Massachusetts Water Resources Authority Employees' Retirement System

Comprehensive Annual Financial Report
For the Year Ended December 31, 2017

Massachusetts Water Resources Authority Employees' Retirement System

Comprehensive Annual Financial Report
For the Year Ended December 31, 2017

Prepared by the Staff and Board of the
Massachusetts Water Resources Authority Employees' Retirement System

Table of Contents

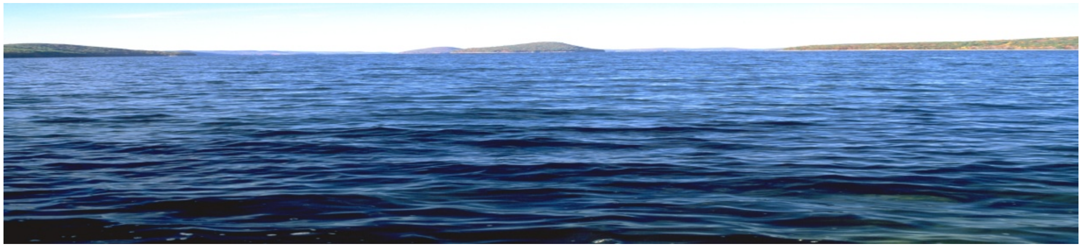
Introductory Section

Financial Section

Investment Section

Actuarial Section

Statistical Section



Introductory Section

MWRA

EMPLOYEES' RETIREMENT SYSTEM

July 17, 2018

Dear Members of the MWRA Employees' Retirement System and interested readers:

On behalf of the MWRA Employees' Retirement System Board (MWRAERSB), I am pleased to present the Comprehensive Annual Financial Report (CAFR) of the MWRA Employees' Retirement System (MWRAERS) for the year ended December 31, 2017. The report is designed to provide a detailed look at the financial, investment and actuarial aspects of the MWRAERS.

A comprehensive report is being issued in the interest of full disclosure to the MWRAERS's members and to demonstrate the diligent stewardship and internal controls that are in place to protect assets and maintain financial integrity. The MWRAERS received the Government Finance Officers Association Certificate of Achievement for Excellence in Financial Reporting for 2013, 2014, 2015 and 2016, a very prestigious award that only a few public retirement systems in New England have received. We are confident that we will be awarded another Certificate for 2017.

By statute the Board meets at least once a month to discuss and review benefit and investment issues and to conduct due diligence assessments of the System's investments. It is the fiduciary responsibility of the Board to insure that current and future retirement benefits will be paid. Therefore, safeguarding the MWRAERS's investment portfolio is a top priority. The MWRAERSB has developed an investment policy that incorporates an asset allocation with a long-term time horizon, and participant demographics. The policy also reflects the impact of the MWRAERS's having the highest funded ratio among public pension Systems in the Commonwealth. Our higher than average funded ratio allows the MWRAERS's portfolio to incorporate less risk than those of Systems with lower funded ratios, which often rely on assuming additional risk as a means to maximize returns, in order to reduce funding deficits. Our portfolio is designed to combine asset classes that involve some investment risk with those intended to yield more stable and predictable returns, and to sufficiently diversify the assets to mitigate risks during the inevitable times when certain asset classes experience more volatile returns.

Investment performance was vigorous in 2017, and we were able to end the year with a positive return of 15.02%, with International and Emerging Markets Equity leading the way, and some Hedge Fund Investments yielding disappointing returns.

The recently released January 1, 2018 Actuarial Study of the MWRA Employees' Retirement System showed an unfunded actuarial liability of $27.7 million. The increase in the unfunded liability when compared to the 1/1/17 valuation is due in large part to the Board's adoption of updated generational mortality assumptions for both disabled and non-disabled participants. These new assumptions take into account future expected mortality improvements. Adoption of the new tables follows the reduction in the investment return assumption from 7.75% to 7.50% made by the Board effective 1/1/17 to more accurately approximate actual long-term expectations, and was adopted methodically, in conjunction with modifications to the Board's Investment Objectives and asset allocation, as a means to minimize risk. The Board will be considering a further reduction in the assumed rate of return when the 1/1/19 actuarial valuation is performed. The MWRA Retirement Board recently adopted a new funding schedule to cover the Employer Normal Cost and Amortization of the Unfunded Actuarial Accrued Liability, and will be working with the plan sponsor in the coming months to develop an optimal funding approach moving forward, given the high funded ratio and relatively short time horizon.

I would like to thank the other Board members for their work ethic and dedication to their service on the Board, as well as the Board's investment consultant, actuary and independent auditors for their valuable assistance with both the preparation of this report, and with other matters. I would also like to thank the Board's legal representatives for their counsel, and the Public Employee Retirement Administration Commission for their oversight of our actions.

Finally, I would like to commend the staff of MWRAERS for their diligent work in preparing this report and their commitment to continually improving administrative operations. I encourage members to carefully review this report as it contains a wealth of information about your retirement system.

Sincerely,

James M. Fleming, Esq.
Chairman

MWRA

EMPLOYEES' RETIREMENT SYSTEM

July 17, 2018

MWRA Employees' Retirement Board
2 Griffin Way
Chelsea, MA 02150

Dear Mr. Chairman and Members of the Board:

I am pleased to submit the Comprehensive Annual Financial Report (CAFR) of the MWRA Employees' Retirement System (MWRAERS) for the year ended December 31, 2017. The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to the MWRAERS for the years ended December 31, 2013 through December 31, 2016. This award is granted when an organization has submitted a CAFR that satisfies the stringent accounting standards and legal requirements set forth by the GFOA.

GASB Statement No. 34 requires that management provide a narrative introduction, overview and analysis to accompany the basic financial statements in the form of Management's Discussion and Analysis (MD&A). This letter of transmittal is designed to complement the MD&A and should be read in conjunction with it. The MWRAERS's MD&A can be found immediately following the report of the independent auditor.

Management assumes full responsibility for the completeness and reliability of the information contained in this report, based upon a comprehensive framework of internal control that it has established for this purpose. Because the cost of internal control should not exceed anticipated benefits, the objective is to provide reasonable, rather than absolute, assurance that the financial statements are free of any material misstatements.

History of the MWRAERS

The MWRAERS was established as part of the Enabling Act in 1984 and became operative on July 1, 1985. The MWRAERS is a contributory defined benefit plan that covers eligible employees of the Massachusetts Water Resources Authority (MWRA). The MWRAERS is administered by a five member Board consisting of the MWRA's Board of Director's Secretary (Ex-Officio Member), the MWRA's Director of Finance (MWRA Appointed Member), two representatives elected from the membership, and a fifth member chosen by the other four who cannot be an employee, retiree or official of the MWRA. One Board member is elected from the group to serve as Chairman.

Investment Results

The MWRAERS has an Investment Policy Statement which establishes investment objectives and policies providing the framework for investments. This Policy is reviewed on an annual basis. A summary of the Investment Policy is included in the Investment Section. The System uses an investment consultant as well as a custodian bank, both selected through an open and competitive process, to ensure proper implementation of MWRA Employees' Retirement Board's (MWRAERB's) Investment Policy, and to safeguard the assets through accurate settlement and recording of transactions.

An integral part of the overall investment policy is the asset allocation policy. MWRAERS' asset allocation is designed to provide an optimal mix of asset classes to provide adequate funds to pay current and future pension benefits. Assets are allocated over various classes such as domestic stocks, domestic bonds, international stocks, real estate, private equity, hedge funds and global assets, in a manner specifically tailored for the MWRAERS by the Board in conjunction with the recommendations of the Investment Consultant. The asset allocation of the MWRAERS is strengthening its focus on preservation of assets, given the System's high funded ratio. Investment market results have demonstrated consistently the importance of a well-diversified asset allocation.

MWRAERS' dollar-weighted investment return of 15.02% for 2017 exceeded both the actuarial expected rate of return of 7.5% and the Investment policy benchmark. Please refer to the Investment Section of this CAFR for more information on investment results.

Major Initiatives

Chapter 68 of the Acts of 2007, An Act to Reduce the Stress on Local Property Taxes Through Enhanced Pension Fund Investment, was signed into law July 25, 2007. This Act amends MGL chapter 32 section 22 and directs the Public Employee Retirement Administration Commission (PERAC) to conduct an annual analysis of all Massachusetts public pension plans. The assessment includes the investment performance and funded ratio of each system every January 1st in accordance with the established methodology and standard. Systems failing to meet the standard are mandated to transfer the systems assets to the Massachusetts Pension Reserve Investment Management (PRIM) Board. The MWRAERS met these mandated standards for each year since 2007 and are not subject to the mandatory transfer of system assets and as of January 1, 2018 has a 96.18% funded ratio on a market value basis.

Benefits

The base upon which the 3% cost of living adjustment (COLA) for retirees is calculated was increased from $12,000 to $13,000, increasing the maximum COLA from $360 to $390 per year. This increased COLA was granted to eligible retirees and survivors effective July 1, 2016. The MWRAERS has granted the maximum 3% COLA allowed by law since enactment of the legislation in 1997.

The MWRA Employees' Retirement Board approved increases to benefits for survivors of deceased active employees under MGL chapter 32 section 12 as well as for survivors of accidental disability retirees receiving benefits in accordance with chapter 32 section 101. For survivors of active employees, the minimum benefit increased from $250 to $500 monthly, while for survivors of accidental disability retirees with effective retirement dates prior to November 1, 1996, the minimum allowance went from $500 to $750.

Signed into law on November 18, 2011, Chapter 176 of the Acts of 2011 became effective February 16, 2012 and is thought to reform and modernize the pension laws for Public employees in Massachusetts. The law creates a new benefit structure for employees hired on or after April 2, 2012. The new age factors established will increase the minimum age for retirement. Calculation of the pension will use a 5 year average and contains anti-spiking provisions for both new members and current employees.

Administration

In April 2017, Kevin McKenna was re-elected to the second elected Board Member's position and will serve a three-year term ending in 2020. Mr. Andrew Pappastergion, the Secretary for the Board of Directors of the MWRA, was appointed as the Ex-Officio Member of the Board effective January 17, 2017. Chairman Fleming was re-elected by declaration after having run unopposed for a three-year term to begin June 30, 2018.

Chapter 176 of the Acts of 2011 has a number of corporate governance provisions that require the MWRAERS adhere to specific procurement procedures for investment management and related services. The Act also mandates training and financial disclosures of all Board members, and all MWRA Retirement Board Members are in full compliance with these requirements.

The MWRAERS strives to provide quality service and information to active and retired members and their beneficiaries, and to the public. To assist in this effort, we maintain and continually update our Internet site, at www.mwraretirement.com and the web portal for employees and retirees has proven to be a useful tool. Our site was recently updated to reflect new standards and requirements for public records disclosures, in order to facilitate access to public information. Easy access to all of the System's financial data has expanded on the site, and now includes our annual audited CAFR, summary annual reports published by PERAC, investment performance, etc.

Internal and Budgetary Controls

The MWRAERS management is responsible for maintaining a system of internal controls designed to provide reasonable, but not absolute, assurance that the financial statements are fairly stated in accordance with accounting principles generally accepted in the United States of America while adequately safeguarding the assets. We believe the current internal controls accomplish this goal. The concept of reasonable assurance recognizes that the cost of internal controls should not exceed their anticipated benefits.

The MWRAERS budget is presented to and approved by the Board each year. All the expenditures are reviewed by the Board at its monthly meeting and compared to the budget on a year-to-date basis.

Accounting

This report has been prepared in accordance with accounting principles generally accepted in the United States of America. The basic financial statements are presented in accordance with the principles promulgated by the Government Accounting Standards Board (GASB).

CliftonLarsonAllen LLP (CLA), a firm of licensed certified public accountants, performed the audit for the MWRAERS. The goal of the independent audit is to provide reasonable assurance that the financial statements for the year ended December 31, 2017 are free of material misstatements. The report of the independent auditors is included in the Financial Section of this report. CLA has issued an unmodified opinion on the MWRAERS's basic financial statements for the year ended December 31, 2017.

Actuarial Funding

The MWRAERS has retained the services of The Segal Company, an independent actuarial firm, to conduct biennial actuarial valuation of the MWRAERS as of January 1, 2018. The funded ratio is one measure of the financial condition of the MWRAERS. The funded ratio is calculated by dividing the net assets of the MWRAERS by the projected pension liability. The projected pension liability is a measure of the present value of total pension benefits estimated to be payable in the future to both current and future retirees and/or beneficiaries. A higher funding ratio gives the members a greater degree of assurance that their pension benefits are secure. As of January 1, 2018, the funded ratio of the MWRAERS was calculated at 94.97% using the actuarial value of assets. On a market value basis the funded ratio was 96.18%. The funded ratio was achieved in the January 1, 2018 valuation using the MWRAERB's reduced assumed rate of return on investments of 7.50%, a strategic move made effective January 1, 2017 by the Board to ensure that long-term expectations are realistic, which in turn reduces the risk of future actuarial losses.

Acknowledgements

I am pleased to have completed this report in accordance with the GFOA Certificate of Achievement guidelines and proud to provide an annual report to our members that is both easy to read and comprehensive. This publication was prepared with the combined efforts of the auditors, actuaries and investment consultant and I would like to acknowledge and thank them for their hard work and tireless collaboration.

Respectfully submitted,

Carolyn Russo

Carolyn Russo
Executive Director

Retirement Board Members

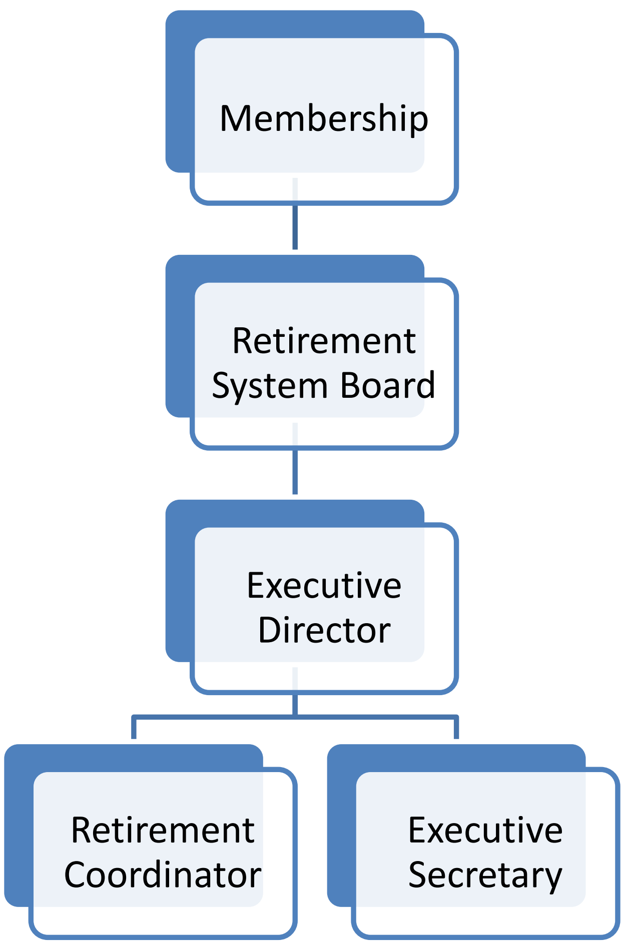
		Term Expiration
Andrew Pappastergion	Ex-Officio Member	no expiration
Thomas J. Durkin	Appointed Member	6/30/2021
James M. Fleming	Elected Member	6/30/2021
Kevin McKenna	Elected Member	4/29/2020
Frank Zecha	Member Appointed by Other Members	1/24/2019

Retirement Board Staff

Carolyn M. Russo	Executive Director
Julie McManus	Retirement Coordinator
Janet DiGregorio	Executive Secretary

Organizational Chart

This Chart does not include Investment professionals who provide services to MWRAERS.
A list of these investment professionals is located on the following page.
Asset allocation, return, and fee information may be found under the Investment Section beginning on page 39.



Consultants, Fund Managers and Professionals

Fund Managers

Alcentra
- Private Equity - Alcentra European DLF

Ascent Venture Partners, Boston, Massachusetts
- Private Equity - Ascent Fund II
- Private Equity - Ascent Fund IV
- Private Equity - Ascent Fund IV-B
- Private Equity - Ascent Fund V
- Private Equity - Ascent Fund VI

Boston Capital Ventures, Boston, Massachusetts
- Private Equity - Ventures III

Boston Company/BNY Mellon, Boston, Massachusetts
- International Equity

CarVal New York, NY
- Private Equity-CVI Credit Value Fin A IV

Castile Ventures, Wellesley, Massachusetts
- Private Equity - Castile Ventures III, L.P

Cerberus Capital Management L.P. , New York, New York
- Real Estate- Institutional Real Estate III

Coho Partners, Berwyn, Pennsylvania
- Equities - Large Cap Value

Entrust, New York, New York
- Hedge Fund of Funds

Foundry Group, Boulder, Colorado
- Private Equity - Foundry 2007
- Private Equity - Foundry 2010
- Private Equity - Foundry 2010 Annex

Intercontinental Real Estate Corporation, Boston, Massachusetts
- Real Estate - Investment Fund IV

Invesco, New York, New York
- Fixed Income - Invesco Core Bonds
- Fixed Income - Mortgage Recovery AIV
- Fixed Income - Mortgage Recovery II
- Private Equity - Invesco Fund IV
- Private Equity - Invesco Fund VI

J.F. Lehman, New York, New York
- Private Equity - JFL Equity Investors IV

Kayne Anderson Capital Advisors, Los Angeles, California
- Private Equity - Energy Fund VII

Landmark Partners, Simsbury, Connecticut
- Real Estate - Landmark VI
- Private Equity - Landmark VIII
- Private Equity - Landmark XV

Lee Munder Capital Group, Boston, Massachusetts
- International Equity - LMCG Emerging Markets (SEI)
- International Equity - LMCG Small Cap International

Loomis Sayles, Boston, Massachusetts
- Small Cap - Small Cap Growth
- Fixed Income - Multi Sector Bonds

Mesirow Financial, Chicago, Illinois
- Real Estate - MFIRE Global Real Estate Investment Program II

Morgan Stanley, New York, New York
- Real Estate - Prime Property

Park Square New York, NY
- Private Equity - Credit Opportunities Fund III

PIMCO Investment LLC, New York, New York
- Total Balanced - PIMCO Core Fund

Pinebridge Investments, New York, New York
- Private Equity - PEP Fund V

Permal Capital Management LLC, Boston, Massachusetts
- Hedge Fund of Funds - Fixed Income Holdings

Fund Managers (Continued)

Public Retirement Investment Trust (PRIT), Boston, Massachusetts
- PRIT General Allocation Account
- PRIT Core Real Estate
- PRIT Hedge Fund
- Private Equity - Vintage Year 2008
- Private Equity - Vintage Year 2009
- Private Equity - Vintage Year 2010
- Private Equity - Vintage Year 2011
- Private Equity - Vintage Year 2012
- Private Equity - Vintage Year 2014
- Private Equity - Vintage Year 2017

Polen Capital, Boca Raton, Florida
- Equities - Large Cap Growth

Private Advisors Richmond, VA
- Private Equity -Small Co. Coinvestment Fund

Rumbline Advisors, Boston, Massachusetts
- Large Cap -S&P 500 Index Fund
- US TIPS

Robeco Boston Partners, Boston, Massachusetts
- Small Cap - Small Cap Value

Schroder Investment Management, New York, New York
- International Equity - Alpha Fund

Select Equity Group
- International Equity - Baxter Street Fund

TA Realty, Boston, Massachusetts
- Real estate - Fund X UTP

TerraCap, Bonita Springs, Florida
- Real Estate - Terracap Partners III
- Real Estate - Terracap Partners IV

Wellington Management Company, LLP, Boston, Massachusetts
- Balanced Investment - Opportunistic Investment

William Blair & Company, Chicago, Illinois
- Balanced Investment - Institutional Macro

Custodian

People's United Bank/Bank New York Mellon, New York

Legal Advisors

The Law Offices of Thomas F. Gibson, Cambridge, Massachusetts

Actuary

The Segal Group, Boston, Massachusetts

Investment Consultant

NEPC, LLC, Boston, Massachusetts

Independent Auditors

CliftonLarsonAllen LLP, Lexington, Massachusetts

Commission Recapture Brokers

Abel Noser, New York, NY
ConvergEx Group, New York, NY

Securities Fraud Monitoring

Berman DeValerio, Boston, MA
Labaton Sucharow, New York, NY
Robbins Geller, Philadelphia, PA

Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

Massachusetts Water Resources Authority

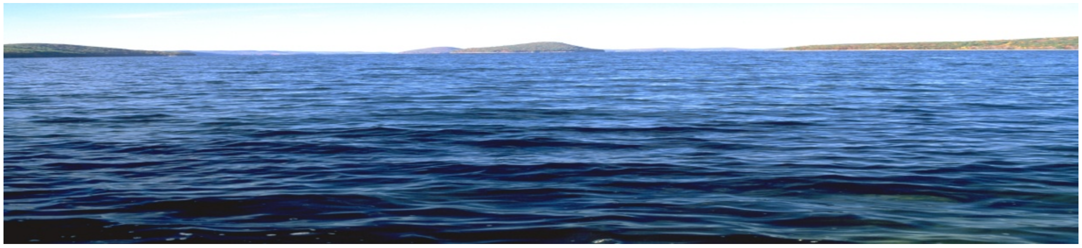
Employees' Retirement System

For its Comprehensive Annual Financial Report for the Fiscal Year Ended

December 31, 2016

Christopher P. Morrill

Executive Director/CEO



Financial Section

Independent Auditors' Report

To the Honorable Retirement Board
Massachusetts Water Resources Authority Employees' Retirement System

Report on the Financial Statements

We have audited the accompanying financial statements of the Massachusetts Water Resources Authority Employees' Retirement System (the System), as of and for the year ended December 31, 2017, and the related notes to the financial statements, as listed in the table of contents.

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.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit 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 System as of December 31, 2017, and the change in financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

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 18), schedule of changes in employer net pension liability and related ratios, schedule of employer contributions and schedule of investment returns (located on pages 33 and 34) 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.

Other Information

Our audit was conducted for the purpose of forming an opinion on the System's financial statements. The supplementary information, introductory section, investment section, actuarial section and statistical section are presented for purposes of additional analysis and are not a required part of the financial statements.

The supplementary information is the responsibility of management and was derived from and relates 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 supplementary information is fairly stated, in all material respects, in relation to the basic financial statements as a whole.

The introductory section, investment section, actuarial section and statistical section have not been subjected to the auditing procedures applied in the audit of the financial statements, and accordingly, we do not express an opinion or provide any assurance on them.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated July 17, 2018 on our consideration of the System'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 System'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 System's internal control over financial reporting and compliance.

CliftonLarsonAllen LLP

CliftonLarsonAllen LLP

Boston, Massachusetts
July 17, 2018

As management of the Massachusetts Water Resources Authority Employees' Retirement System (System), we offer readers of these financial statements this narrative overview and analysis of the System's financial activities for the year ended December 31, 2017.

Financial Highlights

The System's funding objective is to meet long-term benefit obligations through contributions and investment income. As of January 1, 2018, the latest actuarial valuation, the funded ratio was 94.97% based on the actuarial value of assets at that date. As of December 31, 2017, the plan fiduciary net position was 96.18% of the total pension liability.

The System's net position increased by $64,216,612, or 13.8%, when compared to the prior year's net position. Net position is the residual of the System's assets in excess of the System's liabilities as of the statement date. The System's assets are held in trust to meet future benefit payments.

Total investment income (net) was $70,516,672. The money-weighted investment return of 15.02% was greater than the actuarial expected rate of return and the Investment policy benchmark.

Overview of the Financial Statements

The financial statements are comprised of a Statement of Fiduciary Net Position, Statement of Changes in Fiduciary Net Position, Notes to the Financial Statements and Required Supplementary Information.

The **statement of fiduciary net position** presents information on the System's assets and liabilities and the resulting net position held in trust for pension benefits. This is calculated using the following formula: Assets – Liabilities = Net Position restricted for pensions. This statement reflects the System's investments at fair value, as well as cash, receivables and liabilities. The Statement of Fiduciary Net Position reports the financial position of the System at December 31, 2017. Over time, the increase or decrease in net position serves as a useful indicator of the System's financial health.

The **statement of changes in fiduciary net position** presents information showing how the System's net position changed during the year ended December 31, 2017. It reflects contributions by its individual members and participating employer along with deductions for retirement benefits, refunds, withdrawals, and administrative expenses. Investment income during the period is also presented showing income from investing activities.

The **notes to the financial statements** provide additional information that is essential for the reader to gain a full understanding of the data provided in the financial statements.

The **required supplementary information** includes a schedule of changes in employer net pension liability and related ratios, a schedule of employer contributions and a schedule of investment returns.

Financial Analysis

The System's total assets as of December 31, 2017 were $530,243,293 and were comprised of cash and cash equivalents, investments, and receivables. Total assets increased approximately $64,146,000, or 13.8%, from the prior year.

Total liabilities as of December 31, 2017 were $424,508 and represent accounts payable, accrued expenses, amounts due to the MWRA and a payable for securities purchased. Total liabilities decreased approximately $71,000, or 14.3%, from the prior year.

The following tables present current and prior year data on the System's financial statements.

Fiduciary Net Position

Net position was $529,818,785 at the close of the year and is summarized as follows:

Statement of Fiduciary Net Position

	2017	2016
Assets		
Cash and cash equivalents	$ 8,015,906	$ 5,489,484
Investments	517,352,197	459,028,407
Receivables	4,875,190	1,579,609
Total assets	530,243,293	466,097,500
Liabilities		
Accounts payable and accrued expenses	108,882	158,908
Due to MWRA	72,668	69,407
Payable for securities purchased	242,958	267,012
Total liabilities	424,508	495,327
Fiduciary Net Position		
Restricted for pensions	$ 529,818,785	$ 465,602,173

Changes in Fiduciary Net Position

The System's net position increased by $64,216,612 during the year and is summarized as follows:

Statement of Changes in Fiduciary Net Position

	2017	2016
Additions		
Contributions:		
Employer	$ 3,277,369	$ 4,632,624
Plan members	9,091,378	8,757,540
Net investment income:		
Net realized and unrealized gains	67,302,262	18,153,511
Interest and dividends	7,350,366	8,184,742
Less investment fees	(4,135,956)	(2,155,375)
Reimbursements and transfers from other systems	1,730,392	1,401,400
Other	17,000	21,000
Total additions	84,632,811	38,995,442
Deductions		
Benefit payments to plan members and beneficiaries	19,424,026	17,322,150
Reimbursements and transfers to other systems	545,708	229,502
Administrative expenses	446,465	426,054
Total deductions	20,416,199	17,977,706
Change in fiduciary net position	64,216,612	21,017,736
Fiduciary net position - beginning of year	465,602,173	444,584,437
Fiduciary net position - end of year	$ 529,818,785	$ 465,602,173

Additions to Fiduciary Net Position

The amount needed to finance benefits is accumulated through the collection of employer and plan member contributions, earnings on investments and reimbursements and transfers from other systems. These additions resulted in an increase to net position totaling $84,632,811 during the current year versus an increase of $38,995,442 in the previous year. The 2017 and 2016 employer contributions represent 100.0% and 147.9%, respectively, of the annual required contribution. The System had a net investment gain of $70,516,672 in 2017 versus a gain of $24,182,878 in 2016 due to favorable market conditions.

Deductions from Fiduciary Net Position

The primary deductions of the System include the payment of pension benefits to participants and beneficiaries, refunds of contributions, and the costs of administering the System. Deductions to net position totaled \$20,416,199 during the current year versus \$17,977,706 in the previous year. The payment of pension benefits increased by \$2,101,876 or, 12.1%, over the previous year. The increase in these expenses resulted from an increase in benefit payments to newer retirees with higher average compensation and an increase of 61 retirees.

Overall Financial Position

The System experienced a large increase in net position for the year ending December 31, 2017, due to investment performance. Management believes the System is in a solid financial position and will be able to meet its obligations in the future.

Requests for Information

This financial report is designed to provide the Board, our membership, taxpayers, investors, and creditors with a general overview of the System's financial results and to demonstrate the System's accountability for the funding it receives. If you have any questions about this report or need additional financial information, contact the Executive Director at 2 Griffin Way, Chelsea, Massachusetts 02150.

This page left intentionally blank.

MASSACHUSETTS WATER RESOURCES AUTHORITY EMPLOYEES' RETIREMENT SYSTEM
STATEMENT OF FIDUCIARY NET POSITION
DECEMBER 31, 2017

Assets		
Cash and cash equivalents	$	8,015,906
Investments:		
Fixed income		186,327,733
Equities		228,871,590
Real estate		22,601,956
Private equity		33,468,184
Hedge funds		5,719,183
PRIT (external investment pool)		40,363,551
Total investments		517,352,197
Receivables:		
For investments sold		4,865,196
Other		9,994
Total receivables		4,875,190
Total plan assets		530,243,293
Liabilities		
Accounts payable and accrued expenses		108,882
Due to MWRA		72,668
Payable for securities purchased		242,958
Total plan liabilities		424,508
Net position restricted for pensions	$	529,818,785

The accompanying notes are an integral part of the financial statements.

MASSACHUSETTS WATER RESOURCES AUTHORITY EMPLOYEES' RETIREMENT SYSTEM
STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
FOR THE YEAR ENDED DECEMBER 31, 2017

Additions:		
Contributions:		
Employer	$	3,277,369
Plan members		9,091,378
Total contributions		12,368,747
Investment income:		
Interest and dividends		7,350,366
Net realized and unrealized gains		67,302,262
Less: investment fees		(4,135,956)
Net investment income		70,516,672
Reimbursements and transfers from other systems		1,730,392
Other		17,000
Total additions		84,632,811
Deductions:		
Benefits and refunds paid to plan members and beneficiaries		19,424,026
Reimbursements and transfers to other systems		545,708
Administrative expenses		446,465
Total deductions		20,416,199
Change in fiduciary net position		64,216,612
Net position restricted for pensions:		
Beginning of year		465,602,173
End of year	$	529,818,785

The accompanying notes are an integral part of the financial statements.

NOTE 1 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

A. Reporting Entity

The Massachusetts Water Resources Authority Employees' Retirement System (System) was established to provide pension benefits to Massachusetts Water Resources Authority (Authority) employees and their beneficiaries. The System is governed by a five-member board comprised of the Secretary of the Authority's Board (ex-officio), two members elected by the System's participants, one member appointed by the Authority's Board and one member appointed by the System's Board members.

B. Basis of Accounting

The accompanying financial statements are presented on the accrual basis of accounting as prescribed by the Governmental Accounting Standards Board (GASB).

C. Cash, Cash Equivalents and Investments

Cash and cash equivalents is considered to be cash on hand, demand deposits and short-term investments with an original maturity of three months or less from the date of acquisition.

Investments are reported at fair value. Fair values of investments are based on quotations from a national securities exchange, except for the Systems' investment in the Pension Reserves Investment Trust (PRIT), hedge funds, private equity and real estate investments, for which fair values are estimated as detailed below.

<u>PRIT, Hedge Funds, Private Equity and Real Estate Investments</u>
The fair values of these types of investments have been determined by third party investment managers using Net Asset Value (NAV) per share (or its equivalent) on the System's ownership interest in the pool or partner's capital.

D. Basis of Investment Transactions

Purchases and sales of investments are recorded on the trade date. Transactions remaining unsettled as of year-end are recorded as payables for securities purchased and as a receivable for securities sold.

E. Revenue Recognition

Contributions are recognized as additions in the period when they become due pursuant to formal commitments, statutory or contractual requirements. Investment income is recognized when earned.

F. Benefits and Refunds

Benefits and refunds to System members and beneficiaries are recognized as deductions when due and payable in accordance with the terms of the System.

G. Administrative Expenses

Administrative expenses are financed by investment income.

H. Due to MWRA

MWRA pays the System's employees' weekly payroll. At December 31, 2017, $72,668 is owed to MWRA from the System for these costs.

I. Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of additions and deductions during the reporting period. Fair values of real estate funds and alternative investments have been estimated in the absence of readily available market values, and these estimates may be materially different than values that would have been used had a ready market existed.

NOTE 2 – PLAN DESCRIPTION

A. General

The System is a single employer public employee retirement system established by the Authority on July 1, 1985, under Massachusetts General Laws (MGL), Chapter 32, and is regulated by the Massachusetts Public Employee Retirement Administration Commission (PERAC). The System is a defined benefit pension plan that covers employees of the Authority.

Membership in the System is mandatory immediately upon the commencement of employment for all permanent full-time employees working at least 18.75 hours weekly.

Membership in the System was as follows at December 31, 2017:

Active members……………………………………………………	1,100
Inactive members………………………………………………	106
Retirees and beneficiaries currently receiving benefits…..	582
Total…………………………………………………………………	1,788

B. Significant Plan Provisions and Requirements

Benefit provisions and state law establishes contribution requirements of the System. Members of the System become vested after 10 years of creditable service. Normal retirement occurs at age 65.

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.

Under MGL, Chapter 32 Section 3(8)(c), members leaving the Authority's employment to work for other Massachusetts governmental units requires the System transfers their accumulated account balances and creditable service to the retirement system of their new employer. Other such retirement systems are in turn required to make comparable transfers to the System for employees coming to work at the Authority. Per statute, the PERAC actuary shall consider length of service as well as acceptance of military service credit and salary cap provisions if applicable in calculating the liability.

NOTE 3 – DEPOSITS AND INVESTMENTS

Investment Policy

Deposits and investments made by the System are governed by Chapter 32 of the MGL. The System has the ability to invest in equity securities, corporate bonds, annuities and other specified investments in accordance with state laws and regulations.

The Board has the authority for establishing and amending investment policy decisions. Based on the investment objectives and constraints of the System, and based on an annual review of the asset allocation and asset classes, the Board will specify a long-term target allocation for each class of permissible assets. These targets will be expressed as a percentage of the total portfolio, and will have ranges surrounding them, allowing for the portfolio to maintain policy through market fluctuations.

The long-term target allocations are intended as strategic goals. Thus, it is permissible for the overall System's asset allocation to deviate from the long-term target, as would likely occur during manager transitions, asset class restructurings, and other temporary changes in the System. Surplus cash flows are utilized to maintain the asset management structure. Should these cash flows not be sufficient to reallocate the plan according to policy, the transfer of assets may occur between managers. At least annually, the Board reevaluates the portfolio weightings by asset class and adjustments are made accordingly. The following identifies the asset allocation policy as of December 31, 2017:

Asset Class	Target	Range
Domestic Stocks	21%	10-30%
International Stocks	19%	10-25%
Domestic Bonds	22%	15-40%
Real Estate	8%	0-10%
Private Equity	10%	0-12%
Hedge Funds/Absolute Return	5%	0-12%
Global Asset Allocation	15%	5-25%
Cash	0%	0-10%

Rate of Return

For the year ended December 31, 2017, the annual money-weighted rate of return on investments, net of investment expense, was 15.02%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Deposits - Custodial Credit Risk

Custodial credit risk for deposits is the risk that, in the event of a bank failure, the System's deposits may not be recovered. The System's policy for custodial credit risk of deposits is to rely on FDIC insurance. As of December 31, 2017, the System was not exposed to custodial credit risk. The carrying value of the System's deposits totaled $10,000 at December 31, 2017.

Investments Summary

The System's investments at December 31, 2017 are presented below. All investments are presented by investment type, with debt securities presented by maturity (using segmented time distribution).

		Investment Maturities (in Years)			
Investment Type	Total Amount	Less Than 1	1 - 5	6 - 10	More Than 10
Debt Securities:					
Money market mutual funds	$ 8,005,906	$ 8,005,906	$ -	$ -	$ -
Fixed income securities	186,327,733	159,316,678	9,510,237	11,530,155	5,970,663
Total debt securities	194,333,639	$ 167,322,584	$ 9,510,237	$ 11,530,155	$ 5,970,663
Other Investments:					
Equity securities	228,871,590				
External investment pools	40,363,551				
Hedge funds	5,719,183				
Real estate	22,601,956				
Private equity	33,468,184				
Total other investments	331,024,464				
Total investments (including cash and cash equivalents)	$ 525,358,103				

Investments - Interest Rate Risk of Debt Securities

Interest rate risk for debt securities is the risk that changes in interest rates of debt securities will adversely affect the fair value of an investment. The System's policy for interest rate risk is the duration of the portfolio should be consistent with the appropriate indices. Unless otherwise agreed to, the duration of the portfolio must be within 25% of the appropriate benchmark.

Investments - Custodial Credit Risk

Custodial credit risk for investments is the risk that, in the event of the failure of the counterparty, the System will not be able to recover the value of its investments or collateral securities that are in the possession of an outside party. The System's policy for custodial credit risk of investments intends that all investments are either insured and/or registered in the name of the System. As of December 31, 2017, the System was not exposed to custodial credit risk.

Investments - Credit Risk of Debt Securities

Credit risk for debt securities is the risk that an issuer or other counterparty to a debt security will not fulfill its obligations. The System's policies for credit risk of debt securities include the minimum quality rating at the time of purchase cannot be below a rating of CCC. Non-rated securities may comprise 10% of the portfolio, provided that the applicable manager determines that, if such an issue was rated, it would be allowed under the above limitation and that the non-rated issue is deemed to be below BAA (investment grade). Compliance with credit ratings provided by Moody's, Standard & Poor's and Fitch is not sufficient for an issue to be deemed an appropriate investment. The managers are responsible for making an independent analysis of the credit-worthiness of securities.

As of December 31, 2017, the credit quality ratings of the System's debt securities are unrated by any nationally recognized statistical rating organization. All fixed income security investments are unrated pooled bond funds.

Deposits and Investments – Foreign Currency Risk

Foreign currency risk is the risk that fluctuations in exchange rates will adversely affect the fair value of an investment or a deposit. The System does not have a policy regarding foreign currency risk. As of December 31, 2017, the System had indirect exposure to foreign currency risk for certain equity investments issued by foreign countries in the amount of $110,582,067.

Investments – Concentration of Credit Risk

Concentration of credit risk is the risk of loss attributed to the magnitude of the System's investment in a single issuer. The System's policy for concentration of credit risk is that not more than 5% of the market value of the System's portfolio can be invested in the debt obligations of any one issuer, with the exception of securities issued by the U.S. Government, or its agencies, which may be held without limitation. As of December 31, 2017, the System was not exposed to concentration of credit risk.

Fair Value Measurements

The System categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset. Level 1 inputs are quoted prices in active markets for identical assets; Level 2 inputs are significant other observable inputs; Level 3 inputs are significant unobservable inputs. The System has the following recurring fair value measurements as of December 31, 2017:

Investments by Fair Value Level	Fair Value	Fair Value Measurements Using: Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Debt Securities:				
Money market mutual funds	$ 8,005,906	$ 8,005,906	$ -	$ -
Fixed income	186,327,733	186,327,733	-	-
Total Debt Securities	194,333,639	194,333,639	-	-
Equity Securities:				
Equity securities	228,871,590	172,264,653	56,606,937	-
Total Investments by Fair Value Level	423,205,229	$ 366,598,292	$ 56,606,937	$ -
Investments measured at the net asset value (NAV)				
Private equities	33,468,184			
Real estate	22,601,956			
Hedge funds	5,719,183			
External investment pool (PRIT)	40,363,551			
Investments measured at the net asset value (NAV)	102,152,874			
Total Investments measured at Fair Value	$ 525,358,103			

Debt and equity securities classified in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Equity 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 valuation method for investments measured at the net asset value (NAV) per share (or its equivalent) is presented on the following table.

Investments Measured at the NAV

	Fair Value	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
Private equities (1)	$ 33,468,184	21,692,483	N/A[(1)]	N/A[(1)]
Real estate (2)	22,601,956	4,486,709	N/A[(2)]	N/A[(2)]
Hedge funds (3)	5,719,183	-	Quarterly	90 days
External investment pool (PRIT) (4)	40,363,551	-	Monthly	24 Hours
Total Investments Measured at the NAV	$ 102,152,874			

(1) Private Equity Funds: This type includes 19 private equity funds that consist primarily of limited partnership interests in corporate finance and venture capital funds. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the System's ownership interest in partners' capital. The investments can never be redeemed with the funds. Distributions from each of these funds will be received as the underlying investments of the funds are liquidated. It is expected that the underlying assets of the funds will be liquidated over the next 1 to 12 years.

(2) Real Estate Funds: This type includes 8 real estate funds that invest primarily in U.S. commercial real estate and value added opportunities. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the System's ownership interest in partners' capital. There is one investment with an approximate value of $8,400,000 for which the investment can be redeemed quarterly, with a redemption notice period of 90 days. The remaining investments can never be redeemed with the funds. Distributions from each of these funds will be received as the underlying investments of the funds are liquidated. It is expected that the underlying assets of the funds will be liquidated over the next 2 to 15 years.

(3) Hedge Funds: This type includes 1 hedge fund that pursue multiple strategies to diversify risks and reduce volatility. The investments can be redeemed quarterly, with a redemption notice period of 90 days.

(4) PRIT: The System is a participant in the PRIT fund. The System owns units, or shares in the PRIT fund, which is a pooled investment trust. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the System's ownership in the pool.

NOTE 4 – FUNDING POLICY

Chapter 32 of the MGL governs the contributions of plan members and the Authority. Depending on their employment date, active System members must contribute anywhere between 5%-9% of their gross regular compensation. Members hired after December 31, 1978 must contribute an additional 2% of regular compensation in excess of $30,000. These deductions earn interest at a rate determined by PERAC that vests based upon years of service. The Authority is required to pay into the System 100% of the actuarially determined contribution. For the year ended December 31, 2017, employer contributions totaled $3,277,369 and plan member contributions totaled $9,091,378.

Cost-of-living adjustments (COLA's) must be granted by the Board and are the responsibility of the System. COLA may be approved in excess of the Consumer Price Index but not to exceed 3% of the base retirement allowance.

NOTE 5 – NET PENSION LIABILITY (ASSET) OF THE SYSTEM

The components of the net pension liability of the System at December 31, 2017, were as follows:

Total pension liability	$	550,843,740
Plan fiduciary net position		(529,818,785)
Net pension (asset)/liability	$	21,024,955
Plan fiduciary net position as a percentage of the total pension liability		96.18%

Actuarial Methods and Assumptions

The total pension liability was determined by an actuarial valuation as of January 1, 2018, using the following actuarial methods and assumptions, which apply to all periods included in the measurement:

Methods:	
Actuarial cost method	Entry Age Normal Cost Method
Asset valuation method	Market Value
Assumptions:	
Inflation	3.0%
Salary increases	Based on years of service, ranging from 5.75% at 0 years of service decreasing to 4.00% after 9 years of service
Investment rate of return	7.50%, net of pension plan investment expense, including inflation
Cost of living adjustment	3% of the first $13,000

Mortality rates were based on the following:

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 1 year projected generationally with MP-2017

The actuarial assumptions used in the January 1, 2018 valuation were based on the results of an actuarial experience study for the period January 1, 2016 through December 31, 2016.

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 pension plan's target asset allocation as of December 31, 2017 are summarized in the following table:

Asset Class	Long-Term Expected Real Rate of Return (%)
Domestic equity…………………………………………………………	6.15
International developed markets equity…………………………	7.11
International emerging markets equity……………………………	9.41
Core fixed income………………………………………………………	1.68
High-yield fixed income……………………………………………………	4.13
Real estate…………………………………………………………………	4.90
Hedge fund, global tactical asset allocation, risk parity………	3.94
Private equity……………………………………………………………	10.28

Discount Rate

The discount rate used to measure the total pension liability was 7.50 percent. 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 contributions will be made at rates equal to the actuarially determined contribution rates. Based on those assumptions, the pension 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.

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

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

	1% Decrease (6.50%)	Current Discount Rate (7.50%)	1% Increase (8.50%)
Net pension liability (asset)………………………………	89,971,334	21,024,955	(37,437,251)

NOTE 6 – LEGALLY REQUIRED RESERVE ACCOUNTS

The balances in the System's legally required reserves as of December 31, 2017 are as follows:

Description	Amount	Purpose
Annuity Savings Fund….	$ 120,388,979	Active members' contribution balance
Annuity Reserve Fund…	34,121,616	Retired members' contribution account
Military Service Fund…..	148,888	Members' contribution account while on military leave
Pension Reserve Fund…	349,356,676	Amounts appropriated to fund future retirement
Pension Fund………………	25,802,626	Remaining net position
Total……………………………	$ 529,818,785	

All reserve accounts are funded at levels required by state law.

MASSACHUSETTS WATER RESOURCES AUTHORITY EMPLOYEES' RETIREMENT SYSTEM
REQUIRED SUPPLEMENTARY INFORMATION
DECEMBER 31, 2017

Schedule of Changes in Employer Net Pension Liability and Related Ratios (1)

	2017	2016	2015	2014
Total pension liability				
Service cost	$ 11,307,822	$ 11,079,991	$ 10,637,880	$ 10,529,508
Interest	38,520,217	36,917,053	34,598,348	33,587,256
Differences between expected and actual experience	(145,554)	(9,143,704)	-	(8,379,618)
Changes of assumptions	7,977,350	13,298,185	-	4,920,735
Changes of benefit terms	-	2,050,275	-	-
Benefit payments, including refunds of member contributions and net reimbursements and transfers to/from other systems	(18,222,342)	(16,129,253)	(15,389,885)	(12,963,429)
Net change in total pension liability	39,437,493	38,072,547	29,846,343	27,694,452
Total pension liability - beginning	511,406,247	473,333,700	443,487,357	415,792,905
Total pension liability - ending (a)	$ 550,843,740	$ 511,406,247	$ 473,333,700	$ 443,487,357
Plan fiduciary net position				
Contributions - employer	$ 3,277,369	$ 4,632,624	$ 8,159,521	$ 12,629,474
Contributions - employer - military service credit	-	-	-	16,000
Contributions - member	9,091,378	8,757,540	8,402,138	8,245,328
Net investment income	70,516,672	24,182,878	(530,090)	20,483,877
Benefit payments, including refunds of member contributions and net reimbursements and transfers to/from other systems	(18,222,342)	(16,129,253)	(15,389,885)	(12,963,429)
Administrative expense	(446,465)	(426,053)	(412,416)	(407,574)
Net change in plan fiduciary net position	64,216,612	21,017,736	229,268	28,003,676
Plan fiduciary net position - beginning	465,602,173	444,584,437	444,355,169	416,351,493
Plan fiduciary net position - ending (b)	$ 529,818,785	$ 465,602,173	$ 444,584,437	$ 444,355,169
Net pension liability (asset) - ending (a) - (b)	$ 21,024,955	$ 45,804,074	$ 28,749,263	$ (867,812)
Plan fiduciary net position as a percentage of the total pension liability	96.18%	91.04%	93.93%	100.20%
Covered payroll	$ 92,975,107	$ 89,755,173	$ 89,168,911	$ 88,646,339
Net pension liability as a percentage of covered payroll	22.61%	51.03%	32.24%	-0.98%

(1) Data is being accumulated annually to present 10 years of the reported information

Schedule of Employer Contributions

	2017	2016	2015	2014	2013
Actuarially determined contribution...................	$ 3,277,369	3,132,624	8,159,521	7,808,155	5,918,931
Contributions in relation to the actuarially determined contribution...................	3,277,369	4,632,624	8,159,521	12,629,474	12,447,338
Contribution deficiency (excess)..........................	$ -	(1,500,000)	-	(4,821,319)	(6,528,407)
Covered payroll..	$ 92,975,107	89,755,173	89,168,911	88,646,339	84,829,033
Contributions as a percentage of covered payroll..	3.52%	5.16%	9.15%	14.25%	14.67%

(continued)

	2012	2011	2010	2009	2008
Actuarially determined contribution..................	$ 5,765,956	5,511,524	5,342,856	5,621,259	5,334,027
Contributions in relation to the actuarially determined contribution.................	10,490,247	7,363,170	5,342,856	5,621,259	8,630,339
Contribution deficiency (excess)..........................	$ (4,724,291)	(1,851,646)	-	-	(3,296,312)
Covered payroll..	$ 84,829,033	82,870,385	82,870,385	81,961,863	82,313,885
Contributions as a percentage of covered payroll..	12.37%	8.89%	6.45%	6.86%	10.48%

(concluded)

Schedule of Investment Returns (1)

	2017	2016	2015	2014
Annual money-weighted rate of return, net of investment expense.......................	15.02%	5.81%	-0.24%	4.40%

(1) Data is being accumulated annually to present 10 years of the reported information

Changes of Assumptions

The pre-retirement mortality assumption was changed from the RP-2000 Employee Mortality Table projected generationally from 2005 with Scale AA to the RP-2000 Employee Mortality Table projected generationally from 2009 with Scale BB2D.

The post-retirement mortality assumption for non-disabled participants was changed from the RP-2000 Annuitant Mortality Table projected generationally from 2005 with Scale AA to the RP-2000 Employee Mortality Table projected generationally from 2009 with Scale BB2D.

The mortality assumption for disabled participants was changed from the RP-2000 Annuitant Mortality Table set forward 2 years projected generationally from 2005 with Scale AA to the RP-2000 Employee Mortality Table projected generationally from 2015 with Scale BB2D.

The reduction in liability to account for anticipated net 3(8)(c) reimbursements was increased from $8.7 million to $9.3 million based on the average net 3(8)(c) payments in 2016 and 2017.

Methods and Assumptions Used in Calculations of Actuarially Determined Contributions

Methods:	
Actuarial cost method	Entry Age Normal Cost Method
Asset valuation method	Market Value
Assumuptions:	
Inflation	4.0%
Salary increases	Based on years of service, ranging from 6.00% at 0 years of service decreasing to 4.25% after 9 years of service
Investment rate of return	7.75%, net of pension plan investment expense, including inflation
Cost of living adjustment	3% of the first $13,000

In addition, mortality rates were based on the following:

Pre-Retirement	RP-2000 Employee Mortality Table projected generationally from 2009 with Scale BB2D
Healthy Retiree	RP-2000 Employee Mortality Table projected generationally from 2009 with Scale BB2D
Disabled Retiree	RP-2000 Employee Mortality Table projected generationally from 2015 with Scale BB2D

MASSACHUSETTS WATER RESOURCES AUTHORITY EMPLOYEES' RETIREMENT SYSTEM
SUPPLEMENTARY INFORMATION
DECEMBER 31, 2017

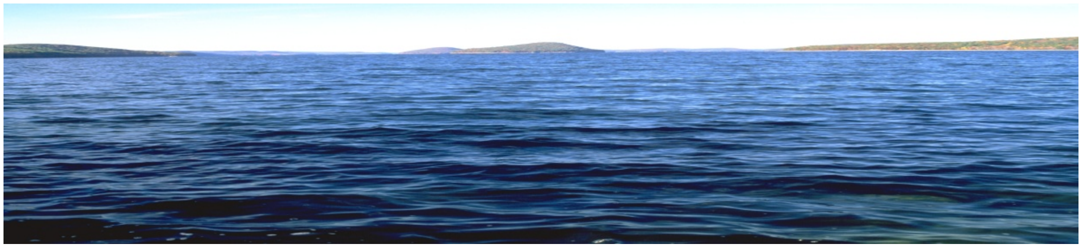
Schedule of Administrative Expenses

The composition of administrative expenses for the year ended December 31, 2017 is as follows:

Personal services	
Salaries	$ 292,395
Professional services	
Legal expenses	26,241
Professional services	612
Medical expenses	1,141
Actuarial Services	23,000
Accounting Services	23,000
Total professional services	73,994
Other Expenses	
Fiduciary insurance	11,790
Service contracts	33,339
Education and training	4,400
Administrative expenses	25,481
Travel	5,066
Total other expenses	80,076
Total Expenses	$ 446,465

Schedule of Investment and Consultants' Expenses

Investment fund managers fees	
Total Balanced	
PIMCO	$ 216,588
PRIM General Allocation Account	17,653
Wellington Opportunistic	117,608
William Blair	165,277
Large Cap Domestic Equity	
Coho	102,062
Polen	148,653
Rhumbline S&P 500	18,659
Small Cap Domestic Equity	
Loomis Sayles	71,898
Robeco	159,625
International Equity	
LMCG Emerging Markets	177,744
LMCG Small Cap International	86,789
SEG Baxter Street	305,167
Hartford Schroders	233,550
Fixed Income	
Entrust	106,093
Invesco Core Bond	139,341
Invesco Mortgage Recovery AIV	5,910
Invesco Mortgage Recovery II	11,036
Loomis Sayles Fixed Income	193,481
PRIT Hedge	177,134
Rhumbline US TIPS	3,014
Real Estate	
Cerberus	16,121
Courtland/Mesirow	13,125
Morgan Stanley Prime Property	83,115
PRIT Real Estate	84,220
TA Realty	16,974
TerraCap III	111,028
TerraCap IV	108,803
Private Equity	
Alcentra	37,707
Ascent IV	14,490
Ascent IV-B	7,260
Ascent V	36,456
Ascent VI	64,675
Castille Ventures III	13,363
Foundry 2007	38,486
Foundry 2010	250,758
Invesco IV	1,748
Invesco VI	20,690
J.F. Lehman	65,961
Kayne Anderson	286,219
Landmark VI	16,252
Landmark VIII	67,446
Landmark XV	25,598
Pinebridge	20,605
PRIT VY 2008	11,978
PRIT VY 2009	3,888
PRIT VY 2010	9,489
PRIT VY 2011	18,608
PRIT VY 2012	10,377
PRIT VY 2014	25,364
PRIT VY 2017	1,626
Private Advisors	7,155
Total investment managers fees	3,946,867
Custodial Fees	
People's United Bank	79,389
Investment consultant fees	
New England Pension Consultants (NEPC)	109,700
Total investment fees	$ 4,135,956



Investment Section

Report on Investment Activity

The information contained in the Investment Section of the Comprehensive Annual Financial Report (CAFR) has been prepared by NEPC, LLC, acting as the investment consultant for the Massachusetts Water Resources Authority (MWRA) Employees' Retirement System (the 'System'). All investment information herein has been reconciled between the MWRA, the investment managers hired by the MWRA, MWRA's custodian, and NEPC. The investment returns presented herein were calculated in a manner consistent with that specified in the Global Investment Performance Standards (GIPS®), as developed by the CFA Institute.

Outline of Investment Policies

The purpose of this document is to set forth the goals and objectives for the explicit purpose of:

- Determining the System's projected financial needs,
- Expressing the Board's position with respect to its risk/reward posture,
- Formulating an appropriate set of goals and objectives for the System's assets,
- Defining the strategy to be implemented by the Board in the endeavor of achieving the goals and objectives,
- Identifying a set of guidelines that the consultant can use in formulating corresponding investment recommendations over the next ten-year time horizon, and
- Establishing procedures and a schedule for monitoring the performance of the System in achieving the stated objectives.

I. MWRA Employees' Retirement System Goals

The MWRA Employees' Retirement System is an employee pension plan established in accordance with Chapter 32 of Massachusetts General Laws ('M.G.L., Chapter 32'). The System and Funds are administered by a Retirement Board (the 'Board') consisting of five members: the Ex-Officio, two appointed members, and two members elected by the general membership of the retirement system. This defined benefit plan is maintained to provide retirement, disability, and/or death benefits, as the case may be, to participants in accordance with Massachusetts General Laws.

The Board of the MWRA Employees' Retirement System has as its primary goal to provide promised benefits to participants and beneficiaries of the system. Plan assets should be equal to or greater than the present value of the projected benefit obligations ('fully funded'). When Plan assets are less than the present value of projected benefit obligations, a schedule will be established and a plan will be in place to meet a fully funded status.

II. Investment Objectives

The investment goal of the fund is to achieve the assumed rate of return over the long term, through a prudently diversified portfolio. In order to achieve needed returns within the stated risk tolerance and in order to diversify plan assets so as to minimize the risk associated with the independence on the success of one enterprise, a policy asset mix will be utilized.

A. Risk and Return Objectives

- To use diversification to minimize the risk of large losses associated with the dependence on the success of one enterprise
- The Board has determined that investment growth should be maintained in such a manner that the minimum nominal rate of return does not cause a negative real rate of return over a full market cycle.
- Return volatility of the aggregate asset base of the System will be measured relative to the volatility experienced by a policy benchmark.
- Volatility or risk shall be measured as the annualized standard deviation, utilizing monthly and/or quarterly total rates of return of the aggregate assets of the System.

III. Investment Constraints

A. Legal and Regulatory

The System is a qualified defined benefit pension plan governed by the M.G.L., Chapter 32.

The Board is charged by law with the responsibility for the investment of the assets of the System. To assist the Board in meeting their fiduciary obligation, they are authorized and permitted by the Public Employee Retirement Administration Commission (PERAC) to engage the services of advisors who possess the necessary specialized research facilities and skilled manpower to assure adherence to the 'Prudent Expert Rule' under such statutes as may now or in the future apply to investments of the System. Legal counsel will be retained by the Trustees to review contracts and provide overall advice as to fiduciary compliance to regulatory authorities.

Assets of this Fund shall be invested in a manner consistent with the fiduciary standards established under Code of Massachusetts Regulations 840 ('840 CMR'). The Board shall also use as precedent the Employee Retirement Income Security Act (ERISA).

Every Fiduciary Shall:

- Discharge his or her duties for the exclusive purpose of providing benefits to the participants of the Plan and their beneficiaries.
- Act with the care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of like character and with like aims.
- Diversify by investment of the Plan so as to minimize the risk of large losses unless under the circumstances it is clearly prudent not to do so.
- Operate in accordance with the MWRA Employees' Retirement System's procedures, documents, and instruments.
- Maintain compliance with the Code of Ethics and Standards of Conduct applicable to their assigned duties.

No Fiduciary Shall:

- Deal with the assets of the MWRA Employees' Retirement System for his or her own account or his or her own interest.

- Act in any manner or on behalf of any person or organization whose interests are adverse to the interests of the MWRA Employees' Retirement System, its members, or beneficiaries.
- Cause the MWRA Employees' Retirement System to engage in a transaction which in any way involves a sale, exchange, lease, or transfer of assets to or from, or the use of assets by or for the benefit, or the furnishing of goods, services, or facilities to or by, or the lending of money or extension of credit to or by any party in one's own interest.

B. Time Horizon

Return assumptions will be based on a ten year time horizon, with a review and analysis to be made at least annually to monitor allocations and assumptions. Should a manager deviate from proscribed mandate or expected risk and return profile by a consequential degree, that manager may be reevaluated at any time.

C. Liquidity

Presently, contributions exceed plan withdrawals to provide benefits, payouts, and/or plan expenses. Portfolio liquidity will be managed based on the cash flow needs of the System.

D. Tax Considerations

The MWRA is a tax-exempt entity. Therefore, investments and strategies will be evaluated only on the basis of expected risks and potential returns.

IV. Risk and Return Considerations

When achieving return objectives required to fully fund the system, the Board is intent on controlling risk. Consistency of returns and risk of loss are primary considerations.

The Board also has determined that the annual performance of plan assets should not vary substantially from returns achieved by other public pension funds with similar goals and objectives.

V. Diversification

The System's aggregate equity portfolio (including international equity and emerging market securities) will be diversified by market capitalization, industry, number of issues, and rate of turnover. The System's aggregate fixed income portfolio will be diversified by quality ratings, maturity schedule, industry, number of issues, and rate of turnover. The System's aggregate Global Asset Allocation portfolio allows for enhanced diversification through exposure to new asset categories, enhanced return and reduced volatility in down markets. The System's aggregate real estate portfolio will be invested in both equity and debt, and diversified geographically, by property type, by manager, and by investor. The System's aggregate private equity portfolio will be invested in private equity partnerships, private equity limited liability companies, and discretionary managers investing in private equity partnerships and private equity limited liability companies. The System's aggregate hedge fund portfolio will provide diversified and uncorrelated investments, which will include a broad array of strategies utilizing both liquid and illiquid securities.

The specific degrees of diversification within the above asset classes will be addressed in each manager's investment guidelines.

VI. Asset Allocation

To achieve needed returns within the stated risk tolerance, and to diversify plan assets so as to minimize the risk associated with the dependence on the success of one enterprise, a policy asset mix will be utilized. To accommodate the growth and avoid excess trading costs, the Board also has implemented asset class ranges.

In developing this asset mix, no portion of the portfolio has been allocated to cash. However, when employing a multi-manager investment approach, managers may raise cash balances in accordance with their individual investment guidelines.

A. Permissible Asset Classes

The Board has specifically indicated those asset classes that may be utilized when investing the System's assets, which are summarized as follows:

Asset Type	Asset Class	Purpose
Equity	Large Cap U.S. Stocks	Total Return Potential
Equity	Small Cap U.S. Stocks	Total Return Potential
Equity	Developed International Stocks	Total Return Potential Diversification
Equity	Emerging Markets Stocks	Total Return Potential Diversification
Equity	Private Equity	Total Return Potential Diversification
Fixed Income	Investment Grade Bonds	Return Stability Income
Fixed Income	High Yield Bonds	Total Return Potential Diversification Income
Fixed Income	Non-U.S. Bonds	Total Return Potential Diversification Income
Real Estate	Real Estate	Total Return Potential Diversification Income
Hedge Funds	Absolute Return Strategies	Return Stability Diversification

Fixed Income / Equity	Global Asset Allocation	Total Return Potential Diversification/Reduced Volatility

B. Expected Returns, Risks, and Correlations for Permissible Asset Classes

The risk and return behavior of the System will be driven primarily by the allocation of investments across asset classes. In determining the appropriate allocation, the expected return and risk behavior of each asset class and the likely interaction of various asset classes in a portfolio must and are examined.

C. Long-Term Target Allocations

Based on the investment objectives and constraints of the MWRA Retirement System, and based on an annual review of the asset allocation and asset classes, the Board will specify a long-term target allocation for each class of permissible assets. These targets will be expressed as a percentage of the total portfolio, and will have ranges surrounding them, allowing for the portfolio to maintain policy through market fluctuations.

The long-term target allocations are intended as strategic goals. Thus, it is permissible for the overall System's asset allocation to deviate from the long-term target, as would likely occur during manager transitions, asset class restructurings, and other temporary changes in the MWRA Retirement System. Deviations from targets that occur due to capital market changes are discussed after the following table:

Asset Allocation Targets

as of 12/31/17

	Target (%)	Range (%)
Domestic Stocks[1]	**21%**	**10-30%**
International Stocks[2]	**19%**	**10-25%**
Domestic Bonds[3]	**22%**	**15-40%**
Real Estate	**8%**	**0-10%**
Private Equity	**10%**	**0-12%**
Hedge Funds/Absolute Return	**5%**	**0-12%**
Global Asset Allocation	**15%**	**5-25%**

[1] Includes large and small cap stocks
[2] Includes developed and emerging markets
[3] Includes high yield and non-U.S. bond holdings

Cash	**0%**	**0-10%**

D. Rebalancing

Surplus cash flows shall be utilized to maintain the asset management structure. Should these cash flows not be sufficient to reallocate the Plan according to the policy, the transfer of assets may occur between managers.

E. Changes to Asset Allocation

At least annually, the Board will reevaluate the portfolio weightings by asset class and adjustments shall be made accordingly.

VII. Review of Investment Policy, Asset Allocation, and Performance

Policy guidelines will be fixed annually by the Board after consideration of the advice and recommendations of the consultant. All modifications of policy guidelines shall be in writing and signed by each of the acting Board members.

VIII. Trading and Proxy Voting by Investment Managers

All transactions are to be governed by negotiation for execution on a 'best execution basis.' The lowest commission cost may not represent the best execution. Investment managers shall be responsible for determining best execution of trades within their assigned portfolio.

Proxy voting shall be implemented by the manager in compliance to policies established by the manager approved by the Board as well as policies included in the investment policy statement. The manager is to report on all votes that are cast and the reason behind their decisions on a semi-annual basis.

IX. Management Structure

To diversify the System's assets so as to minimize the risk associated with dependence on the success of one enterprise, the Board has decided to employ a multi-manager team approach to investing System assets.

A consultant will be employed whose fiduciary responsibilities will be to provide investment advice, including: 1) risk and return assumptions on investments, 2) diversification of System assets so as to minimize risk, while attempting to achieve the System's return objectives, and 3) evaluating, monitoring, and reporting the total portfolio and investment manager returns and compliance to policy guidelines. The consultant is responsible for monthly and quarterly reporting.

Asset managers will be employed to utilize individual expertise within their assigned area of responsibility. Each manager will be governed by individual investment guidelines.

The Board, in recognition of the benefits of commingled funds (i.e., the ability to diversify more extensively than in a small, direct investment account and the lower costs which can be associated with these funds) may elect to invest in such funds on a case-by-case basis. The Board recognizes that it cannot give specific policy directives to a commingled fund with pre-established policies, outlined in each fund's prospectus or offering documents; therefore, the Board is relying on the investment consultant to assess and monitor the investment policies of any funds used by the Fund to ascertain whether they are appropriate for the System. The Board and its Investment Managers, where applicable, will establish a Side Letter Agreement that sets forth that the manager is aware of the Code of Massachusetts Regulations, Investment Regulations, the applicable provisions of the M.G.L., Chapter 32 and that the Manager will comply with the statute and Investment Regulations wherever possible, consistent with the Manager's trust documents, prospectus, implementation documents, etc. creating the commingled fund vehicle.

X. Implementation

All monies invested for the Board by investment managers after the adoption of this investment policy statement shall conform to this statement. To the extent that the Board shall deliver to an investment manager, in cash or kind, or fund assets here to fore invested for them by other investment managers, within 60 days after the delivery of said prior assets by the Board, the entire portfolio managed by the manager shall conform in all aspects to guidelines established to the investment guidelines established for said manager.

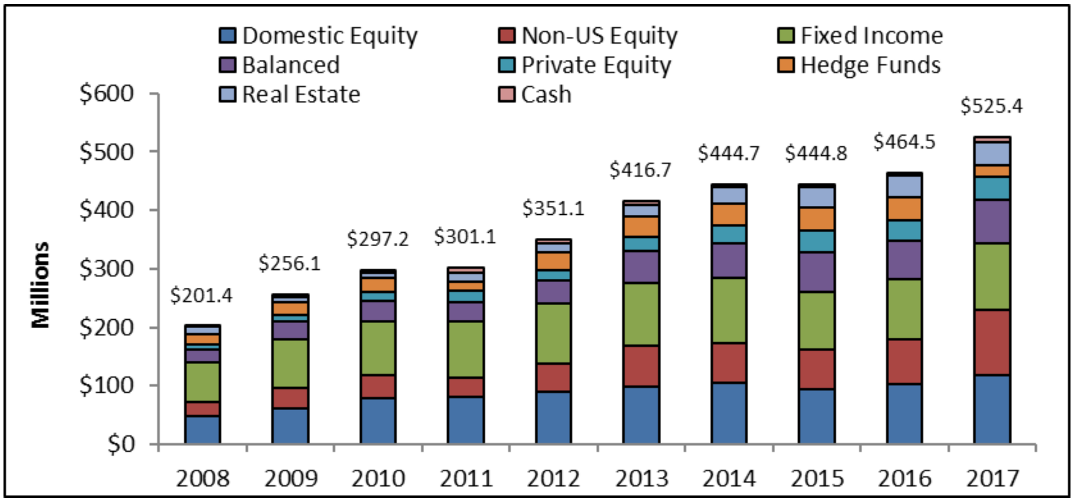
TIME-WEIGHTED INVESTMENT RESULTS[1]
PERIODS ENDING 12/31/2017

	4Q17	1 YR	3 YR	5 YR	10 YR	Since Inception	Inception Date
Total Composite	**3.5**	**15.0**	**6.8**	**8.3**	**6.1**	**6.9**	**1/1/1986**
Allocation Index	3.7	15.1	7.4	8.5	5.4	N/A	
Policy Index	3.7	14.8	7.7	8.3	5.7	N/A	
Total Balanced	**2.5**	**13.2**	**5.0**	**4.4**	**--**	**4.7**	**12/1/2010**
60% MSCI ACWI (Net) / 40% CITI WGBI	3.8	17.1	6.4	6.5	4.2	6.1	
Total Domestic Equity	**5.8**	**21.1**	**9.5**	**14.3**	**8.5**	**6.7**	**5/1/1999**
Russell 3000	6.3	21.1	11.1	15.6	8.6	6.3	
Total Non-US Equity	**4.4**	**30.3**	**7.3**	**7.4**	**1.2**	**4.8**	**3/1/1999**
MSCI EAFE	6.1	33.0	14.2	12.9	5.8	10.0	
Total Fixed Income	**0.9**	**5.8**	**3.1**	**3.7**	**5.9**	**6.8**	**3/1/1999**
Barclays Aggregate	0.4	3.5	2.2	2.1	4.0	4.9	
Total Hedge Fund	**1.7**	**5.2**	**1.3**	**3.9**	**2.1**	**3.3**	**10/1/2006**
HFRI Fund of Funds Composite Index	2.1	7.8	2.6	4.0	1.1	4.1	
Total Real Estate	**3.4**	**9.3**	**10.5**	**11.7**	**5.8**	**8.0**	**4/1/1999**
NCREIF Property Index 1 Qtr Lag	1.8	7.0	9.4	10.2	6.1	9.1	

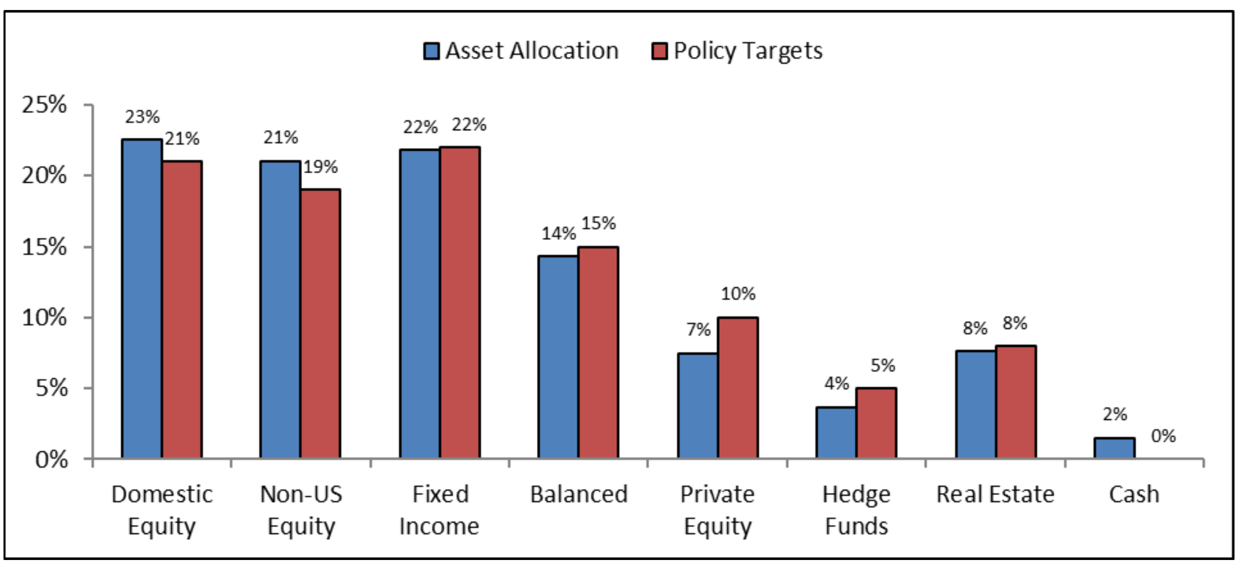
[1] Net of fees

Total Private Equity	**4.7**	**13.5**	**13.0**	**14.6**	**11.9**	**9.3**	**4/1/1999**
NASDAQ W/O Income	6.3	28.2	13.4	18.0	10.0	5.7	
Cash	**0.1**	**0.7**	**0.3**	**0.2**	**--**	**0.2**	**12/1/2010**
91 Day T-Bills	0.3	0.9	0.4	0.3	0.3	1.6	

Historical Asset Allocation - Asset Size

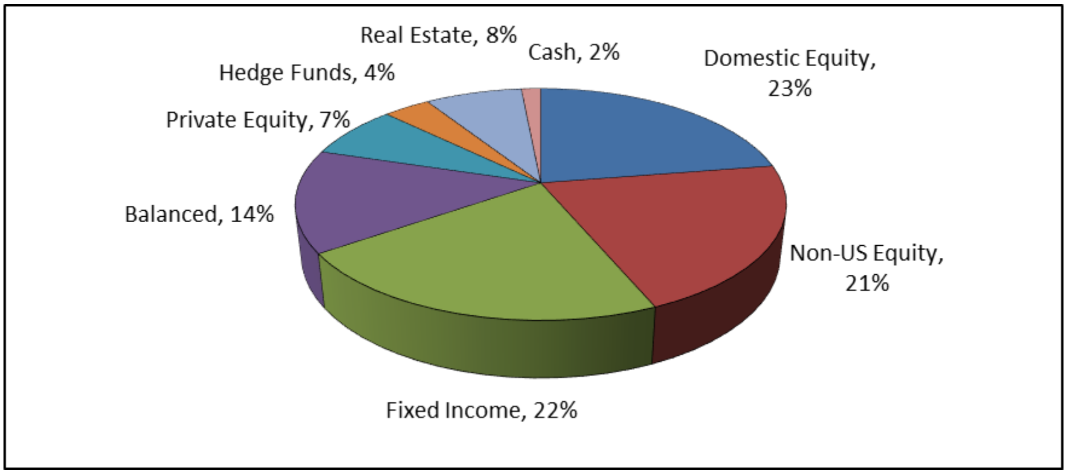


Aggregate Asset Allocation vs. Policy Targets[1]

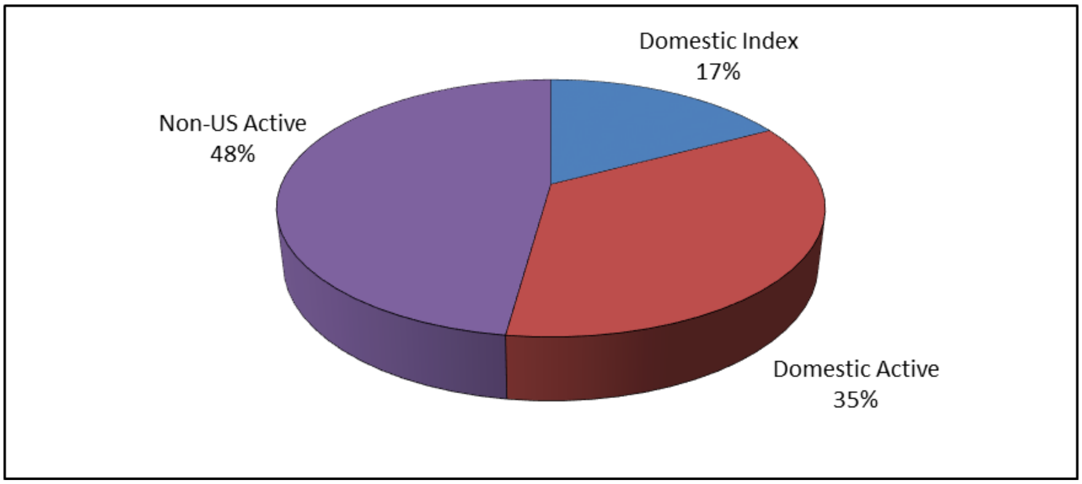


[1] Percentages may not sum to 100% due to rounding.

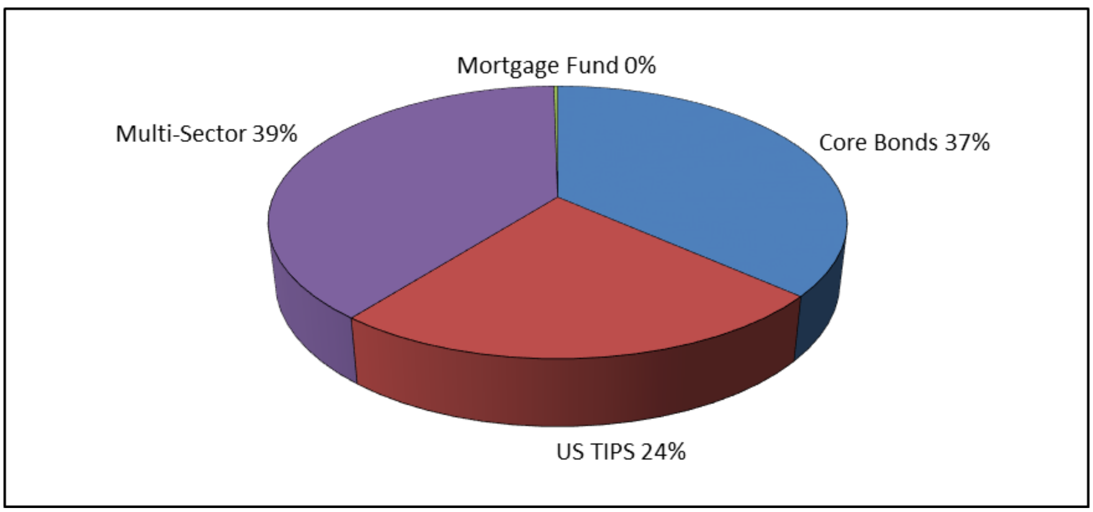
AGGREGATE ASSET ALLOCATION[1]



EQUITY ALLOCATION[1]



FIXED INCOME ALLOCATION[1]



[1] Percentages may not sum to 100% due to rounding.

Ten Largest Stock Holdings by Fair Value

Company	Number of Shares	Fair Value ($MM)	Percentage of Domestic Stock	Industry
Apple	8,797.43	1.5	1.84%	Information Tech.
Lowe's Companies	12,221.11	1.1	1.40%	Consumer Disc.
Microsoft	13,216.06	1.1	1.40%	Information Tech.
UnitedHealth Group	5,051.07	1.1	1.38%	Health Care
Dollar General	11,733.01	1.1	1.35%	Consumer Disc.
State Street	11,108.08	1.1	1.35%	Financials
Illinois Tool Works	6,273.57	1.0	1.29%	Industrials
Abbott Laboratories	17,951.19	1.0	1.27%	Health Care
J M Smucker	7,708.15	1.0	1.18%	Consumer Staples
AFLAC	10,656.07	0.9	1.16%	Financials

Largest Fixed Income Holdings by Fair Value

Security	Market Value ($mm)	% of Bonds
Loomis Sayles Fixed Income	44.9	39.1%
Invesco Core Fixed Income	41.9	36.5%
Rhumbline TIPS	27.8	24.2%
Invesco Mortgage Recovery Fund	0.3	0.3%

2017 Schedule Of Fees & Commission

2017 Investment Manager Fees	
Manager	**Fee**
Alcentra European DLF	$37,707.00
Ascent Fund II	$0.00
Ascent Fund IV	$14,490.00
Ascent Fund IV-B	$7,260.00
Ascent Fund V	$36,456.00
Ascent VI	$64,675.00
Boston Capital	$0.00
Castile Ventures III, L.P.	$13,363.00
Cerberus	$16,121.00
Coho Relative Value Equity	$102,062.30
Courtland/Mesirow M-Fire	$13,125.00
Entrust	$106,093.35
Foundry 2007	$38,486.00
Foundry 2010	$232,957.00
Foundry 2010 Annex	$17,801.00
Intercontinental Real Estate Investment Fund IV	$0.00
Invesco Core Bonds	$139,340.76
Invesco Fund IV	$1,747.65
Invesco Fund VI	$20,690.43
Invesco Mortgage Fund	$5,910.45
Invesco Mortgage Recovery II	$11,036.00
JFL Equity Investors IV, L.P.	$65,961.00
Kayne Energy Fund VII	$286,219.00
Landmark VI	$16,252.00
Landmark VIII	$67,446.00
Landmark XV	$25,598.00
LMCG Emerging Markets	$177,744.00
LMCG Small Cap International	$86,789.00
Loomis Sayles - Multi Sector Bonds	$193,480.96
Loomis Sayles Small Cap Growth	$71,897.57
Morgan Stanley Prime Property	$83,114.76
PIMCO All Asset	$216,588.00
Pinebridge PEP V	$20,605.00
Polen Focused Growth	$148,653.33
PRIM Absolute Return Fund (PRIM Portfolio Completion Strategies)	$177,133.82
PRIM Vintage Year 2008	$11,978.40
PRIM Vintage Year 2009	$3,887.71
PRIM Vintage Year 2010	$9,489.04
PRIM Vintage Year 2011	$18,608.19
PRIM Vintage Year 2012	$10,376.31

PRIM Vintage Year 2014	$25,364.12
PRIM Vintage Year 2017	$1,626.09
PRIT Core Fund	$17,652.87
PRIT Core Real Estate	$84,220.39
Private Advisors Small Co. Coinvestment Fund, LP	$7,154.63
Rhumbline Advisors S&P 500 Index Fund	$18,658.74
Rhumbline TIPS	$3,014.41
Robeco Boston Partners Small Cap Value	$159,625.13
Schroder International Alpha Fund	$233,550.00
SEG Baxter Street	$305,167.40
TA Realty Fund X LP	$16,974.00
TerraCap Partners III, LP	$111,027.73
TerraCap Partners IV, LP	$108,803.44
Wellington Opportunistic Investment	$117,608.00
William Blair	$165,277.00
Total Investment Manager Fees	**$3,946,867.98**
NEPC (Consultant Fee)	$109,699.67
State Street/ People's United Bank (Custodial Bank Fee)	$79,388.80
Total All Investment-Related Fees	**$4,135,956.45**
Plus Administrator Expenses	$446,465.00
Total Expenses	**$4,582,421.45**

2017 Commissions to Brokers

Broker Name	Total Commissions ($)	Total Shares	%/Share
BAIRD, ROBERT W & CO INC, MILWAUKEE	89.08	2,227.00	0.04
BARCLAYS CAPITAL INC./LE, NEW JERSEY	67.64	2,688.00	0.03
BARCLAYS CAPITAL LE, NEW YORK	41.16	1,520.00	0.03
BERNSTEIN SANFORD C & CO, NEW YORK	1,864.76	83,782.00	0.02
BTIG LLC, NEW YORK	2.40	120.00	0.02
CANTOR CLEARING SERV, NEW YORK	28.44	1,422.00	0.02
CANTOR FITZGERALD & CO INC, NEW YORK	-	195.00	-
CITIGROUP GBL MKTS INC, NEW YORK	317.44	8,191.00	0.04
COWEN AND CO LLC, NEW YORK	13.61	544.00	0.03
CREDIT SUISSE, NEW YORK (CSUS)	566.59	23,604.00	0.02
DEUTSCHE BK SECS INC, NY (NWSCUS33)	753.15	40,298.00	0.02
FRIEDMAN, BILLINGS AND RAMSEY, NEW YORK	8.98	449.00	0.02
GOLDMAN SACHS & CO, NY	428.12	16,756.00	0.03
GOLDMAN SACHS EXECUTION & CLEARING, NY	270.22	16,850.00	0.02
ICBC FINCL SVCS, NEW YORK	10.08	672.00	0.02
INSTINET CLEARING SER INC, NEW YORK	30.17	1,206.00	0.03
INSTINET CORP, NEW YORK	2.66	106.00	0.03
INVESTMENT TECH GROUP INC, NEW YORK	15.79	1,947.00	0.01
ITG INC, NEW YORK	35.81	3,029.00	0.01
J.P MORGAN SECURITIES INC, NEW YORK	300.20	12,325.00	0.02
J.P. MORGAN CLEARING CORP, NEW YORK	971.79	33,893.00	0.03
JEFFERIES & CO INC, NEW YORK	1,013.25	2,598,633.03	-
KNIGHT EQUITY MARKETS LP, NEW YORK	86.11	3,444.00	0.03
LIQUIDNET INC, NEW YORK	54.46	3,690.00	0.01
MERRILL LYNCH PIERCE FENNER SMITH INC NY	986.99	44,264.00	0.02
MERRILL LYNCH PROFESSIONAL CLRG, PURCHAS	18.10	905.00	0.02
MORGAN STANLEY & CO INC, NY	44.74	1,833.00	0.02
NATIONAL FINL SVCS CORP, NEW YORK	564.54	16,711.00	0.03
OPPENHEIMER & CO INC, NEW YORK	307.32	7,683.00	0.04
PERSHING LLC, JERSEY CITY	620.07	20,546.00	0.03
RAYMOND JAMES & ASSOC INC, ST PETERSBURG	246.34	6,383.00	0.04
RBC CAPITAL MARKETS LLC, NEW YORK	305.48	8,573.00	0.04
SJ LEVINSON AND SONS LLC, NEW YORK	327.15	13,086.00	0.03
STATE STREET GLOBAL MARKETS LLC, BOSTON	51.45	2,392.00	0.02
STEPHENS INC, LITTLE ROCK	6.32	158.00	0.04
STIFEL NICOLAUS	566.10	14,696.00	0.04
UBS SECURITIES LLC, STAMFORD	531.19	22,419.00	0.02
UNCLASSIFIED	775.44	20,466,015.79	-
WELLS FARGO SECURITIES LLC, CHARLOTTE	43.48	1,087.00	0.04
WILLIAM BLAIR & CO, CHICAGO	582.03	16,806.00	0.03
TOTAL	**12,948.65**	**23,501,148.82**	**0.03**

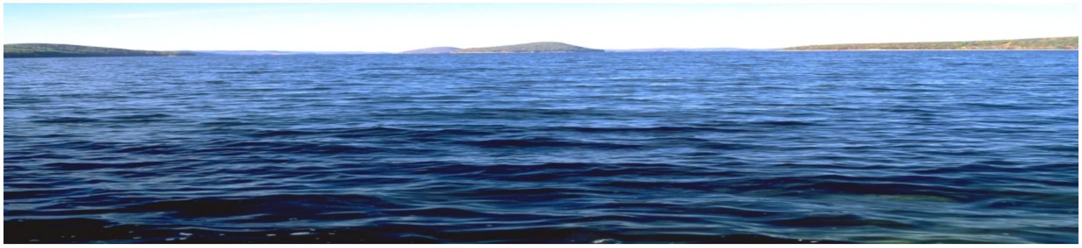
INVESTMENT SUMMARY[1]

	Market Value 12/31/2017 ($mm)	% of Asset Class	% of System
Total System	**525.4**	**NA**	**100%**
Total Domestic Equity Assets	**118.3**	**100%**	**22.5%**
Info. Tech.	22.3	18.9%	4.3%
Consumer Discretionary	16.1	13.6%	3.1%
Health Care	22.1	18.7%	4.2%
Financials	15.5	13.1%	2.9%
Industrials	14.5	12.3%	2.8%
Cons. Staples	10.5	8.9%	2.0%
Energy	7.0	5.9%	1.3%
Other	3.2	2.7%	0.6%
Materials	2.0	1.7%	0.4%
Real Estate	1.7	1.4%	0.3%
Telecommunications	1.7	1.4%	0.3%
Utilities	1.7	1.4%	0.3%
Total Foreign Equity Assets	**110.6**	**100%**	**21.0%**
Europe-Developed	46.0	41.7%	8.8%
Pacific Rim/Australia Asia-Developed	26.7	24.1%	5.1%
Emerging Markets	28.3	25.6%	5.4%
Unclassified	5.8	5.2%	1.1%
North America	3.8	3.4%	0.7%
Total Fixed Income Assets	**114.8**	**100%**	**21.8%**
U.S. Treasury/Agency	26.6	23.2%	5%
Corporate	73.0	63.6%	14%
Mortgage Backed	3.6	3.1%	1%
Foreign	8.3	7.2%	2%
Muni	0.3	0.3%	0%
Asset Backed	0.8	0.7%	0%
Other	2.2	1.9%	0%
Total Alternative Assets	**173.7**	**100%**	**33%**
Balanced [3]	75.2	43%	14%
Hedge Funds	19.3	11%	4%
Real Estate	40.0	23%	8%
Private Equity	39.2	23%	7%
Cash & Cash Equivalents	**8.0**	**100%**	**2%**

[1] Numbers may not sum to 100% due to rounding.
[2] Domestic equity assets include cash held by the system's separate account investments. This cash value fluctuates daily, and represents the residual activity from security transactions within the portfolio.
[3] Balanced investments are presented as "Fixed Income" investments ($71.6M) and "External Investment Pool" ($3.6M) in the System's Statement of Fiduciary Net Position.

LIQUIDITY PROFILE

Benefits payments totaled approximately $19.4 million during the year and along with other payments of $1.0 million resulted in total cash outflows of $20.4 million in 2017. These payments were partially offset by a contribution of approximately $12.4 million from the employer and plan members, and other cash receipts of $1.7 million for a total of $14.1 million in 2017. This resulted in a negative cash flow of approximately $6.3 million for the fiscal year. Note that these figures do not incorporate expected income and asset gains from the MWRAERS' investments. The MWRAERS' portfolio is structured with a long-term expected return of 7.5%.



Actuarial Section

Segal Consulting

116 Huntington Avenue 8th Floor Boston, MA 02116-5744
T 617.424.7336 www.segalco.com

Kathleen A. Riley FSA, MAAA, EA
Senior Vice President and Actuary
kriley@segalco.com

June 12, 2018

Massachusetts Water Resources Authority Employees' Retirement Board
MWRA Chelsea Facility
Two Griffin Way
Chelsea, MA 02150

Dear Board Members:

Segal Consulting has performed a January 1, 2018 actuarial valuation of the Massachusetts Water Resources Authority Employees' Retirement System. This is the most recent actuarial valuation and has been completed in accordance with generally accepted actuarial principles and practices. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Retirement Board are reasonably related to the experience of and the expectations for the Plan.

As part of performing the valuation, Segal Consulting was furnished member data by the Massachusetts Water Resources Authority Employees' Retirement System's administrative staff. Although examined for general reasonableness, the data was not audited by the actuary. In addition, the administrative staff furnished financial statements that were not audited by the actuary.

The funding objective of the plan is to provide for the current cost of benefits (*i.e.*, normal cost) and to reduce the unfunded liability to zero by June 30, 2026. The normal cost is expected to remain at a level percentage of payroll. The unfunded liability is amortized over an 8-year period with the appropriation increasing 4.5% per year.

Valuations have been performed either annually or biennially. Biennial valuations are consistent with the guidelines promulgated by PERAC and GASB. The previous valuation was performed as of January 1, 2017. The assumptions and methods used for funding purposes meet the parameters set by Actuarial Standards of Practice (ASOPs).

Segal Consulting has prepared, and included as part of this report, the following supporting schedules for the Actuarial Section of the December 31, 2017 CAFR:

I. Summary of Actuarial Assumptions and Actuarial Cost Method
II. Schedule of Active Member Valuation Data
III. Schedule of Retirants and Beneficiaries Added to and Removed from Rolls
IV. Solvency Test
V. Analysis of Financial Experience
VI. Summary of Plan Provisions

Please let us know if you have any questions on this material.

Sincerely,

SEGAL CONSULTING

By: Kathleen A. Riley, FSA, MAAA, EA
Senior Vice President and Actuary

KCR/jpb

8729760V1/13922.006

I. Summary of Actuarial Assumptions and Actuarial Cost Method

The actuarial assumptions, as set forth in the accompanying supporting schedules, were selected by the Massachusetts Water Resources Authority Employees' Retirement Board and actuary. Unless stated otherwise, the actuarial assumptions are based upon the actuarial valuation as of January 1, 2018.

Mortality Rates

Pre-Retirement:	RP-2014 Blue Collar Employee Mortality Table projected generationally with Scale MP-2017
Healthy:	RP-2014 Blue Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2017
Disabled:	RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward 1 year projected generationally with MP-2017

The mortality tables reasonably reflect the projected mortality experience of the Plan as of the measurement date based on historical and current demographic data. As part of the analysis, a comparison was made between the actual number of retiree deaths and the projected number based on the prior year's assumptions over the four most recent valuations. The mortality tables were then adjusted to future years using generational projection under Scale MP-2017 to reflect future mortality improvement.

Termination Rates before Retirement

	Mortality		
Age	**Male**	**Female**	**Disability**
20	0.05	0.02	0.01
25	0.06	0.02	0.02
30	0.06	0.02	0.03
35	0.07	0.03	0.05
40	0.08	0.04	0.10
45	0.13	0.07	0.15
50	0.22	0.12	0.19
55	0.36	0.19	0.24
60	0.61	0.27	0.28

Notes: *Mortality rates do not reflect generational projection.*
55% of the disability rates shown represent accidental disability.
40% of the accidental disabilities will die from the same cause as the disability.
55% of the death rates shown represent accidental death.

Withdrawal Rates

	Rate (%)
Years of Service	Withdrawal
0	15.0
1	12.0
2	10.0
3	9.0
4	8.0
5	7.6
6	7.5
7	6.7
8	6.3
9	5.9
10	5.4
11	5.0
12	4.6
13	4.1
14	3.7
15	3.3
16 – 20	2.0
21 – 29	2.0
30+	0.0

The termination rates and disability rates were based on historical and current demographic data, adjusted to reflect economic conditions of the area and estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual number of terminations and disability retirements and the projected number based on the prior year's assumptions over the four most recent valuations.

Retirement Rates

	Rate per year (%)	
Age	Male	Female
50	0.750	1.125
51	0.750	1.125
52	0.750	1.500
53	0.750	1.875
54	1.500	1.875
55	1.500	4.125
56	1.875	4.875

	Rate per year (%)	
Age	**Male**	**Female**
57	1.875	4.875
58	3.750	4.875
59	4.875	4.875
60	9.000	3.750
61	15.000	9.750
62	22.500	11.250
63	18.750	9.375
64	16.500	13.500
65	30.000	11.250
66	18.750	15.000
67	18.750	15.000
68	22.500	18.500
69	22.500	15.000
70	100.000	100.000

The retirement rates were based on historical and current demographic data, adjusted to reflect economic conditions of the area and estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual number of retirements by age and the projected number based on the prior year's assumptions over the four most recent valuations.

Retirement Age for Inactive Vested Participants

Age 55.

The retirement age for inactive vested participants was based on historical and current demographic data, adjusted to reflect economic conditions of the area and estimated future experience and professional judgment.

Unknown Data for Participants

Same as those exhibited by participants with similar known characteristics.

Family Composition

80% of participants are assumed to be married. None are assumed to have dependent children. Females are assumed to be three years younger than their spouses.

Benefit Election

All participants are assumed to elect Option A. The benefit election reflects the fact that all benefit options are actuarially equivalent.

Net Investment Return

7.50%

Salary Increases

Years of Service	Rate
0	5.75%
1	5.25%
2	5.25%
3	5.00%
4	5.00%
5	4.50%
6	4.50%
7	4.25%
8	4.25%
9+	4.00%

The salary scale assumption is a long-term estimate derived from historical data, current and recent market expectations, and professional judgment.

Interest on Employee Contributions

3.50%

Administrative Expenses

$525,000 for calendar 2018, increasing 3.00% per year.

2017 Salary

2017 salary equal to salaries provided in the data, except for new hires where salaries were annualized based on date of hire.

Total Service

Total creditable service reported in the data.

Net 3(8)(c) Liability

Estimated reduction in liability of $9.3 million based on average amount of net 3(8)(c) disbursements over prior two years.

Actuarial Value of Assets

Market value of assets as reported in the System'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 Cost Method

Entry Age Normal Actuarial Cost Method. Entry Age is the age of the participant less Total Service as defined above. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary. Normal cost is determined using the plan of benefits applicable to each participant.

Amortization Method

Employer contribution increases 4.50% per year for fiscal 2020 through fiscal 2025 with a smaller payment in fiscal 2026 to fully fund the System by June 30, 2026. Gains and losses are fully amortized by June 30, 2026.

Recent Changes

The following changes were reflected in the January 1, 2015 valuation:

- The net investment return assumption was lowered from 8.00% to 7.75%.
- The administrative expense assumption was increased from $390,000 for calendar 2013 to $525,000 for calendar 2015.
- The pre-retirement mortality assumption was changed from the RP-2000 Mortality Table projected 13 years using Scale AA to the RP-2000 Employee Mortality Table projected generationally from 2005 with Scale AA.
- The post-retirement mortality assumption for non-disabled participants was changed from the RP-2000 Mortality Table projected 13 years using Scale AA to the RP-2000 Healthy Annuitant Mortality Table projected generationally from 2005 with Scale AA.
- The mortality assumption for disabled participants was changed from the RP-2000 Mortality Table set forward 2 years projected 13 years using Scale AA to the RP-2000 Healthy Annuitant Mortality Table set forward 2 years projected generationally from 2005 with Scale AA.
- The retirement rates were reduced by 25%.

- The salary increase assumption was changed as follows:

	Rate	
Years of Service	**Current**	**Previously**
0	6.00%	7.00%
1	5.50%	6.50%
2	5.50%	6.50%
3	5.25%	6.00%
4	5.25%	6.00%
5	4.75%	5.50%
6	4.75%	5.50%
7	4.50%	5.00%
8	4.50%	5.00%
9+	4.25%	4.75%

- The reduction in liability to account for anticipated net 3(8)(c) reimbursements was increased from $5.2 million to $7.2 million based on the average net 3(8)(c) payments in 2013 and 2014.

The following changes were effective January 1, 2017:

- The net investment return assumption was lowered from 7.75% to 7.50%.
- The pre-retirement mortality assumption was changed from the RP-2000 Employee Mortality Table projected generationally from 2005 with Scale AA to the RP-2000 Employee Mortality Table projected generationally from 2009 with Scale BB2D.
- The post-retirement mortality assumption for non-disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table projected generationally from 2005 with Scale AA to the RP-2000 Employee Mortality Table projected generationally from 2009 with Scale BB2D.
- The mortality assumption for disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table set forward 2 years projected generationally from 2005 with Scale AA to the RP-2000 Employee Mortality Table projected generationally from 2015 with Scale BB2D.
- The salary increase assumption was changed as follows:

	Rate	
Years of Service	**Current**	**Previously**
0	5.75%	6.00%
1	5.25%	5.50%
2	5.25%	5.50%
3	5.00%	5.25%
4	5.00%	5.25%
5	4.50%	4.75%
6	4.50%	4.75%
7	4.25%	4.50%
8	4.25%	4.50%
9+	4.00%	4.25%

- The reduction in liability to account for anticipated net 3(8)(c) reimbursements was increased from $7.2 million to $8.7 million based on the average net 3(8)(c) payments in 2015 and 2016.

The following changes were effective January 1, 2018:

- The pre-retirement mortality assumption was changed from the RP-2000 Employee Mortality Table projected generationally from 2009 with Scale BB2D to the RP-2014 Blue Collar Employee Mortality Table projected generationally with Scale MP-2017.
- The post-retirement mortality assumption for non-disabled participants was changed from the RP-2000 Annuitant Mortality Table projected generationally from 2009 with Scale BB2D to the RP-2014 Blue Collar Annuitant Mortality Table projected generationally with Scale MP-2017.
- The mortality assumption for disabled participants was changed from the RP-2000 Annuitant Mortality Table projected generationally from 2015 with Scale BB2D to the RP-2014 Blue Collar Annuitant Mortality Table set forward 1 year projected generationally with Scale MP-2017.
- The reduction in liability to account for anticipated net 3(8)(c) reimbursements was increased from $8.7 million to $9.3 million based on the average net 3(8)(c) payments in 2016 and 2017.

The following Schedules (II. – V.) are accumulating data each full valuation year or annually to present 10 years of the reported information.

II. Schedule of Active Member Valuation Data

Valuation date	Number	Projected annual payroll ($)	Annual average pay ($)	% Increase in average pay per year
1/1/2010	1,108	$81,962,000	$73,973	- -
1/1/2011	1,110	82,870,000	74,658	0.93
1/1/2013	1,091	84,829,033	77,753	2.05
1/1/2015	1,090	89,168,911	81,806	2.57
1/1/2017	1,095	93,569,377	85,451	2.20
1/1/2018	1,100	96,767,777	87,971	2.95

III. Schedule of Retirees and Beneficiaries Added to and Removed from Rolls

	Added to Rolls		Removed from Rolls		Rolls at end of year			
Year ended	Number	Annual Allowannces[1]	Number	Annual Allowances	Number	Annual Allowannces[1]	% Increase in annual allowances	Average annual allowances
2012	61	$2,380,699	5	$61,467	397	$11,069,722	30.6	$27,883
2014	91	3,658,868	12	251,979	476	14,581,693	31.7	30,634
2016	80	3,727,766	20	532,663	536	17,977,080	23.3	33,539
2017	53	2,310,558	7	248,508	582	20,234,689	12.6	34,768

[1] Annual allowances are shown for retirees in pay status at the end of the year.

IV. Solvency Test

	Actuarial Accrued Liability				Portion of Actuarial Accrued Liability Covered by Assets		
Valuation Date	(1) Active/Inactive member contributions	(2) Retirees and beneficiaries	(3) Active/Inactive members (Employer financed)	Actuarial value of assets	(1)	(2)	(3)
1/1/2013	$108,978,697	$106,973,144	$169,344,232	$341,515,023	100	100	74
1/1/2015	111,917,112	142,699,213	188,871,032	435,841,439	100	100	96
1/1/2017	118,789,289	179,180,324	213,436,634	493,403,059	100	100	92
1/1/2018	120,629,588	204,979,899	225,234,253	523,135,101	100	100	88

V. Analysis of Financial Experience

	Year Ended December 31				
	2017	2016	2015	2014	2013
1. Unfunded actuarial accrued liability as of January 1	$18,003,188	$3,124,466	$7,645,918	$37,721,430	$43,781,050
2. Normal cost as of January 1	11,832,822	11,609,396	11,162,881	10,937,057	10,466,083
3. Employer and employee contributions during year	(12,368,747)	(13,390,164)	(16,561,659)	(20,978,411)	(20,137,363)
4. Interest					
(a) For whole year on (1) + (2)	2,237,700	1,141,874	1,457,682	3,892,679	4,339,771
(b) For half year on (3)	(419,625)	(469,220)	(580,356)	(758,522)	(728,111)
(c) Total interest	$1,818,075	$672,654	$877,326	$3,134,157	$3,611,660
5. Expected unfunded actuarial accrued liability	19,285,338	2,016,352	3,124,466	30,814,233	37,721,430
6. Actual unfunded actuarial accrued liability	27,708,639	18,003,188		7,645,918	
7. (Gain) or loss for the year: (6) – (5)	$8,423,301	$15,986,836		$(23,168,315)	
8. Investment (gain) or loss	$736,876	$9,784,085		$(20,090,768)	
9. (Gains) or losses from sources other than investments	(290,925)	(10,480,258)		(7,998,282)	
10. Plan changes	- -	2,050,275		- -	
11. Assumption changes	7,977,350	14,632,734		4,920,735	

VI. Summary of Plan Provisions

The following summarizes the major provisions of Chapter 32 of the Massachusetts General Laws.

Plan Year

January 1 – December 31

Retirement Benefits

Employees covered by the Contributory Retirement Law are classified into one of four groups depending on job classification. Group 1 comprises most positions in state and local government. It is the general category of public employees. Group 4 comprises mainly police and firefighters. Group 2 is for other specified hazardous occupations. (Officers and inspectors of the State Police are classified as Group 3.)

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 the number of years and full months of creditable service at the time of retirement and multiplied by a percentage according to the following table based on the age of the member at retirement:

	Age Last Birthday at Date of Retirement		
Percent	**Group 1**	**Group 2**	**Group 4**
2.5	65 or over	60 or over	55 or over
2.4	64	59	54
2.3	63	58	53
2.2	62	57	52
2.1	61	56	51
2.0	60	55	50
1.9	59	- -	49
1.8	58	- -	48
1.7	57	- -	47
1.6	56	- -	46
1.5	55	- -	45

A member's final three-year average salary is defined as the greater of the highest consecutive three-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last three years of creditable service prior to retirement.

For employees hired on April 2, 2012 or later, the annual amount of the retirement allowance is based on the member's final five-year average salary multiplied by the number of years and full months of creditable service at the time of retirement and multiplied by a percentage according to the following tables based on the age and years of creditable service of the member at retirement:

For members with less than 30 years of creditable service:

Age Last Birthday at Date of Retirement

Percent	Group 1	Group 2	Group 4
2.50	67 or over	62 or over	57 or over
2.35	66	61	56
2.20	65	60	55
2.05	64	59	54
1.90	63	58	53
1.75	62	57	52
1.60	61	56	51
1.45	60	55	50

For members with 30 years of creditable service or greater:

Age Last Birthday at Date of Retirement

Percent	Group 1	Group 2	Group 4
2.500	67 or over	62 or over	57 or over
2.375	66	61	56
2.250	65	60	55
2.125	64	59	54
2.000	63	58	53
1.875	62	57	52
1.750	61	56	51
1.625	60	55	50

A member's final five-year average salary is defined as the greater of the highest consecutive five-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last five years of creditable service prior to retirement.

For employees who became members after January 1, 2011, regular compensation is limited to 64% of the federal limit found in 26 U.S.C. 401(a)(17). In addition, regular compensation for members who retire after April 2, 2012 will be limited to prohibit "spiking" of a member's salary to increase the retirement benefit.

For all employees, the maximum annual amount of the retirement allowance is 80 percent of the member's final three-year average salary. Any member who is a veteran also receives an additional yearly retirement allowance of $15 per year of creditable service, not exceeding $300. The veteran allowance is paid in addition to the 80 percent maximum.

Employee Contributions

Employees hired before January 1, 1975 contribute 5 percent of their salary; employees hired after January 1, 1975 and before December 31, 1983 contribute 7 percent; employees hired after January 1, 1984 contribute 8 percent; employees hired after July 1, 1996 contribute 9 percent.

In addition, employees hired after December 31, 1978 contribute an additional 2 percent of salary in excess of $30,000.

Employees hired after 1983 who leave with less than five years of credited service receive no interest on their contributions, and employees who leave with five but less than ten years receive one-half the rate of regular interest otherwise payable. Commencing July 1, 2010, employees who voluntarily terminate employment, who have less than 10 years of service and request a refund, receive 3% interest on their contributions.

Employees in Group 1 hired on or after April 2, 2012 with 30 years of creditable service or greater will pay a base contribution rate of 6%.

Retirement Benefits (Superannuation)

Members of Group 1, 2 or 4 hired prior to April 2, 2012 may retire upon the attainment of age 55. For retirement at ages below 55, twenty years of creditable service is required.

Members hired prior to April 2, 2012 who terminate before age 55 with ten or more years of creditable service are eligible for a retirement allowance upon the attainment of age 55 (provided they have not withdrawn their accumulated deductions from the Annuity Savings Fund of the System).

Members of Group 1 hired April 2, 2012 or later may retire upon the attainment of age 60. Members of Group 2 or 4 hired April 2, 2012 or later may retire upon the attainment of age 55. Members of Group 4 may retire upon attainment of age 50 with ten years of creditable service.

Members hired April 2, 2012 or later who terminate before age 55 (60 for members of Group 1) with ten or more years of creditable service are eligible for a retirement allowance upon the attainment of age 55 (60 for members of Group 1) provided they have not withdrawn their accumulated deductions from the Annuity Savings Fund of the System.

Ordinary Disability Benefits

A member who is unable to perform his job due to a non-occupational disability will receive a retirement allowance if he has ten or more years of creditable service and has not reached age 55. The annual amount of such allowance shall be determined as if the member retired for superannuation at age 55 (age 60 for Group 1 members hired on or after April 2, 2012), based on the amount of creditable service at the date of disability. For veterans, there is a minimum benefit of 50 percent of the member's most recent year's pay plus an annuity based on his or her own contributions.

Accidental Disability Benefit

For a job-connected disability, the benefit is 72 percent of the member's most recent annual pay plus an annuity based on his own contributions, plus additional amounts for surviving children. Benefits are capped at 75 percent of annual rate of regular compensation for employees who become members after January 1, 1988.

Death Benefits

In general, the beneficiary of an employee who dies in active service will receive a refund of the employee's own contributions. Alternatively, if the employee were eligible to retire on the date of his or her death, a spouse's benefit will be paid equal to the amount the employee would have received under Option C. The surviving spouse of a member who dies with two or more years of credited service has the option of a refund of the employee's contributions or a monthly benefit regardless of eligibility to retire, if they were married for at least one year. The allowance provided for under this option shall not be less than $500 per month, and there are additional amounts for surviving children.

If an employee's death is job-connected, the spouse will receive 72 percent of the member's most recent annual pay in addition to a refund of the member's accumulated deductions, plus additional amounts for surviving children. However, in accordance with Section 100 of Chapter 32, the surviving spouse of a police officer, firefighter or corrections officer is killed in the line of duty will be eligible to receive an annual benefit equal to the maximum salary held by the member at the time of death, and will be eligible for pay increases that would have been awarded to the officer if they were still living.

Upon the death of a job-connected disability retiree who retired prior to November 7, 1996 and could not elect an Option C benefit, a surviving spouse will receive an allowance of $9,000 if the member dies for a reason unrelated to the cause of disability.

"Heart and Lung Law" and Cancer Presumption

Any case of hypertension or heart disease resulting in total or partial disability or death to a uniformed fireman or permanent member of a police department, or certain employees of a county correctional facility is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. Any case of disease of the lungs or respiratory tract resulting in total disability or death to a uniformed fireman is presumed to have been suffered in the line of duty, unless the contrary this shown by competent evidence. There is an additional presumption for uniformed firemen that certain types of cancer are job-related if onset occurs while actively employed or within five years of retirement.

Options

Members may elect to receive a full retirement allowance payable for life under Option A. Under Option B a member may elect to receive a lower monthly allowance in exchange for a guarantee that at the time of death contributions not expended for annuity payments will be refunded to his beneficiary. Option C allows the member to take a lesser retirement allowance in exchange for providing a survivor with two-thirds of the lesser amount. Option C pensioners will have their benefits converted from a reduced to a full retirement if the beneficiary predeceases the retiree.

Post-Retirement Benefits

The Board has adopted the provisions of Section 51 Chapter 127 of the Acts of 1999, which provide that the Retirement Board may approve an annual COLA in excess of the Consumer Price Index but not to exceed a 3% COLA on the first $13,000 of a retirement allowance.

Changes in Plan Provisions

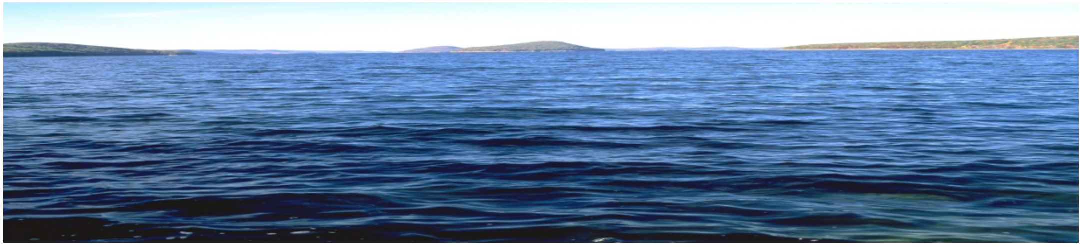
None.

VII. Schedules of Funding Progress *

Actuarial Valuation Date		Actuarial Value of Assets (A)		Actuarial Accrued Liability (AAL) Entry Age (B)		Unfunded AAL (UAAL) (B-A)	Funded Ratio (A/B)		Covered Payroll (C)	UAAL as a Percentage of Covered Payroll ((B-A)/C)
01/01/18	$	523,135,101	$	550,843,740	$	27,708,639	94.97%	$	92,975,107	29.8%
01/01/17		493,403,059		511,406,247		18,003,188	96.48%		89,755,173	20.1%
01/01/15		435,841,439		443,487,357		7,645,918	98.28%		88,646,339	8.6%
01/01/13		341,515,023		385,296,073		43,781,050	88.64%		84,829,033	51.6%
01/01/11		299,331,000		341,521,000		42,190,000	87.65%		82,870,000	50.9%
01/01/10		276,270,000		319,876,000		43,606,000	86.37%		81,962,000	53.2%
01/01/09		222,477,000		301,652,000		79,175,000	73.75%		82,314,000	96.2%
01/01/07		211,716,000		255,962,000		44,246,000	82.71%		75,444,000	58.6%

*Data is being accumulated each full valuation year to present 10 years of the reported information

Please refer to the ten-year schedule of employer contributions (page 34) included in the required supplementary information for a comparison between actuarially determined contributions and contributions made.



Statistical Section

Statistical Section

This part of the Massachusetts Water Resources Authority Employees' Retirement System's Comprehensive Annual Financial Report presents information as a context for understanding what the information in the financial statements, note disclosures, and required supplementary information says about the Massachusetts Water Resources Authority Employees' Retirement System's overall financial health

Schedule of Additions to Fiduciary Net Position by Source (a)

Year		Plan Member Contributions	Employer Contributions	Investment Income (b)	Other (c)	Total
2008	$	7,459,620	15,203,860	(59,887,525)	771,165	(36,452,880)
2009		7,523,693	5,471,172	46,018,069	761,026	59,773,961
2010		7,505,077	8,150,055	34,708,095	806,485	51,169,712
2011		7,544,647	5,511,524	2,314,175	935,138	16,305,484
2012		7,855,760	12,341,893	38,698,894	938,285	59,834,832
2013		7,948,445	12,447,338	56,951,114	1,018,293	78,365,190
2014		8,245,328	12,645,474	20,483,877	1,123,092	42,497,771
2015		8,402,138	8,159,521	(530,090)	1,331,481	17,363,050
2016		8,757,540	4,632,624	24,182,878	1,422,400	38,995,442
2017		9,091,378	3,277,369	70,516,672	1,747,392	84,632,811

(a) Information derived from audited financial statements (2012 - 2017) and unaudited Annual Statement of Financial Condition filed with PERAC (2008 - 2011)

(b) Net of investment expenses

(c) Includes reimbursements and transfers of employees' contributions from other public pension systems

Schedule of Deductions from Fiduciary Net Position by Type (a)

Year		Benefits	Refunds	Sub-total	Administrative Expenses	Reimbursements and Transfers to Other Systems	Total
2008	$	6,537,868	703,883	7,241,751	432,485	471,861	8,146,097
2009		7,199,926	422,103	7,622,029	353,982	213,267	8,189,277
2010		8,115,183	315,600	8,430,784	386,282	202,076	9,019,142
2011		9,163,784	408,826	9,572,610	347,356	209,900	10,129,866
2012		10,279,649	223,082	10,502,731	383,802	244,310	11,130,843
2013		11,773,192	72,299	11,845,491	410,778	622,410	12,878,679
2014		13,614,473	262,148	13,876,621	407,574	209,900	14,494,095
2015		15,385,334	412,481	15,797,815	412,416	923,551	17,133,782
2016		17,052,150	270,000	17,322,150	426,054	229,502	17,977,706
2017		19,143,991	280,035	19,424,026	446,465	545,708	20,416,199

(a) Information derived from audited financial statements (2012 - 2017) and unaudited Annual Statement of Financial Condition filed with PERAC (2008 - 2011)

Schedule of Total Change in Fiduciary Net Position (a)

Year	Total Change in Fiduciary Net Position
2008	$ (44,598,977)
2009	51,584,683
2010	42,150,570
2011	6,175,618
2012	48,703,989
2013	65,486,511
2014	28,003,676
2015	229,268
2016	21,017,736
2017	64,216,612

(a) Information derived from audited financial statements (2012 -2017) and unaudited Annual Statement of Financial Condition filed with PERAC (2008 - 2011)

Schedule of Benefit Expenses by Type (a)

Year ended December 31	Regular* ($)	Disability* ($)	Beneficiary* ($)	Annuities ($)	Total ($)
2008	$ 3,811,499	1,105,087	257,551	1,363,731	6,537,868
2009	4,041,747	1,280,429	357,412	1,520,338	7,199,926
2010	4,507,903	1,398,180	453,569	1,755,531	8,115,183
2011	4,971,773	1,613,513	600,961	1,977,537	9,163,784
2012	5,626,480	1,709,728	637,994	2,305,447	10,279,649
2013	6,681,557	1,768,654	685,929	2,637,052	11,773,192
2014	7,817,352	1,832,978	758,469	3,205,675	13,614,473
2015	8,682,348	2,092,721	897,682	3,712,583	15,385,334
2016	9,776,498	2,162,420	992,623	4,120,609	17,052,150
2017	11,277,050	2,203,053	1,037,932	4,625,956	19,143,991

(a) Source: MWRA ERS Staff

Schedule of Retired Members by Type of Benefit (b)(c)

	12/31/2017	12/31/2016
Superannuation		
Under $10,000	9	9
$10,000 - $19,999	74	77
$20,000 - $29,999	113	112
$30,000 - $39,999	85	75
$40,000 - $49,999	69	57
$50,000 - $59,999	31	29
$60,000 - $69,999	25	18
$70,000 - $79,999	18	17
$80,000 & over	17	11
Total	441	405
Ordinary Disability		
Under $10,000	1	1
$10,000 - $19,999	4	4
$20,000 - $29,999	3	3
$30,000 - $39,999	5	5
$40,000 - $49,999	0	0
$50,000 - $59,999	1	1
$60,000 - $69,999	0	0
$70,000 - $79,999	0	0
$80,000 & over	0	0
Total	14	14
Accidental Disability		
Under $10,000	0	0
$10,000 - $19,999	1	0
$20,000 - $29,999	5	6
$30,000 - $39,999	15	17
$40,000 - $49,999	21	17
$50,000 - $59,999	8	8
$60,000 - $69,999	2	1
$70,000 - $79,999	0	0
$80,000 & over	0	0
Total	52	49
Beneficiaries		
Under $10,000	11	12
$10,000 - $19,999	33	29
$20,000 - $29,999	19	16
$30,000 - $39,999	8	6
$40,000 - $49,999	4	4
$50,000 - $59,999	0	0
$60,000 - $69,999	0	0
$70,000 - $79,999	0	1
$80,000 & over	0	0
Total	75	68
Total Retired Members		
Under $10,000	21	22
$10,000 - $19,999	112	110
$20,000 - $29,999	140	137
$30,000 - $39,999	113	103
$40,000 - $49,999	94	78
$50,000 - $59,999	40	38
$60,000 - $69,999	27	19
$70,000 - $79,999	18	18
$80,000 & over	17	11
Total	582	536

(b) Source: Segal Consulting

(c) This table provides for the most comprehensive average benefit payment data available.

Schedule of Retired Members by Years of Credited Service

	2017			2016		
Years of Credited Service	Average Monthly Benefit ($)	Final Average Salary ($)	Number of Retired Members	Average Monthly Benefit ($)	Final Average Salary ($)	Number of Retired Members
0 - 5	1,777	40,642	9	1,910	42,929	8
5 - 10	2,070	45,140	13	2,042	45,140	13
10 - 15	1,805	59,673	156	1,792	59,542	152
15 - 20	2,340	63,383	125	2,363	63,389	119
20 - 25	3,009	73,207	115	2,960	72,292	109
25 - 30	3,939	81,378	105	3,906	80,907	90
30 - 35	4,980	85,309	39	4,706	82,395	27
35 - 40	6,123	101,886	15	5,816	97,648	13
40 - 45	5,393	88,480	4	5,368	88,480	4
45 - 50	4,441	67,556	1	4,441	67,556	1