following:

	<u>2016</u>	<u>Additions</u>	<u>Disposals/ transfers</u>	<u>2017</u>
Capital assets not being depreciated:				
Land	\$ 29,868	\$ 5	\$ -	\$ 29,873
Construction in progress	<u>115,758</u>	<u>102,088</u>	<u>(90,423)</u>	<u>127,423</u>
Total capital assets not being depreciated	<u>145,626</u>	<u>102,093</u>	<u>(90,423)</u>	<u>157,296</u>
Capital assets being depreciated:				
Plant and equipment – water and sewage system	9,576,517	91,840	-	9,668,357
Furniture and fixtures	17,508	35	-	17,543
Leasehold improvements	2,423	-	-	2,423
Motor vehicles and equipment	<u>7,423</u>	<u>1,475</u>		<u>8,898</u>
Total capital assets being depreciated	<u>9,603,871</u>	<u>93,350</u>	<u>-</u>	<u>9,697,221</u>
Less: accumulated depreciation for:				
plant and equipment – water and sewage system	3,620,166	188,975	-	3,809,141
Furniture and fixtures	17,234	96	-	17,330
Leasehold improvements	2,120	12	-	2,132
Motor vehicles and equipment	<u>1,887</u>	<u>613</u>	<u>-</u>	<u>2,500</u>
Total accumulated depreciation	<u>3,641,407</u>	<u>189,696</u>	<u>-</u>	<u>3,831,103</u>
Total capital assets being depreciated, net	<u>5,962,464</u>	<u>(96,346)</u>	<u>-</u>	<u>5,866,118</u>
Total capital assets, net	<u>\$ 6,108,090</u>	<u>\$ 5,747</u>	<u>\$ (90,423)</u>	<u>\$ 6,023,414</u>

Depreciation and amortization for fiscal years 2018 and 2017 was \$202,799 and \$201,481, respectively.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

**(9) Leases**

**Operating**

The Authority leases electrical power assets, office space in Boston, and other property under long-term operating leases. Future minimum rental payments required under operating leases having initial or remaining non-cancelable lease terms in excess of one year at June 30, 2018 are as follows:

<u>Year Ending June 30:</u>	<u>Amount</u>
2019	\$ 3,036
2020	5,989
2021	11,152
2022	12,370
2023	10,314
2024–2027	35,488
Total	<u>\$ 78,349</u>

Rental expense was \$4,638 and \$4,220 in fiscal years 2018 and 2017, respectively.

**Capital**

In fiscal year 2002, the Authority entered into a 30-year capital lease agreement for the new maintenance facility. The interest rate for the capital lease is 7.83%. Future minimum lease payments for the capital lease at June 30, 2018 are as follows:

<u>Year Ending June 30:</u>	<u>Principal</u>	<u>Interest</u>	<u>Total</u>
2019	\$ 1,126	\$ 2,091	\$ 3,217
2020	1,217	2,000	3,217
2021	1,316	1,901	3,217
2022	1,423	1,794	3,217
2023	1,538	1,679	3,217
2024–2028	9,778	6,307	16,085
2029–2032	10,821	1,779	12,600
Total	<u>\$ 27,219</u>	<u>\$ 17,551</u>	<u>\$ 44,770</u>

Under this lease, the Authority is also responsible for “Additional Rent,” as defined in the lease. The Additional Rent includes real estate taxes, assessments, and other government charges.

The associated capital asset is reported in plant and equipment – water and sewage system at a cost of \$37,134 with \$19,806 of accumulated depreciation as of June 30, 2018.

# MASSACHUSETTS WATER RESOURCES AUTHORITY

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

## (10) Retirement Benefits

### (a) *Plan Description*

The Enabling Act provided for the establishment of the Massachusetts Water Resources Authority Employees' Retirement System (the Plan), a contributory single-employer retirement system that is separate from the State Employees Retirement System. The Plan is a defined benefit pension plan covering those employees not employed by the MDC prior to July 1, 1985. Complete financial statements for the Plan can be obtained from the Authority's administrative offices at Charlestown Navy Yard, 100 First Avenue, Boston, MA 02129.

### (b) *Benefits Provided*

The Plan provides retirement, disability and death benefits. For employees hired prior to April 2, 2012, the annual amount of the retirement allowance is based on the member's final three-year average salary multiplied by (1) the number of years and full months of creditable service at the time of retirement and (2) a percentage based on age at retirement in accordance with a schedule provided by state law. Assuming normal retirement at age 65, this percentage is 2.5%, which is reduced for individuals who retire prior to age 65 to reflect the longer pay out period.

For employees hired on or after April 2, 2012, the annual amount of the retirement allowance is based on the member's final five-year average salary multiplied by (1) the number of years and full months of creditable service at the time of retirement and (2) a percentage based on age at retirement in accordance with a schedule provided by state law. Assuming normal retirement at age 67, this percentage is 2.5%.

Employees hired prior to April 2, 2012, may elect early retirement after 20 years of service or at any time after attaining age 55 with 10 years of eligible service. Plan members who become permanently and totally disabled may be eligible to receive a disability retirement allowance. The amount of benefits to be received depends on several factors, including the member's age, compensation, veteran status, years of service and whether or not the disability is work-related. In addition, certain death benefits exist for beneficiaries of employees who die in active service.

All MDC personnel who became employees of the Authority on July 1, 1985, and were members of the State Employees Retirement System, retained their membership in that system. The Authority is not liable for retirement allowances paid to or on account of these employees. Funding of the pension liability of the State Employees Retirement System is the obligation of the Commonwealth. Employees covered by this plan become 100% vested after 10 years of service.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

**(c) Employees Covered by Benefit Terms**

At December 31, 2017 (the date of the Plan's latest actuarial valuation), the following employees were covered by the benefit terms:

Retired Participants and Beneficiaries Receiving Benefits	582
Inactive Participants Entitled to a Return of their Employee Contributions	64
Inactive Participants with a Vested Right to a Deferred or Immediate Benefit	42
Active Participants	<u>1,100</u>
Total	<u><u>1,788</u></u>

**(d) Contributions**

Contributions made by employees are based upon a percentage of employee base pay (5% for employees hired before December 31, 1974, 7% for employees hired between January 1, 1975 and December 31, 1983, 8% for employees hired between December 31, 1983, and June 30, 1996, and 9% for employees hired after July 1, 1996). Additionally, certain employees earning in excess of \$30 contribute an extra 2% of their salary effective January 1, 1979. Employees receive full payment of contributions upon withdrawal from the Plan and 50% of interest earned for employees with five to nine years of service or 100% of interest earned for employees with 10 or more years of service.

The Authority's 2018 and 2017 contributions to the plan were based on an amount approved by the Retirement Board and the Authority's board of directors, which is based on an actuarially determined amount. The Authority's Enabling Act requires funding to be made in accordance with the Retirement Board's recommendation. In fiscal year 2018 the Authority made a \$3.3 million required contribution. In fiscal year 2017 the Authority made a \$3.1 million required contribution and an additional \$1.5 million optional contribution.

**(e) Net Pension Liability**

The Plan's net pension liability was measured as of December 31, 2017 and 2016. The total pension liability as of December 31, 2017 was determined by an actuarial valuation as of those dates.

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

*Actuarial assumptions:* The total pension liability in the January 1, 2018 actuarial valuation was determined using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	3%
Salary Increases	Based on years of service, starting at 5.75% at 0 years of service decreasing to 4% after 9 years of service
Investment Rate of Return	7.50%
Cost of Living Adjustments	3% of first \$13,000
Mortality Rates:	
Pre-Retirement:	RP-2014 Blue Collar Employee Mortality Table projected generationally with Scale MP-2017
Healthy Retiree:	RP-2014 Blue Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2017
Disabled Retiree:	RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward one year projected generationally with Scale MP-2017

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

*Rates of returns on investments:* The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the Plan's target asset allocation are summarized as follows:

<u>Asset Class</u>	<u>Target Allocation (%)</u>	<u>Long-Term Expected Rate of Return (%)</u>	
		<u>December 31, 2017</u>	<u>December 31, 2016</u>
Domestic Equity	21%	6.15	6.44
International Equity	19	7.11 - 9.41	7.40 - 9.42
Real Estate	7	4.9	5
Private Equity	9	10.28	10.47
Hedge Funds	23	3.94	3.75
Fixed Income	<u>21</u>	1.68 - 4.13	2.02 - 4.43
Total	<u><u>100%</u></u>		

**(f) Discount Rate**

The discount rate used to measure the total pension liability was 7.50%. The projection of cash flows used to determine the discount rate assumed that Plan member contributions will be made at the current contribution rate and that the Authority contributions will be made at rates equal to the actuarially determined contribution rates. Based on those assumptions, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments of current Plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.



**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

*(g) Changes in the Net Pension Liability*

	Increase (Decrease)		
	Total Pension Liability	Plan Fiduciary Net Position	Net Pension Liability
	(a)	(b)	(a) - (b)
<b>Balances at June 30, 2016</b>	\$ 473,333	\$ 444,584	\$ 28,749
Changes for the Year:			
Service Cost	11,080	-	11,080
Interest	36,917	-	36,917
Differences Between Expected and actual experience	(9,143)	-	(9,143)
Contributions - employer	-	4,633	(4,633)
Contributions - employee	-	8,757	(8,757)
Net investment income	-	24,183	(24,183)
Benefit payments	(16,129)	(16,129)	-
Administrative expenses	-	(426)	426
Changes of assumptions	13,298	-	13,298
Changes of benefit terms	2,050	-	2,050
Net changes	38,073	21,018	17,055
<b>Balances at June 30, 2017</b>	511,406	465,602	45,804
Changes for the year:			
Service cost	11,308	-	11,308
Interest	38,520	-	38,520
Differences between expected and actual experience	(146)	-	(146)
Contributions - employer	-	3,277	(3,277)
Contributions - employee	-	9,091	(9,091)
Net investment income	-	70,517	(70,517)
Benefit payments	(18,222)	(18,222)	-
Administrative expenses	-	(447)	447
Changes of assumptions	7,977	-	7,977
Net changes	39,437	64,216	(24,779)
<b>Balances at June 30, 2018</b>	\$ 550,843	\$ 529,818	\$ 21,025

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

**(h) Sensitivity of the Net Pension Liability (Asset) to Changes in the Discount Rate**

The following presents the net pension liability (asset), calculated using the discount rate of 7.50%, as well as what the net pension liability (asset) would be if it were calculated using a discount rate that is 1-percentage-point lower (6.50%) or 1-percentage-point higher (8.50%) than the current rate:

	<b>1% Decrease (6.50%)</b>	<b>Current Discount (7.50%)</b>	<b>1% Increase (8.50%)</b>
Net pension liability (asset) as of June 30, 2018	<u>\$ 89,971</u>	<u>\$ 21,025</u>	<u>\$ (37,437)</u>

**(i) Pension Expense and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions**

For the year ended June 30, 2018, the Authority recognized pension expense of \$12,408 and reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

	<b>Deferred Outflow of Resources</b>	<b>Deferred Inflow of Resources</b>
Differences between expected and actual experience	\$ -	\$ (9,010)
Changes of assumptions	17,154	-
Net difference between projected and actual earnings on pension plan investments	<u>-</u>	<u>(5,953)</u>
Total	<u>\$ 17,154</u>	<u>\$ (14,963)</u>

Amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows:

<u>Year Ending June 30:</u>	<u>Amount</u>
2019	\$ 5,909
2020	3,284
2021	(3,139)
2022	(5,169)
2023	<u>1,306</u>
Total	<u>\$ 2,191</u>

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

**(11) Other Postemployment Benefits (OPEB)**

**(a) Plan Description**

In addition to providing the pension benefits described, the Authority provides postemployment health care and life insurance benefits for retired employees through the Group Insurance Commission (GIC). The GIC is a quasi-independent state agency that administers an agent multi-employer defined benefit OPEB plan. The benefits, benefit levels, employee contributions and employer contributions are governed by the Authority and can be amended by the Authority. The plan does issue a separate financial report that can be obtained by contacting the Massachusetts Water Resources Authority, Finance Division, 100 First Avenue, Boston, MA 02129.

In April, 2015, the Authority established the MWRA Other Post-Employment Benefits (OPEB) Irrevocable Trust. The Trust was established for the sole purpose of providing for the advance funding of future costs of retired employee health insurance and other benefits provided to retirees. An initial deposit of \$10.8 million was made to the trust upon establishment of the trust. The balance of the trust was \$29.8 million and \$22.8 million at June 30, 2018 and June 30, 2017, respectively.

**(b) Plan Membership**

At June 30, 2018 plan membership consisted of the following:

Inactive plan members or beneficiaries currently receiving benefits	746
Inactive plan members entitled to but not yet receiving benefits	41
Active plan members	<u>960</u>
Total	<u><u>1,747</u></u>

**(c) Benefits Provided**

The Authority provides medical, prescription drug, mental health/substance abuse and life insurance to retirees and their covered dependents. All active employees who retire from the Authority and meet the eligibility criteria will receive these benefits.

**(d) Contributions**

Retirees who retired on or before July 1, 1994 contribute 10% of the cost of the health plans, as determined by the GIC. Those who retired after July 1, 1994 contribute 15% of the cost of the health plan and those who retired after October 1, 2009 contribute 20% of the cost of the health plan, as determined by the GIC. The Authority contributes the remainder of the health plan costs on a pay-as-you-go basis.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

**(e) Investments**

*Investment policy.* The assets are invested by the Trust with the Commonwealth of Massachusetts Pension Reserves Investment Trust (PRIT) fund. The Trust's Board of Trustees may vote to approve a different investment vehicle, at its discretion. The following was the PRIT fund's asset allocation at June 30, 2018:

<u>Asset Class</u>	<u>Target Allocation (%)</u>
Global Equity	39 %
Fixed Income	22
Private Equity	12
Real Estate	10
Other	<u>17</u>
Total	<u><u>100 %</u></u>

*Concentrations.* No investment in any one organization represented 5% or more of the Trust's fiduciary net position.

*Rate of return.* For the year ended June 30, 2018 and 2017, the annual money-weighted rate of return on investments, net of investment expense was 8.58% and 10.58%, respectively. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for changing amounts actually invested.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

**(f) Changes in the Net OPEB Liability**

	Increase (Decrease)		
	Total OPEB Liability	Plan Fiduciary Net Position	Net OPEB Liability
	(a)	(b)	(a) - (b)
<b>Balances at June 30, 2017</b>	\$ 154,254	\$ 22,782	\$ 131,472
Changes for the year:			
Service cost	2,820	-	2,820
Interest	10,821	-	10,821
Differences between expected and actual experience	(11,860)	-	(11,860)
Contributions - employer	-	10,093	(10,093)
Net investment income	-	1,956	(1,956)
Benefit payments	(5,057)	(5,057)	-
Net changes	(3,276)	6,992	(10,268)
<b>Balances at June 30, 2018</b>	<u>\$ 150,978</u>	<u>\$ 29,774</u>	<u>\$ 121,204</u>

*Actuarial assumptions.* The total OPEB liability was determined by an actuarial valuation as of January 1, 2018, and update procedures were used to roll forward the total OPEB liability to June 30, 2018. The following actuarial assumptions, applied to all periods included in the measurement, unless otherwise specified:

Inflation	3.0%
Salary increases	5.75%, decreasing over 9 years to an ultimate of 4.0%
Investment rate of return	7.0%, net of OPEB plan investment expense, including inflation
Healthcare cost trend rates	8.0% for 2018, decreasing 0.5% per year to an ultimate rate of 5.0%

Mortality rates were based on the RP-2014 Blue Collar Mortality Table for Employees projected using generational mortality and scale MP-2017 for active employees, the RP-2014 Blue Collar Mortality Tables for Healthy Annuitants projected using generational mortality and scale MP-2017 for retirees and the RP-2014 Blue Collar Mortality Tables for Healthy Annuitants projected using generational mortality and scale MP-2017 set forward one year for the disabled.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

The long-term expected rate of return on OPEB plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the target asset allocation as of June 30, 2018 (see discussion of the Trust's investment policy) are summarized in the following table:

<u>Asset Class</u>	<u>Long-Term Expected Real Rate of Return</u>
Global Equity	6.15 - 9.41%
Fixed Income	1.68 - 4.13
Private Equity	10.28
Real Estate	4.9
Other	3.94 - 4.71

*Discount rate.* The discount rate used to measure the total OPEB liability was 7.0%. The projection of cash flows used to determine the discount rate assumed that Authority contributions will be made at rates equal to the actuarially determined contribution rates. Based on those assumptions, the OPEB plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on OPEB plan investments was applied to all periods of projected benefit payments to determine the total OPEB liability. The discount rate used in the prior actuarial valuation was 7.0%.

*Sensitivity of the net OPEB liability to changes in the discount rate.* The following presents the net OPEB liability of the Authority, as well as what the Authority's net OPEB liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.0%) or 1-percentage-point higher (8.0%) than the current discount rate:

	<u>1% Decrease (6.0%)</u>	<u>Discount Rate (7.0%)</u>	<u>1% Increase (8.0%)</u>
Net OPEB Liability	<u>\$ 142,517</u>	<u>\$ 121,204</u>	<u>\$ 103,608</u>

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

*Sensitivity of the net OPEB liability to changes in the healthcare cost trend rates.* The following presents the net OPEB liability of the Authority, as well as what the Authority's net OPEB liability would be if it were calculated using healthcare cost trend rates that are 1-percentage-point lower (7.0%) or 1-percentage-point higher (9.0%) than the current healthcare cost trend rates:

	<u>1% Decrease</u> <u>(7.0% - 4.0%)</u>	<u>Base Rate</u> <u>(8.0% - 5.0%)</u>	<u>1% Increase</u> <u>(9.0% - 6.0%)</u>
Net OPEB Liability	<u>\$ 98,898</u>	<u>\$ 121,204</u>	<u>\$ 146,968</u>

**(g) OPEB Expense and Deferred Outflows of Resources and Deferred Inflows of Resources Related to OPEB**

For the year ended June 30, 2018, the Authority recognized OPEB expense of \$9,856 and reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources:

	<u>Deferred Outflow</u> <u>of Resources</u>	<u>Deferred Inflow</u> <u>of Resources</u>
Differences between expected and actual experience	\$ -	\$ (9,884)
Net difference between projected and actual earnings on pension plan investments	<u>-</u>	<u>(148)</u>
Total	<u>\$ -</u>	<u>\$ (10,032)</u>

Amounts reported as deferred outflows of resources and deferred inflows of resources related to OPEB will be recognized in OPEB expense as follows:

<u>Year Ending June 30:</u>	<u>Amount</u>
2019	\$ (2,014)
2020	(2,014)
2021	(2,014)
2022	(2,014)
2023	<u>(1,976)</u>
Total	<u>\$ (10,032)</u>

**(h) Annual OPEB Costs and Net OPEB Obligation under GASB No. 45**

The Authority's fiscal year 2017 annual OPEB expense is calculated based on the annual required contribution of the employer (ARC), an amount actuarially determined in accordance with the parameters of GASB Statement No. 45. The ARC represents a level of funding that, if paid on an ongoing basis, is projected to cover the normal cost per year and amortize the unfunded actuarial liability over a period of thirty years.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

The following table shows the components of the Authority's annual OPEB cost for the year ended June 30, 2017, the amount actually contributed to the plan, and the change in the Authority's net OPEB obligation based on an actuarial valuation as of January 1, 2016:

Annual required contribution (ARC)	\$ 10,948
Interest on net OPEB obligation	7,485
Adjustment to ARC	<u>(5,869)</u>
 Annual OPEB cost	 12,564
Contributions made	<u>(9,116)</u>
 Increase in net OPEB obligation	 3,448
Net OPEB obligation – beginning of year	<u>106,927</u>
 Net OPEB obligation – end of year	 <u><u>\$ 110,375</u></u>

The Authority's annual OPEB cost, the percentage of annual OPEB cost contributed to the plan, and the net OPEB obligation were as follows:

<u>Fiscal Year Ended</u>	<u>Annual OPEB Cost</u>	<u>Percentage of OPEB Cost Contributed</u>	<u>Net OPEB Obligation</u>
2017	\$ 12,564	73%	\$ 110,375
2016	16,134	61	106,927
2015	15,692	95	100,597



# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

### ***Funded Status and Funding Progress***

The funded status of the plan as of January 1, 2016, the date of the most recent actuarial valuation, was as follows:

Actuarial accrued liability (AAL)	\$ 131,430
Actuarial value of plan assets	<u>(10,827)</u>
Unfunded actuarial accrued liability (UAAL)	<u>\$ 120,603</u>
Funded ratio (actuarial value of plan assets/AAL)	8.2%
Covered payroll (active plan members)	\$ 96,118
UAAL as a percentage of covered payroll	125.5%

Actuarial valuations of an ongoing plan involve estimates of the value of reported amount and assumptions about the probability of occurrence of events far into the future. Examples included assumptions about future employment, mortality, and the healthcare cost trend. Amounts determined regarding the funded status of the plan and the annual required contributions of the employer are subject to continual revision as actual results are compared with past expectations and new estimates are made about the future. The schedule of funding progress, presented as required supplementary information following the notes to the financial statements, presents multiyear trend information that shows whether the actuarial value of plan assets is increasing or decreasing over time relative to the actuarial accrued liabilities for benefits.

### ***Actuarial Methods and Assumptions***

Projections of benefits for financial reporting purposes are based on the plan as understood by the Authority and the plan members and include the types of benefits provided at the time of each valuation and the historical pattern of sharing of benefit costs between the Authority and plan members to that point. The actuarial methods and assumptions used include techniques that are designed to reduce short-term volatility in actuarial accrued liabilities and the actuarial value of assets, consistent with the long-term perspective of the calculations.

In the January 1, 2016 actuarial valuation, the projected unit credit cost method was used. The actuarial value of assets was \$10.8 million. The actuarial assumptions included a 7.0% investment rate of return and an initial annual healthcare cost trend rate of 9.5% which decreases to a 5.5% long-term trend rate for all healthcare benefits after ten years. The amortization costs for the initial UAAL is a level percentage of payroll for a period of 30 years, on an open basis. This has been calculated assuming the amortization payment increases at a rate of 3%.

## **(12) Commitments and Contingencies**

### ***(a) General***

The Authority's capital improvement program continues to proceed. As part of this program, the Authority has entered into a number of contracts for the design and construction of infrastructure and improvements to its facilities. Commitments under these contracts aggregated approximately \$641,080 at June 30, 2018.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

The Authority's operating and construction plans are designed to comply with the Federal District Court's schedule of actions. The Authority has incurred capital expenditures of approximately \$11,400,000 from fiscal years 1986 through 2018, including those projects required to comply with the Federal District Court's schedule. The Authority anticipates spending an additional \$1,308,350 on these projects through fiscal year 2023. These capital expenditures have been forecasted based upon certain preliminary assumptions and estimates, which may change significantly as design and construction of the necessary facilities proceed. Funding is expected to come from various federal and state grants, as available and approved, and from the Authority's debt proceeds. To date, federal appropriations for the Boston Harbor Project have aggregated \$810,000.

#### **(b) Boston Harbor Case**

The Authority continues to be a defendant, along with Boston Water and Sewer Commission (BWSC) and the Commonwealth, in the federal Boston Harbor Case. The federal action was originally brought in 1985 by the United States on behalf of the United States Environmental Protection Agency (EPA) and by certain citizens' groups for Clean Water Act violations. As part of the Boston Harbor Case, the Authority was required to undertake certain corrective actions to meet wastewater treatment, discharge and combined sewer overflow (CSO) requirements, including the completion of new and improved primary and secondary treatment facilities at Deer Island. Beyond these major improvements to its wastewater treatment capabilities, the Authority also was required to improve water quality in the Alewife Brook and Charles and Mystic Rivers by its adoption of a Long Term CSO Control Plan which was comprised of 35 projects, the last three of which were completed on time by the close of calendar year 2015. In March 2016 the federal district court formally received the Authority's 2015 annual CSO project report, officially noting completion of all Plan projects.

In March 2006, the Authority reached agreement with the United States and the Massachusetts Department of Environmental Protection (DEP) on the scope and schedule for the remaining CSO projects which was filed with the Court as part of a joint motion to amend the Court Schedule. In April 2006, the Court allowed the joint motion and issued an Order with a schedule. Under the Order, the Authority now has a three-year performance assessment period, from 2018 through 2020, to conduct analyses which will compare project benefits of the CSO program against actual performance results and to report those findings to the district court.

As part of the agreement, DEP agreed to reissue and EPA agreed to approve five (5) consecutive variances of no more than three years duration each, through the year 2020, for the Charles River and Alewife Brook/Upper Mystic River that are consistent with and limited to the requirements in the Authority's revised Long Term CSO Control Plan. Variances have most recently been issued by DEP in or about August 2016. The variances will respectively remain in place for the Charles River until September 1, 2019 and for the Alewife/Upper Mystic until September 1, 2019. In addition, the United States and the Authority agreed to withdraw the February 27, 1987 *Stipulation of the United States and the Massachusetts Water Resources Authority on Responsibility and Legal Liability for Combined Sewer Overflows* and replace it with a Second Stipulation that requires the Authority to implement the CSO requirements set forth in the Court Schedule and to meet the levels of control described in the Authority's long term CSO Control Plan. Once these performance parameters have been reached, the Second Stipulation makes the Authority responsible for only those CSO outfalls which it owns and operates.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

There has been no imposition of penalties by the Court against MWRA on the merits of the claims originally asserted in the Boston Harbor Case to date. The Court always retains the right to order remedial action and to assess penalties.

#### ***(c) Deer Island Submarine Power Cable***

In 2004, the United States Army Corps of Engineers (Corps) notified Boston Edison Co. (NStar), its subsidiary Harbor Energy Electric Company (HEEC), and the Authority of allegations that each, as permittees, were in violation of certain depth requirements contained in a permit (MA BOSS 198900530, dated August 31, 1989) which authorized the installation of a submarine electric power cable running under the channel bed of Boston Harbor extending from South Boston to Deer Island, used to provide electric power for Deer Island operations. The Corps alleges that the power cable, in places, has been installed at depths less than those required by the permit and would eventually interfere with a project of harbor dredging known as the Boston Harbor Deep Draft Navigation Improvement Project (the "Project") which will allow deep-draft cargo vessels to dock in Boston Harbor.

MWRA's position is that it is not the owner of the cable, that it was not involved in the planning, design, location or installation of the cable, that it had no meaningful knowledge, participation in or control over the misplacement of the cable and therefore should have no legal responsibility to move it or relocate it. MWRA has also maintained that its status as a "permittee" in the Corps' permit differs substantially from that of NSTAR and HEEC as the former merely lent its name to an application for the permit solely because it would allow permit review by the Corps to be expedited. The cable is vitally important to MWRA as it provides the primary means by which electricity is delivered to Deer Island to power its wastewater operations.

#### Settlement Efforts

Efforts to resolve the dispute concerning compliance with the permit and responsibility for the cable protection costs date back to approximately 2005. Discussions during these prior years among the interested parties over the years produced only a proposed method intended by NSTAR and HEEC for protection of the cable from the Project which would have entailed carefully exposing the cable, placing concrete mats over it followed by backfilling of sediments over both the cable and mats without either moving it or burying the cable deeper in the channel. The Authority has consistently advised NSTAR and HEEC that it has and will accept no financial responsibility whatsoever for the costs of either protecting or relocating the cable.

#### Litigation and Conditional Settlement

United States of America v. NSTAR Electric Company d/b/a Eversource Energy, Harbor Electric Energy Co., and Massachusetts Water Resources Authority, U.S. District Court, District of Massachusetts, C.A. No. 16-11470-RGS. As a result of the need to achieve even deeper dredging depths than the Army Corps had initially recommended in 2016 and the likelihood that those depths might not be practicably reachable especially in light of the addition of the proposal to add protective concrete mats, the United States, acting on behalf of the Corps, commenced a lawsuit in July 2016 in the federal district court in Boston against MWRA, NSTAR and HEEC under the Rivers and Harbors Act and under the Clean Water Act asking the federal district court to determine the permittees' non-compliance with the 1990 permit and to assess penalties for the

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

obstruction caused by the mis-located cable in two shipping channels of Boston Harbor. In that lawsuit, the Corps also asked that MWRA, NSTAR and HEEC, each named as permittees under the permit, be enjoined from further maintaining the cable in its present location. MWRA filed its Answer to the Complaint, including cross claims against co-defendants NSTAR and HEEC, in August 2016. Following a failed motion to dismiss both the Complaint and MWRA's cross-claims, NSTAR and HEEC eventually filed their Answer to the Complaint and cross-claimed against MWRA upon a theory of indemnification that MWRA had the primary obligation as the sole customer of the cable to pay any and all expenses necessary to correct the location of the cable improperly installed by HEEC.

Resolution of the federal court litigation was conditionally accomplished over the period of May through July 2017 when it became imperative that the Corps be able to determine whether it would be able to save the federal appropriation dollars for the Project without the aid of or reliance upon the federal court's enforcement powers. The first component of this recent resolution was the negotiation and execution of an agreement among MWRA, NSTAR and HEEC of an agreement whereby HEEC will provide MWRA with a new 115 kV power cable over a different cross-harbor route by December 31, 2019.

The second component of the conditional resolution of the federal court lawsuit involves the entry of a Stipulation and Order in the federal lawsuit by the parties and the Court in July 2017 which, inter alia, compels NSTAR and HEEC, but not MWRA, to be responsible for all costs and efforts toward the design and installation, by the end of calendar year 2019 inclusive of all permitting, of the new 115 kV power cable along a new route to serve MWRA's power distribution needs at its Deer Island facility. NSTAR and HEEC, but not MWRA, have further agreed to de-energize and decommission the existing non-compliant power cable by February 2020 and remove from the harbor channels portions of the old cable by May 2020. The Order includes the potential assessment of stipulated penalties and/or actual delay damages against NSTAR and HEEC, but not MWRA, for failure without good cause to meet those milestones, the completion of which are necessary to allow the harbor and shipping channel-deepening Project to move forward. MWRA will not be a permittee with respect to the new Corps permit and satisfaction of HEEC and NSTAR's obligations regarding the installation of the new cable will preclude the Corps from any further enforcement of its 1990 permit against MWRA. All claims of all parties to the federal court lawsuit have been stayed pending satisfaction of the obligations of HEEC and NSTAR under the Stipulation and Order. Completion of all obligations under the Stipulation and Order will result in the eventual dismissal with prejudice of all such claims.

#### *(d) Miscellaneous*

The Authority is also a defendant in several legal actions and administrative proceedings arising out of its operation, maintenance, and improvement of the water and sewer systems under its care. It is the opinion of management that any judgments or settlements that may result from these actions will not have a materially adverse effect upon the Authority.

# MASSACHUSETTS WATER RESOURCES AUTHORITY

Notes to Financial Statements

June 30, 2018 and 2017

(Dollars in thousands)

## **(13) Risk Management**

The Authority is exposed to various risks of loss. The risk management program involves insurance and self insurance related to property, general liability (including automobile, marine and employers' liability), excess liability, public officials' liability, workers' compensation, unemployment liability, and employee health care and life insurance.

Buildings, plants, and equipment are fully insured on an all risk replacement basis to the extent that losses exceed \$2,500 per occurrence, up to a limit of \$300,000. The Authority maintains insurance coverage for general liability, automobile liability, marine liability, and employers' liability to the extent that losses exceed \$2,500 per occurrence, up to a limit of \$25,000. In addition to the primary liability insurance, the Authority maintains excess liability policies with additional limits of \$75,000. The Authority also maintains public officials' liability insurance with a limit of \$5,000 per occurrence with a \$1,000 deductible. All insurance policies are renewed on an annual basis.

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Schedules of Employer Contributions – Last Ten Years

### Required Supplementary Information– GASB No. 68

(Unaudited)

(Dollars in Thousands)

	Fiscal year ended June, 30									
	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Actuarially Determined Contribution Contributions in Relation to the Actuarially Determined Contribution	\$ 3,277	\$ 3,133	\$ 8,159	\$ 7,808	\$ 5,919	\$ 5,766	\$ 5,512	\$ 5,343	\$ 5,621	\$ 5,334
Contribution Deficiency (Excess)	\$ -	\$ (1,500)	\$ -	\$ (4,821)	\$ (6,528)	\$ (4,724)	\$ (1,851)	\$ -	\$ -	\$ (3,296)
Covered Payroll	\$ 92,975	\$ 89,755	\$ 89,169	\$ 88,646	\$ 84,829	\$ 84,829	\$ 82,870	\$ 82,870	\$ 81,962	\$ 82,314
Contributions as a Percentage of Covered Payroll	3.52%	5.16%	9.15%	14.25%	14.67%	12.37%	8.89%	6.45%	6.86%	10.48%

#### Notes to Required Supplementary Information

Valuation Date: Actuarial determined contributions for fiscal 2017 and 2018 are determined with the January 1, 2015 actuarial valuation.

Actuarial Cost Method: Entry age normal

Amortization Method: Payments increase at 4.5% per year

Remaining Amortization Period: 9 years from July 1, 2015

Asset Valuation Method: Market value of assets as reported in the Plan's annual statement less unrecognized return in each of the last five years. Unrecognized return is equal to the difference between the actual market value return and the expected market value return and is recognized over a five-year period, further adjusted, if necessary, to be within 10% of the market value.

#### Actuarial Assumptions:

Investment Rate of Return	7.75%
Discount Rate	7.75%
Inflation Rate	4.00%
Projected Salary Increases	Based on years of service, ranging from 6% at 0 years of service decreasing to 4.25% after 9 years of service.
Cost of Living Adjustments	3% on first \$13,000

#### Plan Membership:

Retired Participants and Beneficiaries Receiving Benefits	476
Inactive Participants Entitled to a Return of their Employee Contributions	47
Inactive Participants with a Vested Right to a Deferred or Immediate Benefit	48
Active Participants	1,090
<b>Total</b>	<b>1,661</b>

See accompanying independent auditors' report

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Schedules of Changes in the Employer's Net Pension Liability and Related Ratios – Last Ten Years

Required Supplementary Information– GASB No. 68

(Unaudited)

(Dollars in Thousands)

	Measurement Date			
	December 31,			
	2017	2016	2015	2014
<b>Total Pension Liability:</b>				
Service cost	\$ 11,308	\$ 11,080	\$ 10,638	\$ 10,529
Interest	38,520	36,917	34,598	33,587
Differences between expected and actual experience	(146)	(9,143)	-	(8,380)
Changes of assumptions	7,977	13,298	-	4,921
Changes of benefit terms	-	2,050	-	-
Benefit payments, including refunds of employee contributions	(18,222)	(16,129)	(15,390)	(12,963)
Net change in total pension liability	39,437	38,073	29,846	27,694
Total pension liability - beginning	511,406	473,333	443,487	415,793
Total pension liability - ending	<u>\$ 550,843</u>	<u>\$ 511,406</u>	<u>\$ 473,333</u>	<u>\$ 443,487</u>
<b>Plan Fiduciary Net Position:</b>				
Contributions - employer	\$ 3,277	\$ 4,633	\$ 8,159	\$ 12,630
Contributions - employee	9,091	8,757	8,402	8,245
Net investment income	70,517	24,183	(530)	20,484
Benefit payments, including refunds of employee contributions	(18,222)	(16,129)	(15,390)	(12,963)
Administrative expenses	(447)	(426)	(412)	(408)
Other - military service fund contribution	-	-	-	16
Net change in fiduciary net position	64,216	21,018	229	28,004
Plan fiduciary net position - beginning	465,602	444,584	444,355	416,351
Plan fiduciary net position - ending	<u>\$ 529,818</u>	<u>\$ 465,602</u>	<u>\$ 444,584</u>	<u>\$ 444,355</u>
Net Pension Liability (Asset) - Ending	\$ 21,025	\$ 45,804	\$ 28,749	\$ (868)
Plan's Fiduciary Net Position as a				
Percentage of the Total Pension Liability	96.18%	91.04%	93.93%	100.20%
Covered Payroll	\$ 92,975	\$ 89,755	\$ 89,169	\$ 88,646
Net Pension Liability (Asset) as a Percentage of				
Covered Payroll	22.61%	51.03%	32.24%	(0.98%)

This schedule is intended to present 10 years of data. Additional years will be presented when available.

See accompanying independent auditors' report.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Schedules of Changes in the Employer's Net OPEB Liability and Related Ratios – Last Ten Years

Required Supplementary Information– GASB No. 75

(Unaudited)

(Dollars in Thousands)

	<u>2018</u>
<b>Total OPEB Liability</b>	
Total OPEB Liability - Beginning	\$ 154,254
Service Cost	2,820
Interest	10,821
Change of Benefit Terms	-
Differences between expected and actual experience	(11,860)
Change of assumptions	-
Benefit Payments	<u>(5,057)</u>
Net Change in total OPEB liability	(3,276)
Total OPEB Liability - Ending	<u>150,978</u>
<b>Plan Fiduciary Net Position</b>	
Plan fiduciary net position - beginning	<u>22,782</u>
Contributions - employer (claims + additional funding)	10,093
Contributions - employee	-
Net Investment Income	1,956
Benefit Payments	<u>(5,057)</u>
Net Change in plan fiduciary net position	6,992
Plan fiduciary net position - ending	<u>29,774</u>
Net OPEB Liability	<u><u>\$ 121,204</u></u>
Plan fiduciary net position as a percentage of the total OPEB liability	19.7%
Covered payroll	\$ 94,816
MWRA's net OPEB liability as a percentage of covered payroll	127.8%

Data is being accumulated annually to present 10 years of the reported information.

See accompanying independent auditors' report



# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Schedules of Employer Contributions – Last Ten Years

### Required Supplementary Information– GASB No. 75

(Unaudited)

(Dollars in Thousands)

	Fiscal year ended June 30,									
	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Actuarially determined contribution	\$ 11,400	\$ 10,948	\$ 14,996	\$ 14,564	\$ 15,621	\$ 14,482	\$ 19,151	\$ 17,433	\$ 18,896	\$ 17,554
Contributions in relation to the actuarially determined contribution	10,093	9,723	9,804	14,852	3,493	2,813	3,986	3,293	2,151	1,806
Contribution deficiency (excess)	\$ 1,307	\$ 1,225	\$ 5,192	\$ (288)	\$ 12,128	\$ 11,669	\$ 15,165	\$ 14,140	\$ 16,745	\$ 15,748
Covered Payroll	\$ 94,816	\$ 86,475								
Contributions as a Percentage of Covered Payroll	127.8%	152.7%								

#### Notes to Schedule

##### Methods and assumptions used to determine contributions rates:

Actuarial cost method	Entry Age Normal
Amortization method	30 years (closed)
Asset valuation method	Market value of assets
Inflation	3%
Healthcare cost trend rates	8% for 2018, decreasing 0.5% per year to an ultimate rate of 5%
Discount rate	7%
Mortality	<i>Actives:</i> RP-2014 Blue Collar mortality table for employees projected using generational mortality and scale MP-2017 <i>Retirees:</i> RP-2014 Blue Collar mortality tables for healthy annuitants projected using generational mortality and scale MP-2017 <i>Disabled:</i> RP-2014 Blue Collar mortality tables for healthy annuitants projected using generational mortality and scale MP-2017. Set forward one year.

See accompanying independent auditors' report

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Schedule of Funding Progress

Required Supplementary Information– GASB No. 45

June 30, 2017

(Unaudited)

(Dollars in Thousands)

Other Postemployment Benefits						
Actuarial Valuation	Assets (a)	Actuarial Accrued Liability (AAL) – (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a)/(c))
January 1, 2016	\$ 10,827	\$ 131,430	\$ 120,603	8.2%	\$ 96,118	125.5%
January 1, 2014	-	167,744	167,744	-	85,993	195.1
January 1, 2012*	-	179,595	179,595	-	82,679	217.2
January 1, 2010	-	192,096	192,096	-	81,372	236.1
January 1, 2008	-	180,833	180,833	-	79,298	228.0

See accompanying independent auditors' report

\*Actuarial accrued liability and unfunded actuarial accrued liability is from revised January 1, 2012 actuarial valuation.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**  
Accounts Established by the General Revenue Bond Resolution

June 30, 2018  
(comparative totals for June 30, 2017)

(Dollars in thousands)

	<u>Construction</u>	<u>Debt Service</u>	<u>Operating</u>	<u>Rate Stabilization</u>	<u>Revenue</u>	<u>Combined Reserves</u>	<u>Total</u>
Balance – June 30, 2017	\$ 117,813	\$ 449,972	\$ 39,249	\$ 36,512	\$ 33,372	\$ 22,042	\$ 698,960
Proceeds from:							
Revenue Bonds and Loans	120,841	30,763	-	-	-	-	151,604
Cash Received							
from Customers	-	-	-	-	738,156	-	738,156
Interest Income	1,172	179	-	-	17,677	(16,251)	2,777
Debt Service Grant	-	-	-	-	-	-	-
Grant Receipts	452	4,216	-	-	47	-	4,715
Construction Payments	(147,981)	-	-	-	-	-	(147,981)
Capital Lease Payments	(1,041)	(2,175)	-	-	-	-	(3,216)
Debt Service Payment	(994)	(423,972)	-	-	(40,002)	-	(464,968)
Other Commonwealth							
Payments	-	-	-	-	(24,326)	-	(24,326)
Interfund Transfers	15,172	415,659	821	6,532	(453,551)	15,367	-
Transfers from (to)							
Operating Account	368	3,056	-	-	(241,421)	(411)	(238,408)
Balance – June 30, 2018	<u>\$ 105,802</u>	<u>\$ 477,698</u>	<u>\$ 40,070</u>	<u>\$ 43,044</u>	<u>\$ 29,952</u>	<u>\$ 20,747</u>	<u>\$ 717,313</u>

	<u>Sewer</u>	<u>Water</u>	<u>Total</u>	
			<u>2018</u>	<u>2017</u>
Restricted Investments:				
Construction	\$ 66,596	\$ 39,206	\$ 105,802	\$ 117,813
Debt Service - Debt Service Reserves	90,584	59,349	149,933	150,250
Debt Service - Debt Service P & I	205,784	96,906	302,690	273,811
Debt Service - Revenue Redemption	5,591	19,484	25,075	25,911
Operating Reserve	26,730	13,340	40,070	39,249
Rate Stabilization Reserve	28,439	14,605	43,044	36,512
Revenue	22,348	7,604	29,952	33,372
Combined - Renewal and Replacement Reser	5,722	1,025	6,747	8,042
Combined - Insurance Reserve	7,000	7,000	14,000	14,000
Total Restricted Investments	<u>\$ 458,794</u>	<u>\$ 258,519</u>	<u>\$ 717,313</u>	<u>\$ 698,960</u>

See accompanying independent auditors' report.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Combining Statement of Net Position

June 30, 2018

(Dollars in thousands)

<b>Assets</b>	<b>Sewer</b>	<b>Water</b>	<b>Combined Total</b>
Unrestricted current assets:			
Cash and cash equivalents	\$ 35,778	\$ 16,836	\$ 52,614
Investments	1,687	9,565	11,252
Intergovernmental loans	6,641	24,613	31,254
Accounts receivable	130	713	843
Total unrestricted current assets	<u>44,236</u>	<u>51,727</u>	<u>95,963</u>
Restricted assets:			
Investments	463,896	260,532	724,428
Interest receivable	1,480	251	1,731
Grant receivable	856	89	945
Total restricted assets	<u>466,232</u>	<u>260,872</u>	<u>727,104</u>
Capital assets:			
Capital assets – not being depreciated	82,632	127,771	210,403
Capital assets – being depreciated – net	3,469,413	2,268,534	5,737,947
Total capital assets	<u>3,552,045</u>	<u>2,396,305</u>	<u>5,948,350</u>
Regulatory assets	431,941	73,974	505,915
Other assets, net	50,624	159,839	210,463
Total assets	<u>4,545,078</u>	<u>2,942,717</u>	<u>7,487,795</u>
<b>Deferred Outflows of Resources</b>			
Deferred outflows from pension	11,497	5,657	17,154
Deferred outflows from derivative instruments	18,963	2,025	20,988
Deferred outflows from refunding debt	26,872	20,725	47,597
<b>Liabilities</b>			
Current liabilities:			
Accounts payable and accrued expenses	46,917	2,548	49,465
Commercial paper notes	21,000	54,000	75,000
Current portion of long-term debt	158,644	67,273	225,917
Total current liabilities	<u>226,561</u>	<u>123,821</u>	<u>350,382</u>
Payable from restricted assets:			
Accounts payable for construction	15,214	4,442	19,656
Accrued interest on bonds payable	51,467	28,524	79,991
Reserves	35,722	22,352	58,074
Total payable from restricted assets	<u>102,403</u>	<u>55,318</u>	<u>157,721</u>
Retainage on construction in progress	3,759	5,808	9,567
Long-term debt – less current portion	3,269,376	1,922,940	5,192,316
Long-term capital lease	18,965	8,254	27,219
Net pension liability	13,229	7,796	21,025
Other postemployment benefits	78,062	43,142	121,204
Liability for derivative instruments	18,963	2,025	20,988
Total liabilities	<u>3,731,318</u>	<u>2,169,104</u>	<u>5,900,422</u>
<b>Deferred Inflows of Resources</b>			
Deferred inflows from pension	9,691	5,272	14,963
Deferred inflows from OPEB	6,461	3,571	10,032
Deferred inflows from regulated activities	19,606	23,112	42,718
<b>Net Position</b>			
Net investment in capital assets	275,012	484,745	759,757
Restricted	268,740	89,027	357,767
Unrestricted	291,583	196,292	487,875
Total net position	<u>\$ 835,335</u>	<u>\$ 770,064</u>	<u>\$ 1,605,399</u>
Commitments and contingencies			
See accompanying independent auditors' report			

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Combining Statement of Net Position

June 30, 2017

(Dollars in thousands)

<b>Assets</b>	<b>Sewer</b>	<b>Water</b>	<b>Combined Total</b>
Unrestricted current assets:			
Cash and cash equivalents	\$ 34,020	\$ 16,246	\$ 50,266
Investments	1,749	9,857	11,606
Intergovernmental loans	8,451	22,128	30,579
Accounts receivable	95	664	759
Total unrestricted current assets	<u>44,315</u>	<u>48,895</u>	<u>93,210</u>
Restricted assets:			
Investments	440,554	265,039	705,593
Interest receivable	1,269	393	1,662
Total restricted assets	<u>441,823</u>	<u>265,432</u>	<u>707,255</u>
Capital assets:			
Capital assets – not being depreciated	72,557	84,739	157,296
Capital assets – being depreciated – net	3,567,535	2,298,583	5,866,118
Total capital assets	<u>3,640,092</u>	<u>2,383,322</u>	<u>6,023,414</u>
Regulatory assets	509,194	113,234	622,428
Other assets, net	47,452	154,262	201,714
Total assets	<u>4,682,876</u>	<u>2,965,145</u>	<u>7,648,021</u>
<b>Deferred Outflows of Resources</b>			
Deferred outflows from pension	31,306	16,604	47,910
Deferred outflows from derivative instruments	32,420	3,335	35,755
Deferred outflows from refunding debt	38,815	29,529	68,344
<b>Liabilities</b>			
Current liabilities:			
Accounts payable and accrued expenses	55,170	1,130	56,300
Commercial paper notes	19,500	79,500	99,000
Current portion of long-term debt	147,653	46,186	193,839
Total current liabilities	<u>222,323</u>	<u>126,816</u>	<u>349,139</u>
Payable from restricted assets:			
Accounts payable for construction	13,849	4,998	18,847
Accrued interest on bonds payable	52,199	26,298	78,497
Reserves	35,164	22,089	57,253
Total payable from restricted assets	<u>101,212</u>	<u>53,385</u>	<u>154,597</u>
Retainage on construction in progress	3,477	3,621	7,098
Long-term debt – less current portion	3,405,690	1,931,929	5,337,619
Long-term capital lease	19,591	8,670	28,261
Net pension liability	29,187	16,617	45,804
Other postemployment benefits	78,008	32,367	110,375
Liability for derivative instruments	32,420	3,335	35,755
Total liabilities	<u>3,891,908</u>	<u>2,176,740</u>	<u>6,068,648</u>
<b>Deferred Inflows of Resources</b>			
Deferred inflows from pension	7,660	4,150	11,810
Deferred inflows from regulated activities	19,573	33,702	53,275
<b>Net Position</b>			
Net investment in capital assets	248,895	481,008	729,903
Restricted	253,147	85,926	339,073
Unrestricted	364,234	233,087	597,321
Total net position	<u>\$ 866,276</u>	<u>\$ 800,021</u>	<u>\$ 1,666,297</u>

Commitments and contingencies

See accompanying independent auditors' report

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Combining Statement of Revenues, Expenses, and Changes in Net Position

Year Ended June 30, 2018

(Dollars in thousands)

	<u>Sewer</u>	<u>Water</u>	<u>Combined Total</u>
Operating revenues :			
Customer services	\$ 477,379	\$ 250,902	\$ 728,281
Other	7,989	2,034	10,023
	<u>485,368</u>	<u>252,936</u>	<u>738,304</u>
Total operating revenues			
Operating Expenses:			
Operations	62,402	44,541	106,943
Maintenance	20,007	9,060	29,067
Payments in lieu of taxes	-	8,220	8,220
Engineering, general, and administrative	82,250	51,377	133,627
	<u>164,659</u>	<u>113,198</u>	<u>277,857</u>
Total operating expenses			
Income from operating before depreciation	320,709	139,738	460,447
Depreciation and amortization	144,454	58,345	202,799
Operating Income	<u>176,255</u>	<u>81,393</u>	<u>257,648</u>
Regulatory accounting provisions:			
Change in reserves	(557)	(264)	(821)
Change in regulatory provisions, net	(77,286)	(28,670)	(105,956)
	<u>(77,843)</u>	<u>(28,934)</u>	<u>(106,777)</u>
Total regulatory accounting provisions			
Nonoperating revenues (expenses):			
Debt service grant	856	89	945
Investment income	2,911	1,084	3,995
Interest expense	(131,526)	(71,741)	(203,267)
Changes in derivative related accounts	2,528	412	2,940
	<u>(125,231)</u>	<u>(70,156)</u>	<u>(195,387)</u>
Total nonoperating expenses			
Net loss before capital grants and contributions	(26,819)	(17,697)	(44,516)
Capital grants and contributions	2,545	2,170	4,715
Decrease in net position	(24,274)	(15,527)	(39,801)
Total net position - beginning of year	866,276	800,021	1,666,297
Restatement to comply with GASB Statement No. 75	(6,667)	(14,430)	(21,097)
Total net position - end of year	<u>\$ 835,335</u>	<u>\$ 770,064</u>	<u>\$ 1,605,399</u>

See accompanying independent auditors' report

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

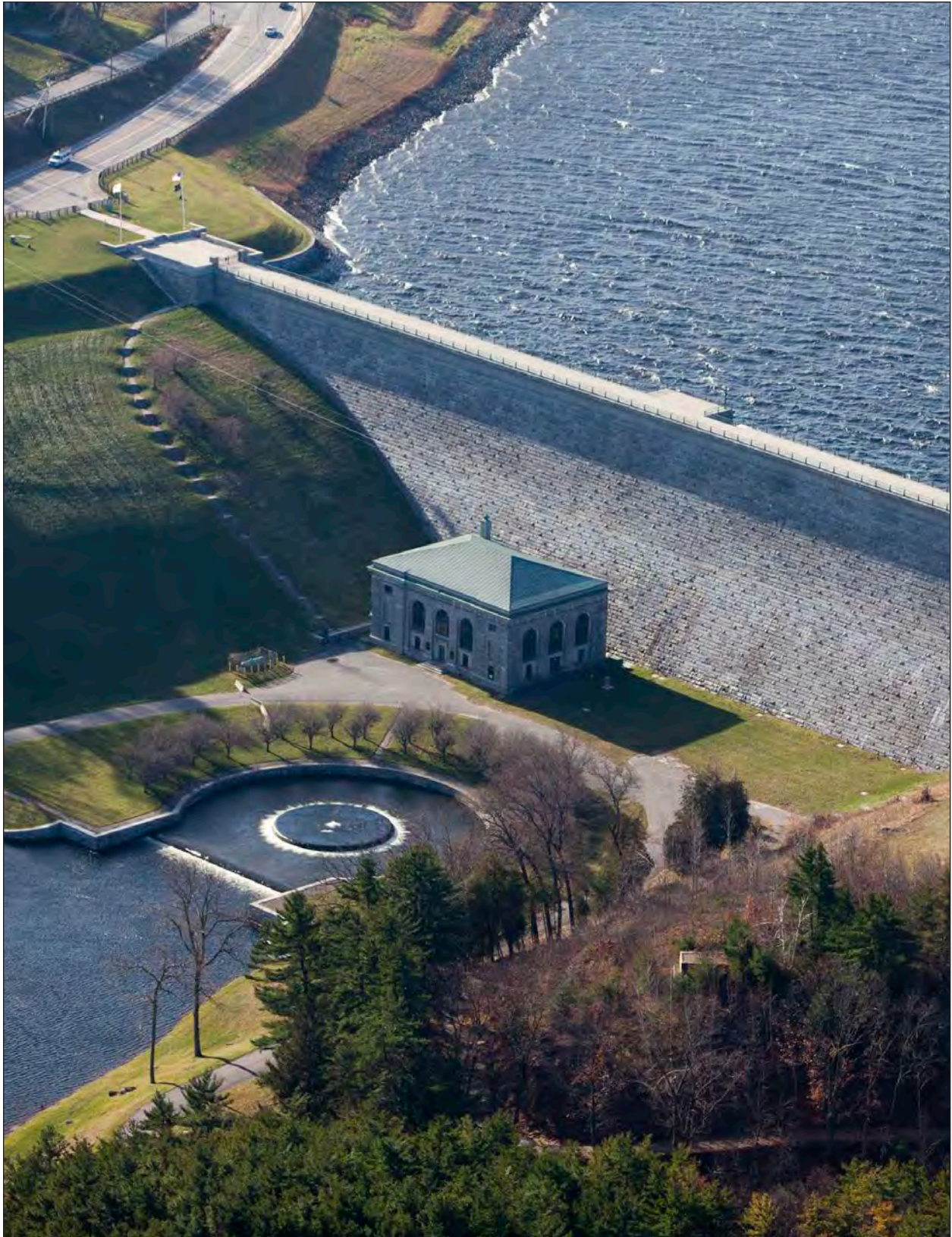
Combining Statement of Revenues, Expenses, and Changes in Net Position

Year Ended June 30, 2017

(Dollars in thousands)

	<u>Sewer</u>	<u>Water</u>	<u>Combined Total</u>
Operating revenues :			
Customer services	\$ 463,210	\$ 242,723	\$ 705,933
Other	4,770	6,073	10,843
	<u>467,980</u>	<u>248,796</u>	<u>716,776</u>
Operating Expenses:			
Operations	63,010	43,834	106,844
Maintenance	20,909	9,890	30,799
Payments in lieu of taxes	-	8,191	8,191
Engineering, general, and administrative	86,512	53,923	140,435
	<u>170,431</u>	<u>115,838</u>	<u>286,269</u>
Income from operating before depreciation	297,549	132,958	430,507
Depreciation and amortization	<u>144,077</u>	<u>57,404</u>	<u>201,481</u>
Operating Income	<u>153,472</u>	<u>75,554</u>	<u>229,026</u>
Regulatory accounting provisions:			
Change in reserves	502	(334)	168
Change in regulatory provisions, net	<u>(48,980)</u>	<u>(13,902)</u>	<u>(62,882)</u>
Total regulatory accounting provisions	<u>(48,478)</u>	<u>(14,236)</u>	<u>(62,714)</u>
Nonoperating revenues (expenses):			
Debt service grant	363	28	391
Investment income	2,998	126	3,124
Interest expense	(138,308)	(79,495)	(217,803)
Changes in derivative related accounts	2,528	412	2,940
	<u>(132,419)</u>	<u>(78,929)</u>	<u>(211,348)</u>
Net loss before capital grants and contributions	(27,425)	(17,611)	(45,036)
Capital grants and contributions	<u>2,737</u>	<u>4,487</u>	<u>7,224</u>
Decrease in net position	(24,688)	(13,124)	(37,812)
Total net position - beginning of year	<u>890,964</u>	<u>813,145</u>	<u>1,704,109</u>
Total net position - end of year	<u>\$ 866,276</u>	<u>\$ 800,021</u>	<u>\$ 1,666,297</u>

See accompanying independent auditors' report



Wachusett Dam



# Statistical Section



This part of the Massachusetts Water Resources Authority’s Fiscal Year 2018 Comprehensive Annual Financial Report presents detailed information to provide context to the information in the financial statements, note disclosures, required supplementary information and supplemental schedules.

## CONTENTS

### Financial Trends (78–81)

These schedules contain trend information to help the reader understand how MWRA’s financial performance and well-being have changed over time.

### Revenue Capacity (82–85)

These schedules contain information to help the reader assess MWRA’s primary revenue source and community assessments.

### Debt Capacity (86–89)

These schedules present information to help the reader assess the affordability of the MWRA’s current level of outstanding debt and MWRA’s ability to issue additional debt in the future.

### Demographic and Economic Information (90–95)

These schedules offer demographic and economic indicators to help the reader understand the environment within which MWRA’s financial activities take place.

### Operating Information (96–98)

These schedules contain service and infrastructure data to help the reader understand how the information in MWRA’s financial report relates to the services the MWRA’s provides and the activities it performs.

MASSACHUSETTS WATER RESOURCES AUTHORITY  
**Components of Net Position**  
**Last Ten Fiscal Years**  
(Dollars in thousands)

	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>
Net investment in capital assets	\$ 759,757	\$ 729,903	\$ 679,739	\$ 632,029
Restricted	357,767	339,073	346,366	329,814
Unrestricted	487,875	597,321	678,004	749,750
<b>Total net position</b>	<u>\$ 1,605,399</u>	<u>\$ 1,666,297</u>	<u>\$ 1,704,109</u>	<u>\$ 1,711,593</u>

Source: FY2009–2018 financial statements, reclassified to conform to 2018 presentation

<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>
\$ 608,232	\$ 588,872	\$ 705,721	\$ 835,638	\$ 936,746	\$ 984,797
310,393	346,008	330,775	264,617	243,541	306,909
837,790	860,287	796,751	774,678	737,187	681,870
<u>\$ 1,756,415</u>	<u>\$ 1,795,167</u>	<u>\$ 1,833,247</u>	<u>\$ 1,874,933</u>	<u>\$ 1,917,474</u>	<u>\$ 1,973,576</u>

MASSACHUSETTS WATER RESOURCES AUTHORITY  
**Changes in Net Position**  
**Last Ten Fiscal Years**  
(Dollars in thousands)

	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>
<b>Operating revenues:</b>				
Customer service	\$ 728,281	\$ 705,933	\$ 683,501	\$ 661,305
Other	10,023	10,843	13,472	7,299
Total operating revenues	<u>738,304</u>	<u>716,776</u>	<u>696,973</u>	<u>668,604</u>
<b>Operating expenses:</b>				
Operations	106,943	106,844	98,972	102,322
Maintenance	29,067	30,799	30,978	28,323
Payments in lieu of taxes	8,220	8,191	8,129	7,966
Engineering, general, and administrative	133,627	140,435	133,959	124,792
Total operating expenses	<u>277,857</u>	<u>286,269</u>	<u>272,038</u>	<u>263,403</u>
Depreciation and amortization	<u>202,799</u>	<u>201,481</u>	<u>197,128</u>	<u>194,000</u>
Operating income	<u>257,648</u>	<u>229,026</u>	<u>227,807</u>	<u>211,201</u>
<b>Nonoperating items:</b>				
Regulatory accounting provisions	(106,777)	(62,714)	(72,162)	(41,634)
Net nonoperating expenses	(198,327)	(214,288)	(204,259)	(217,218)
Capital grants and contributions	4,715	7,224	38,190	6,429
Changes in derivative related accounts	2,940	2,940	2,940	2,940
Total nonoperating items	<u>(297,449)</u>	<u>(266,838)</u>	<u>(235,291)</u>	<u>(249,483)</u>
Change in net position	(39,801)	(37,812)	(7,484)	(38,282)
Total net position – beginning of year	1,666,297	1,704,109	1,711,593	1,756,415
Restatement to comply with GASB*	(21,097)	-	-	(6,540)
<b>Total net position – end of year</b>	<u><u>\$ 1,605,399</u></u>	<u><u>\$ 1,666,297</u></u>	<u><u>\$ 1,704,109</u></u>	<u><u>\$ 1,711,593</u></u>

\*2018 - GASB 75

\*2015 - GASB 68

\*2009 - GASB 49

<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>
\$ 639,691	\$ 617,415	\$ 599,372	\$ 579,240	\$ 571,360	\$ 550,720
8,326	5,978	3,248	5,114	2,938	4,473
<u>648,017</u>	<u>623,393</u>	<u>602,620</u>	<u>584,354</u>	<u>574,298</u>	<u>555,193</u>
100,778	101,425	99,802	93,756	96,923	93,795
29,453	26,956	26,776	27,964	25,561	27,444
7,872	7,640	7,311	7,000	6,732	6,104
<u>135,401</u>	<u>131,329</u>	<u>127,621</u>	<u>126,127</u>	<u>131,551</u>	<u>132,828</u>
273,504	267,350	261,510	254,847	260,767	260,171
193,062	190,852	191,124	180,734	189,798	181,314
<u>181,451</u>	<u>165,191</u>	<u>149,986</u>	<u>148,773</u>	<u>123,733</u>	<u>113,708</u>
(3,808)	23,917	57,229	74,139	67,995	48,974
(225,293)	(239,616)	(259,537)	(263,761)	(234,588)	(246,164)
5,958	6,630	7,696	7,036	8,211	7,120
2,940	5,798	2,940	(8,728)	(21,453)	(9,451)
<u>(220,203)</u>	<u>(203,271)</u>	<u>(191,672)</u>	<u>(191,314)</u>	<u>(179,835)</u>	<u>(199,521)</u>
(38,752)	(38,080)	(41,686)	(42,541)	(56,102)	(85,813)
1,795,167	1,833,247	1,874,933	1,917,474	1,973,576	2,065,956
-	-	-	-	-	(6,567)
<u>\$ 1,756,415</u>	<u>\$ 1,795,167</u>	<u>\$ 1,833,247</u>	<u>\$ 1,874,933</u>	<u>\$ 1,917,474</u>	<u>\$ 1,973,576</u>

**MASSACHUSETTS WATER RESOURCES AUTHORITY**  
**Historical Rate Revenue and Percentage Increases**  
**Last Ten Fiscal Years**  
(Dollars in millions)

	Water		Sewer		Combined	
	Amount	Increase	Amount	Increase	Amount	Increase
2018	\$ 242.4	3.5%	\$474.6	3.0%	\$717.0	3.2%
2017	234.3	3.5	460.6	3.3	694.9	3.3
2016	226.4	7.7	446.1	1.4	672.4	3.4
2015	210.2	3.5	440.1	3.4	650.3	3.4
2014	203.2	3.7	425.5	3.4	628.7	3.5
2013	196.0	6.6	411.5	1.4	607.5	3.5
2012	183.9	2.0	405.8	4.2	589.7	3.5
2011	180.2	0.6	389.6	1.9	659.8	1.5
2010	179.1	(0.6)	382.3	6.0	651.4	3.8
2009	180.2	7.1	360.6	3.2	540.8	4.5

Note: Rate revenue is derived exclusively from member community assessments and does not include other charges and fees.

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**MASSACHUSETTS WATER RESOURCES AUTHORITY**  
**Historical Revenues, Expenses and Fund Deposits**  
**Last Ten Fiscal Years**  
(Dollars in thousands)

	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>
<b>Revenues:</b>				
Rates and Charges	\$ 726,073	\$ 703,688	\$ 681,223	\$ 650,316
Investment Income	12,755	9,758	10,303	9,689
Transfer from Rate Stabilization Fund	-	-	-	-
Other Income	12,231	13,088	15,750	18,289
<b>Total Revenues</b>	<b>751,059</b>	<b>726,534</b>	<b>707,276</b>	<b>678,294</b>
<b>Operating Expenses</b>				
Operating Expenses	263,226	258,046	293,682	258,534
Capital Lease	3,217	3,217	3,217	3,217
<b>Net Operating Revenues</b>	<b>484,616</b>	<b>465,271</b>	<b>410,377</b>	<b>416,543</b>
<b>Debt Service on Bonds</b>				
Debt Service on Bonds	\$ 279,790	\$ 286,666	\$ 274,212	\$ 233,079
Other Debt Service	158,485	139,430	114,481	161,736
Debt Prepayment	10,900	10,995	-	-
<b>Amount Available After Operations and Debt Service</b>	<b>\$ 35,441</b>	<b>\$ 28,180</b>	<b>\$ 21,685</b>	<b>\$ 21,728</b>
<b>Fund Deposits:</b>				
Reserve Funds	\$ 821	\$ (168)	\$ (35)	\$ 483
Construction Fund	\$ 14,683	\$ 13,059	\$ 11,462	\$ 10,464
Core Fund	\$ -	\$ -	\$ -	\$ 730
Rate Stabilization	\$ 6,532	\$ -	\$ -	\$ -

Note: Schedule prepared in accordance with MWRA General Bond Resolution.



<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>
\$ 628,721	\$ 607,512	\$ 589,700	\$ 569,800	\$ 561,431	\$ 540,819
12,130	13,590	16,268	15,193	15,223	19,769
3,500	-	1,092	5,030	7,312	5,073
19,296	15,881	12,920	14,554	12,866	68,118
663,647	636,983	619,980	604,577	596,832	633,779
257,724	252,333	245,210	240,678	244,729	298,107
3,217	3,217	3,217	3,217	3,217	3,217
402,706	381,433	371,553	360,682	348,886	332,455
\$ 228,652	\$ 209,826	\$ 208,332	\$ 224,746	\$ 199,368	\$ 179,463
160,032	158,666	145,722	124,656	136,677	142,507
-	-	-	-	-	-
\$ 14,022	\$ 12,941	\$ 17,499	\$ 11,280	\$ 12,841	\$ 10,485
\$ 169	\$ 1,398	\$ 195	\$ (407)	\$ (653)	\$ 1,743
\$ 9,516	\$ 8,535	\$ 7,481	\$ 7,539	\$ 5,967	\$ 5,634
\$ 132	\$ -	\$ -	\$ -	\$ -	\$ -
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

**MASSACHUSETTS WATER RESOURCES AUTHORITY**  
**Debt Service Coverage**  
**Last Ten Fiscal Years**  
(Dollars in thousands)

	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>
Operating Revenues	\$ 738,304	\$ 716,776	\$ 696,973	\$ 668,605
Interest Income	12,755	9,758	10,303	9,689
Special Payment Obligation	-	-	-	-
Transfers from Rate Stabilization Fund	-	-	-	-
<b>Total Revenues</b>	<b>\$ 751,059</b>	<b>\$ 726,534</b>	<b>\$ 707,276</b>	<b>\$ 678,294</b>
Operating Expenses	\$ (263,394)	\$ (266,415)	\$ (278,887)	\$ (271,329)
Special Payment Obligation	-	-	-	-
Commonwealth Obligations	23,757	23,912	27,470	27,168
OPEB	(236)	3,449	11,555	9,401
Pollution Remediation	1,225	4,752	322	3,394
Capital Lease	(3,217)	(3,217)	(3,217)	(3,217)
<b>Net Revenues</b>	<b>\$ 509,194</b>	<b>\$ 489,015</b>	<b>\$ 464,519</b>	<b>\$ 443,711</b>
CORE Fund Deposits	-	-	-	862
Revenues Available for Primary and SRF Primary Coverage (Before Provision for Transfer to Rate Stabilization Fund)(A)	\$ 509,194	\$ 489,015	\$ 464,519	\$ 442,849
Provision for Transfer to Rate Stabilization Fund	\$ 6,532	\$ -	\$ -	\$ -
Revenues Available for Primary and SRF Primary Coverage (After Provision for Transfer to Rate Stabilization Fund)(B)	\$ 502,662	\$ 489,015	\$ 464,519	\$ 442,849
Required Senior Debt Service Fund Deposits(C)	\$ 261,383	\$ 262,093	\$ 272,570	\$ 208,500
Required Subordinated Debt Service Deposits(D)	\$ 158,485	\$ 139,430	\$ 114,481	\$ 161,737
Coverage:				
Before Provision for Transfer to Rate Stabilization Fund:				
Primary	195%	187%	170%	212%
SRF Primary	121%	122%	120%	120%
After Provision for Transfer to Rate Stabilization Fund:				
Primary	192%	187%	170%	212%
SRF Primary	120%	122%	120%	120%
Required CORE Fund Deposits	N/A	N/A	N/A	\$862
CORE Fund Deposits	N/A	N/A	N/A	\$862

Note: Schedule prepared in accordance with MWRA General Bond Resolution.

<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>
\$ 648,017	\$ 623,393	\$ 602,620	\$ 584,354	\$ 574,297	\$ 555,193
12,130	13,590	16,268	15,193	15,223	19,769
-	-	-	-	-	53,744
3,500	-	1,092	5,030	7,312	5,073
<b>\$ 663,647</b>	<b>\$ 636,983</b>	<b>\$ 619,980</b>	<b>\$ 604,577</b>	<b>\$ 596,832</b>	<b>\$ 633,779</b>
\$ (273,500)	\$ (267,351)	\$ (261,510)	\$ (254,846)	\$ (260,765)	\$ (260,171)
-	-	-	-	-	53,744
26,641	26,004	25,630	24,709	23,349	22,440
13,521	13,123	15,118	14,169	16,838	15,808
2,261	--	--	--	--	--
(3,217)	(3,217)	(3,217)	(3,217)	(3,217)	(3,217)
<b>\$ 429,353</b>	<b>\$ 405,542</b>	<b>\$ 396,001</b>	<b>\$ 385,392</b>	<b>\$ 373,037</b>	<b>\$ 354,895</b>
132	-	-	-	-	-
\$ 429,221	\$ 405,542	\$ 396,001	\$ 385,392	\$ 373,037	\$ 354,895
\$ -	\$ -	\$ -	\$ 4,148.00	\$ 7,527.00	\$ 3,108.00
\$ 429,221	\$ 405,542	\$ 396,001	\$ 381,244	\$ 365,510	\$ 351,787
\$ 203,338	\$ 192,834	\$ 188,054	\$ 199,294	\$ 179,440	\$ 171,958
\$ 160,032	\$ 151,598	\$ 145,236	\$ 117,656	\$ 129,667	\$ 132,032
211%	210%	211%	193%	208%	206%
118%	118%	119%	122%	121%	117%
211%	210%	211%	191%	204%	206%
118%	118%	199%	120%	118%	116%
\$132	\$ -	\$ -	\$ -	\$ -	\$ -
\$132	\$ -	\$ -	\$ -	\$ -	\$ -

**MASSACHUSETTS WATER RESOURCES AUTHORITY**  
**Long Term Debt by System**  
**Last Ten Fiscal Years**  
(Dollars in thousands)

	2018		2017		2016		2015	
	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water
<b>General Revenue Bonds:</b>								
1993C Series Bonds	-	-	-	-	-	-	8,807	1,258
1998A Series Bonds	-	-	-	-	-	-	-	-
2002B Series Bonds	-	-	-	-	-	-	-	-
2002J Series Bonds	171,651	17,369	218,739	22,601	247,895	26,285	254,960	27,070
2003D Series Bonds	-	-	-	-	-	-	-	-
2004A Series Bonds	-	-	-	-	-	-	-	-
2006A Series Bonds	-	-	-	-	-	-	-	62,320
2007A Series Bonds	-	-	-	-	-	-	33,660	164,340
2009A Series Bonds	-	-	-	-	-	-	48,180	16,060
2010A Series Bonds	-	-	973	417	3,630	1,556	59,605	25,545
2011B Series Bonds	5,495	2,355	5,852	2,508	55,892	23,954	94,350	40,436
2012A Series Bonds	37,295	37,295	37,295	37,295	49,043	49,043	66,310	66,310
2014D Series Bonds	40,912	19,253	41,851	19,694	46,427	21,848	48,052	22,613
2016B Series Bonds	31,685	31,685	32,985	32,985	32,985	32,985	-	-
2017B Series Bonds	34,120	34,120	34,120	34,120	-	-	-	-
2018B Series Bonds	64,548	43,032	-	-	-	-	-	-
<b>General Revenue Refunding Bonds:</b>								
1997D Series Bonds	-	-	-	-	-	-	-	-
1998B Series Bonds	-	-	-	-	-	-	-	-
2004B Series Bonds	-	-	-	-	-	-	-	-
2005A Series Bonds	-	-	-	-	118,730	145,115	138,173	168,878
2005B Series Bonds	-	-	-	-	25,082	50,163	26,763	53,527
2006B Series Bonds	-	-	22,823	7,608	23,614	7,871	129,431	43,144
2007B Series Bonds	544,278	103,672	544,278	103,672	544,278	103,672	544,278	103,672
2009B Series Bonds	91,019	35,396	104,562	40,663	113,386	44,094	193,043	75,072
2010B Series Bonds	55,648	40,297	57,214	41,431	62,608	45,337	95,836	69,399
2011C Series Bonds	125,252	195,908	125,252	195,908	125,252	195,908	127,592	199,568
2012B Series Bonds	18,223	68,552	18,223	68,552	18,223	68,552	18,223	68,552
2013A Series Bonds	57,408	45,107	79,537	62,493	92,758	72,882	95,102	74,723
2014E Series Bonds	13,654	1,951	13,654	1,951	22,133	3,162	24,714	3,531
2014F Series Bonds	43,837	97,573	43,837	97,573	43,837	97,573	43,873	97,652
2016C Series Bonds	345,874	332,311	347,624	333,991	347,624	333,991	-	-
2016D Series Bonds	67,769	36,491	67,769	36,491	-	-	-	-
2017C Series Bonds	112,275	137,225	114,635	140,110	-	-	-	-
2018C Series Bonds	16,425	5,475	-	-	-	-	-	-
<b>General Revenue Bonds (variable rates):</b>								
1999B Series Bonds	32,820	21,880	35,160	23,440	35,160	23,440	35,160	23,440
<b>General Revenue Refunding Bonds (variable rates):</b>								
2002C Series Bonds	11,290	23,830	11,290	23,830	11,290	23,830	11,290	23,830
2002D Series Bonds	-	-	-	-	-	-	-	-
2008A Series Bonds	184,294	25,131	187,343	25,547	206,664	28,181	251,438	34,287
2008B Series Bonds	-	-	-	-	-	-	-	-
2008C Series Bonds	82,848	3,452	97,248	4,052	101,395	4,225	105,427	4,393
2008D Series Bonds	-	-	-	-	-	-	-	-
2008E Series Bonds	122,949	10,691	122,949	10,691	122,949	10,691	122,949	10,691
2008F Series Bonds	-	-	-	-	4,500	45,500	4,500	45,500
2012E Series Bonds	12,590	47,361	12,897	48,518	13,194	49,636	13,194	49,636
2012F Series Bonds	-	-	10,936	41,139	12,663	47,637	12,663	47,637
2012G Series Bonds	35,424	1,476	45,024	1,876	47,789	1,991	50,477	2,103
2014A Series Bonds	4,500	45,500	4,500	45,500	4,500	45,500	4,500	45,500
2014B Series Bonds	5,828	58,927	5,828	58,927	5,828	58,927	5,828	58,927
2018A Series Bonds	10,628	39,982	-	-	-	-	-	-
2018D Series Bonds	4,500	45,500	-	-	-	-	-	-
<b>Revolving Loan:</b>								
2015C Revolving Loan	26,500	26,500	39,500	39,500	39,500	39,500	-	-
<b>General Revenue Bonds with the Massachusetts Clean Water Trust:</b>	766,343	176,538	814,296	192,155	853,081	182,716	859,991	182,973
<b>Total</b>	<b>3,177,882</b>	<b>1,811,833</b>	<b>3,298,193</b>	<b>1,795,238</b>	<b>3,431,908</b>	<b>1,885,764</b>	<b>3,528,369</b>	<b>1,912,586</b>



MASSACHUSETTS WATER RESOURCES AUTHORITY  
**Schedule of Sewer Flows**  
**Last Ten Fiscal Years**  
(Million gallons per day)

<b>MWRA Community</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>
Arlington	4.79	4.64	3.96	4.56
Ashland	1.28	1.36	1.11	1.16
Bedford	2.51	2.46	2.34	2.57
Belmont	2.93	2.69	2.31	2.89
Boston (BWSC)	89.82	87.04	80.51	87.21
Braintree	7.07	6.26	6.63	7.08
Brookline	8.05	7.72	7.07	8.62
Burlington	3.58	3.38	3.00	3.31
Cambridge	17.98	17.83	16.31	17.93
Canton	3.24	2.79	2.59	2.77
Chelsea	5.49	5.12	4.67	5.16
Dedham	3.92	3.41	3.06	3.53
Everett	5.60	5.12	4.54	4.95
Framingham	7.32	6.87	7.15	7.62
Hingham S.D.	1.32	1.25	1.22	1.37
Holbrook	0.91	0.85	0.83	0.89
Lexington	5.03	4.59	4.22	4.93
Malden	8.73	8.45	8.19	9.20
Medford	7.52	7.17	6.72	8.26
Melrose	4.18	4.29	3.69	4.64
Milton	3.28	3.04	2.56	3.26
Natick	2.77	2.76	2.80	2.93
Needham	3.68	3.52	3.06	3.39
Newton	14.21	14.73	14.11	15.22
Norwood	6.20	5.41	4.58	5.29
Quincy	13.48	12.58	12.11	13.56
Randolph	3.85	3.58	2.82	3.52
Reading	2.88	2.89	2.42	2.83
Revere	6.18	6.14	5.97	6.82
Somerville	10.63	10.27	9.96	10.70
Stoneham	3.13	2.68	2.39	3.16
Stoughton	3.24	2.75	2.60	3.20
Wakefield	4.17	4.09	3.59	4.26
Walpole	2.07	1.99	1.75	1.88
Waltham	9.07	8.39	8.10	9.11
Watertown	3.48	3.36	3.00	3.31
Wellesley	3.22	3.15	2.82	3.14
Westwood	1.76	1.78	1.50	1.50
Weymouth	8.65	7.93	7.15	7.82
Wilmington	1.45	1.40	1.28	1.33
Winchester	2.30	2.23	1.94	2.24
Winthrop	2.10	2.14	1.85	1.90
Woburn	6.29	6.48	5.83	6.86

Source: MWRA metering

<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>
4.15	4.47	5.08	4.72	5.88	5.35
1.20	1.22	1.24	1.10	1.34	1.31
2.42	2.41	2.52	2.33	2.85	2.64
2.56	2.92	3.10	3.05	3.98	3.67
85.18	94.79	97.02	95.81	100.40	93.82
6.39	6.58	6.82	6.52	6.97	6.61
8.89	9.09	10.03	9.61	11.74	10.83
3.12	3.22	3.45	3.53	4.18	3.85
16.15	17.28	17.16	16.84	19.60	20.31
2.98	2.77	2.26	2.44	2.40	2.54
4.76	4.88	4.91	5.08	5.35	4.48
3.44	3.57	3.61	3.39	4.42	3.97
4.85	5.15	5.81	4.81	6.08	5.63
6.76	7.05	6.11	6.28	7.73	7.08
1.25	1.32	1.26	1.28	1.41	1.14
0.86	0.92	0.76	0.78	0.90	0.87
4.47	5.06	5.25	5.00	6.96	6.33
8.13	8.95	9.11	9.18	9.72	9.48
7.09	7.96	7.68	7.63	9.95	9.44
3.86	4.50	4.69	3.91	4.89	4.68
2.93	3.14	3.33	3.32	4.24	3.63
2.95	3.07	3.10	2.95	2.94	2.98
3.29	3.52	3.62	3.71	4.69	4.07
13.29	15.31	17.09	15.61	19.43	19.36
4.97	5.13	4.82	4.50	5.52	4.99
12.96	13.45	14.09	13.79	16.36	14.58
3.41	3.66	3.63	3.43	4.07	3.77
2.65	2.86	3.07	2.87	3.46	3.15
6.13	7.01	7.50	7.36	7.97	7.31
9.30	10.87	10.63	10.79	11.86	10.22
2.70	3.15	3.47	3.12	3.91	3.60
2.67	2.66	3.09	2.83	4.35	3.78
3.50	3.88	4.42	4.21	5.27	4.80
1.89	2.00	1.93	1.92	2.55	2.31
8.06	9.26	9.39	9.77	11.28	11.28
3.14	3.49	3.68	3.66	4.30	4.15
3.05	3.38	3.63	3.29	4.25	3.82
1.28	1.42	1.42	1.33	1.78	1.57
6.90	8.18	7.56	7.39	8.94	7.93
1.20	1.20	1.32	1.27	1.53	1.27
1.99	2.30	2.39	2.28	2.74	2.59
1.84	1.99	2.21	2.22	2.53	2.18
6.97	7.34	7.28	7.48	9.08	8.57

**MASSACHUSETTS WATER RESOURCES AUTHORITY**  
**Schedule of Water Flows**  
**Last Ten Fiscal Years**  
(Million gallons per day)

<b>MWRA Water Customer</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>
Arlington	3.676	3.782	3.907	3.826
Belmont	2.032	2.105	2.187	2.157
Boston (BWSC)	63.418	64.334	64.902	64.567
Brookline	4.948	5.068	5.275	5.500
Chelsea	3.368	3.323	3.283	3.248
Chicopee	5.131	5.122	5.306	5.251
Clinton	1.416	1.433	1.637	1.700
Everett	3.778	3.905	3.883	3.755
Framingham	5.752	5.883	6.017	6.621
Lexington	5.047	5.304	5.377	5.824
Lynnfield W.D.	0.549	0.560	0.522	0.488
Malden	5.088	4.941	5.225	5.684
Marblehead	1.804	1.817	1.839	1.803
Medford	4.587	4.624	4.944	5.059
Melrose	2.038	2.071	2.207	2.323
Milton	2.420	2.578	2.632	2.598
Nahant	0.323	0.390	0.384	0.357
Newton	8.511	8.973	9.986	10.095
Norwood	2.771	2.835	2.776	2.932
Quincy	8.106	8.869	9.209	9.330
Reading	1.610	1.658	1.646	1.625
Revere	3.600	3.673	3.770	3.919
Saugus	2.852	2.926	2.862	2.935
Somerville	5.636	5.805	6.186	5.672
So. Hadley FD #1	1.034	1.070	1.091	1.082
Southborough	0.934	0.984	1.050	1.014
Stoneham	2.220	2.247	2.336	2.573
Swampscott	1.461	1.426	1.431	1.380
Waltham	6.600	6.599	7.077	7.133
Watertown	2.640	2.582	2.553	2.599
Weston	1.739	1.973	1.940	1.919
Wilbraham	1.107	1.166	1.193	1.153
Winthrop	1.224	1.196	1.225	1.312
Cambridge (Partial)	0.000	1.403	0.942	-
Canton (Partial)	1.198	1.867	1.559	1.068
Dedham-Westwood W.D. (Partial)	0.134	0.198	0.140	0.273
Lynn (LWSC) (Partial)	0.269	0.233	0.690	0.175
Marlborough (Partial)	4.074	3.834	3.570	3.247
Needham (Partial)	0.638	0.703	0.933	0.907
Northborough (Partial)	0.890	0.912	0.906	0.891
Peabody (Partial)	3.487	2.105	1.126	1.257
Stoughton (Partial)	0.102	0.154	0.526	0.979
Wakefield (Partial)	1.541	1.667	1.426	1.505
Wellesley (Partial)	1.160	0.994	1.054	0.820
Winchester (Partial)	1.144	1.407	1.542	1.042
Woburn (Partial)	2.400	2.627	2.482	2.673
Worcester (Partial)	0.000	2.322	0.001	-
Comm. of Mass. - Fernald (Other)	-	-	-	0.015
D.C.R. Parks Division (Other)	0.068	0.044	0.052	0.058
MWRA - Deer Island Water (Other)	1.275	1.325	1.397	1.279
Other Reservoir Withdrawals (Other)	6.001	2.821	-	-
Quinapoxet Withdrawal (Other)	5.250	2.654	7.582	3.824
Blue Hills Ski Area (DCR)	0.035	-	-	-
Westboro State Hospital (Other)	-	-	-	-
Wilmington (Other)	0.456	0.485	0.539	0.456
Westboro State Hospital (DYS) (Other)	0.024	0.023	0.024	0.045

Source: MWRA metering



<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>
3.778	3.933	4.061	4.309	3.872	3.962
2.113	2.169	2.174	2.092	2.186	2.153
63.184	64.325	64.395	65.128	65.530	67.578
5.462	5.344	5.078	5.120	5.110	5.340
3.306	3.121	3.095	3.036	3.036	3.048
5.285	5.394	5.496	5.457	5.620	5.541
1.719	1.951	1.975	1.896	1.689	1.676
3.832	3.902	3.857	4.007	4.168	4.462
6.504	6.542	6.578	6.859	6.426	6.551
5.145	4.961	4.534	4.990	4.548	4.733
0.463	0.415	0.354	0.415	0.360	0.410
5.250	5.372	5.524	5.486	5.252	5.650
1.791	1.715	1.698	1.757	1.751	1.786
5.075	4.957	4.835	5.077	4.994	4.923
2.235	2.218	2.144	2.247	2.101	2.108
2.394	2.464	2.442	2.383	2.288	2.208
0.331	0.307	0.290	0.311	0.287	0.332
9.174	8.858	8.891	8.871	8.448	8.830
2.892	2.736	2.808	3.241	2.904	2.918
9.173	8.933	8.878	9.126	9.051	9.511
1.616	1.648	1.601	1.728	1.669	1.800
3.909	3.798	3.871	3.975	4.116	4.077
2.805	2.632	2.668	2.892	2.906	2.807
5.609	5.843	5.521	5.706	5.815	5.881
1.074	1.128	1.159	1.209	1.142	1.233
0.956	0.909	0.860	0.973	0.886	0.974
2.793	2.982	2.785	2.849	2.687	2.722
1.559	1.459	1.546	1.510	1.397	1.451
6.823	6.855	6.753	7.451	7.369	7.577
2.661	2.606	2.583	2.664	2.550	2.800
1.675	1.608	1.599	1.719	1.368	1.401
1.112	1.153	1.121	1.174	1.047	1.038
1.263	1.243	1.241	1.264	1.182	1.262
5.874	-	-	-	-	-
0.875	1.082	1.560	1.968	2.292	2.281
0.039	0.089	0.063	0.046	0.001	0.008
0.227	0.172	0.233	0.230	0.177	0.173
3.482	2.969	2.260	3.294	2.243	2.500
0.787	0.894	1.091	0.802	0.303	0.365
0.875	0.882	0.882	0.760	0.707	0.828
1.155	0.828	0.509	0.668	0.442	0.320
0.759	0.753	0.632	0.658	0.544	0.541
1.355	1.439	1.360	1.531	1.436	1.462
0.686	1.499	0.789	1.058	0.906	0.985
1.048	0.987	0.928	0.978	0.819	0.830
2.383	3.029	2.520	2.317	1.813	2.310
-	0.002	-	-	-	-
0.063	0.066	0.060	0.070	0.083	0.092
0.061	0.052	0.047	0.052	0.050	0.048
1.247	1.310	1.448	1.341	1.418	1.356
-	-	-	0.160	0.908	0.637
4.110	6.241	0.530	5.544	-	3.358
-	-	-	-	-	-
-	0.014	0.015	0.039	0.121	0.127
0.256	0.204	0.084	0.555	0.206	0.304
0.017	0.017	-	-	-	-

**MASSACHUSETTS WATER RESOURCES AUTHORITY**  
**Sewer-System Total**  
**Community Population Estimates**  
**Last Ten Calendar Years**

<b>Population</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>
Arlington	40,993	45,052	44,204	44,212	44,028	43,711	43,290	42,844	41,719	40,993
Ashland	15,807	17,684	17,185	17,191	17,150	16,993	16,767	16,593	15,381	15,807
Bedford	13,545	14,411	14,058	14,086	13,975	13,765	13,455	13,320	13,813	13,545
Belmont	23,291	26,171	25,425	25,431	25,332	25,204	24,987	24,729	23,723	23,291
Boston Water & Sewer Commission	620,535	673,184	651,710	649,917	645,966	636,479	625,087	617,594	645,169	620,535
Braintree	35,294	37,297	36,984	36,968	36,727	36,249	35,990	35,744	35,488	35,294
Brookline	54,896	59,126	59,277	59,246	59,128	59,115	59,132	58,732	56,417	54,896
Burlington	24,985	26,351	25,502	25,507	25,463	25,165	24,755	24,498	25,749	24,985
Cambridge	105,596	110,651	107,705	107,732	107,289	106,471	106,038	105,162	108,771	105,596
Canton	22,048	22,952	22,257	22,246	22,221	21,932	21,710	21,561	22,370	22,048
Chelsea	41,577	38,599	37,359	37,881	37,670	36,828	35,649	35,177	37,483	41,577
Dedham	24,630	25,263	25,322	25,346	25,299	24,974	24,895	24,729	24,811	24,630
Everett	37,353	44,840	43,484	43,110	42,935	42,567	42,101	41,667	38,299	37,353
Framingham	64,885	71,594	70,569	70,583	70,441	70,068	68,991	68,318	67,191	64,885
Hingham Sewer District	7,611	7,708	7,370	7,260	7,475	7,279	7,201	7,162	7,863	7,611
Holbrook	10,644	11,022	10,994	10,988	10,952	10,899	10,866	10,791	10,732	10,644
Lexington	30,272	33,410	32,810	32,817	32,650	32,272	31,718	31,394	30,925	30,272
Malden	55,597	60,840	60,776	60,788	60,509	60,374	60,071	59,450	56,146	55,597
Medford	55,573	57,213	57,266	57,385	57,170	57,033	56,738	56,173	55,578	55,573
Melrose	26,708	27,928	27,777	27,810	27,690	27,435	27,263	26,983	27,091	26,708
Milton	26,187	27,351	27,358	27,345	27,270	27,158	27,182	27,003	26,186	26,187
Natick	31,880	36,137	35,326	35,339	35,214	33,760	33,349	33,006	32,335	31,880
Needham	28,560	30,755	29,797	29,785	29,736	29,366	29,083	28,886	29,021	28,560
Newton	82,139	89,045	87,908	87,927	87,971	86,307	85,945	85,146	84,592	82,139
Norwood	28,211	29,097	29,021	29,007	28,951	28,780	28,801	28,602	28,442	28,211
Quincy	92,339	93,688	93,373	93,327	93,494	93,027	92,909	92,271	91,028	92,339
Randolph	30,082	33,610	33,541	33,519	33,456	33,226	32,336	32,112	31,022	30,082
Reading	23,052	25,834	25,397	25,433	25,327	25,192	25,001	24,747	23,509	23,052
Revere	60,204	53,157	53,316	54,063	53,756	53,179	52,459	51,755	51,693	60,204
Somerville	75,662	81,322	78,929	78,857	78,804	77,104	76,519	75,754	76,491	75,662
Stoneham	21,471	21,953	21,803	21,808	21,734	21,605	21,659	21,437	21,558	21,471
Stoughton	26,927	28,431	28,197	28,183	28,106	27,849	27,150	26,962	27,154	26,927
Wakefield	24,717	26,753	26,147	26,182	26,080	25,613	25,191	24,932	25,196	24,717
Walpole	23,133	25,125	24,788	24,776	24,818	24,562	24,234	24,070	23,448	23,133
Waltham	60,236	63,002	62,412	62,424	62,227	61,918	61,181	60,632	60,604	60,236
Watertown	32,365	34,025	33,124	33,130	32,996	32,863	32,248	31,915	33,117	32,365
Wellesley	27,244	29,215	28,897	29,180	29,090	28,748	28,152	27,982	27,398	27,244
Westwood	14,189	15,279	14,904	14,896	14,876	14,768	14,721	14,618	14,322	14,189
Weymouth	53,261	55,972	55,510	55,482	55,419	54,906	54,116	53,743	53,977	53,261
Wilmington	21,649	23,570	23,199	23,204	23,147	22,936	22,557	22,325	22,369	21,649
Winchester	21,090	22,808	22,159	22,166	22,079	21,869	21,594	21,374	21,495	21,090
Winthrop	17,943	18,190	17,979	18,232	18,111	17,940	17,737	17,497	19,235	17,943
Woburn	36,871	39,452	39,162	39,170	39,083	38,949	38,520	38,120	38,983	36,871
<b>SYSTEM</b>	<b>2,171,252</b>	<b>2,315,067</b>	<b>2,270,281</b>	<b>2,269,939</b>	<b>2,261,815</b>	<b>2,236,438</b>	<b>2,209,348</b>	<b>2,187,510</b>	<b>2,207,894</b>	<b>2,171,252</b>

Source: U.S. Census Bureau

**MASSACHUSETTS WATER RESOURCES AUTHORITY**  
**Sewer-System Total**  
**Community Population Estimates**  
**Last Ten Calendar Years**

<b>System Share</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>
Arlington	1.89%	1.95%	1.95%	1.95%	1.95%	1.95%	1.96%	1.96%	1.89%	1.89%
Ashland	0.73%	0.76%	0.76%	0.76%	0.76%	0.76%	0.76%	0.76%	0.70%	0.73%
Bedford	0.62%	0.62%	0.62%	0.62%	0.62%	0.62%	0.61%	0.61%	0.63%	0.62%
Belmont	1.07%	1.13%	1.12%	1.12%	1.12%	1.13%	1.13%	1.13%	1.07%	1.07%
Boston Water & Sewer Commision	28.58%	29.08%	28.71%	28.63%	28.56%	28.46%	28.29%	28.23%	29.22%	28.58%
Braintree	1.63%	1.61%	1.63%	1.63%	1.62%	1.62%	1.63%	1.63%	1.61%	1.63%
Brookline	2.53%	2.55%	2.61%	2.61%	2.61%	2.64%	2.68%	2.68%	2.56%	2.53%
Burlington	1.15%	1.14%	1.12%	1.12%	1.13%	1.13%	1.12%	1.12%	1.17%	1.15%
Cambridge	4.86%	4.78%	4.74%	4.75%	4.74%	4.76%	4.80%	4.81%	4.93%	4.86%
Canton	1.02%	0.99%	0.98%	0.98%	0.98%	0.98%	0.98%	0.99%	1.01%	1.02%
Chelsea	1.91%	1.67%	1.65%	1.67%	1.67%	1.65%	1.61%	1.61%	1.70%	1.91%
Dedham	1.13%	1.09%	1.12%	1.12%	1.12%	1.12%	1.13%	1.13%	1.12%	1.13%
Everett	1.72%	1.94%	1.92%	1.90%	1.90%	1.90%	1.91%	1.90%	1.73%	1.72%
Framingham	2.99%	3.09%	3.11%	3.11%	3.11%	3.13%	3.12%	3.12%	3.04%	2.99%
Hingham	0.35%	0.33%	0.32%	0.32%	0.33%	0.33%	0.33%	0.33%	0.36%	0.35%
Holbrook	0.49%	0.48%	0.48%	0.48%	0.48%	0.49%	0.49%	0.49%	0.49%	0.49%
Lexington	1.39%	1.44%	1.45%	1.45%	1.44%	1.44%	1.44%	1.44%	1.40%	1.39%
Malden	2.56%	2.63%	2.68%	2.68%	2.68%	2.70%	2.72%	2.72%	2.54%	2.56%
Medford	2.56%	2.47%	2.52%	2.53%	2.53%	2.55%	2.57%	2.57%	2.52%	2.56%
Melrose	1.23%	1.21%	1.22%	1.23%	1.22%	1.23%	1.23%	1.23%	1.23%	1.23%
Milton	1.21%	1.18%	1.21%	1.20%	1.21%	1.21%	1.23%	1.23%	1.19%	1.21%
Natick	1.47%	1.56%	1.56%	1.56%	1.56%	1.51%	1.51%	1.51%	1.46%	1.47%
Needham	1.32%	1.33%	1.31%	1.31%	1.31%	1.31%	1.32%	1.32%	1.31%	1.32%
Newton	3.78%	3.85%	3.87%	3.87%	3.89%	3.86%	3.89%	3.89%	3.83%	3.78%
Norwood	1.30%	1.26%	1.28%	1.28%	1.28%	1.29%	1.30%	1.31%	1.29%	1.30%
Quincy	4.25%	4.05%	4.11%	4.11%	4.13%	4.16%	4.21%	4.22%	4.12%	4.25%
Randolph	1.39%	1.45%	1.48%	1.48%	1.48%	1.49%	1.46%	1.47%	1.41%	1.39%
Reading	1.06%	1.12%	1.12%	1.12%	1.12%	1.13%	1.13%	1.13%	1.06%	1.06%
Revere	2.77%	2.30%	2.35%	2.38%	2.38%	2.38%	2.37%	2.37%	2.34%	2.77%
Somerville	3.48%	3.51%	3.48%	3.47%	3.48%	3.45%	3.46%	3.46%	3.46%	3.48%
Stoneham	0.99%	0.95%	0.96%	0.96%	0.96%	0.97%	0.98%	0.98%	0.98%	0.99%
Stoughton	1.24%	1.23%	1.24%	1.24%	1.24%	1.25%	1.23%	1.23%	1.23%	1.24%
Wakefield	1.14%	1.16%	1.15%	1.15%	1.15%	1.15%	1.14%	1.14%	1.14%	1.14%
Walpole	1.07%	1.09%	1.09%	1.09%	1.10%	1.10%	1.10%	1.10%	1.06%	1.07%
Waltham	2.77%	2.72%	2.75%	2.75%	2.75%	2.77%	2.77%	2.77%	2.74%	2.77%
Watertown	1.49%	1.47%	1.46%	1.46%	1.46%	1.47%	1.46%	1.46%	1.50%	1.49%
Wellesley	1.25%	1.26%	1.27%	1.29%	1.29%	1.29%	1.27%	1.28%	1.24%	1.25%
Westwood	0.65%	0.66%	0.66%	0.66%	0.66%	0.66%	0.67%	0.67%	0.65%	0.65%
Weymouth	2.45%	2.42%	2.45%	2.44%	2.45%	2.46%	2.45%	2.46%	2.44%	2.45%
Wilmington	1.00%	1.02%	1.02%	1.02%	1.02%	1.03%	1.02%	1.02%	1.01%	1.00%
Winchester	0.97%	0.99%	0.98%	0.98%	0.98%	0.98%	0.98%	0.98%	0.97%	0.97%
Winthrop	0.83%	0.79%	0.79%	0.80%	0.80%	0.80%	0.80%	0.80%	0.87%	0.83%
Woburn	1.70%	1.70%	1.72%	1.73%	1.73%	1.74%	1.74%	1.74%	1.77%	1.70%
<b>SYSTEM</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

**MASSACHUSETTS WATER RESOURCES AUTHORITY**  
**Full-time Equivalent Employees by Function**  
**Last Ten Fiscal Years**

Division	2018		2017		2016		2015	
	FTE	Vacancy Rate	FTE	Vacancy Rate	FTE	Vacancy Rate	FTE	Vacancy Rate
Executive	4.0	20.00%	5.0	0.00%	5.0	0.00%	5.0	0.00%
Internal Audit	6.7	12.50%	6.7	12.50%	6.7	12.50%	6.7	12.50%
Public Affairs	10.9	15.38%	11.9	7.69%	12.9	7.14%	12.9	7.69%
Affirmative Action	6.0	0.00%	4.0	33.33%	6.0	0.00%	5.0	33.33%
Emergency Preparedness	8.0	0.00%	8.0	0.00%	5.8	0.00%	4.8	0.00%
Tunnel Redundancy	1.0	0.00%	-		-		-	
Finance	33.5	19.05%	35.5	14.29%	37.5	11.63%	38.3	9.30%
Operations	923.3	8.70%	930.0	7.35%	922.7	6.93%	925.1	7.35%
Law	13.5	26.32%	13.5	26.32%	15.5	15.79%	14.5	26.32%
Administration	135.5	13.46%	135.4	12.26%	138.0	10.32%	138.0	9.74%

<b>2014</b>		<b>2013</b>		<b>2012</b>		<b>2011</b>		<b>2010</b>		<b>2009</b>	
FTE	Vacancy Rate	FTE	Vacancy Rate	FTE	Vacancy Rate	FTE	Vacancy Rate	FTE	Vacancy Rate	FTE	Vacancy Rate
5.0	0.00%	5.0	0.00%	5.0	0.00%	4.0	0.00%	4.0	0.00%	4.0	0.00%
7.5	0.00%	7.5	0.00%	7.5	0.00%	7.5	0.00%	7.2	0.00%	7.2	0.00%
11.9	7.69%	12.9	0.00%	12.9	0.00%	13.9	0.00%	14.9	0.00%	13.9	0.00%
6.0	14.29%	7.0	0.00%	6.8	12.50%	7.0	12.50%	8.0	0.00%	8.0	0.00%
5.8	0.00%	4.8	0.00%	3.8	0.00%	4.8	0.00%	3.8	0.00%	3.8	0.00%
-	-	-	-	-	-	-	-	-	-	-	-
39.3	4.65%	39.3	6.98%	41.3	4.55%	42.3	2.27%	43.2	2.22%	42.3	2.27%
917.2	7.55%	935.1	4.96%	939.8	4.77%	949.4	3.35%	955.0	4.68%	956.1	3.59%
14.9	15.79%	15.1	15.79%	16.1	10.53%	17.1	5.26%	17.1	10.00%	18.1	5.00%
136.6	9.03%	139.6	8.97%	144.8	5.77%	147.4	3.85%	147.1	7.41%	160.0	3.03%

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Capital Asset Statistics by Function



### 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%





# Massachusetts Water Resources Authority

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