

*In the opinion of Bond Counsel, under existing law and assuming continued compliance with the Internal Revenue Code of 1986, as amended, interest on the 2016 Bonds is not included in gross income for federal income tax purposes and is not an item of tax preference for the purpose of computing the alternative minimum tax imposed on individuals and corporations, although such interest will be taken into account in determining adjusted current earnings for the purpose of computing the alternative minimum tax imposed upon certain corporations. In the opinion of Bond Counsel, the 2016 Bonds, their transfer and the income therefrom, including any profit made on the sale thereof, are exempt from Massachusetts personal income taxes and the 2016 Bonds are exempt from Massachusetts personal property tax. See “Tax Exemption” herein.*



## MASSACHUSETTS WATER RESOURCES AUTHORITY

### \$104,260,000 General Revenue Refunding Bonds, 2016 Series D (Green Bonds)

**Dated:** Date of Initial Delivery

**Due:** As shown on the inside cover

The Massachusetts Water Resources Authority (the “Authority”) will issue its General Revenue Refunding Bonds, 2016 Series D (Green Bonds) (the “2016 Bonds”) as fully registered bonds in the name of Cede & Co., as nominee for The Depository Trust Company (“DTC”), New York, New York. Purchases of the 2016 Bonds will be made in book-entry form only, in the denominations of \$5,000 or any integral multiple thereof, and no physical delivery of the 2016 Bonds will be made to purchasers. So long as Cede & Co. is the registered owner of the 2016 Bonds, principal and interest on the 2016 Bonds are payable to DTC by U.S. Bank National Association, as Trustee. See “The 2016 Bonds – Book-Entry-Only System.”

The 2016 Bonds will bear interest at the fixed rates and mature in the years and in the principal amounts set forth on the inside cover hereof. Interest on the 2016 Bonds will accrue from their date of delivery. Interest on the 2016 Bonds will be payable on February 1 and August 1, commencing on February 1, 2017. The 2016 Bonds will be subject to optional and mandatory sinking fund redemption prior to maturity, as more fully described herein.

The 2016 Bonds will constitute general obligations of the Authority. In addition, the 2016 Bonds will be secured by a lien on and pledge of certain revenues and other moneys of the Authority, as described herein. Neither The Commonwealth of Massachusetts (the “Commonwealth”) nor any political subdivision thereof shall be obligated to pay the principal of, premium, if any, or interest on any 2016 Bond, and neither the faith and credit nor the taxing power of the Commonwealth or any political subdivision thereof is pledged to such payment. The Authority has no taxing power.

*The 2016 Bonds are offered when, as and if issued by the Authority and received by the Underwriters, subject to the approval of legality by McCarter & English, LLP, Boston, Massachusetts, Bond Counsel, and certain other conditions. Certain legal matters will be passed upon for the Authority by its Disclosure Counsel, Greenberg Traurig, LLP, Boston, Massachusetts, and for the Underwriters by their counsel Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., Boston, Massachusetts. Delivery of the 2016 Bonds to DTC or its custodial agent is expected in New York, New York on or about August 24, 2016.*

**J.P. Morgan   Barclays   BofA Merrill Lynch   Citigroup   Morgan Stanley**

**Goldman, Sachs & Co.   Jefferies   Ramirez & Co., Inc.   RBC Capital Markets   Wells Fargo Securities**

August 3, 2016

<sup>†</sup> See “Ratings” herein.

**\$104,260,000**  
**Massachusetts Water Resources Authority**  
**General Revenue Refunding Bonds, 2016 Series D (Green Bonds)**  
**Maturities, Amounts, Interest Rates, Yields and CUSIP<sup>†</sup> Numbers**

<u>Year</u> <u>(August 1)</u>	<u>Amount</u>	<u>Interest</u> <u>Rate</u>	<u>Yield</u>	<u>CUSIP<sup>†</sup></u>	<u>Year</u> <u>(August 1)</u>	<u>Amount</u>	<u>Interest</u> <u>Rate</u>	<u>Yield</u>	<u>CUSIP<sup>†</sup></u>
2024	\$ 835,000	5.00%	1.32%	576051QR0	2031	\$ 5,625,000	5.00%	1.91%*	576051QH2
2025	2,510,000	5.00	1.43	576051QB5	2032	5,645,000	5.00	1.96*	576051QJ8
2026	2,490,000	5.00	1.54	576051QC3	2033	12,075,000	5.00	2.01*	576051QK5
2027	2,320,000	5.00	1.67*	576051QD1	2034	6,690,000	5.00	2.06*	576051QL3
2028	390,000	5.00	1.75*	576051QE9	2035	7,025,000	5.00	2.11*	576051QM1
2029	1,755,000	5.00	1.81*	576051QF6	2036	7,380,000	5.00	2.16*	576051QN9
2030	7,320,000	5.00	1.86*	576051QG4	2037	7,750,000	5.00	2.19*	576051QP4

\$34,450,000 3.00% Term Bond Due August 1, 2042 to Yield 2.94%\* CUSIP Number: 576051QQ2<sup>†</sup>

\* Yield to first optional redemption date of August 1, 2026.

† CUSIP is a registered trademark of the American Bankers Association. CUSIP Global Services (CGS) is managed on behalf of the American Bankers Association by S&P Global Market Intelligence. Copyright © 2016 CUSIP Global Services. All rights reserved.

The CUSIP numbers have been assigned by an independent company not affiliated with the Authority and are included solely for the convenience of the holders of the 2016 Bonds. Neither the Authority nor the Trustee is responsible for the selection or uses of the CUSIP numbers, and no representation is made as to their correctness on the 2016 Bonds or as indicated above. The CUSIP numbers are subject to being changed after the issuance of the 2016 Bonds as a result of various subsequent actions including, but not limited to, a refunding in whole or in part of the 2016 Bonds as a result of the procurement of secondary market portfolio insurance or other similar enhancement by investors that is applicable to all or a portion of the 2016 Bonds.

The information set forth herein has been obtained from the Authority, DTC and other sources that are deemed to be reliable but, as to information from sources other than the Authority, it is not to be construed as a representation of the Authority. The information and expressions of opinion herein are subject to change without notice, and neither the delivery of this Official Statement nor any sale of the 2016 Bonds shall under any circumstances create any implication that there has been no change in the affairs of the Authority since the date hereof.

No dealer, broker, salesperson or other person has been authorized to give any information or to make any representation other than as contained in this Official Statement and, if given or made, such other information or representation must not be relied upon as having been authorized by the Authority. This Official Statement does not constitute an offer to sell or the solicitation of an offer to buy nor shall there be any sale of the 2016 Bonds by any person in any jurisdiction in which it is unlawful for such person to make such offer, solicitation or sale.

INFORMATION IN THIS OFFICIAL STATEMENT, INCLUDING THE APPENDICES, THAT HAS BEEN PROVIDED BY THE CONSULTING ENGINEER, HAS BEEN INCLUDED IN RELIANCE UPON CDM SMITH, INC. AS EXPERTS.

THIS OFFICIAL STATEMENT, INCLUDING THE APPENDICES, CONTAINS FORECASTS, PROJECTIONS AND ESTIMATES THAT ARE BASED ON CURRENT EXPECTATIONS OR ASSUMPTIONS. IF AND WHEN INCLUDED IN THIS OFFICIAL STATEMENT, THE WORDS "EXPECTS," "FORECASTS," "PROJECTS," "INTENDS," "ANTICIPATES," "ESTIMATES," "ASSUMES" AND ANALOGOUS EXPRESSIONS ARE INTENDED TO IDENTIFY FORWARD-LOOKING STATEMENTS. ANY SUCH STATEMENTS INHERENTLY ARE SUBJECT TO A VARIETY OF RISKS AND UNCERTAINTIES THAT COULD CAUSE ACTUAL RESULTS TO DIFFER MATERIALLY FROM THOSE THAT HAVE BEEN PROJECTED. SUCH RISKS AND UNCERTAINTIES INCLUDE, AMONG OTHERS, GENERAL ECONOMIC AND BUSINESS CONDITIONS, CHANGES IN POLITICAL, SOCIAL AND ECONOMIC CONDITIONS, REGULATORY INITIATIVES AND COMPLIANCE WITH GOVERNMENTAL REGULATIONS, LITIGATION AND VARIOUS OTHER EVENTS, CONDITIONS AND CIRCUMSTANCES, MANY OF WHICH ARE BEYOND THE CONTROL OF THE AUTHORITY. THESE FORWARD-LOOKING STATEMENTS SPEAK ONLY AS OF THE DATE OF THIS OFFICIAL STATEMENT. THE AUTHORITY DOES NOT PLAN TO ISSUE ANY UPDATE OR REVISION TO ANY FORWARD-LOOKING STATEMENT CONTAINED HEREIN TO REFLECT ANY CHANGE IN THE AUTHORITY'S EXPECTATIONS WITH REGARD THERETO OR ANY CHANGE IN EVENTS, CONDITIONS OR CIRCUMSTANCES ON WHICH ANY SUCH STATEMENT IS BASED, SUBJECT TO ITS CONTRACTUAL OBLIGATIONS OF CONTINUING DISCLOSURE AS DESCRIBED HEREIN.

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**MASSACHUSETTS WATER RESOURCES AUTHORITY**

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**Financial Advisor**

Public Financial Management, Inc.

**Bond Counsel**

McCarter & English, LLP

**Independent Accountants**

KPMG LLP

**Consulting Engineer**

CDM Smith Inc.

**Disclosure Counsel**

Greenberg Traurig, LLP

**Bond Trustee**

U.S. Bank National Association

**OFFICIAL STATEMENT**  
OF THE  
**MASSACHUSETTS WATER RESOURCES AUTHORITY**  
RELATING TO

**\$104,260,000 General Revenue Refunding Bonds, 2016 Series D (Green Bonds)**

*The following introductory statement is subject in all respects to more complete information contained elsewhere in this Official Statement. The order and placement of materials in this Official Statement, including the Appendices hereto, are not to be deemed to be a determination of relevance, materiality or relative importance, and this Official Statement, including the cover page, the inside cover page, and Appendices, should be considered in its entirety. All capitalized terms used in this Official Statement that are not otherwise defined herein shall have the meanings ascribed to them in Appendix C.*

**INTRODUCTION**

**Purpose.** This Official Statement provides certain information concerning the Massachusetts Water Resources Authority (the “Authority” or “MWRA”) in connection with the sale of \$104,260,000 aggregate principal amount of the Authority’s General Revenue Refunding Bonds, 2016 Series D (Green Bonds) (the “2016 Bonds”). The 2016 Bonds are to be issued under and secured by the Authority’s Amended and Restated General Revenue Bond Resolution, effective as of April 23, 2015 (as amended and supplemented, the “General Bond Resolution”). In addition, the 2016 Bonds will be issued and secured under the Authority’s Seventy-Third Supplemental Resolution, approved by the Authority by resolution adopted on June 29, 2016 (the “Supplemental Resolution” and collectively with the General Bond Resolution, the “General Resolution”). The 2016 Bonds will constitute valid and binding general obligations of the Authority and will be further secured by a pledge of certain revenues of the Authority in accordance with the terms of the General Resolution. See “Security for the 2016 Bonds – General,” “– Outstanding Indebtedness,” and “– Additional Indebtedness.” Terms used, and not otherwise defined, in this Official Statement are defined in Appendix C – “Summary of Certain Provisions of the General Resolution.”

The 2016 Bonds are secured on a parity basis with all other senior revenue Bonds issued under the General Resolution. The proceeds of the 2016 Bonds will be used to refund certain of the Authority’s Outstanding Bonds (the “Refunded Bonds”). See “Application of Bond Proceeds and Other Moneys,” “Plan of Refunding,” and Appendix E – “Table of Refunded Bonds.”

**The Authority.** The Authority, established by the Massachusetts Water Resources Authority Act, Chapter 372 of the Acts of 1984 of The Commonwealth of Massachusetts (as amended, the “Act”), is a body politic and corporate, a public instrumentality and an independent public authority of The Commonwealth of Massachusetts (the “Commonwealth”). In 1985, the Authority assumed possession and control from the Metropolitan District Commission, a department of the Commonwealth (the “MDC”) (which became part of the Department of Conservation and Recreation (the “DCR”) in July 2003), of a water distribution system (the “Waterworks System”) and a sewer system (the “Sewer System,” and collectively with the Waterworks System, the “Systems”), which provide wholesale services in service areas encompassing, in whole or in part, 61 communities located primarily in eastern Massachusetts, including most of the metropolitan Boston area. Fifty-one cities, towns and special purpose entities (collectively, “Local Bodies”) currently are authorized to receive water from the Waterworks System. Forty-three Local Bodies, included in the Act as originally adopted, connect their local sewer systems to the regional sewage collection and treatment facilities constituting the Sewer System. In addition, the Authority provides wholesale wastewater services to two communities in Central Massachusetts. Approximately 2.8 million people, or approximately 43% of the total population of the Commonwealth, live in the Authority’s service areas. See “The Authority and its Service Areas.”

**Rates and Charges.** The Authority's primary source of revenue is the wholesale rates and charges assessed to the Local Bodies. In Fiscal Year 2017 (July 1, 2016 through June 30, 2017), approximately 96.6% of the Authority's revenues are budgeted to be derived from such assessed rates and charges. One Local Body, the Boston Water and Sewer Commission (the "BWSC"), a public instrumentality of the Commonwealth providing retail water and sewer services within the City of Boston, is budgeted to account for approximately 31.0% of the Authority's combined water and sewer charges in Fiscal Year 2017. The obligation to pay the Authority's rates and charges for services rendered is a general obligation of each Local Body, supported by its full faith and credit and payable from all available revenue sources, including local retail user charges and, in the case of city and town Local Bodies ("Municipal Local Bodies") only, real and personal property taxes and financial aid distributed to such Municipal Local Bodies by the Commonwealth ("local aid"). No specific revenues of the Local Bodies, however, are pledged for the payment of the Authority's wholesale rates and charges. Since its inception, the Authority has collected 100% of its rates and charges within the Fiscal Year in which they were due.

The Authority is required by the Act to set its rates and charges at levels sufficient, together with other available revenues, to pay, among other things, its current expenses and its debt service, and is required by the General Resolution to provide debt service coverage at specified levels. In accordance with the Act, the Authority's rate-setting responsibility is exercised by its Board of Directors independent of the approval of any department, agency or other instrumentality of the Commonwealth or any other governmental body. The Authority's rate-setting is not subject to certain limitations imposed by the Massachusetts law, commonly known as "Proposition 2½," on the rate of growth of assessments by state and other governmental entities on municipalities. See "Local Bodies – Municipal Sources of Revenue."

From Fiscal Year 2013 through Fiscal Year 2017, the average annual increase in the Authority's assessed rates and charges was approximately 3.4%, with an approximate 3.3% increase in Fiscal Year 2017. See "Rates and Charges – Historical Rates and Charges" and "Management's Review of Operating Results – Fiscal Year 2017 Current Expense Budget." The Authority continues to believe that the economic and environmental benefits of an improved water and wastewater infrastructure help to maintain public support for its services and expects that these considerations, together with the statutory enforcement mechanisms available to it for collection of its rates and charges, will continue to assure that the Authority's revenue requirements are met. See "Rates and Charges – Future Rates and Charges" and "– Enforcement."

**The Capital Improvement Program.** In addition to its operating responsibilities, the Authority is responsible for rehabilitating, repairing and maintaining the Systems and for operating them in compliance with applicable environmental laws, including the requirements of the federal Safe Drinking Water Act (the "SDWA") and the federal Clean Water Act. Since its assumption of the ownership and operations of the Systems in 1985, the Authority has undertaken an extensive program of capital improvements to the Systems through the implementation of rolling capital improvement programs (the "CIP"). Capital expenditures since the Authority's inception through June 30, 2016 totaled more than \$8.1 billion. The Authority's most significant project to date, the Deer Island Wastewater Treatment Plant and related facilities (the "Deer Island Treatment Plant Project"), was completed at an approximate cost of \$3.8 billion. The Authority also has completed the construction of all facilities included in its CSO Control Plan (defined below) (collectively, with the Deer Island Treatment Plant Project, the "Boston Harbor Project"), at an approximate cost of \$899.0 million, as well as several large sewer interceptor projects. Significant completed capital improvements to the Waterworks System include the MetroWest Water Supply Tunnel, the Norumbega Covered Storage Reservoir, and the John J. Carroll Water Treatment Plant. The results of the Authority's efforts are demonstrated improvements to the environment as well as to the delivery of its services.

Prior to Fiscal Year 2014, much of the CIP responded to legally mandated projects. Of the approximate \$8.1 billion expended on capital projects through June 30, 2016, approximately 80% was for legally mandated projects. In particular, the CIP was developed in response to orders of the United States District Court for the District of Massachusetts (the "District Court") in the matter of *U.S. v. M.D.C. et al.*, No. 85-0489-RGS (the "Clean Water Act Case"), which governed the Boston Harbor Project, including the implementation of a long-term plan (the "CSO Control Plan") for control of combined sewer overflows (discharges into the Sewer System of combined wastewater and stormwater flows), as well as regulations promulgated under the SDWA. Commencing in Fiscal Year 2014 with the CSO Control Plan nearing completion, the primary focus of the CIP shifted to asset maintenance, long-term water redundancy, and other projects designed to upgrade and improve components of the



Systems identified in the Authority's master plan for the Systems, most recently updated in 2013 (the "Master Plan").

The Authority developed the Master Plan in order to assess Authority-wide needs, identify and prioritize projects to address those needs, and establish timeframes to undertake such projects that reflect appropriate fiscal constraints necessary for the Authority to continue to manage increases in its rates and charges. The Master Plan includes capital expenditures over a 40-year period. The Authority's current capital improvement program (the "FY17 CIP") for its Fiscal Year 2017 incorporates the highest priority projects identified in the Master Plan that have projected spending in the Fiscal Year 2014 to Fiscal Year 2018 timeframe. The FY17 CIP includes a five-year capital spending cap for the five Fiscal Years 2014 through 2018 of approximately \$618.7 million. For further information on the CIP, see "Capital Improvement Program" and "Environmental Regulation and Litigation."

**Designation of Green Bonds.** The Authority is issuing the 2016 Bonds as "Green Bonds" due to the adherence of the projects being refinanced through the issuance of the 2016 Bonds to the standards of the Clean Water Act and the SDWA. See Appendix F – "Description of Green Bonds Projects." The purpose of labeling the 2016 Bonds as Green Bonds is to allow investors to invest directly in bonds which finance environmentally beneficial projects. The projects being refinanced through the issuance of the 2016 Bonds have been completed and, accordingly, no further information with respect to such funded projects will be provided. Holders of Green Bonds do not assume any specific risk with respect to any of the funded projects.

**Appendices.** Attached hereto as Appendix A are the Authority's audited financial statements at June 30, 2015 and 2014 and for the Fiscal Years then ended. Attached hereto as Appendix B is the Consulting Engineer's Financial Feasibility Report, dated July 26, 2016 (the "July 2016 Report"), prepared by CDM Smith Inc., the Authority's consulting engineer (the "Consulting Engineer"), relating to certain financial matters and projections of the Authority, including the Authority's estimated future rates and charges for Fiscal Years 2018 through 2022. Attached hereto as Appendix C is a Summary of Certain Provisions of the General Resolution prepared by Bond Counsel to the Authority. Attached hereto as Appendix D is the proposed form of legal opinion of Bond Counsel. Attached hereto as Appendix E is a table of Refunded Bonds prepared by Bond Counsel to the Authority. Attached hereto as Appendix F is a Description of the Green Bonds Projects, which has been provided by the Authority.

**Documents.** Copies of the General Bond Resolution can be obtained from the Authority's website at [www.mwra.com](http://www.mwra.com).

## THE 2016 BONDS

The following is a summary of certain provisions of the 2016 Bonds. Reference is hereby made to the 2016 Bonds and the General Resolution, each in their entirety, for detailed provisions of the 2016 Bonds. For definitions of certain terms and additional detailed information relating to the 2016 Bonds, see Appendix C – "Summary of Certain Provisions of the General Resolution."

### GENERAL

The 2016 Bonds will be issued in the aggregate principal amount of \$104,260,000. The 2016 Bonds will be dated as of the date of their initial delivery and will mature in the years and in the principal amounts set forth on the inside cover of this Official Statement. The 2016 Bonds will be offered in Authorized Denominations of \$5,000 and integral multiples thereof.

Interest on the 2016 Bonds will be payable on February 1 and August 1, commencing February 1, 2017, at the interest rates set forth on the inside cover of this Official Statement. The record date for payment of interest on the 2016 Bonds is the 15<sup>th</sup> day of the calendar month preceding the date on which interest is to be paid. Interest will accrue on the basis of a 360-day year consisting of 12 months of 30 days each.

## REDEMPTION

**Mandatory Sinking Fund Redemption.** The 2016 Bonds maturing on August 1, 2042 shall be subject to mandatory sinking fund redemption and shall be redeemed by sinking fund installments on August 1 of each of the years and in the amounts set forth in the following table at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the date of redemption.

### 2016 BONDS DUE AUGUST 1, 2042

<u>Year</u>	<u>Sinking Fund Installment</u>
2038	\$8,060,000
2039	8,290,000
2040	8,530,000
2041	8,785,000
2042 <sup>†</sup>	785,000

<sup>†</sup> Final maturity.

**Optional Redemption.** The 2016 Bonds maturing on or before August 1, 2026 are not subject to redemption prior to maturity. The 2016 Bonds maturing after August 1, 2026 are subject to optional redemption prior to maturity, commencing on August 1, 2026, in whole or in part on any Business Day, at the option of the Authority and in such order of maturity and sinking fund installments within a maturity as may be determined by the Authority, at a redemption price of par plus accrued interest to the date of redemption.

**Notice of Redemption and Other Notices.** So long as DTC or its nominee is the Bondholder, the Authority and the Trustee will recognize DTC or its nominee as the Bondholder for all purposes, including notices and voting. Conveyance of notices and other communications by DTC to Direct Participants (hereinafter defined), by Direct Participants to Indirect Participants (hereinafter defined), and by Direct Participants and Indirect Participants to Beneficial Owners (hereinafter defined) will be governed by arrangements among them, subject to any statutory and regulatory requirements as may be in effect from time to time.

The Trustee shall give notice of redemption to the Bondholders at least once and not less than 30 days prior to the date fixed for redemption. Failure to mail notice to a particular Bondholder, or any defect in the notice to such Bondholder, shall not affect the redemption of any other Bond. So long as DTC or its nominee is the Bondholder, any failure on the part of DTC or failure on the part of a nominee of a Beneficial Owner (having received notice from a Direct Participant or otherwise) to notify the Beneficial Owner so affected, shall not affect the validity of the redemption.

Notice of optional redemption of any 2016 Bonds may and, if the Authority shall so instruct the Trustee, shall be given conditionally. If and to the extent that any conditions specified or referred to in a notice of redemption are not satisfied on or prior to the proposed redemption date and, if not satisfied, are not waived by the Authority, then such 2016 Bonds shall not be redeemed pursuant to such notice and shall remain outstanding in accordance with their terms.

**Purchase in Lieu of Redemption.** In the event that the Authority exercises its right to optionally redeem any 2016 Bonds, the Authority may purchase some or all of the 2016 Bonds called for redemption if it gives written notice to the Trustee that it wishes to purchase the principal amount of the series of 2016 Bonds specified in the notice, at a purchase price equal to the Redemption Price. On the date specified as the redemption date, the Authority shall cause to be furnished to the Trustee funds in an amount and at the time necessary to permit the Trustee to purchase such 2016 Bonds on the redemption date. Any such purchase of 2016 Bonds by the Authority shall at the option of the Authority, as designated in the written notice delivered to the Trustee, either be credited against principal or sinking fund installments due on such series of 2016 Bonds, and such 2016 Bonds so purchased shall be delivered to the Trustee for cancellation, or shall not be deemed to be a payment or redemption of the 2016 Bonds or any portion thereof and such purchase shall not operate to extinguish or discharge the indebtedness evidenced by such 2016 Bonds.

**Selection for Redemption.** In the event that less than all of the 2016 Bonds of any maturity are to be redeemed and for so long as the Book-Entry-Only System remains in effect for the 2016 Bonds, the portion of any 2016 Bond of a particular maturity to be redeemed shall be selected by DTC in such manner as DTC may determine. If the Book-Entry-Only System for the 2016 Bonds is no longer in effect, selection for redemption of less than all the 2016 Bonds of any maturity will be made by the Trustee by lot or in any other manner of selection the Trustee in its discretion shall deem appropriate and fair.

## **BOOK-ENTRY-ONLY SYSTEM**

DTC will act as securities depository for the 2016 Bonds. The 2016 Bonds will be issued as fully-registered securities registered in the name of Cede & Co. (DTC's partnership nominee) or such other name as may be requested by an authorized representative of DTC. One fully-registered 2016 Bond certificate will be issued for each maturity of the 2016 Bonds, each in the aggregate principal amount of such maturity, and will be deposited with DTC.

DTC, the world's largest securities depository, is a limited-purpose trust company organized under the New York Banking Law, a "banking organization" within the meaning of the New York Banking Law, a member of the Federal Reserve System, a "clearing corporation" within the meaning of the New York Uniform Commercial Code, and a "clearing agency" registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934. DTC holds and provides asset servicing for over 3.5 million issues of U.S. and non-U.S. equity issues, corporate and municipal debt issues, and money market instruments (from over 100 countries) that DTC's participants ("Direct Participants") deposit with DTC. DTC also facilitates the post-trade settlement among Direct Participants of sales and other securities transactions in deposited securities, through electronic computerized book-entry transfers and pledges between Direct Participants' accounts. This eliminates the need for physical movement of securities certificates. Direct Participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation ("DTCC"). DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, and clearing corporations that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly ("Indirect Participants"). DTC has a Standard & Poor's rating of AA+. The DTC Rules applicable to its Participants are on file with the Securities and Exchange Commission. More information about DTC can be found at [www.dtcc.com](http://www.dtcc.com).

Purchases of 2016 Bonds under the DTC system must be made by or through Direct Participants, which will receive a credit for the 2016 Bonds on DTC's records. The ownership interest of each actual purchaser of each Security ("Beneficial Owner") is in turn to be recorded on the Direct and Indirect Participants' records. Beneficial Owners will not receive written confirmation from DTC of their purchase. Beneficial Owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in the 2016 Bonds are to be accomplished by entries made on the books of Direct and Indirect Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in 2016 Bonds, except in the event that use of the book-entry system for the 2016 Bonds is discontinued.

To facilitate subsequent transfers, all 2016 Bonds deposited by Direct Participants with DTC are registered in the name of DTC's partnership nominee, Cede & Co., or such other name as may be requested by an authorized representative of DTC. The deposit of 2016 Bonds with DTC and their registration in the name of Cede & Co. or such other DTC nominee do not affect any change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the 2016 Bonds; DTC's records reflect only the identity of the Direct Participants to whose accounts such 2016 Bonds are credited, which may or may not be the Beneficial Owners. The Direct and Indirect Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time.

Redemption notices shall be sent to DTC. If less than all of the 2016 Bonds within a maturity are being redeemed, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in such maturity to be redeemed.

Neither DTC nor Cede & Co. (nor any other DTC nominee) will consent or vote with respect to 2016 Bonds unless authorized by a Direct Participant in accordance with DTC's MMI Procedures. Under its usual procedures, DTC mails an Omnibus Proxy to the Authority as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.'s consenting or voting rights to those Direct Participants to whose accounts 2016 Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Principal and interest payments on the 2016 Bonds will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC's practice is to credit Direct Participants' accounts upon DTC's receipt of funds and corresponding detail information from the Authority or the Trustee, on payable date in accordance with their respective holdings shown on DTC's records. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such Participant and not of DTC (nor its nominee), the Trustee, or the Authority, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of redemption proceeds, distributions, and dividend payments to Cede & Co. (or such other nominee as may be requested by an authorized representative of DTC) is the responsibility of the Authority or the Trustee, disbursement of such payments to Direct Participants will be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners will be the responsibility of Direct and Indirect Participants.

DTC may discontinue providing its services as depository with respect to the 2016 Bonds at any time by giving reasonable notice to the Authority or the Trustee. Under such circumstances, in the event that a successor depository is not obtained, 2016 Bond certificates are required to be printed and delivered.

The Authority may decide to discontinue use of the system of book-entry-only transfers through DTC (or a successor securities depository). In that event, 2016 Bond certificates will be printed and delivered to DTC.

The information contained in this section concerning DTC and DTC's book-entry system has been obtained from sources that the Authority believes to be reliable, but the Authority takes no responsibility for the accuracy thereof. Neither the Trustee nor the Authority will have any responsibility or obligation to the Direct Participants or the persons for whom they act as nominees with respect to the payments to the Direct Participants, the Indirect Participants or Beneficial Owners.

## **EXCHANGE AND TRANSFER**

If for any reason the Book-Entry-Only System is discontinued, the 2016 Bonds will be exchangeable and transferable on the registration books of the Authority at the designated corporate trust office of the Trustee in Authorized Denominations of \$5,000 and integral multiples thereof. Upon presentation and surrender of any 2016 Bond for transfer or exchange, the Trustee will authenticate and deliver in the name of the designated transferee or transferees or the registered owner, as appropriate, one or more new fully registered 2016 Bonds of the same maturity in any Authorized Denomination or Denominations. For every exchange or transfer of 2016 Bonds, the Authority or the Trustee may make a charge sufficient to reimburse it for any tax, fee or other governmental charge required to be paid with respect to such exchange or transfer. The Authority shall not be obligated to make any transfer or exchange of any 2016 Bonds during the 15-day period preceding an interest or principal payment date. Neither the Authority nor the Trustee shall be required to transfer or exchange the 2016 Bonds for a period of 15 days next preceding the mailing of any notice of redemption or to transfer or exchange any 2016 Bond called for redemption.

**APPLICATION OF BOND PROCEEDS AND OTHER MONEYS**

**GENERAL**

The proceeds of the 2016 Bonds are expected to be applied on the date of issue of the 2016 Bonds in the estimated amounts as follows (rounded to the nearest dollar):

**SOURCES OF FUNDS:**

Principal Amount of 2016 Bonds.....	\$104,260,000
Original Issue Premium.....	<u>19,065,852</u>
TOTAL.....	\$123,325,852

**USE OF FUNDS:**

Deposit to Refunding Trust Fund.....	\$122,376,240
Costs of Issuance (including Underwriters' discount) .....	<u>949,612</u>
TOTAL .....	\$123,325,852

**PLAN OF REFUNDING**

A portion of the proceeds of the 2016 Bonds will be deposited into the Refunding Trust Fund established under a Refunding Trust Agreement (the "Refunding Trust Agreement") to be entered into between the Authority and U.S. Bank National Association, as trustee for the Refunded Bonds. Such amounts will be invested in Defeasance Obligations and will be applied to pay scheduled principal of and interest on the Refunded Bonds, if any, prior to, and the redemption prices of plus accrued interest on all Refunded Bonds on, their applicable redemption dates, as set forth in Appendix E. All such refundings are contingent upon delivery of the 2016 Bonds.

**SECURITY FOR THE 2016 BONDS**

**GENERAL**

The following summary of the security for the 2016 Bonds is qualified in its entirety and reference is hereby made to Appendix C hereto and to the General Resolution, which set forth in further detail provisions relating to the security for the 2016 Bonds. For definitions of certain capitalized terms used but not defined herein, see Appendix C - "Summary of Certain Provisions of the General Resolution."

The 2016 Bonds constitute valid and binding general obligations of the Authority and the full faith and credit of the Authority is pledged to the payment of the principal and redemption price of and interest on the 2016 Bonds. The Authority is subject to suit, but its property is not generally subject to attachment or levy by execution to satisfy a judgment on the 2016 Bonds. The Authority has no taxing power.

Neither the Commonwealth nor any political subdivision thereof shall be obligated to pay the principal of or premium or interest on any 2016 Bond, and neither the faith and credit nor taxing power of the Commonwealth or of any political subdivision thereof is pledged to such payment.

The General Resolution provides for the issuance of senior revenue bonds and subordinated revenue bonds thereunder. The Authority may issue additional bonds on a parity with the 2016 Bonds and the other senior revenue bonds issued to date (collectively, "Bonds") upon the satisfaction of certain conditions. See "Security for the 2016 Bonds – Outstanding Indebtedness," and "– Additional Indebtedness," and Appendix C – "Summary of Certain Provisions of the General Resolution – Additional Indebtedness," "– Conditions Precedent to Delivery of a Series of Bonds," and "– Conditions Precedent to Delivery of a Series of Parity or Senior Secured Bonds." All Bonds are equally and ratably secured under the provisions of the General Resolution and by the Funds and Accounts established thereunder, and all Bonds will be on parity with the 2016 Bonds. See "Debt Service Reserve Fund" below.

The General Resolution also permits the issuance of Subordinated Bonds which are referred to herein, together with the Bonds, as “Secured Bonds.” Subordinated Bonds are secured by a pledge of the Revenues of the Authority subordinate to the pledge securing Bonds (only the interest on CP Notes, which constitute Subordinated Bonds, is secured by the subordinated lien on Revenues). In the event of any Event of Default under the General Resolution, so long as there are any Bonds Outstanding, directions to the Trustee with respect to remedies shall be given by a majority of the holders of the Outstanding Bonds, excluding the holders of the Subordinated Bonds. See Appendix C – “Summary of Certain Provisions of the General Resolution – Events of Default,” “– Proceedings Brought by Trustee,” and “– Restrictions on Action by Holders of Secured Bonds.”

The Act limits the total amount of the Authority’s unrefunded bonds and notes that may be Outstanding at any time. See “Financial Operations – Debt Limitation.” For a table showing the debt service on Outstanding Secured Bonds, see “Financial Operations – Outstanding and Proposed Indebtedness.”

## **NET REVENUE PLEDGE**

In the General Resolution, the Authority pledges as security for Bonds, including the 2016 Bonds, (i) its Revenues, (ii) all moneys or securities held in any Fund or Account established under the General Resolution (except the Operating Fund, the Note Payment Fund, the Rebate Fund and any Subordinated Debt Service Reserve Fund) together with all investment earnings thereon (except to the extent such earnings are required to be deposited into the Rebate Fund), and (iii) all other moneys and securities to be received by the Authority or by any Fiduciary pursuant to the General Resolution. In the General Resolution, the Authority further pledges as security for the Subordinated Bonds the property described in clauses (i) through (iii) of the preceding sentence (except monies or securities in the Debt Service Fund and the Debt Service Reserve Fund), subject to the prior pledge for the payment of Bonds described in the preceding sentence. Such pledges are subject to the provisions of the General Resolution regarding the application of Revenues and the other moneys pledged as security for Secured Bonds. For the definition of Revenues see Appendix C – “Summary of Certain Provisions of the General Resolution.”

The General Resolution provides that the Authority shall promptly cause all Revenues received to be deposited in the Revenue Fund held by the Trustee and that prior to application to the Debt Service Fund, the Subordinated Debt Service Fund and the other Funds and Accounts established under the General Resolution, the Revenues on deposit in the Revenue Fund are to be applied to the Authority’s expenses of maintaining, repairing and operating the Systems and engaging in other activities authorized by the Act.

The General Resolution provides that the funds on deposit in the Revenue Fund be transferred by the Trustee on the last Business Day of each month to the following funds and accounts in the following order:

*First*, to the Operating Fund, an amount necessary to make the amount on deposit therein equal to the Operating Expenses for the next succeeding three months as shown in the Operating Budget of the Authority on file with the Trustee.

*Second*, to the Debt Service Fund, the amounts necessary on a pro rata basis (i) to make up any deficiency in any Subaccount resulting from an increase in the applicable interest rate on any Variable Rate Bonds over the rate assumed in calculating the amount required for a prior deposit pursuant to the General Resolution, (ii) to increase the amount on deposit in each Subaccount of the Interest Account to equal interest included in Adjusted Debt Service next coming due on Outstanding Bonds of the applicable Series accrued and unpaid and to accrue to and including the last day of the next succeeding month after taking into account any available moneys in the corresponding Subaccount of the Capitalized Interest Account, (iii) to increase the amount on deposit in each Subaccount of the Principal Account to equal that portion of the Principal Installment included in Adjusted Debt Service next coming due (within twelve months) on Outstanding Bonds of the applicable Series accrued and unpaid and to accrue to and including the last day of the next succeeding month, (iv) to increase the amount on deposit in each Subaccount of the Redemption Account to equal the Redemption Price of Outstanding Bonds of the applicable Series then called for redemption (other than Sinking Fund Installments) as of any date on or prior to the last day of the next succeeding month, and (v) on a pro rata basis to each Subaccount of the Interest Account established with respect to regularly scheduled payments

under interest rate swap agreements or other hedge agreements (“regularly scheduled swap payments”) relating to a Series of Bonds, the amount (if any) necessary to increase the amount on deposit in each such Subaccount so that it equals that portion of the regularly scheduled swap payments next coming due with respect to such Series of Bonds accrued and unpaid and to accrue to and including the last day of the next succeeding month.

*Third*, to the Subordinated Debt Service Fund, the amounts with respect to Subordinated Bonds determined in the same manner as the amounts in the Debt Service Fund set forth in the preceding paragraph with respect to Bonds.

*Fourth*, to the Debt Service Reserve Fund, to the Common Account therein one-twelfth (1/12) of the amount, if any, necessary to increase the amount on deposit in such Account, determined as of the first day of the Fiscal Year, to an amount equal to the Debt Service Reserve Fund Requirement (provided that no such deposit shall be required in a Fiscal Year following the funding of the Common Account in connection with the issuance of a Series of Bonds, and (ii) the deposit required by any Supplemental Resolution to any Special Account.

*Fifth*, to the Subordinated Debt Service Reserve Fund, (i) an amount necessary to increase the amount on deposit in each Series Subaccount of the Common Account to equal the level required by any Supplemental Resolution, and (ii) the deposit required by any Supplemental Resolution to any Special Account.

*Sixth*, to the Commonwealth Obligation Fund, an amount equal to the amount of Commonwealth Obligations payable during the next succeeding month.

*Seventh*, to the Rebate Fund, the amount of the Rebate Fund Requirement, if any, determined in accordance with the applicable Supplemental Resolution.

Each fund and account must be funded from Revenues to the amount required under the General Resolution before Revenues are transferred to funds and accounts lower in the flow of funds.

On each December 31 and June 30 or, if such day is not a Business Day, on the next preceding Business Day, the Trustee is required under the General Resolution to transfer funds in the Revenue Fund to the Operating Reserve Fund, the Insurance Reserve Fund, the Renewal and Replacement Reserve Fund and the Water Pollution Abatement Fund in the amounts specified in the General Resolution, then to the Revolving Fund, as directed by the Authority, and the remainder to the General Fund except to the extent that the Authority directs that the remainder be retained in the Revenue Fund.

See Appendix C – “Summary of Certain Provisions of the General Resolution – Flow of Funds from the Revenue Fund” for a more detailed explanation of the flow of funds.

## **COVERAGE COVENANTS**

Under the Act and the General Resolution, the Authority is required to meet the following three covenants with respect to Rates and Charges (collectively, the “Coverage Covenants”).

**Rate Covenant.** Pursuant to the General Resolution, and as required by the Act, the Authority covenants that for each Fiscal Year it will maintain Revenues sufficient to pay Current Expenses, debt service on Indebtedness, required deposits to reserves, costs of maintenance, replacement or improvement of the Systems to be funded as Current Expenses, and all amounts which the Authority may be obligated to pay by any law or contract (the “Rate Covenant”).

**Coverage Ratio Covenants.** In addition to the Rate Covenant, the Authority is required under the General Resolution to fix and adjust Rates and Charges sufficient to provide Revenues Available for Bond Debt Service in each Fiscal Year in an amount (i) at least equal to debt service for such Fiscal Year on all Outstanding Bonds (which

term excludes Subordinated Bonds) multiplied by the Primary Bond Coverage Ratio of 1.2 (the “Primary Bond Coverage Requirement”), and (ii) so long as any Parity Subordinated Bonds shall be Outstanding, for any 12-month period, at least equal to (a) debt service during such 12-month period on all Outstanding Bonds plus debt service during such 12-month period for all Outstanding Parity Subordinated Bonds (b) multiplied by the Secured Bond Coverage Ratio of 1.1 (the “Secured Bond Coverage Ratio”).

The Primary Bond Coverage Ratio may be adjusted by the Authority provided that such adjustment will not adversely affect the then current ratings, if any, assigned to any Series of Outstanding Secured Bonds by each Rating Agency. In any event, the Primary Bond Coverage Ratio shall not be less than 1.1. See Appendix C – “Summary of Certain Provisions of the General Resolution.”

In addition, the Authority may provide for additional subordinated bond coverage requirements in supplemental resolutions authorizing the issuance of Subordinated Bonds (“Subordinated Bond Coverage Requirements”). In such event, the Authority shall also fix and adjust Rates and Charges sufficient to provide Revenues Available for Subordinated Debt Service in each Fiscal Year at least equal to the Subordinated Bond Coverage Requirement. At this time, there is no Subordinated Bond Coverage Requirement in effect in addition to the coverage requirements described in the preceding two paragraphs.

**Covenant as to Establishment of Rates; Failure to Comply with Covenants.** Under the General Resolution, the Authority covenants to adopt its Rates and Charges strictly in accordance with the Act as in effect on the original effective date of the General Revenue Bond Resolution (*i.e.*, January 24, 1990), which establishment shall be conclusive and final and not subject to supervision or regulation by the Commonwealth or any of its political subdivisions, at a level sufficient to satisfy the Coverage Covenants.

If in any Fiscal Year the Authority shall not comply with the Coverage Covenants, then the Authority shall not be deemed to be in default under the General Resolution so long as it shall specify to the Trustee the corrective steps that it has taken to ensure compliance with the Coverage Covenants for the then current Fiscal Year; retain the Consulting Engineer or a Rate Consultant to review the adequacy of the Authority’s charges with respect to the Systems and to recommend changes necessary for the Authority to be in compliance with the Coverage Covenants; and use its best efforts to effect such changes as recommended by the Consulting Engineer or Rate Consultant. See Appendix C – “Summary of Certain Provisions of the General Resolution – Covenants of the Authority – Covenant as to Rates and Charges; Debt Service Coverage Ratio.”

**Operating Reserve Fund and Rate Stabilization Fund Transfers.** The Authority may include moneys transferred from the Operating Reserve Fund and the Rate Stabilization Fund as Revenues Available for Bond Debt Service in meeting the Coverage Covenants, subject to certain limitations. See the definition of “Revenues Available for Bond Debt Service,” “Operating Reserve Fund,” and “Rate Stabilization Fund” in Appendix C – “Summary of Certain Provisions of the General Resolution.”

## **DEBT SERVICE RESERVE FUND**

The General Resolution establishes a Debt Service Reserve Fund to be funded in an amount that equals the Debt Service Reserve Fund Requirement. The Debt Service Reserve Fund Requirement is an amount, calculated as of the first day in each Fiscal Year or the date of issuance of a Series of Bonds, equal to the least of (i) 50% of the maximum amount of Adjusted Debt Service due in any succeeding Fiscal Year on all Bonds Outstanding on such date, (ii) 10% of the original net proceeds of such Bonds, (iii) 125% of the average annual Debt Service on such Bonds, or (iv) the maximum amount of Debt Service due on such Bonds in any succeeding Fiscal Year. The Debt Service Reserve Fund Requirement, after giving effect to the issuance of the 2016 Bonds, is approximately \$147.4 million. See Appendix C – “Summary of Certain Provisions of the General Resolution.”

Moneys in the Debt Service Reserve Fund are available for the payment of principal of and premium and interest on all Bonds, but not Subordinated Bonds, equally and ratably. See “Financial Operations – Outstanding and Proposed Indebtedness” for a table setting forth the debt service requirements on the Authority’s Outstanding Bonds and Subordinated Bonds prior to the issuance of the 2016 Bonds. In the event that moneys are withdrawn from the Debt Service Reserve Fund, such withdrawal shall be replenished as nearly as practicable in 12 equal monthly



installments commencing in the Fiscal Year following such withdrawal. See Appendix C – “Summary of Certain Provisions of the General Resolution – Flow of Funds from the Revenue Fund.”

## **OTHER RESERVES**

The General Resolution also establishes an Operating Reserve Fund, an Insurance Reserve Fund and a Renewal and Replacement Reserve Fund. The annual requirement for each such reserve is funded in two installments on each December 31 and June 30. Under certain circumstances, moneys on deposit in each of these reserves are available to pay debt service on Secured Bonds. Additionally, other reserves and funds established under the General Resolution are generally available, with certain exceptions, to pay debt service on Secured Bonds in the event Revenues are insufficient. See Appendix C – “Summary of Certain Provisions of the General Resolution – Debt Service Fund,” “– Subordinated Debt Service Fund,” “– Priority of Funds in the Event of Debt Service Fund Shortfall” and “– Priority of Funds in the Event of Subordinated Debt Service Fund Shortfall.”

**Operating Reserve Fund.** The Operating Reserve Fund is funded from Revenues in the amount of the Operating Reserve Fund Requirement which must be at least one-sixth (1/6th) of the annual Operating Expenses set forth in the Operating Budget. Moneys in the Operating Reserve Fund may be transferred to the Operating Fund for the payment of Operating Expenses upon delivery of a Certificate of an Authorized Representative of the Authority. See Appendix C – “Summary of Certain Provisions of the General Resolution – Operating Reserve Fund.”

**Insurance Reserve Fund.** The Insurance Reserve Fund is funded from Revenues in the amount of the Insurance Reserve Fund Requirement. Moneys in the Insurance Reserve Fund may be applied by the Authority in the same manner as insurance proceeds, as provided in the General Resolution. See Appendix C – “Summary of Certain Provisions of the General Resolution – Insurance Reserve Fund.”

**Renewal and Replacement Reserve Fund.** The Renewal and Replacement Reserve Fund is funded from Revenues in the amount of the Renewal and Replacement Reserve Fund Requirement. Moneys in the Renewal and Replacement Reserve Fund shall be applied to fund emergency repairs and replacements and other expenditures for repairs and replacements not provided for in the Operating Budget and the Capital Budget. See Appendix C – “Summary of Certain Provisions of the General Resolution – Renewal and Replacement Reserve Fund.”

The adequacy of each of the Operating Reserve Fund Requirement, the Insurance Reserve Fund Requirement and the Renewal and Replacement Reserve Fund Requirement is reviewed annually by the Authority. The adequacy of Operating Reserve Fund Requirement and the Renewal and Replacement Reserve Fund Requirement also is reviewed every third year by the Consulting Engineer and the adequacy of the Insurance Reserve Fund Requirement is reviewed every third year by the Consulting Engineer or an insurance consultant. The adequacy of the funding requirements have been confirmed for the Insurance Reserve Fund by the Authority’s insurance consultant in a report dated February 2014, and for the Operating Reserve Fund and the Renewal and Replacement Reserve Fund by the Consulting Engineer in its most recent triennial report dated October 2014 with respect to the Systems, prepared and delivered in accordance with the General Resolution.

Appendix C – “Summary of Certain Provisions of the General Resolution.”

## **OUTSTANDING INDEBTEDNESS**

Upon the issuance of the 2016 Bonds, the Authority will have Outstanding approximately \$3.2 billion of Bonds, \$980.1 million of Subordinated Bonds issued to the Massachusetts Clean Water Trust (“SRF Bonds”), \$902.7 million of Multi-Modal Subordinated General Revenue Bonds and Subordinated General Revenue Bonds, and a \$100 million revolving loan note (which, together with the Authority Trust Obligations, constitute Subordinated Bonds), and \$49 million of tax-exempt commercial paper notes (the “CP Notes”), which CP Notes constitute Subordinated Parity Bond Anticipation Notes. The interest on the CP Notes, but not the principal thereof, is secured by a lien on Revenues on parity with the lien securing other Subordinated Bonds. In addition to the bonds and notes listed above, in November 2007 the Authority received a loan from the Massachusetts Development Finance Agency of Clean Renewable Energy Bond proceeds, which loan is outstanding in the approximate amount of \$0.12 million and is payable from the General Fund.

For a further description of such Outstanding Indebtedness and a table setting forth the debt service requirements on the Authority's Outstanding Secured Bonds following the issuance of the 2016 Bonds, see "Financial Operations – Outstanding and Proposed Indebtedness."

## **ADDITIONAL INDEBTEDNESS**

The General Resolution contains certain conditions precedent to the issuance of additional Bonds, among them that the Authority shall have met its Primary Bond Coverage Ratio Covenant for the most recent period of 12 consecutive months for which data is available and that the Consulting Engineer shall certify that for the Fiscal Year of issuance and the Fiscal Year thereafter either (i) projected Revenues Available for Bond Debt Service will be sufficient to satisfy the Primary Bond Coverage Ratio Covenant (taking into account the Series of Bonds to be issued and any other Series of Bonds to be issued in such Fiscal Year), or (ii) projected Revenues Available for Bond Debt Service, including only increases in Rates and Charges then approved and including increases in Operating Expenses to the extent required by the General Resolution, will be sufficient to pay debt service on all Bonds (taking into account the Series of Bonds to be issued) and certain required reserve deposits. The foregoing requirements need not be met for Bonds issued to refund other Bonds so long as debt service is not increased in any Fiscal Year and the latest maturity date of Secured Bonds is not extended. The General Resolution requires that upon the issuance of Bonds, for refunding purposes or otherwise, the Debt Service Reserve Fund (which secures Bonds but not Subordinated Bonds) be fully funded to its applicable requirement. The General Resolution provides certain conditions precedent to the issuance of Subordinated Bonds that are similar to the conditions required in connection with the issuance of additional Bonds. In addition, the General Resolution permits the Authority to issue other Indebtedness including, but not limited to, revenue, grant and bond anticipation notes, Indebtedness secured by the General Fund and certain non-recourse Indebtedness. See Appendix C – "Summary of Certain Provisions of the General Resolution – Additional Indebtedness," "– Conditions Precedent to Delivery of a Series of Bonds" and "– Conditions Precedent to Delivery of a Series of Parity or Senior Secured Bonds."

## **PROPOSED MODIFICATIONS TO THE GENERAL RESOLUTION**

The General Resolution provides that it may be amended by the Authority subject to certain conditions. With certain exceptions, an amendment of the General Resolution requires the consent of the holders of at least two-thirds of the aggregate outstanding principal amount of the Series of Secured Bonds that would be affected by such amendment, measured at the time such amendment becomes effective. Principal exceptions include the following: (i) certain specified amendments may be made by the Authority acting alone or by the Authority with the consent of the Trustee, (ii) no amendment of the General Resolution may permit a reduction of principal or Redemption Price of or a change in the terms of redemption, maturity of principal or resolution of principal or Redemption Price of any Secured Bond, a reduction of the interest rate on any Secured Bond, or a change in the terms of redemption or maturity of principal of any installment of interest on any Secured Bond, in each case without the consent of the holder of such Secured Bond, (iii) no amendment of the General Resolution may reduce the percentages or otherwise affect the classes of Secured Bonds required to consent to modifications to the General Resolution without the consent of the holders of all the Secured Bonds, and (iv) no amendment of the General Resolution may change or modify any of the rights or obligations of the Trustee unless the Trustee assents thereto. For a more complete description of the amendment provisions of the General Resolution, see Appendix C – "Summary of Certain Provisions of the General Resolution – Supplemental Resolutions" and "– Amendments." In addition, certain modifications to the General Resolution may also be subject to consent by other financial institutions, such as credit enhancers and liquidity providers, pursuant to the terms of contracts between such financial institutions and the Authority.

A number of modifications to the General Resolution, which are reflected in the provisions of the General Resolution summarized above and in Appendix C, became effective in April 2015. One of the modifications that was proposed but that has not yet been effectuated is the following:

- The general Bondholder consent requirement would be reduced from the holders of two-thirds of the outstanding principal amount of each Series of Secured Bonds affected by a proposed amendment to the holders of 51% of the outstanding principal amount of such Series of Secured Bonds.

This amendment will require the consent of the holders of 100% in aggregate principal amount of the Secured Bonds Outstanding at the time such amendment becomes effective and compliance with the other provisions of the General Resolution applicable to amendments. **At the time of issuance of the 2016 Bonds, the Underwriters of the 2016 Bonds will consent and the original purchasers of the 2016 Bonds will be deemed, by their purchase of the 2016 Bonds, to have consented to the proposed modification on behalf of themselves and all subsequent holders of the 2016 Bonds. The proposed modification will apply to the 2016 Bonds only when and if the proposed modification becomes effective upon the consent of the requisite number of holders as described above.** After giving effect to the issuance of the 2016 Bonds, the Authority will have obtained consents from holders of 86.6% in aggregate principal amount of Secured Bonds Outstanding. The Authority intends to request that the underwriters or the initial purchasers of each future Series of Secured Bonds issued by the Authority consent to this amendment at the time of issuance of each such Series. The subsequent holders of each such Series of Secured Bonds will be deemed to have consented to this amendment upon their purchase of such Secured Bonds. For further details of the proposed modification, see Appendix C – “Summary of Certain Provisions of the General Resolution.”

## **THE AUTHORITY AND ITS SERVICE AREAS**

### **PURPOSES AND POWERS**

The Authority was created by the Act, effective January 1, 1985. Pursuant to the Act, the Authority has several main objectives: to construct and maintain sewage treatment facilities which ensure that the Sewer System’s wastewater discharges meet federal and state pollution control requirements; to maintain, operate and improve an adequate water supply distribution system and provide water in conformance with all applicable state and federal regulations; to establish programs for leak detection and reduction of infiltration and inflow within its service areas; to repair, replace, rehabilitate and extend the Systems and to finance the capital and operating expenses arising from their operations on a self-sustaining basis; to provide professional management and Systems-wide planning; and to establish and administer charges on a basis that will foster the conservation of water and improve the quality of the environment.

The Authority owns all personal property constituting the Systems. Real property, including all watersheds, reservoirs and other water rights relating to the Systems (the “DCR Watershed System”), is owned by the Commonwealth and administered by DCR. Under the Act, the Authority has an exclusive right to utilize such quantities of water as may be safely yielded from the DCR Watershed System that are necessary to provide the Authority’s water supply. See “The Systems.”

Under the Act, the Authority may: issue revenue bonds and notes (subject to the debt limitation contained in the Act) (see “Financial Operations – Debt Limitation”); hire personnel and engage consultants and other experts; adopt budgets for its operations and capital improvement programs and establish, after it has held public hearings, rates and charges for its services; expand the service areas of the Waterworks System and the Sewer System subject to certain approvals and other conditions (see “The Systems”); acquire property by purchase, lease or, under certain limitations, eminent domain (other than water and water rights) and lease, sell, transfer or otherwise encumber its property (subject to legal restraints on the disposition of certain public property); and establish rates and charges for its services and commodities without supervision by other agencies of the Commonwealth or any other governmental body and enforce the collection thereof (see “Rates and Charges”).

The Act provides that the Authority’s existence shall continue until terminated by law, provided that no such law shall take effect so long as any bonds or notes of the Authority are outstanding unless adequate provision has been made for the payment or satisfaction of such obligations.

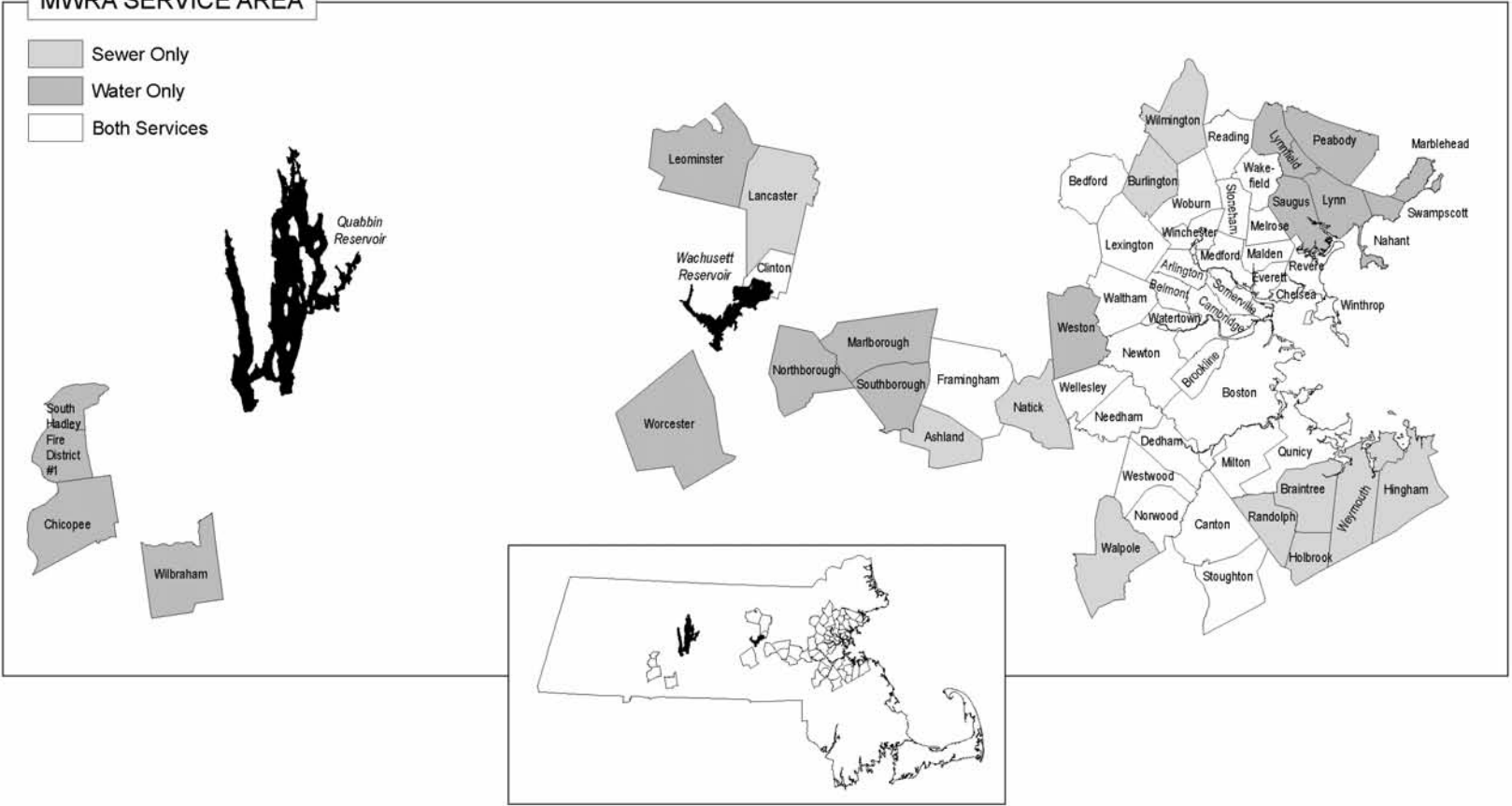
### **SERVICE AREAS AND MAP**

The Authority currently provides wholesale water and sewer services in service areas encompassing, in whole or in part, 61 communities located primarily in eastern Massachusetts, including most of the cities and towns in the metropolitan Boston area. Approximately 2.8 million people, or approximately 43% of the total population of the Commonwealth, live in the Authority’s service areas. Under certain circumstances, the Authority’s service areas may be expanded to include additional communities. See “The Systems.”

The map on the following page shows the Authority’s current service areas for water and sewer services.

MWRA SERVICE AREA

- Light Gray Box: Sewer Only
- Dark Gray Box: Water Only
- White Box: Both Services



## CHARGES TO LOCAL BODIES

The percentage of the Authority’s revenues that has been derived from the rates and charges paid by the Local Bodies for the Authority’s wholesale water and sewer services has varied over time. On average, more than 80% of the Authority’s revenues have been derived from such rates and charges, and in Fiscal Year 2017, approximately 96.6% of the Authority’s revenues are expected to be derived from such rates and charges. The Local Bodies in turn fund payment of the Authority’s rates and charges from a variety of local sources. The obligation to pay the Authority’s rates and charges is a general obligation of each Local Body, supported by its full faith and credit and payable from all revenue sources. See “Local Bodies.”

The Act originally authorized 46 Local Bodies to be served by the Waterworks System, 32 of which currently derive their entire municipal water supply from the Waterworks System. Eleven currently receive a portion of their water supply from the Waterworks System. Three – Cambridge, Leominster and Worcester – do not generally receive water from the Authority. In addition to those Local Bodies originally authorized by the Act to be served by the Waterworks System, the Authority’s Board of Directors has approved additional members of the Waterworks System – the Towns of Bedford (which receives its water through the Town of Lexington), Stoughton, Reading and Wilmington, and the Dedham-Westwood Water District (which previously had received a portion of its water supply from the Waterworks System). The Authority also is considering the further addition of members to the Waterworks System. See “The Systems – The Waterworks System – Extension and Contraction of Waterworks Service Area.” The allocation among Local Bodies of the Authority’s water charges for each Fiscal Year generally is based upon water consumption in the preceding calendar year. See “Rates and Charges – General.”

The Act authorizes 43 Local Bodies to be served by the Sewer System, all of which currently receive service from the Authority. The Authority also provides wholesale wastewater services to the Town of Clinton and the Lancaster Sewer District through the Clinton Wastewater Treatment Plant. No new communities have become members of the Sewer System. The Authority’s sewer charges are allocated on a proportional basis utilizing, among other factors, total metered flow, contributing population and census population. See “Rates and Charges – General.”

Five Local Bodies, of which the BWSC is the largest, are budgeted to account for approximately 47.2% of the aggregate rates and charges assessed in Fiscal Year 2017 as follows:

	<u>Percent of Total FY 2017 Authority Water Charges *</u>	<u>Percent of Total FY 2017 Authority Sewer Charges *</u>	<u>Percent of Total FY 2017 Authority Charges *</u>
Boston Water & Sewer Commission	35.3%	28.7%	31.0%
City of Newton	5.5	4.5	4.8
City of Quincy	5.0	4.4	4.6
City of Cambridge	0.0	5.2	3.4
City of Somerville	<u>3.3</u>	<u>3.5</u>	<u>3.4</u>
Total	49.1%	46.1%	47.2%

\* Totals may not sum due to rounding.

The following table sets forth the Fiscal Year 2017 charges assessed by the Authority to each Local Body, except charges to certain Local Bodies and certain governmental users with special arrangements with the Authority. See Footnote 1 to the following table and “Local Bodies – Special Arrangements.”

**FISCAL YEAR 2017 SYSTEMS CHARGES BY LOCAL BODY**

Systems Charges

Percent of  
Total FY 2017  
Charges

<u>Local Body</u>	<u>Water</u>	<u>Sewer</u>	<u>Total</u>	
Arlington	\$ 4,976,564	\$ 7,993,120	\$ 12,969,684	1.87%
Ashland	0	2,485,174	2,485,174	0.36
Bedford	0	3,368,331	3,368,331	0.48
Belmont	2,828,456	4,825,479	7,653,935	1.10
Boston Water and Sewer Commission <sup>2</sup>	82,771,709	132,271,845	215,043,554	30.95
Braintree	0	9,100,270	9,100,270	1.31
Brookline	7,046,691	12,894,419	19,941,110	2.87
Burlington	0	5,078,461	5,078,461	0.73
Cambridge	0	23,745,695	23,745,695	3.42
Canton	1,673,754	4,137,162	5,810,916	0.84
Chelsea	4,215,080	7,663,315	11,878,395	1.71
Dedham	0	5,311,572	5,311,572	0.76
Dedham-Westwood Water District <sup>4</sup>	196,381	0	196,381	0.03
Everett	4,948,191	8,124,101	13,072,292	1.88
Framingham	8,159,808	12,824,962	20,984,770	3.02
Hingham Sewer District	0	1,798,028	1,798,028	0.26
Holbrook	0	1,759,996	1,759,996	0.25
Leominster	0	0	0	0.00
Lexington	7,349,661	7,265,870	14,615,531	2.10
Lynn Water & Sewer Commission <sup>3</sup>	243,938	0	243,938	0.04
Lynnfield Water District <sup>4</sup>	643,348	0	643,348	0.09
Malden	6,950,768	12,941,073	19,891,841	2.86
Marblehead	2,341,415	0	2,341,415	0.34
Marlborough	3,887,876	0	3,887,876	0.56
Medford	6,432,219	11,878,789	18,311,008	2.64
Melrose	2,915,635	6,251,952	9,167,587	1.32
Milton	3,360,396	5,362,055	8,722,451	1.26
Nahant	476,532	0	476,532	0.07
Natick	0	5,756,705	5,756,705	0.83
Needham	1,039,372	5,683,915	6,723,287	0.97
Newton	12,950,552	20,518,241	33,468,793	4.82
Northborough	1,135,772	0	1,135,772	0.16
Norwood	3,652,867	7,023,166	10,676,033	1.54
Peabody	1,507,269	0	1,507,269	0.22
Quincy	11,776,311	19,971,978	31,748,289	4.57
Randolph	0	6,272,186	6,272,186	0.90
Reading	2,109,549	4,769,928	6,879,477	0.99
Revere	4,943,964	10,611,549	15,555,513	2.24
Saugus	3,692,889	0	3,692,889	0.53
Somerville	7,658,290	15,918,035	23,576,325	3.39
Southborough	948,422	0	948,422	0.14
Stoneham	3,174,690	4,542,049	7,716,739	1.11
Stoughton	1,144,245	4,747,341	5,891,586	0.85
Swampscott	1,834,151	0	1,834,151	0.26
Wakefield	1,852,218	5,813,697	7,665,915	1.10
Walpole	0	3,713,877	3,713,877	0.53
Waltham	9,384,159	13,122,122	22,506,281	3.24
Watertown	3,290,986	5,971,377	9,262,363	1.33
Wellesley	1,056,294	5,459,750	6,516,044	0.94
Weston	2,445,970	0	2,445,970	0.35
Westwood	0	2,598,265	2,598,265	0.37
Weymouth	0	11,765,811	11,765,811	1.69
Wilmington	703,075	2,595,601	3,298,676	0.47
Winchester	1,544,349	4,033,770	5,578,119	0.80
Winthrop	1,643,615	3,320,069	4,963,684	0.71
Woburn	3,355,306	9,324,662	12,679,968	1.82
<b>Total</b>	<b><u>\$234,262,737</u></b>	<b><u>\$460,615,763</u></b>	<b><u>\$694,878,500</u></b>	<b><u>100.00%</u></b>

- <sup>1</sup> This chart excludes six communities, the revenues received from which are accounted for by the Authority as other charges for services, rather than as rates and charges. These excluded communities include four of the 24 communities that receive water pursuant to contracts: Chicopee, South Hadley (served by South Hadley Fire District No. 1), Wilbraham and Worcester. Worcester currently only receives water services on an emergency basis. The fifth excluded community is Clinton, which receives its first 800 million gallons of water per year at no charge pursuant to a special act, and typically consumes less than 800 million gallons annually, but would be charged generally applicable rates for any amounts in excess thereof. Clinton also receives wastewater services provided by the Clinton Wastewater Treatment Plant and charges for this service are excluded from this chart. The sixth excluded community, Lancaster (served by the Lancaster Sewer District), receives wastewater services provided by the Clinton Wastewater Treatment Plant. The six excluded communities are budgeted to account for approximately \$5.9 million in Authority revenues for Fiscal Year 2017. The chart also excludes Leominster, which, although named in the Act to be served by the Authority's Waterworks System, has taken no water from the Authority since January 1991.
- <sup>2</sup> The Authority's services to the City of Boston are provided through and assessed to the BWSC. The BWSC is a body politic and corporate and independent political subdivision of the Commonwealth. The City of Boston is not liable for the rates and charges imposed on the BWSC by the Authority.
- <sup>3</sup> The Authority's services to a single large industrial user in Lynn are provided through and assessed to the Lynn Water and Sewer Commission (the "LWSC"). The LWSC provides service to the rest of Lynn from its own resources without obtaining service from the Authority. The LWSC is a body politic and corporate and independent political subdivision of the Commonwealth. Neither the City of Lynn nor the retail industrial user is liable for the rates and charges imposed on the LWSC by the Authority.
- <sup>4</sup> The Authority provides water services to a portion of the population of Lynnfield through the Lynnfield Water District, a body corporate of the Commonwealth, and to the Towns of Dedham and Westwood through the Dedham-Westwood Water District, a body politic and corporate of the Commonwealth. The Town of Lynnfield and the Towns of Dedham and Westwood are not liable for the rates and charges imposed by the Authority on the Lynnfield Water District and the Dedham-Westwood Water District, respectively.

Subject to applicable federal and state regulations and certain regulatory powers of the Authority, Local Bodies continue to exercise control over their respective retail water distribution and wastewater collection systems. Except in an emergency, written notice of any proposed local rules and regulations regarding use of the retail systems must be furnished to the Authority prior to adoption. Regulatory powers for monitoring and regulating Local Bodies conferred by the Act upon the Authority relate to matters such as water conservation and development of local water supply sources, implementation of federal and state toxic waste and pretreatment laws, reduction of infiltration and inflow of ground and surface waters into the Sewer System, and installation of water meters. See "The Systems."

By state legislative action or with the Authority's approval, Local Bodies currently served by the Authority could seek to develop alternative water or wastewater delivery systems, although such systems would need to comply with all applicable federal and state environmental standards. The Authority believes that such alternatives are likely to be prohibitive in cost for most of the Local Bodies and, particularly in the case of alternative sewage treatment facilities, would take many years to implement.

## **RATES AND CHARGES**

### **GENERAL**

For Fiscal Year 2017, approximately 96.6% of the Authority's budgeted revenues are expected to be derived from wholesale rates and charges assessed to the Local Bodies. The remaining revenues are expected to be derived primarily from investment income and miscellaneous income, including assessments to certain Local Bodies not included as rates and charges. The Act requires that the Authority set its rates and charges at levels sufficient to pay, among other things, its current expenses and its debt service, and to provide the debt service coverage required by the General Resolution. See "Security for the Authority Trust Obligations – Coverage Covenants."

In accordance with the Act, the Authority's rate setting is exercised independently by its Board of Directors without being subject to the approval of any department, agency or other instrumentality of the Commonwealth or any other governmental body. The Authority's rates and charges are adopted annually in June after notice and public hearing, and review of non-binding recommendations by the Authority's Advisory Board. The level of the Authority's rates and charges assessed to Local Bodies is not subject to the limitations set forth in Proposition 2½. For a discussion of the effect of Proposition 2½ on the ability of Municipal Local Bodies to raise revenues to pay assessed rates and charges through property tax levies, see "Local Bodies – Municipal Sources of Revenue."

The Authority's charges for services are billed directly to Local Bodies on a wholesale basis. The Authority currently certifies annual charges to each Local Body on or about July 1 of each year. To assist Local Bodies with their respective annual budget or rate-setting processes, the Authority furnishes them with preliminary estimates of their respective rates and charges for the following Fiscal Year in February of each year. Authority charges are payable in 10 equal installments due on or before the first business day of each month, excluding January and July, of each Fiscal Year. There is an interest charge of 1% per month for late payments.

As required by the Act, the Authority establishes charges of general application separately for the services provided by the Waterworks System and the Sewer System. In setting water rates, the Authority first identifies through its budgeting process the total amount of revenue that must be raised through water rates in a given Fiscal Year, net of other anticipated sources of revenue, such as investment income, receipts from water supply contracts and other special arrangements. Generally, charges for water services are computed by the Authority on the basis of the proportional metered water use of each Local Body for the immediately preceding calendar year. Accordingly, with certain exceptions, the Fiscal Year 2017 water charges are based on the Local Bodies' metered water use in calendar year 2015.

Sewer charges are computed on a proportional allocation basis utilizing, among other things, total flow, contributing population and census population for each Local Body. Consistent with the initial step in setting water rates, the Authority first determines the total amount of revenue required to be raised from sewer charges. The total amount of required revenue for the Sewer System is allocated either to operating costs or capital costs. Operating costs are allocated to each Local Body based on the average of the prior three calendar years' total flow, with adjustments for strength of flow to take into account above-average concentrations of total suspended solids and biochemical oxygen demand. Capital costs, including debt service, are allocated to each Local Body based on a combination of (i) the average of the prior three years' peak month wastewater flow and average concentrations of total suspended solids and biochemical oxygen demand, (ii) the proportion of the population of the Local Body that is served by the local sewer system (the "contributing population") to the total contributing population in the Sewer System, and (iii) the proportion of the Local Body's U.S. census population, based upon the Commonwealth's most recent bi-annual update (the "census population"), to the total census population in the Sewer System.

## HISTORICAL RATES AND CHARGES

The Authority's rates and charges have increased at an average annual rate of approximately 3.4% for the period from Fiscal Year 2013 through Fiscal Year 2017. To date, 100% of the Authority's rates and charges were collected within 30 days of their due dates, except for one instance in which the Authority made special arrangements with a Municipal Local Body to extend its due date. The following table sets forth the aggregate budgeted charges of the Authority from Fiscal Year 2013 through Fiscal Year 2017, and the percentage change from the prior Fiscal Year.

### HISTORICAL RATE REVENUE AND PERCENTAGE INCREASES<sup>1</sup> (dollar amounts in millions)

Fiscal Year	Water		Sewer		Combined	
	Amount	Increase	Amount	Increase	Amount	Increase
2013	\$196.0	--	\$411.5	--	\$607.5	--
2014	203.2	3.7%	425.5	3.4%	628.7	3.5%
2015	210.2	3.5	440.1	3.4	650.3	3.4
2016	226.4	7.7	446.1	1.4	672.4	3.4
2017	234.3	3.5	460.6	3.3	694.9	3.3

<sup>1</sup> Does not include revenues received by the Authority from Local Bodies pursuant to contracts or special acts that are accounted for as other charges for service rather than as rates and charges.

The costs of the CIP projects primarily have been funded through the proceeds of long-term indebtedness, including such major projects as the Boston Harbor Project, the MetroWest Water Supply Tunnel, and the John J.



Carroll Water Treatment Plant. As a result, the debt service on such indebtedness is a significant portion of the Authority's Current Expense Budget. Approximately 63.2% of total expenses included in the Fiscal Year 2017 Current Expense Budget (the "FY17 CEB") is for capital financing expenses. In recent years, the Authority has managed rate increases through the use of commercial paper, refinancing existing debt at lower interest rates, issuing variable rate debt, additional borrowing at subsidized interest rates from the Trust, use of reserves to defease debt, and various efficiency and cost control strategies, including significant reductions in staffing levels. The Authority's efforts have resulted in mitigating rate increases to date and in leveling out anticipated rate increases due to increasing debt service costs. Nonetheless, the Authority's rates and charges will continue to increase as the Authority's operating expenses increase and as the Authority continues to undertake capital improvements to upgrade and maintain the Systems. See "Future Rates and Charges" below.

The Authority is eligible to receive funding from the Commonwealth's Water and Sewer Rate Relief Fund (the "Fund") in order to mitigate increases in rates. The amount of such debt service assistance is subject to annual appropriation by the Commonwealth and varies annually. In recent fiscal years, the Commonwealth has reduced or eliminated appropriations to the Fund. Accordingly, for planning purposes, the Authority has assumed that it will not receive any debt service assistance in Fiscal Year 2017 and in future years. The Authority cannot predict the amount, if any, of debt service assistance that will be appropriated in future years.

### **FUTURE RATES AND CHARGES**

While the Authority expects to continue to seek and adopt measures to moderate its future rate increases, the Authority's rates and charges are expected to continue to increase to meet the increased debt service costs necessary to finance the projects included in the CIP, and to fund increased operating expenses resulting from the operation of the Systems.

The table below sets forth the Authority's estimates of its rate revenue requirements for Fiscal Years 2018 through 2022, based on the FY17 CEB and assuming the Authority will not receive debt service assistance during the projection period. The estimates also assume an inflation rate of 2.5% for capital projects that are not yet under contract, and that annual capital expenditures will be capped at \$160 million and will be made in accordance with the FY17 CIP. The planning estimates assume that all of the Authority's future long-term bond financings will consist of 30-year debt with fixed rates of interest of 5.0% in Fiscal Years 2017 and 2018, 5.5% in Fiscal Year 2019, 5.75% in Fiscal Year 2020, and 6.0% in Fiscal Year 2021 and thereafter. Variable rate indebtedness of the Authority is assumed to bear interest at 3.25% in Fiscal Year 2017, 3.5% in Fiscal Year 2018, 3.75% in Fiscal Year 2019, and 4.0% in Fiscal Year 2020 and thereafter. Loans from the Trust are assumed to bear interest at an effective rate of 2.0% with a 20-year term for water projects and at an effective rate of 2.5% with a 30-year term for sewer projects. Operating expenses (other than labor costs) are inflated at 3.0% annually; labor costs are inflated at 2.7% annually. The Authority believes that the estimates are based upon realistic cost estimates and other assumptions, and include adequate provision for contingencies. See "Historical Rates and Charges," above, and "Management's Review of Operating Results - Fiscal Year 2017 Current Expense Budget," and Appendix B – "July 2016 Report of the Consulting Engineer." However, as discussed below, there can be no assurance that actual revenue requirements or expenditures will not vary from current estimates and cause actual rates and charges to be different from current estimates. For a discussion of risk factors that could lead to higher costs in the CIP, see "Capital Improvement Program – Factors Affecting the Capital Projects."

### **ESTIMATED FUTURE RATE REVENUE REQUIREMENTS AND PERCENTAGE INCREASES** (dollar amounts in millions)

<b><u>Fiscal Year</u></b>	<b><u>Rate Revenue</u></b>	<b><u>Percentage Increase</u></b>
2017	\$694.9	--
2018	721.2	3.8%
2019	748.4	3.8
2020	776.7	3.8
2021	805.9	3.8
2022	836.1	3.8

Actual retail rate increases of specific Local Bodies vary considerably because of different practices among Local Bodies in the extent to which the Authority's rates and charges are incorporated into retail user charges and the disparity in levels of the local water and sewer costs of the Local Bodies. Based upon the most recent survey conducted by the Authority's Advisory Board of Local Bodies' rates and charges (the "2015 Survey") and the Authority's budgeted rates and charges for Fiscal Year 2015, and assuming annual household water usage of 90,000 gallons, the 2015 Survey estimates that the annual average household combined water and sewer bill in those Local Bodies that receive full water and sewer services from the Authority is approximately \$1,474. Actual annual bills vary from this average, in part due to the fact that there are certain Local Bodies that in the past raised their own retail rates at paces different from the Authority's rate increases and to the fact that actual annual household usage in many Local Bodies is less than 90,000 gallons. See Appendix B – "July 2016 Report of the Consulting Engineer – Section 4.3 Retail Customer Impacts."

The Local Bodies fund their payment of the Authority's rates and charges in a variety of ways, so that it is difficult to generalize about the effect of the Authority's future rate increases on retail ratepayers, including households and businesses in the service area. Provision for and payment of increasing rates and charges will depend on a number of factors, including the Local Bodies' methods of funding Authority charges and the availability of local sources of revenue.

From time to time, public concern is expressed regarding the increasing level of the Authority's rates and charges. The Authority believes that public awareness of several factors will continue to mitigate public opposition. These factors include: (i) the federal and state legal and regulatory mandates (including legal enforcement orders issued by courts or administrative agencies) to which the Authority is subject, (ii) the importance of improvements to the Systems to support future regional economic growth, (iii) public support for meeting environmental protection and public health goals, and (iv) the Authority's success in mitigating rate increases in the past, including an average annual increase of approximately 3.4% in Fiscal Years 2013 through 2017.

The Authority believes that the considerations described above have contributed to the Authority receiving substantial financial assistance, from both the federal and state governments, to help finance the CIP. This financial assistance – in the form of capital grants, loans from the Trust at subsidized interest rates, and debt service assistance – helped in the past to mitigate rate increases. The Authority will continue to pursue financial assistance for its programs through legislative and other avenues to help mitigate future rate increases, however, there can be no assurance as to the receipt or continuation of state or federal support.

## **ENFORCEMENT**

The Authority has adopted, and is authorized by the Act to enforce, billing and collection procedures and regulations, including requirements for the submission to the Authority of relevant information regarding the provision of retail services by Local Bodies. In the event any charge to a Local Body is not paid when due, the Act authorizes the Authority to recover the amount due, together with interest and other actual damages, by action in the state superior court.

Without suit, the Authority may use an intercept mechanism (the "local aid intercept") established by the Act to recover amounts unpaid by a Local Body. To trigger this mechanism, the Authority must certify to the State Treasurer the amount of any unpaid charge, whereupon the State Treasurer is required by the Act to deduct such unpaid charge from all amounts payable to the Local Body by the Commonwealth, if any, regardless of their intended use (including state reimbursements, grants and general local aid funds) and to pay such amount over to the Authority. For a description of general local aid funds as a source of revenue available to Local Bodies to pay Authority charges, see "Local Bodies – Municipal Sources of Revenue." The Authority has covenanted in the General Resolution to use this enforcement mechanism in the event that a Local Body fails to make timely payment. The Authority has successfully used the local aid intercept six times since 1990, including, in one case, following a Local Body's protesting of the Authority's rates and charges. The amounts intercepted represented less than one-tenth of one percent of all rates and charges assessed and collected in the applicable Fiscal Year. The Authority has not used the local aid intercept in more than 20 years.

Distributions of local aid payable to the municipalities served by Special Purpose Local Bodies, including the BWSC, would not be available to meet unpaid charges due the Authority through the local aid intercept. Municipalities served by such Special Purpose Local Bodies account for approximately 31.4% of the Authority's combined rates and charges assessed for Fiscal Year 2017.

Under the laws of the Commonwealth, there are currently several other similar local aid intercept mechanisms that may affect the amounts available for intercept on behalf of the Authority. The State Treasurer is authorized to deduct from a Local Body's local aid distributions amounts owed by such Local Body to the Commonwealth for certain assessments and charge-backs. In addition, under the so-called Qualified Bond Act, cities and towns in the Commonwealth, including certain Local Bodies, may secure their bonds and notes by authorizing the State Treasurer to intercept from their respective local aid distributions the amount necessary to pay principal and interest on such debt. Under state law, the amounts available for intercept on behalf of the Authority also may be affected by actions taken by or on behalf of the state Department of Revenue, the Massachusetts School Building Authority, and the Massachusetts Bay Transportation Authority, among others, with respect to amounts owed to or by a Local Body. Finally, under the Commonwealth legislation establishing the Trust, the State Treasurer may, under certain circumstances, deduct from a community's local aid distribution (i) the amount of charges owed by the community to the Trust, (ii) the amount of charges owed by the community to any entity that provides wastewater or drinking water service to the community and has a repayment obligation to the Trust (a "Regional Unit") that the Regional Unit has not fulfilled by reason of the default of such community in its payment obligations to the Regional Unit, and (iii) the community's pro rata share of any payment obligation of a Regional Unit to the Trust that has not been fulfilled but not due to the default of any particular community or communities served by the Regional Unit. Since the Authority is a Regional Unit under the Trust's enabling act, failure by the Authority to pay debt service on its loans from the Trust would permit the Trust to exercise its intercept against the Local Bodies. As of July 1, 2016, the Authority had outstanding approximately \$1.0 billion in aggregate principal amount of loans from the Trust. The Trust also has made loans to or purchased local governmental obligations from 47 Local Bodies, including the BWSC, in an approximate aggregate principal amount of \$573.3 million outstanding as of July 1, 2016, the debt service on which also is subject to intercept.

In addition to the possibility of a Municipal Local Body's local aid being accessed by another offset mechanism prior to the Authority's attempt to intercept it, the availability of local aid in the future to satisfy unpaid charges imposed by the Authority will be dependent upon, among other things, the aggregate amount actually appropriated by the state Legislature and distributed by the Governor in a fiscal year. For a discussion of these and other factors affecting local aid, see "Local Bodies – Municipal Sources of Revenue."

## **OTHER SOURCES OF REVENUE**

The Authority receives revenues from other sources, including water supply contracts and other arrangements between the Authority and certain Local Bodies under which amounts paid to the Authority are not accounted for by the Authority as assessed rates and charges (although such contract revenues are included in the definition of Rates and Charges for purposes of the General Resolution). Such revenue is budgeted to be approximately \$8.8 million in Fiscal Year 2017. See "Local Bodies – Special Arrangements." The Authority also receives investment earnings on various funds that it holds, which are budgeted to total approximately \$9.5 million in Fiscal Year 2017. Revenues from permits, fines, fees and other miscellaneous sources are budgeted to total approximately \$6.5 million in Fiscal Year 2017.

## **LOCAL BODIES**

### **GENERAL**

The Authority provides services to Local Bodies on a wholesale basis. The obligation of the Local Bodies to pay for these services is a general obligation payable from any and all sources of revenue available to the Local Bodies. The legal structure of a Local Body determines which revenue sources are available to it under state law. The revenues available to Special Purpose Local Bodies, each a retail system operator, are limited primarily to retail user fees and charges and investment income. Such entities have no taxing power and do not ordinarily receive distributions of local aid. Revenues of Municipal Local Bodies used to pay the Authority's rates and charges are derived primarily from retail user charges, property taxes, and local aid. All Municipal Local Bodies have instituted

retail user charges, although there are substantial differences in the proportion of its full costs that each Municipal Local Body recovers through its retail user charges.

## **BOSTON WATER AND SEWER COMMISSION**

The BWSC is budgeted to account for approximately 31.0% of the Authority's combined rates and charges assessed for Fiscal Year 2017. Established in 1977 as a public instrumentality, a body politic and corporate and a political subdivision of the Commonwealth, the BWSC is responsible for the retail operation of the water distribution and wastewater collection and storm water drainage systems of the City of Boston (the "City") and for the maintenance and improvement of such systems. The BWSC purchases its water in bulk from the Authority. Such water is delivered through 29 active metered connections located at various points throughout the BWSC's water distribution system. The BWSC's sewer system transports the City's wastewater to the Authority's interceptor sewers, which convey the wastewater to the Authority's Deer Island Treatment Plant for treatment and disposal.

The Authority's charges to the BWSC constitute general obligations of the BWSC. The BWSC has no taxing power but funds its operations through the collection of user fees and charges. Chapter 436 of the Acts of 1977 of the Commonwealth (the "BWSC Act") requires the BWSC to establish its rates and charges at levels sufficient to (i) pay the current expenses of the BWSC (including the Authority's rates and charges), (ii) pay all BWSC debt service, (iii) create and maintain reasonable reserves required by any bond resolution, (iv) provide funds for paying the cost of all necessary repairs, replacements and renewals of the BWSC's systems, and (v) pay or provide for any and all amounts that the BWSC may be obligated to pay or provide for by law or contract. The BWSC's rates and charges are independently set by the BWSC and are not subject to regulation or approval by any other governmental body. However, the BWSC is required to give written notice to the Authority of its proposed rules and regulations, including its rates, relating to its water and sewer services prior to adoption.

The BWSC serves approximately 88,000 accounts. Its 20 largest users as of December 31, 2015 are estimated to account for approximately 20% of the BWSC's aggregate retail user charges. Its customers include many large commercial entities, governmental agencies and not-for-profit institutions including its five largest customers: the Boston Housing Authority, the City of Boston, the Massachusetts Port Authority, Boston University and Medical Area Total Energy. The BWSC has realized surpluses from its operations in each year since its inception.

As of July 1, 2016, the BWSC had approximately \$447.5 million aggregate principal amount of revenue bonds outstanding. The BWSC has granted a security interest in its revenues as security for its revenue bonds. The BWSC's bond resolutions also provide that debt service on the BWSC's revenue bonds and operating expenses of the BWSC shall be paid prior to the Authority's rates and charges. As of July 1, 2016, the BWSC had loans from the Trust outstanding in the amount of \$0.8 million and combined loans/grants from the Authority outstanding in the amount of \$31.0 million.

The single largest component of the BWSC's expenses has been assessments to the BWSC by the Authority. Authority assessments for the costs of water supply and wastewater treatment services provided to the BWSC have continued and, based on BWSC projections, will continue to increase as a percentage of the BWSC's total expenses. The BWSC estimates that the Authority's assessments to the BWSC will be 62.3% of the total costs of operation of the BWSC in calendar year 2016.

## **MUNICIPAL SOURCES OF REVENUE**

**General.** Cities and towns in the Commonwealth are limited by state law as to the types of revenues that they can raise to support local spending, including for the rates and charges of the Authority. Under current state law, the Municipal Local Bodies may derive their revenues from several sources, including water and sewer user charges, property taxes, local aid distributions, certain excise receipts (including motor vehicle excises, local option excises on hotel and motel room occupancy and aircraft fuel), departmental revenues (including parking fines and building permit fees), and investment income. Some of the revenue sources discussed in this subsection are not available to Special Purpose Local Bodies, including the BWSC.

**User Fees and Charges.** Each Municipal Local Body owns and operates a distribution system of pipes for water and a collection system for sewage. Each Municipal Local Body is authorized by state law to charge just and

equitable retail user charges to cover the respective costs of providing these municipal services, including operation and maintenance of the Municipal Local Body's system, replacement of capital components of the system over time, and the Authority's annual charges to such Municipal Local Body. These retail user charges are not subject to the limitations of Proposition 2½. Under the Act, Local Bodies may establish rates and charges for retail services on a flat rate basis or on an ascending unit rate based on quantity, and may permit adjustments in their local rates for the age, infirmity or poverty of their retail customers.

The Act also permits the Authority, subject to federal and state constitutional restrictions on the impairment of contracts in effect on the effective date of the Act, to require Local Bodies to adopt systems of rates and charges that comply with applicable federal and state law and with Authority policies designed to promote water conservation, full local cost recovery, the elimination of infiltration and inflow of ground and surface waters, and the pretreatment of industrial wastes.

The revenues received by a Municipal Local Body through its retail user charges are not pledged to the payment of any costs of the local systems, including the payment of the rates and charges of the Authority. A Municipal Local Body may elect, however, to segregate such retail user charges and apply them only to the costs of the respective local systems.

Enforcement remedies are available under state law to Municipal Local Bodies to collect unpaid retail user charges. A Municipal Local Body may terminate water and sewer service to any retail user who has not paid the respective charges. In addition, if a Municipal Local Body accepts the applicable statutory sections, unpaid water and sewer charges become a lien upon the associated real estate by operation of law and are added to the property tax bill for such real estate. In general, the laws relating to the imposition of interest on unpaid real estate taxes and the foreclosure of title to real estate for nonpayment of taxes apply equally to unpaid water and sewer charges.

Among the Municipal Local Bodies, different local policies, including each Municipal Local Body's decision about the extent to which the costs of operating its local system are recovered through its retail rates, and the complexity of its rate structure and its accounting methodologies, result in divergent retail user charges. Currently, while all Municipal Local Bodies have instituted retail user charges, certain Municipal Local Bodies may not recover the entire cost of providing retail services through user charges. The Authority is able to offer technical assistance to the Municipal Local Bodies to help them establish systems of retail user charges and identify costs that can be recovered through such charges.

**Property Taxes.** Property taxes are raised through assessments against real and personal property in a municipality. State law mandates a revaluation of all taxable property every three years. These revaluations are reviewed and certified by the Commonwealth. In the years between the revaluations, the Commonwealth permits municipalities to establish new values for year-to-year increases in assessments on the basis of market trends, using the most recent revaluation as a basis. These new values, together with the municipalities' proposed tax rates, are subject to annual certification by the Commonwealth. The property tax levy generally is certified by the Commonwealth in the fall. Most municipalities adopt a quarterly payment schedule for property taxes, with installments due on August 1, November 1, February 1 and May 1.

Proposition 2½ generally constrains levels of property taxation, one of the primary sources of revenue for cities and towns in the Commonwealth, and limits the charges and fees imposed on cities and towns by certain governmental entities. The law is not a constitutional provision and accordingly is subject to amendment or repeal by the state Legislature. Proposition 2½ contains limitations on the revenues that may be collected by certain governmental entities, including a limitation on the property taxes that may be levied by any city or town in any fiscal year to the lesser of (i) 2.5% of the full and fair cash valuation of the real estate and personal property therein, and (ii) 2.5% over the previous year's levy limit plus any growth in the tax base from certain new construction and parcel subdivisions. Proposition 2½ also limits any increase in the charges and fees assessed by certain governmental entities on cities and towns to the sum of (i) 2.5% of the total charges and fees imposed in the preceding fiscal year, and (ii) any increase in charges for services customarily provided locally or services obtained by the city or town at its option.

Any property tax increase in excess of the limits imposed by Proposition 2½ must be approved by a vote of the municipality. However, amendments to Proposition 2½ enacted in 1994 permit a Municipal Local Body, and a Special Purpose Local Body through agreement with the municipalities it serves, to offset increases in user charges

resulting from increases in water and sewer debt service costs (including increases in the Authority's debt service costs incorporated into the Authority's rates and charges to such Local Body) through the assessment of property taxes in excess of the limits imposed by Proposition 2½, subject to certain conditions, without requiring a vote of the municipality.

**Local Aid.** Local aid is the generic term used to describe all distributions made by the Commonwealth to cities and towns. Certain local aid distributions are earmarked for specific programs, *e.g.*, a large portion of local aid has been earmarked for public education, but the bulk of such distributions are available to the municipality to be applied to any authorized expenditures. Except for amounts distributed to municipalities pursuant to state law from state lottery receipts, all local aid is subject to annual appropriation by the state Legislature. The major formula used by the state Legislature in determining the payment level to each city and town tends to provide proportionately more local aid to communities with relatively lower per capita income and with higher service cost levels in order to compensate for the gap between certain fixed costs incurred by a municipality and its revenue-raising capacity. The bulk of the local aid distributions are, by state law, made quarterly. From time to time legislation and voter initiative petitions are approved that affect the amount of local aid to be distributed by the Commonwealth.

Under the Massachusetts Constitution and state finance law, the State Treasurer and the Governor have the authority to withhold or delay local aid payments under certain circumstances. Any available moneys in the state treasury, including amounts appropriated for local aid, may be used as a matter of last resort by the State Treasurer if required to pay Commonwealth notes. Moreover, the statute governing the Commonwealth's distribution of school aid (which constitutes a portion of the local aid distribution) provides that such payments are due only to the extent that sufficient funds are available therefor.

The amount of local aid distributions varies, based on the Commonwealth's budget constraints, and there can be no assurance that local aid will not be reduced in the future. However, the Authority believes that the availability of its various enforcement mechanisms, including its statutory authority to intercept local aid distributions, will adequately provide for the payment of its rates and charges. For a comparison of the Authority's rates and charges with respect to each Municipal Local Body, see "The Authority and Its Service Areas" and "Charges to Local Bodies." For a discussion of the Authority's enforcement mechanisms and the possible limits on the availability of the local aid intercept, see "Rates and Charges – Enforcement."

## **SPECIAL ARRANGEMENTS**

Twenty-five Local Bodies are provided water services pursuant to contracts between the Local Bodies and the Authority or by special legislative acts. Of these Local Bodies, 19 pay for water services at the full water rates. Various arrangements are in effect for five communities, which in the aggregate account for approximately 5.0% of total consumption in Fiscal Year 2017, not including the Town of Bedford, which is not metered by the Authority and receives its water through the Town of Lexington. Southborough receives its first 150 million gallons per year at no charge. Clinton receives its first 800 million gallons of water per year at no charge pursuant to a special act, and typically consumes less than 800 million gallons annually, but would be charged generally applicable rates for any amounts in excess thereof.

Pursuant to Authority regulations, continuation of water supply services to any Local Body under special acts or contracts shall be made on such reasonable terms and charges as the Authority shall determine, provided in each instance the Authority determines that (i) the safe yield of the DCR Watershed System, on advice of the DCR Division of Water Supply Protection, is sufficient to meet the projected demand (provided that any Local Body previously receiving water supply services on a contract basis shall not be denied continuation of service if it has no other local water supply capable of being developed), (ii) no existing or potential local water supply has been abandoned, (iii) the Local Body has adopted a water management plan approved by the state Water Resources Commission, (iv) the Local Body has adopted effective demand management, leak detection and water system rehabilitation measures, (v) a local water source feasible for development has not been identified by the Local Body or the Massachusetts Department of Environmental Protection ("DEP,") and (vi) a water use survey has been completed identifying all local users in the Local Body consuming in excess of 20 million gallons per year.

The provision of sewer services by the Sewer System, in contrast to the special acts and contractual arrangements governing a portion of the services provided by the Waterworks System, is governed solely by the Act and other applicable federal and state environmental quality laws and regulations.

## MANAGEMENT AND ORGANIZATION OF THE AUTHORITY

### BOARD MEMBERSHIP

The Authority is governed by an eleven-member Board of Directors (the “Board”) chaired by the Secretary of Energy and Environmental Affairs for the Commonwealth. The Secretary and two other members are appointed by the Governor – one resident of a Connecticut River basin community and one resident of a Merrimack River basin community who represent water resources protection interests (terms coterminous with the Governor). At least one of the three gubernatorial appointments must be a representative of a minority group. One member is appointed by the Mayor of Quincy (term coterminous with the Mayor) and one member is appointed by the Winthrop Town Council by majority vote (four-year term). Three members of the Board are appointed by the Mayor of Boston (terms coterminous with the Mayor), and three are appointed by the Advisory Board (staggered three-year terms). See “Advisory Board” below. Six members of the Board constitute a quorum, and the affirmative vote of six members is required to approve any matter put to a vote of the Board. The members of the Board continue to serve until a successor is appointed.

The present members of the Board, their occupations, appointment categories, the dates of their original appointment and the dates of expiration of their terms as members of the Board are set forth on the following table.

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## BOARD OF DIRECTORS

<u>Member</u>	<u>Occupation</u>	<u>Date and Source of Original Appointment</u>	<u>Current Term Expires</u>
Matthew A. Beaton, <i>Chair</i>	Secretary of Energy and Environmental Affairs <i>Ex Officio</i>	January 8, 2015	Coterminous with term as Secretary
John J. Carroll, <i>Vice Chair</i>	General Manager, Town of Norwood	February 27, 1985; Advisory Board	June 30, 2017
Joseph C. Foti, <i>Secretary</i>	Director of Public Works, City of Chelsea	June 21, 2001; Advisory Board	June 30, 2019
Austin Blackmon	Chief of Environment, Energy and Open Space, City of Boston	March 9, 2015; Mayor of Boston	Coterminous with Mayor
Kevin L. Cotter	Business Manager/Treasurer, Plumbers and Gasfitters Local 12 (Retired)	September 3, 2002; Mayor of Boston	Coterminous with Mayor
Paul E. Flanagan	Fire Chief, Town of Winthrop	October 15, 2012; Winthrop Town Council	February 15, 2019
Andrew M. Pappastergion	Commissioner, Department of Public Works, Town of Brookline	June 25, 1997; Advisory Board	June 30, 2018
Brian Peña	Commissioner, Lawrence Water and Sewer Department	June 22, 2015; Governor	Coterminous with Governor
Henry F. Vitale	Executive Director, Boston Water and Sewer Commission	January 15, 2013; Mayor of Boston	Coterminous with Mayor
John J. Walsh	Manufacturing Engineer (Retired)	June 3, 2009; Mayor of Quincy	Coterminous with Mayor
Jennifer L. Wolowicz	Assistant Town Administrator, Town of South Hadley	March 18, 2013; Governor	Coterminous with Governor

### ORGANIZATION, MANAGEMENT AND STAFF

The staff of the Authority is headed by an Executive Director who is responsible for the implementation of Authority programs, policies and procedures at the direction of the Board. There are four divisions and several departments that report directly to the Executive Director, including the Office of Emergency Preparedness, the Affirmative Action Compliance Unit, the Internal Audit Department and Public Affairs.

The Chief Operating Officer heads the Operations Division together with two Deputy Chief Operating Officers. One deputy is responsible for Operations, Engineering and Construction and the other deputy is responsible for Programs, Policy and Planning. Although the Operations Division provides some services on a consolidated basis to more efficiently support both Water and Sewer Systems, the costs for providing water and sewer services are separately tracked in order to comply with the Act.

The Finance Division, headed by the Director of Finance, comprises four departments - Treasury, Rates and Budget, Controller, and Risk Management. The Administration Division, headed by the Director of



Administration, comprises six departments – Human Resources, Management Information Systems, Procurement, Real Property and Environmental Management, Fleet Services, and Facilities Management.

The Law Division addresses legal and regulatory issues involving the Authority.

Brief resumes of the Authority's senior management appear below:

**Frederick A. Laskey**, *Executive Director*

Mr. Laskey was appointed Executive Director in May 2001. Before joining the Authority in June 2001, Mr. Laskey served as Commissioner of the Massachusetts Department of Revenue from 1999 to 2001, managing the Commonwealth's tax administration, child support enforcement and local services. He served as Secretary of Administration and Finance from 1998 to 1999. As Secretary, he was the Governor's chief fiscal advisor, with oversight of the state's \$20 billion annual budget and managed the Cabinet Secretariat that oversees the entire state workforce. Before joining the Cabinet, Mr. Laskey served as Senior Deputy Commissioner of the Massachusetts Department of Revenue from 1994 to 1998, and was designated by the Commissioner to serve on the Board of Bank Incorporation. From 1993 to 1994, he served as Assistant Secretary in the Executive Office for Administration and Finance. Mr. Laskey holds a Bachelor of Arts degree in political science and history from University of Massachusetts, Boston. Mr. Laskey has a contract with the Authority that expires in June 2019.

**Michael J. Hornbrook**, *Chief Operating Officer*

Mr. Hornbrook was appointed the first Chief Operating Officer of the Authority in June 2000. Prior to this appointment, from 1995 to 2000, Mr. Hornbrook was responsible for the overall management of the Authority's CSO, Infiltration/Inflow, and Wastewater System planning programs. Previously, he directed the development and administration of the Sewerage Division's capital projects (1994-1995), and was responsible for the management of individual wastewater capital projects (1989-1994). From 1980 to 1989, Mr. Hornbrook held various engineering positions within the Massachusetts Department of Environmental Protection, Divisions of Waterways, Water Supply and Water Pollution Control. Mr. Hornbrook received a Bachelor's degree in civil engineering from the University of Massachusetts, Amherst. Mr. Hornbrook has a contract with the Authority that expires in May 2019.

**Thomas J. Durkin**, *Director of Finance*

Mr. Durkin was appointed Director of Finance in January 2015; he previously had served as Treasurer of the Authority since January 2008. Prior to joining the Authority, Mr. Durkin was the Deputy City Manager for the City of Chelsea, Massachusetts. Mr. Durkin also served as Finance Director for the Cities of Chelsea and Beverly, Massachusetts and as Treasurer for the City of Peabody, Massachusetts. Mr. Durkin holds a Master of Science degree in Corporate Finance from Bentley College and a Bachelor of Arts degree from the University of Massachusetts, Lowell.

**Michele S. Gillen**, *Director of Administration*

Ms. Gillen was appointed Director of Administration in January 2015, formerly serving as Deputy Director of Administration and Finance of the Authority since October 2009. Prior to her appointment as Deputy Director of Administration and Finance, Ms. Gillen served as Director of Real Property and Environmental Management (2005 -2009). Ms. Gillen also has held several positions within the Authority's Public Affairs Department. Ms. Gillen holds a Bachelor of Arts degree from Fordham University and a Master of Science degree from the University of Massachusetts at Boston.

**Matthew R. Horan, *Treasurer***

Mr. Horan was appointed Treasurer in January 2015, formerly serving as Deputy Treasurer of the Authority since July 2008. Prior to his appointment as Deputy Treasurer, Mr. Horan served as the Authority's Project Manager, Debt and Finance (2003 -2008). Mr. Horan also has held several positions within the Authority's Operations Division. Mr. Horan holds a Bachelor of Science degree and a Master of Science degree from Boston College.

**Steven A. Remsberg, *General Counsel***

Mr. Remsberg was appointed General Counsel in May 2004. Prior to joining the Authority, Mr. Remsberg served in the position of Acting General Counsel with the Massachusetts Department of Revenue from March 2003 to May 2004. Between April 2000 and March 2003, Mr. Remsberg served as the Associate General Counsel and from January 1997 to April 2000, as Chief of the Litigation Bureau at the Department of Revenue. Between 1989 and 1997, Mr. Remsberg practiced law with the Boston firm of Hinckley, Allen & Snyder and between 1979 and 1989 with the Boston firm of Snyder, Tepper & Comen. Mr. Remsberg holds a law degree from the University of Pittsburgh Law School and a bachelor's degree in economics from Dickinson College.

**EMPLOYEES**

As of July 1, 2016, the Authority had approximately 1,157 employees, including persons with professional qualifications in the fields of construction, engineering, environmental science, accounting, finance, law and management. The Authority believes that future staffing needs to support facilities constructed under the CIP are adequately reflected in its projected revenue requirements.

Under Massachusetts law, employees of the Authority have certain organizational and representational rights which include the right to organize, to bargain collectively by representatives of their choosing on questions of wages, hours and other terms and conditions of employment and to engage in lawful concerted activities for bargaining or other mutual aid or protection. The law prohibits strikes by Authority employees.

As of July 1, 2016, approximately 1,093 of the Authority's employees were organized into five collective bargaining units: Unit 1 is represented by United Steelworkers Local Union 9358; Unit 2 is represented by the American Federation of State, County and Municipal Employees Council 93 Local 1242; Unit 3 is represented by the National Association of Government Employees, Local R1-168; Unit 6 is represented by United Steelworkers Local Union 9360; and Unit 9 is represented by the Massachusetts Organization of State Engineers and Scientists.

The Authority's collective bargaining agreement with Unit 2 expires on March 31, 2017. The Authority's collective bargaining agreements with Units 1, 3, 6 and 9 expire on June 30, 2017.

The Act provides that no collective bargaining agreement entered into by the Authority shall limit inherent management rights including (i) employment, assignment and promotion of employees, (ii) termination and discharge of employees on reasonable grounds, (iii) determination of the Authority's levels of service and staffing and the methods, means and personnel for performing operations, (iv) supervision, evaluation and establishment of productivity standards, and (v) use of part-time regular employees and independent contractors and vendors.

The Authority believes that its relationships with its employees and their representatives are generally good.

**ADVISORY BOARD**

The Advisory Board to the Authority was established by the Act to serve as a liaison between the Authority and the Local Bodies. It is composed of one representative from 60 of the 61 Local Bodies (Lancaster is not represented on the Advisory Board), one from the Metropolitan Area Planning Council (a legislatively-created, comprehensive regional planning organization), and six persons appointed by the Governor to include an expert in environmental protection, one representative each from the Connecticut River basin, the Quabbin/Ware watershed

areas and the Wachusett watershed area, and two persons qualified by membership or affiliation in organizations directly concerned with the recreational or commercial uses of Boston Harbor.

The Advisory Board, whose staff is headed by an executive director and includes a budget analyst and other professionals, is empowered by the Act to do the following:

- Name three members to the Authority's Board;
- Approve, subject to other requirements of the Act, extension of service to additional communities;
- Make recommendations to the Authority on annual expense budgets, capital facility programs and expenditure budgets and user charges;
- Hold hearings on matters relating to the Authority; and
- Make recommendations to the Governor and the Legislature regarding the Authority.

The Advisory Board actively monitors the Authority's programs from the perspective of the Authority's rate payers. In addition to participating in the process of formulating the Authority's current expense budgets and capital improvement programs, the Advisory Board has pursued legislative support for debt service assistance, watershed protection and other measures of interest to the Local Bodies. The Advisory Board works with the Authority to enhance community assistance programs and share technical information and resources. The Advisory Board also developed the sewer rate methodology upon which the Authority's Sewer System annual rates and charges are based. See "Rates and Charges - General."

The Authority and Advisory Board share the goals of improved service to the Local Bodies and additional financial assistance for the Authority's programs.

## **RETIREMENT SYSTEMS AND EMPLOYEE BENEFITS**

All employees of the Authority are members of a contributory retirement system for public employees. The Act provides that all employees transferred to the Authority from the MDC on July 1, 1985 who were members of the State Employees' Retirement System (the "State System") shall remain members of the State System. All other employees of the Authority are members of a separate retirement system established in the Act known as the Massachusetts Water Resources Authority Retirement System (the "Authority System"). The Authority System is managed by a five-member board consisting of the Secretary of the Authority, *ex officio*, two members elected each for three-year terms by the present and retired members of the Authority System, a member appointed by the Authority for a three-year term, and another member selected by the other four members.

Neither the Authority nor the Authority System has any liability for retirement benefits paid to members of the State System. For these individuals, the total cost of benefits earned while employed by the Authority is paid by the Commonwealth and by the employees' own contributions. As of July 1, 2016, 72 employees of the Authority were members of the State System. While employees of the DCR Division of Water Supply Protection are not members of the Authority System and the Authority is not directly responsible for the payment of benefits, the cost of such benefits can be included in the computation of the expenses of the Division that are reimbursable in part by the Authority. See "The Systems – The Waterworks System."

The retirement benefits of employees of the Authority System are funded in part by employee contributions and investment returns, and in part by the Authority. As of July 1, 2016, there were 1,103 active members, 96 inactive members, and 510 retirees in the Authority System. The Act requires the Authority to pay annually to the Authority System any amounts needed to finance any pension benefits earned by its members. The Authority System undertakes an actuarial study every two years, the most recently completed study being as of January 1, 2015 (the "2015 Pension Study"). The unfunded accrued liability reported in the 2015 Pension Study was estimated to be approximately \$7.6 million, resulting in the Authority System being approximately 98.3% funded. The Authority's contributions to the Authority System for Fiscal Years 2012 through 2016 were approximately \$7.3 million (including a \$1.9 million optional payment), \$10.5 million (including a \$4.7 million optional payment), \$12.4 million (including a \$4.9 million optional payment), \$12.6 million (including an optional payment of \$4.8 million), and \$8.2 million, respectively. The FY17 CEB includes a \$4.6 million contribution (including an optional payment of \$1.5 million) to the Authority System. The Authority is scheduled to make the necessary contributions so that the Authority System will be fully funded by Fiscal Year 2024.

Employee contributions to both the State System and Authority System range from 5% of salary to not more than 11% of salary depending upon salary and the initial date of becoming a member of a system. Employees of the Authority do not participate in the federal Social Security Administration System.

GASB Statement No. 43, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*, was effective for the Fiscal Year ending June 30, 2007. The Authority began to implement GASB Statement No. 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions*, for the Fiscal Year ending June 30, 2008.

In addition to providing the pension benefits described above, the Authority provides other postemployment health care and life insurance benefits (“OPEB”) for retired employees through the Group Insurance Commission (“GIC”). GIC is a quasi-independent state agency that administers an agent multi-employer defined benefit OPEB plan (the “OPEB Plan”). The benefits, benefit levels, employee contributions and employer contributions are governed by and can be amended by the Authority. As of January 1, 2014, the most recent actuarial evaluation date for the Authority’s OPEB liability, approximately 529 retirees and survivors and 1,088 active employees met the eligibility requirements for the OPEB Plan and the unfunded actuarial accrued liability was determined to be \$166.5 million. At the end of Fiscal Year 2015, the Authority calculated its net OPEB liability at \$100.6 million. The Authority previously decided not to fund any OPEB liability until the Authority System was fully funded. As discussed above, based on the 2015 Pension Study, the Authority System was 98.3% funded as of January 1, 2015. Accordingly, in Fiscal Year 2015 the Authority established an irrevocable OPEB trust (the “OPEB Trust”) and began funding it in April 2015 with an initial deposit of \$10.8 million, including \$10 million released from reserves in connection with certain modifications to the General Resolution that became effective in April 2015, and \$800,000 that had been segregated by the Authority toward its OPEB liability in Fiscal Year 2010. In Fiscal Year 2016, \$5.2 million was deposited to the OPEB Trust and the FY17 CEB includes \$4.9 million for deposit to the OPEB Trust, which represents 50% of the Actuarial Required Contribution (the “ARC”) for Fiscal Year 2017, based on the January 1, 2014 actuarial evaluation after reduction of the pay-as-you-go portion included in the FY17 CEB. The Authority has assumed that the OPEB Trust will be funded annually at 50% of the ARC for the applicable fiscal year, based on the January 1, 2014 actuarial evaluation and after reduction of the pay-as-you-go portion included in the CEB for such fiscal year, in the rate projections included as part of the FY17 CEB.

## **PUBLIC AFFAIRS**

The Authority maintains strong relationships with the various constituencies it serves, including the Local Bodies, the Advisory Board, elected and appointed officials, interest groups, and the public at-large. Public outreach and education – critical to building support for the Authority’s operational and environmental objectives – are accomplished through a wide variety of activities, including community assistance programs, technical assistance to industrial customers, the Authority’s website, social media, rapid response to public inquiries, facility tours, informational publications, school education programs, intergovernmental and media liaisons, and targeted programs for communities impacted by Authority facilities.

## **FINANCIAL OPERATIONS**

### **GENERAL**

As required by the Act, the Authority’s operations for sewage collection, treatment and disposal and for delivery of water are treated separately for accounting and billing purposes, and revenues, expenses, assets and funds pertaining to these two operations are segregated by function. Indirect administrative costs and capital costs are allocated to water or sewer operations, as appropriate. The Authority’s Fiscal Year commences on July 1.

The Authority uses a budgetary system of accounting in setting its rates and charges and preparing its annual budget (the “Current Expense Budget” or “CEB”) for its current expenses, including operating costs and direct and indirect administrative costs (collectively, “Current Expenses”). United States of America generally accepted accounting principles (“GAAP”) are used by the Authority in preparing its monthly internal and annual audited financial statements.

**Current and Capital Expense Budgets.** In accordance with the Act, the Authority adopts annually a Current Expense Budget, which may be amended under certain circumstances. While the Authority’s Current

Expense Budget must be submitted to the Advisory Board for comment and recommendation not less than 60 days prior to its adoption, and amendments to the budget must be submitted to the Advisory Board no less than 30 days prior to their adoption, the Authority's Current Expense Budget is not subject to approval by any board (including the Advisory Board), department, agency or other instrumentality of the Commonwealth or any other governmental body.

The Act requires that the Authority adopt and update capital facilities programs for the Systems and capital expense budgets to implement and finance such programs. See "Capital Improvement Program."

## **MANAGEMENT AND FINANCIAL CONTROLS**

The Authority uses a performance-based budgeting format for its Current Expense Budget, which provides a basis for measuring operating activities, strengthens managerial accountability for each of the departments and provides a framework for the apportionment of resources. The Authority also uses a system of monthly and quarterly reports on key management indicators. Presentation formats allow for month-to-month, year-to-date, and year-to-year comparisons.

The Authority uses a variety of fiscal management systems to monitor and control Current Expenses. In addition to weekly cash reports, the Authority monitors its spending through monthly variance reports for each of its cost centers. Variance explanations are prepared at the end of the first three quarters of the Fiscal Year. At the end of the second and third fiscal quarters, the budget variance report includes updated forecasts of year-end expenditures.

The Authority has instituted a set of fiscal controls for the CIP. The Authority prepares monthly and quarterly reports on capital budget performance and semi-annual variance analysis reports on the capital budget. From time-to-time, as necessary, the Authority follows its established budget amendment policy to make adjustments to the capital budget. Procurements are processed by a central department to ensure uniform contract language, standard safeguards and competitive bids for the Authority. Contract amendments and construction change orders are subject to critical review and evaluation by field and budget staff, procurement officers, and legal counsel. The Authority also has instituted audit procedures to examine wage, overhead and profit rates on professional service contracts. Resident inspectors monitor all construction in progress to ensure quality of material and workmanship. Claims by contractors are reviewed and negotiated by the Authority's inspection and legal staff.

The Authority has an integrated management information system for its financial functions, including general ledger, budget, accounts receivable, debt management, cash management, procurement, accounts payable, and payroll systems. The Authority regularly upgrades and enhances this system to ensure the ongoing efficiency of its operation.

The Authority's business plan defines critical operational goals and objectives, as well as related activities and improvements in support of these objectives. The Authority also has developed annual performance targets that provide a quantifiable standard against which to measure progress towards achieving these objectives.

## **OUTSTANDING AND PROPOSED INDEBTEDNESS**

The following table sets forth debt service on the Authority's Outstanding Secured Bonds, after giving effect to the issuance of the 2016 Bonds, for each Fiscal Year in which such Secured Bonds will be Outstanding.

**SECURED BONDS DEBT SERVICE**  
(in thousands of dollars)

Fiscal Year	Debt Service On General Revenue Bonds <sup>1</sup>		Debt Service On Subordinated Bonds <sup>2</sup>		Total Secured Bonds Debt Service
	Principal	Interest	Principal	Interest <sup>3</sup>	
2017	\$108,705	\$164,681	\$ 64,487	\$62,717	\$400,590
2018	100,890	160,365	90,028	60,449	411,732
2019	105,995	154,969	104,366	57,938	423,268
2020	112,320	149,391	111,270	56,397	429,379
2021	72,535	144,272	191,157	51,798	459,763
2022	147,475	138,182	129,221	44,812	459,690
2023	150,730	139,357	168,433	40,080	498,599
2024	175,385	122,146	110,003	35,400	442,935
2025	165,780	113,521	98,832	29,679	407,812
2026	152,510	105,446	96,999	26,271	381,226
2027	157,670	97,639	123,892	22,258	401,458
2028	163,915	89,570	90,974	17,785	362,245
2029	169,000	81,375	81,984	13,693	346,052
2030	162,645	73,343	52,778	12,687	301,453
2031	157,175	65,535	39,463	10,809	272,981
2032	138,905	58,359	37,842	9,737	244,843
2033	124,845	51,896	32,846	8,069	217,656
2034	114,425	45,772	32,712	6,912	199,821
2035	110,955	39,857	32,371	5,651	188,835
2036	125,745	33,662	29,999	4,315	193,721
2037	117,360	27,502	27,377	2,951	175,190
2038	111,140	21,813	24,826	1,604	159,384
2039	118,605	16,078	7,229	589	142,501
2040	105,245	10,588	4,008	450	120,291
2041	96,250	5,841	4,110	349	106,550
2042	43,120	2,706	3,161	259	49,246
2043	25,755	1,098	3,243	180	30,276
2044	4,365	339	1,441	113	6,258
2045	4,590	115	1,479	76	6,260
2046	0	0	1,517	39	1,556
<b>Total</b>	<b>\$3,344,035</b>	<b>\$2,115,420</b>	<b>\$1,798,048</b>	<b>\$584,066</b>	<b>\$7,841,569</b>

Totals may not add due to rounding.

<sup>1</sup> Does not include debt service on the Refunded Bonds.

<sup>2</sup> Includes debt service on SRF Bonds, net of subsidy amounts. Does not include debt service on CP Notes or a revolving loan.

<sup>3</sup> The Authority has entered into several interest rate exchange agreements (“swaps”), pursuant to which the Authority pays interest to the swap counterparty at a fixed rate and receives interest at a variable rate. The Authority’s current payment obligations under its swaps are secured on a parity basis with the Subordinated Bonds; however, any termination obligations would be payable only from amounts in the Commonwealth Obligation Fund. The table assumes the fixed rate of interest payable under these swaps, inclusive of fees, with respect to a related portion of Subordinated Bonds for the periods in which the swaps are in effect. Variable rate indebtedness not covered by a swap is included at 4%.

Based on the FY17 CIP, the Authority currently projects that it will issue approximately \$863.2 million of additional Secured Bonds from Fiscal Year 2017 through Fiscal Year 2022 to finance the CIP. This projection incorporates various assumptions, including assumptions as to interest rates on indebtedness and investments, inflation rates and the size and timing of capital expenditures, and it assumes legislative approval of adequate and timely increases in the Authority's debt limit. See "Debt Limitation" below. Although this Official Statement does not contain rate projections beyond Fiscal Year 2022, the Authority expects to issue additional Secured Bonds beyond Fiscal Year 2022.

Additionally, the Commonwealth has issued bonds to finance certain watershed preservation projects. The debt service on such bonds is payable annually by the Authority to the Commonwealth as a charge for the costs of the DCR Division of Water Supply Protection. Such charges constitute Commonwealth Obligations under the General Resolution. These charges are included in the Authority's estimates of its future rates and charges.

From time to time the Authority has entered into interest rate exchange agreements ("swaps") with respect to certain of its outstanding variable rate Subordinated Bonds. The Authority currently has five swaps in effect, pursuant to which the Authority pays a fixed rate of interest in exchange for a floating rate of interest paid by the swap counterparty, and one swap with a forward starting date in 2030, pursuant to which the Authority will pay a fixed rate of interest in exchange for a floating rate of interest to be paid by the swap counterparty, as shown in the table below.

<b>Counterparty</b>	<b>Outstanding Notional Amount As of July 1, 2016</b>	<b>Fixed Rate Payable by MWRA</b>	<b>Variable Rate Payable to MWRA</b>	<b>Termination</b>
Citigroup Financial Products, Inc.	\$92.9 million	3.994%	SIFMA	2026
Morgan Stanley Capital Services Inc.	\$62.0 million	4.033%	SIFMA	2026
Barclays Bank PLC	\$133.3 million	5.144% increasing to 6.585% in 2019	67% of 3-month LIBOR + 0.13%	2030
Wells Fargo Bank, N.A.	\$133.3 million	5.494% increasing to 6.935% in 2019	SIFMA	2030
Barclays Bank PLC*	\$70.4 million	6.585%	67% of 3-month LIBOR + 0.13%	2037

\*Term commences in 2030.

## **DEBT LIMITATION**

The Act contains a limitation on the total amount of unrefunded bonds and notes of the Authority that may be outstanding at any one time. The debt limit is currently \$6.45 billion. Upon the issuance of the 2016 Bonds, the Authority will have outstanding approximately \$5.23 billion of bonds and notes.

The Authority periodically has requested and received increases in its debt limit to allow for the issuance of bonds to finance the CIP. The Authority expects to seek additional increases in the limit, if necessary, in order to finance the CIP in the future. Any such increase is subject to legislative approval. Failure to secure increases in the debt limit sufficient to finance the CIP as planned would require the Authority to adjust its construction plans and schedules and seek alternative sources of funding.

## **REPORTS**

In accordance with the Act, the Authority submits annual financial reports and five-year progress reports to the Governor, the President of the state Senate, the Speaker of the state House of Representatives, the Advisory Board and the Chairpersons of the state Senate and House Committees on Ways and Means. The annual reports contain financial statements relating to its operations maintained in accordance with GAAP and audited by

independent certified public accountants. The five-year progress reports are prepared with the participation of an independent citizen panel, documenting activities of the prior period, and anticipated challenges for the future. The most recent five-year report was submitted in December 2010; the Authority is in the process of finalizing the progress report for the period ending December 2015.

The Authority has retained KPMG LLP as its independent accountants to audit the financial statements of the Authority. Included in Appendix A are the audited financial statements of the Authority at June 30, 2015 and June 30, 2014 and for the Fiscal Years then ended. See “Financial Statements.”

Pursuant to the General Resolution, the Authority files with the Trustee a triennial report of the Consulting Engineer, setting forth a detailed analysis of the Authority’s Systems, Current Expense Budget and CIP, including recommendations as to reserve requirements and other matters. The most recent triennial report, the 2014 Triennial Report, was completed in October 2014 and appears in Appendix B to the Authority’s Official Statement, dated November 6, 2014, relating to the issuance of the Authority’s General Revenue Bonds, 2014 Series D, General Revenue Refunding Bonds, 2014 Series E, and General Revenue Refunding Bonds, 2014 Series F, which Official Statement is available through the Municipal Securities Rulemaking Board’s Electronic Municipal Market Access system (“EMMA”) and can be found at <http://emma.msrb.org/ER815375-ER634658-ER1036257.pdf>.

The Authority also files other reports and information from time to time with federal and state governmental authorities in accordance with legislative and regulatory requirements.

## **MANAGEMENT’S REVIEW OF OPERATING RESULTS**

### **HISTORICAL REVENUES, EXPENSES AND FUND DEPOSITS**

The following table is prepared in accordance with the General Resolution and sets forth a summary of the Authority’s historical revenues, expenses and fund deposits for Fiscal Years 2011 through 2015. For financial statements prepared in accordance with GAAP regarding Fiscal Year 2015, see Appendix A - “Financial Statements of the Authority.”

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**HISTORICAL REVENUES, EXPENSES AND  
FUND DEPOSITS**  
(in thousands of dollars)

	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>
Revenues					
Rates and Charges	\$569,800	\$589,700	\$607,512	\$628,721	\$650,316
Investment Income <sup>1</sup>	15,193	16,268	13,590	12,130	9,689
Transfer from Rate Stabilization Fund	5,030	1,092	0	3,500	0
Other Income	<u>14,554</u>	<u>12,920</u>	<u>15,881</u>	<u>19,296</u>	<u>18,289</u>
Total Revenues	<u>\$604,577</u>	<u>\$619,980</u>	<u>\$636,983</u>	<u>\$663,647</u>	<u>\$678,294</u>
Operating Expenses <sup>2</sup>	\$240,678	\$245,210	\$252,333	\$257,724	\$258,534
Capital Lease	<u>3,217</u>	<u>3,217</u>	<u>3,217</u>	<u>3,217</u>	<u>3,217</u>
Net Operating Revenues	<u>\$360,682</u>	<u>\$371,553</u>	<u>\$381,433</u>	<u>\$402,706</u>	<u>\$416,543</u>
Debt Service on Bonds	\$224,746	\$208,332	\$209,826	\$228,652	\$233,079
Other Debt Service <sup>3</sup>	<u>24,656</u>	<u>145,722</u>	<u>158,666</u>	<u>166,032</u>	<u>161,736</u>
Amount Available After Operations and Debt Service	<u>\$ 11,280</u>	<u>\$ 17,499</u>	<u>\$ 12,941</u>	<u>\$ 14,022</u>	<u>\$ 21,728</u>
Fund Deposits					
Reserve Funds	\$ (407)	\$ 195	\$ 1,398	\$ 169	\$ 483
Construction Fund <sup>4</sup>	\$ 7,539	\$ 7,481 <sup>4</sup>	\$ 8,535 <sup>4</sup>	\$ 9,516 <sup>4</sup>	\$ 10,464 <sup>4</sup>
Core Fund	\$ 0	\$ 0	\$ 0	\$ 132	\$ 730

<sup>1</sup> Unrealized gains or losses recorded on investments are excluded.

<sup>2</sup> Includes payment of certain Commonwealth Obligations, that are paid after Debt Service on Secured Bonds and that are not included in Operating Expenses for purposes of calculating certain Coverage Covenants; excludes depreciation.

<sup>3</sup> Includes debt service on variable rate Subordinated Bonds, including SRF Bonds. Excludes amortized issuance expenses, refinanced principal payments and interest on CP Notes.

<sup>4</sup> Includes deposits from current revenue to fund capital projects.

**FISCAL YEAR 2011**

The Fiscal Year 2011 CEB (the "FY11 CEB") was adopted by the Board of Directors in June 2010. The FY11 CEB totaled \$601.9 million. Non-rate revenue totaled \$32.1 million, resulting in a rate revenue requirement of \$569.8 million, an increase of 1.49% over Fiscal Year 2010. The Authority budgeted to receive no debt service assistance in Fiscal Year 2011. The FY11 CEB used \$5.0 million of rate stabilization funds.

The FY11 CEB included \$601.9 million in current expenses for Fiscal Year 2011, consisting of approximately \$209.6 million in direct expenses, \$38.0 million of indirect expenses, and \$354.3 million of capital financing expenses.

Total actual expenses in Fiscal Year 2011, were \$600.4 million, or 0.2% less than budgeted, direct expenses of \$204.3 million were 2.5% less than budgeted, capital financing expenses of \$360.2 million were 1.6% higher than budgeted, and indirect expenses of \$35.9 million were 5.2% less than budgeted. Direct expenses were under budget primarily due to fewer than budgeted filled positions, less electricity and diesel fuel usage than budgeted, delayed timing of maintenance work, and lower than projected usage and pricing of chemical purchases, primarily sodium hypochlorite at the Deer Island Treatment Plant.

Total actual revenues for Fiscal Year 2011 were \$604.6 million; \$2.7 million or 0.4% higher than budgeted.

**FISCAL YEAR 2012**

The Fiscal Year 2012 Current Expense Budget (the "FY12 CEB") was adopted by the Board of Directors in June 2011. The FY12 CEB totaled \$618.2 million. Non-rate revenue totaled \$28.5 million, resulting in a rate revenue requirement of \$589.7 million, an increase of 3.49% over Fiscal Year 2011. Included in the non-rate

revenue amount was \$1.1 million of rate stabilization funds. The FY12 CEB assumed that the Authority would receive \$350,000 of state debt service assistance in Fiscal Year 2012; the Authority received \$384,323 in April 2012. The FY12 CEB included approximately \$618.2 million in current expenses for Fiscal Year 2012, an increase of \$16.3 million over the Fiscal Year 2011 Current Expense Budget. Total current expenses included in the FY12 CEB comprised approximately \$209.3 million in direct expenses, \$40.9 million of indirect expenses, and approximately \$368 million of capital financing expenses.

Total actual expenses in Fiscal Year 2012 were approximately \$610.2 million, or approximately 1.3% less than budgeted. Direct expenses of approximately \$204.8 million were approximately 2.1% less than budgeted, capital financing expenses of approximately \$364.8 million were approximately 0.9% less than budgeted, and indirect expenses of approximately \$40.6 million were approximately 0.8% less than budgeted.

Total actual revenues for Fiscal Year 2012 were approximately \$620 million or approximately 0.3% more than budgeted.

### **FISCAL YEAR 2013**

The Fiscal Year 2013 Current Expense Budget (the "FY13 CEB") was adopted by the Board of Directors in June 2012. The FY13 CEB totaled \$635.9 million. Non-rate revenue totaled \$28.3 million, resulting in a rate revenue requirement of \$607.5 million, an increase of 3.0% over Fiscal Year 2012. The FY13 CEB used no rate stabilization funds. The FY13 CEB assumed the Authority would receive \$350,000 of debt service assistance in Fiscal Year 2013, however, subsequent amendments to the Commonwealth's fiscal year 2013 budget eliminated all appropriations for debt service assistance.

Total FY13 CEB expenses increased by \$17.7 million, or 2.9%, over FY 2012 CEB expenses, of which \$7.3 million, or 2.0%, represented increased capital financing expenses. The FY13 CEB included approximately \$635.9 million in current expenses for Fiscal Year 2013, consisting of approximately \$214.9 million in direct expenses, \$45.7 million of indirect expenses, and \$375.3 million of capital financing expenses. Based on the FY13 CEB, the Authority established a rate increase of 3.0% in Fiscal Year 2013.

Total actual expenses in Fiscal Year 2013 were approximately \$634.0 million, or approximately 0.3% less than budgeted. Direct expenses of approximately \$208.6 million were approximately 3.0% less than budgeted, capital financing expenses of approximately \$380.2 million (including an optional defeasance and redemption totaling \$25.4 million) were approximately 1.3% more than budgeted, and indirect expenses of approximately \$45.1 million were approximately 1.3% less than budgeted.

Total actual revenues for Fiscal Year 2013 were approximately \$637.0 million or approximately 0.2% more than budgeted.

### **FISCAL YEAR 2014**

The Fiscal Year 2014 Current Expense Budget (the "FY14 CEB") was adopted by the Board of Directors in June 2013. The FY14 CEB totaled approximately \$658.4 million. Non-rate revenue totaled approximately \$29.7 million, resulting in a rate revenue requirement of \$628.7 million, an increase of approximately 3.5% over Fiscal Year 2013. The FY14 CEB assumed that the Authority would receive no debt service assistance for Fiscal Year 2014 or thereafter. The FY14 CEB used \$3.5 million of rate stabilization funds.

The FY14 CEB included approximately \$658.4 million in current expenses for Fiscal Year 2014, consisting of approximately \$214.4 million in direct expenses, \$46.8 million of indirect expenses, and \$397.2 million of capital financing expenses. Total FY14 CEB expenses increased by \$24.4 million, or 3.9%, over Fiscal Year 2013 actual expenses, of which \$17.0 million represented increased capital financing expenses before offsets, a 4.5% increase over Fiscal Year 2013 actual capital financing expenses. Capital financing expenses accounted for approximately 60.3% of total budgeted expenses for Fiscal Year 2014.

Total actual expenses in Fiscal Year 2014 were approximately \$659.4 million, or approximately 0.2% less than budgeted. Direct expenses of approximately \$211.6 million were approximately 1.3% less than budgeted,

capital financing expenses of approximately \$401.5 million (including funds in the amount of \$26.2 million applied to an optional defeasance) were approximately 1.1% more than budgeted, and indirect expenses of approximately \$46.3 million were approximately 1.1% less than budgeted.

Total actual revenues for Fiscal Year 2014 were approximately \$663.6 million or approximately 0.8% more than budgeted.

## **FISCAL YEAR 2015**

The Fiscal Year 2015 Current Expense Budget (the “FY15 CEB”) was adopted by the Board of Directors in June 2014. The FY15 CEB totaled \$674.5 million. Non-rate revenue totaled approximately \$24.2 million, resulting in a rate revenue requirement of \$650.32 million, an increase of 3.4% over Fiscal Year 2014. The FY15 CEB used no rate stabilization funds and assumed the Authority would receive no debt service assistance in Fiscal Year 2015 or thereafter.

Total FY15 CEB expenses increased by \$16.1 million, or 2.4%, over the current expense budget for Fiscal Year 2014, of which \$12.6 million represented increased capital financing expenses. The FY15 CEB included approximately \$674.5 million in current expenses for Fiscal Year 2015, consisting of approximately \$217.1 million of direct expenses, \$47.5 million of indirect expenses, and \$409.8 million of capital financing expenses. Based on the FY15 CEB, the Authority established a rate increase of 3.4% for Fiscal Year 2015.

Total actual expenses in Fiscal Year 2015 were approximately \$6.2 million or 0.9% less than budgeted. Direct expenses were approximately \$4.7 million less than budgeted, primarily due to actual utilities and wages and salaries being less than budgeted, and capital financing expenses of approximately \$409.2 million (including optional cash defeasances totaling \$26.5 million of certain Bonds) were approximately \$0.6 million less than budgeted.

Total actual revenues for Fiscal Year 2015 were approximately \$3.8 million or approximately 0.6% more than budgeted.

## **FISCAL YEAR 2016 CURRENT EXPENSE BUDGET AND THIRD QUARTER RESULTS**

The FY16 CEB was adopted by the Board of Directors in June 2015. The FY16 CEB totals approximately \$702.5 million. Non-rate revenue totaled approximately \$30.3 million, resulting in a rate revenue requirement of \$672.4 million, an increase of 3.4% over Fiscal Year 2015. The FY16 CEB used no rate stabilization funds and assumed that the Authority would receive no new debt service assistance in Fiscal Year 2016 or thereafter.

The FY16 CEB included approximately \$702.5 million in current budgeted expenses for Fiscal Year 2016, consisting of approximately \$222.8 million of direct expenses, \$47.0 million of indirect expenses, and \$432.7 million of capital financing expenses. Total FY16 CEB expenses increased by \$34.2 million, or 5.1%, over Fiscal Year 2015 actual expenditures, of which \$23.5 million represents increased capital financing expenses, a 5.7% increase over Fiscal Year 2015 actual capital financing expenses. Capital financing expenses accounted for approximately 61.6% of total budgeted expenses for Fiscal Year 2016.

As of the end of the third quarter of Fiscal Year 2016, total expenses were \$489.8 million, or 4.0% less than budgeted, direct expenses of \$156.0 million were 1.8% less than budgeted, capital financing expenses of \$301.1 million were 5.4% less than budgeted, and indirect expenses of \$32.7 million were 1.6% less than budgeted. Direct expenses were less than budgeted due primarily to wages and salaries, utilities and workers compensation expenses being less than budgeted, although expenditures for maintenance costs were higher than budgeted.

Total revenue through the third quarter of Fiscal Year 2016 was \$530.7 million or 0.5% more than budgeted. The Authority also received \$873,804 in debt service assistance in Fiscal Year 2016.

## **FISCAL YEAR 2017 CURRENT EXPENSE BUDGET**

In June 2017, the Board approved the FY17 CEB. The FY17 CEB totals \$719.6 million, an increase of 2.4% over the FY16 CEB. Non-rate revenue totals \$24.7 million, resulting in a rate revenue requirement of \$694.9 million, an increase of approximately 3.3% over Fiscal Year 2016. The FY17 CEB assumes that the Authority will receive no state debt service assistance for Fiscal Year 2017 or thereafter; however, the FY17 CEB utilizes the debt service assistance (\$873,804) received by the Authority in June 2016. The FY17 CEB does not use any rate stabilization funds or bond redemption funds.

Total expenses in the FY17 CEB increased by \$17.1 million, or 2.4%, over the FY16 CEB, with an increase in capital financing expenses of \$22.4 million, an increase in direct expenses of \$3.7 million, and a decrease in indirect operating expenses of \$9.0 million. The FY17 CEB includes \$226.5 million of direct expenses, \$38.0 million of indirect expenses, and \$455.1 million of capital financing expenses. Capital financing expenses represent 63.2% of total expenses in the FY17 CEB. Planned capital expenditures for Fiscal Year 2017 are less than scheduled principal payments due in Fiscal Year 2017 on Secured Bonds.

## **DEBT SERVICE COVERAGE**

The Authority has met or exceeded the Coverage Covenants, as required by the General Resolution, in each of the last five Fiscal Years, as shown in the following table. For a discussion of projected debt service coverage, see Appendix B – “July 2016 Report of the Consulting Engineer.”

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**HISTORICAL COVERAGE**  
(in thousands of dollars)

	<u>FY2011</u>	<u>FY2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>
Operating Revenues	\$ 584,354	\$ 602,620	\$ 623,392	\$ 648,019	\$ 668,605
Interest Income	15,193	16,268	13,592	12,128	9,689
Transfers from Rate Stabilization Fund <sup>1</sup>	<u>5,030</u>	<u>1,092</u>	<u>0</u>	<u>3,500</u>	<u>0</u>
Total Revenues	604,577	619,980	636,984	663,647	678,294
Operating Expenses	(254,846)	(261,510)	(267,351)	(273,500)	(271,329)
Commonwealth Obligations <sup>2</sup>	24,709	25,630	26,004	26,641	27,168
OPEB <sup>3</sup>	14,169	15,118	13,123	13,521	9,401
Pollution Remediation	--	--	--	2,261	3,394
Capital Lease	<u>(3,217)</u>	<u>(3,217)</u>	<u>(3,217)</u>	<u>(3,217)</u>	<u>(3,217)</u>
Net Revenues	\$385,392	\$396,001	\$405,543	\$429,353	\$443,711
CORE Fund Deposits	0	0	0	132	862
Revenues Available for Primary and SRF Primary Coverage (Before Provision for Transfer to Rate Stabilization Fund)(A)	<u>\$385,392</u>	<u>\$396,001</u>	<u>\$405,543</u>	<u>\$429,221</u>	<u>\$442,849</u>
Provision for Transfer to Rate Stabilization Fund <sup>2</sup>	<u>\$ 4,148</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 0</u>
Revenues Available for Primary and SRF Primary Coverage (After Provision for Transfer to Rate Stabilization Fund)(B)	<u>\$381,244</u>	<u>\$396,001</u>	<u>\$405,543</u>	<u>\$429,221</u>	<u>\$442,849</u>
Required Senior Debt Service Fund Deposits(C)	<u>\$199,294</u>	<u>\$188,054</u>	<u>\$192,834</u>	<u>\$203,338</u>	<u>\$208,500</u>
Required Subordinated Debt Service Deposits(D)	<u>\$117,656</u>	<u>\$145,236</u>	<u>\$151,598</u>	<u>\$160,032</u>	<u>\$161,737</u>
Coverage:					
Before Provision for Transfer to Rate Stabilization Fund:					
Primary <sup>4</sup>	193%	211%	210%	211%	212%
SRF Primary <sup>5</sup>	122%	119%	118%	118%	120%
After Provision for Transfer to Rate Stabilization Fund:					
Primary <sup>6</sup>	191%	211%	210%	211%	212%
SRF Primary <sup>7</sup>	120%	119%	118%	118%	120%
Required CORE Fund Deposits <sup>8</sup>	0	0	0	\$132	\$862
CORE Fund Deposits	0	0	0	\$132	\$862

<sup>1</sup> Amounts transferred from the Rate Stabilization Fund to the Revenue Fund are included as Revenues for coverage purposes in the year of such transfer up to an amount equal to 0.1 times Required Debt Service Fund Deposits for such year. Consistent with this treatment, in calculating coverage for a Fiscal Year, moneys transferred to the Rate Stabilization Fund are not included as Revenues.

<sup>2</sup> Commonwealth Obligations are paid after debt service on Bonds and are, therefore, excluded from Operating Expenses in calculating coverage.

<sup>3</sup> Represents the Authority's OPEB liability under GASB 45.

<sup>4</sup> A divided by C.

<sup>5</sup> A divided by the sum of C and D.

<sup>6</sup> B divided by C.

<sup>7</sup> B divided by sum of C and D.

<sup>8</sup> The Community Obligation and Revenue Enhancement ("CORE") Fund is required to be funded at the end of each Fiscal Year in the amount of at least 10% of the Required Debt Service Fund Deposits for all Bonds Outstanding as of the beginning of such Fiscal Year. The CORE Fund was eliminated pursuant to amendments to the General Resolution effective in April 2015; the Authority made monthly deposits to the Core Fund through April, 2015.

## THE SYSTEMS

### THE WATERWORKS SYSTEM

**History.** Boston and surrounding communities have one of the oldest public water supply systems in the United States, dating to 1652 when the “Water Works Company” was incorporated to construct Boston’s first waterworks facility. Facilities were added over the years to meet increasing demand, and by the mid-1800s, a large scale water supply system utilizing cast iron pipes from a series of area reservoirs had been fully developed. In 1895, after a major study of the existing Boston metropolitan water supply and demand forecasts, work was begun on a major expansion project, the Wachusett Reservoir and Aqueduct. Construction of the Wachusett Reservoir, finished in 1908, more than doubled the System’s yield. In 1919, after the state Legislature commissioned a second major water supply study, planning was begun for the Quabbin Reservoir. Construction of the Quabbin Reservoir, completed in 1939 and filled to capacity by 1946, represented the last major expansion of the System’s water supply, increasing the reservoirs’ total storage capacity from 78 billion gallons to approximately 490 billion gallons, and the watershed area from approximately 185 square miles to approximately 467 square miles.

**Water Supply.** The Act granted to the Authority the exclusive right to utilize for water supply purposes all of the water from the existing DCR Watershed System as may be safely yielded. The safe yield is defined to be the average quantity of water that can be supplied on a continuous basis through a drought period. Under present operating rules the Authority’s water sources can supply a safe yield of approximately 300 million gallons per day (“mgd”). The Authority’s statutory right to utilize water derived from the DCR Watershed System includes the delivery, distribution and sale of water and the receipt by the Authority of revenues from charges relating to such delivery, distribution and sale.

DCR’s Division of Water Supply Protection (the “Division”) is responsible for management and maintenance of the DCR Watershed System, including a mandate to construct, maintain and operate a system of watersheds, reservoirs, water rights and rights in sources of water supply, and to supply a sufficient supply of pure water to the Authority. Other DCR responsibilities include forestry and wildlife management; conservation of water, land and other natural resources; preservation of the environment; and operation of a visitor’s center at the Quabbin Reservoir.

The Authority must pay the Commonwealth for the Division’s watershed management and maintenance costs, including the cost of debt service on certain Commonwealth bonds issued to finance the acquisition of development rights and other interests in land within the DCR Watershed System. See “Financial Operations - Outstanding and Proposed Indebtedness.”

The present major sources of water to the Waterworks System are the watersheds of the Quabbin Reservoir, the Ware River and the Wachusett Reservoir. Other standby sources include the Sudbury Reservoir and the Framingham Reservoir No. 3. The Quabbin Reservoir, located approximately 65 miles west of Boston, is one of the largest reservoirs in the world built exclusively for water supply purposes, covering 39 square miles with a capacity of 412 billion gallons. Water for the Quabbin Reservoir is derived from the impounded Swift River, a tributary of the Connecticut River, with a runoff from 186 square miles of watershed. In addition, a limited quantity of the runoff from 98 square miles of the Ware River watershed is diverted to the Quabbin Reservoir.

The Wachusett Reservoir is located in central Massachusetts, approximately 35 miles west of Boston. The Wachusett Reservoir has a capacity of 65 billion gallons and a surface area of approximately 6.5 square miles. The Sudbury Reservoir, in the Sudbury River watershed, has an 8.4 billion gallon capacity and a surface area of approximately two square miles. Framingham Reservoir No. 3, also in the Sudbury River watershed, has a capacity of 1.2 billion gallons and a surface area of approximately one-half of a square mile. The Sudbury and Framingham Reservoirs are currently maintained off-line for emergency use only.

In close conjunction with the Authority, the DCR has developed and implemented Watershed Protection Plans for the Quabbin, Wachusett and Ware watershed areas to protect water quality in the reservoirs. Components of this program include a land acquisition program funded by the Authority targeting critical lands over 15 years, a completed sewer project to improve tributary water quality, public access controls around the reservoir, state regulations on development in critical areas along tributaries, and a substantial water quality monitoring and

research program. Updated five-year protection programs for all three watersheds, covering the 2014-2019 period, have been approved by DEP. The plans focus on continuing protection efforts to minimize the level of pathogens entering the reservoir.

**Water Transmission and Distribution.** Because of the variety of local conditions and elevations, six water pressure zones are required for the Authority's waterworks service area. These six zones are supplied through tunnels and aqueducts from the two active source water reservoirs and water is distributed through pumping and major transmission and storage facilities, all of which are owned and maintained by the Authority. Major system components include approximately 350 miles of aqueducts, tunnels and mains, 12 active distribution storage reservoirs and standpipes, 11 active pumping stations, and three active hydro-electric power stations.

Water from the Quabbin Reservoir, which has an elevation 530 feet above the base elevation of Boston, is delivered to the Wachusett Reservoir by the Quabbin Aqueduct, a 24.6-mile tunnel. From the Wachusett Reservoir, water is delivered through the eight-mile Cosgrove Tunnel, built in the 1960s, and the Wachusett Aqueduct, first used in 1898, to the Hultman Aqueduct intake structure in Marlborough and to the Weston Reservoir via the Weston Aqueduct. The Hultman Aqueduct, in service since the 1940s, connects with the Cosgrove Tunnel and continues the delivery of water 17.8 miles into the Boston area. Water from the Wachusett Reservoir and the back-up Sudbury Reservoir can be delivered in an emergency through the 17.5-mile Sudbury Aqueduct, built in 1878, to the Chestnut Hill Reservoir which is now off-line. With the completion of the 17.6-mile MetroWest Water Supply Tunnel, the Hultman Aqueduct was rehabilitated in phases and now provides redundancy for large segments of the MetroWest Water Supply Tunnel. In addition, the Authority is undertaking several additional projects designed to provide further redundancy to the water transmission system, including at the Wachusett Aqueduct. See "Capital Improvement Program - Capital Projects in FY17 CIP - Waterworks Projects."

The major links of the water supply distribution system in the Boston area are the Authority's 5.4-mile City Tunnel, a 7.1 mile City Tunnel Extension serving communities north of Boston, and the Dorchester Tunnel, a 6.4-mile tunnel providing distribution to communities south of Boston. The Authority provides water supply to each Local Body through one or more metered connections and through certain non-metered connections that are used on an emergency basis only. Less than 5% of monthly water consumption is estimated, rather than metered, due to the necessary use of an emergency connection or to a faulty meter or other system malfunction. The water distribution system has a total of 160 metered connections and approximately 73 non-metered emergency connections. The Authority is responsible for the maintenance of the water distribution system to and including the metered connection or, in the case of an emergency connection, the emergency valve. Local communities served by the Authority distribute water to their retail customers through approximately 6,000 miles of community-maintained water pipelines.

**Water Quality.** The Authority received a waiver from DEP of filtration requirements for water supplied from Wachusett Reservoir to the metropolitan Boston area. To meet the waiver requirements and to comply with applicable SDWA regulations, the Authority constructed the John J. Carroll Water Treatment Plant (previously referred to as the Walnut Hill Water Treatment Plant) (the "Carroll Water Treatment Plant") in Marlborough, and has completed construction of a second primary disinfection treatment process at the Carroll Water Treatment Plant. See "Environmental Regulation and Litigation - Water Supply - Drinking Water Regulation."

The Authority has eliminated the use of open distribution reservoirs by constructing covered storage facilities, because existing uncovered distribution reservoirs are vulnerable to airborne contaminants and allow the growth of bacteria, plants and algae. Approximately 2.4 billion gallons of open reservoirs have been replaced with more than 200 million gallons of covered storage downstream of the Carroll Water Treatment Plant.

The Authority received a conditional waiver from DEP of filtration requirements for water supplied to three communities in western Massachusetts by the Chicopee Valley Aqueduct from the Ware River/Quabbin Reservoir supply system. To meet the waiver conditions and improve disinfection and corrosion control to assure water quality and SDWA compliance, the Authority constructed a disinfection facility at Ware (the "Ware Disinfection Facility"), and two 12.5 million gallon concrete water storage tanks to replace the open Nash Hill Reservoir. The Authority also has completed construction of a second primary disinfection treatment process for

the Ware Disinfection Facility. See “Environmental Regulation and Litigation - Water Supply - Drinking Water Regulation.”

The Authority’s Local Water Infrastructure Rehabilitation Assistance Program provides interest free loans to eligible water communities to replace, rehabilitate, and maintain components of their waterworks systems. The program, which began in Fiscal Year 2001, is in its second phase and is currently funded at \$210 million.

The Authority works with state and local officials to increase awareness of water quality issues affecting the water distribution systems operated by the Authority and the Local Bodies. In addition, the Authority collaborates with Local Bodies to deal with local water quality problems as they arise. Recently, the Authority’s Board of Directors approved funding in the amount of \$100 million, to provide interest-free loans to Local Bodies to assist them in replacing lead service lines in their local water distribution systems. See “Capital Improvement Program – Capital Projects in FY17 CIP – Waterworks Projects.”

**Water Demand.** At the time the Authority assumed responsibility for the Waterworks System in 1985, the average daily withdrawal of water from the system had exceeded the safe yield of 300 mgd in each year since 1969. To address the problem, the Authority established programs for detecting and repairing leaks, encouraging conservation and reduced water use, preserving and developing local supply sources, and implementing a drought response plan. In large part as a result of the Authority’s programs, water use declined by over 100 mgd since 1987, and since 1989 average daily withdrawals have been within the safe yield. Demand continues to decline due to continued improvements in water use efficiency changes in plumbing fixtures and appliances. Barring a drought more severe than any on record and assuming continuing conservation efforts and proper maintenance of the transmission and distribution system, the Authority projects that its existing supplies will be more than sufficient for its water supply needs through at least the year 2030. The Authority currently has no plans to develop any new sources of water. For a description of certain of the environmental and regulatory constraints involved in the process of augmenting the Authority’s water supply, see “Environmental Regulation and Litigation – Water Supply – Expansion of Water Supplies.”

**Extension and Contraction of Waterworks Service Area.** Under the Act, the Authority may extend the Waterworks System to additional communities not currently served on such reasonable terms as the Authority may determine. Such an extension of service requires that the Authority first make certain findings similar to those required to be made in connection with the continuation of water supply services to communities currently served under special acts or contracts. See “Local Bodies – Special Arrangements.” Any extension of the Waterworks System is subject to the approval of the Governor, the state Legislature, the Advisory Board, and the regulatory bodies within the Commonwealth’s Executive Office of Energy and Environmental Affairs (“EOEEA”) having jurisdiction. Extension of the Waterworks System to any community not currently served by the Authority also requires the approval by majority vote of its city council or town meeting, as the case may be. The Authority also is authorized to enter into arrangements not involving an extension of the Waterworks System to provide water supply services to any community or any agency or facility of the Commonwealth or the United States not currently served, provided (i) no such arrangement shall extend for a period greater than six months without the approval of the Advisory Board, and (ii) the Authority finds that the arrangement will not jeopardize its ability to service its existing statutory and contractual supply agreements. In cases of water supply emergency, as determined by DEP, the Authority may approve a connection to an adjoining community.

The Authority has extended services to five additional Local Bodies since commencing operations of the Waterworks System in 1985. The Authority is in active discussions with several additional communities regarding the possible extension of the Waterworks System service area, in part due to the excess of supply now available to the Authority’s service area. The Authority does not expect that any additional admissions to the service area will result in the use of water demand above the safe yield of 300 mgd, and expects water usage to remain significantly under the safe yield for the foreseeable future.

A community requesting admission to the Waterworks System is required to pay an entrance fee for its proportional share of historic investments in the system, a connection fee to cover all costs associated with establishing a connection to the Waterworks System, and the prevailing water rate for all annual water consumption pursuant to the Authority’s policy. The policy further requires a community that requests a temporary connection to the Waterworks System to pay a cost per million gallons which includes the prevailing water rate, a



proportional asset value contribution, and, in certain recurring cases, a surcharge on the then-prevailing water rate (as well as the asset value contribution) of up to 10%. Should such a community ultimately seek admission to the Waterworks System, any asset value contribution would be credited to its entrance fee, but the surcharge would be non-refundable and would not be credited to other costs.

A Local Body specified in the Act as eligible for receiving water supply services could seek to withdraw from the Waterworks System by state legislative action. However, in the opinion of the Authority and its Consulting Engineer, the cost and time required to implement adequate alternative water supply sources in accordance with existing and anticipated state and federal environmental laws and regulations generally would preclude this course of action as a practical matter for any substantial portion of the Waterworks System's service area.

## **THE SEWER SYSTEM**

**History.** The Authority's existing wastewater facilities include certain components constructed as early as 1884, when the Boston Main Drainage System was originally placed in operation. At that time, combined sewage was pumped by a pump station constructed in 1884 to Moon Island in Boston Harbor, where sewage was held in storage tanks before being released on the outgoing tides. In 1898, the Neponset Valley Sewer System was completed, with flows sent to Moon Island through the Boston Main Drainage System. Also in 1898, a pump station was constructed on Deer Island in Boston Harbor to pump sewage from the metropolitan area north of Boston to Deer Island, where it was held in storage tanks before being released on the outgoing tides. In 1904, the original South Sewerage System was completed, conveying flow from the Charles River Watershed, the Neponset River Watershed and areas south of the Boston Main Drainage System. After screening at Nut Island, flows from the South Sewerage System were discharged into Boston Harbor. Some flow from the Boston Main Drainage System also was redirected to Nut Island. In response to concerns about water pollution, a primary wastewater treatment plant was constructed on Nut Island in 1952 to treat the discharge from the South Sewerage System and, in 1968, a second primary wastewater treatment plant at Deer Island was completed and flow from the Boston Main Drainage System began to be diverted to Deer Island.

**Wastewater Collection.** The 43 communities within the Authority's sewer service area own and operate approximately 5,400 miles of local sewers, which connect to the Authority's approximately 240 miles of large interceptor sewers located to parallel the natural drainage patterns of the Mystic, Charles and Neponset River Watersheds. Approximately one-third of the sewage treated by the Authority originates in the BWSC's wastewater conveyance system. The Authority operates and maintains the regional wastewater transport and treatment system, including 230 miles of interceptor sewer, 11 pumping stations, five headworks, four CSO treatment facilities and the treatment plants at Deer Island and Clinton. The Local Bodies' sewer collection systems, some of which are combined sanitary and storm sewers, connect to the Authority's wastewater transport system through more than 1,800 connections.

The Sewer System is divided into a northern system and southern system. The northern system serves 26 communities with a total population of approximately 1.3 million. The four pumping stations in the northern system serve to pump wastewater into interceptors that carry the wastewater to four headworks where large debris is screened out and grit is removed. From the headworks, the wastewater flows down vertical shafts into one of two deep rock tunnels 300 feet under Boston Harbor, through which the wastewater is carried to Deer Island. Flow also is conveyed to Deer Island by means of a 10-foot diameter interceptor through Winthrop. At Deer Island a large pumping station, substantially rehabilitated in 1995, lifts the flow from the tunnels into the treatment plant.

The southern system serves a total population of approximately 700,000. The wastewater is pumped by seven pumping stations into interceptors that carry the wastewater to the High Level Sewer and ultimately to the Nut Island Headworks. At Nut Island, the headworks facility removes grit and screenings before the flow enters the Inter-Island Tunnel for transport to Deer Island, where it is lifted by pumps at the South System Pump Station to the treatment plant.

**Wastewater Treatment.** The Deer Island Treatment Plant includes, at Deer Island, pumping, headworks, odor control, disinfection, primary and secondary treatment and residual facilities and utilities (including a hydropower plant), a 4.8-mile deep rock inter-island tunnel that brings south system flows from Nut

Island to Deer Island for treatment, and a 9.5-mile deep rock outfall tunnel. Primary treatment design capacity at the Deer Island Treatment Plant allows for an average daily flow of approximately 361 mgd and a peak hourly flow of 1,270 mgd. Since the startup of the new primary treatment facilities at Deer Island in 1996, the Authority has consistently been in compliance with the discharge limitations specified in its National Pollutant Discharge Elimination System (“NPDES”) permit issued under the Clean Water Act. Effluent wastewater is disinfected and discharged into Massachusetts Bay through a series of diffusers located at the end of the 9.5 mile effluent outfall tunnel, which has a maximum discharge capacity of 1,270 mgd at mean high tide. Sludge resulting from the treatment process is anaerobically digested and then piped to and processed at the dewatering and pelletization facility located at the Fore River Shipyard in Quincy. See “Residuals Management” below.

The wastewater treatment plant in Clinton serves an area adjoining the Wachusett Reservoir watershed lands in central Massachusetts made up of the towns of Clinton and Lancaster (served by the Lancaster Sewer District) and includes an advanced secondary treatment facility with a design capacity for an average flow of 3 mgd.

The Authority’s Toxics Reduction and Control Department administers a permitting and inspection effort that allows for control and limitation of the volume and type of industrial waste discharged into the Sewer System so that both sludge and effluent from the treatment plants meet applicable environmental standards.

The Authority’s sewer use regulations, which give the Authority the ability to assess civil and financial penalties directly against violators of its regulations and permits, have been coupled with vigorous enforcement measures. As of July 1, 2016, the Authority has assessed penalties against industrial dischargers to its Sewer System in an aggregate amount of approximately \$12.0 million since its inception.

**Residuals Management.** The Authority operates sludge dewatering and pelletization facilities located on a portion of the site of the former Fore River Shipyard in Quincy. Digested liquid sludge is piped to the site from Deer Island and is processed for use as fertilizer in agriculture, horticulture and turf management. Sludge cake or pellets that are not used as fertilizer are landfilled. The Authority has entered into a contract with New England Fertilizer Company (“NEFCo.”) for both the operation and management of the plant and the disposition, through sale or otherwise, of the sludge. The current NEFCo. contract expires in 2020.

NEFCo. has a subcontract with a landfill operator for use in the event of emergencies. The Authority also maintains an emergency preparedness plan that identifies out-of-state landfills that could be utilized in the event that NEFCo. is not able to dispose of the wastewater residuals. The Authority acquired a site in Walpole to construct an in-state landfill in the event that capacity or other issues emerged with the other landfills.

**Combined Sewer Overflows; Infiltration and Inflow.** Many older areas of Boston, Cambridge, Chelsea and Somerville are served by combined sewers, which are pipes that carry both sanitary flow and stormwater runoff. These sewers, built mostly before 1910, were designed to discharge combined flows in excess of the sewer capacity into nearby waterways during heavy rainstorms to protect the system, as well as homes and businesses connected to it, from flooding. The Authority’s and communities’ interceptors, trunk sewers, and pumping systems serving the combined sewer areas are not capable of fully handling combined flows generated by large storm events. Combined flows in excess of the sewer systems’ capacities historically were diverted and discharged through overflow conduits into Boston Harbor, Dorchester Bay, the Charles, Mystic and Neponset Rivers, and Alewife Brook. These overflows have been a source of pollution in Boston Harbor and its tributary rivers. In December 2015, the Authority achieved substantial completion of the CSO Control Plan, which was developed as part of the Clean Water Act Case to address discharges at 84 CSO outfalls hydraulically related to the Authority’s Sewer System. Under the CSO Control Plan, 34 of the 84 outfalls were closed: and the discharge frequency and volume at the remaining outfalls have been significantly reduced. Additional CSO control has been achieved as a result of separate actions undertaken by certain Local Bodies with CSO permits. The Authority also has constructed or improved and upgraded four treatment facilities that provide screening, disinfection and dechlorination at CSO outfalls that discharge the majority of the remaining CSO volume. As a result of these efforts, the total annual volume of CSO discharge in a typical rainfall year is projected to be reduced by approximately 88%, from 3.3 billion gallons in 1988 to 0.4 billion gallons, with 93% of the remaining overflow receiving treatment at the Authority’s four CSO facilities.

Further increasing the burden on the Sewer System are infiltration of groundwater into the Sewer System through leaks in pipes, joints and connections, and inflow of storm water from a number of sources into otherwise separate, local sewer systems (“infiltration and inflow”). The Authority has developed programs, including an Infiltration/Inflow Local Financial Assistance Program (a combined grant and interest-free loan program) to provide more than \$242.6 million in funding for local sewer improvements, to encourage and assist efforts to reduce infiltration and inflow within the local collection systems of the Local Bodies. See “Capital Improvement Program – Capital Improvement Planning.”

**Extension and Contraction of Wastewater Service Area.** The Act authorizes the Authority to provide sewer service for a limited term to any person within or outside its service area not currently connected to the Sewer System, provided any such arrangement does not entail an extension of the Sewer System or have a term in excess of six months (unless a longer term is approved by the Advisory Board). The Act authorizes the Authority to extend the Sewer System to additional local bodies, provided such extension is approved by the Governor, the state Legislature, the Advisory Board and DEP. Extension of the Sewer System to any community not currently served by the Authority also requires the approval by majority vote of its city council or town meeting, as the case may be. Prior to extending the Sewer System to any new local body, the Authority must determine that (i) the safe capacity of the Sewer System as so extended will be sufficient to meet ordinary wet weather demand, (ii) all feasible measures have been taken by the local body to limit infiltration and inflow of surface and ground waters into the Sewer System, and (iii) the local body has adopted an industrial pretreatment program in accordance with applicable law. At the present time, the Authority does not anticipate adding any communities to the Sewer System.

Although a Local Body could withdraw from the Sewer System by state legislative action, in the opinion of the Authority and its Consulting Engineer, existing and anticipated state and federal environmental laws and regulations would cause any alternative to the Authority’s wastewater collection services for a Local Body to be prohibitively expensive as a practical matter since it would require the construction of new treatment facilities in accordance with state and federal environmental laws.

## **SECURITY**

The Authority’s Office of Emergency Preparedness is responsible for the protection of critical water and wastewater infrastructure, and the coordination of all security, emergency planning and response efforts. The Authority has completed a Vulnerability Assessment and Emergency Response Plan, both mandated by the federal Bioterrorism Act of 2002, and maintains individual Emergency Action Plans for each facility, and event-driven plans for every reasonably foreseeable contingency. An Emergency Services Unit, established and funded through several Homeland Security grants, is trained and equipped to provide rapid response to any incidents of water system contamination. This Unit is equipped with boats, a boom deployment unit and a mobile laboratory, enabling it to respond to spills at any of the Authority’s open reservoirs and facilities. The Authority’s facilities are patrolled by the Massachusetts State Police, and a private security service provides additional protection at the Deer Island Treatment Plant, the Authority’s Chelsea and Charlestown facilities, and the Carroll Water Treatment Plant. Guards also monitor cameras, intrusion alarms, key card access and fire alarms for major waterworks facilities at a central security monitoring point in Chelsea.

## **CAPITAL IMPROVEMENT PROGRAM**

### **CAPITAL IMPROVEMENT PLANNING**

The Act requires the Authority to adopt and update capital facilities programs for the Systems and capital expense budgets to implement and finance such programs. The Authority annually prepares and updates the CIP. In June 2016, the Board of Directors approved the FY17 CIP, which includes spending for Fiscal Years 2014 through 2018, and projections through Fiscal Year 2023 and beyond. The FY17 CIP reflects the Authority’s ongoing efforts to manage rate increases to the Local Bodies while continuing to upgrade and maintain the Systems, and the Authority’s effort to align its project prioritization process with the Master Plan.

The CIP describes all ongoing capital projects and new projects to be initiated during a 10-year planning period. The costs shown for each project in the CIP include any payments made on such project prior to the

commencement of the 10-year planning period, the expected costs for such project for each year of a five-year budget period, and the expected balance of such costs through completion of the project, if completion is beyond the five-year budget period. The Authority updates the CIP annually and rolls it forward every five years. The five-year budget period included in the FY17 CIP is the period from Fiscal Year 2014 through Fiscal Year 2018.

The Authority also establishes a five-year baseline spending cap corresponding to the five-year budget period included in the CIP. The baseline spending cap for Fiscal Years 2014 through 2018 (the “Current Cap Period”), established at the time of adoption of the Fiscal Year 2014 CIP, was \$791.7 million. The calculation of the spending cap was revised in connection with developing the Fiscal Year 2015 CIP (the “FY15 CIP”) to remove the Authority’s two community managed financial assistance programs – the Local Water Infrastructure Rehabilitation Assistance Program and the Infiltration/Inflow Local Financial Assistance Program, which was intended to preserve spending capacity for projects undertaken directly by the Authority. The FY15 CIP included increased spending of \$50 million for the Infiltration/Inflow Local Financial Assistance Program. See “Capital Improvement Program – Capital Projects In FY17 CIP – Wastewater Projects.” The baseline spending cap for the current Cap Period, as included in the FY17 CIP, is now \$618.7 million.

During the course of the Fiscal Year, the Authority’s financial information system produces monthly statements of capital spending compared to the budget plan. The Authority reports on capital program progress in its monthly management indicators report and dollar variances in its monthly financial update. At mid-year and at year-end progress, project schedules and variances are summarized and reported. The Authority reviews and revises, as necessary, the scope and anticipated cost of the projects included in the CIP periodically during the course of the Fiscal Year.

#### FISCAL YEAR 2017 CIP

The FY17 CIP totals approximately \$7.0 billion, of which approximately \$3.9 billion had been expended through Fiscal Year 2015, with a remaining balance of \$3.1 billion. These amounts do not include approximately \$4.1 billion of completed projects that have been removed from the CIP, including the Deer Island Treatment Plant Project.

The FY17 CIP includes planned expenditures of \$155.7 million for Fiscal Year 2017, total projected expenditures of approximately \$661.2 million for Fiscal Years 2014 through 2018, projected spending of \$1.2 billion for Fiscal Year 2019 through 2023, and projected spending of \$1.5 billion for beyond Fiscal Year 2023, in each case exclusive of contingencies. The majority of spending in the FY17 CIP is in the areas of asset protection (57.1%) and water system redundancy (24.5%). During the five-year budget period, approximately 39.1% of included spending is allocated to water projects, 55.0% is allocated to wastewater projects, and the remaining 5.9% to business operations and support.

#### FISCAL YEAR 2017 CAPITAL IMPROVEMENT PROGRAM EXPENDITURE FORECAST FOR FISCAL YEARS 2014-2018\*

(in millions of dollars)

	<u>Total Contract Amount</u>	<u>Payments through FY15</u>	<u>FY14</u>	<u>FY15</u>	<u>FY16</u>	<u>FY17</u>	<u>FY18</u>	<u>Total FY14-FY18†</u>	<u>Beyond FY18†</u>
Wastewater System Improvements	\$3,083.7	\$1,867.1	\$ 55.7	\$ 75.4	\$ 65.1	\$ 70.4	\$ 97.2	\$363.8	\$ 983.9
Waterworks System Improvements	3,806.3	1,938.4	41.0	22.7	30.1	73.0	91.7	258.4	1,673.2
Business & Operations Support	<u>134.1</u>	<u>88.5</u>	<u>5.5</u>	<u>5.5</u>	<u>6.1</u>	<u>12.3</u>	<u>9.5</u>	<u>39.0</u>	<u>5.2</u>
<b>Total†</b>	<b>\$7,024.1</b>	<b>\$3,894.0</b>	<b>\$102.2</b>	<b>\$103.6</b>	<b>\$101.3</b>	<b>\$155.7</b>	<b>\$198.4</b>	<b>\$661.2</b>	<b>\$2,674.7</b>

\* Does not include program contingency of \$26.0 million. Reflects FY17 CIP as adopted by the Board of Directors in June, 2016; not updated for Fiscal Year 2016 actual expenditures.

† Totals may not sum due to rounding.

## CAPITAL PROJECTS IN FY17 CIP

The majority of spending in the FY17 CIP reflects the continued shift from legally mandated projects, to projects that support asset protection, water system redundancy, water pipeline replacement and rehabilitation, and community assistance programs. A description of the most significant projects included in the FY17 CIP follows, including the approximate costs for the five-fiscal year period covered by the FY17 CIP (Fiscal Years 2014 through 2018).

### **Waterworks Projects**

Capital projects for the Waterworks System are designed to upgrade and extend the useful life of the water supply, transmission and distribution systems in order to assure a satisfactory and consistent level of water quality and distribution throughout the Waterworks System. Certain of these projects are mandated by federal regulatory requirements.

**Drinking Water Quality Improvements.** The Authority is undertaking a series of projects to protect reservoir watersheds, provide and improve water treatment facilities, and upgrade distribution storage and pipelines. The projects, as a whole, are designed to improve each aspect of the Waterworks System from the watersheds to the consumer to ensure that high quality water reliably reaches the Authority's customers' taps. One of the five largest Waterworks Projects included in the FY17 CIP (at approximately \$35.7 million) is the construction of a 20-million gallon covered distribution tank and redundant pump station to replace the open Spot Pond Reservoir. See "Environmental Regulation and Litigation – Water Supply."

**Transmission System.** Critical needs of the Authority's aqueduct system include the provision of redundancy for critical sections of the transmission system, particularly in the areas to the north and south of Boston. Among the largest Waterworks Projects included in the FY17 CIP (at approximately \$63.4 million) are projects designed to improve water transmission redundancy. The first include the construction of an emergency pump station to pump water from the Wachusett Aqueduct to the Carroll Water Treatment Plant. This project, together with the rehabilitation of the Hultman Aqueduct and other interconnection projects, will provide fully treated water transmission redundancy from the Wachusett Reservoir to the beginning of the metropolitan Boston distribution system in Weston. The second project would provide critical redundancy improvements for the City Tunnel, the City Tunnel Extension and the Dorchester Tunnel. This project is still in the conceptual design stage. The FY17 CIP includes a \$1.4 billion placeholder to fund this project, which is expected to occur over at least a 15-year period.

**Distribution and Pumping.** The FY17 CIP continues the rehabilitation, upgrade or new construction of pipelines, pumping facilities, valves and meters. Three of the largest projects included in the FY17 CIP are improvements to the distribution and pumping systems designed to further improve redundancy in the Waterworks System. The second largest Waterworks Project (at approximately \$46.5 million) is a redundancy project for the Northern Intermediate High service area. This project includes a seven-mile redundant pipeline to reduce both the risk and impact of a pipeline failure. The construction of a redundant pipeline and distribution storage in the Southern Extra High service area (at an approximate cost of \$31.5 million) will improve system operation and reliability to five communities in the southern metropolitan service area. The rehabilitation of one of the Weston Aqueduct Supply Mains (at an approximate cost of \$16.7 million), which carry water into the Waterworks service area from the MetroWest Water Supply Tunnel and the Hultman Aqueduct, is another key component of the Authority's long-term redundancy plan for the metropolitan tunnel system.

**Other Waterworks Projects.** Among these projects are the Authority's Local Water System Assistance Program, which provides financial assistance to Local Bodies to undertake pipeline relining and replacement projects for their retail water distribution systems, including a new program to provide interest-free loans to assist Local Bodies in replacing lead service lines, and Waterworks System facility asset protection (approximately \$2.6 million).

## **Wastewater Projects**

A substantial portion of the Authority's capital expenditures to date have been for improvements to the Sewer System, particularly the Boston Harbor Project. The FY16 CIP includes substantial funding in the area of asset protection to maintain the facilities constructed as part of the Boston Harbor Project, as well as other projects designed to maintain and improve the Sewer System. A description of the most significant projects included in the FY16 CIP follows.

**Interception and Pumping.** The Authority has undertaken several major projects to extend, enlarge and rehabilitate large sewer interceptors to alleviate sewer surcharging and overflow problems. These projects were necessitated by the age of the systems and their inadequate capacity to serve existing or projected populations. The Authority is now developing projects to ensure the proper maintenance and protection of these and other interception and pumping facility assets, including equipment replacement, facility improvements, and utility and process control system upgrades and improvements (approximately \$85.6 million).

**Treatment and Residuals.** To protect the investment of MWRA ratepayers in the Deer Island Treatment Plant Project by ensuring timely replacement of Plant systems, which contain more than 60,000 pieces of equipment with an approximate value of \$1 billion, the Authority is continuing its significant asset protection program through maintenance and capital improvements at the Deer Island Treatment Plant, including equipment and system replacement and upgrades (the "DITP Asset Protection Project"). Included in the FY17 CIP is approximately \$126.3 million for this project. Approximately 34.7% of total spending included in the FY17 CIP is for the costs of the DITP Asset Protection Project. Also included in the FY17 CIP is an additional \$13.2 million for asset protection at the Clinton Wastewater Treatment Plant, and approximately \$3.3 million for asset protection of the Authority's residual facilities.

**Combined Sewer Overflows.** Discharges of combined wastewater and stormwater runoff from CSO outfalls in the Authority's system and four of the Local Bodies' systems (Boston, Cambridge, Chelsea and Somerville) historically compromised the water quality in Boston Harbor, Dorchester Bay, the Charles, Mystic and Neponset Rivers, and Alewife Brook. Under the Clean Water Act Case, the Authority has the responsibility for developing and implementing the CSO Control Plan, addressing the discharges from the 84 CSO outfalls within the service area of and hydraulically related to the Authority's Sewer System. The schedule for implementing the projects was established by order of the District Court in the Clean Water Act Case, which called for the Authority to complete construction of the last of the 35 projects by December 2015. In December 2015, the Authority achieved substantial completion of the CSO Control Plan. The FY17 CIP includes approximately \$66.0 million for this project, the majority of which has been expended. See, "Environmental Regulation and Litigation – Wastewater Management – Boston Harbor: Clean Water Act Case."

**Other Wastewater Projects.** Included in the FY17 CIP is additional funding for the Authority's Infiltration/Inflow Local Financial Assistance Program, which provides financial assistance to Local Bodies for the rehabilitation of their local collection systems, with the goal of structurally reducing infiltration/inflows into their local sewer systems and thereby reducing the volume of wastewater treated by the Authority at the Deer Island Treatment Plant (approximately \$69.5 million).

## **BUSINESS AND OPERATIONS SUPPORT AND CONTINGENCY**

**Business and Operations Support.** Business and operations support projects include vehicle and security equipment purchases, technical assistance contracts, funds for the upgrade of the Authority's Management Information Systems, "green energy" projects, and security improvements.

**Contingencies.** In each budget cycle project contingency is estimated for a five-year period. The contingency is established as a percentage of the expected capital expenditure cash outlays in each of the Fiscal Years: 15% for tunnel construction and 7% for all other projects.

## **FACTORS AFFECTING THE CAPITAL PROJECTS**

The following is not intended as a complete summary, but describes some of the uncertainties that may affect the Authority's capital programs. Unforeseen circumstances affecting the projects may result in delays or cost escalations not currently provided for in the Authority's projections.

The Authority must complete its capital projects in a complex legal and political environment. Many of its projects require special coordination among engineering, legal, and regulatory activities requiring the assistance and cooperation of federal, state and local governmental agencies. They may be governed by court-ordered or administrative deadlines or requirements. Many of the Authority's projects also involve impacts on surrounding communities, extensive permitting and concerns for environmental mitigation.

The scope and complexity of many of the Authority's capital projects makes the timetable and expenditure forecasts for the CIP subject to change. Such factors as future environmental or other legal mandates, as well as traditional construction risks could alter the Authority's forecasts. In preparing estimates of future revenue requirements for the CIP, the Authority has included inflation assumptions for the purposes of projecting the level of project expenditures when expected to be made or contracted for in accordance with each project's cash flow projections.

## **SOURCES AND USES OF CAPITAL FUNDS**

The Authority expects to finance its capital expenditures principally from the proceeds of revenue bonds issued under the General Resolution. Certain capital improvements are eligible for federal grants and loans under the Clean Water Act and the SDWA's revolving fund program. The Authority also plans a gradual increase in the use of current revenues to fund certain capital projects.

## **ENVIRONMENTAL REGULATION AND LITIGATION**

The Authority's Waterworks System and Sewer System are subject to significant regulation under federal and state environmental laws.

## **WATER SUPPLY**

In the maintenance and expansion of water supply, the Authority is subject to environmental and regulatory oversight chiefly in the areas described below.

**Drinking Water Regulation.** Under the SDWA, the U.S. Environmental Protection Agency ("EPA") regulates the level of contaminants allowed in drinking water by establishing national drinking water standards so that drinking water will be protected against microbiological or chemical contaminants. Standards include maximum levels, treatment techniques, and other performance standards for contaminants such as coliform bacteria, and lead and copper. Enforcement of drinking water standards in Massachusetts under the SDWA has been delegated to DEP, which also acts under authority of state law and has adopted Massachusetts Drinking Water Standards.

In accordance with SDWA requirements, the Authority eliminated all uncovered distribution storage and, based on annual reviews, DEP continues to find that the Authority's water supply meets federal criteria for unfiltered sources. The Authority undertook a staged compliance schedule for capital improvements to modify treatment processes at the Carroll Water Treatment Plant and the Ware Disinfection Facility, to meet regulations promulgated in January 2006 under the SDWA that require all unfiltered water systems to have two means of primary disinfection beginning in calendar year 2014. Based on findings from pilot testing and other research, the Authority selected ultraviolet light disinfection ("UV disinfection") for the second means of disinfection as the most sound and cost-effective method. The Authority met the deadlines for implementation of the UV disinfection systems as required under the SDWA.

Under the Lead and Copper Rule, the Authority is required to conduct sampling in conjunction with the Local Bodies to detect the presence of lead in their customers' tap water. Improved corrosion control was implemented in 1996, and lead levels have dropped over 90% from initial testing in 1992. Authority system-wide levels in its most recent annual sampling round, conducted in September 2015, were below the lead action level again, as they have been since 2004. The Authority's system also continues to meet the copper standard. Individual communities above the lead action level are required by DEP to conduct lead education and lead service line replacement programs.

**Water Resources Management.** Pursuant to the State Water Management Act (the "WMA"), water users with surface or ground water withdrawals of more than 100,000 gallons per day must have a WMA Permit or Registration, depending upon whether the withdrawal was existing at the time the WMA was enacted. Under the WMA, the Authority is registered to withdraw 311.9 mgd from the Nashua and Chicopee Rivers. WMA Registrations are renewed every 10 years. In December 2007, DEP, which administers the WMA, issued the Authority its most recent Registration, covering the period 2008 through 2017. The Commonwealth's Permit Extension Act subsequently extended the Registration by four years to 2021. The current Registration maintains the Authority's registered volume of 311.9 mgd. The Authority's current Registration (as well as that of all other WMA Registrants) for the first time includes water conservation conditions, although these conditions will require the promulgation of new regulations by DEP in order to become effective. To date, DEP has not promulgated such new regulations. The conditions of the Registration require best management practices that build upon the Authority's existing conservation programs.

**Expansion of Water Supplies.** In addition to the provisions of the WMA, other state laws and regulations would govern any substantial structural augmentations to the Waterworks System's water supply. These include legislative approval for diversion of any river or stream for water supply purposes outside its own basin or for any structural action by the Authority in any water donor basin, including any capital improvement, which is expected to create a new interbasin transfer or increase the rate of any existing interbasin transfer. Approval by the state Water Resources Commission, an interagency policy management group within the EOEEA, is also required for any increase over the present rate of interbasin transfers of surface or groundwater. The Commonwealth's existing policies regarding water supply and management mandate that all economically feasible local sources of supply be developed before diversion of a major river source may be considered. Environmental impact assessment and mitigation requirements under the Massachusetts Environmental Policy Act ("MEPA") and, in certain circumstances, the National Environmental Policy Act ("NEPA"), also must be met. The Authority does not foresee any circumstances requiring expansion or augmentation of the Authority's water supply.

## WASTEWATER MANAGEMENT

**Sewage Collection, Treatment and Disposal.** The Clean Water Act imposes several permit and regulatory requirements on wastewater treatment systems. Public sewage treatment plant owners and operators such as the Authority are required to provide secondary treatment as established by federal regulation for all wastewater discharge from treatment plants into waters of the United States. Under the Clean Water Act, individual states, with EPA concurrence, also establish water quality standards classifying water body uses and pollutant control criteria to protect those uses. All sewage system discharges require NPDES permits specifying applicable technology based requirements, as well as any more stringent controls required to achieve the water quality standards established by the state pursuant to federal regulations. The NPDES permits for the Deer Island Treatment Plant and the Clinton Wastewater Treatment Plant are issued jointly by DEP and EPA. See "NPDES Permits" below. Major wastewater treatment systems also must adopt and enforce pretreatment regulations for industries and other non-domestic sources discharging into sewers. Treatment plants are also subject to the Clean Water Act and state regulations governing sludge use and disposal.

The Clean Water Act is enforced by EPA and DEP through administrative orders and procedures. Violations also may be the basis for federal law suits brought on EPA's behalf by the United States Department of Justice (the "DOJ") or by private citizens. DOJ brought such an action against the Authority and others, referred to herein as the Clean Water Act Case, as described below.

**NPDES Permits.** The Authority operates its sewage system, including the Deer Island Treatment Plant and CSO outfalls, under a NPDES permit (the "DITP Permit"), which became effective in August 2000. The DITP



Permit incorporates federal secondary treatment requirements, other technology based requirements, and other limits necessary for discharges to meet water quality standards established by the Commonwealth. The DITP Permit includes extensive water quality monitoring, a contingency plan (the “Contingency Plan”) to identify and respond to water quality changes that could potentially be related to effluent discharges from the effluent outfall tunnel, and numerous other requirements for pollution prevention, facility best management practices, management of infiltration/inflow, and restrictions on dry day flow.

The quality of wastewater effluent discharged from the Deer Island Treatment Plant is continuously monitored by the Authority to assess compliance with water quality standards and pollutant limits set forth in the DITP Permit. The Deer Island Treatment Plant operates in compliance with the requirements of the DITP Permit. Because of the intermittent operation of CSO treatment facilities and the challenge of providing treatment in rapidly fluctuating flows, excursions from effluent limits applicable to treated CSO discharges under the DITP Permit have occurred. Regulatory variances remain in existence from the water quality standards for CSO discharges to the Lower Charles River/Charles River Basin and the Alewife Brook/Upper Mystic River. These variances only apply to permitted CSO outfalls that discharge to these receiving waters. Federal and state approvals of these variances acknowledge that it is not feasible to fully attain the Class B water quality standard for these receiving waters for the duration of the variances. Pursuant to an agreement between the Authority, EPA and DEP, these variances will be extended through 2020.

The Authority placed the 9.5 mile effluent outfall tunnel at the Deer Island Treatment Plant, which discharges to Massachusetts Bay, on-line in September 2000, and as a result implemented a comprehensive Ambient Monitoring Plan that has been attached to the DITP Permit since that time. The monitoring includes water column, sediment quality, and fish and shellfish, and is overseen by an independent panel of scientists. The results of the monitoring have shown only a localized signature of the outfall discharge, and no adverse impacts to Massachusetts Bay, while Boston Harbor’s ecosystem has rebounded. The Authority proposed revisions and efficiencies to the Ambient Monitoring Plan that were approved by the regulatory agencies in December 2010.

The Authority submitted its renewal application for the DITP Permit in February 2005. The nominal five-year term of the current DITP Permit expired in August 2005. The DITP Permit remains in effect until a succeeding permit becomes final. EPA continues to work on a draft permit but has not yet issued one for the Authority’s review with respect to the Deer Island Treatment Plant.

The Authority submitted its NPDES Permit renewal application for the Clinton Wastewater Treatment Plant (the “Clinton Permit”) in May 2005, as the five-year term of the Clinton Permit expired in November 2005. The Clinton Permit, like the DITP Permit, remains in effect until a succeeding permit becomes final. EPA issued two draft permits, the second, being a revision to the first draft, in September 2013. The Authority commented on both draft permits and objected to provisions that included two Local Bodies as co-permittees.

**Boston Harbor: Clean Water Act Case.** The Authority has been a defendant in the Clean Water Act Case since 1985, along with BWSC and the Commonwealth, in a consolidated lawsuit brought in the District Court by the United States, acting at the request of EPA, and certain citizen groups, suing the Authority and other defendants for violations of NPDES permit conditions and certain terms of outstanding administrative orders previously issued by EPA. With the completion of the Deer Island Treatment Plant Project in 2001, the District Court’s oversight for the most part was limited to CSO related requirements. The Authority achieved substantial completion of the CSO Control Plan in December 2015. With the achievement of this milestone, the only significant remaining requirement under the Clean Water Act Case, in addition to the filing of biannual compliance reports, is the requirement that the Authority conduct a three-year performance assessment of the CSO Control Plan commencing in 2018 to verify that the specified long-term levels of control have been achieved and to submit a report on the results of the assessment by December 2020.

**Cross-Harbor Power Cable Litigation.** The Authority has been named as a defendant, along with NSTAR Electric Company, formerly known as the Boston Edison Company (“NSTAR”) and its subsidiary Harbor Electric Energy Company (“HEEC”), in a civil action brought in July 2016 by the United States of America, at the request of the United States Army Corps of Engineers (the “Corps”). The civil action seeks injunctive relief and civil penalties for alleged violations of the federal Rivers and Harbors Act of 1899 and the Clean Water Act, in connection with a permit issued to the defendants in September 1989 (the “1989 permit”) that authorized the

installation of a submarine electric power cable that runs under the channel bed of Boston Harbor and provides electric power to the Deer Island Treatment Plant. The installation of the power cable was undertaken by NSTAR as part of the Boston Harbor Project. MWRA had become a co-permittee under the 1989 permit to facilitate the timely issuance of the 1989 permit. In 2004, the Corps asserted that NSTAR and MWRA were in violation of the 1989 permit. The Corps alleged that the power cable, in places, had been installed at depths less than those required by the 1989 permit and demanded that the permittees develop plans and an implementation schedule for bringing the power cable's depth and location into compliance with the 1989 permit, in order for a proposed project involving the deep-draft vessel dredging of Boston Harbor to move forward without damaging the power cable. The civil action seeks injunctive relief ordering the defendants to comply with all terms of the 1989 permit, including the depth requirements, or ordering the defendants to remove the power cable. The Authority consistently has maintained throughout the various discussions and negotiations over the past several years with the U.S. Attorney and the Corps prior to the commencement of the civil action that MWRA had no responsibility for the design, construction or installation of the power cable and therefore has no responsibility for the power cable protection or relocation work.

Prior to the commencement of the action, NSTAR and HEEC, MWRA and the Corps had reached a proposed resolution in June 2016. The proposed resolution, among other things, would have provided that HEEC and NSTAR, and not MWRA, would be responsible for performing the work needed to protect the power cable during the dredging project. This proposed resolution would not have required MWRA to share the power cable protection costs with HEEC or NSTAR, but rather would allow the ultimate issue of responsibility for the power cable protection costs to be decided in separate proceedings. See "Other Regulatory and Compliance Matters – Cross-Harbor Power Cable," below. After the proposed resolution had been reached, the Authority learned from the Corps that the Massachusetts Port Authority, which owns several deep draft ship berths intended for use in the immediate vicinity of the power cable, had questioned whether NSTAR's plans for protecting the power cable would allow the power cable to be positioned deeply enough to accommodate such deep draft ships. NSTAR and HEEC currently are performing additional survey work to determine whether the power cable can be protected as originally planned, or whether it can be moved or must be replaced. The Authority understands that NSTAR has estimated the cost of replacement of the power cable to be in the range of \$50 - \$100 million.

The Authority expects to oppose the civil action and is considering its alternatives, given its position that the Authority had no responsibility for the design, installation or construction of the power cable and does not own or control it. The Authority cannot predict the outcome of the civil action, however, if the Authority were to be ordered to pay any portion of the relocation costs, the Authority expects that such costs would be funded through the Authority's CIP.

In November 2015 and during the negotiations with the Corps, NSTAR and HEEC described above, MWRA filed a declaratory judgment action with the Massachusetts Superior Court (the "Superior Court") against both HEEC and NSTAR asking that the court determine that MWRA has no obligation to pay or share in the costs to be expended by HEEC in protecting the power cable. In June 2016, the Superior Court granted the defendants' motion to dismiss the action, in part on the grounds that no sufficiently active dispute existed at the time between MWRA and HEEC and NSTAR as to responsibility for power cable protection costs. The dismissal was without prejudice to the Authority's right to re-file the complaint in the future. The Authority is considering whether to appeal the dismissal, especially in light of the newly-filed federal civil action.

**Other Environmental Litigation.** The Authority's activities and projects in connection with the ongoing operation and maintenance of the Waterworks System and the Sewer System give rise, from time to time, to actions brought against the Authority under federal and state environmental legislation and regulations. There are no outstanding actions that would likely have a material adverse effect on the Systems or the Authority's programs.

**Other Regulatory and Compliance Matters.** In addition to program requirements of the Clean Water Act already reflected in the DITP Permit, the Clinton Permit and the Clean Water Act Case, other regulatory requirements under federal and state law may impose additional operating requirements on the Authority.

EPA has promulgated regulations covering the treatment and handling of sewage sludge, which provide aggressive protection of the environment and public health while permitting beneficial sludge reuse. In addition to the federal standards, the Authority's sewage sludge products must comply with regulations applicable in each jurisdiction in which such products are used, including Massachusetts. Sewage sludge regulations adopted by DEP also govern permissible application and distribution of sludge as fertilizer in Massachusetts.

In common with most water and wastewater operating agencies, the Authority's operations and improvements for its Systems are subject to numerous environmental regulatory requirements in addition to the SDWA and the Clean Water Act. These include environmental impact assessment requirements under NEPA and MEPA, permitting requirements under various federal and state laws for construction projects, and various requirements affecting the Authority's properties and operations under the Federal Resource Conservation and Recovery Act of 1976 and the Federal Comprehensive Environmental Response, Compensation and Liabilities Act of 1980, the federal Clean Air Act, federal and related state laws and regulations regarding the handling, treatment and storage of oil, hazardous materials and other waste, water quality standards, and air pollution control requirements.

***Cross-Harbor Power Cable.*** The provision of electric transmission services to the Deer Island Treatment Plant originally was governed by an agreement, entered into in 1990, among NSTAR's predecessor, Boston Edison Co., HEEC and MWRA (the "1990 Agreement"), which expired in November 2015. In October 2015, HEEC filed a petition with the Massachusetts Department of Public Utilities ("MDPU"), which had approved the 1990 Agreement, seeking to establish, under a formal tariff, the terms, conditions and cost formulas for HEEC's continued provision of electric transmission services to the Deer Island Treatment Plant. MDPU has ruled, on an interim basis, that it will not consider in the tariff proceeding the issue of whether HEEC may recover, as part of a tariff, the costs of protecting the power cable during the planned deep-draft vessel dredging of Boston Harbor. See, "Environmental Regulation and Litigation – Wastewater Management – Cross-Harbor Power Cable Litigation." In prior orders entered in the tariff proceeding, MDPU also has indicated that the dispute among MWRA, HEEC and NSTAR regarding the costs of protecting the power cable would be better resolved in a state court proceeding, but has left open the possibility that MDPU may have some future fact-finding role to play under its regulatory primary jurisdiction. MDPU held a hearing in June 2016 concerning a range of tariff issues, not including future power cable protection costs, and the parties are following a briefing schedule, with a decision from MDPU expected after September 2016.

## LEGISLATIVE AND OTHER DEVELOPMENTS

From time to time legislation is introduced in the state Legislature proposing to affect the Authority, which has included adding certain capital projects to its responsibilities, increasing the Authority's debt authorization, providing financial assistance for its programs, and requiring it to make payments to other governmental entities in the Commonwealth. The Authority cannot predict whether any such legislative proposals affecting the Authority will be enacted or imposed in the future.

## LITIGATION

There is no threatened or pending litigation against or affecting the Authority that, to the knowledge of the Authority, seeks to restrain or enjoin the issuance, sale or delivery of the 2016 Bonds, or to in any way contest or affect the validity of the 2016 Bonds, the General Resolution, or any proceedings of the Authority taken with respect to the issuance or sale of the 2016 Bonds or with respect to the General Resolution, or in any way contesting the existence or powers of the Authority.

The Authority is a defendant in a number of suits arising out of its operations and activities. These actions include contract claims arising from the Authority's capital projects as well as personal injury and property damage claims. To the best knowledge of the Authority's General Counsel, no litigation is pending or threatened which, in the opinion of the Authority's General Counsel, if decided adversely to the Authority, would be likely to result, either individually or in the aggregate, in final judgments against the Authority that would materially adversely affect its ability to meet debt service payments on the 2016 Bonds, when due, or its obligations under the General Resolution, or materially adversely affect its financial condition. See also, "Environmental Regulation and Litigation."

In addition, due to the nature and scope of the CIP, the substantial number of Authority construction projects may result from time to time in the bringing of material claims for damages in tort or contract against the Authority. While the outcome of such litigation cannot be predicted, the Authority believes that it has made adequate provision through insurance, indemnification, performance bonds, construction monitoring, contingencies and reserves, among other measures, to limit its exposure to liability as a result of such claims.

### **TAX EXEMPTION**

Bond Counsel is of the opinion that, under existing law, except as described below, interest on the 2016 Bonds is not included in gross income for federal income tax purposes, and is not an item of tax preference for the purpose of computing the alternative minimum tax imposed on individuals and corporations under the Internal Revenue Code of 1986, as amended (the "Code"), although such interest will be taken into account in determining adjusted current earnings for the purpose of computing the alternative minimum tax imposed upon certain corporations. See Appendix D – "Proposed Form of Opinion of Bond Counsel."

The Code imposes certain requirements and restrictions on the use and investment of proceeds of state and local governmental obligations, including the 2016 Bonds, and a requirement for payment to the federal government (called a "rebate") of certain proceeds derived from the investment thereof. Failure to comply with the Code's requirements subsequent to the issuance of the 2016 Bonds could cause interest on the 2016 Bonds to become subject to federal income taxation, and such inclusion could be retroactive to the date of their issuance. On or before delivery of the 2016 Bonds to the original purchasers, the Authority will provide covenants or certificates evidencing that it will take all lawful action necessary to comply with those provisions of the Code that, except for such compliance, would affect adversely the excludability of interest on the 2016 Bonds from gross income for federal income tax purposes. Bond Counsel has not opined as to the other federal tax consequences resulting from holding the 2016 Bonds.

Interest paid on tax-exempt obligations such as the 2016 Bonds is now generally required to be reported by payors to the Internal Revenue Service ("IRS") and to recipients in the same manner as interest on taxable obligations. In addition, such interest may be subject to "backup withholding" if the owner of such 2016 Bond fails to provide the information required in IRS Form W-9, Request for Taxpayer Identification Number and Certification, or the IRS has specifically identified said owner as being subject to backup withholding because of prior underreporting. Neither the information reporting requirement nor the backup withholding requirement affects the excludability of interest on the 2016 Bonds from gross income for federal tax purposes.

In the opinion of Bond Counsel, the 2016 Bonds, their transfer and the income therefrom, including any profit made on the sale thereof, are exempt from Massachusetts personal income taxes and the 2016 Bonds are exempt from Massachusetts personal property tax, although the 2016 Bonds and the interest thereon are included in the measure of estate and inheritance taxes and of certain corporation excise and franchise taxes. Bond Counsel has not opined as to other Massachusetts tax consequences or as to the taxability of the 2016 Bonds, their transfer and the income therefrom, including any profit made on the sale thereof, under the laws of jurisdictions other than the Commonwealth.

In general, if an owner acquires a 2016 Bond for a purchase price (excluding accrued interest) or otherwise at a tax basis that reflects a premium over the sum of all amounts payable on such 2016 Bond after the acquisition date (excluding certain "qualified stated interest" that is unconditionally payable at least annually at prescribed rates), such 2016 Bond (a "Premium Bond") will have bond premium. In general, for federal and Massachusetts tax purposes, an owner of a Premium Bond must amortize the bond premium over the remaining term of the Premium Bond, based on the owner's yield over the remaining term of the Premium Bond determined on the basis of constant yield principles. An owner of a Premium Bond must amortize the bond premium by offsetting the qualified stated interest allocable to each interest accrual period, under the owner's regular method of accounting, against the bond premium allocable to that period. In the case of a tax-exempt bond, such as a 2016 Bond, that is a Premium Bond, if the bond premium allocable to an accrual period exceeds the qualified stated interest allocable to that accrual period, the excess is a nondeductible loss. Under certain circumstances, the owner of a Premium Bond may realize a taxable gain upon disposition of the Premium Bond even though it is sold or redeemed for an amount less than or equal to the owner's original acquisition cost.

The federal and state tax opinions of Bond Counsel with respect to the 2016 Bonds are described above. It should be noted that the ownership or disposition of, or the accrual or receipt of interest on, the 2016 Bonds may otherwise affect the federal or state tax liability of owners of the 2016 Bonds. The nature and extent of these other tax consequences will depend upon the particular tax status of the owners of the 2016 Bonds or such owners' other items of income or deduction. Bond Counsel expresses no opinion regarding any such other tax consequences, and such owners should consult with their own tax advisors with respect to such consequences.

Governmental action such as federal, state or local legislation, administrative pronouncements or court decisions may affect the tax-exempt status of interest on the 2016 Bonds, gain from the sale or other disposition of the 2016 Bonds, the market value of the 2016 Bonds, or the marketability of the 2016 Bonds. For example, the President of the United States has submitted proposals to Congress for legislation that would, among other things, limit the value of tax-exempt interest for higher-income taxpayers. No prediction can be made as to the ultimate outcome of these legislative proposals. If enacted into law, such proposals (or any other proposal involving a piecemeal or comprehensive review of the provisions of the Code, including provisions affecting the federal tax treatment of interest on tax-exempt bonds, that Congress might consider) could affect the tax exemption of interest, market price or marketability of tax-exempt bonds (including the 2016 Bonds). Prospective purchasers of the 2016 Bonds should consult their own tax and financial advisers regarding such matters.

The impact of any such governmental action on the tax-exempt status, market price or marketability of the 2016 Bonds cannot be predicted. Owners of the 2016 Bonds are encouraged to consult their personal or institutional tax and financial advisors with respect to the tax and financial aspects of ownership of the 2016 Bonds.

On the date of delivery of the 2016 Bonds, Bond Counsel will issue an opinion substantially in the form attached hereto as Appendix D – “Proposed Form of Opinion of Bond Counsel.”

#### **FINANCIAL ADVISOR**

Public Financial Management, Inc. (“PFM”) serves as financial advisor to the Authority for debt management and other financial matters. PFM has acted as independent financial advisor to the Authority with respect to the 2016 Bonds. PFM is not obligated to undertake, and has not undertaken, either to make an independent verification of or to assume responsibility for, the accuracy, completeness, or fairness of the information contained in this Official Statement and the appendices hereto. PFM is an independent financial advisory firm and is not engaged in the business of underwriting, trading or distributing securities.

#### **FINANCIAL STATEMENTS**

KPMG LLP, the Authority’s independent auditor, has not been engaged to perform and has not performed, since the date of its report referenced therein, any procedures on the financial statements of the Authority as of June 30, 2015 and 2014, and for the Fiscal Years then ended, included in Appendix A to this Official Statement. KPMG LLP also has not performed any procedures relating to this Official Statement or the 2016 Bonds.

#### **CONSULTING ENGINEER**

CDM Smith Inc. serves as the Authority’s engineering consultant. The Consulting Engineer’s Triennial Report provides an independent engineering analysis of the Authority’s Systems and a financial feasibility analysis of the Authority’s current operations and CIP. The most recent triennial report, the 2014 Triennial Report, was completed in October 2014 and appears in Appendix B to the Authority’s Official Statement, dated November 6, 2014, relating to the issuance of the Authority’s General Revenue Bonds, 2014 Series D, General Revenue Refunding Bonds, 2014 Series E, and General Revenue Refunding Bonds, 2014 Series F, which Official Statement is available through EMMA. See, “Financial Operations – Reports.” Attached hereto as Appendix B is the July 2016 Report of the Consulting Engineer relating to certain financial matters and projections of the Authority, including the Authority’s estimated future rates and charges through Fiscal Year 2022.

## **CERTAIN LEGAL MATTERS**

All legal matters incident to the authorization, issuance, sale and delivery of the 2016 Bonds are subject to the approval of McCarter & English, LLP, Boston, Massachusetts, Bond Counsel to the Authority. Certain legal matters will be passed upon for the Authority by its Disclosure Counsel, Greenberg Traurig, LLP, Boston, Massachusetts and for the Underwriters by their counsel, Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., Boston, Massachusetts.

## **RATINGS**

The 2016 Bonds have been rated “AA+” by Fitch Ratings (“Fitch”), One State Street Plaza, New York, New York, “Aa1” by Moody’s Investors Service, Inc. (“Moody’s”), 99 Church Street, New York, New York and “AA+” by Standard & Poor’s Global Ratings (“Standard & Poor’s”), a division of The McGraw-Hill Companies, Inc., 55 Water Street, New York, New York.

The ratings express only the views of the rating agencies. The explanation of the significance of the ratings may be obtained from Fitch, Moody’s and Standard & Poor’s, respectively. There is no assurance that any rating will continue for any period of time or that it will not be revised or withdrawn. Any revision or withdrawal of ratings on the 2016 Bonds may have an effect on the market price thereof.

## **VERIFICATION OF MATHEMATICAL COMPUTATIONS**

The arithmetical accuracy of certain computations included in the schedules provided by J.P. Morgan Securities LLC (“J.P. Morgan”) and PFM relating to (i) computation of anticipated receipts of principal and interest on the Defeasance Obligations and the anticipated payments of principal and interest to redeem the Refunded Bonds, and (ii) computation of the yields on the 2016 Bonds and the Defeasance Obligations was examined by The Arbitrage Group. Such computations were based solely upon assumptions and information supplied by J.P. Morgan and PFM. The Arbitrage Group restricted its procedures to examining the arithmetical accuracy of certain computations and has not made any study or evaluation of the assumptions and information upon which the computations are based and, accordingly, has not expressed an opinion on the data used, the reasonableness of the assumptions, or the achievability of future events.

## **UNDERWRITING**

The Underwriters, for whom J.P. Morgan is serving as representative (the “Representative”), have agreed, subject to certain conditions set forth in a bond purchase agreement to be entered into by the Authority and the Representative, to purchase from the Authority the 2016 Bonds at an aggregate price of \$122,876,354.44, representing the par amount of the 2016 Bonds, plus original issue premium of \$19,065,852.45, less Underwriters’ discount of \$449,498.01. The Underwriters will be obligated to purchase all 2016 Bonds if any such 2016 Bonds are purchased. The Underwriters may offer and sell the 2016 Bonds to certain dealers and others (including dealers depositing 2016 Bonds into investment trusts) at prices lower than the public offering prices (or yields higher than the offering yields) stated on the inside cover page hereof. The principal offering prices (or yields) set forth on the inside cover page hereof may be changed from time to time after the initial offering by the Underwriters. The obligation of the Underwriters to accept delivery of the 2016 Bonds is subject to the terms and conditions set forth in the bond purchase agreement, the approval of legal matters by counsel and other conditions.

In addition, certain of the Underwriters have entered into distribution agreements with other broker-dealers (some of which may not have been designated by the Authority as Underwriters) for the distribution of the 2016 Bonds at the original issue prices. Such agreements generally provide that the relevant Underwriter will share a portion of its underwriting compensation or selling concession with such broker-dealers.

The Underwriters and their respective affiliates are full service financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, principal investment, hedging, financing and brokerage services. Certain of the Underwriters and their respective affiliates have, from time to time, performed, and may in the future perform, various financial advisory

and investment banking services for the Authority, for which they received or will receive customary fees and expenses.

In the ordinary course of their various business activities, the Underwriters and their respective affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities, which may include credit default swaps) and financial instruments (including bank loans) for their own accounts and for the accounts of their customers and may at any time hold long and short positions in such securities and instruments. Such investment and securities activities may involve securities and instruments of the Authority.

The Underwriters and their respective affiliates may also communicate independent investment recommendations, market color or trading ideas and/or public or express independent research views in respect to such assets, securities or instruments and may at any time hold, or recommend to clients that they should acquire, long and/or short positions in such assets, securities and instruments.

Wells Fargo Securities, one of the Underwriters of the 2016 Bonds, is the trade name for certain securities-related capital markets and investment banking services of Wells Fargo & Company and its subsidiaries, including Wells Fargo Bank, National Association, which conducts its municipal securities sales, trading and underwriting operations through the Wells Fargo Bank, NA Municipal Products Group, a separately identifiable department of Wells Fargo Bank, National Association, registered with the Securities and Exchange Commission as a municipal securities dealer pursuant to Section 15B(a) of the Securities Exchange Act of 1934.

## CONTINUING DISCLOSURE

**General.** The Authority has undertaken for the benefit of the owners of the 2016 Bonds to provide certain continuing disclosure pursuant to the provision of Rule 15c2-12(b)(5) under the Securities Exchange Act of 1934 (as amended, the “Rule”). Specifically, the Authority and State Street Bank and Trust Company, predecessor in interest to U.S. Bank National Association, as Dissemination Agent (the “Dissemination Agent”) have executed and delivered a Continuing Disclosure Agreement dated November 21, 1995 (the “CDA”), which has been previously supplemented (as supplemented, the “Continuing Disclosure Agreement”) for the benefit of the owners of all bonds (including the 2016 Bonds) issued by or on behalf of the Authority that are designated by resolution of the Authority as subject to and having the benefits of the Continuing Disclosure Agreement. For the prior five years, the Authority has complied in all material respects with the terms of the Continuing Disclosure Agreement, except that notices regarding changes in ratings of certain Subordinated Bonds were not filed with respect to short-term rating changes on such Subordinated Bonds due to changes in the ratings of the applicable liquidity providers.

**Annual Filings.** Pursuant to the Continuing Disclosure Agreement, not later than January 1 of each year, commencing January 1, 1998, the Authority will, or will cause the Dissemination Agent to, provide an Annual Filing (as described below) to each nationally recognized municipal securities information repository (the “National Repositories”), which currently consists of the Municipal Securities Rulemaking Board (the “MSRB”) through EMMA, and any public or private repository or entity designated by the Commonwealth as a state information depository for the purpose of the Rule (a “State Depository” and, collectively with the National Repositories, the “Repositories”). The Annual Filing may be submitted as a single document or as separate documents comprising a package, and may cross-reference other information as provided in the Continuing Disclosure Agreement. If the Dissemination Agent determines that the Authority has failed to comply with the undertaking regarding the Annual Filing, the Dissemination Agent will send a notice to that effect in a timely manner to the MSRB and the State Depository, if any.

The Authority’s Annual Filing will contain or incorporate by reference the following:

(a) quantitative information for, or as of the end of, the preceding Fiscal Year of the type presented in the Authority’s most recent official statement, including (i) a summary table of revenues, expenses and fund deposits, (ii) the amount of outstanding indebtedness of the Authority, and the debt limit as of the end of the Fiscal Year, (iii) a summary table with respect to the coverage covenants in the Authority’s General Resolution, and (iv) a summary table showing the Authority’s capital investments by major category during the preceding Fiscal Year;

(b) quantitative information for the current Fiscal Year of the type presented in the Authority's most recent official statement, including (i) a table of the Authority's current water and wastewater charges by Local Body, (ii) the current expense budget's rate revenue requirement and the percentage increases for water and wastewater over the prior Fiscal Year, and (iii) executive summaries of the Authority's most recently adopted current expense budget and capital improvement program; and

(c) the most recently available audited financial statements of the Authority, prepared in accordance with accounting principles generally accepted in the United States of America. (If audited financial statements for the preceding Fiscal Year are not available when the Annual Filing is submitted, the Annual Filing will include unaudited financial statements for the preceding Fiscal Year.)

Any or all of the items listed above may be incorporated by reference from other documents, including official statements of debt issues of the Authority or related public entities, which have been submitted to each of the Repositories or the Securities and Exchange Commission. If the document incorporated by reference is a final official statement, it must be available from the MSRB.

**Reporting of Material Events.** Pursuant to the Continuing Disclosure Agreement, whenever the Authority obtains knowledge of the occurrence of any of the following events with respect to the 2016 Bonds (each a "Listed Event"), the Authority will promptly notify the Dissemination Agent. The Dissemination Agent shall file a notice of such occurrence in a timely manner not in excess of ten business days after the occurrence of the event with the MSRB and the State Depository, if any.

1. Principal and interest payment delinquencies.
2. Non-payment related defaults, if material.
3. Unscheduled draws on debt service reserves reflecting financial difficulties.
4. Unscheduled draws on credit enhancements reflecting financial difficulties.
5. Substitution of credit or liquidity providers, or their failure to perform.
6. Receipt by the Authority of an adverse tax opinion, the issuance by the IRS of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the 2016 Bonds, or the occurrence of other material events affecting the tax status of the 2016 Bonds.
7. Modifications to rights of any owners of the 2016 Bonds, if material.
8. Bond calls, if material, and tender offers.
9. Defeasance of the 2016 Bonds or any portion thereof.
10. Release, substitution or sale of property securing repayment of any 2016 Bonds, if material.
11. Rating changes.
12. Bankruptcy, insolvency, receivership or similar proceeding of the Authority.\*

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\* For the purposes of the event identified in item 12, the event is considered to occur when any of the following occur: The appointment of a receiver, fiscal agent or similar officer for an obligated person in a proceeding under the U.S. Bankruptcy Code or in any other proceeding under state or federal law in which a court or governmental  
(continued...)



13. The consummation of a merger, consolidation or acquisition involving the Authority or the sale of substantially all of the assets of the Authority, other than in the ordinary course of business, the entry into a definitive agreement to undertake such action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material.

14. The appointment of a successor or additional trustee, or the change of name of a trustee, if material.

**Termination of Reporting Obligation.** The Authority's and Dissemination Agent's obligations under the Continuing Disclosure Agreement will terminate upon the defeasance, prior redemption or payment in full of all of the bonds (including the 2016 Bonds) designated as subject to the agreement.

**Amendment; Waiver.** Notwithstanding any other provision of the Continuing Disclosure Agreement, the Authority and the Dissemination Agent may amend the Continuing Disclosure Agreement, and any provision of the Continuing Disclosure Agreement may be waived, if such amendment or waiver is permitted by the Rule, as evidenced by an opinion of counsel expert in federal securities laws, acceptable to both the Authority and the Dissemination Agent, to the effect that such amendment or waiver would not, in and of itself, cause the Authority's undertakings to violate the Rule if such amendment or waiver had been effective on the date of the 2011 Supplement but taking into account any subsequent change in or official interpretation of the Rule.

If the amendment provides for a change in the accounting principles to be followed in preparing financial statements, the Annual Filing for the year in which the change is made shall present a comparison between the financial statements or information prepared on the basis of the new accounting principles and those prepared on the basis of the former accounting principles. The comparison shall include a qualitative discussion of the differences in the accounting principles and the impact of the change in the accounting principles on the presentation of the financial information in order to provide information to investors to enable them to evaluate the ability of the Authority to meet its obligations. To the extent reasonably feasible, the comparison shall also be quantitative. A notice of the change in the accounting principles shall be sent to each Repository.

**Default.** In the event of a failure of the Authority or the Dissemination Agent to comply with any provision of the Continuing Disclosure Agreement, the Dissemination Agent may (and, at the request of any of the Underwriters or the owners of at least 25% aggregate principal amount outstanding of the 2016 Bonds, shall), or any owner of the 2016 Bonds may, seek a court order for specific performance by the Authority or Dissemination Agent, as the case may be, of its obligations under the Continuing Disclosure Agreement. A default under the Continuing Disclosure Agreement shall not be deemed an Event of Default under the General Resolution, and the sole remedy under the Continuing Disclosure Agreement in the event of any failure of the Authority or the Dissemination Agent to comply with the Continuing Disclosure Agreement shall be an action to compel performance of the defaulting party's obligations thereunder and not for money damages in any amount.

## BONDS AS LEGAL INVESTMENTS

Under Section 14 of the Act, bonds and notes of the Authority are made securities in which all public officers and agencies of the Commonwealth and its political subdivisions, all insurance companies, trust

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(continued...)

authority has assumed jurisdiction over substantially all of the assets or business of the obligated person, or if such jurisdiction has been assumed by leaving the existing governing body and officials or officers in possession but subject to the supervision and orders of a court or governmental authority, or the entry of an order confirming a plan of reorganization, arrangement or liquidation by a court or governmental authority having supervision or jurisdiction over substantially all of the assets or business of the obligated person.

companies in their commercial departments, savings banks, cooperative banks, banking associations, investment companies, executors, administrators, trustees and other fiduciaries may properly invest funds, including capital in their control or belonging to them.

### **BONDS AS SECURITY FOR DEPOSIT**

Under Section 14 of the Act, bonds and notes of the Authority are made securities that may properly be deposited with and received by any state or municipal officer of any agency or political subdivision of the Commonwealth for any purpose for which the deposit of bonds or other obligations of the Commonwealth is now or may hereafter be authorized by law.

### **MISCELLANEOUS**

The summaries or descriptions herein of provisions of the Act, the 2016 Bonds, the General Resolution and the Continuing Disclosure Agreement, and all references to other materials not purporting to be quoted in full, are only brief outlines of some of the provisions thereof and do not purport to summarize or describe all of the provisions thereof. So far as any statements are made in this Official Statement involving matters of opinion, whether or not expressly so stated, they are intended merely as such and not as representations of fact. Copies of the documents mentioned in this paragraph are on file at the offices of the Authority and the Trustee.

*[Signature page follows.]*

The execution and delivery of this Official Statement have been duly authorized by the Massachusetts Water Resources Authority.

MASSACHUSETTS WATER RESOURCES AUTHORITY

By: /s/ Frederick A. Laskey  
Executive Director

By: /s/ Thomas J. Durkin  
Director of Finance

August 3, 2016

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**APPENDIX A**  
**FINANCIAL STATEMENTS OF THE AUTHORITY**  
**June 30, 2015 and 2014**

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**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Financial Statements and Supplemental Schedules  
and Required Supplementary Information

June 30, 2015 and 2014

(With Independent Auditors' Report Thereon)

# MASSACHUSETTS WATER RESOURCES AUTHORITY

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**KPMG LLP**  
Two Financial Center  
60 South Street  
Boston, MA 02111

## **Independent Auditors' Report**

The Board of Directors  
Massachusetts Water Resources Authority:

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

We have audited the accompanying statements of net position of the Massachusetts Water Resources Authority (the Authority), as of June 30, 2015 and 2014, and the statements of revenues, expenses, and changes in net position, and cash flows for the years then ended, and the related notes to the financial statements.

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

Management is responsible for the preparation and fair presentation of these financial statements in accordance with U.S. generally accepted accounting principles; 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 audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

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

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

### ***Opinion***

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Authority at June 30, 2015 and 2014, and the changes in net position and cash flows for the years then ended in accordance with U.S. generally accepted accounting principles.



***Emphasis of Matter***

As discussed in Note 2a to the financial statements, the Authority adopted Governmental Accounting Standards Board (GASB) Statement No. 68, *Accounting and Financial Reporting for Pensions*. Our opinion is not modified with respect to this matter.

***Other Matters***

*Required Supplementary Information*

U.S. generally accepted accounting principles require that the management’s discussion and analysis on pages 3 through 11 and schedules of funding progress, schedules of employer contributions and schedules of changes in net pension liability and related ratios on pages 53 through 55 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management’s responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

*Supplementary and Other Information*

Our audit was conducted for the purpose of forming an opinion on the Authority’s basic financial statements. The supplemental schedules listed in the table of contents are presented for purposes of additional analysis and are not a required part of the basic financial statements.

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

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

In accordance with *Government Auditing Standards*, we have also issued our report dated August 26, 2015 on our consideration of the Authority’s internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is 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 internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Authority’s internal control over financial reporting and compliance.

**KPMG LLP**

Boston, Massachusetts  
August 26, 2015

## MASSACHUSETTS WATER RESOURCES AUTHORITY

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

June 30, 2015 and 2014

(Unaudited)

This section of the Authority's annual financial report presents our discussion and analysis of the Authority's financial performance during the Fiscal Years ended June 30, 2015 and 2014. Please read it in conjunction with the Authority's financial statements, which immediately follow this section.

#### **Financial Highlights – Fiscal Year 2015**

The Fiscal Year 2015 customer service revenues were approximately \$661.3 million. Of this amount, rate revenues represent approximately 98.3%, or \$650.3 million, and were \$21.6 million higher than Fiscal Year 2014. This was due to an increase in assessments.

Total operating expenses, excluding depreciation, were approximately \$263.4 million in Fiscal Year 2015. The 3.7% decrease in total operating expenses over Fiscal Year 2014 is the result of a decrease in utility and maintenance costs.

Net nonoperating expenses decreased \$8.1 million, or 3.6%, due to a \$10.5 million increase in investment income offset by a \$1.6 million increase in interest expense and no debt service assistance. The increase in investment income was primarily due to an increase in the unrealized gain on investments. Lower long-term interest rates have caused the market values of investments to increase.

Total assets at June 30, 2015 were approximately \$7.9 billion, a \$166.3 million, or 2.0%, decrease over total assets at June 30, 2014.

During Fiscal Year 2015, the Authority issued General Revenue Bonds 2014 Series D and General Revenue Refunding Bonds, 2014 Series E and 2014 Series F for a total of \$243.9 million. The proceeds from these bonds were used to finance new capital projects and refund \$194.6 million of the Authority's outstanding bonds. The interest rate on these bonds was 4% to 5% during Fiscal Year 2015.

Total capital assets (net of depreciation) were approximately \$5.9 billion at June 30, 2015, a \$137.8 million, or 2.3%, decrease over June 30, 2014. The decrease was primarily due to the rate of depreciation being higher than the rate of capitalization.

#### **Financial Highlights – Fiscal Year 2014**

The Fiscal Year 2014 customer service revenues were approximately \$639.7 million. Of this amount, rate revenues represent approximately 98.3%, or \$628.7 million, and were \$21.2 million higher than Fiscal Year 2013. This was due to an increase in assessments.

Total operating expenses, excluding depreciation, were approximately \$273.5 million in Fiscal Year 2014. The 2.3% increase in total operating expenses over Fiscal Year 2013 is the result of increases in personnel costs, maintenance and pension costs. Pension expense increased as an additional, optional \$5 million contribution was made in Fiscal Year 2014, as well as a \$1.6 million payment that reflects recognition of the projected increases associated with revised mortality tables.

Net nonoperating expenses decreased \$14.3 million, or 6.0%, due to an \$8.5 million increase in investment income, a \$5 million decrease in interest expense and receipt of \$0.8 million of debt service assistance. The increase in

## MASSACHUSETTS WATER RESOURCES AUTHORITY

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

June 30, 2015 and 2014

(Unaudited)

investment income was due to a changing portfolio of investments, yielding a smaller unrealized loss on investments.

Total assets at June 30, 2014 were approximately \$8.1 billion, a \$155.3 million, or 1.9%, decrease over total assets at June 30, 2013.

During Fiscal Year 2014, the Authority issued direct-purchase General Revenue Refunding Bonds, 2014 Series A and 2014 Series B for a total of \$114.8 million. The proceeds from these bonds were used to refund \$114.8 million of the Authority's outstanding bonds. The interest rate on these bonds was 0.44% to 0.59% during Fiscal Year 2014.

Total capital assets (net of depreciation) were approximately \$6.1 billion at June 30, 2014, a \$80.8 million, or 1.3%, decrease over June 30, 2013. The decrease was primarily due to the rate of depreciation being higher than the rate of capitalization.

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

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

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

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

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

The Authority's total net position at June 30, 2015 was approximately \$1.7 billion, a \$44.8 million decrease from June 30, 2014. Total assets decreased \$166.3 million, or 2.0%, to \$7.9 billion, and total liabilities decreased \$167.0 million, or 2.6%, to \$6.3 billion.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

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

June 30, 2015 and 2014

(Unaudited)

The Authority's total net position at June 30, 2014 was approximately \$1.8 billion, a \$38.8 million decrease from June 30, 2013. Total assets decreased \$155.3 million, or 1.9%, to \$8.1 billion, and total liabilities decreased \$115.7 million, or 1.8%, to \$6.5 billion.

#### Net Position (Dollars in thousands)

	2015	2014	2013	Percentage change 2015–2014	Percentage change 2014–2013
Current assets	\$ 130,438	126,567	125,159	3.1%	1.1%
Restricted assets	675,664	718,750	762,951	(6.0)	(5.8)
Capital assets	5,935,338	6,073,139	6,153,926	(2.3)	(1.3)
Other assets	1,208,077	1,197,311	1,229,006	0.9	(2.6)
<b>Total assets</b>	<b>7,949,517</b>	<b>8,115,767</b>	<b>8,271,042</b>	<b>(2.0)</b>	<b>(1.9)</b>
Deferred outflows of resources from pension	14,601	—	—	100.0	—
Deferred outflows of resources from derivative instruments	44,183	40,977	43,867	7.8	(6.6)
Deferred outflows of resources from refunded debt	73,204	73,617	87,360	(0.6)	(15.7)
Current liabilities	356,568	371,594	328,837	(4.0)	13.0
Payable from restricted assets	159,064	217,707	204,905	(26.9)	6.2
Long-term debt	5,601,104	5,697,812	5,876,695	(1.7)	(3.0)
Long-term lease	30,114	30,938	31,700	(2.7)	(2.4)
Other liabilities	153,028	148,803	140,422	2.8	6.0
<b>Total liabilities</b>	<b>6,299,878</b>	<b>6,466,854</b>	<b>6,582,559</b>	<b>(2.6)</b>	<b>(1.8)</b>
Deferred inflows of resources from pension	6,983	—	—	100.0	—
Deferred inflows of resources from regulated activities	63,051	7,092	24,543	789.0	(71.1)
Net position:					
Net investment in capital assets	788,429	774,390	755,266	1.8	2.5
Restricted	290,362	271,424	307,208	7.0	(11.6)
Unrestricted	\$ 632,802	710,601	732,693	(10.9)	(3.0)
<b>Total net position</b>	<b>1,711,593</b>	<b>1,756,415</b>	<b>1,795,167</b>	<b>(2.6)%</b>	<b>(2.2)%</b>

#### Changes in Net Position

The decrease in net position at June 30, 2015 was \$44.8 million, or 2.6%, as compared with June 30, 2014. The Authority's total operating revenues increased by 3.2% to \$668.6 million and total operating expenses decreased 3.7% to \$263.4 million.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Management's Discussion and Analysis – Required Supplementary Information

June 30, 2015 and 2014

(Unaudited)

The decrease in net position at June 30, 2014 was \$38.8 million, or 2.2%, as compared with June 30, 2013. The Authority's total operating revenues increased by 3.9% to \$648 million and total operating expenses increased 2.3% to \$273.5 million.

<b>Changes in Net Position</b>					
(Dollars in thousands)					
	<u>2015</u>	<u>2014</u>	<u>2013</u>	<u>Percentage change 2015–2014</u>	<u>Percentage change 2014–2013</u>
<b>Operating revenues:</b>					
Customer service revenues	\$ 661,305	639,691	617,415	3.4%	3.6%
Other revenues	7,299	8,326	5,978	(12.3)	39.3
<b>Total operating revenues</b>	<b>668,604</b>	<b>648,017</b>	<b>623,393</b>	<b>3.2</b>	<b>3.9</b>
<b>Operating expenses:</b>					
Operations	102,322	100,778	101,425	1.5	(0.6)
Maintenance	28,323	29,453	26,956	(3.8)	9.3
Payments in lieu of taxes	7,966	7,872	7,640	1.2	3.0
Engineering, general, and administrative	124,792	135,401	131,329	(7.8)	3.1
<b>Total operating expenses</b>	<b>263,403</b>	<b>273,504</b>	<b>267,350</b>	<b>(3.7)</b>	<b>2.3</b>
Depreciation and amortization	194,000	193,062	190,852	0.5	1.2
<b>Operating income</b>	<b>211,201</b>	<b>181,451</b>	<b>165,191</b>	<b>16.4</b>	<b>9.8</b>
<b>Nonoperating items:</b>					
Regulatory accounting provisions	(41,634)	(3,808)	23,917	993.3	(115.9)
Net nonoperating expenses	(217,218)	(225,293)	(239,616)	(3.6)	(6.0)
Capital grants and contributions	6,429	5,958	6,630	7.9	(10.1)
Changes in derivative related accounts	2,940	2,940	5,798	—	(49.3)
<b>Total nonoperating items</b>	<b>(249,483)</b>	<b>(220,203)</b>	<b>(203,271)</b>	<b>13.3</b>	<b>8.3</b>
<b>Change in net position</b>	<b>(38,282)</b>	<b>(38,752)</b>	<b>(38,080)</b>	<b>(1.2)</b>	<b>1.8</b>
<b>Total net position – beginning of year</b>	<b>1,756,415</b>	<b>1,795,167</b>	<b>1,833,247</b>	<b>(2.2)</b>	<b>(2.1)</b>
Restatement to comply with GASB 68	(6,540)	—	—	100.0	—
<b>Total net position – end of year</b>	<b>\$ 1,711,593</b>	<b>1,756,415</b>	<b>1,795,167</b>	<b>(2.6)%</b>	<b>(2.2)%</b>

During Fiscal Year 2015, the increases in customer service revenues were primarily due to the 3.43% increase in the rate revenue requirement (\$21.6 million).

During Fiscal Year 2014, the increases in customer service revenues were primarily due to the 3.49% increase in the rate revenue requirement (\$21.2 million).

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Management's Discussion and Analysis – Required Supplementary Information

June 30, 2015 and 2014

(Unaudited)

Total operating costs, before depreciation and amortization, were approximately \$263.4 million in Fiscal Year 2015. The 3.7% decrease in total operating expenses over Fiscal Year 2014 is the result of a decrease in utility and maintenance costs.

Total operating costs, before depreciation and amortization, were approximately \$273.5 million in Fiscal Year 2014. The 2.3% increase in total operating expenses over Fiscal Year 2013 is the result of increases in personnel costs, maintenance and pension costs. Pension expense increased as an additional, optional \$5 million contribution, as well as a \$1.6 million payment that reflects recognition of the projected increases associated with revised mortality tables were made in Fiscal Year 2014.

In Fiscal Year 2015, net nonoperating expenses decreased \$8.1 million, or 3.6%, due to a \$10.5 million increase in investment income offset by a \$1.6 million increase in interest expense and no debt service assistance. The increase in investment income was primarily due to an increase in the unrealized gain on investments. Lower long-term interest rates have caused the market values of investments to increase.

In Fiscal Year 2014, net nonoperating expenses decreased \$14.3 million, or 6.0%, due to an \$8.5 million increase in investment income, a \$5 million decrease in interest expense and receipt of \$0.8 million of debt service assistance. The increase in investment income was due to a changing portfolio of investments, yielding a smaller unrealized loss on investments.

**Operating Costs by Functionality**  
(Dollars in thousands)

	<b>2015</b>	<b>2014</b>	<b>2013</b>	<b>Percentage change 2015–2014</b>	<b>Percentage change 2014–2013</b>
Wastewater treatment and transport	\$ 93,870	94,703	96,255	(0.9)%	(1.6)%
Water treatment and transport	35,545	35,395	34,702	0.4	2.0
Water and wastewater quality	8,041	7,731	7,430	4.0	4.1
Metering and monitoring	6,662	6,094	5,845	9.3	4.3
Facilities planning, design, and construction	9,504	9,318	9,337	2.0	(0.2)
Management information systems	10,162	10,325	9,115	(1.6)	13.3
Administration and support	48,625	47,997	45,923	1.3	4.5
<b>Total direct operating costs</b>	<b>212,409</b>	<b>211,563</b>	<b>208,607</b>	<b>0.4</b>	<b>1.4</b>
Indirect operating costs	50,994	61,941	58,743	(17.7)	5.4
<b>Total operating costs</b>	<b>\$ 263,403</b>	<b>273,504</b>	<b>267,350</b>	<b>(3.7)%</b>	<b>2.3%</b>

All functional areas experienced increased spending due to contractual salary increases. Wastewater and water treatment and transmission cost increases were offset by decreases in chemical and utility costs. In addition, metering and monitoring expenses increased due to increased maintenance and telephone costs. Management information systems costs decreased due to a reduction in purchases of computer hardware. Administration and support expenses increased due to higher health insurance and workers' compensation expenses.

## MASSACHUSETTS WATER RESOURCES AUTHORITY

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

June 30, 2015 and 2014

(Unaudited)

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

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

An initial deposit of \$10.8 million was made to the trust upon establishment of the trust.

#### **Capital Assets and Debt Administration**

##### ***Capital Assets***

As of June 30, 2015 and 2014, the Authority had \$5.9 billion and \$6.1 billion of capital assets (net of depreciation), respectively. This includes land, construction in progress, plant and equipment for the water and sewer systems, furniture and fixtures, leasehold improvements, and motor vehicles and equipment. The Authority’s net capital assets decreased approximately \$137.8 million, or 2.3%, during Fiscal Year 2015, primarily due to the rate of depreciation being higher than the rate of capitalization.

**Capital Assets**  
(Net of depreciation, dollars in thousands)

	<u>2015</u>	<u>2014</u>	<u>2013</u>	<u>Percentage change 2015–2014</u>	<u>Percentage change 2014–2013</u>
Land	\$ 23,750	23,741	23,733	—%	—%
Construction in progress	205,582	193,180	163,916	6.4	17.9
Plant and equipment, water, and sewer systems	5,701,134	5,852,085	5,962,858	(2.6)	(1.9)
Furniture and fixtures	503	425	750	18.4	(43.3)
Leasehold improvements	315	327	339	(3.7)	(3.5)
Motor vehicles and equipment	4,054	3,381	2,330	19.9	45.1
	<u>\$ 5,935,338</u>	<u>6,073,139</u>	<u>6,153,926</u>	<u>(2.3)%</u>	<u>(1.3)%</u>

##### ***Debt Administration***

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



## MASSACHUSETTS WATER RESOURCES AUTHORITY

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

June 30, 2015 and 2014

(Unaudited)

#### ***Bond Resolutions***

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

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

In April 2015, the Authority released \$46.3 million in reserves as authorized under a 2007 amendment to the General Bond Resolution. Of the \$46.3 million, \$25 million came from the Renewal and Replacement reserve and the balance from the Community Obligation and Revenue Enhancement reserve. The \$46.3 million was deployed to defease debt of \$36.3 million, and \$10 million was deposited into the MWRA Other Post-Employment Benefits (OPEB) Irrevocable Trust. The 2007 amendment also included new calculations for determining the Debt Service Reserve Fund requirement. At June 30, 2015 these new calculations resulted in an excess in the Debt Service Reserve of \$67.1 million, which will be used to defease debt in Fiscal Year 2016.

The 2007 General Bond Resolution amendment was accomplished as a result of the Authority's history of meeting its debt service obligations and the completion of major projects. The Authority continues to have over \$275 million in reserves after this activity.

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

The Authority's \$3.4 billion Senior Lien General Revenue Bonds are rated Aa1 from Moody's Investors Service, AA+ by Standard and Poors Ratings Services and AA+ from FitchRatings. The \$963 million Subordinate Lien General Revenue Bonds are rated Aa2 from Moody's Investors Service, AA by Standard and Poors Ratings Services and AA from FitchRatings. Some of the Authority's revenue bonds are enhanced by bond insurance. The credit ratings of these bond series will be the higher rating of either the Authority or the firm providing the enhancement. In the case of bonds enhanced by a letter of credit, the rating will be the highest of the Authority's, the provider or, if available, a joint rating. The subordinated debt of \$1.0 billion with the Massachusetts Clean Water Trust is not rated as the Authority's debt.

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

In June 2015, the Board approved the Fiscal Year 2016 Current Expense Budget (CEB), which totals \$702.5 million in expenses.

The \$702.5 million expense total is comprised of \$432.7 million (61.6%) in capital financing costs and \$269.8 million (38.4%) in operating expenses, of which \$222.8 million (82.6%) is for direct expenses and \$47.0 million (17.4%) is for indirect expenses. The total represents an increase of \$34.2 million from Fiscal Year

## MASSACHUSETTS WATER RESOURCES AUTHORITY

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

June 30, 2015 and 2014

(Unaudited)

2015 spending, which is comprised of \$10.7 million in higher operating costs and \$23.5 million in higher debt service costs.

The Fiscal Year 2016 rate revenue requirement approved by the Board is \$672.5 million; an increase of 3.4% compared with the Fiscal Year 2015 budget.

Fiscal Year 2016 budgeted nonrate revenue totals \$30.0 million, an increase of \$2.7 million from actual Fiscal Year 2015 nonrate revenue. The nonrate revenue budget is comprised of \$9.4 million in investment income, \$19.8 million in other user charges and other revenue and \$.8 million in entrance fees.

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

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

Major planned and ongoing projects include:

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

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Management's Discussion and Analysis – Required Supplementary Information

June 30, 2015 and 2014

(Unaudited)

**Contacting the Authority's Financial Management**

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

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Statements of Net Position

June 30, 2015 and 2014

(Dollars in thousands)

<b>Assets</b>	<b>2015</b>	<b>2014</b>
Unrestricted current assets:		
Cash and cash equivalents (note 4)	\$ 41,451	57,488
Investments (note 4)	58,031	37,769
Intergovernmental loans (note 7)	30,587	30,304
Accounts receivable	369	1,006
Total unrestricted current assets	<u>130,438</u>	<u>126,567</u>
Restricted assets:		
Investments (note 4)	673,198	716,208
Interest receivable	2,466	2,542
Total restricted assets	<u>675,664</u>	<u>718,750</u>
Capital assets:		
Capital assets – not being depreciated (note 8)	229,332	216,921
Capital assets – being depreciated – net (note 8)	5,706,006	5,856,218
Total capital assets	<u>5,935,338</u>	<u>6,073,139</u>
Regulatory assets (note 3)	767,283	797,591
Other assets, net (notes 7 and 10)	440,794	399,720
Total assets	<u>7,949,517</u>	<u>8,115,767</u>
<b>Deferred Outflows of Resources</b>		
Deferred outflows from pension (note 10)	14,601	—
Deferred outflows from derivative instruments (note 6)	44,183	40,977
Deferred outflows from refunding debt	73,204	73,617
<b>Liabilities</b>		
Current liabilities:		
Accounts payable and accrued expenses	59,320	59,434
Commercial paper notes (note 6)	130,000	170,000
Current portion of long-term debt (note 6)	167,248	142,160
Total current liabilities	<u>356,568</u>	<u>371,594</u>
Payable from restricted assets:		
Accounts payable for construction	16,060	28,635
Accrued interest on bonds payable	85,548	86,983
Reserves (note 5)	57,456	102,089
Total payable from restricted assets	<u>159,064</u>	<u>217,707</u>
Retainage on construction in progress	8,248	5,823
Long-term debt – less current portion (note 6)	5,601,104	5,697,812
Long-term capital lease (note 9)	30,114	30,938
Other postemployment benefits (note 11)	100,597	102,003
Liability for derivative instruments (note 6)	44,183	40,977
Total liabilities	<u>6,299,878</u>	<u>6,466,854</u>
<b>Deferred Inflows of Resources</b>		
Deferred inflows from pension (note 10)	6,983	—
Deferred inflows from regulated activities (note 3)	63,051	7,092
<b>Net Position</b>		
Net investment in capital assets	788,429	774,390
Restricted	290,362	271,424
Unrestricted	632,802	710,601
Total net position	<u>\$ 1,711,593</u>	<u>1,756,415</u>

Commitments and contingencies (notes 9, 10, 11, 12, and 13)

See accompanying notes to financial statements.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Statements of Revenues, Expenses, and Changes in Net Position

Years ended June 30, 2015 and 2014

(Dollars in thousands)

	<u>2015</u>	<u>2014</u>
Operating revenues (note 2):		
Customer services	\$ 661,305	639,691
Other	7,299	8,326
Total operating revenues	<u>668,604</u>	<u>648,017</u>
Operating expenses:		
Operations	102,322	100,778
Maintenance	28,323	29,453
Payments in lieu of taxes	7,966	7,872
Engineering, general, and administrative	124,792	135,401
Total operating expenses	<u>263,403</u>	<u>273,504</u>
Income from operations before depreciation	405,201	374,513
Depreciation and amortization	<u>194,000</u>	<u>193,062</u>
Operating income	<u>211,201</u>	<u>181,451</u>
Regulatory accounting provisions:		
Change in reserves (note 5)	44,633	(170)
Change in regulatory provisions, net (note 3)	<u>(86,267)</u>	<u>(3,638)</u>
Total regulatory accounting provisions	<u>(41,634)</u>	<u>(3,808)</u>
Nonoperating revenues (expenses):		
Debt service grant	—	854
Investment income	15,949	5,433
Interest expense	(233,167)	(231,580)
Changes in derivative related accounts	2,940	2,940
Total nonoperating expenses	<u>(214,278)</u>	<u>(222,353)</u>
Net loss before capital contributions	(44,711)	(44,710)
Capital grants and contributions	<u>6,429</u>	<u>5,958</u>
Decrease in net position	(38,282)	(38,752)
Total net position, beginning of year	1,756,415	1,795,167
Restatement to comply with GASB Statement No. 68 (note 2a)	<u>(6,540)</u>	—
Total net position, end of year	<u>\$ 1,711,593</u>	<u>1,756,415</u>

See accompanying notes to financial statements.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Statements of Cash Flows

Years ended June 30, 2015 and 2014

(Dollars in thousands)

	<u>2015</u>	<u>2014</u>
Cash flows from operating activities:		
Cash received from customers	\$ 661,941	639,306
Cash paid to suppliers for goods and services	(125,248)	(119,056)
Cash paid to employees for services	(138,669)	(128,816)
Cash paid in lieu of taxes	(7,966)	(7,872)
Other operating receipts	6,271	8,286
Net cash provided by operating activities	<u>396,329</u>	<u>391,848</u>
Cash flows from capital and related financing activities:		
Proceeds from sale of revenue bonds, loans, and notes	113,915	151,146
Capital grants for construction	6,429	5,958
Debt service grant	—	854
Capital lease principal payments	(829)	(762)
Capital lease interest payments	(2,388)	(2,455)
Repayment of debt	(232,024)	(274,415)
Interest paid on debt	(221,871)	(228,522)
Plant expenditures	(114,369)	(92,808)
Net cash used for capital and related financing activities	<u>(451,137)</u>	<u>(441,004)</u>
Cash flows from investing activities:		
Purchases of short-term investments	(2,070)	(3,936)
Sales and maturities of short-term investments	21,200	72,050
Changes in restricted money market investments	9,880	(20,011)
Interest received	9,761	12,580
Net cash provided by investing activities	<u>38,771</u>	<u>60,683</u>
Net (decrease) increase in cash and cash equivalents	<u>(16,037)</u>	<u>11,527</u>
Cash and cash equivalents, beginning of year	<u>57,488</u>	<u>45,961</u>
Cash and cash equivalents, end of year	\$ <u><u>41,451</u></u>	\$ <u><u>57,488</u></u>
Reconciliation of operating income to net cash provided by operating activities:		
Operating income	\$ 211,201	181,451
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation and amortization	194,000	193,062
Change in other accounts	(322)	(431)
Change in accounts payable	(8,550)	17,766
Net cash provided by operating activities	\$ <u><u>396,329</u></u>	\$ <u><u>391,848</u></u>

Noncash capital and related financing activities:

In fiscal 2015, general revenue refunding bonds in the aggregate principal amount of \$170,800 were issued to defease \$194,615 of bonds outstanding.

In fiscal 2014, general revenue refunding bonds in the aggregate principal amount of \$114,755 were issued to defease \$114,755 of bonds outstanding.

See accompanying notes to financial statements.

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

### (1) Organization

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

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

### (2) Summary of Significant Accounting Policies

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

#### (a) Basis of Presentation

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

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

In addition, the Authority applies the provisions of GASB Statement No. 62, *Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 FASB and AICPA Pronouncements*, to provide a better matching of revenues and expenses. The effect of this policy has been to defer certain outflows of resources, which will be recovered through future revenues in accordance with the Authority's rate model, and to record deferred inflows of resources for revenue collected through current rates for costs expected to be incurred in the future. The effects of the Authority's accounting policies are discussed further in note 3.

The Authority has implemented GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*. This Statement requires that the net pension liability (asset) be reflected on the Statements of Net Position, as well as deferred inflows and outflows from pension activities. The Authority's 2015 Statement of Net Position reflects a net pension asset due to the fair value of pension assets at the

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

measurement date exceeding pension liability. In accordance with the Statement, the Authority has restated Net Position as of July 1, 2014. Restating the prior year was not practical.

In April, 2015, the Authority established the MWRA Other Post-Employment Benefits (OPEB) Irrevocable Trust. The Trust was established for the sole purpose of providing for the advance funding of future costs of retired employee health insurance and other benefits provided to retirees. In no event shall any part of the principal or income of the Trust be paid or revert back to the Authority or be used for any purpose whatsoever other than for the exclusive benefit of retirees and their beneficiaries.

**(b) Capital Assets**

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

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

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

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

During Fiscal Years 2015 and 2014, none of the Authority's interest expense was capitalized to construction in progress in accordance with its current policy of recovering such costs through rates as incurred. Rates collected for principal payments on debt related to assets under construction are deferred until the related asset is completed and depreciation commences.



**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

**(d) Depreciation**

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

	<u>Years</u>
Plant and equipment, water and sewerage systems	5–100
Motor vehicles and equipment	5
Furniture and fixtures	7
Leasehold improvements	3–5

**(e) Revenue Recognition**

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

**(f) Cash and Cash Equivalents**

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

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

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

**(h) Investments**

Investments, other than guaranteed investment contracts, are recorded at fair value. Fair value is determined based on quoted market price. Guaranteed investment contracts are recorded at cost. The Authority recorded unrealized gains of \$6,252 in Fiscal Year 2015 and unrealized losses of \$6,699 in Fiscal Year 2014 as part of investment income.

**(i) Use of Estimates**

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, and disclosure of contingent assets and liabilities at the date of the financial

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

statements, and the reported amounts of revenues and expenditures during the reporting period. Actual results could differ from those estimates.

**(j) *Compensated Absences***

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

**(k) *Pensions***

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

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

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

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

A summary of the activity of regulatory assets and deferred inflows for Fiscal Years 2015 and 2014 is as follows:

	<u>Sewer</u>	<u>Water</u>	<u>Total</u>
Balance – June 30, 2013 – net	\$ 654,366	139,771	794,137
Difference between depreciation of capital assets not financed by grants or capital contributions, and debt service in excess of interest expense	(21,060)	(29)	(21,089)
Other – net	<u>15,922</u>	<u>1,529</u>	<u>17,451</u>
Balance – June 30, 2014 – net	649,228	141,271	790,499
Difference between depreciation of capital assets not financed by grants or capital contributions, and debt service in excess of interest expense	(25,504)	(4,804)	(30,308)
Other – net	<u>(45,130)</u>	<u>(10,829)</u>	<u>(55,959)</u>
Balance – June 30, 2015 – net	\$ <u><u>578,594</u></u>	<u><u>125,638</u></u>	<u><u>704,232</u></u>

The net balance at June 30, 2015 and 2014 is presented on the statements of net position as follows:

	<u>2015</u>	<u>2014</u>	<u>Current year change</u>
Regulatory assets	\$ 767,283	797,591	(30,308)
Deferred inflows from regulatory activities	<u>(63,051)</u>	<u>(7,092)</u>	<u>(55,959)</u>
Net change	\$ <u><u>704,232</u></u>	<u><u>790,499</u></u>	<u><u>(86,267)</u></u>

The balance in the rate stabilization reserve was \$36,512 at June 30, 2015 and 2014, respectively.

**(4) Deposits and Investments**

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

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

The custodial credit risk for deposits and certificates of deposit is the risk that, in the event of a bank failure, the Authority’s deposits may not be recovered. The deposits in the bank in excess of the insured amount are uninsured and uncollateralized.

The bank deposits at June 30, 2015 and 2014 were \$41,993 and \$58,008, respectively. Of these amounts, \$41,743 and \$57,758 were exposed to custodial credit risks as uninsured and uncollateralized.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

**(b) Investments**

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

The following guaranteed investment contract was in force as of June 30, 2015 and 2014, respectively. Such contracts are fully collateralized and recorded at cost:

<u>Investment agreement provider</u>	<u>Rate</u>	<u>Maturity</u>	<u>2015</u>	<u>2014</u>
Wells Fargo Bank, N.A.	5.17%	August 1, 2016	\$ 14,456	14,456
Total			\$ <u>14,456</u>	<u>14,456</u>

**(c) Credit Ratings**

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

The guaranteed investment contracts and money market funds are not rated.

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

**(d) Concentration Risk**

The Authority has no investments, at fair value, which exceeds 5% of the Authority's total investments as of June 30, 2015 and 2014, except for the following investment with the Federal Farm Credit Bureau (FFCB):

<u>Investment</u>	<u>June 30, 2015</u>		<u>June 30, 2014</u>	
	<u>Fair Value</u>	<u>% of Investments</u>	<u>Fair Value</u>	<u>% of Investments</u>
2.97% FFBC U.S. Security	\$ 46,681	6.4	\$ 45,378	6.0

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

**(e) Interest Rate Risk**

The following is a listing of the Authority's fixed income investments and related maturity schedule as of June 30, 2015 and 2014:

		<b>June 30, 2015</b>				
		<b>Investment maturities (in years)</b>				
<b>Investment type</b>	<b>Fair value</b>	<b>&lt;1</b>	<b>1-3</b>	<b>4-8</b>	<b>&gt;9</b>	
Money market mutual funds	\$ 469,289	469,289	—	—	—	
U.S. agency obligations	247,484	—	—	38,817	208,667	
Guaranteed investment contract	14,456	—	14,456	—	—	
Total	\$ 731,229	469,289	14,456	38,817	208,667	

		<b>June 30, 2014</b>				
		<b>Investment maturities (in years)</b>				
<b>Investment type</b>	<b>Fair value</b>	<b>&lt;1</b>	<b>1-3</b>	<b>4-8</b>	<b>&gt;9</b>	
Money market mutual funds	\$ 479,170	479,170	—	—	—	
U.S. agency obligations	260,351	—	—	43,497	216,854	
Guaranteed investment contract	14,456	—	14,456	—	—	
Total	\$ 753,977	479,170	14,456	43,497	216,854	

The Authority's bond resolution limits maturities to less than 15 years. The majority of the Authority's investments are held in short-term money market funds and long-term investments in U.S. agency obligations that are held in the debt service reserve funds where the intent is to hold until maturity.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

**(f) Restricted Investments by Fund**

The following summarizes restricted investments as of June 30, 2015 and 2014 by various funds and accounts established by the Authority for debt covenants and other purposes:

	<b>2015</b>	<b>2014</b>
Restricted investments:		
Construction	\$ 72,375	80,109
Debt service reserves	215,749	224,484
Debt service	256,852	232,143
Revenue redemption	25,025	32,716
Revenue	74,618	74,128
Renewal and replacement reserve	8,466	32,182
Insurance	14,000	14,000
Community obligation and revenue enhancement	—	20,447
OPEB Reserve	—	807
Insurance related escrow deposits	6,113	5,192
Total restricted investments	\$ 673,198	716,208

**(5) Bond Resolution Reserves**

The components of the reserves required by the general and supplemental bond resolutions at June 30, 2015 and 2014 are as follows:

<b>Reserves</b>	<b>Sewer</b>	<b>Water</b>	<b>2015 Total</b>	<b>2014 Total</b>
Renewal and replacement	\$ 2,544	1,457	4,001	29,001
Insurance	7,000	7,000	14,000	14,000
Operating	26,536	12,919	39,455	38,972
Community obligation and revenue enhancement	—	—	—	20,116
Total	\$ 36,080	21,376	57,456	102,089

A renewal and replacement reserve of \$6,000 was established through grant receipts transferred from the Commonwealth in 1985 and is included in restricted net position at June 30, 2015 and 2014.

In April, 2015, the Authority released \$46,300 in reserves as authorized under a 2007 amendment to the General Bond Resolution. Of the \$46,300, \$25,000 came from the Renewal and Replacement reserve and the balance from the Community Obligation and Revenue Enhancement reserve.

During 2015, modifications to the Resolution included new calculations for determining the debt service reserve fund balance. The new calculation now requires the reserve fund level to be at least 50% of the maximum annual debt service or \$150,000 at June 30, 2015. The amount deposited in the reserve fund at June 30, 2015 was \$215,749 of which \$67,100 is to be used to defease outstanding debt in Fiscal Year 2016.

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June 30, 2015 and 2014

(Dollars in thousands)

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

Long-term debt at June 30, 2015 and 2014 consisted of the following:

	<b>2015</b>	<b>2014</b>
General Revenue Bonds:		
1993 Series C, 5 1/4%, issued December 2, 1993, due 2015	\$ 10,065	19,625
2002 Series J, 5% to 5 1/2%, issued December 18, 2002, due 2016 to 2042	282,030	297,300
2006 Series A, 4%, issued March 16, 2006, due 2042 to 2046	62,320	149,990
2007 Series A, 4 3/8% to 5%, issued February 1, 2007, due 2023 to 2046	198,000	198,000
2009 Series A, 5%, issued February 19, 2009, due 2029 to 2039	64,240	76,445
2010 Series A, 4% to 5%, issued May 6, 2010, due 2020 to 2040	85,150	96,530
2011 Series B, 2% to 5%, issued May 19, 2011, due 2015 to 2041	134,785	140,140
2012 Series A, 3% to 5%, issued April 19, 2012, due 2018 to 2042	132,620	139,365
2014 Series D, 5%, issued November 19, 2014, due 2015 to 2044	70,665	—
	<u>1,039,875</u>	<u>1,117,395</u>
General Revenue Refunding Bonds:		
2004 Series B, 5%, issued September 29, 2004	—	38,405
2005 Series A, 5% to 5 1/4%, issued April 14, 2005, due 2015 to 2034	307,050	344,830
2005 Series B, 5%, issued April 14, 2005, due 2031 to 2035	80,290	80,290
2006 Series B, 4% to 5%, issued March 16, 2006, due 2016 to 2040	172,575	216,935
2007 Series B, 5 1/4%, issued February 1, 2007, due 2023 to 2038	647,950	647,950
2009 Series B, 3 3/8% to 5%, issued February 19, 2009, due 2016 to 2039	268,115	271,030
2010 Series B, 5%, issued May 6, 2010, due 2015 to 2032	165,235	173,835
2011 Series C, 3 1/8% to 5 1/4%, issued December 8, 2011, due 2018 to 2042	327,160	327,160
2012 Series B, 4 1/4% to 5%, issued April 19, 2012, due 2026 to 2029	86,775	86,775
2013 Series A, 3% to 5%, issued March 27, 2013, due 2016 to 2036	169,825	169,835
2014 Series E, 5%, issued November 19, 2014, due 2016 to 2020	28,245	—
2014 Series F, 4% to 5%, issued November 19, 2014, due 2020 to 2041	141,525	—
	<u>2,394,745</u>	<u>2,357,045</u>

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	<u>2015</u>	<u>2014</u>
General Revenue Bonds with the Massachusetts Clean Water Trust:		
1993 Series D, 5 1/4%, issued January 6, 1994	\$ —	315
1995 Series A, 5%%, issued November 21, 1995, due 2015	340	665
1998 Series C, 4 3/4% to 5 3/8%, issued July 9, 1998, due 2015 to 2018	2,035	2,800
1999 Series E Sewer, 4 3/4% to 5 3/8%, issued October 6, 1999, due 2015 to 2029	6,649	6,984
1999 Series E Water, 4 3/4% to 5 3/8%, issued October 6, 1999, due 2015 to 2019	3,760	4,440
1999 Series F, 5 3/4% to 6%, issued November 3, 1999, due 2015 to 2029	232,560	248,850
2000 Series E Sewer, 5 1/5% to 5 5/8%, issued November 1, 2000, due 2015 to 2030	50,478	52,615
2000 Series E Water, 5 1/5% to 5 5/8%, issued November 1, 2000, due 2015 to 2020	4,705	5,400
2001 Series C Water, 5% to 5 1/4%, issued July 26, 2001, due 2016 to 2021	2,030	2,330
2001 Series D Sewer, 5 1/4% to 5 3/4%, issued July 26, 2001, due 2015 to 2029	2,983	3,438
2001 Series D Water, 5 1/4% to 5 3/4%, issued July 26, 2001, due 2015 to 2019	532	628
2002 Series H Sewer, 5% to 5 1/4%, issued October 31, 2002, due 2015 to 2032	65,370	67,935
2002 Series H Water, 5% to 5 1/4%, issued October 31, 2002, due 2015 to 2022	15,845	17,530
2002 Series I Sewer, 5 1/5% to 5 5/8%, issued October 31, 2002, due 2015 to 2030	1,807	1,890
2002 Series I Water, 5 1/5% to 5 5/8%, issued October 31, 2002, due 2015 to 2020	12	14
2003 Series A Water, 5%, issued October 31, 2002, due 2015 to 2022	728	806
2003 Series B Water, 5% to 5 1/4%, issued July 24, 2003, due 2016 to 2021	1,834	2,106
2003 Series C Sewer, 4% to 5 1/2%, issued November 6, 2003, due 2015 to 2033	23,798	24,664
2003 Series C Water, 3 3/4% to 5 1/2%, issued November 6, 2003, due 2015 to 2023	11,240	12,285



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	<u>2015</u>	<u>2014</u>
2004 Series C Sewer, 4% to 5 1/2%, issued October 26, 2004, due 2015 to 2033	\$ 8,076	8,373
2004 Series C Water, 5%, issued October 26, 2004, due 2015 to 2022	758	867
2004 Series D Sewer, 4 1/2% to 5 1/4%, issued November 29, 2004, due 2015 to 2034	43,115	45,591
2004 Series D Water, 5% to 5 1/4%, issued November 29, 2004, due 2015 to 2024	7,925	8,544
2005 Series C Sewer, 4% to 5 1/2%, issued November 3, 2005, due 2015 to 2033	5,245	5,502
2005 Series C Water, 4% to 5 1/2%, issued November 3, 2005, due 2015 to 2023	588	642
2005 Series D Sewer, 2% to 2 3/10%, issued November 16, 2005, due 2015 to 2035	49,509	51,631
2005 Series D Water, 0% to 2%, issued November 16, 2005, due 2015 to 2025	8,412	9,152
2005 Series E Sewer, 2%, issued November 16, 2005, due 2015 to 2025	243	263
2005 Series E Water, 2%, issued November 16, 2005, due 2015 to 2025	55	59
2006 Series C Sewer, 5% to 5 1/4%, issued October 26, 2006, due 2015 to 2034	6,543	6,836
2006 Series D Sewer, 2% to 2 3/10%, issued December 14, 2006, due 2015 to 2036	48,584	51,058
2006 Series D Water, 0% to 2%, issued November 16, 2006, due 2015 to 2026	18,333	19,808
2006 Series E Sewer, 2%, issued December 14, 2006, due 2015 to 2026	243	260
2006 Series E Water, 2%, issued December 14, 2006, due 2015 to 2026	108	116
2007 Series C Sewer, 2% to 2 3/10%, issued November 9, 2007, due 2015 to 2035	3,043	3,279
2007 Series C Water, 2%, issued November 9, 2007, due 2015 to 2025	1,683	1,833
2007 Series D Sewer, 2 3/10%, issued November 9, 2007, due 2015 to 2036	19,218	19,882
2007 Series E Sewer, 2% to 2 2/5%, issued December 18, 2007, due 2015 to 2037	47,817	49,807
2007 Series E Water, 2%, issued December 18, 2007, due 2015 to 2027	13,891	14,818

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	<u>2015</u>	<u>2014</u>
2008 Series G Sewer, 2%, issued		
December 9, 2008, due 2015 to 2026	\$ 4,062	4,374
2008 Series G Water, 2%, issued		
December 9, 2008, due 2015 to 2026	852	914
2009 Series C Sewer, 2% to 2 2/5%, issued		
March 18, 2009, due 2015 to 2038	68,865	72,808
2009 Series C Water, 2%, issued		
March 18, 2009, due 2015 to 2028	22,484	23,862
2009 Series D Sewer, 2% to 2 2/5%, issued		
December 15, 2009, due 2015 to 2037	8,960	9,386
2009 Series D Water, 2%, issued		
December 15, 2009, due 2015 to 2027	958	1,022
2010 Series D Sewer, 2% to 2 2/5%, issued		
July 8, 2010, due 2015 to 2040	23,124	23,954
2010 Series D Water, 2%, issued		
July 8, 2010, due 2015 to 2030	19,179	20,186
2011 Series A Sewer, 2% to 2 2/5%, issued		
March 15, 2011, due 2015 to 2038	4,944	5,204
2011 Series A Water, 2%, issued		
March 15, 2011, due 2015 to 2028	4,350	4,622
2012 Series C Sewer, 2% to 2 2/5%, issued		
June 6, 2012, due 2015 to 2040	6,976	7,342
2012 Series C Water, 2%, issued		
June 6, 2012, due 2015 to 2030	3,421	3,599
2012 Series D Sewer, 2% to 2 2/5%, issued		
June 13, 2012, due 2015 to 2042	40,367	42,229
2012 Series D Water, 2%, issued		
June 13, 2012, due 2015 to 2032	7,886	8,241
2013 Series B Sewer, 2% to 2 2/5%, issued		
May 22, 2013, due 2016 to 2043	28,972	30,476
2013 Series B Water, 2%, issued		
May 22, 2013, due 2016 to 2033	7,906	8,262
2014 Series C Sewer, 2% to 2 2/5%, issued		
May 30, 2014, due 2015 to 2042	4,743	4,911
2014 Series C Water, 2%, issued		
May 30, 2014, due 2015 to 2032	5,499	5,760

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	<u>2015</u>	<u>2014</u>
2015 Series A Sewer, 2% to 2 2/5%, issued January 7, 2015, due 2016 to 2045	47,933	—
2015 Series A Water, 2%, issued January 7, 2015, due 2016 to 2035	15,807	—
2015 Series B Sewer, 2% to 2 2/5%, issued May 14, 2015, due 2015 to 2043	3,388	—
2015 Series B Water, 2%, issued May 14, 2015, due 2015 to 2033	2,193	—
	<u>1,042,964</u>	<u>1,031,168</u>
<b>General Revenue Bonds (variable rates):</b>		
1999 Series B, 0.02% to 0.12%, issued January 29, 1999, due 2017 to 2028	58,600	58,600
	<u>58,600</u>	<u>58,600</u>
<b>General Revenue Refunding Bonds (variable rates):</b>		
2002 Series C, 0.01% to 0.12%, issued August 15, 2002, due 2020	\$ 35,120	35,120
2008 Series A, 0.02% to 0.13%, issued May 29, 2008, due 2015 to 2037	285,725	334,345
2008 Series C, 0.01% to 0.11%, issued May 29, 2008, due 2015 to 2026	109,820	113,840
2008 Series E, 0.02% to 0.14%, issued May 29, 2008, due 2020 to 2037	133,640	133,640
2008 Series F, 0.01% to 0.11%, issued May 29, 2008, due 2025 to 2029	50,000	50,000
2012 Series E, 0.02% to 0.11%, issued November 15, 2012, due 2016 to 2031	62,830	62,830
2012 Series F, 0.02% to 0.11%, issued November 15, 2012, due 2016 to 2031	60,300	60,300
2012 Series G, 0.02% to 0.11%, issued November 15, 2012, due 2015 to 2023	52,580	55,260
2014 Series A, 0.11% to 0.13%, issued May 20, 2014, due 2022 to 2025	50,000	50,000
2014 Series B, 0.11% to 0.13%, issued May 20, 2014, due 2018 to 2022	64,755	64,755
	<u>904,770</u>	<u>960,090</u>
	<u>5,440,954</u>	<u>5,524,298</u>

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	<u>2015</u>	<u>2014</u>
Less:		
Unamortized bond premiums and discounts	248,648	233,984
Current portion of long-term debt	<u>(167,248)</u>	<u>(142,160)</u>
	81,400	91,824
Long-term debt, net	\$ <u>5,522,354</u>	<u>5,616,122</u>

Long-term obligations at June 30, 2015 and 2014 consisted of the following:

	<u>2015 beginning balance</u>	<u>Additions</u>	<u>Reductions</u>	<u>2015 ending balance</u>	<u>Due within one year</u>
General revenue bonds	\$ 1,175,995	73,105	150,625	1,098,475	13,890
General revenue refunding bonds	3,317,135	170,800	188,420	3,299,515	93,225
General revenue bonds with the Massachusetts Clean Water Trust	1,064,204	69,321	57,525	1,076,000	60,133
Borrowings associated with derivative instruments	<u>48,654</u>	<u>—</u>	<u>2,940</u>	<u>45,714</u>	<u>—</u>
	\$ <u>5,605,988</u>	<u>313,226</u>	<u>399,510</u>	<u>5,519,704</u>	<u>167,248</u>

	<u>2014 beginning balance</u>	<u>Additions</u>	<u>Reductions</u>	<u>2014 ending balance</u>	<u>Due within one year</u>
General revenue bonds	\$ 1,203,830	—	27,835	1,175,995	20,715
General revenue refunding bonds	3,390,435	114,755	188,055	3,317,135	63,920
General revenue bonds with the Massachusetts Clean Water Trust	1,109,586	10,695	56,077	1,064,204	57,525
Borrowings associated with derivative instruments	<u>51,594</u>	<u>—</u>	<u>2,940</u>	<u>48,654</u>	<u>—</u>
	\$ <u>5,755,445</u>	<u>125,450</u>	<u>274,907</u>	<u>5,605,988</u>	<u>142,160</u>

The Authority is required to establish water and sewer rates and charges at a level sufficient to provide, among other things, primary and subordinated debt service coverage ratios of 120% and 110%, respectively. For the year ended June 30, 2015, the Authority had primary and subordinated debt service coverage ratios of 212% and 120%, respectively.

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

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

On June 2, 2010, the Authority executed Bond Anticipation Notes with the Massachusetts Clean Water Trust (formerly the Massachusetts Water Pollution Abatement Trust) for funding under the American Reinvestment and Recovery Act of 2009 (ARRA). The principal on these notes, totaling \$33,036, will be forgiven upon issuance of a Project Completion Certificate and the Authority's compliance with the requirements of ARRA. The Authority has drawn down \$33,036 to date, which is presented as long-term debt on the Authority's statements of net position. In July 2015, the Massachusetts Clean Water Trust cancelled \$27,550 of these notes, as all ARRA requirements were met. The remaining \$5,486 is expected to be closed out in Fiscal Year 2016.

On November 19, 2014, the Authority issued General Revenue Bonds, 2014 Series D for \$73,105 and General Revenue Refunding Bonds, 2014 Series E and 2014 Series F for \$28,245 and \$142,555, respectively.

The proceeds from the Series D bonds were used to finance new construction projects and to pay a portion of outstanding commercial paper notes.

The proceeds from the Series E bonds were used to refund \$38,405 of General Revenue Refunding Bonds 2004 Series B. The proceeds from the Series F bonds were used to refund \$6,080 of General Revenue Refunding Bonds 2005 Series A, \$87,670 of General Revenue Bonds 2006 Series A, \$41,470 of General Revenue Refunding Bonds 2006 Series B, \$12,205 of General Revenue Bonds 2009 Series A and \$8,785 of General Revenue Bonds 2010 Series A.

The interest rate on these bonds is 4% to 5%. The cash flow required to make principal and interest payments on the refunding bonds is approximately \$56,425 less than the debt service requirements of the refunded bonds. The economic gain (the difference between the present values of the debt service payments on the old and new debt) obtained from this refunding is \$20,169.

On May 20, 2014, the Authority issued direct-purchase General Revenue Refunding Bonds, 2014 Series A and General Revenue Refunding Bonds 2014 Series B for \$50,000 and \$64,755, respectively. The Series A and B bonds refunded a portion of the General Revenue Refunding Bonds 2008 Series F.

The variable interest rate on these bonds will be based on 70% of LIBOR set on the first business day of each month. The monthly payment will be a combination of this variable interest and a fixed component of 34 basis points for 2014 Series A and 48 basis points for 2014 Series B.

### ***Synthetic Fixed Rate Swap Transactions***

In connection with several of its bond issues, the Authority has entered into various interest rate swap agreements to reduce the impact of changes in interest rates on its variable rate debt. Under these agreements, the Authority pays a fixed interest rate (ranging from 4.0% to 6.6%) and receives interest from the swap counterparties at a variable rate (either Securities Industry and Financial Markets Association (SIFMA) rate

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or a percentage of LIBOR). The SIFMA rate is based on the seven-day high-grade market index of tax-exempt variable rate demand obligations.

<u>Item</u>	<u>Objective</u>	<u>Effective date</u>	<u>Current notional amount</u>	<u>Termination date</u>	<u>Fixed payable swap rate</u>	<u>Variable receivable swap rate</u>	<u>Fair value at June 30, 2015</u>	<u>Fair value at June 30, 2014</u>
A	Hedge changes in cash flows on the 2008 Series A Bonds	April 4, 2011	\$ 133,300	August 1, 2030	5.144%	67% LIBOR PLUS 0.13%	\$ (10,676)	(9,467)
B	Hedge changes in cash flows on the 2008 Series E Bonds	October 28, 2008	133,300	August 1, 2030	5.494	SIFMA	(20,492)	(17,485)
C	Hedge changes in cash flows on the 2008 Series A and 2008 Series E Bonds	August 1, 2030	70,400	August 1, 2037	6.585	67% LIBOR PLUS 0.13%	(1,896)	(1,079)
D	Hedge changes in cash flows on the 2008 Series C Bonds	May 29, 2008	97,135	November 1, 2026	3.994	SIFMA	(10,366)	(10,709)
E	Hedge changes in cash flows on the 2008 Series C and 2012 Series G Bonds	May 29, 2008	64,760	November 1, 2026	4.033	SIFMA	(577)	(185)
F	Hedge changes in cash flows on the 2008 Series A Bonds	August 15, 2002	50,710	August 1, 2015	4.127	67% LIBOR	(176)	(2,052)
						Total	\$ <u>(44,183)</u>	<u>(40,977)</u>

All of the above are pay-fixed interest rate swap agreements. Under these interest rate swap agreements, the Authority incurred net interest expense of \$22,334 and \$24,364 in Fiscal Year 2015 and Fiscal Year 2014, respectively.

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

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

The aggregate fair value balance of the derivative instruments at June 30, 2015 and 2014 is \$(44,183) and \$(40,977), respectively, and is reflected on the Authority's statements of net position as a liability for derivative instruments. This liability is offset by deferred outflows from derivative instruments. The original notional amounts of the interest rate swaps totaled \$885,895.

The fair values of the interest rate swaps were estimated using the zero-coupon method. This method calculates the future net settlement payments required by the swap, assuming that the current forward rates implied by the yield curve correctly anticipate future spot interest rates. These payments are then discounted using the spot rates implied by the current yield curve for hypothetical zero-coupon bonds due on the date of each future net settlement on the swaps.

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***Risk Disclosure***

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

The following represents the credit ratings of the counterparties as of June 30, 2015:

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

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

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

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

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

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

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Using rates as of June 30, 2015, debt service requirements of the hedged variable rate bonds and net swap payments, assuming current interest rates remain constant, were as follows:

	<u>Variable-rate</u>		<u>Interest rate swaps, net</u>	<u>Total</u>
	<u>Principal</u>	<u>Interest</u>		
Fiscal year ending June 30:				
2016	\$ 57,710	214	20,566	78,490
2017	7,197	209	17,714	25,120
2018	25,003	206	14,941	40,150
2019	26,000	195	12,599	38,794
2020	27,000	168	12,685	39,853
2021–2025	201,000	480	40,590	242,070
2026–2030	64,895	207	17,364	82,466
2031–2035	28,900	150	13,277	42,327
2036–2038	41,500	22	2,775	44,297
Total	\$ <u>479,205</u>	<u>1,851</u>	<u>152,511</u>	<u>633,567</u>

***Demand Bonds***

Included in variable rate long-term debt of \$963,370 is \$672,905 of subordinated variable rate demand obligations (VRDOs). The bonds were issued on various dates from 1999 through 2008. Subordinated VRDOs are subject to purchase on the demand of the holder at a price equal to principal plus accrued interest. The ability of the Authority to purchase such bonds, if not remarketed, is secured through letters of credit and standby bond purchase agreements with various nationally recognized financial institutions that expire between December 2015 and May 2018. The VRDOs are classified as long-term debt because the liquidity agreement for each series contains term out provisions that, if demand is made to repurchase the bonds, calls for a three to five year amortization to repay the bonds.

In 2014, \$114,755 of 2014 Series A and B General Revenue Refunding Bonds were issued as direct-purchase bonds, to be held by the purchaser for a specific period of time and are not subject to purchase or remarketing at the demand of the holder and therefore do not require a letter of credit or standby bond purchase agreement. The \$50,000 of Series A and \$64,775 of Series B have been purchased through April 2017 and April 2019, respectively. These bonds, in addition to 2012 Series E, F & G General Revenue Refunding Bonds, totaling \$175,710, have three to five year term out provisions beginning at the expiration date.



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At June 30, 2015, the following bonds outstanding are considered defeased in-substance:

<b>Description</b>	<b>Redemption date</b>	<b>Redemption price</b>	<b>Outstanding principal amount</b>
1992 Series A	2015–2019	100	\$ 201,850
1993 Series C	2015	100	15,740
1998 Series B	2015–2016	100	13,410
2002 Series J	2015, 2017	100	15,725
2005 Series A	2017	100	49,615
2006 Series A	2016, 2018	100	137,680
2006 Series B	2015–2018	100	113,745
2007 Series A	2017	100	2,000
2009 Series A	2015–2016, 2019	100	19,385
2009 Series B	2015, 2017	100	6,035
2010 Series A	2015–2020	100	14,850
2010 Series B	2017	100	9,735
2011 Series B	2017-2018, 2020	100	7,460
2012 Series A	2015–2017, 2020	100	12,360
2013 Series A	2017-2018	100	810
2014 Series D	2017–2018	100	2,440
2014 Series F	2018	100	1,030

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

In June 2015, the Authority used funds on hand to defease \$2,595 of the 2010 Series A, \$2,395 of the 2011 Series B, \$1,000 of the 2012 Series A and \$2,440 of the 2014 Series D General Revenue bonds outstanding and \$12,250 of the 2005 Series A, \$2,890 of the 2006 Series B, \$2,915 of the 2009 Series B, \$10 of the 2013 Series A and \$1,030 of the 2014 Series F General Revenue Refunding bonds outstanding.

In April 2015, the Authority used funds on hand to defease \$6,650 of the 2002 Series J, \$2,960 of the 2011 Series B and \$3,210 of the 2012 Series A General Revenue bonds outstanding and \$19,450 of the 2005 Series A General Revenue Refunding bonds outstanding.

In June 2014, the Authority used funds on hand to defease \$1,210 of the 2010 Series A, \$2,105 of the 2011 Series B and \$2,825 of the 2012 Series A General Revenue bonds outstanding and \$10,545 of the 2004 Series B and \$9,735 of the 2010 Series B and \$800 of the 2013 Series A General Revenue Refunding bonds outstanding.

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At June 30, 2015, outstanding bonds that are redeemable before their scheduled due dates are as follows:

<b>Description</b>	<b>Redemption date</b>	<b>Redemption price</b>	<b>Outstanding principal amount</b>
2002 Series J	on or after August 1, 2012	100	\$ 1,000
2005 Series A	August 2017	100	240,625
2005 Series B	August 2017	100	80,290
2006 Series A	August 2016	100	62,320
2006 Series B	August 2018	100	33,080
2006 Series B	August 2016	100	138,440
2007 Series A	February 2017	100	198,000
2009 Series A	August 2019	100	64,240
2009 Series B	August 2019	100	181,885
2010 Series A	August 2020	100	83,760
2010 Series B	August 2020	100	114,565
2011 Series B	August 2021	100	120,385
2011 Series C	August 2016	100	6,000
2011 Series C	August 2021	100	291,160
2012 Series A	August 2016	100	6,440
2012 Series A	August 2022	100	120,740
2012 Series B	August 2022	100	86,775
2013 Series A	August 2023	100	46,515
2014 Series D	August 2024	100	59,485
2014 Series F	August 2024	100	93,655

The variable rate General Revenue Bonds are subject to redemption prior to maturity at the option of the Authority in whole or in part, on any interest payment date for bond Series 1999B and 2002C and on any business day for bond Series 2008A, 2008C through F, 2012G, 2014A and 2014B, respectively. Series 2012E and 2012F are subject to redemption prior to maturity on any interest payment date after November 15, 2014 and November 3, 2014, respectively.

During Fiscal Year 2015, the Authority executed loan agreements with the Massachusetts Clean Water Trust providing for 2015 Series A Sewer and Water loans in the principal amounts of \$47,933 and \$15,807, respectively and 2015 Series B Sewer and Water loans in the principal amounts of \$3,388 and \$2,193, respectively. All proceeds for these loans were received by June 30, 2015.

During Fiscal Year 2014, the Authority executed loan agreements with the Massachusetts Clean Water Trust providing for 2014 Series C Sewer and Water loans in the principal amounts of \$4,911 and \$5,760, respectively. All proceeds for these loans were received by June 30, 2014.

Federal and Commonwealth subsidies for purposes of offsetting principal payments aggregating \$47,847 will be recognized as capital grants in aid of construction over the term of the loans.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

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Interest is payable semiannually on all debt, except on the commercial paper, on which interest is payable upon maturity and the General Revenue Bonds with variable interest rates on which interest is payable monthly. The Senior General Revenue Bonds and the General Revenue Refunding Bonds are collateralized equally and ratably by a lien and pledge on substantially all of the Authority's cash and revenues, except the operating fund. The subordinated debt series, including the commercial paper interest are collateralized equally and ratably by a subordinated pledge on substantially all of the Authority's revenues and cash and investments, except the operating, senior debt service, and debt service reserve funds. Premiums, discounts, issuance costs, and the excess of reacquisition price over the carrying amount of the defeased debt are being amortized over the lives of the respective issues.

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

	<u>Principal</u>	<u>Interest</u>	<u>Total</u>
Year ending June 30:			
2016	\$ 167,248	227,793	395,041
2017	179,366	222,170	401,536
2018	213,195	213,823	427,018
2019	216,200	232,675	448,875
2020	248,050	197,728	445,778
2021–2025	1,479,768	805,992	2,285,760
2026–2030	1,261,835	507,210	1,769,045
2031–2035	800,440	285,109	1,085,549
2036–2040	567,499	128,419	695,918
2041–2045	252,083	34,608	286,691
2046–2050	55,270	2,380	57,650
Total	\$ <u>5,440,954</u>	<u>2,857,907</u>	<u>8,298,861</u>

The Authority issued commercial paper notes of \$130,000 to finance capital expenditures, which are secured by \$100,000 and \$250,000 irrevocable direct-pay letters of credit which expire on September 8, 2015, and November 30, 2015, respectively. These letters of credit carry a fee of 0.65% and 0.30% per annum, respectively, on the amount available. The maximum aggregate principal amount of commercial paper which may be outstanding at any one time is \$350,000.

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Commercial paper at June 30, 2015 and 2014 consisted of the following:

	<b>2015 Beginning balance</b>	<b>Additions</b>	<b>Reductions</b>	<b>2015 Ending balance</b>
0.15% commercial paper	\$ —	34,000	—	34,000
0.33% commercial paper	—	47,000	—	47,000
0.11% commercial paper	—	49,000	—	49,000
0.21% commercial paper	34,000	—	34,000	—
0.31% commercial paper	87,000	—	87,000	—
0.17% commercial paper	49,000	—	49,000	—
	<u>\$ 170,000</u>	<u>130,000</u>	<u>170,000</u>	<u>130,000</u>

	<b>2014 Beginning balance</b>	<b>Additions</b>	<b>Reductions</b>	<b>2014 Ending balance</b>
0.21% commercial paper	\$ —	34,000	—	34,000
0.31% commercial paper	—	87,000	—	87,000
0.17% commercial paper	—	49,000	—	49,000
0.32% commercial paper	34,000	—	34,000	—
0.35% commercial paper	87,000	—	87,000	—
0.17% commercial paper	23,000	—	23,000	—
	<u>\$ 144,000</u>	<u>170,000</u>	<u>144,000</u>	<u>170,000</u>

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

The Authority has entered into various interest-free loan agreements with certain member communities. Under these agreements, the Authority loaned these communities \$30,094 and \$29,531 in Fiscal Year 2015 and 2014, respectively, to be received in five or ten equal annual installments.

The long-term portion of these loans at June 30, 2015 and 2014, is \$124,946 and \$125,439, respectively, and is included in other assets. The loans due within one year total \$30,587 and \$30,304 at June 30, 2015 and 2014, respectively. This program is designed to assist member communities with sewer and water systems rehabilitation.

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(Dollars in thousands)

**(8) Capital Assets**

Capital assets at June 30, 2015 and 2014 consisted of the following:

	<u>2014</u>	<u>Additions</u>	<u>Disposals/ transfers</u>	<u>2015</u>
Capital assets – not being depreciated:				
Land	\$ 23,741	9	—	23,750
Construction in progress	<u>193,180</u>	<u>39,186</u>	<u>(26,784)</u>	<u>205,582</u>
Total capital assets – not being depreciated	<u>216,921</u>	<u>39,195</u>	<u>(26,784)</u>	<u>229,332</u>
Capital assets – being depreciated:				
Plant and equipment – water and sewage system	9,039,342	25,423	—	9,064,765
Furniture and fixtures	17,177	331	—	17,508
Leasehold improvements	2,423	—	—	2,423
Motor vehicles and equipment	<u>4,430</u>	<u>1,022</u>	<u>—</u>	<u>5,452</u>
Total capital assets – being depreciated	<u>9,063,372</u>	<u>26,776</u>	<u>—</u>	<u>9,090,148</u>
Less accumulated depreciation for:				
Plant and equipment – water and sewage system	3,187,257	176,374	—	3,363,631
Furniture and fixtures	16,752	253	—	17,005
Leasehold improvements	2,096	12	—	2,108
Motor vehicles and equipment	<u>1,049</u>	<u>349</u>	<u>—</u>	<u>1,398</u>
Total accumulated depreciation	<u>3,207,154</u>	<u>176,988</u>	<u>—</u>	<u>3,384,142</u>
Total capital assets – being depreciated – net	<u>5,856,218</u>	<u>(150,212)</u>	<u>—</u>	<u>5,706,006</u>
Capital assets – net	\$ <u><u>6,073,139</u></u>	<u><u>(111,017)</u></u>	<u><u>(26,784)</u></u>	<u><u>5,935,338</u></u>

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Capital assets at June 30, 2014 and 2013 consisted of the following:

	<u>2013</u>	<u>Additions</u>	<u>Disposals/ transfers</u>	<u>2014</u>
Capital assets – not being depreciated:				
Land	\$ 23,733	8	—	23,741
Construction in progress	<u>163,916</u>	<u>95,499</u>	<u>(66,235)</u>	<u>193,180</u>
Total capital assets – not being depreciated	<u>187,649</u>	<u>95,507</u>	<u>(66,235)</u>	<u>216,921</u>
Capital assets – being depreciated:				
Plant and equipment – water and sewage system	8,974,445	64,897	—	9,039,342
Furniture and fixtures	17,177	—	—	17,177
Leasehold improvements	2,423	—	—	2,423
Motor vehicles and equipment	<u>3,100</u>	<u>1,330</u>	<u>—</u>	<u>4,430</u>
Total capital assets – being depreciated	<u>8,997,145</u>	<u>66,227</u>	<u>—</u>	<u>9,063,372</u>
Less accumulated depreciation for:				
Plant and equipment – water and sewage system	3,011,587	175,670	—	3,187,257
Furniture and fixtures	16,427	325	—	16,752
Leasehold improvements	2,084	12	—	2,096
Motor vehicles and equipment	<u>770</u>	<u>279</u>	<u>—</u>	<u>1,049</u>
Total accumulated depreciation	<u>3,030,868</u>	<u>176,286</u>	<u>—</u>	<u>3,207,154</u>
Total capital assets – being depreciated – net	<u>5,966,277</u>	<u>(110,059)</u>	<u>—</u>	<u>5,856,218</u>
Capital assets – net	<u>\$ 6,153,926</u>	<u>(14,552)</u>	<u>(66,235)</u>	<u>6,073,139</u>

Depreciation and amortization for Fiscal Years 2015 and 2014 was \$194,000 and \$193,062, respectively.

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Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

**(9) Leases**

**(a) Operating**

The Authority leases electrical power assets, office space in Boston, and other property under long-term operating leases. Future minimum rental payments required under operating leases having initial or remaining non-cancelable lease terms in excess of one year at June 30, 2015 are as follows:

Year ending June 30:			
2016		\$	3,452
2017			2,389
2018			3,180
2019			3,214
2020			3,192
2021–2023			8,204
	Total	\$	<u>23,631</u>

Rental expense was \$6,268 and \$6,970 in Fiscal Years 2015 and 2014, respectively.

**(b) Capital**

In Fiscal Year 2003, the Authority entered into a 30-year capital lease agreement for the new maintenance facility. The interest rate for the capital lease is 7.83%. Future minimum lease payments for the capital lease at June 30, 2015 are as follows:

	<u>Principal</u>	<u>Interest</u>	<u>Total</u>
Year ending June 30:			
2016	\$ 891	2,326	3,217
2017	963	2,254	3,217
2018	1,041	2,176	3,217
2019	1,126	2,091	3,217
2020–2024	7,156	8,929	16,085
2025–2029	10,572	5,513	16,085
2030–2034	8,365	1,019	9,384
Total	\$ <u>30,114</u>	<u>24,308</u>	<u>54,422</u>

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

The associated capital asset is reported in plant and equipment – water and sewage system at a cost of \$37,134 with \$16,093 of accumulated depreciation as of June 30, 2015.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

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(Dollars in thousands)

**(10) Retirement Benefits under GASB 68**

**(a) *Plan Description***

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

**(b) *Benefits Provided***

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

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

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

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



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June 30, 2015 and 2014

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**(c) Employees covered by benefit terms**

At December 31, 2014, the date of the Plan's latest actuarial valuation, the following employees were covered by the benefit terms:

Retired participants and beneficiaries receiving benefits	476
Inactive participants entitled to a return of their employee contributions	47
Inactive participants with a vested right to a deferred or immediate benefit	48
Active participants	<u>1,090</u>
	<u>1,661</u>

**(d) Contributions**

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

The Authority's 2015 and 2014 contributions to the plan were based on an amount approved by the Retirement Board and the Authority's board of directors, which is based on an actuarially determined amount. The Authority's Enabling Act requires funding to be made in accordance with the Retirement Board's recommendation.

**(e) Net Pension Liability (Asset)**

The Plan's net pension liability (asset) was measured as of December 31, 2014, and the total pension liability (asset) used to calculate the net pension liability (asset) was determined by an actuarial valuation as of that date.

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(Dollars in thousands)

*Actuarial assumptions.* The total pension liability (asset) in the December 31, 2014 actuarial valuation was determined using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	4%
Salary increases	Based on years of service, starting at 6% at 0 years of service decreasing to 4.25% after 9 years of service
Investment rate of return	7.75%
Cost of living adjustments	3% of first \$12,000
Mortality rates:	
Pre-retirement:	RP-2000 Employee Mortality Table projected generationally from 2005 with Scale AA
Healthy retiree:	RP-2000 Healthy Annuitant Mortality Table projected generationally from 2005 with Scale AA
Disabled retiree:	RP-2000 Healthy Annuitant Mortality Table set forward two years projected generationally from 2005 with Scale AA

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Rates of returns on investments: The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the Plan's target asset allocation as of December 31, 2014 are summarized as follows:

<u>Asset Class</u>	<u>Target Allocation (%)</u>	<u>Long-Term Expected Rate of Return (%)</u>
Domestic Bonds	25	4.25
Domestic Equity	18	6.4
International Equity	17	7.07 - 9.26
Real Estate	6	4.3
Private Equity	9	11.26
Hedge Funds	9	3.44 - 3.77
Fixed Income	16	1.53 - 4.25
Cash	0	0.96
	<u>100</u>	

- (f) **Discount rate.** The discount rate used to measure the total pension liability was 7.75%. The projection of cash flows used to determine the discount rate assumed that Plan member contributions will be made at the current contribution rate and that the Authority contributions will be made at rates equal to the actuarially determined contribution rates. Based on those assumptions, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments of current Plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

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**(g) Changes in the Net Pension Liability (Asset)**

	Increase (Decrease)		
	Total Pension Liability  (a)	Plan Fiduciary Net Position  (b)	Net Pension Liability (Asset) (a) - (b)
<b>Balances at 6/30/2014</b>	\$ 415,793	\$ 416,351	\$ (558)
<b>Changes for the year</b>			
Service cost	10,529	—	10,529
Interest	33,587	—	33,587
Differences between expected and actual experience	(8,380)	—	(8,380)
Contributions - employer	—	12,630	(12,630)
Contributions - employee	—	8,245	(8,245)
Net investment income	—	20,484	(20,484)
Benefit payments	(12,963)	(12,963)	—
Administrative expenses	—	(408)	408
Other changes	4,921	16	4,905
<b>Net changes</b>	<u>27,694</u>	<u>28,004</u>	<u>(310)</u>
<b>Balances at 6/30/2015</b>	<u>\$ 443,487</u>	<u>\$ 444,355</u>	<u>\$ (868)</u>

**(h) Sensitivity of the net pension liability (asset) to changes in the discount rate.** The following presents the net pension liability (asset), calculated using the discount rate of 7.75%, as well as what the net pension liability (asset) would be if it were calculated using a discount rate that is 1-percentage-point lower (6.75%) or 1-percentage-point higher (8.75%) than the current rate:

	1% Decrease (6.75%)	Current Discount (7.75%)	1% Increase (8.75%)
Net Pension Liability (Asset) as of June 30, 2015	\$56,442	(\$868)	(\$49,555)

**(i) Pension expense and deferred outflows of resources and deferred inflows of resources related to pensions.** For the year ended June 30, 2015, the Authority recognized pension expense of \$4,719 and reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

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	<u>Deferred Outflow of Resources</u>		<u>Deferred Inflow of Resources</u>
Differences between expected and actual experience	\$ -	\$	6,983
Changes of assumptions	4,101		-
Net difference between projected and actual earnings on pension plan investments	10,500		-
	<u>\$ 14,601</u>	\$	<u>6,983</u>

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

**Year ended June 30:**

2016	\$ 2,048
2017	2,048
2018	2,049
2019	2,049
2020	(576)

**Retirement Benefits under GASB 27**

**(a) Plan Description**

The Enabling Act provided for the establishment of the Massachusetts Water Resources Authority Employees' Retirement System (the Plan), a contributory single-employer retirement system that is separate from the State Employees Retirement System. The Plan is a defined benefit pension plan covering those employees not employed by the MDC prior to July 1, 1985. Covered payroll for all Authority employees in the Plan was \$84,829 at the actuarial valuation date, January 1, 2013.

Under the provisions of the Plan, pension benefits vest after 10 years of full-time employment. An employee may retire after 20 years of service or at age 55 and completion of 10 years of service. At age 65, annual pension benefits equal 2.5% of the employee's average regular compensation earned during the last three years of employment or any three consecutive years when compensation was higher, multiplied by each year of creditable service. The benefit is reduced if retirement occurs before age 65 or if survivor's benefits are elected. The Plan also provides death and disability benefits. Ordinary disability benefits are available only to employees under age 55 with at least 10 years of

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service. Complete financial statements for the Plan can be obtained from the Authority's administrative offices at Charlestown Navy Yard, 100 First Avenue, Boston, MA 02129.

**(b) Funding Policy**

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

The Authority's 2014 contributions to the plan were based on an amount approved by the Retirement Board and the Authority's board of directors, which is based on an actuarially determined amount. The Authority's Enabling Act requires funding to be made in accordance with the Retirement Board's recommendation.

**(c) Annual Pension Cost and Net Pension Obligation**

The annual required contribution for the year ended June 30, 2014, determined by the January 1, 2011 actuarial valuation, was as follows:

Annual required contribution	\$	5,903
Contributions made		<u>(5,903)</u>
Increase (decrease) in net pension obligation		—
Net pension obligation, beginning of year		<u>—</u>
Net pension obligation, end of year	\$	<u><u>—</u></u>

**(d) Three-Year Trend Information**

	<u>Annual pension cost (APC)</u>	<u>Percentage of ARC contributed</u>	<u>Net pension asset (obligation)</u>
Fiscal year ending:			
2014	\$ 5,903	100%	\$ —
2013	5,750	100	—
2012	5,489	100	—

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**(e) Funded Status and Funding Progress**

As of January 1, 2013, the funded status of the Plan was as follows:

Actuarial accrued liability	\$	385,296
Actuarial value of assets		<u>341,515</u>
Unfunded actuarial accrued liability (UAAL)	\$	<u>43,781</u>
Funded ratio		88.6%
Covered payroll	\$	84,829
UAAL as percentage of covered payroll		51.6%

The schedule of funding progress, presented as required supplementary information following the notes to the financial statements, presents multiyear trend information about whether the actuarial value of plan assets are increasing or decreasing over time relative to the actuarial accrued liability for benefits. Effective for the January 1, 2007 actuarial valuation, the Authority changed to the entry age normal actuarial cost method. Prior actuarial valuations were completed using the aggregate cost method.

**(f) Actuarial Methods and Assumptions**

The annual required contribution for the current year was determined as part of the January 1, 2011, actuarial valuation using the entry age normal actuarial cost method. Under this method an unfunded actuarial accrued liability of \$42,190 was calculated. The actuarial assumptions included (a) 8% investment rate of return and (b) projected salary increase of 4.75% per year. Liabilities for cost of living increases have been assumed at an annual increase of 3%, on the first \$12 of benefit payments. The actuarial value of assets is determined by projecting the market value of assets as of the beginning of the prior plan year with the assumed rate of return during that year (8.0%) and accounting for deposits and disbursements with interest at the assumed rate of return. An adjustment is then applied to recognize the difference between the actual investment return and expected return over a five year period. As of January 1, 2011 the unfunded actuarially accrued liability is being amortized over 13 years using an open group method which assumes a 4.5% per year increase in payroll.

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

**(a) Plan Description**

In addition to providing the pension benefits described, the Authority provides postemployment health care and life insurance benefits for retired employees through the Group Insurance Commission (GIC). The GIC is a quasi-independent state agency that administers an agent multi-employer defined benefit OPEB plan. The benefits, benefit levels, employee contributions and employer contributions are governed by the Authority and can be amended by the Authority. As of January 1, 2014, the actuarial valuation date, approximately 529 retirees and survivors and 1,088 active employees meet the eligibility requirements. The plan does not issue a separate financial report.

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June 30, 2015 and 2014

(Dollars in thousands)

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

**(b) Benefits Provided**

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

**(c) Funding Policy**

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

**(d) Annual OPEB Costs and Net OPEB Obligation**

The Authority's Fiscal Year 2015 annual OPEB expense is calculated based on the annual required contribution of the employer (ARC), an amount actuarially determined in accordance with the parameters of GASB Statement No. 45. The ARC represents a level of funding that, if paid on an ongoing basis, is projected to cover the normal cost per year and amortize the unfunded actuarial liability over a period of thirty years. The following table shows the components of the Authority's annual OPEB cost for the year ending June 30, 2015, the amount actually contributed to the plan, and the change in the Authority's net OPEB obligation based on an actuarial valuation as of January 1, 2014:

Annual Required Contribution (ARC)	\$	14,564
Interest on net OPEB obligation		6,484
Adjustment to ARC		(5,356)
Annual OPEB cost		15,692
Contributions made		(14,851)
Increase in net OPEB obligation		841
Net OPEB obligation – beginning of year		99,756
Net OPEB obligation – end of year	\$	100,597



**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

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

<u>Fiscal year ended</u>	<u>Annual OPEB cost</u>	<u>Percentage of OPEB cost contributed</u>	<u>Net OPEB obligation</u>
2015	\$ 15,692	95%	\$ 100,597
2014	15,897	22	99,756
2013	14,806	18	87,352

Net OPEB obligation – beginning of year reflected above is from revised January 1, 2012 actuarial valuation.

**(e) Funded Status and Funding Progress**

The funded status of the plan as of January 1, 2014, the date of the most recent actuarial valuation, was as follows:

Actuarial accrued liability (AAL)	\$ 166,493
Actuarial value of plan assets	<u>—</u>
Unfunded actuarial accrued liability (UAAL)	<u>\$ 166,493</u>
Funded ratio (actuarial value of plan assets/AAL)	—%
Covered payroll (active plan members)	\$ 85,993
UAAL as a percentage of covered payroll	193.6%

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

**(f) Actuarial Methods and Assumptions**

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

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

In the January 1, 2014 actuarial valuation the projected unit credit cost method was used. The actuarial value of assets was not determined as the Authority has not advance funded its obligation. The actuarial assumptions included a 6.5% investment rate of return and an initial annual healthcare cost trend rate of 9.5% which decreases to a 5.5% long-term trend rate for all healthcare benefits after ten years. The amortization costs for the initial UAAL is a level percentage of payroll for a period of 30 years, on an open basis. This has been calculated assuming the amortization payment increases at a rate of 3.25%.

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

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

The Authority's capital improvement program continues to proceed. As part of this program, the Authority has entered into a number of contracts for the design and construction of infrastructure and improvements to its facilities. Commitments under these contracts aggregated approximately \$429,180 at June 30, 2015.

The Authority's operating and construction plans are designed to comply with the Federal District Court's schedule of actions. The Authority has incurred capital expenditures of approximately \$10,540,000 from Fiscal Years 1986 through 2015, including those projects required to comply with the Federal District Court's schedule. The Authority anticipates spending an additional \$1,578,000 on these projects through Fiscal Year 2023. These capital expenditures have been forecasted based upon certain preliminary assumptions and estimates, which may change significantly as design and construction of the necessary facilities proceed. Funding is expected to come from various federal and state grants, as available and approved, and from the Authority's debt proceeds. To date, federal appropriations for the Boston Harbor Project have aggregated \$810,000.

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

The Authority continues to be a defendant, along with Boston Water and Sewer Commission (BWSC) and the Commonwealth, in the federal Boston Harbor Case. The federal action was originally brought in 1985 by the United States on behalf of the United States Environmental Protection Agency (EPA) and by certain citizens groups for Clean Water Act violations. As part of the Boston Harbor Case, the Authority was required to undertake certain corrective actions to meet wastewater treatment, discharge and combined sewer overflow (CSO) requirements. The only corrective action remaining is CSO related which is currently scheduled for completion in 2015.

In March 2006, the Authority reached agreement with the United States and the Massachusetts Department of Environmental Protection (DEP) on the scope and schedule for the remaining CSO projects which was filed with the Court as part of a joint motion to amend the Court Schedule. In April 2006, the Court allowed the joint motion and issued an Order with a schedule. Under the Order, the Authority has until 2020 to complete the remaining CSO work and subsequent monitoring which will be used to verify that the long term CSO control goals are achieved.

As part of the agreement, DEP agreed to reissue and EPA agreed to approve five (5) consecutive variances of no more than three years duration each, through the year 2020, for the Charles River and Alewife Brook/Upper Mystic River that are consistent with and limited to the requirements in the Authority's revised Long Term CSO Control Plan. Variances have most recently been issued by DEP

## MASSACHUSETTS WATER RESOURCES AUTHORITY

### Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

in or about August 2013. The variances will respectively remain in place for the Charles River until October 1, 2016 and for the Alewife/Upper Mystic until September 1, 2016. In addition, the United States and the Authority agreed to withdraw the February 27, 1987 *Stipulation of the United States and the Massachusetts Water Resources Authority on Responsibility and Legal Liability for Combined Sewer Overflows* and replace it with a Second Stipulation that requires the Authority to implement the CSO requirements set forth in the Court Schedule and to meet the levels of control described in the Authority's long term CSO control plan. Upon completion of the long term CSO control plan and with results that demonstrate performance parameters are as predicted, the stipulation makes the Authority responsible for only those CSO outfalls which it owns and operates. As a result of the agreement, the Authority now has 35 CSO projects, of which, 32 are complete and the remaining three are under construction.

December 2015 is the scheduled completion date for the last of the CSO projects. The federal court schedule requires MWRA to commence a three-year performance assessment of the completed projects starting in January 2018 and to submit a report to the Court assessing attainment of the long term control levels by December 2020.

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

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

In 2004, the United States Army Corps of Engineers (Corps) asserted that Boston Edison Co. (NStar), its subsidiary Harbor Energy Electric Company (HEEC), and the Authority were in violation of a permit (MA BOSS 198900530, dated August 31, 1989) which authorized the installation of a submarine electric power cable. The cable runs under the channel bed of Boston Harbor and extends from South Boston to Deer Island and is used to provide electric power for Deer Island operations. The Corps alleges that the power cable, in places, has been installed at depths less than those required by the permit. The Corps has demanded that the permittees develop plans and an implementation schedule for bringing the cable's depth and location into compliance with the permit. The demand has been made in connection with and in anticipation of a Massachusetts Port Authority project known as the Boston Harbor Deep Draft Navigation Improvement Project. The Project involves dredging operations intended to deepen the harbor channel so as to make it navigable by deep-draft vessels. The intended route of the Project's dredging operations will come very close to the depth at which the cable is believed to be located. The Project has now received the various design, environmental and state and federal funding approvals necessary to the start of the work. Project dredging operations in the vicinity of the cable could begin within one year's time.

# MASSACHUSETTS WATER RESOURCES AUTHORITY

## Notes to Financial Statements

June 30, 2015 and 2014

(Dollars in thousands)

The Authority has responded to the Corps stating that it had become a co-permittee only to facilitate issuance of the permit, that it did not install and has never owned the cable, and therefore, it has neither any right nor financial responsibility, nor the ability, to move or alter the position of the cable. In May 2005, the Department of Justice (DOJ) advised the permittees that the matter had been referred to DOJ by the Corps for the purpose of either commencing a lawsuit to compel the relocation of the cable or negotiating an amicable resolution that would bring the permittees into compliance with the permit's conditions. The Authority has informed the Court in the Boston Harbor Case of its position in its Compliance and Progress report filed on June 15, 2005. Discussions among the interested parties over the years has produced a method proposed and intended by NSTAR and HEEC for protection of the cable from the Massport project by way of carefully exposing it and placing concrete mats over it, without either moving it or burying it deeper in the channel. The Authority has advised NSTAR and HEEC that it has no financial responsibility whatsoever for the costs of either protecting or relocating the cable.

**(d) *Miscellaneous***

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

**(13) Risk Management**

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

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

**REQUIRED SUPPLEMENTARY INFORMATION**

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Schedules of Funding Progress

Required Supplementary Information - GASB No. 27

June 30, 2015

(Unaudited)

(Dollars in thousands)

**Employees' retirement system**

<b>Actuarial valuation</b>	<b>Assets (a)</b>	<b>Actuarial Accrued Liability (AAL) – (b)</b>	<b>Unfunded AAL (UAAL) (b-a)</b>	<b>Funded ratio (a/b)</b>	<b>Covered payroll (c)</b>	<b>UAAL as a percentage of covered payroll ((b-a)/(c))</b>
January 1, 2013	341,515	385,296	43,781	88.6	84,829	51.6
January 1, 2011	299,331	341,521	42,190	87.6	82,870	50.9
January 1, 2010	276,270	319,876	43,606	86.4	81,962	53.2
January 1, 2009	222,477	301,652	79,175	73.8	82,314	96.2
January 1, 2008	240,484	278,050	37,566	86.5	78,925	47.6
January 1, 2007	211,716	255,962	44,246	82.7	75,444	58.6

Effective for the January 1, 2007 actuarial valuation, the Authority changed actuarial cost methods. See footnote 10 (e).

**Other postemployment benefits**

<b>Actuarial valuation</b>	<b>Assets (a)</b>	<b>Actuarial Accrued Liability (AAL) – (b)</b>	<b>Unfunded AAL (UAAL) (b-a)</b>	<b>Funded ratio (a/b)</b>	<b>Covered payroll (c)</b>	<b>UAAL as a percentage of covered payroll ((b-a)/(c))</b>
January 1, 2014	\$ —	166,493	166,493	—	\$ 85,993	193.6
January 1, 2012*	—	179,595	179,595	—	82,679	217.2
January 1, 2010	—	192,096	192,096	—	81,372	236.1
January 1, 2008	—	180,833	180,833	—	79,298	228.0
January 1, 2006	—	154,449	154,449	—	72,476	213.1

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

See accompanying independent auditors' report.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**  
Schedules of Employer Contributions - Last Ten Years  
Required Supplementary Information- GASB No. 68  
(Unaudited)  
(Dollars in thousands)

	Year End December 31,									
	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Actuarially determined contribution	7,808	5,919	5,766	5,512	5,343	5,621	5,334	4,259	4,904	3,408
Contributions in relation to the actuarially determined contribution	<u>12,629</u>	<u>12,447</u>	<u>10,490</u>	<u>7,363</u>	<u>5,343</u>	<u>5,621</u>	<u>8,630</u>	<u>11,358</u>	<u>4,904</u>	<u>3,408</u>
Contribution deficiency (excess)	<u>\$ (4,821)</u>	<u>\$ (6,528)</u>	<u>\$ (4,724)</u>	<u>\$ (1,851)</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ (3,296)</u>	<u>\$ (7,099)</u>	<u>\$ -</u>	<u>\$ -</u>
Employee covered payroll	\$ 88,646	84,829	84,829	82,870	82,870	81,962	82,314	75,444	75,444	65,790
Contributions as a percentage of employee covered payroll	14.25%	14.67%	12.37%	8.89%	6.45%	6.86%	10.48%	15.05%	6.50%	5.18%

**Notes to Required Supplementary Information**

Valuation date	Actuarial determined contributions for fiscal 2016 and 2017 are determined with the January 1, 2015 actuarial valuation.
Actuarial cost method	Entry age normal
Amortization method	Payments increase at 4.5% per year
Remaining amortization period	9 years from July 1, 2015
Asset valuation method	Market value of assets as reported in the Plan's annual statement less unrecognized return in each of the last five years. Unrecognized return is equal to the difference between the actual market value return and the expected market value return and is recognized over a five-year period, further adjusted, if necessary, to be within 10% of the market value.

Actuarial assumptions:

Investment rate of return	7.75%
Discount rate	7.75%
Inflation rate	4%
Projected salary increases	Based on years of service, ranging from 6% at 0 years of service decreasing to 4.25% after 9 years of service.
Cost of living adjustments	3% on first \$12,000

Plan membership:

Retired participants and beneficiaries receiving benefits	476
Inactive participants entitled to a return of their employee contributions	47
Inactive participants with a vested right to a deferred or immediate benefit	48
Active participants	<u>1,090</u>
Total	1,661

See accompanying independent auditors' report.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

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

Required Supplementary Information- GASB No. 68

June 30, 2015

(Unaudited)

(Dollars in thousands)

	<b>2014</b>
<hr/>	
<b>Total Pension Liability</b>	
Service Cost	\$ 10,529
Interest	33,587
Differences between expected and actual experience	(8,380)
Changes of assumptions	4,921
Changes of benefit terms	0
Benefit payments, including refunds of employee contributions	<u>(12,963)</u>
<b>Net change in total pension liability</b>	\$ 27,694
<b>Total pension liability - beginning</b>	<u>415,793</u>
<b>Total pension liability - ending</b>	<u><u>\$ 443,487</u></u>
<hr/>	
<b>Plan Fiduciary Net Position</b>	
Contributions - employer	\$ 12,630
Contributions - employee	8,245
Net investment income	20,484
Benefit payments, including refunds of employee contributions	(12,963)
Administrative expenses	(408)
Other - military service fund contribution	<u>16</u>
<b>Net change in fiduciary net position</b>	\$ 28,004
<b>Plan fiduciary net position - beginning</b>	<u>416,351</u>
<b>Plan fiduciary net position - end</b>	<u><u>\$ 444,355</u></u>
<hr/>	
<b>Net pension liability (asset) - ending</b>	(868)
<b>Plan's fiduciary net position as a percentage of the total pension liability</b>	100.20%
<b>Covered employee payroll</b>	88,646
<b>Net pension liability (asset) as a percentage of covered employee payroll</b>	-0.98%

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

See accompanying independent auditors' report.



## **SUPPLEMENTAL SCHEDULES**

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Accounts Established by the General Revenue Bond Resolution

Year ended June 30, 2015

(comparative totals for June 30, 2014)

(Dollars in thousands)

	<u>Construction</u>	<u>Revenue</u>	<u>Debt service</u>	<u>Reserves</u>	<u>Total</u>
Balance – June 30, 2014	\$ 80,109	74,128	509,790	46,182	710,209
Proceeds from:					
Revenue bonds and loans	99,719	—	14,196	—	113,915
Cash received from customers	—	668,213	—	—	668,213
Interest income	146	1,715	13,512	1,326	16,699
Debt service grant					—
Grant receipts	200	—	6,229	—	6,429
Construction payments	(114,369)	—	—	—	(114,369)
Capital lease payments	(829)	—	(2,388)	—	(3,217)
Debt service payment	(2,186)	(28,029)	(408,680)	(15,000)	(453,895)
Other commonwealth payments	—	(27,342)	—	—	(27,342)
Interfund transfers	9,001	(371,519)	362,560	(42)	—
Transfers from (to) operating account	584	(242,548)	2,407	(10,000)	(249,557)
Balance – June 30, 2015	\$ <u>72,375</u>	<u>74,618</u>	<u>497,626</u>	<u>22,466</u>	<u>667,085</u>
		<u>Sewer</u>	<u>Water</u>	<u>2015 total</u>	<u>2014 total</u>
Restricted investments:					
Construction	\$	33,134	39,241	72,375	80,109
Debt service reserves		131,387	84,362	215,749	224,484
Debt service		181,669	75,183	256,852	232,143
Revenue redemption		5,783	19,242	25,025	32,716
Revenue		21,910	52,708	74,618	74,128
Renewal and replacement reserve		6,677	1,789	8,466	32,182
Insurance		7,000	7,000	14,000	14,000
Community obligation and revenue enhancement		—	—	—	20,447
Total restricted investments	\$	<u>387,560</u>	<u>279,525</u>	<u>667,085</u>	<u>710,209</u>

See accompanying independent auditors' report.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Combining Statement of Net Position

June 30, 2015

(Dollars in thousands)

<b>Assets</b>	<b>Sewer</b>	<b>Water</b>	<b>Combined total</b>
Unrestricted current assets:			
Cash and cash equivalents	\$ 38,462	2,989	41,451
Investments	26,284	31,747	58,031
Intergovernmental loans	8,832	21,755	30,587
Accounts receivable	72	297	369
Total unrestricted current assets	<u>73,650</u>	<u>56,788</u>	<u>130,438</u>
Restricted assets:			
Investments	391,612	281,586	673,198
Interest receivable	1,184	1,282	2,466
Total restricted assets	<u>392,796</u>	<u>282,868</u>	<u>675,664</u>
Capital assets:			
Capital assets – not being depreciated	143,396	85,936	229,332
Capital assets – being depreciated – net	3,385,562	2,320,444	5,706,006
Total capital assets	<u>3,528,958</u>	<u>2,406,380</u>	<u>5,935,338</u>
Regulatory assets	602,426	164,857	767,283
Other assets – net	316,933	123,861	440,794
Total assets	<u>4,914,763</u>	<u>3,034,754</u>	<u>7,949,517</u>
<b>Deferred Outflows of Resources</b>			
Deferred outflows from pension	9,578	5,023	14,601
Deferred outflows from derivative instruments	40,247	3,936	44,183
Deferred outflows from refunding debt	44,888	28,316	73,204
<b>Liabilities</b>			
Current liabilities:			
Accounts payable and accrued expenses	48,729	10,591	59,320
Commercial paper notes	52,000	78,000	130,000
Current portion of long-term debt	126,208	41,040	167,248
Total current liabilities	<u>226,937</u>	<u>129,631</u>	<u>356,568</u>
Payable from restricted assets:			
Accounts payable for construction	13,335	2,725	16,060
Accrued interest on bonds payable	55,326	30,222	85,548
Reserves	36,080	21,376	57,456
Total payable from restricted assets	<u>104,741</u>	<u>54,323</u>	<u>159,064</u>
Retainage on construction in progress	4,460	3,788	8,248
Long-term debt – less current portion	3,619,053	1,982,051	5,601,104
Long-term capital leases	20,702	9,412	30,114
Other postemployment benefits	72,141	28,456	100,597
Liability for derivative instruments	40,247	3,936	44,183
Total liabilities	<u>4,088,281</u>	<u>2,211,597</u>	<u>6,299,878</u>
<b>Deferred Inflows of Resources</b>			
Deferred inflows from pension	4,581	2,402	6,983
Deferred inflows from regulated activities	23,832	39,219	63,051
<b>Net Position</b>			
Net investment in capital assets	234,429	554,000	788,429
Restricted	184,678	105,684	290,362
Unrestricted	473,675	159,127	632,802
Total net position	<u>\$ 892,782</u>	<u>818,811</u>	<u>1,711,593</u>
Commitments and contingencies			

See accompanying independent auditors' report.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

Combining Statement of Net Position

June 30, 2014

(Dollars in thousands)

<b>Assets</b>	<b>Sewer</b>	<b>Water</b>	<b>Combined total</b>
Unrestricted current assets:			
Cash and cash equivalents	\$ 35,469	22,019	57,488
Investments	26,117	11,652	37,769
Intergovernmental loans	8,634	21,670	30,304
Accounts receivable	99	907	1,006
Total unrestricted current assets	<u>70,319</u>	<u>56,248</u>	<u>126,567</u>
Restricted assets:			
Investments	438,143	278,065	716,208
Interest receivable	1,441	1,101	2,542
Total restricted assets	<u>439,584</u>	<u>279,166</u>	<u>718,750</u>
Capital assets:			
Capital assets – not being depreciated	142,791	74,130	216,921
Capital assets – being depreciated – net	3,493,338	2,362,880	5,856,218
Total capital assets	<u>3,636,129</u>	<u>2,437,010</u>	<u>6,073,139</u>
Regulatory assets	627,931	169,660	797,591
Other assets – net	272,532	127,188	399,720
Total assets	<u>5,046,495</u>	<u>3,069,272</u>	<u>8,115,767</u>
<b>Deferred Outflows of Resources</b>			
Deferred outflows from derivative instruments	37,282	3,695	40,977
Deferred outflows from refunding debt	42,846	30,771	73,617
<b>Liabilities</b>			
Current liabilities:			
Accounts payable and accrued expenses	48,476	10,958	59,434
Commercial paper notes	92,000	78,000	170,000
Current portion of long-term debt	116,250	25,910	142,160
Total current liabilities	<u>256,726</u>	<u>114,868</u>	<u>371,594</u>
Payable from restricted assets:			
Accounts payable for construction	23,267	5,368	28,635
Accrued interest on bonds payable	56,307	30,676	86,983
Reserves	69,068	33,021	102,089
Total payable from restricted assets	<u>148,642</u>	<u>69,065</u>	<u>217,707</u>
Retainage on construction in progress	2,496	3,327	5,823
Long-term debt – less current portion	3,690,335	2,007,477	5,697,812
Long-term capital leases	21,213	9,725	30,938
Other postemployment benefits	71,890	30,113	102,003
Liability for derivative instruments	37,282	3,695	40,977
Total liabilities	<u>4,228,584</u>	<u>2,238,270</u>	<u>6,466,854</u>
<b>Deferred Inflows of Resources</b>			
Deferred inflows from regulated activities	(21,297)	28,389	7,092
<b>Net Position</b>			
Net investment in capital assets	201,738	572,652	774,390
Restricted	189,572	81,852	271,424
Unrestricted	528,026	182,575	710,601
Total net position	<u>\$ 919,336</u>	<u>837,079</u>	<u>1,756,415</u>
Commitments and contingencies			

See accompanying independent auditors' report.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

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

Year ended June 30, 2015

(Dollars in thousands)

	<u>Sewer</u>	<u>Water</u>	<u>Combined total</u>
Operating revenues:			
Customer services	\$ 442,571	218,734	661,305
Other	4,416	2,883	7,299
Total operating revenues	<u>446,987</u>	<u>221,617</u>	<u>668,604</u>
Operating expenses:			
Operations	61,956	40,366	102,322
Maintenance	20,339	7,984	28,323
Payments in lieu of taxes	—	7,966	7,966
Engineering, general, and administrative	79,505	45,287	124,792
Total operating expenses	<u>161,800</u>	<u>101,603</u>	<u>263,403</u>
Income from operations before depreciation	285,187	120,014	405,201
Depreciation	<u>136,794</u>	<u>57,206</u>	<u>194,000</u>
Operating income	<u>148,393</u>	<u>62,808</u>	<u>211,201</u>
Regulatory accounting provisions:			
Change in reserves	32,988	11,645	44,633
Change in regulatory provisions, net	<u>(70,634)</u>	<u>(15,633)</u>	<u>(86,267)</u>
Total regulatory accounting provisions	<u>(37,646)</u>	<u>(3,988)</u>	<u>(41,634)</u>
Nonoperating income (expense):			
Investment income	11,571	4,378	15,949
Interest expense	(152,099)	(81,068)	(233,167)
Changes in derivative related accounts	2,528	412	2,940
Total nonoperating expense	<u>(138,000)</u>	<u>(76,278)</u>	<u>(214,278)</u>
Net loss before capital grants	(27,253)	(17,458)	(44,711)
Capital grants	<u>4,989</u>	<u>1,440</u>	<u>6,429</u>
Decrease in net position	(22,264)	(16,018)	(38,282)
Total net position – beginning of year	919,336	837,079	1,756,415
Restatement to comply with GASB Statement No. 68	<u>(4,290)</u>	<u>(2,250)</u>	<u>(6,540)</u>
Total net position – end of year	\$ <u><u>892,782</u></u>	<u><u>818,811</u></u>	<u><u>1,711,593</u></u>

See accompanying independent auditors' report.

**MASSACHUSETTS WATER RESOURCES AUTHORITY**

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

Year ended June 30, 2014

(Dollars in thousands)

	<u>Sewer</u>	<u>Water</u>	<u>Combined total</u>
Operating revenues:			
Customer services	\$ 427,971	211,720	639,691
Other	3,797	4,529	8,326
Total operating revenues	<u>431,768</u>	<u>216,249</u>	<u>648,017</u>
Operating expenses:			
Operations	61,092	39,686	100,778
Maintenance	21,311	8,142	29,453
Payments in lieu of taxes	—	7,872	7,872
Engineering, general, and administrative	87,838	47,563	135,401
Total operating expenses	<u>170,241</u>	<u>103,263</u>	<u>273,504</u>
Income from operations before depreciation	261,527	112,986	374,513
Depreciation	<u>138,092</u>	<u>54,970</u>	<u>193,062</u>
Operating income	<u>123,435</u>	<u>58,016</u>	<u>181,451</u>
Regulatory accounting provisions:			
Change in reserves	204	(374)	(170)
Change in regulatory provisions, net	<u>(5,138)</u>	<u>1,500</u>	<u>(3,638)</u>
Total regulatory accounting provisions	<u>(4,934)</u>	<u>1,126</u>	<u>(3,808)</u>
Nonoperating income (expense):			
Operating grant	785	69	854
Investment income	3,032	2,401	5,433
Interest expense	(152,097)	(79,483)	(231,580)
Changes in derivative related accounts	2,528	412	2,940
Total nonoperating expense	<u>(145,752)</u>	<u>(76,601)</u>	<u>(222,353)</u>
Net loss before capital grants	(27,251)	(17,459)	(44,710)
Capital grants	<u>4,446</u>	<u>1,512</u>	<u>5,958</u>
Decrease in net position	(22,805)	(15,947)	(38,752)
Total net position – beginning of year	<u>942,141</u>	<u>853,026</u>	<u>1,795,167</u>
Total net position – end of year	\$ <u><u>919,336</u></u>	<u><u>837,079</u></u>	<u><u>1,756,415</u></u>

See accompanying independent auditors' report.

**APPENDIX B**

**JULY 2016 REPORT OF THE CONSULTING ENGINEER**

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# Appendix B

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July 26, 2016

Board of Directors  
Massachusetts Water Resources Authority  
Charlestown Navy Yard  
100 First Avenue  
Boston, MA 02129

Subject: Financial Feasibility Report General Revenue Refunding Bonds, 2016 Series D (Green Bonds)

Dear Members of the Board:

We are submitting herewith a Supplemental Report prepared to support the Massachusetts Water Resources Authority (the "MWRA" or the "Authority") in connection with its issuance of the General Revenue Refunding Bonds, 2016 Series D (Green Bonds) (the "Bonds"). This report incorporates by reference the Triennial Report prepared by CDM Smith in October 2014 (the "2014 Triennial Report") which assessed the condition and operations of the Authority. Terms used in this report that are not defined herein have the same definitions as used in the 2014 Triennial Report and/or the Official Statement for the Bonds.

Since the Triennial Report was prepared, the Authority has completed the construction of a major element of its capital program, the Combined Sewer Overflow (CSO) program with total costs of nearly \$900 million. Originally consisting of 26 site-specific projects, the long-term CSO control plan ultimately included a total of 34 projects that have been completed in accordance with the U.S. District Court-ordered schedule. As a result of this effort, CSO volumes will have been reduced from approximately 3.3 billion gallons in 1988 to approximately 0.45 billion gallons annually. The Authority will now undertake a period of post-construction monitoring to evaluate the impact of the construction program and determine if the necessary levels of CSO control and water quality have been achieved. A report is due to the U. S. District Court in 2020 on the impacts of the program and assessing whether additional work may or may not be necessary to comply with applicable standards.

The balance of this Supplemental Report provides an evaluation of the Authority's financial status and projections. We stand ready to respond to any questions regarding the content of our work.

Very truly yours,  
CDM Smith Inc.



Joseph T. Ridge  
Vice President

# Financial Requirements

## 1 Introduction

Our financial evaluation and projections are based on a review of the Authority's audited financial statements and various budget documents, current and historical, as well as the Authority's financial projections. Our analysis is based on the following documents and data sources: the Authority's preliminary, unaudited operating results for FY 2016 and actual results for prior fiscal years, the FY 2017 Current Expense Budget (the "CEB"), the FY 2017 Capital Improvement Program (the "CIP"), and the Authority's projections of grant receipts, escrows, and participation in the Massachusetts Clean Water Trust SRF loan program (the "SRF"), as contained in the FY 2017 CEB. In addition, we have incorporated the anticipated results of the Bonds.

The purposes of this section are to describe:

- Projected Authority expenses for FY 2017 through FY 2022.
- Projected non-rate revenues for the same period.
- Projected rate increases.
- Impacts of such rate increases on customers.
- Projected compliance with various Resolution covenants.

The Authority's projections reflect assumptions regarding the schedule, timing and cost of certain key capital projects.

## 2 Key Assumptions

This section describes the key assumptions that have been used in the Authority's projections. These projections take into account the data and information described above, assumptions regarding economic conditions, Authority policies and spending practices, and the Authority's most recent financings. These projections also take into account Authority-developed projections on the use of debt escrows and tax-exempt commercial paper ("TECP"). The projections are developed such that the Authority's projected revenues and expenses meet the various requirements of the Resolution.

As described in subsequent subsections (see Section 3.4, Capital Spending), the amended Resolution requires the Authority to comply with two rate covenants regarding the adequacy of rate revenue. The covenants require that the Authority generate sufficient revenue to meet all annual revenue requirements including operation and maintenance expenses, *pro rata* debt service fund deposits, and reserve fund requirements; and provide revenue available for revenue bond debt service payments in each fiscal year equal to the sum of the Primary and Supplemental Coverage Ratios. The key assumptions and inputs used for these projections are:

- Variable rate debt is assumed to carry an interest rate of 3.25 percent in FY 2017, 3.50 percent in FY 2018, 3.75 percent in FY 2019, and 4.0 percent in FY 2020 and thereafter. Future senior debt is assumed to be 30-year debt, with interest rates of 5.0 percent for FY 2017, 5.25 percent

for FY 2018, 5.50 percent for FY 2019, 5.75 for FY 2020, and 6.0 percent for subsequent fiscal years.

- SRF loans for water projects will carry an effective interest rate of 2.0 percent with a 20-year term. SRF loans for sewer projects will carry an effective interest rate of 2.5 percent with a 30-year term.
- Capital costs are projected to inflate at an average annual rate of 2.5 percent for projects not yet under contract. It should be noted that changes to this assumption will not have a significant impact on the Authority's projected increases in total expenses over the forecast period, but will have a greater impact over the longer term.
- Labor costs are projected to inflate at an average annual rate of 2.7 percent for FY 2018 and all subsequent fiscal years. Other operating and maintenance costs for existing facilities are projected to inflate at an average annual rate of 3.0 percent for all future years. Projects scheduled to come on line from FY 2018 to FY 2022 are projected to have a modest impact on the Authority's total operating expenses.
- Capital spending is based on the FY 2017 CIP, and it is assumed that the Authority's expenditure rate will average 85 percent of the budgeted cash expenditure rate. However, two-thirds of the deferred expenditures are expected to be spent three years later. Thus, the amount deferred in FY 2017 is added to FY 2020 anticipated CIP expenditures.
- The Authority received \$873,804 in debt service assistance on April 2016, applied as an offset to FY 2017 capital financing costs. The Authority's projections assume that no additional debt service assistance will be received during the projection period.
- The Authority does not project the use of Rate Stabilization funds until FY 2020, with estimated usage of \$6.9 million in that year. The Authority projects the use of \$10.3 million in Rate Stabilization funds for FY 2021, and \$10.9 million in FY 2022. The projections assume the use of \$15.8 million from the Bond Redemption Fund in FY 2022.
- The Authority projects a prepayment to defease future debt service in FY 2017 in the amount of \$11.0 million. The Authority projects prepayments to defease debt in the amount of \$15.0 million in FY 2018, and \$12.0 million in FY 2019.

### **3 Rate Revenue Requirements**

In describing the projected rate revenue requirements as shown in Tables 1 through 3, we have followed the Authority's CEB format with expenditures classified as direct, indirect and capital financing. Non-rate revenue is then applied against total expenses to determine the Authority's rate revenue requirement for a particular fiscal year.

#### **3.1 Direct Expenses**

Projected direct expenses are summarized in Table 1 and discussed in the following sections. Direct expenditures are projected to increase from approximately \$226.5 million in FY 2017 to approximately \$260.6 million in FY 2022, an average annual increase of 2.9 percent. These projections reflect the costs of operating and maintaining the Systems, as well as the net incremental

costs associated with new facilities and projects that the Authority anticipates becoming operational during this time.

**Table 1**  
**Budgeted and Projected Direct Expenses, By Fund, FY 2017-2022**  
**(\$ in 000's)**

	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
Sewer Fund						
Direct Expenses <sup>1</sup>	\$150,525	\$154,376	\$159,535	\$163,900	\$168,309	\$173,086
Waterworks						
Fund Direct Expenses <sup>2</sup>	<u>\$76,007</u>	<u>\$78,196</u>	<u>\$80,468</u>	<u>\$82,760</u>	<u>\$85,124</u>	<u>\$87,561</u>
<b>Total Direct Expenses</b>	<b>\$226,532</b>	<b>\$232,572</b>	<b>\$240,003</b>	<b>\$246,660</b>	<b>\$253,433</b>	<b>\$260,648</b>

<sup>1</sup> Includes Sewer Division, sewer portions of the Field Operating Division and allocated Engineering and Construction, Laboratory Service and Administrative. Excludes Clinton Wastewater Treatment Plant.

<sup>2</sup> Includes Waterworks Division, water portions of Field Operating Division, the Clinton Wastewater Treatment Plant and allocated Engineering and Construction, Laboratory Services and Administrative.

Note: Totals may not add exactly due to rounding.

Total direct expenses are projected to increase from \$226.5 million in FY 2017 to \$260.6 million in FY 2022, an average annual increase of 2.9 percent. This largely reflects the anticipated inflationary increases in labor and other operating costs. The Authority has also been actively pursuing various cost saving measures including, but not limited to, lease space reductions, staff cross-training, negotiating competitive agreements for energy and chemicals, and increasing energy self-generation to further control costs over the short- and long-term.

Sewer Fund direct expenses, as presented in Table 1, exclude the Clinton Wastewater Treatment Plant expenses, but include allocated administrative expenses. (The Clinton Wastewater Treatment Plant is treated as a Waterworks Fund expense because the facility was constructed to mitigate the impact of certain Waterworks System facilities). Sewer Fund direct expenses are projected to increase at an average annual rate of approximately 2.8 percent from FY 2017 to FY 2022, reflecting primarily the impact of assumed inflation increases for operating existing facilities. There will be net incremental savings on Sewer Fund direct expenses from capital improvements through FY 2022, due in large part to savings in future years from the Deer Island Treatment Plant "DITP" asset protection projects.

Administrative and support expenses are allocated between the Waterworks Fund and the Sewer Fund, based on the total direct annual costs in each Fund. Approximately 62 percent of allocable direct administrative expenses were assigned to the Sewer Fund for FY 2017, and this allocation remains constant throughout the forecast period.

The Waterworks Fund direct expenses are projected to increase at an average annual rate of 2.8 percent between FY 2017 and FY 2022. The Waterworks Fund expenses include Clinton Wastewater Treatment Plant costs.

Table 2 presents a breakdown of the Authority's projected combined direct expenses, by expense category. These expenses are presented by CEB line item for the period FY 2017 through FY 2022. Excluding capital financing expenses, labor costs are the Authority's largest line item expense representing 56.6 percent of total operating expenses over the projection period, and are projected to increase from \$128.6 million in FY 2017 to \$147.0 million in FY 2022. Labor costs are expected to increase at an average annual increase of 2.7 percent over the period between FY 2017 and FY 2022.

**Table 2**  
**Budgeted and Projected Direct Expenses, by Category, FY 2017-2022**  
**(\$ in 000's)**

<b>Category</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
Labor	\$128,638	\$132,116	\$135,689	\$139,352	\$143,115	\$146,979
Chemicals	\$9,110	\$9,407	\$9,713	\$10,004	\$10,304	\$10,614
Utilities	\$21,541	\$21,119	\$22,472	\$23,146	\$23,689	\$24,440
Maintenance & Materials	\$37,300	\$38,903	\$39,828	\$41,105	\$42,338	\$43,608
<u>Services</u>	<u>\$29,942</u>	<u>\$31,026</u>	<u>\$32,302</u>	<u>\$33,052</u>	<u>\$33,987</u>	<u>\$35,007</u>
<b>Total Direct Expenses</b>	<b>\$226,532</b>	<b>\$232,572</b>	<b>\$240,003</b>	<b>\$246,660</b>	<b>\$253,433</b>	<b>\$260,648</b>

Note: Totals may not add exactly due to rounding.

Chemical costs account for approximately 4.1 percent of direct expenses and are estimated to increase at an average annual rate of 3.1 percent between FY 2017 and FY 2022, in large part reflecting assumed inflation for future costs. Chemical costs do not include funding for potential costs associated with a new DITP NPDES permit, when it is issued. (Note: currently, the Authority has no knowledge about the potential timing of the issuance of the permit.)

Utilities, which represent approximately 9.3 percent of direct expenses, are expected to increase at an average annual rate of 2.6 percent between FY 2017 and FY 2022, reflecting the Authority's fixed price energy agreements, as well as most recent pricing outlook and trends in fuel and electricity market prices and planned usage. Maintenance and materials, which represent 16.7 percent of direct expenses over the projection period, are projected to increase at an average annual rate of 3.2 percent from FY 2017 to FY 2022. Services represent 13.4 of the direct expenses, and are projected to increase at an average annual rate of 3.2 over the projection period.

### **3.2 Indirect Expenses**

Indirect expenses for FY 2017 through FY 2022 are summarized in Table 3. Indirect expenses include a number of cost items that reflect financial commitments by the Authority, but which are not directly controlled by an operating division of the Authority. As an example, the Authority has agreed to compensate certain Local Bodies because of the adverse impacts caused by the construction of new

facilities. These mitigation payments are financial obligations of the Authority and are allocated specifically to either the Waterworks System or the Sewer System.

**Table 3**  
**Budgeted and Projected Indirect Expenses, FY 2017-2022**  
**(\$ in 000's)**

Category	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Insurance	\$1,998	\$2,078	\$2,161	\$2,247	\$2,337	\$2,431
Watershed/PILOT	\$24,291	\$26,291	\$26,996	\$27,720	\$28,464	\$29,228
Cable Substation Lease	\$774	\$1,562	\$1,501	\$1,497	\$759	\$1,535
Mitigation	\$1,558	\$1,597	\$1,637	\$1,678	\$1,720	\$1,763
OPEB	\$4,876	\$5,035	\$5,205	\$5,387	\$5,580	\$5,787
Reserves Additions	(\$168)	\$932	\$1,274	\$1,156	\$1,055	\$1,383
<u>Pension Fund Deposits</u>	<u>\$4,633</u>	<u>\$3,277</u>	<u>\$3,429</u>	<u>\$3,587</u>	<u>\$3,752</u>	<u>\$3,925</u>
<b>Total Indirect Expenses</b>	<b>\$37,962</b>	<b>\$40,773</b>	<b>\$42,204</b>	<b>\$43,272</b>	<b>\$43,667</b>	<b>\$46,051</b>

Note: Totals may not add exactly due to rounding.

The major indirect expenses are:

**Insurance:** The Authority purchases property and casualty insurance from external insurance carriers, and self-insures for significant levels of property and general liabilities.

**Watershed/PILOT:** The Enabling Act requires the Authority to pay the Commonwealth for two obligations. The first obligation is to reimburse the Commonwealth for the operating costs and debt service associated with land acquisitions of the DCR's Division of Water Supply Protection. The Authority prepaid the remaining debt service associated with the land acquisition in FY 2016, from the operating surplus. The second obligation is to make payments in lieu of taxes ("PILOT") to each city or town with land located in the Authority's watersheds. PILOTs are revalued every four years, the most recent occurring in FY 2014, which resulted in a 14 percent increase in that portion of the PILOT. The Authority's projections assume that PILOT payments will increase 2.5 percent annually until FY 2018, which carries a 14 percent increase on account of it being a revaluation year. Subsequent fiscal years are assumed to increase at 3.0 percent annually.

**Cable and Substation Lease:** Eversource (formerly, NSTAR) and Harbor Electric Energy Company ("HEEC"), a subsidiary, installed a cross-harbor power cable and built a power substation to supply electric power for the construction and operation of the DITP. The Authority had agreed to repay HEEC's capital investment for the cross-harbor electrical cable on a 25-year schedule, with contractual obligations ending in FY 2015. HEEC is seeking to establish a tariff formalizing the terms for continued supply of power to the DITP. The Authority has projected payments for capacity and maintenance charges. See the Official

Statement, of which this Appendix B is a part, under the heading “Environmental Regulation and Litigation – Wastewater Management – Other Regulatory and Compliance Matters – Cross-Harbor Power Cable”.

**Mitigation:** The Authority is party to an agreement that requires the Authority to make payments to the Town of Winthrop to ameliorate the adverse physical, social, and economic impacts of the DITP. The Authority estimates that this mitigation payment will equal \$779,000 in FY 2017. The Authority also has a mitigation agreement with the City of Quincy that requires the Authority to make payments for police, fire, and other municipal services for several Authority water and sewer facilities located in Quincy, and the Authority estimates that the mitigation payment will equal \$779,000 in FY 2017. The agreement terms with both communities were extended through FY 2025, as such the projections assume both agreements remain in effect in substantially their current forms throughout the forecast period.

**Additions to Reserves:** The Authority is required by the terms of the Resolution to maintain reserve funds for operations, insurance, and renewal and replacement. These reserves are incrementally funded each year, as necessary, to bring them to stipulated levels. These are discussed in more detail in the following section.

**Pension Fund Contribution:** During FY 2008, the Authority modified its methodology for assessing retirement liability to be more consistent with Chapter 32 of the Massachusetts General Laws. The new methodology resulted in the funding level decreasing from fully funded to an 85 percent funded level. The Authority’s Retirement Board voted to recognize this liability and assessed the pension liabilities. For FY 2017, the Authority anticipates contributing \$4.6 million to the Pension Fund, with a required contribution of \$3.1 million based on the most recent actuarial evaluation completed January 2015, and an additional contribution of \$1.5 million. The actuarial evaluation also found that as of January 2015, the Authority has funded 98.3% of its pension liability, and anticipates having the pension liability fully funded in FY 2025.

**Other Post-Employment Benefits:** The Authority adopted GASB 45 in FY 2008, which requires accounting and reporting of post-employment benefits other than pensions (“OPEB”). In lieu of funding its OPEB liabilities, the Authority elected to use funds that would otherwise be allocated to OPEB to prefund its unfunded pension liability reducing the 17-year funding schedule. As a result of the high funding level of the pension system in FY 2015, the Authority’s Board of Directors created the Massachusetts Water Resources Authority Irrevocable Other Post-Employment Benefits Trust (the “OPEB Trust”). The Authority has deposited approximately \$16.0 million into the OPEB Trust. This was a combination of \$10.0 million related to the reserve released as a result of the amendments to the General Bond Resolution, \$800,000 in FY 2011 funds set aside for OPEB related expenses, and a \$5.2 million deposit on June 30, 2016. For FY 2017, the Authority has budgeted for a deposit of \$4.9 million to the OPEB Trust.

### 3.3 Reserve Funds

The Authority is required by the Resolution to meet funding requirements for certain funds. The Authority is required to maintain an Operating Reserve Fund to be used in the event of unexpected or extraordinary fluctuations in monthly operation and maintenance expenses. The Authority is



required to have on deposit in the Operating Reserve Fund at the end of each fiscal year an amount equal to one-sixth of that fiscal year's operating expenses. (Operating expenses are the total of direct and indirect expenses found in the Tables 2 and 3, less the amounts expended for Watershed/PILOT, Reserve additions, and OPEB Trust contributions).

The Authority is required to maintain a balance in the Operating Reserve Fund equal to one-sixth of annual operating expenses. At the end of FY 2016, the Operating Reserve had a projected balance of \$39.4 million. The projected mandatory contribution to the fund is \$932,000 for FY 2018, \$1.3 million for FY 2019, \$1.1 million for FY 2020 and FY 2021, and \$1.4 million for FY 2022 in order to maintain a balance in compliance with the Resolution.

The Resolution requires the Authority to fund an Insurance Reserve Fund to a level confirmed by a qualified insurance consultant. In February 2011, the Authority's insurance consultant reviewed the adequacy of the Insurance Reserve Fund and concluded that an acceptable range for the fund would be somewhere between \$12 million and \$16 million. The Authority reduced the Insurance Reserve Fund balance to \$14 million, representing the mid-point of the approved range. The Authority expects the fund balance to remain level at \$14 million throughout the forecast period. The Insurance Reserve Fund Requirement has not been independently reviewed or evaluated by CDM Smith. The Insurance Reserve Fund was reviewed in February 2014 by the Authority's insurance consultant and that report confirmed the adequacy of the \$14 million fund balance.

The Resolution also requires the Authority to fund a Renewal and Replacement Reserve Fund, based on the recommendations of the Consulting Engineer. The Renewal and Replacement Reserve Fund is established to pay the costs of emergency repairs or capital improvements to the Systems when funds are not available in either the Construction Fund or the Operating Fund. Projects financed from the Renewal and Replacement Reserve Fund must be necessary to ensure the continual operation of the Systems, and not previously identified to be financed from the Operating Fund. The Renewal and Replacement Reserve Fund requirement is presently established at a total of \$35 million, as most recently determined in the 2014 Triennial Report. The Resolution, as amended, requires the Authority to maintain a minimum cash balance of \$10 million in the Renewal and Replacement Reserve Fund. The remaining balance will be met through unused capacity in the TECP. No additional deposits are projected to be required over the forecast period.

The Authority has in the past and may in the future pre-fund required reserve fund deposits.

### **3.4 Capital Spending**

The projected capital spending for FY 2017 through FY 2022 is presented in Table 4, based on the FY 2017 CIP. The capital expenditures presented in this table are presented on a cash basis, and represent the anticipated actual expenditures for various projects. The projected capital expenditures are based on contracts that are currently underway, as well as projected future projects reflected in the CIP. Inflated estimates are based on a 2.5 percent average annual inflation rate for all projects that are not under contract until after the end of FY 2017. In our opinion, the assumed inflation rate is reasonable given anticipated inflation trends. This inflation rate should provide an adequate allowance for currently unforeseen factors that could increase inflation pressures on construction costs.

Contingency amounts shown in Table 4 are based on projected cash expenditures. The contingency in a particular year is estimated to be 7.0 percent of projected spending, except for tunnel related projects which carry a 15 percent contingency. We believe that the Authority's contingency



assumptions are reasonable and appropriate and provide sufficient allowances to cover unanticipated events.

**Table 4**  
**Projected Capital Spending, Inflated and Uninflated, FY 2017-2022**  
**(\$ in 000's)**

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
<b>Sewer System<sup>1</sup></b>						
Contracted <sup>2</sup>	\$42,987	\$38,393	\$825	(\$4,157)	(\$1,695)	(\$16,320)
Uncontracted <sup>2</sup>	\$25,182	\$58,213	\$104,470	\$130,737	\$124,681	\$121,445
<u>Contingency<sup>2</sup></u>	<u>\$5,400</u>	<u>\$7,455</u>	<u>\$8,116</u>	<u>\$9,712</u>	<u>\$9,486</u>	<u>\$8,262</u>
<b>Subtotal<sup>2</sup></b>	<b>\$73,570</b>	<b>\$104,061</b>	<b>\$113,411</b>	<b>\$136,292</b>	<b>\$132,473</b>	<b>\$113,387</b>
<b>Waterworks System<sup>1</sup></b>						
Contracted <sup>2</sup>	\$39,387	\$32,870	\$8,158	\$473	(\$257)	(\$2,817)
Uncontracted <sup>2</sup>	\$30,421	\$56,488	\$61,349	\$110,581	\$138,589	\$112,695
<u>Contingency<sup>2</sup></u>	<u>\$5,175</u>	<u>\$6,552</u>	<u>\$4,967</u>	<u>\$8,167</u>	<u>\$10,036</u>	<u>\$8,016</u>
<b>Subtotal<sup>2</sup></b>	<b>\$74,983</b>	<b>\$95,910</b>	<b>\$74,474</b>	<b>\$119,221</b>	<b>\$148,367</b>	<b>\$117,895</b>
Total CIP— Uninflated <sup>2</sup>	\$148,553	\$199,971	\$187,885	\$255,513	\$280,840	\$231,281
Total CIP—Inflated	\$150,040	\$206,184	\$201,527	\$282,338	\$317,870	\$271,293
<u>Reduction for Maximum CIP<sup>3</sup></u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>(\$82,338)</u>	<u>(\$137,870)</u>	<u>(\$111,293)</u>
<b>Total CIP Spending</b>	<b>\$150,040</b>	<b>\$206,184</b>	<b>\$201,527</b>	<b>\$200,000</b>	<b>\$180,000</b>	<b>\$160,000</b>

<sup>1</sup> Includes allocated Administrative Division expenses.

<sup>2</sup> Stated in 2017 dollars throughout forecast period.

<sup>3</sup> The Authority's financial projections assume maximum annual CIP spending of \$200 million in FY 2020, \$180 million in FY 2021, and \$160 million in FY 2022.

Waterworks and Sewer Systems capital spending is projected to decline in total as the Authority completes major elements of the CIP, including the various improvements in the water storage system, and wastewater capital improvements. In June 2013, the Authority established a capital

spending cap for FY 2014 to FY 2018 with baseline capital expenditures totaling \$718.0 million and a total baseline cap of \$791.7 million. The FY 2017 CIP projects total spending for the FY 2014 to FY 2018 cap timeframe at \$618.7 million, or \$173.0 million under the baseline cap, including contingency and inflation.

The FY 2017 CIP identifies water system redundancy, asset protection, support for community assistance programs, and pipeline replacement and rehabilitation as the primary focus of the CIP going forward.

The Authority has in recent years spent a large amount of its Wastewater CIP on CSO programs to comply with federal legal mandates. This program accounted for 38.2 percent of total CIP spending over the 2009-2013 spending cap period. The Authority has completed construction of all of the legally mandated CSO projects. For the FY 2014-FY 2018 spending cap period, this program is estimated to account for only 10.0% of total CIP spending.

The Authority is currently in the discussion and planning phase regarding the feasibility and impacts of long-term redundancy improvements for the Metropolitan Tunnels that supply water to the metropolitan Boston area, as well as the design and replacement of the heat and power systems at the DITP. The FY 2017 CIP includes a placeholder of \$1.4 billion for the long-term redundancy project.

The Authority is a party to ongoing litigation regarding the specifications of the cross-harbor cable installed by HEEC. At this time, the Authority has not included any potential costs stemming from this litigation in its CIP projections, however, the Authority believes the impact of any costs for which it may be deemed responsible would not be significant. See the Official Statement, of which this Appendix B is a part, under the heading "Environmental Regulation and Litigation – Wastewater Management – Cross-Harbor Power Cable Litigation".

Table 5 presents the projected flow of funds within the Construction Fund from FY 2017 through FY 2022. Most construction funding is projected to be financed with long-term debt or SRF loans; however, the Authority intends to fund a total of \$88.2 million in capital expenditures through pay-as-you-go current year funding for the projection period. The assumption for future years is that SRF loan availability remains stable beyond FY 2017, but that no grant funding will be available.

**Table 5**  
**Construction Fund Projected Cash Flow, FY 2017-2022**  
(\$ in 000's)

	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
Construction Needs <sup>1</sup>	\$141,346	\$189,608	\$184,198	\$185,004	\$173,618	\$156,153
Financed by:						
Balance: Begin. of Year	\$119,414	\$156,924	\$28,530	\$26,980	\$26,742	\$25,895
Long Term Debt	\$110,656	\$6,014	\$126,448	\$127,565	\$114,572	\$111,940
SRF	\$56,000	\$42,000	\$42,000	\$42,000	\$42,000	\$42,000
Pay As You Go	\$12,200	\$13,200	\$14,200	\$15,200	\$16,200	\$17,200
<b>Balance: End of Year<sup>2</sup></b>	<b>\$156,924</b>	<b>\$28,530</b>	<b>\$26,980</b>	<b>\$26,742</b>	<b>\$25,895</b>	<b>\$40,883</b>

<sup>1</sup> Construction needs is approximately 85 percent of Total CIP--Inflated line shown on bottom of Table 4, plus two-thirds of the 15 percent deferred three years earlier.

<sup>2</sup> The Balance: End of Year is equal to the sum of the available sources, less projected construction needs.

Note: Totals may not add exactly due to rounding.

The Authority has developed its projections of borrowing amounts in a fiscal year, such that it begins the following fiscal year with a construction fund starting balance that, when combined with SRF loans, grants, and pay-as-you-go capital, is at least 10 percent of the next fiscal year's construction requirement. This, coupled with the availability of TECP, provides a sufficient cushion to prevent disruption of the Authority's capital program from unanticipated or unfavorable capital market conditions.

The capital spending program described in the preceding paragraphs affects the Authority's revenue requirement in two ways:

- Debt service must be paid on the bonds issued to fund the program.
- Sufficient revenues must be generated to comply with the Primary and Secured Coverage requirements.

Table 6 presents existing and projected debt service resulting from the projected capital spending program and assumes that the Authority is not constrained by its statutory debt limitation. Annual debt service in a fiscal year is based on the monthly debt service deposits that are required in accordance with the Resolution. As noted earlier, no Commonwealth debt service assistance is assumed for the projection period beyond FY 2017.

The future senior debt service reflects the estimated impact of the net savings realized from the issuance of the Bonds.

**Table 6**  
**Current and Projected Debt Service, FY 2017-2022**  
**(\$ in 000's)**

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
<b>Senior Debt</b>						
Principal to be Issued in FY <sup>1</sup>	\$125,000	\$10,652	\$142,847	\$144,375	\$130,362	\$127,462
Existing Senior Debt Service	\$263,095	\$264,052	\$272,565	\$222,833	\$316,933	\$320,495
<u>Future Senior Debt Service</u>	<u>\$5,035</u>	<u>\$169</u>	<u>\$4,727</u>	<u>\$4,918</u>	<u>\$4,548</u>	<u>\$4,443</u>
Total Senior Debt Service	\$268,130	\$264,221	\$277,292	\$227,751	\$321,481	\$324,938
Debt Service Assistance	(\$874)	\$0	\$0	\$0	\$0	\$0
<u>Bond Redemption Account</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>(\$15,783)</u>
Net Senior Debt Service	\$267,256	\$264,221	\$277,292	\$227,751	\$321,481	\$309,155
<b>Subordinated/SRF Debt</b>						
Principal to be Issued in FY <sup>1</sup>	\$56,000	\$42,000	\$42,000	\$42,000	\$42,000	\$42,000
Existing Debt Service	\$138,851	\$155,356	\$161,788	\$247,755	\$176,901	\$207,790
<u>Future Debt Service</u>	<u>\$18,119</u>	<u>\$19,601</u>	<u>\$21,821</u>	<u>\$24,039</u>	<u>\$26,219</u>	<u>\$28,441</u>
Total Subordinated/SRF Debt Service	\$156,970	\$174,957	\$183,609	\$271,794	\$203,120	\$236,230
<u>Debt Service Assistance</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
Net Subordinated/SRF Debt Service	\$156,970	\$174,957	\$183,609	\$271,794	\$203,120	\$236,230
<b>Total Debt Service</b>	<b>\$424,226</b>	<b>\$439,178</b>	<b>\$460,900</b>	<b>\$499,545</b>	<b>\$524,601</b>	<b>\$545,385</b>

<sup>1</sup>Total principal amount represents the amount of bonds required to provide the Construction Fund Deposit shown on line 1 of Table 5, plus repayment of TECP issued in prior fiscal year(s). This amount is increased to reflect Debt Service Reserve Fund Requirements and cost of issuance.

Note: Totals may not add exactly due to rounding.

Total Senior Debt Service is projected to increase from approximately \$268.1 million in FY 2017, to approximately \$324.9 million in FY 2022 before accounting for debt service assistance in FY 2017, proceeds from the Bond Redemption Account, and incorporating the impact of the net savings from the issuance of the Bonds. In Table 6, Net Senior Debt Service reflects the senior debt service with the reduction of the offsets from debt service assistance in FY 2017 and the Bond Redemption Account. The Bond Redemption Account is a valuable rate-smoothing tool available to the Authority, and the Authority estimates that it will have nearly \$26.1 million in the Bond Redemption Account at the beginning of the forecast period. The Authority expects to draw \$15.8 million from the Account in FY 2022, which is currently projected to be the fiscal year with the highest debt service funding requirement; however, the timing and amount of actual usage may vary.

Subordinated debt service, including both SRF and other outstanding subordinated Authority debt, is projected to increase from \$157.0 million in FY 2017 to \$236.2 million in FY 2022. No future variable rate debt is assumed to be issued over the timeframe of these projections, an assumption that may change based on market conditions. Projected SRF debt service assumes an interest rate of 2.5 percent for sewer related debt for and a rate of 2.0 percent for water related debt throughout the projection period.

### 3.5 Non-Rate Revenues

The Authority receives revenues from a variety of sources that offset the amount that must be collected from the Local Bodies. Total non-rate revenues are budgeted at \$24.7 million in FY 2017 and are projected to increase to a total of \$43.3 million in FY 2022. Table 7 summarizes these sources from FY 2017 through FY 2027.

**Table 7**  
**Projected Non-Rate Revenue, FY 2017-2022**  
**(\$ in 000's)**

	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
Rate Stabilization Fund Withdrawal	\$0	\$0	\$0	\$6,871	\$10,332	\$10,908
Miscellaneous	\$15,272	\$15,539	\$15,820	\$16,002	\$16,299	\$16,615
<u>Investment Income</u>	<u>\$9,473</u>	<u>\$11,545</u>	<u>\$12,632</u>	<u>\$14,450</u>	<u>\$15,566</u>	<u>\$15,795</u>
<b>Total Non-Rate Revenue</b>	<b>\$24,745</b>	<b>\$27,084</b>	<b>\$28,451</b>	<b>\$37,323</b>	<b>\$42,198</b>	<b>\$43,318</b>

Note: Totals may not add exactly due to rounding.

Major non-rate revenue sources are briefly described in the following:

**Rate Stabilization Fund Withdrawal:** When annual revenues exceed expenses, the Authority may deposit the money in the Rate Stabilization Fund. In future years, money may be withdrawn from the fund to reduce rate revenue requirements. The projections cap Rate Stabilization Fund withdrawals at an amount no greater than 10 percent of the Required Debt Service Fund Deposits, net of Debt Service Assistance credited to Senior Debt for such year, consistent with the Resolution, and use such amounts as available to moderate projected rate

increases consistent with Authority practice. The Rate Stabilization Fund balance at the end of FY 2016 is projected to be approximately \$36.5 million. For FY 2017, the Authority does not anticipate withdrawals from the Rate Stabilization Fund, however the Authority anticipates withdrawals of \$6.9 million in FY 2020, \$10.3 million in FY 2021, and \$10.9 million in FY 2022.

**Investment Income:** The Authority earns interest by investing fund balances in a variety of interest-bearing securities. These amounts are transferred to the Revenue Fund and are available to meet the ongoing obligations of the Authority. Investment income for FY 2017 is estimated to increase by approximately \$121,000 from FY 2016 levels. Total investment income is projected to increase from approximately \$9.5 million in FY 2017 to approximately \$15.8 million in FY 2022. The fluctuations in investment income between FY 2017 and FY 2022 partially reflect changes in the Construction Fund, Rate Stabilization Fund, and Debt Service Reserve Fund balances.

**Miscellaneous:** The Authority also receives certain amounts from Local Bodies, primarily the so-called CVA communities served by the Chicopee Valley Aqueduct that are provided water under various contracts, as well as payments from the Town of Clinton for partial operation of the Clinton Wastewater Treatment Plant. Between FY 2017 and FY 2022, the Authority is projected to receive approximately \$30.7 million from the CVA communities under the contractual service agreements. The Authority estimates that over the same period of time it will collect \$10.6 million in water revenue from sewer customers to offset water usage at the DITP. The Authority also receives a variety of fees, penalties and charges in its normal course of business. Miscellaneous revenue for FY 2017 is anticipated to decrease \$5.4 million from FY 2016 budgeted levels largely due to a one-time \$5.6 million payment in FY 2016 by the City of Cambridge for water purchased during the Huron Avenue Sewer Separation project.

## 4 Rate Revenue Requirement and Retail Customer Impacts

### 4.1 Rate Revenue Requirement

Table 8 summarizes the projected rates for FY 2017 through FY 2022 based on the FY 2017 CEB and reflecting the anticipated impact of the Bonds. For FY 2017, the Authority's rate revenue requirement increased by approximately 3.3 percent over FY 2016 levels to a total of approximately \$694.5 million. The rate revenue requirement equals the total amount of expenses in a fiscal year (including required reserve deposits and any amounts required to meet coverage requirements) less non-rate revenues. Of this amount, approximately \$460.4 million will be required to meet the expenses of the Sewer System, including allocated administrative and indirect expenses, and approximately \$234.1 million for the Waterworks System.

Rate revenues are projected to increase to approximately \$835.9 million in FY 2022, an average annual increase of 3.8 percent from FY 2017 levels. For the Sewer System, the rate revenue requirement is projected to increase from \$460.4 million to approximately \$547.4 million, an average annual increase of approximately 3.5 percent. The Waterworks System revenue requirement is projected to increase from \$234.1 million in FY 2017 to approximately \$288.6 million in FY 2022, an average annual increase of 4.3 percent.

The Authority historically has attempted to smooth total rate increases to mitigate significant short term rate increases. Recognizing that smoothing total rate increases is beneficial to Local Bodies receiving both water and sewer service only, in FY 2017 the Authority has begun to smooth rates at the Sewer and Waterworks Systems level. Rate smoothing at the Systems level will create sustainable

and predictable rates for each System, which will help mitigate short term rate spikes and provide consistent rates for the Local Bodies that only receive one service from the Authority.

**Table 8**  
**Projected Rate Revenue Requirement<sup>1</sup> Increases, FY 2017-2022**  
**(\$ in 000's)**

	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
Sewer Fund Rate Revenue	\$460,405	\$477,616	\$494,589	\$511,284	\$529,586	\$547,356
Waterworks Fund Rate Revenue	<u>\$234,131</u>	<u>\$243,389</u>	<u>\$253,634</u>	<u>\$265,165</u>	<u>\$276,075</u>	<u>\$288,555</u>
<b>Total Rate Revenue</b>	<b>\$694,536</b>	<b>\$721,006</b>	<b>\$748,222</b>	<b>\$776,449</b>	<b>\$805,661</b>	<b>\$835,911</b>
Annual Rate Increase	3.3%	3.8%	3.8%	3.8%	3.8%	3.8%

<sup>1</sup> Projections in this table reflect the anticipated impacts of the Bonds.

Note: Totals may not add exactly due to rounding.

The higher Sewer System rate revenue requirement generally reflects the financing and operational costs associated with the DITP, the long-term CSO control plan and other legally mandated projects, the asset management program, and anticipated I/I projects. The relatively higher percentage increase over the projection period in the Waterworks System reflects in part the Authority's anticipated focus on asset protection and water system redundancy initiatives.

These projected rate revenue increases are the product of a large number of assumptions, including the rate of growth in Authority operating expenses and economic and financial assumptions. They also assume that the Authority uses the Rate Stabilization Fund consistent with the Resolution and the Bond Redemption Account to smooth future projected rate increases.

## **4.2 Rate Allocation Methodology**

The Authority's charges for the services of the Waterworks and Sewer Systems, identified as Total Rate Revenue in the preceding table, are billed to Local Bodies on a wholesale basis. This means that the Authority bills Local Bodies, including special districts, rather than the individual residences or businesses served by the Systems. Separate charges applicable to the respective Systems are established each year as required by the Enabling Act; these charges are established at levels at least sufficient, together with other available revenue, to pay the full annual revenue requirement, as described in subsequent sections.

### **4.2.1 Water Rate Methodology**

Using an average cost methodology, the Authority's net annual Waterworks System costs for the current fiscal year, including operation and maintenance, debt service, and reserve fund requirements are recovered from Local Bodies in proportion to their prior calendar year annual water consumption. For FY 2016, the unit cost of water was \$3,488 per million gallons; in FY 2017, the unit cost of water is \$3,472 per million gallons; and based on the Authority's projections the unit cost of water will be approximately \$3,608 per million gallons in FY 2018.



#### 4.2.2 Contractual Agreements for Water Service

Twenty-four of the 50 water-served Local Bodies are “contract communities” in which water is supplied pursuant to water supply agreements. The list of water-served communities evolved through various legislative acts that allowed the communities/water districts to join the system. The water supply agreements contain terms and conditions agreed to by the respective Local Bodies and the Authority. Nineteen of the 24 contract communities pay for water at the full water rates. The three CVA communities have a separate assessment. There are four additional entities served by the Authority, including state hospitals and the DCR. Clinton is also considered a water-served community; however, Clinton withdraws its first 800 mg of water per year from the Authority's water supply reservoirs via its own infrastructure free of charge under special legislation. The Authority has had and continues to have discussions with additional communities and Local Bodies regarding potential water sales to meet various needs and has added five Local Bodies to the Waterworks System since its inception.

#### 4.2.3 Wastewater Rate Methodology

The Authority's wastewater rate methodology encompasses the following elements:

**Operation and Maintenance Expense:** Each Local Body's annual allocation in FY 2017 is based upon the average total annual metered flow for the prior three years from each community taking into account three separate prices for each portion of wastewater: total annual flow, pounds of suspended solids, and pounds of biochemical oxygen demand.

**Capital Costs:** A flow-based method, adjusted for strength, is used to recover one quarter of the capital costs, and a population-based method is used to recover the remaining three quarters. For each Local Body in FY 2017, flow calculations are based on the average of the month in the prior three calendar years in which the highest average daily flows occurred for that community. The remaining share of capital costs is allocated based on population: 50 percent of the balance (37.5 percent of the total) assigned on the basis of the community's total or census population and 50 percent of the balance (37.5 percent of the total) on the basis of the presently served population.

#### 4.2.4 Enforceability of Charges

The Authority's charges to Local Bodies are a general obligation of the Local Bodies. Local Bodies fund payment of the Authority's wholesale rates and charges from a number of revenue sources, including local retail water and wastewater charges, real and personal property taxes, Commonwealth local aid distributions, or a combination of the preceding. In the event any charge to a Local Body is not paid when due, the Enabling Act authorizes the Authority to recover the amount due, together with interest and other actual damages, by action in the state Superior Court. Without suit, the Authority may also certify to the State Treasurer the amount of any unpaid charge from a Local Body (except the Boston Water and Sewer Commission, the Lynn Water and Sewer Commission, the Dedham-Westwood Water District, and the Lynnfield Water District, which collectively will account for approximately 31.4 percent of total rate revenues in FY 2017), whereupon the State Treasurer is required by the Act to deduct the amount due from any distribution of local aid then payable to such Local Body by the Commonwealth, if any, and instead to pay such amount to the Authority. The Authority has collected 100 percent of its rates and charges in each year of its existence. This local aid intercept has been used only eight times in total, and not since FY 1993. To date, 100 percent of the Authority's rates and charges were collected within 30 days of due dates, except for one instance in which the Authority made special arrangements with a Local Body to extend the due date.



The availability of local aid distributions in the future to satisfy unpaid charges imposed by the Authority with respect to those Local Bodies eligible to receive such distributions will be dependent upon, among other things, the aggregate amount actually appropriated to each Local Body by the state legislature in a fiscal year for local aid distribution, and to the extent to which a Local Body's local aid distribution may have already been accessed under other valid intercept mechanisms.

### **4.3 Retail Customer Impacts**

The Local Bodies and their retail customers will continue to be impacted by the projected increases in the Authority's charges for water and wastewater service over the next several years. Local Bodies will be required to increase their contributions through retail user fee increases. Due to the variety of revenue sources used by the Local Bodies and the differences in service levels, it is difficult to accurately assess the impact of the projected increases in the Authority's charges on the average household in the Authority's service area. The Advisory Board annually surveys the Local Bodies, and on the basis of the 2015 *Annual Water and Sewer Retail Rate Survey*, the Advisory Board has estimated that during FY 2015 the average annual household charges for water and wastewater service across the 22 Local Bodies receiving both services will total \$1,474 using an industry standard benchmark that the average household consumes 90,000 gallons per year. For FY 2017 and FY 2018 we project that the average household bill assuming 90,000 gallons average annual consumption will increase to approximately \$1,616 and \$1,689, respectively. When making these projections, we have assumed (1) that the Local Body that provides retail services receives both water and sewer services from the Authority, (2) that the Local Body passes on to each household 100 percent of any Authority increases in the form of retail user fees, (3) that the Local Body's charges increase by 5.0 percent annually through FY 2022, and (4) that the Authority's charges constitute approximately 44 percent of the Local Bodies' charges in FY 2017.

Table 9 summarizes the projected annual household bills through FY 2022 assuming average household consumption of 90,000 gallons per year. Typical annual household bills are projected to increase to approximately \$2,015 in FY 2022. Of this amount, \$856 is the Authority wholesale charge and \$1,159 is the projected local charge.

These estimates of household charges are based on the assumptions regarding inflationary increases, long-term debt interest rates, state and federal assistance, estimates of additional operating expenses related to new facilities, and construction costs of new facilities. These estimated charges are, therefore, subject to change.

We believe that assuming average annual consumption of 90,000 gallons per year overstates residential consumption in many of the Local Bodies, and that most residential customers consume significantly less. Another benchmark that the Authority is using is based on 61,000 gallons per year per household, or 68 percent of the industry benchmark which the Authority believes tracks closer to actual consumption in its service area. Consequently, the average annual household bills described above and presented below are not reflective of the actual cost of water and sewer service being incurred by the Local Bodies' residential customers. At the consumption level of 61,000 gallons, the average retail bill during FY 2017 would be approximately \$1,096, and in FY 2022 the average bill is estimated to be \$1,366.

**Table 9**  
**Projected Typical Household Bills, FY 2017-2022**  
**(\$ in 000's)**

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
<b>Combined</b>						
Local	\$908	\$953	\$1,001	\$1,051	\$1,104	\$1,159
<u>MWRA</u>	<u>\$709</u>	<u>\$736</u>	<u>\$764</u>	<u>\$794</u>	<u>\$824</u>	<u>\$856</u>
Total	\$1,616	\$1,689	\$1,765	\$1,845	\$1,928	\$2,015
<b>Water</b>						
Local	\$337	\$354	\$372	\$391	\$410	\$431
<u>MWRA</u>	<u>\$323</u>	<u>\$336</u>	<u>\$350</u>	<u>\$366</u>	<u>\$381</u>	<u>\$399</u>
Total	\$661	\$690	\$722	\$757	\$791	\$829
<b>Sewer</b>						
Local	\$571	\$599	\$629	\$661	\$694	\$728
<u>MWRA</u>	<u>\$385</u>	<u>\$400</u>	<u>\$414</u>	<u>\$428</u>	<u>\$443</u>	<u>\$458</u>
Total	\$956	\$999	\$1,043	\$1,088	\$1,137	\$1,186

The retail rates within the Authority's service area are among the highest in the country according to the Advisory Board's 2015 *Annual Water and Sewer Retail Rate Survey*. The survey found an average annual combined water and sewer household bill of approximately \$1,474 assuming 90,000 gallons of water use for all 61 communities served by the Authority. However, comparing the costs to households of water and sewer services across jurisdictions is difficult given differing methodologies in establishing user fees, capital assessments, general tax support, and the availability of state and federal financial assistance. In addition, it is important to take into account regional variations in water consumption and household income when assessing the impact of such bills on residential customers. The Authority believes that with these factors taken into account its service costs are comparable to many utilities across the country.

For certain segments of the Authority's service area population, especially those with low and/or fixed incomes, we believe that the retail rates may be burdensome. If these increases are not mitigated in some fashion, certain demographic groups within the retail customer base may find the projected increases unaffordable. However, Local Bodies have a variety of means for mitigating these impacts, including lifeline rates, subsidization from other revenue sources, and discounts for senior and low-income households. Several of these measures have already been implemented by certain Local Bodies to mitigate the burden on the most vulnerable retail customers.

Based upon our review, and recognizing the availability and use of retail rate alternatives by the Local Bodies, we are reasonably confident that the Authority's projected rates and charges will be within the ability of the individual Local Bodies and their collective retail customer base to afford.

## 5 Compliance with the General Bond Resolution

Table 10 summarizes our evaluation of the Authority's compliance with certain terms of the Resolution from FY 2017 through FY 2022. The data included in this table regarding non-rate revenues, operating expenses, debt service assistance and reserve fund deposits are described in prior sections. Rate revenue is described in the preceding section. In general, the Authority must generate sufficient rate revenue to meet all operating and capital expenses after accounting for non-rate revenue, such as debt service assistance and investment income. In addition, the Authority's total revenues must be sufficient to comply with the debt service coverage requirements of the Resolution.

Projected annual revenue requirements of the Authority, including operation and maintenance expenses, debt service, and deposits into the various reserve funds are discussed previously. The Authority may deposit certain year-end surpluses from operations into the Rate Stabilization Fund (line 18) and use the accumulated balance in this fund to mitigate the impact of future increases in revenue requirements, subject to the terms of the Resolution and management discretion. Year-end surpluses have resulted from favorable variances of capital financing and other operating expenses, and non-rate revenues.

In addition to meeting its yearly cash requirements, the annual revenues of the Authority must be adequate to comply with certain covenants of the Resolution, including the covenants prescribed in Section 705 as to annual level of rates and charges and the required annual debt service coverage ratio (the "Rate Covenant"), as well as the covenants outlined in Section 206 concerning conditions precedent to the issuance of additional revenue bonds (the "Additional Bonds Test"). (For a more complete description of these requirements, see the Official Statement, of which this Appendix B is a part, including Appendix C, Summary of Certain Provisions of the General Bond Resolution.)

In order to comply with the Rate Covenant, annual revenues of the Authority must be adequate to: (1) meet all annual revenue requirements including operation and maintenance expenses, *pro rata* debt service fund deposits, and reserve fund requirements; and (2) provide revenue available for revenue bond debt service payments in each fiscal year equal to the sum of the Primary and Supplemental Coverage Ratios. Revenue available from current year operations must provide the Primary Bond Coverage Ratio of 120 percent.

The Authority is also required to maintain Revenues Available for Bond Debt Service at a level equal to 110 percent of debt service on all senior and secured bonds, including bonds issued to the SRF (Secured Bond Rate Covenant).

As shown on lines 23 through 25 of Table 10, the Authority is projected to generate sufficient revenues to comply with the applicable coverage requirements. The projected Primary Bond Coverage Ratio (line 24) exceeds the 120 percent requirement for all forecasted years. The Secured Bond Coverage Ratio (line 25) is projected to equal or surpass the 110 percent level in all forecasted years.

**Table 10**  
**Projected Compliance with Resolution<sup>1</sup>, FY 2017-2022**  
**(\$ in 000's)**

		FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
	<b>Revenues</b>						
1	Non-Rate Revenues:						
2	Investment Income	\$9,473	\$11,545	\$12,632	\$14,450	\$15,566	\$15,795
3	Rate Stabilization Fund	\$0	\$0	\$0	\$6,871	\$10,332	\$10,908
4	Miscellaneous	\$15,272	\$15,539	\$15,820	\$16,002	\$16,299	\$16,615
5	Rate Revenue Requirement	<u>\$694,536</u>	<u>\$721,006</u>	<u>\$748,222</u>	<u>\$776,449</u>	<u>\$805,661</u>	<u>\$835,911</u>
6	<b>Total Revenue</b>	<b>\$719,281</b>	<b>\$748,090</b>	<b>\$776,674</b>	<b>\$813,772</b>	<b>\$847,859</b>	<b>\$879,229</b>
7	Operating Expenses	\$235,494	\$241,086	\$248,731	\$255,669	\$262,001	\$270,301
8	Chelsea Facility Lease	\$3,217	\$3,217	\$3,217	\$3,217	\$3,217	\$3,217
9	<u>Other Post-Employment Benefits</u>	<u>\$4,876</u>	<u>\$5,035</u>	<u>\$5,205</u>	<u>\$5,387</u>	<u>\$5,580</u>	<u>\$5,787</u>
10	<b>Net Operating Revenues</b>	<b>\$475,694</b>	<b>\$498,751</b>	<b>\$519,520</b>	<b>\$549,499</b>	<b>\$577,061</b>	<b>\$599,924</b>
11	<b>Debt Service</b>						
12	Senior Debt Service	\$268,130	\$264,221	\$277,292	\$227,751	\$321,481	\$324,938
13	Debt Service Assistance & Bond Redemption Account	(\$874)	\$0	\$0	\$0	\$0	(\$15,783)
14	Secured Debt Service	<u>\$156,970</u>	<u>\$174,957</u>	<u>\$183,609</u>	<u>\$271,794</u>	<u>\$203,120</u>	<u>\$236,230</u>
15	<b>Total Debt Service</b>	<b>\$424,226</b>	<b>\$439,178</b>	<b>\$460,900</b>	<b>\$499,545</b>	<b>\$524,601</b>	<b>\$545,385</b>
16	Watershed and PILOT	\$24,291	\$26,291	\$26,996	\$27,720	\$28,464	\$29,228
17	Reserve Fund Deposits	(\$168)	\$932	\$1,274	\$1,156	\$1,055	\$1,383

18	Rate Stabilization Fund Deposits	\$0	\$0	\$0	\$0	\$0	\$0
19	Current Revenue for Capital	\$12,200	\$13,200	\$14,200	\$15,200	\$16,200	\$17,200
20	CP Interest for Water Pipeline Program	\$4,149	\$4,149	\$4,149	\$4,149	\$4,149	\$4,149
21	Debt Service Defeasance	\$10,995	\$15,000	\$12,000	\$1,729	\$2,591	\$2,578
22	<b>Balance Available Year End</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
23	<b>Rate Covenant Test</b>						
24	<b>Primary Coverage<sup>2</sup></b>	<b>1.78</b>	<b>1.89</b>	<b>1.87</b>	<b>2.41</b>	<b>1.80</b>	<b>1.94</b>
25	<b>Secured Coverage<sup>3</sup></b>	<b>1.12</b>	<b>1.14</b>	<b>1.13</b>	<b>1.10</b>	<b>1.10</b>	<b>1.10</b>

<sup>1</sup> These projections reflect the anticipated impact of the Bonds.

<sup>2</sup> Primary Coverage equals Net Revenues divided by Senior Debt.

<sup>3</sup> Secured Coverage equals Net Revenues divided by Total Debt.

Note: Totals may not add exactly due to rounding.

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**SUMMARY OF CERTAIN PROVISIONS OF THE GENERAL RESOLUTION**

The following is a brief summary of certain provisions of the Massachusetts Water Resources Authority (the “Authority”) Amended and Restated General Revenue Bond Resolution, that became effective on April 23, 2015 (as amended and supplemented to date, the “General Resolution”). Certain modifications to the General Resolution were approved by the Authority’s Board of Directors on January 10, 2007 and all but one are currently reflected in the General Resolution. The one additional modification that is pending relates to the general Bondholder consent requirement which, upon its effectiveness, would be reduced from the holders of two-thirds of the outstanding principal amount of each Series of Secured Bonds affected by a proposed amendment to the holders of 51% of the outstanding principal amount of such Series of Secured Bonds (the “Amendment Consent Modification”) and will be effective only upon the consent of 100% in aggregate principal amount of the Secured Bonds Outstanding at the time such amendment becomes effective and compliance with other provisions in the General Resolution and in other documents of the Authority applicable to amendments. See the caption “Powers of Amendment,” herein. The Authority intends to request that the initial purchasers of this and each future Series of Secured Bonds, including an underwriter purchasing such Secured Bonds for reoffering, will consent to this amendment at the time of original issue of each Series and each subsequent Bondholder will purchase such Secured Bond subject to the modification. Each Bondholder will be deemed to have consented to this amendment upon its purchase of the 2016 Bonds.

**By their acceptance of the 2016 Bonds and any future Series of Secured Bonds, the owners thereof will (i) agree to all the terms of the General Resolution as currently in effect and the proposed Amendment Consent Modification, (ii) waive the applicability of the provisions of the General Resolution affected by such Amendment Consent Modification, and (iii) agree to any amendments to the General Resolution that may be necessary, in the opinion of Bond Counsel, to effect such modifications.**

This summary does not purport to be complete and reference is made to the General Resolution for full and complete statements of its terms and provisions. In particular and without limitation, this summary does not include a description of the provisions of the Twenty-Fourth Supplemental Resolution relating to the Authority’s Multi-Modal Subordinated General Revenue Bonds, 1999 Series B, the Twenty-Seventh Supplemental Resolution relating to the Authority’s Tax-Exempt Commercial Paper Notes, Series 1999, the Thirty-Ninth Supplemental Resolution relating to the Authority’s Multi-Modal Subordinated General Revenue Refunding Bonds, 2002 Series C and 2002 Series D, the Fifty-Fourth Supplemental Resolution relating to the Authority’s Multi-Modal Subordinated General Revenue Refunding Bonds, 2008 Series A through F, the Sixty-Fourth Supplemental Resolution relating to the Authority’s Subordinated General Revenue Bonds, 2012 Series E, 2012 Series F and 2012 Series G, and the Seventieth Supplement Resolution relating to the Authority’s Subordinated General Revenue Notes, 2015 Series C, each as amended to the date of this Information Statement.

“Accountant” shall mean KPMG LLP or any independent certified public accountant (or a firm thereof) of recognized standing, selected by the Authority and satisfactory to the Trustee and may be the accountant regularly auditing the books of the Authority.

“Adjusted Debt Service” for any period of time, with respect to any category or Series of Secured Bonds shall mean, the Debt Service for such period of time with respect to such Series except that, if any Refundable Principal Installment of such Series is included in Debt Service for such period of time, Adjusted Debt Service shall mean Debt Service determined as if such Refundable Principal Installment had been payable over a period extending from the due date of such Refundable Principal Installment through the date identified in the Supplemental Resolution authorizing such Series (which date may be no later than the last date on which such Series could have been stated to mature under the Act as in effect on the date of issuance of such Series), in installments which would have required level annual payments of the sum of Principal Installments and interest over such period. Interest deemed payable in any period of time after the actual due date of any Refundable Principal Installment of any Series of Secured Bonds shall be calculated at the applicable Refundable Principal Installment Pro Forma Interest Rate (using the actuarial method of calculation).

“Aggregate Adjusted Debt Service” shall mean, for any Fiscal Year, and with respect to Bonds or Subordinated Bonds, the aggregate of the Adjusted Debt Service on all Series of Bonds or Subordinated Bonds for such Fiscal Year.

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“Authorized Representative” shall mean, with respect to the Authority, the Chairman, the Vice Chairman, the Executive Director, the Director of Administration and Finance or the Treasurer of the Authority and, when used in reference to an act or document, shall also mean any other person authorized by resolution of the Authority to perform such act or sign such document.

“Bond” or “Bonds” shall mean any bonds, notes or other evidences of indebtedness, as the case may be, authenticated and delivered pursuant to the General Resolution in the manner described under the heading Conditions Precedent to Delivery of a Series of Bonds and shall also mean any Parity Bond Anticipation Notes and any Parity Reimbursement Obligation incurred with respect to Bonds, but shall not mean Subordinated Bonds, other Bond Anticipation Notes or other Indebtedness.

“Bond Anticipation Notes” shall mean any of the notes issued in anticipation of a Series of Secured Bonds pursuant to the General Resolution and shall include, unless the context otherwise indicates, Parity Bond Anticipation Notes and Subordinated Parity Bond Anticipation Notes.

“Bond Counsel’s Opinion” shall mean an opinion by McCarter & English, LLP, or any attorney or firm of attorneys of nationally recognized standing in the field of law relating to revenue bonds of public instrumentalities, selected by the Authority and satisfactory to the Trustee and may be an attorney or firm regularly providing services to the Authority.

“Business Day” shall mean any day other than a Saturday, a Sunday or any other day on which any Fiduciary is authorized or required by law to be closed for business.

“Capital Budget” shall mean the capital expenditure budget of the Authority as in effect from time to time in accordance with Section 8(b) of the Act and the General Resolution.

“Capital Improvements” shall mean extensions, improvements, enlargements, betterments, alterations, renewals and replacements of the System or other property of the Authority (including land, equipment and other real or personal property), which (i) is used or useful in connection with the System or any part thereof, (ii) is constructed, acquired or made by or on behalf of the Authority subsequent to the date of adoption of the General Resolution, and (iii) is properly chargeable (whether or not so charged by the Authority) according to generally accepted accounting principles, as additions to utility plant accounts.

“Code” shall mean the Internal Revenue Code of 1986, as amended, including any regulations promulgated thereunder or applicable thereto.

“Commonwealth Obligations” shall mean obligations of the Authority payable to the Commonwealth, including without limitation obligations with respect to principal of, premium, if any, or interest on Commonwealth debt required to be paid by the Authority under applicable law, amounts payable to the Commonwealth pursuant to Section 5(b) of the Act, state taxes, payments in lieu of taxes collected by the Commonwealth on behalf of any municipality, payments on account of administrative costs of the Watershed Division and state governmental charges of all other kinds, but not including Water Pollution Abatement Obligations; and shall also include Special Payment Obligations, which shall be payable equally and ratably with all other Commonwealth Obligations.

“Consulting Engineer” shall mean Camp Dresser & McKee Inc. or any independent engineer or firm of engineers selected by the Authority pursuant to the General Resolution.

“Costs” as applied to any Project, shall mean all or any part of the cost, paid by or on behalf of or reimbursable by or to the Authority, of undertaking and carrying out such Project including, without limitation, any item of “cost” as defined in the Act.

“Credit Facility” shall mean a letter of credit, revolving credit agreement, standby purchase agreement, surety bond, insurance policy or similar obligation, arrangement or instrument issued by a bank, insurance company or other financial institution, the senior long term debt obligations of which (or the holding company of any bank) are rated in either of the highest two rating categories by each Rating Agency which provides for payment of all or a



portion of the Principal Installments or interest due on any Series of Secured Bonds or provides funds for the purchase of such Secured Bonds or portions thereof.

“Current Expenses” shall mean any expenses incurred by or for the account of the Authority or reimbursable by or to the Authority for maintaining, repairing or operating the System and engaging in other activities authorized by the Act including, without limiting the generality of the foregoing, any item of “current expense” as defined in the Act, amounts defined herein as Operating Expenses, Debt Service, Commonwealth Obligations or Water Pollution Abatement Obligations, and other current expenses required or permitted by law to be paid by or reimbursable to the Authority.

“Debt Service” for any period of time shall mean, as of any date of calculation and with respect to any Series of Indebtedness, an amount equal to the sum of (i) interest payable during such period of time on Indebtedness of such Series (including any interest payable on any Parity Bond Anticipation Notes), except to the extent that such interest is to be paid from amounts representing Capitalized Interest and (ii) the Principal Installments of the Indebtedness of such Series payable during such period of time. Such interest and Principal Installments for such Series shall be calculated on the assumption that (x) no Indebtedness of such Series Outstanding at the date of calculation will cease to be Outstanding except by reason of the payment thereof upon stated maturity or upon mandatory redemption by application of Sinking Fund Installments and (y) as to future period, Variable Rate Indebtedness will bear interest at the greater of (A) the rate or rates which were assumed by the Authority in the current Operating Budget to be borne by such Variable Rate Indebtedness during such period or (B) the weighted average of the actual rate or rates borne by such Variable Rate Indebtedness over the preceding month, or (C) but only for the first Fiscal Year in which such Variable Rate Indebtedness is Outstanding, the interest rate stipulated by the Authority in the Supplemental Resolution authorizing such Indebtedness.

“Defeasance Obligations” shall mean the obligations described in clause (a), (b), (c), (d) or (j) of the definition of Investment Securities; provided that such obligations shall not be redeemable prior to the maturity date or stated redemption date relied upon in satisfying the conditions of the General Resolution with respect to defeasance.

“Designated Debt” shall mean any Series of Secured Bonds with respect to which there shall be in effect a Qualified Swap.

“Depository” shall mean any bank or trust company selected by the Authority, as the case may be, as a depository of moneys to be held under the provisions of the General Resolution, any may include the Trustee.

“Event of Default” shall mean any event specified as such in the General Resolution.

“Fiduciary” shall mean the Trustee or any Paying Agent or Depository.

“Financial Guaranties” shall mean one or more of the following: (i) irrevocable, unconditional and unexpired letters of credit issued by banking institutions the senior long-term debt obligations of which (or the holding company of any such banking institution) have (at the time of issue of such letter of credit) a rating in either of the two highest categories from each Rating Agency; or (ii) an irrevocable and unconditional policy or policies of insurance in full force and effect issued by municipal bond insurers or multiline insurers the obligations insured by which are eligible for a rating in either of the two highest categories from each Rating Agency; in each case providing for the payment of sums for the payment of Principal Installments of and interest on Secured Indebtedness in the manner provided in the General Resolution; and providing further that any such Financial Guaranty must be drawn upon on a date which is at least seven (7) days prior to the expiration date of such Financial Guaranty in an amount equal to the deficiency which would exist if the Financial Guaranty expired, unless a substitute Financial Guaranty is acquired prior to such expiration date as provided in a related Supplemental Resolution.

“Fiscal Year” shall mean the twelve-month period commencing July 1 of any calendar year and ending June 30 of the succeeding calendar year or such other twelve-month period as may be provided by the Act or authorized by the Authority pursuant to the Act.

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“Governmental Obligations” shall mean direct general obligations of, or obligations the timely payment of principal of and interest on which are unconditionally guaranteed by, the United States of America.

“Grant Agreements” shall mean any and all agreements between the Authority (by original execution or by transfer from the Metropolitan District Commission pursuant to the Act) and the United States of America or the Commonwealth, or any agency, department, bureau, commission or other instrumentality of either thereof, all as the same may be amended or supplemented from time to time, providing for or relating to the provision of Grant Receipts to the Authority.

“Grant Receipts” shall mean any money received by or on behalf of the Authority under or pursuant to a Grant Agreement as or on account of a grant or contribution, heretofore or hereafter made, in aid of or with respect to any Project (including without limitation any such moneys received by the Commonwealth or the Metropolitan District Commission in trust for the Authority pursuant to Sections 4 and 5 of the Act as or on account of a grant or contribution, heretofore made, in aid of or with respect to any improvement to the System).

“Indebtedness” shall mean indebtedness for borrowed money of the Authority, including without limitation all Bonds, Subordinated Bonds, Bond Anticipation Notes, Reimbursement Obligations, Special Subordinated Indebtedness and the Prior Notes but shall not include Special Payment Obligations.

“Investment Securities” shall mean and include any of the following securities, if and to the extent the same are at the time legal investments by the Authority of the funds to be invested therein and conform to the policies set forth in any investment guidelines adopted by the Authority or by a duly appointed subcommittee of its Board of Directors and in effect at the time of the making of such investment:

- (a) Government Obligations;
- (b) Certificates or receipts representing direct ownership of future interest or principal payments on Government Obligations or any obligations of agencies or instrumentalities of the United States of America which are backed by the full faith and credit of the United States, which obligations are held by a custodian in safekeeping on behalf of the holders of such receipts;
- (c) Bonds, debentures, notes or other evidences of indebtedness issued by any of the following: Federal Home Loan Mortgage Corporation; Student Loan Marketing Association; Federal Home Loan Banks; Federal National Mortgage Association; Government National Mortgage Association; Bank for Cooperatives; Federal Intermediate Credit Banks; Federal Financing Bank; Export-Import Bank of the United States; Federal Land Banks; or any other agency or instrumentality of the United States of America; or the International Reconstruction Development Bank;
- (d) All other obligations issued or unconditionally guaranteed as to the timely payment of principal and interest by an agency of person controlled or supervised by and acting as an instrumentality of the United States of America pursuant to authority granted by Congress;
- (e) Interest-bearing time or demand deposits, certificates of deposit, or other similar banking arrangements with any government securities dealer, bank, trust company, savings and loan association, national banking association or other savings institution (including the Trustee), provided that such deposits, certificates, and other arrangements are fully insured by the Federal Deposit Insurance Corporation or the Federal Savings and Loan Insurance Corporation or (ii) interest-bearing time or demand deposits or certificates of deposit with any bank, trust company, national banking association or other savings institution (including the Trustee), provided such deposits and certificates are in or with a bank, trust company, national banking association or other savings institution whose long-term unsecured debt is rated in one of the three highest long-term rating categories by S&P and Moody’s (if such rating agencies are Rating Agencies) and, if rated by any other Rating Agency, rated in the three highest rating categories of such Rating Agency, and provided further that with respect to (i) and (ii) any such obligations are held by the Trustee or a bank, trust company or national banking association (other than the issuer of such obligations, unless the issuer is the Trustee);

(f) Repurchase agreements collateralized by securities described in subparagraphs (a), (b), (c) or (d) above with any registered broker/dealer or with any commercial bank, provided that (1) a specific written repurchase agreement governs the transaction, (2) the securities are held, free and clear of any lien, by the Trustee or an independent third party acting solely as agent for the Trustee, and such third party is (a) a Federal Reserve Bank, or (b) a bank which is a member of the Federal Deposit Insurance Corporation and which has combined capital, surplus and undivided profits of not less than \$25 million, and the Trustee shall have received written confirmation from such third party that it holds such securities, free and clear of any lien, as agent for the Trustee, (3) the repurchase agreement has a term of thirty days or less, or the Trustee will value the collateral securities no less frequently than monthly and will liquidate the collateral securities if any deficiency in the required collateral percentage is not restored within five business days of such valuation, and (4) the fair market value of the collateral securities in relation to the amount of the repurchase obligation, including principal and interest, is equal to at least 102%;

(g) Money market funds rated in the highest category by S&P and Moody's (if such rating agencies are Rating Agencies) and, if rated by any other Rating Agency, rated in the highest rating category of such Rating Agency;

(h) Commercial paper rated in the highest rating category by S&P and Moody's (if such rating agencies are Rating Agencies) and, if rated by any other Rating Agency, rated in the highest rating category of such Rating Agency;

(i) Shares of investment companies or cash equivalent investments which are authorized to invest only in assets or securities described in subparagraphs (a), (b), (c), (d) and (f) above;

(j) Obligations the interest on which is excluded from gross income for purposes of federal income taxation that have been advance-refunded prior to their maturity and that are fully and irrevocably secured as to principal and interest by Government Obligations, or Government Obligations which have been stripped of their unmature interest coupons and interest coupons stripped from Government Obligations, held in trust for the payment thereof which obligations are rated in the highest rating category by each Rating Agency;

(k) Short-term or long-term obligations the interest on which is excludable from gross income for Federal income tax purposes and that are rated in the three highest rating categories by S&P and Moody's (if such rating agencies are Rating Agencies) and, if rated by any other Rating Agency, rated in the three highest rating categories of such Rating Agency, or shares of investment companies or cash equivalent investments which are authorized to invest primarily in such obligations;

(l) participation units in a combined investment fund created under Section 38A of Chapter 29 of the General Laws of the Commonwealth;

(m) investment contracts with banks or other financial institutions whose long-term unsecured debt or claims-paying ability is rated in one of the three highest rating categories by S&P and Moody's (if such rating agencies are Rating Agencies) and, if rated by any other Rating Agency, rated in the three highest rating categories of such Rating Agency; and

(n) forward purchase agreements for the delivery of securities described in subparagraph (a), (b), (c), (d), (h) or (k) above from financial institutions rated in one of the three highest rating categories by S&P and Moody's (if such rating agencies are Rating Agencies) and, if rated by any other Rating Agency, rated in one of the three highest rating categories by such Rating Agency; and

(o) any other investment authorized pursuant to an amendment or supplement hereto pursuant to the General Resolution.

Obligations of any Fiduciary or an affiliate thereof may be Investment Securities, provided that they otherwise qualify.

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“Local Body Default” shall mean a default in the payment of any Rates and Charges due to the Authority by a Local Body, as certified by an Authorized Representative of the Authority in accordance with the provisions of the General Resolution.

“Moody’s” shall mean Moody’s Investors Service Inc.

“Net Revenues” shall mean with respect to a period to time all Revenues accrued in such period in accordance with general accepted accounting principles less the Operating Expenses incurred or payable during such period in accordance with generally accepted accounting principles; provided, however, that the proceeds of revenue anticipation notes shall not constitute Revenues and the principal amount of such notes shall not constitute Operating Expenses for the purpose of calculating Net Revenues.

“Operating Budget” shall mean the Operating Budget duly adopted by the Authority in the same manner as its Current Expense Budget, except as provided in the General Resolution, as amended from time to time, in accordance with the General Resolution, which Operating Budget may constitute a portion of, or an exhibit or appendix to, such Current Expense Budget.

“Operating Expenses” shall mean the Authority’s expenses, whether or not annually recurring, of maintaining, repairing and operating the System and engaging in other activities authorized by the Act including, without limiting the generality of the foregoing, amounts for administrative expenses including costs of salaries and benefits and amounts required to finance pension benefits earned by employees of the Authority, as provided in the Act; cost of insurance, payments for engineering, financial, accounting, legal and other services rendered to the Authority, payments under any interest rate exchange, cap, or other hedge agreement which have been designated by the authority as Operating Expenses for purposes of the General Resolution in such agreement; costs incurred or payable by the Authority with respect to the System Real Property (as defined in the Act); costs of issuance not financed in the Costs of a Project paid by the Authority; and payments of interest on revenue anticipation notes and other Current Expenses; but not including depreciation, recognition upon disposal or other retirement of a capital asset, Debt Service payable from any Fund or Account established hereunder, Commonwealth Obligations, Water Pollution Abatement Obligations, Special Payment Obligations, and expenses incurred in connection with a separate facility financing as described under “Additional Indebtedness - Special Subordinated Indebtedness.”

“Option Bonds” shall mean Secured Bonds which by their terms may be tendered by and at the option of the owner thereof for purchase or payment by the Authority prior to the stated maturity thereof.

“Outstanding”, when used with reference to Bonds or any other Indebtedness, shall mean, as of any date, all Bonds or other evidences of Indebtedness theretofore or thereupon being authenticated and delivered under the General Resolution except:

(a) any Bonds or other evidences of Indebtedness canceled by the Trustee at or prior to such date;

(b) any Bond or other evidence of Indebtedness (or portion thereof) for the payment or redemption of which there shall be set aside and held in trust hereunder either; (i) moneys in an amount sufficient to pay when due the Principal Installments or Redemption Price thereof, together with all accrued interest, (ii) Defeasance Obligations in such principal amounts, of such maturities, bearing such interest and otherwise having such terms and qualifications, as are necessary to provide moneys (whether as principal or interest) in an amount sufficient to pay when due the Principal Installments or Redemption Price thereof, together with all accrued interest, or (iii) any combination of (i) and (ii) above, and, if such Bond or other evidence of Indebtedness or portion thereof is to be redeemed, for which notice of redemption has been given as provided in the General Resolution, or the applicable Supplemental Resolution, or provision satisfactory to the Trustee has been made for the giving of such notice;

(c) any Bond or other evidence of Indebtedness in lieu of or in substitution for which other Bonds or other evidences of Indebtedness have been authenticated and delivered; and

(d) any Bond or other evidence of Indebtedness deemed to have been paid as provided in the General Resolution.

“Parity Bond Anticipation Notes” shall mean Bond Anticipation Notes the interest on which is payable from and secured by a pledge of, and a lien on, the Revenues on a parity with the lien created by the General Resolution to secure the Bonds.

“Parity or Senior Secured Bonds” shall mean any Secured Bonds issued on a parity with or senior to the SRF Bonds.

“Parity Reimbursement Obligation” shall mean a Reimbursement Obligation the payment of which is secured by a pledge of, and a lien on, Revenues on a parity with the lien created in favor of a class of Secured Bonds by the General Resolution.

“Parity Subordinated Bonds” shall mean the Authority’s General Revenue Bonds (Subordinated Series), 2005 Series D originally issued on November 16, 2005 and each Series of Subordinated Bonds or Bond Anticipation Notes theretofore or thereafter issued on a parity with such 2005 Series D Subordinated Bonds, and shall also mean any Subordinated Parity Bond Anticipation Notes and any Parity Reimbursement Obligations incurred with respect to Parity Subordinated Bonds.

“Payment Date” shall mean, with respect to any class of Secured Bonds, each date on which interest or a Principal Installment or both shall be due and payable on any of such Outstanding Secured Bonds according to their respective terms.

“Primary Bond Coverage Requirement” shall mean, for any twelve-month period, the product of the Primary Bond Coverage Ratio and the Required Debt Service Fund Deposits for all Outstanding Bonds for such period.

“Principal Installment” shall mean, as of any date of calculation and with respect to any Series of Secured Indebtedness, so long as any obligations of such Series are Outstanding, (i) the principal amount of obligations of such Series due on a certain future date for which no Sinking Fund Installments have been established or (ii) the unsatisfied balance of any Sinking Fund Installments due on a certain future date for obligations of such Series. For the purposes of the preceding sentence, “Principal Amount” shall include (x) any amount designated in, or determined pursuant to, the applicable Supplemental Resolution, as the “principal amount” with respect to any Bonds or Subordinated Bonds which do not pay full current interest for all or any part of their term, (y) the Tender Option Price of any Option Bonds which may be tendered to the Authority for purchase or payment prior to the stated maturity thereof in accordance with the terms of the Supplemental Resolution authorizing such Option Bonds, unless such amount is secured by a Credit Facility which is not in default and (z) the principal amount of any Parity Reimbursement Obligation. Principal Installment shall, however, not include the principal of Bond Anticipation Notes.

“Pro Forma Bond Issue” shall mean when used with reference to the Debt Service Reserve Fund Requirement or the Subordinated Debt Service Reserve Fund Requirement in connection with a Series of Variable Rate Indebtedness, the hypothetical fixed rate long-term bond issue set forth in the Supplemental Resolution authorizing such Series, having (i) the same maturities (and sinking fund provisions, if any) as the Series of Variable Rate Indebtedness to which it relates and (ii) such interest rate or rates as the Authority shall reasonably deem to be the equivalent of the rates which would have been borne by such Series of Variable Rate Indebtedness if such Series had been issued as a Series of Fixed Rate Indebtedness; provided that such interest rate shall be not less than 80% of the “30-year revenue bond index” the most recently published by The Bond Buyer or, if such index is no longer published such other substantially comparable index as determined by the Authority with the approval of the Trustee.

“Project” shall mean any undertaking or other activity by or on behalf of the Authority to maintain, improve or enlarge the System or to maintain, improve or enlarge any facilities owned or operated by any Local Body the maintenance, improvement or enlargement of which directly or indirectly affects the Waterworks

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Operations or Sewer Operations of the Authority or to acquire, construct, maintain, improve or enlarge any other facilities or properties to be lawfully owned or operated by the Authority including, without limitation, any “project” as defined in the Act.

“Qualified Swap” shall mean an interest rate exchange, cap or other hedge agreement (a) whose Designated Debt is all or part of a particular Series of Secured Bonds and (b) which has been designated to the Trustee by the Authority as a Qualified Swap with respect to such Secured Bonds.

“Rates and Charges” shall mean all charges, whether denominated as charges, fees, rates, assessments or otherwise, established by the Authority for the water supply or sewer services provided by the Authority.

“Rating Agencies” shall mean Moody’s and S&P and their respective successors and assigns if such rating agencies are maintaining a rating on the Secured Bonds at the request of the Authority, and shall also include any other rating agency nationally recognized for skill and expertise in rating the credit of obligations such as the Secured Bonds and which is maintaining a rating on the Secured Bonds at the request of the Authority.

“Rebate Fund Requirement” means, as of any date of calculation, an amount equal to the aggregate of the amounts, if any, specified in each Series Resolution authorizing the issuance of a Series of Indebtedness as the amount required to be maintained in the Rebate Fund with respect to such Indebtedness.

“Redemption Price” shall mean, when used with respect to a Secured Bond or portion thereof, the principal amount thereof plus the applicable premium, if any, payable upon either optional or mandatory redemption thereof pursuant to the General Resolution.

“Refundable Principal Installment” shall mean any Principal Installment for any Series of Bonds or Subordinated Bonds which the Authority intends to pay with moneys which are not Revenues, provided that such intent shall have been expressed in the Supplemental Resolution authorizing such Series of Bonds or Subordinated Bonds and provided further that such Principal Installment shall be a Refundable Principal Installment only until the date of adoption of the Rates and Charges for the Fiscal Year (after which time such Refundable Principal Installment shall be treated as payable in level payments of the sum of the Principal Installments and interest over a five-year period commencing in such Fiscal Year at an interest rate determined by the Authority, set forth on a Certificate based on then prevailing interest rates for obligations such as the Bonds or the Subordinated Bonds, as the case may be) in which such Principal Installment comes due unless the Authority has delivered to the Trustee a Certificate of an Authorized Representative to the effect that it has made provision for the payment of such Principal Installment from a source other than Revenues.

“Refundable Principal Installment Pro Forma Interest Rate” shall mean, when used with reference to a Refundable Principal Installment, such hypothetical fixed interest rate as the Authority shall designate in the Supplemental Resolution authorizing such Refundable Principal Installment, based on then prevailing interest rates for obligations such as the Bonds or the Subordinated Bonds, as the case may be, to be the net interest cost which would have been borne by the Bonds or the Subordinated Bonds, as the case may be, constituting such Refundable Principal Installment if they had been payable on a level debt service basis over a period from the due date of such Refundable Principal Installment through the date identified in the Supplemental Resolution authorizing such Refundable Principal Installment (which date may be no later than the last date on which such Refundable Principal Installment could have been stated to mature under the Act as in effect on the date of issuance of such Refundable Principal Installment).

“Regularly Scheduled Qualified Swap Payments” shall mean the regularly scheduled payments under the terms of Qualified Swap which are payable by the Authority absent any termination, default or dispute in connection with such Qualified Swap.

“Reimbursement Obligation” shall mean the obligation of the Authority described in the General Resolution to reimburse the issuer of a Credit Facility for amounts paid by such issuer thereunder together with interest thereon, whether or not such obligation to so reimburse is evidenced by a promissory note or other similar instrument.

“Renewal and Replacement Reserve Cash Requirement” shall mean the greater of (a) the lesser of (i) the Renewal and Replacement Reserve Fund Requirement and (ii) \$10,000,000 and (b) the Renewal and Replacement Reserve Requirement minus the unutilized credit available to the Authority under any commercial paper program or committed line of credit established by the Authority for the purpose of financing capital spending of the Authority.

“Required Debt Service Fund Deposits” shall mean, for any period of time, all deposits made to the Principal and Interest Accounts of the Debt Service Fund for such period whether pursuant to the flow of funds provisions, application of investment earnings provisions or any other provision of the General Resolution (but shall not include amounts transferred from the Capitalized Interest Account, amounts paid from state debt service assistance which the Authority elects not to include in Revenues or other funds of the Authority that are not Revenues and are not transferred from other Funds or Accounts established under the General Resolution).

“Required Debt Service Fund Deposits” shall mean, for any period of time, all deposits made to the Principal and Interest Accounts of the Debt Service Fund for such period whether pursuant to the provisions of the General Resolution described in paragraph (a) under the heading Flow of Funds from the Revenue Fund or provisions regarding transfer of investment earnings described in paragraph (b) under the heading Investment of Certain Funds (including earnings retained in the Debt Service Fund) or any other provision of the General Resolution or any Supplemental Resolution, but shall not include amounts transferred from the Capitalized Interest Account or amounts paid from state debt service assistance which the Authority elects not to include in Revenues or other funds of the Authority that are not Revenues and are not transferred from other Funds or Accounts established under the General Resolution. For the purpose of this definition, for each Series of Designated Debt consisting of Bonds for any period, the amount required to be deposited into the Interest Account of the Subordinated Debt Service Fund pursuant to the provisions of the General Resolution described in clauses (a)(iii)(B) and (a)(iii)(E) under the heading Flow of Funds from the Revenue Fund shall be deemed to be solely the Regularly Scheduled Qualified Swap Payments relating to such Series of Designated Debt provided in the applicable Qualified Swap (and calculated, if variable in rate, as provided in the definition of “Debt Service”).

“Required Subordinated Debt Service Fund Deposits” shall mean, for any period of time, all deposits required to be made to the Principal and Interest Accounts of the Subordinated Debt Service Fund for such period with respect to Parity Subordinated Bonds, whether pursuant to the provisions of the General Resolution described in paragraph (a) under the heading Flow of Funds from the Revenue Fund or provisions regarding transfer of investment earnings described in paragraph (b) under the heading Investment of Certain Funds (including earnings retained in the Subordinated Debt Service Fund) or any other provision of the General Resolution or any Supplemental Resolution providing for the issuance of Parity Subordinated Bonds, provided; however, that such deposits shall not include amounts transferred from the Capitalized Interest Account or amounts paid from state debt service assistance which the Authority elects not to include in Revenues or other funds of the Authority that are not Revenues and are not transferred from other Funds or Accounts established under the General Resolution. For purposes of determining Required Subordinated Debt Service Fund Deposits with respect to any Series of Parity Subordinated Bonds constituting Water Pollution Abatement Obligations, such deposit requirements shall be determined in accordance with any debt service schedule set forth in the Supplemental Resolution or other agreement or instrument relating to such Series of Parity Subordinated Bonds that identifies loan payments net of contract assistance and reserve fund earnings, if applicable, as adjusted from time to time, but no adjustment on account of a failure to receive payment of any investment in such a reserve fund or of any contract assistance shall be required to be made unless the Authority shall determine to do so and, further, no adjustment on account of the use of a reserve fund to cover a payment default shall be required, unless the Authority shall determine to do so, in determining Required Subordinated Debt Service Fund Deposits occurring prior to the earlier of (i) eighteen months following the date which follows the occurrence of the event resulting in the increased loan payment or (ii) the next establishment by the Authority of its Rates and Charges which can feasibly incorporate the increased loan payment resulting from such event. For the purpose of this definition, for each Series of Designated Debt consisting of Parity Subordinated Bonds for any period, the amount required to be deposited into the Interest Account of the Debt Service Fund pursuant to the provisions of the General Resolution described in clauses (a)(ii)(B) and (a)(ii)(E) under the heading Flow of Funds from the Revenue Fund shall be deemed to be solely the Regularly Scheduled Qualified Swap Payments relating to such Series of Designated Debt provided in the applicable Qualified Swap (and calculated, if variable in rate, as provided in the definition of “Debt Service”).

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“Revenues” shall mean and include all income, revenue, receipts, and other moneys derived by the Authority from its operation of the Systems and engaging in other activities authorized by the Act and all accounts, general intangibles and contract or other rights to receive the same, whether existing at the date of adoption of a General Resolution or thereafter coming into existence and whether held by the Authority at such date or thereafter acquired, and the proceeds thereof including, without limiting the generality of the foregoing, all “revenue” as defined in the Act and receipts from Rates and Charges and, except to the extent provided in the General Resolution, the proceeds of insurance and condemnation awards received with respect to, and proceeds from the sale or other disposition of any portion of, the System, and shall include, without limiting the foregoing, all interest and investment income or moneys held under the General Resolution which are deposited in the Revenue Fund, the Operating Fund or the Debt Service Fund, but not including the proceeds of any Special Subordinated Indebtedness or any Grant Receipts (except to the extent otherwise provided herein or in any other resolution of the Authority), any revenues, receipts or other moneys of a facility financed with repayments of principal of loans made from the Revolving Loan Fund, or any amounts permitted to be received and held outside of the various Funds and Accounts established by the General Resolution.

“Revenues Available for Bond Debt Service” shall mean, with respect to a twelve-month period, Net Revenues for such period plus (i) amounts transferred from the Rate Stabilization Fund to the Revenue Fund during such period; and (ii) amounts transferred from the Operating Reserve Fund to the Operating Fund in such period; provided, however, for purposes of calculating Revenues Available for Bond Debt Service, the sum of clause (i) and (ii) above shall not exceed the product of (x) the difference between the Primary Bond Coverage Ratio and 1.0, if any, and (y) the Required Debt Service Fund Deposits for all Outstanding Bonds for such period; and provided, further, that for purposes of calculating Revenues Available for Bond Debt Service the amount included pursuant to clause (i) above shall not exceed the product of (x) 0.1 and (y) the Required Debt Service Fund Deposits for all Outstanding Bonds for such period. Revenues deposited to the General Fund which are subsequently transferred to the Rate Stabilization Fund shall not be included in Revenues Available for Bond Debt Service in the year that such Revenues are deposited to the General Fund.

“Revenues Available for Subordinated Debt Service” shall mean with respect to a Fiscal Year, Revenues Available for Bond Debt Service less Required Debt Service Fund Deposits on all Series of Bonds Outstanding during such Fiscal Year.

“S&P” shall mean Standard & Poor’s Ratings Group.

“Secured Bond Coverage Ratio” shall mean 1.1 as adjusted from time to time pursuant to the General Resolution.

“Secured Bonds” or “Secured Indebtedness” shall mean all Bonds and all Subordinated Bonds.

“Secured Bond Coverage Requirement” shall mean, for any twelve-month period, the product of the Secured Bond Coverage Ratio and the sum of (i) the Required Debt Service Fund Deposits of all Outstanding Bonds for such period and (ii) the Required Subordinated Debt Service Fund Deposits for all Outstanding Parity Subordinated Bonds for such period.

“Series” or “Series of Secured Bonds” shall mean all of the Secured Bonds authenticated and delivered on original issuance identified pursuant to the Supplemental Resolution authorizing such Secured Bonds as a separate Series of Secured Bonds and any Secured Bonds thereafter authenticated and delivered in lieu of or in substitution therefor pursuant to the General Resolution regardless of variations in maturity, interest rate or other provisions.

“Sewer Operations” shall mean the “sewer division” established pursuant to Section 8(a) of the Act.

“Sinking Fund Installment” shall mean, as of any particular date of calculation, the amount required by the General Resolution or any Supplemental Resolution to be paid by the Authority on a future date for the retirement of the principal amount of Outstanding Bonds or Subordinated Bonds which are stated to mature subsequent to such future date, but does not include any amount payable by the Authority by reason only of the maturity of a Bond or Subordinated Bond.



“Special Credit Facility” shall mean, with respect to any Series of Secured Bonds or portion thereof, a Credit Facility (a) which provides funds for (i) the direct payment of the Principal Installments of and interest on such Secured Bonds when due or (ii) the payment of the Principal Installments of and interest on such Secured Bonds in the event amounts otherwise pledged to the payment thereof are not available when due or (iii) the payment of the Tender Option Price of any Option Bond which may be tendered to the Authority for purchase or payment in accordance with the Supplemental Resolution authorizing such Option Bond (in any case, regardless of whether such Credit Facility provides funds for any other purpose) and (b) which (i) requires the Authority to directly reimburse the issuer of such Credit Facility for amounts paid thereunder and (ii) provides that such obligation is a Parity Reimbursement Obligation.

“Special Payment Obligations” shall mean payment obligations under any interest rate exchange, cap or other hedge agreement or other long-term contract which have been designated as payable from the Commonwealth Obligation Fund in such agreement.

“Special Subordinated Indebtedness” shall mean Indebtedness incurred in anticipation of grant receipts; incurred in anticipation of revenues; payable from and secured by the General Fund; incurred with respect to the financing of a separate facility; or incurred in connection with the Revolving Loan Fund, all in accordance with the provisions of the General Resolution.

“SRF Bonds” shall mean Water Pollution Abatement Obligations of the Authority.

“SRF Program Bonds” shall mean bonds of the Trust secured by SRF Bonds.

“Subordinated Bonds” shall mean bonds or indebtedness which have a lien subordinate to the lien of the Bonds, on the Funds and Accounts and property established under the General Resolution, and shall also mean any Subordinated Parity Bond Anticipation Notes and any Parity Reimbursement Obligation incurred with respect to Subordinated Bonds; provided that the Subordinated Bonds have no lien on the Debt Service Fund or the Debt Service Reserve Fund.

“Subordinated Debt Service Reserve Fund Requirement” shall mean the aggregate of the amounts, if any, required to be deposited in the Subordinated Debt Service Reserve Fund pursuant to all Supplemental Resolutions authorizing the issuance of Subordinated Bonds.

“Subordinated Parity Bond Anticipation Notes” shall mean Bond Anticipation Notes the interest on which is payable from and secured by a pledge of, and a lien on, the Revenues on a parity with the lien created by the General Resolution to secure the Subordinated Bonds.

“Supplemental Bond Coverage Requirement” for any Fiscal Year shall mean, unless the context otherwise indicates, the Required Debt Service Fund Deposits for all Bonds Outstanding as of the beginning of such Fiscal Year, times the Supplemental Bond Coverage Ratio.

“Supplemental Resolution” shall mean a resolution of the Authority authorizing the issuance of a Series of Bonds or Subordinated Bonds or otherwise amending or supplementing the General Resolution, adopted in accordance with the General Resolution.

“System” shall mean collectively the “Waterworks System” and the “Sewer System” as such terms are defined in Section 1(o) and 1(v) of the Act.

“Tax Exempt Indebtedness” shall mean Indebtedness the interest on which is excluded from gross income of the holder thereof for federal income tax purposes which was accompanied by a favorable Bond Counsel’s Opinion regarding such exclusion on the date of such Indebtedness.

“Tender Option Price” shall mean, with respect to any Option Bond tendered for purpose or payment in accordance with the Supplemental Resolution authorizing such Option Bond, an amount equal to the principal amount of such Option Bond.

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“Trust” shall mean the Massachusetts Clean Water Trust (formerly the Massachusetts Water Pollution Abatement Trust) first established pursuant to Chapter 275 of the Acts of 1989 of the Commonwealth.

“Trust Bond Resolution” shall mean a bond resolution of the Trust providing for the issuance of a series of SRF Program Bonds.

“Variable Rate Indebtedness” shall mean, as of any date of determination, any Indebtedness on which the interest rate borne thereby may vary during any part of its remaining term. For the purpose of calculating the applicable Series Debt Service Reserve Fund Requirement with respect to any Series of Variable Rate Indebtedness, the Adjusted Debt Service on such Series shall be determined by reference to the Pro Forma Bond Issue for such Series set forth in the Supplemental Resolution authorizing such Series.

“Water Pollution Abatement Obligations” shall mean obligations incurred and owing to the Trust.

“Watershed Division” shall mean the Division of Watershed Management established by Section 42 of Chapter 372 of the Acts of 1984 of the Commonwealth.

“Waterworks Operations” shall mean the “waterworks division” established pursuant to Section 8(a) of the Act.

### The Pledge Effected by the General Resolution

(a) Under the General Resolution, there are pledged for the payment of the Bonds, in accordance with their terms and the provisions of the General Resolution, subject only to the provisions of the General Resolution permitting the application thereof for or to the purposes and on the terms and conditions therein set forth: (i) all Revenues; (ii) all moneys or securities in any of the Funds, Accounts and Subaccounts (except the Operating Fund, the Rebate Fund, the Note Payment Fund and the Subordinated Debt Service Reserve Fund) together with the investment earnings thereon except to the extent such earnings are required to be deposited in the Rebate Fund pursuant to a Supplemental Resolution, and (iii) all other moneys and securities to be received, held or set aside by the Authority or by any Fiduciary pursuant to the General Resolution.

(b) Subject only to the prior pledge created for the payment of the Bonds in paragraph (a) above, and on the terms and conditions set forth therein with respect to such prior pledge, the property described in clauses (i)-(iii) of said paragraph (a) (except moneys or securities in the Debt Service Fund and the Debt Service Reserve Fund) and the Subordinated Debt Service Reserve Fund are further pledged under the General Resolution to the payment of the Subordinated Bonds. (Section 501)

### Additional Indebtedness

(a) Except for additional Indebtedness issued in accordance with the provisions of the General Resolution, the Authority shall not issue any bonds, notes or other evidences of indebtedness secured by a pledge of or other lien or charge on the Revenues and shall not create or cause to be created any lien or charge on such Revenues or on any amounts held by any Fiduciary under the General Resolution; but the Authority shall not be prevented from issuing bonds or notes or other obligations for the corporate purposes of the Authority payable out of, or secured by a pledge of, Revenues to be derived on and after the date that the pledge of the Revenues provided in the General Resolution shall be discharged and satisfied as provided in the General Resolution and which recite on their face that such pledge of said amounts is and shall be in all respects subordinate to the provisions of the General Resolution and the lien and pledge created by the General Resolution.

(b) Notwithstanding anything in the General Resolution to the contrary, so long as no default under the General Resolution shall have occurred and be continuing, the Authority may issue at any time or from time to time:

(i) Indebtedness issued in anticipation of Grant Receipts which may be secured solely by a pledge of the proceeds of such Indebtedness, the Grant Receipts anticipated, other amounts on deposit from

time to time in any separate account established by the Authority to hold Grant Receipts, earnings thereon and other amounts not constituting Revenues under the General Resolution; or

(ii) Indebtedness issued in anticipation of the Revenues to be received in a particular Fiscal Year, whether unsecured or secured by a pledge of Revenues; provided that (a) any such Indebtedness shall be payable no later than one year from its date of issue (or, in the case of Indebtedness issued to renew any such Indebtedness, no later than one year from the date of issue of the original issue of Indebtedness), (b) the aggregate amount of such Indebtedness Outstanding at any one time in a Fiscal Year shall not exceed fifty percent (50%) of the Revenues for the immediately preceding Fiscal Year and (c) the proceeds of such Indebtedness (other than the proceeds of Indebtedness issued to pay a prior issue of such Indebtedness) shall be deposited in the Revenue Fund; or

(iii) Indebtedness payable from and secured by amounts on deposit in or to be deposited in the General Fund pursuant to the General Resolution.

Any Indebtedness described in this paragraph (b), in addition to the security therefor described herein, may be issued as general obligations of the Authority or as special obligations payable solely from the Revenues, Grant Receipts, proceeds, moneys, securities or funds pledged as security therefor.

(c) Notwithstanding anything in the General Resolution to the contrary, the Authority may issue Indebtedness secured solely by the revenues, receipts or other moneys derived by the Authority from the lease, license, operation, sale or other disposition of any facility or equipment (whether or not part of the System) hereafter constructed or acquired by or on behalf of the Authority with the proceeds of such Indebtedness. Such Indebtedness shall be special, limited obligations of the Authority payable solely out of the revenues, receipts and other moneys pledged therefor. Such revenues, receipts and other moneys shall not be considered Revenues hereunder provided that (i) neither the debt service on such Indebtedness nor any cost of the acquisition, construction, operation, maintenance or repair of any such facility or equipment nor provision for reserves for any of the foregoing shall be paid from the proceeds of Secured Indebtedness or from Revenues (other than Revenues deposited in or available for deposit in the General Fund pursuant to the General Resolution) or shall be included in Operating Expenses, (ii) any such revenues, receipts and moneys in excess of such debt service, cost of acquisition, construction, operation, maintenance and repair and reserves shall be deposited in the Revenue Fund (and upon such deposit shall be deemed Revenues), and (iii) prior to the issue of any such Indebtedness, the Authority shall deliver to the Trustee a certificate of the Consulting Engineer certifying that the lease, license, operation, sale or other disposition of such facility or equipment and the application of the revenues, receipts and other moneys derived therefrom to the operation, maintenance and repair thereof and the payment of the debt service on the Indebtedness issued therefor and the provision of reserves for the foregoing, will not result in any decrease in the Revenues projected by such Consulting Engineer to be received by the Authority during the succeeding five Fiscal Years (including the Fiscal Year in which such Indebtedness is issued).

(d) Notwithstanding anything in the General Resolution to the contrary, the Authority may issue Indebtedness secured by a pledge of moneys in the Revolving Loan Fund which either (i) have been committed to loans to Local Bodies or (ii) represent payments made by Local Bodies on loans previously made from the Revolving Loan Fund, or by a pledge of moneys in the General Fund. Any lien granted on such moneys in the Revolving Loan Fund to secure such Indebtedness shall be senior to the pledge of the General Resolution but any lien granted on moneys in the General Fund to secure such Indebtedness shall be junior to such pledge. Any such Indebtedness shall be issued pursuant to a separate resolution of the Authority and each instrument evidencing such Indebtedness shall state expressly that the holders of such Indebtedness shall have no rights to the Revenues or other moneys held in Funds and Accounts established under the General Resolution except for moneys in the Revolving Loan Fund or in the General Fund as described in this paragraph. (Section 709)

Conditions Precedent to Delivery of a Series of Bonds

The Bonds of a Series shall be executed by the Authority for issuance and delivered to the Trustee and thereupon shall be authenticated by the Trustee and delivered to the Authority or upon its order, but only upon the receipt by the Trustee of certain documents and opinions relating to such Bonds and:

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(a) except in the case of any Series of Refunding Secured Bonds issued in the manner described in clause (i) under the heading Conditions Precedent to Delivery of Refunding Secured Bonds or any Parity Bond Anticipation Notes,

(i) a Certificate of an Authorized Representative of the Authority certifying that for the most recent period of twelve consecutive months preceding the date on which such Bonds are to be issued for which such information is available, Revenues Available for Bond Debt Service were at least equal to the Primary Bond Coverage Requirement provided that for any Series of Bonds issued on or prior to June 30, 1990 the requirement of this section (a)(i) shall be deemed satisfied; and

(ii) either

(A) a Certificate of the Consulting Engineer certifying that for both the Fiscal Year in which such Bonds are to be issued and the Fiscal Year immediately following, projected Revenues Available for Bond Debt Service, assuming transfers from the Rate Stabilization Fund only to the extent such assumption is set forth in a Certificate of the Authority, are at least equal to the Primary Bond Coverage Requirement for all Series of Bonds Outstanding in such Fiscal Year, taking into account the Series of Bonds to be issued and any other Series of Bonds which is projected to be issued on or before the last day of such Fiscal Year; or

(B) a certificate of the Consulting Engineer certifying that

(1) for the Fiscal year in which such Bonds are to be issued, projected Revenues Available for Bond Debt Service, calculated without assuming any increase in Rates and Charges other than those then approved in accordance with the General Resolution, and assuming transfers from the Rate Stabilization Fund only to the extent such assumption is set forth in a Certificate of the Authority, are at least equal to the sum of (x) the Required Debt Service Fund Deposits for all Series of Bonds then Outstanding in such Fiscal Year, taking into account the particular Series of Bonds to be issued, and (y) any amounts required to be deposited in the Operating Reserve Fund, the Insurance Reserve Fund or the Renewal and Replacement Reserve Fund to satisfy the applicable Requirement for such Fund, taking into account the particular Series of Bonds to be issued; and

(2) for the Fiscal Year immediately following the Fiscal Year in which such Bonds are to be issued, projected Revenues Available for Bond Debt Service as calculated for Section (ii)(B)(1), but adjusted to reflect any increases in Operating Expenses shown on the Authority's proposed or final Operating Budget for such following Fiscal Year or, if such Budget has not been submitted, as adjusted to reflect an increase in Operating Expenses over the previous three Fiscal Years, are at least equal to the sum of (x) the Required Debt Service Fund Deposits on all Series of Bonds included for purposes of (ii)(B)(1)(x) above and (y) only if such Operating Budget has been adopted, any amounts required to be deposited in the Operating Reserve Fund to satisfy the Operating Reserve Fund Requirement in such Fiscal Year.

(b) a Certificate of the Authorized Representative of the Authority, dated as of the date of such delivery, stating that there is no Event of Default by the Authority with respect to the performance of any of the covenants, conditions, agreements or provisions contained in the General Resolution provided, however that the Authority need deliver no such certification with respect to compliance with covenants as to Rates and Charges for a Series of Refunding Secured Bonds issued pursuant to the General Resolution; and

(c) such further documents and moneys as are required by the General Resolution or any Supplemental Resolution. (Section 206)

Conditions Precedent to Delivery of a Series of Secured Bonds Senior to or on Parity with Subordinated Bonds.

(a) The Subordinated Bonds of a Series shall be executed by the Authority for issuance and delivery to the Trustee and thereupon shall be authenticated by the Trustee and delivered to the Authority or upon its order, but only upon the receipt by the Trustee of the items, opinions and certificates described in the provisions under the heading Conditions Precedent to Delivery of a Series of Bonds (except for the requirements of paragraph (a) thereof), restated as appropriate for the issuance of Subordinated Bonds and any items, opinions or certificates required by the Supplemental Resolution authorizing such Subordinated Bonds.

(b) In addition, so long as any Parity Subordinated Bonds are outstanding, then Secured Bonds which are paid on a parity with or senior to the Parity Subordinated Bonds may be issued by the Authority only if there shall have been delivered to the Trustee in addition to any documents required by paragraph (a) above:

(i) a Certificate of a Consulting Engineer of the Authority certifying that for the most recent period of twelve consecutive months preceding the date on which such parity or senior Secured Bonds are to be issued for which such information is available, Revenues Available for Bond Debt Service were at least equal to the Secured Bond Coverage Requirement; and

(ii) either (A) a Certificate of a Consulting Engineer of the Authority certifying that for both the Fiscal Year in which such parity or senior Secured Bonds are to be issued and the Fiscal Year immediately following, projected Revenues Available for Bond Debt Service, assuming transfers from the Rate Stabilization Fund only to the extent such assumption is set forth in a Certificate of the Authority, are at least equal to the Secured Bond Coverage Requirement for all Series of Bonds and Parity Subordinated Bonds Outstanding in such Fiscal Year, taking into account the Series of parity or senior Secured Bonds to be issued and any other Series of parity or senior Secured Bonds which is projected to be issued on or before the last day of such Fiscal Year; or (B) a Certificate of an Authorized Representative of the Authority certifying that

(1) for the Fiscal Year in which such parity or senior Secured Bonds are to be issued, projected Revenues Available for Bond Debt Service, calculated without assuming any increase in Rates and Charges other than those then approved in accordance with the General Resolution, and assuming transfers from the Rate Stabilization Fund only to the extent such assumption is set forth in a Certificate of the Authority, are at least equal to the sum of (x) the Required Debt Service Fund Deposits and Required Subordinated Debt Service Fund Deposits for all Series of Bonds and Parity Subordinated Bonds then Outstanding in such Fiscal Year, taking into account the particular Series of parity or senior Secured Bonds to be issued, and (y) any amounts required to be deposited in the Operating Reserve Fund, the Insurance Reserve Fund or the Renewal and Replacement Reserve Fund to satisfy the Requirement for such Fund, taking into account the particular Series of parity or senior Secured Bonds to be issued; and

(2) for the Fiscal Year immediately following the Fiscal Year in which such parity or senior Secured Bonds are to be issued, projected Revenues Available for Bond Debt Service as calculated for (b)(ii)(B)(1) above, but adjusted to reflect any increases in Operating Expenses shown on the Authority's proposed or final Operating Budget for such following Fiscal Year or, if such Budget has not been submitted as adjusted to reflect an increase in Operating Expenses not less than the average percentage increase in Operating Expenses over the previous three Fiscal Years, are at least equal to the sum of (x) the Required Debt Service Fund Deposits and the Required Subordinated Debt Service Fund Deposits on the Series of Bonds and Parity Subordinated Bonds included for purposes of (b)(ii)(B)(1) above and (y) any amounts required to be deposited in the Operating Reserve Fund to satisfy the applicable Requirement for such Fund in such Fiscal Year. (Section 206A)

Conditions Precedent to Delivery of Refunding Secured Bonds

One or more Series of Refunding Secured Bonds may be issued pursuant to the General Resolution at any time to refund any Outstanding Secured Bonds provided that (i) with respect to Bonds issued to refund Bonds, (A)

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Aggregate Adjusted Debt Service on the Bonds immediately after the issuance of such Refunding Secured Bonds for each Fiscal Year shall be no greater than Aggregate Adjusted Debt Service on all Bonds immediately prior to the issuance of such Refunding Secured Bonds and (B) the final maturity of all Bonds Outstanding immediately after the issuance of such Refunding Secured Bonds shall be no later than the final maturity of all Bonds Outstanding immediately prior to the issuance of such Refunding Secured Bonds, (ii) with respect to Parity Subordinated Bonds issued to refund Parity Subordinated Bonds, (A) Aggregate Adjusted Debt Service on all Parity Subordinated Bonds immediately after the issuance of such Refunding Secured Bonds for each Fiscal Year shall be no greater than Aggregate Adjusted Debt Service on all Parity Subordinated Bonds Outstanding immediately prior to the issuance of such Refunding Secured Bonds and (B) the final maturity of all Parity Subordinated Bonds Outstanding immediately after the issuance of such Refunding Secured Bonds shall be no later than the final maturity immediately prior to the issuance of such Refunding Secured Bonds, or (iii ) the requirements detailed in subparagraph (a) under the heading Conditions Precedent to Delivery of a Series of Bonds in the case of an issue of additional Bonds, or the requirements detailed in subparagraph (b) under the heading Conditions Precedent to Delivery of a Series of Secured Bonds Senior to or on Parity with Subordinated Bonds in the case of an issue of additional Parity Subordinated Bonds, shall have been satisfied after giving effect to the proposed refunding, all as shown in a Certificate signed by an Authorized Representative of the Authority (and, as to certain matters, a Certificate signed by the Consulting Engineer) and delivered to the Trustee prior to the authentication and delivery of such Series of Refunding Secured Bonds. Refunding Secured Bonds shall be issued in a principal amount sufficient, together with other moneys available therefor, to accomplish such refunding and to make the deposits in the Funds, Accounts and Subaccounts required by the provisions of the Supplemental Resolution authorizing such Secured Bonds.

### Express Reservation of Rights

The Authority expressly reserves the right to issue Subordinated Bonds payable from the Subordinated Debt Service Fund prior to, on a parity with or junior to the SRF Bonds, to establish one or more covenants for the sole benefit of some or all of such additional Subordinated Bonds, and to fund one or more accounts within the Subordinated Debt Service Reserve Fund for the sole benefit of some or all of such Subordinated Bonds. (Sixth Supplemental Resolution Section 309)

### Bond Anticipation Notes

Whenever the Authority shall authorize the issuance of a Series of Secured Bonds, the Authority may, by resolution, authorize the issuance of notes (and renewals thereof) in anticipation of such Secured Bonds. The principal of and interest on such notes and renewals thereof shall be payable from the proceeds of such notes or from the proceeds of the sale of the Series of Secured Bonds in anticipation of which such notes are issued. The proceeds of such Secured Bonds may be pledged for the payment of the principal of and interest on such notes and any such pledge shall have a priority over any other pledge of such proceeds created by the General Resolution. The Authority may pledge the Revenues to the payment of the interest on such notes which pledge may be on a parity with the pledge securing all Bonds in which event such interest shall be payable from the Debt Service Fund. The Authority may also pledge the Revenues and moneys on deposit in the General Fund and the Rate Stabilization Fund to the payment of the principal of such notes but such pledge shall be subordinate to the pledge securing the payment of the Secured Bonds. (Section 208)

### Special Subordinated Indebtedness

The Authority may, at any time, or from time to time, issue Special Subordinated Indebtedness payable out of, and which may be secured by a pledge of and lien on such amounts in such Funds as may from time to time be available for the purpose of payment thereof as provided in the General Resolution. Any pledge of or lien on amounts held by the Trustee shall be, and shall be expressed to be subordinate in all respects to the pledge created by the General Resolution as security for the Secured Bonds. Such Special Subordinated Indebtedness shall be issued only as follows:

(a) Notwithstanding anything in the General Resolution to the contrary, so long as no default shall have occurred under the General Resolution and be continuing, the Authority may issue at any time or from time to time:

(i) Indebtedness issued in anticipation of Grant Receipts secured solely by a pledge of the proceeds of such Indebtedness, Grant Receipts including the Grant Receipts anticipated, earnings thereon and other amounts not constituting Revenues under the General Resolution; or

(ii) Indebtedness issued in anticipation of the Revenues to be received in a particular Fiscal Year, whether unsecured or secured by a pledge of Revenues; provided that (a) any such Indebtedness shall be payable no later than one year from its date of issue (or, in the case of Indebtedness issued to renew any such Indebtedness, no later than one year from the date of issue of the original issue of Indebtedness), (b) the aggregate principal amount of such Indebtedness Outstanding at any one time in a Fiscal Year shall not exceed fifty percent (50%) of the Revenues for the immediately preceding Fiscal Year and (c) the proceeds of such Indebtedness (other than the proceeds of Indebtedness issued to pay a prior issue of such Indebtedness) shall be deposited in the Revenue Fund; or

(iii) Indebtedness payable from and secured by amounts on deposit in or to be deposited in the General Fund pursuant to the General Resolution.

Any Indebtedness described in this paragraph (a), in addition to the security therefor described or provided for herein, may be issued as general obligations of the Authority or as special obligations payable solely from the Revenues, Grant Receipts, proceeds, moneys, securities or funds pledged as security therefor.

(b) Notwithstanding anything in the General Resolution to the contrary, the Authority may issue Indebtedness secured solely by the revenues derived by the Authority from any facility or equipment (whether or not part of the System) hereafter constructed or acquired by or on behalf of the Authority with the proceeds of such Indebtedness. Such Indebtedness shall be special, limited obligations of the Authority payable solely out of the revenues pledged therefor. Such revenues, receipts and other moneys shall not be considered Revenues under the General Resolution provided that (i) neither the debt service on such Indebtedness nor any cost of any such facility or equipment nor provision for reserves for any of the foregoing shall be paid from the proceeds of Secured Indebtedness or from Revenues (other than Revenues deposited in or available for deposit in the General Fund pursuant to the General Resolution) or shall be included in Operating Expenses, (ii) any such revenues in excess of such debt service, cost of acquisition, construction, operation, maintenance and repair and reserves shall be deposited in the Revenue Fund (and upon such deposit shall be deemed Revenues), and (iii) prior to the issue of any such Indebtedness, the Authority shall deliver to the Trustee a Certificate of the Consulting Engineer certifying that the operation, of such facility or equipment and the application of the revenues derived therefrom to the operation, maintenance and repair thereof and the payment of the debt service on the Indebtedness issued therefor and the provision of reserves for the foregoing, will not result in any decrease in the Revenues projected by such Consulting Engineer to be received by the Authority during the succeeding five Fiscal Years (including the Fiscal Year in which such Indebtedness is issued).

(c) Notwithstanding anything in the General Resolution to the contrary, the Authority may issue Indebtedness secured by a pledge or certain moneys in the Revolving Loan Fund or by moneys in the General Fund. Any lien granted on such moneys in the Revolving Loan Fund to secure such Indebtedness shall be senior to the pledge of the General Resolution but any lien granted on moneys in the General Fund to secure such Indebtedness shall be junior to such pledge. (Sections 209 and 709)

#### Credit Facilities

(a) In connection with the issuance of any Series of Secured Bonds under the General Resolution, the Authority may obtain or cause to be obtained one or more Credit Facilities providing for payment of all or a portion of the Debt Service or to become due on such Secured Bonds, providing for the purchase of such Secured Bonds by the issuer of such Credit Facility or providing funds for the purchase of such Secured Bonds by the Authority.

(b) The Authority may also in an agreement with the issuer of such Credit Facility agree to directly reimburse such issuer for amounts paid under the terms of such Credit Facility, together with interest thereon (the "Reimbursement Obligation"); provided, however, that no Reimbursement Obligation shall be deemed to be Outstanding for the purposes of the General Resolution until amounts are paid under such Credit Facility. Any such Reimbursement Obligation may be secured by a pledge of, and a lien on, Revenues on a parity with the lien created

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by the General Resolution (a “Parity Reimbursement Obligation”). Any such Parity Reimbursement Obligation shall be deemed to be a Secured Bond. (Section 210)

### Establishment of Funds and Accounts

- (a) The following Funds and Accounts are established by the General Resolution:
- (i) Construction Fund, containing a:
    - (A) Waterworks System Account; and
    - (B) Sewer System Account;
  - (ii) Cost of Issuance Fund;
  - (iii) Revenue Fund;
  - (iv) Operating Fund;
  - (v) Debt Service Fund, containing a:
    - (A) Principal Account;
    - (B) Interest Account;
    - (C) Redemption Account; and
    - (D) Capitalized Interest Account;
  - (vi) Subordinated Debt Service Fund, containing a:
    - (A) Principal Account;
    - (B) Interest Account;
    - (C) Redemption Account; and
    - (D) Capitalized Interest Account;
  - (vii) Debt Service Fund containing a Common Account;
  - (viii) Subordinated Debt Service Reserve Fund containing a Common Account;
  - (ix) [Reserved]
  - (x) Commonwealth Obligation Fund;
  - (xi) Rebate Fund;
  - (xii) Operating Reserve Fund;
  - (xiii) Insurance Reserve Fund;
  - (xiv) Renewal and Replacement Reserve Fund;
  - (xv) Water Pollution Abatement Fund;
  - (xvi) Rate Stabilization Fund;
  - (xvii) Revolving Loan Fund;
  - (xviii) General Fund; and
  - (xix) Note Payment Fund.

(b) Any Supplemental Resolution which provides for a Special Credit Facility may establish one or more “Special Accounts” in the Debt Service Reserve Fund or the Subordinated Debt Service Reserve Fund. Unless otherwise expressly provided in the General Resolution, all of the Funds, Accounts and Subaccounts shall be held by the Trustee, except the Operating Fund and the Construction Fund or any Accounts or Subaccounts therein, which may be held by one or more Depositories. (Section 502)

### Construction Fund

There shall be deposited from time to time in the Subaccounts of the Construction Fund (i) the proceeds of casualty insurance, contractors’ performance bonds and any condemnation, as determined by the Authority in accordance with the General Resolution; (ii) the balance remaining of the proceeds of any Bond Anticipation Notes issued to pay the Costs of a Project after payment or provision for payment of such notes; (iii) any amounts required to be deposited therein pursuant to the General Resolution or any Supplemental Resolution; (iv) any moneys transferred pursuant to the General Resolution from the Rate Stabilization Fund or from the General Fund; and (v) any other amounts received by the Authority for or in connection with the Waterworks System and the Sewer System, respectively, and determined by the Authority to be deposited therein, which are not otherwise required to be applied by the General Resolution. Except as otherwise provided under the heading Priority of Funds in Event of Debt Service Fund Shortfall or Priority of Funds in Event of Subordinated Debt Service Fund Shortfall or if investment earnings on moneys in the Construction Fund are required to be transferred to the Rebate Fund, amounts



in the Construction Fund shall be expended only to pay Costs of a Project pursuant to requisitions filed in accordance with the Supplemental Resolution. At any time from time to time the Trustee may transfer amounts on deposit therein between a particular Subaccount within the Waterworks System Account and the corresponding Subaccount within the Sewer System Account upon receipt of a Certificate of an authorized Representative of the Authority requesting such transfer. If the Authority at any time cannot certify that it reasonably expects the moneys on deposit in any Subaccount of the Construction Funds which constitutes the proceeds of Tax Exempt Indebtedness to be expended for the Costs of a Project, then such shall be transferred to the Redemption Account and applied solely to the redemption of Secured Bonds of the applicable Series on the first date on which such Secured Bonds may be called without premium (unless the Authority shall elect to call such Secured Bonds earlier at a premium). (Section 503)

#### Cost of Issuance Fund

There shall be deposited from time to time in a separate Subaccount of the Cost of Issuance Fund for each Series of Secured Bonds issued under the General Resolution any amounts required to be deposited therein pursuant to the terms of a Supplemental Resolution with respect to such Series. Moneys in the Cost of Issuance Fund shall be paid upon the filing by the Authority with the Trustee its requisition therefor (in the form set forth in a Supplemental Resolution) signed by an Authorized Representative of the Authority. (Section 504)

#### Deposits of Revenues

The Authority shall promptly cause all Revenues received to be deposited in the Revenue Fund held by the Trustee. There shall also be deposited into the Revenue Fund by the Trustee or any other Fiduciary all other amounts required by the General Resolution to be so deposited. (Section 505)

#### Flow of Funds from the Revenue Fund

(a) On the last Business Day of each month the Trustee shall, after making any transfers that are required by the General Resolution, from the amounts on deposit in the Revenue Fund, make the following deposits in the following order:

(i) To the Operating Fund, the amount necessary to make the amount on deposit therein equal to Operating Expenses for the next succeeding three months, as shown on the Operating Budget.

(ii) To the Debt Service Fund:

(A) on a pro rata basis the amount necessary to make up any deficiency in any Subaccount resulting from an increase in the applicable interest rate on any Variable Rate Bonds over the rate which was assumed in calculating the amount required for a prior deposit pursuant to the General Resolution;

(B) on a pro rata basis to each Subaccount of the Interest Account, after taking into account any available moneys in the corresponding Subaccount of the Capitalized Interest Account if any, the amount necessary to increase the amount on deposit in each such Subaccount so that it equals interest included in Adjusted Debt Service next coming due on Outstanding Bonds of the applicable Series accrued and unpaid and to accrue to and including the last day of the next succeeding month (assuming, in the case of Variable Rate Bonds, no further adjustments in the applicable interest rate);

(C) on a pro rata basis to each Subaccount of the Principal Account the amount necessary to increase the amount on deposit in each such Subaccount so that it equals that portion of the Principal Installment included in Adjusted Debt Service next coming due on Outstanding Bonds of the applicable Series accrued and unpaid and to accrue (assuming such Principal Installment accrues on the same basis as simple interest on a debt) to and including the last day of the next succeeding month; provided, however, that no deposit shall be required to be made with

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respect to a Bond prior to twelve months before the next Principal Installment coming due on such Bond; and

(D) on a pro rata basis to each Subaccount of the Redemption Account the amount, if any, necessary to increase the amount on deposit in each Subaccount so that it equals the Redemption Price of Outstanding Bonds of the applicable Series then called for redemption (other than from Sinking fund Installments) as of any date on or prior to last day of the next succeeding month, after taking into account amounts on deposit in the applicable Subaccount within the Principal Account, if any, available to pay such Bonds called for redemption.

(E) on a pro rata basis to each Subaccount of the Interest Account established with respect to Regularly Scheduled Qualified Swap Payments relating to a Series of Designated Debt consisting of Bonds, the amount (if any) necessary to increase the amount on deposit in each such Subaccount so that it equals that portion of the Regularly Scheduled Qualified Swap Payment next coming due with respect to such Series of Designated Debt accrued and unpaid and to accrue (assuming such Regularly Scheduled Qualified Swap Payment accrues on the same basis as simple interest on a debt) to and including the last day of the next succeeding month.

The Trustee shall not be required to make any payments into the Debt Service Fund when the aggregate amount of money in the Debt Service Fund and the Debt Service Reserve Fund is at least equal to the amount required to defease the lien of the General Resolution granted to secure payment of Bonds pursuant to the provisions of the General Resolution described under the heading Defeasance.

(iii) To the Subordinated Debt Service Fund deposits determined with respect to Subordinated Bonds in the same manner as the deposits set forth in clause (ii) above with respect to Bonds; provided, that there also shall be paid on a pro rata basis to each Subaccount of the Interest Account established with respect to Regularly Scheduled Qualified Swap Payments relating to a Series of Designated Debt, the amount (if any) necessary to increase the amount on deposit in each such Subaccount so that it equals that portion of the Regularly Scheduled Qualified Swap Payment next coming due with respect to such Series of Designated Debt accrued and unpaid and to accrue (assuming such Regularly Scheduled Qualified Swap Payment accrues on the same basis as simple interest on a debt) to and including the last day of the next succeeding month.

The Trustee shall not be required to make any payments into the Subordinated Debt Service Fund when the aggregate amount of money in the Debt Service Fund and the Debt Service Reserve Fund is at least equal to the amount required to defease the lien of the General Resolution granted to secure payment of Bonds and when the aggregate amount of money in the Subordinated Debt Service Fund and the Subordinated Debt Service Reserve Fund is at least equal to the amount required to defease the lien of the General Resolution granted to secure payment of Subordinated Bonds, all pursuant to the provisions of the General Resolution described under the heading Defeasance.

(iv) To the Debt Service Reserve Fund,

(A) to the Common Account therein one-twelfth (1/12) the amount, if any, necessary to increase the amount on deposit in such Account, determined as of the first day of the Fiscal Year, to an amount equal to the Debt Service Reserve Fund Requirement (provided that no such deposit shall be required in a Fiscal Year following the funding of the Common Account in connection with the issuance of a Series of Bonds pursuant to the General Resolution); and

(B) to each such Special Account the deposit required by any Supplemental Resolution.

(v) To the Subordinated Debt Service Reserve Fund,

(A) to each Series Subaccount of the Common Account therein the amount, if any, necessary to increase the amount on deposit in such Subaccount to the level required by any Supplemental Resolution;

(B) to each Special Account the deposit required by any Supplemental Resolution.

(vi) [Reserved].

(vii) To the Commonwealth Obligation Fund, the amount equal to the amount of Commonwealth Obligations (including, without limitation, Special Payment Obligations) payable during the next succeeding month, as shown on the Operating Budget.

(viii) To the Rebate Fund, the amount of the Rebate Fund Requirement, if any, determined in accordance with the Supplemental Resolution.

(b) On each December 31 and June 30, or, if such days are not Business Days, on the next preceding Business Day, the Trustee shall, from the amounts on deposit in the Revenue Fund, and after making the deposits referred to in paragraph (a) above, make the following deposits in the following order:

(i) To the Operating Reserve Fund, one half of the difference between the amount on deposit in such Fund on the first day of the current Fiscal Year and the Operating Reserve Fund Requirement for the current Fiscal Year.

(ii) To the Insurance Reserve Fund, one half of the difference between the amount on deposit in such Fund on the first day of the current Fiscal Year and the Insurance Reserve Fund Requirement for the current Fiscal Year.

(iii) To the Renewal and Replacement Reserve Fund, one half of the difference between the amount on deposit in such Fund on the first day of the current Fiscal Year and Renewal and Replacement Reserve Requirement for the current Fiscal Year.

(iv) To the Water Pollution Abatement Fund, the amount necessary to increase the amount on deposit therein so that it equals the amount of Water Pollution Abatement Obligations payable during the next six months, as certified by an Authorized Representative of the Authority.

(v) To the Revolving Loan Fund, such amount as the Authority may from time to time determine.

(vi) Subject to the provisions of paragraph (c) below, the General Fund, any moneys remaining after making the deposits set forth above.

(c) On any June 30 and December 31 on which deposits are to be made pursuant to (b) above, after making the deposits required by clauses (i)-(v) of paragraph (b) above, the Trustee, on direction of an Authorized Representative, shall retain all or portion of the remaining moneys in the Revenue Fund to provide additional moneys for deposits required under paragraph (a) above during the next six months. (Section 506)

### Operating Fund

The Operating Fund shall be established as one or more accounts with one or more banks or trust companies, as the Authority shall determine, which shall be Depositories. Moneys held in the Operating Fund shall be applied by the Authority to the payment of Operating Expenses in accordance with the Operating Budget. Moneys in the Revenue Fund and the Operating Reserve Fund shall be paid by the Trustee to the Authority for deposit into the Operating Fund pursuant to the General Resolution. If on any June 30, or, if such day is not a Business Day, on the next preceding Business Day, the amount on deposit in the Operating Fund exceeds the

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amount equal to the next three months of Operating Expenses as shown on the Authority's Operating Budget then such excess shall be transferred to the Revenue Fund. (Section 507)

### Debt Service Fund

(a) The Trustee shall, for each Series of Bonds Outstanding, pay (i) on each Bond Payment Date, from the moneys on deposit in the applicable Subaccounts within the Principal Account and Interest Account of the Debt Service Fund the amounts required for the payment of the Principal Installments and for the payment of interest, respectively, due on such Date; (ii) on any redemption date other than for sinking fund redemption, from the applicable Subaccounts within the Interest Account and Redemption Account of the Debt Service Fund the amounts required for the payment of accrued interest and for the payment of principal of and premium, if any, respectively, on Bonds to be redeemed; and (iii) on any date of purchase, from the applicable Subaccounts within the Principal Account and of the Debt Service Fund, the amounts required for the payment of principal and interest, respectively, of any Bonds to be purchased to the extent sufficient amounts are not available therefor under a Credit Facility in accordance with the applicable Supplemental Resolution.

(b) The amounts accumulated in the applicable Subaccount within the Principal Account of the Debt Service Fund for each Sinking Fund Installment shall, at the direction of an Authorized Representative of the Authority, be applied (together with amounts in the applicable Subaccount within the Interest Account of the Debt Service Fund with respect to interest on the Bonds for which such Sinking Fund Installment was established) by the Trustee at the written direction of the Authority prior to the forty-fifth day preceding the due date of such Sinking Fund Installment as follows:

(1) to the purchase of Bonds of the Series and maturity for which such Sinking Fund Installment was established, at prices (including any brokerage and other charges) not exceeding the Redemption Price payable for such Bonds when such Bonds are redeemable by application of such Sinking Fund Installment plus unpaid interest accrued to the date of purchase; or

(2) to the redemption of such Bonds, if then redeemable by their terms, at or below the Redemption Price referred to in clause (1) above;

provided, however, that the Trustee shall not call for redemption or purchase any Bonds pursuant to this paragraph (b) which have already been called for redemption pursuant to the provisions of the General Resolution.

(c) Upon the purchase or redemption of any Bond pursuant to paragraph (b) above, an amount equal to the principal amount of the Bond so purchased or redeemed shall be credited toward the next Sinking Fund Installment thereafter to become due and the amount of any excess of the amounts so credited over the amount of such Sinking Fund Installment shall be credited against future Sinking Fund Installments in direct chronological order.

(d) As soon as practicable after the forty-fifth day preceding the due date of any such Sinking Fund Installment, the Trustee shall proceed to call for redemption, pursuant to the General Resolution, on such due date Bonds of the Series and maturity for which such Sinking Fund Installment was established in the amount of such Sinking Fund Installment. The Trustee shall so call such Bonds for redemption whether or not it then has moneys in the Debt Service Fund sufficient to pay the applicable Redemption Price thereof on the redemption date. (Section 508)

### Priority of Funds in Event of Debt Service Fund Shortfall

If on any Bond Payment Date there shall be insufficient monies available in the applicable Subaccount within the applicable Account in the Debt Service Fund to provide for payment of the Principal Installments of or interest on any Series of Bonds then due, after drawing any moneys available for such purpose from any applicable Credit Facility or Special Account in the Debt Service Reserve Fund, the Trustee shall withdraw and apply the necessary moneys to provide for such insufficiency from the following Funds and Accounts in the following order: (i) amounts in the Redemption Account not yet committed to the redemption of Bonds, (ii) the General Fund, (iii)

amounts in the Revolving Loan Fund not yet committed to loans to Local Bodies, (iv) the Rate Stabilization Fund, (v) the Water Pollution Abatement Fund, (vi) the Renewal and Replacement Reserve Fund, (vii) the Insurance Reserve Fund, (viii) the Operating Reserve Fund, (ix) the Commonwealth Obligation Fund, (x) [Reserved], (xi) [Reserved], (xii) the Common Account in the Debt Service Reserve Fund, (xiii) the Subordinated Debt Service Fund, (xiv) the Cost of Issuance Fund and (xv) the Construction Fund. (Section 508(e))

In connection with the issuance or maintenance of any Designated Debt consisting of Bonds, the Authority may establish within the Interest Account of the Debt Service Fund one or more Subaccounts for the purpose of holding funds to be applied to the payment of Regularly Scheduled Qualified Swap Payments relating to such Designated Debt. Such moneys shall be applied by the Trustee, at the direction of the Authority, to the payment of such Regularly Scheduled Qualified Swap Payments. (Section 508(f))

#### Subordinated Debt Service Fund

(a) The Trustee shall, for each Series of Subordinated Bonds Outstanding, make payments similar to those set forth with respect to Bonds under the heading Debt Service Fund. The Trustee shall also apply moneys in the Subordinated Debt Service Fund as set forth under the heading Priority of Funds in Event of Debt Service Fund Shortfall. Moneys in the Subordinated Debt Service Fund shall also be transferred to the Note Payment Fund and applied to the payment of interest on notes issued pursuant to the terms described under the heading Bond Anticipation Notes to the extent provided in any Supplemental Resolution authorizing such notes.

(b) The amounts accumulated in the applicable Subaccount within the Principal Account of the Subordinated Debt Service Fund for each Sinking Fund Installment may be applied (together with amounts in the applicable Subaccount within the Interest Account of the Subordinated Debt Service Fund with respect to interest on the Subordinated Bonds for which such Sinking Fund was established) by the Trustee to the purchase or redemption of Subordinated Bonds of the Series and maturity for which such Sinking Fund Installment was established in the same manner as moneys in the Debt Service Fund may be applied to Bonds as set forth in paragraph (b) under the heading Debt Service Fund. Upon such purchase or redemption, an amount equal to the principal amount of the Subordinated Bond so purchased or redeemed shall be credited toward the next Sinking Fund Installment thereafter to become due and the amount of any excess of the amounts so credited over the amount of such Sinking Fund Installment shall be credited against future Sinking Fund Installments in direct chronological order.

(c) As soon as practicable after the forty-fifth day preceding the due date of any such Sinking Fund Installment, the Trustee shall proceed to call for redemption on such due date Subordinated Bonds of the Series and maturity for which such Sinking Fund Installment was established in the amount of such Sinking Fund Installment. The Trustee shall so call such Subordinated Bonds for redemption whether or not it then has moneys in the Subordinated Debt Service Fund sufficient to pay the applicable Redemption Price thereof on the redemption date.

(d) In connection with the issuance or maintenance of any Designated Debt, the Authority may establish within the Interest Account of the Subordinated Debt Service Fund one or more Subaccounts for the purpose of holding funds to be applied to the payment of Regularly Scheduled Qualified Swap Payments relating to such Designated Debt. Such moneys shall be applied by the Trustee, at the direction of the Authority, to the payment of such Regularly Scheduled Qualified Swap Payments. (Section 509)

#### Priority of Funds in Event of Subordinated Debt Service Fund Shortfall

If on any Subordinated Bond Payment Date there shall be insufficient moneys available in the applicable Subaccount within the applicable Account in the Subordinated Debt Service Fund to provide for payment of the Principal Installments of or interest on any Series of Subordinated Bonds then due, after drawing any moneys available for such purpose from any applicable Credit Facility or Special Account in the Subordinated Debt Service Reserve Fund, subject to any transfers to be made on such date pursuant to the terms described under the heading Priority of Funds in Event of Debt Service Fund Shortfall, the Trustee shall withdraw and apply the necessary moneys to provide for such insufficiency from the following Funds and Accounts in the following order: (i) amounts in the Redemption Account of the Subordinated Debt Service Fund not yet committed to the redemption of Bonds, (ii) the General Fund, (iii) amounts in the Revolving Loan Fund not yet committed to loans to Local Bodies, (iv) the Rate Stabilization Fund, (v) the Water Pollution Abatement Fund, (vi) the Renewal and

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Replacement Reserve Fund, (vii) the Insurance Reserve Fund, (viii) the Operating Reserve Fund, (ix) the Commonwealth Obligation Fund, (x) [Reserved], (xi) [Reserved], (xii) the Common Account in the Subordinated Debt Service Reserve Fund, (xiii) the Costs of Issuance Fund and, (xiv) the Construction Fund. (Section 509(e))

### Debt Service Reserve Fund

(a) Amounts on deposit in each of the Subaccounts within the Common Account in the Debt Service Reserve Fund shall be applied on a pro rata basis, to the extent other funds are not available therefor pursuant to the General Resolution, solely to pay the Principal Installments of and interest on the Bonds when due. Amounts on deposit in each of the Special Accounts in the Debt Service Reserve Fund shall be applied, to the extent other funds are not available therefor pursuant to the General Resolution, solely to pay the Principal Installments of and interest on the Bonds of the Series to which such Special Account relates as and when specified in the applicable Supplemental Resolution.

(b) If, as of June 30, or, if such day is not a Business Day, on the next preceding Business Day, the amount in the Common Account exceeds the Debt Service Reserve Fund Requirement for the Fiscal Year then ending after giving effect to any Financial Guaranty deposited in the Common Account, the Trustee shall withdraw from the Common Account the amount of any excess therein as of the date of such withdrawal and deposit the moneys so withdrawn (i) if and to the extent that such excess occurred on account of a reduction of the Debt Service Reserve Fund Requirement or the deposit of a Financial Guaranty, into the Redemption Account of the Debt Service Fund or the Redemption Account of the Subordinated Debt Service Fund, as the Authority shall direct, to be applied to the redemption of Secured Bonds and (ii) otherwise, first into the Interest Account of the Debt Service Fund until the amount on deposit therein is equal to the next deposit required to be made to such Account pursuant to the provisions of the General Resolution described in paragraph (a) under the heading Flow of Funds from the Revenue Fund and second to the Principal Account of the Debt Service Fund until the amount on deposit therein is equal to the next deposit required to be made to such Account pursuant to the provisions of the General Resolution described in paragraph (a) under the heading Flow of Funds from the Revenue Fund. Any balance of such excess remaining shall be applied as provided in the previous sentence with respect to deposits required pursuant to the provisions of the General Resolution described in paragraph (a) under the heading Flow of Funds from the Revenue Fund for as many succeeding months as is necessary to fully apply such excess. If, as of June 30, or, if such day is not a Business Day, on the next preceding Business Day, the amount in any Special Account exceeds its requirement under the applicable Supplemental Resolution for the Fiscal Year then ending, after giving effect in the case of each such Account to any Financial Guaranty deposited in such Account, the Trustee shall withdraw from such Account the amount of any excess therein as of the date of such withdrawal and deposit the moneys so withdrawn (i) if and to the extent that such excess occurred on account of a reduction of a reserve requirement or the deposit of a Financial Guaranty, into the Redemption Account of the Debt Service Fund or the Redemption Account of the Subordinated Debt Service Fund, as the Authority shall direct, to be applied to the redemption of Secured Bonds and (ii) otherwise, first into the applicable Subaccount of the Interest Account of the Debt Service Fund until the amount on deposit therein is equal to the next deposit required to be made to such Subaccount pursuant to the General Resolution and second to the related Subaccount of the Principal Account of the Debt Service Fund until the amount on deposit therein is equal to the next deposit required to be made to such Subaccount pursuant to the provisions of the General Resolution described in paragraph (a) under the heading Flow of Funds from the Revenue Fund. Any balance of such excess remaining shall be applied as provided in the previous sentence with respect to deposits required pursuant to the provisions of the General Resolution described in paragraph (a) under the heading Flow of Funds from the Revenue Fund for as many succeeding months as is necessary to fully apply such excess.

(c) Whenever the amount (exclusive of Financial Guaranties) in all of the Accounts in the Debt Service Reserve Fund, together with the amount in the Debt Service Fund, is sufficient to pay all Outstanding Series of Bonds in accordance with their respective terms, the funds on deposit in the Debt Service Reserve Fund shall be transferred to the Debt Service Fund and applied to the redemption or payment at maturity of all Bonds Outstanding.

(d) In lieu of the required deposits and transfers to any Account in the Debt Service Reserve Fund, the Authority may cause to be deposited in any such Account Financial Guaranties. The Financial Guaranties shall be payable (upon the giving of notice as required under the General Resolution) on any date on which moneys will be required to be withdrawn from the applicable Account in the Debt Service Reserve Fund and such withdrawal cannot be met by moneys on deposit in the applicable Account. If a disbursement is made pursuant to Financial

Guaranties, the Authority shall be obligated either (i) to reinstate the maximum limits of such Financial Guaranties or (ii) to deposit into the applicable Account, funds in the amount of the disbursement made under such Financial Guaranties.

(e) In the event of the refunding of any Bonds, the Trustee shall, upon the written direction of the Authority, withdraw from the Subaccount and Account related to the Bonds to be refunded all or any portion of the amounts accumulated therein with respect to the Bonds to be refunded and deposit such amounts as provided in such written direction; provided that such withdrawal shall not be made unless (i) immediately thereafter the bonds being refunded shall be deemed to have been paid pursuant to the General Resolution, and (ii) after giving effect to any amounts being simultaneously deposited therein, the amount remaining in each Subaccount and Account after such withdrawal shall not be less than the applicable Requirement. (Section 510)

#### Subordinated Debt Service Reserve Fund

Moneys in the Subordinated Debt Service Reserve Fund shall be applied to the Subordinated Bonds in a manner similar to the application of moneys in the Debt Service Reserve Fund to payment of Bonds. (Section 511)

#### Commonwealth Obligation Fund

Moneys in the Commonwealth Obligation Fund shall be transferred to the Commonwealth to satisfy Commonwealth Obligations due and payable by the Authority; provided that moneys in such Fund which are to be applied to Special Payment Obligations shall be transferred as directed by a Certificate of an Authorized Representative. The Trustee shall also apply moneys in the Commonwealth Obligation Fund as provided under the headings Priority of Funds in Event of Debt Service Fund Shortfall and Priority of Funds in Event of Subordinated Debt Service Fund Shortfall. If as of any June 30, the amount on deposit in the Commonwealth Obligation Fund is in excess of the amount payable on the Commonwealth Obligations in the Fiscal Year then ending then such excess shall be transferred to the Revenue Fund. (Section 512)

#### Certain Notices

So long as the SRF Bonds are outstanding, the Authority agrees to provide to the Trust notice of any draw pursuant to the provisions described under the heading Priority of Funds in Event of Debt Service Fund Shortfall or Priority of Funds in Event of Subordinated Debt Service Fund Shortfall or any draw on the Community Obligation and Revenue Enhancement Fund or Debt Service Reserve Fund for the purpose of paying debt service on any Secured Bond. (Sixth Supplemental Resolution Section 308)

#### Operating Reserve Fund

(a) Moneys in the Operating Reserve Fund shall be transferred to the Operating Fund to be applied to the payment of Operating Expenses upon delivery of a Certificate of an Authorized Representative of the Authority to the effect that moneys on deposit in the Operating Fund are insufficient therefor. The Trustee shall also apply moneys in the Operating Reserve Fund as provided under the headings Priority of Funds in Event of Debt Service Fund Shortfall and Priority of Funds in Event of Subordinated Debt Service Fund Shortfall.

(b) If on any December 31 or June 30 Revenues are insufficient to make the deposits to the Operating Reserve Fund required to be made from the Reserve Fund, or if on any date the Authority delivers a Certificate to the Trustee to the effect that moneys in the Operating Fund and the Operating Reserve Fund are insufficient to meet Operating Expenses then due and payable then, subject to any transfers to be made on such date provided under the headings Priority of Funds in Event of Debt Service Fund Shortfall and Priority of Funds in Event of Subordinated Debt Service Fund Shortfall, the Trustee shall withdraw and apply the necessary moneys to provide for such insufficiency from the following Funds and Accounts in the following order: (i) the General Fund; (ii) amounts in the Revolving Loan Fund not yet committed to loans to Local Bodies; (iii) the Rate Stabilization Fund; (iv) the Water Pollution Abatement Fund; (v) the Renewal and Replacement Reserve Fund; and (vi) the Insurance Reserve Fund. On each June 30, excesses in the Operating Reserve Fund shall be transferred to the Revenue Fund. (Section 514)

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### Insurance Reserve Fund

(a) Moneys in the Insurance Reserve Fund may be applied by the Authority only to the purpose and in the manner provided for the proceeds of insurance set forth in the General Resolution. The Trustee shall also apply moneys in the Insurance Reserve Fund as provided under the headings Priority of Funds in Event of Debt Service Fund Shortfall and Priority of Funds in Event of Subordinated Debt Service Fund Shortfall.

(b) If on any day on which a transfer from the Revenue Fund to the Insurance Reserve Fund is required pursuant to the General Resolution Revenues are insufficient to make the deposits to the Insurance Reserve Fund required by General Resolution to be made from the Revenue Fund, or if on any date the Authority delivers a Certificate to the Trustee to the effect that moneys in the Insurance Reserve Fund are insufficient to meet claims properly payable from such Fund then due and payable then, subject to any transfers to be made on such date provided under the headings Priority of Funds in Event of Debt Service Fund Shortfall, Priority of Funds in Event of Subordinated Debt Service Fund Shortfall and Operating Reserve Fund, the Trustee shall withdraw and apply the necessary moneys to provide for such insufficiency from the following Funds and Accounts in the following order: (i) the General Fund; (ii) amounts in the Revolving Loan Fund not yet committed to loans to Local Bodies; (iii) the Rate Stabilization Fund; (iv) the Water Pollution Abatement Fund and (v) the Renewal and Replacement Reserve Fund. On each June 30 excesses in the Insurance Reserve Fund shall be transferred to the Revenue Fund. (Section 515)

### Renewal and Replacement Reserve Fund

(a) Moneys in the Renewal and Replacement Reserve Fund shall be applied as hereinafter provided to the Cost of any Capital Improvement which is not provided for by moneys available in the Construction Fund or the Operating Fund. The Trustee shall withdraw from such Fund and deposit in one or more special separate Subaccounts established for such purpose in the Construction Fund or, if the Authority has by resolution determined to subsequently finance such Capital Improvement by the issuance of Secured Bonds in a Subaccount relating to such Secured Bonds, any amount requested by the Authority but only upon receipt of a certificate of an Authorized Representative (i) specifying the Capital Improvement to which such amount will be applied, its estimated Cost and estimated completion date and (ii) certifying (a) that such Capital Improvement is reasonably required for the continued operation of the System or the maintenance of Revenues, (b) that all or a portion of the Cost of such Capital Improvement was not included in the Cost of Capital Improvements to be financed in whole or in part from the Operating Fund and (c) that only the Cost of such Capital Improvement that is in excess of the amounts available therefor in such Fund, is being or has previously been requisitioned from the Renewal and Replacement Reserve Fund. Upon completion of such Capital Improvement, any amount so deposited and not necessary to pay the Cost of such Capital Improvement shall be redeposited in the Renewal and Replacement Reserve Fund. The Trustee shall also apply moneys in the Renewal and Replacement Reserve Fund as provided under the headings Priority of Funds in the Event of Debt Service Fund Shortfall, Priority of Funds in Event of Subordinated Debt Service Shortfall, Operating Reserve Fund and Insurance Reserve Fund.

(b) If on any day on which a transfer from the Reserve Fund to the Renewal and Replacement Reserve Fund is required provided under the headings Priority of Funds in Event of Debt Service Fund Shortfall, Priority of Funds in Event of Subordinated Debt Service Shortfall, Operating Reserve Fund and Insurance Reserve Fund Revenues are insufficient to make the deposits to the Renewal and Replacement Reserve Fund required to be made from the Revenue Fund, or if on any date the Authority delivers a Certificate to the Trustee to the effect that moneys in the Renewal and Replacement Reserve Fund are insufficient to meet the Costs of a Capital Improvement to be funded as described in paragraph (a) above then due and payable then, subject to any transfers to be made on such date provided under the headings Priority of Funds in Event of Debt Service Fund Shortfall, Priority of Funds in Event of Subordinated Debt Service Shortfall, Operating Reserve Fund and Insurance Reserve Fund, the Trustee shall withdraw and apply the necessary moneys to provide for such insufficiency from the following Funds and Accounts in the following order: (i) the General Fund; (ii) amounts in the Revolving Loan Fund not yet committed to loans to Local Bodies; (iii) the Rate Stabilization Fund and (iv) the Water Pollution Abatement Fund.

(c) If on any June 30 or, if such day is not a Business Day, on the next preceding Business Day, the amount in the Renewal and Replacement Fund is in excess of the Renewal and Replacement Reserve Cash Requirement for the Fiscal Year then ending, such excess shall be transferred to the Revenue Fund or shall be



retained in the Renewal and Replacement Reserve Fund upon the delivery of a Certificate of an Authorized Representative of the Authority to the effect that such amounts being retained are necessary to meet the Costs of Capital Improvements properly payable from such Fund as described in paragraph (a) above.

#### Water Pollution Abatement Fund

(a) Moneys in the Water Pollution Abatement Fund shall be transferred as directed by the Authority for the payment of Water Pollution Abatement Obligations upon receipt by the Trustee of the Certificate of an Authorized Representative that moneys in respect to Water Pollution Abatement Obligations are due and payable by the Authority. The Trustee shall also apply moneys in the Water Pollution Abatement Fund as described under the headings Priority of Funds in Event of Debt Service Fund Shortfall, Priority of Funds in Event of Subordinated Debt Service Fund Shortfall, Operating Reserve Fund, Insurance Reserve Fund and Renewal and Replacement Reserve Fund.

(b) On each June 30, excesses in the Water Pollution Abatement Fund shall be transferred to the Revenue Fund. (Section 516A)

#### Rate Stabilization Fund

Moneys shall be transferred to the Rate Stabilization Fund from the General Fund as provided in the General Resolution. Moneys in the Rate Stabilization Fund may be transferred to a separate Subaccount of the Construction Fund upon receipt of a Certificate of an Authorized Representative to the effect that such moneys are necessary to pay the Costs of Projects for which no other funds in the Construction Fund are available. Moneys in the Rate Stabilization Fund shall be transferred to the Revenue Fund upon delivery to the Trustee of a Certificate of an Authorized Representative of the Authority or in accordance with the provisions of an Operating Budget. The Trustee shall also apply moneys in the Rate Stabilization Fund as described under the headings Priority of Funds in Event of Debt Service Fund Shortfall, Priority of Funds in Event of Subordinated Debt Service Fund Shortfall, Operating Reserve Fund, Insurance Reserve Fund and Renewal and Replacement Reserve Fund. Moneys in the Rate Stabilization Fund shall also be transferred to the Note Payment Fund and applied to the payment of principal of and interest on Bond Anticipation Notes to the extent provided in any Supplemental Resolution authorizing such notes. (Section 517)

#### Revolving Loan Fund

Moneys in the Revolving Loan Fund shall be used to make loans on such terms and conditions as the Authority may deem appropriate to Local Bodies receiving water or sewer service from the Authority for the purpose of financing capital improvements to be made to the water distribution and waste-water collection systems of such Local Bodies. Repayments of principal and interest on such loans shall be transferred upon receipt by the Authority to the Trustee and deposited in the Revolving Loan Fund unless the Authority shall instruct the Trustee that repayments of interest on such loans are to be deposited in the Revenue Fund. Any such interest payments deposited in the Revenue Fund shall be deemed "Revenues." Any such loans and repayments, together with any notes or other instruments evidencing such loans and any security provided therefor and the rights to receive such repayments, and any amounts on deposit in the Revolving Loan Fund committed to funding such loans may be pledged as security for any Indebtedness incurred pursuant to the General Resolution for the purpose of funding such loans. The Trustee shall also apply moneys in the Revolving Loan Fund as described under the headings Priority of Funds in Event of Debt Service Fund Shortfall, Priority of Funds in Event of Subordinated Debt Service Fund Shortfall, Operating Reserve Fund, Insurance Reserve Fund and Renewal and Replacement Reserve Fund. (Section 518)

#### General Fund

(a) Moneys in the General Fund shall be transferred to the Rate Stabilization Fund upon delivery to the Trustee of a Certificate of an Authorized Representative of the Authority (i) to the effect that, for the previous Fiscal Year, the requirements of the Combined Bond Coverage Requirement shall have been satisfied and (ii) setting forth the amount of Revenues Available for Bond Debt Service for such period in excess of Primary Bond Coverage

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Requirement for such period which are then on deposit in the General Fund to be transferred by the Trustee to the Rate Stabilization Fund, provided that the transfer shall not be in an amount greater than such excess. The Trustee shall also transfer moneys in the General Fund to a separate subaccount of the Construction Fund upon receipt of a Certificate of an Authorized Representative to the effect that such moneys are necessary to pay the Costs of Projects for which no other funds in the Construction Fund are available. Moneys in the General Fund may also be transferred to the Redemption Account and applied to the redemption of Secured Bonds. The Trustee shall also apply moneys in the General Fund as described under the headings Priority of Funds in Event of Debt Service Fund Shortfall, Priority of Funds in Event of Subordinated Debt Service Fund Shortfall, Operating Reserve Fund, Insurance Reserve Fund and Renewal and Replacement Reserve Fund. Moneys in the General Fund shall also be transferred to the Note Payment Fund and applied to the payment of principal of and interest on Bond Anticipation Notes to the extent provided in any Supplemental Resolution authorizing such notes.

(b) On any date, subject to the requirements of the shortfall provisions of the Debt Service Fund, the Subordinated Debt Service Fund, the Operating Reserve Fund, the Insurance Reserve Fund and the Renewal and Replacement Reserve Fund, the Authority may, by a Certificate of its Authorized Representative and without any further showing, direct that moneys be transferred from the General Fund to any Fund or Account established under the General Resolution other than the Revenue Fund, the Operating Fund, the Principal and Interest Accounts in the Debt Service Fund and the Rate Stabilization Fund. (Section 519)

### Note Payment Fund

(a) The Authority shall deposit into a separate account the Note Payment Fund the proceeds of any Secured Bonds issued to provide for the payment of Bond Anticipation Notes of the Authority as directed by the Supplemental Resolution for such Secured Bonds and shall deposit amounts transferred pursuant to the General Resolution as described in paragraph (a) under the heading Subordinated Debt Service Fund and paragraph (a) under the heading General Fund.

(b) Moneys on deposit in a subaccount of the Note Payment Fund shall be applied to the payment of the Bond Anticipation Notes with respect to which such subaccount was established upon receipt by the Trustee of a Certificate of the Authority as required by General Resolution. Any moneys remaining in a subaccount of the Note Payment Fund after payment of the Bond Anticipation Notes with respect to which such account was established shall be transferred to and deposited in a separate subaccount established within the Construction Fund. (Section 520)

### Depositories

All moneys or securities held by the Trustee under the provisions of the General Resolution shall constitute trust funds and the Trustee may, and shall, if directed in writing by an Authorized Representative of the Authority, deposit such moneys or securities with one or more Depositories in trust for the Trustee. Moneys or securities in the Operating Fund shall be deposited by the Authority with one or more Depositories in trust for the authority. All moneys or securities deposited under the provisions of the General Resolution with the Trustee or any Depository shall be held in trust and applied only in accordance with the provisions of the General Resolution, and each of such Funds established by the General Resolution shall be a trust fund for the purposes thereof. Each Depository holding moneys or securities in trust for the Trustee shall be a bank or trust company organized under the laws of the Commonwealth or a national banking association (having its principal office with the Commonwealth), having capital stock, surplus and undivided earnings aggregating at least \$100,000,000 (or such greater amount as set forth in a Supplemental Resolution) and willing and able to accept the office on reasonable and customary terms and authorized by law to act in accordance with the provisions of the General Resolution. (Section 521)

### Investment of Certain Funds

(a) Moneys held in the Debt Service Fund, the Subordinated Debt Service Fund and the Note Payment Fund shall be invested and reinvested by the Trustee to the fullest extent practicable in Investment Securities (other than those of the type described in subparagraph (e) of the definition of Investment Securities in the General Resolution) which mature not later than at such times as shall be necessary to provide moneys when needed for payments to be made from such Funds. Subject to the provisions of the General Resolution, moneys held in the

Debt Service Reserve Fund and the Subordinated Debt Service Reserve Fund shall be invested and reinvested by the Trustee to the fullest extent practicable in Investment Securities (other than those of the type described in subparagraph (e) of the definition of Investment Securities in the General Resolution) which mature not later than at such times as shall be necessary to provide moneys when needed for payment to be made from such Funds. Moneys held in any other Fund or Account established under the General Resolution may be invested and reinvested in Investment Securities. The Trustee shall make all such investments of moneys held by it in accordance with written instructions from any Authorized Representative of the Authority, which may for this purpose include one or more investment advisors designated in writing by such Representative from time to time. In making any investment in any Investment Securities with moneys in any Fund or Account established under the General Resolution, the Authority and the Trustee may combine such moneys with moneys in any other Fund or Account. Moneys in any Fund or Account shall be invested so as to mature not later than such times as shall be necessary to provide moneys when needed for payments to be made from such Fund or Account.

(b) Interest (net of that which represents a return of accrued interest paid in connection with the purchase of any investment) and other investment earnings on any moneys or investments in the Funds and Accounts, other than the Construction Fund, the Cost of Issuance Fund, the Operating Fund, the Note Payment Fund, the Debt Service Fund, the Debt Service Reserve Fund, the Subordinated Debt Service Fund and the Subordinated Debt Service Reserve Fund shall be paid into the Revenue Fund, on the last Business Day of each month. Interest and other investment earnings on any moneys or investments in the Operating Fund, the Debt Service Fund, the Subordinated Debt Service Fund and the Note Payment Fund shall be retained in the Fund in which such earnings accrued; provided that the Authority may direct that the earnings on moneys in the Operating Fund may be deposited in the Revenue Fund. Interest and other investment earnings on any moneys or investments in the Debt Service Fund and the Debt Service Reserve Fund shall be paid on the last Business Day of each month, first to the Interest Account of the Debt Service Fund and second to the Principal Account of the Debt Service Fund; and interest and any other investment earnings on the Subordinated Debt Service Reserve Fund shall be paid on the last Business Day of each month, first to the Interest Account of the Subordinated Debt Service Fund and second to the Principal Account of the Subordinated Debt Service Fund; provided, however, that the Authority may direct that investment earnings on any moneys or investments in the Debt Service Fund or the Subordinated Debt Service Reserve Fund may be deposited for such period of time as the Authority may determine in the Revenue Fund or the Construction Fund if the authority shall obtain a Bond Counsel's Opinion to the effect that such application of earnings shall not adversely affect the exclusion of interest on any Tax Exempt Indebtedness from gross income of the holder for federal income tax purposes. Interest and other investment earnings on any other moneys or investments in Construction Fund attributable to any subsequent series of Secured Bonds shall be paid on the last Business Day of each month, to the related Subaccounts of the Debt Service Fund (or the Subordinated Debt Service Fund if so specified in the applicable Supplemental Resolution) first to the Interest Account and second to the Principal Account; provided, however, that the Authority may from time to time direct that all or a portion of such earnings may be retained in the Construction Fund for any period of time if there shall be provided a Certificate of an Authorized Officer of the Authority on the date of such direction and on each July 1 thereafter, so long as such direction remains in effect, (i) certifying for the most recent preceding period of twelve consecutive months, Revenues Available for Bond Debt Service were at least equal to the Primary Bond Coverage Requirement for both the current the Primary Bond Coverage Requirement and (ii) projecting that Revenues Available for Bond Debt Service will be at least equal to and, if the period so directed by Authority includes it, the following fiscal year. Earnings retained in the Construction Fund will not be included in the calculation of Revenues Available for Bond Debt Service. For purposes of this paragraph, interest shall not include the return of accrued interest paid in connection with the purchase of any investment.

(c) Notwithstanding the foregoing, the Authority may direct that investment earnings reasonably expected to be subject to the requirements of section 148(f) of the Code or the Treasury Regulations applicable thereto may be deposited directly to the Rebate Fund to the extent desirable to comply with the requirements of section 148(f) of the Code or the Treasury Regulations applicable thereto. (Section 523 and Second Supplemental Resolution Section 401)

(d) Pursuant to the provisions described in paragraph (b), investment earnings derived from moneys on deposit from time to time in the Construction Fund and the Subordinated Debt Service Fund attributable to the SRF Bonds shall be transferred on the last Business Day of each month to the related Subaccounts of the

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Subordinated Debt Service Fund, first to the Interest Subaccount and second to the Principal Subaccount. (Section 523)

### Valuation and Sale of Investments

Obligations purchased as an investment of moneys in any Fund created under the provisions of the General Resolution shall be deemed at all times to be a part of such Fund and any profit realized from the liquidation of such investment shall be credited to such Fund and any loss resulting from the liquidation of such investment shall be charged to such Fund.

In computing the amount in any Fund created under the provisions of the General Resolution for any purpose provided in the General Resolution, obligations purchased as an investment of moneys therein shall be valued at the amortized cost of such obligations or the market value thereof, whichever is lower. Any deficiency resulting from a decrease in the valuation of investments held in the Debt Service Reserve Fund may be disregarded for purposes of calculating deposits required from the Revenue Fund (but not for purposes of deposits required to make the amount on deposit in each Subaccount of the Debt Service Reserve Fund equal to the applicable Series Debt Service Reserve Fund Requirement) provided that the amount on deposit in the Debt Service Reserve Fund is at least 95% of the Debt Service Fund Requirement. The accrued interest paid in connection with the purchase of any obligation shall be included in the value thereof until interest on such obligation is paid. Such computation shall be made annually on June 30 for all Funds and at such other times as the Authority shall determine or as may be required by the General Resolution. (Section 524)

### Rebate Fund

Upon the issuance, sale and delivery of any Series of Indebtedness subject to the Rebate Fund Requirement, the Trustee shall establish a separate account within the Rebate Fund for such Series. Funds on deposit in the Rebate Fund shall be applied as set forth in the applicable Supplemental Resolution. Unless otherwise specified in the applicable Supplemental Resolution, interest or other income derived from the investment or deposit of moneys in the Rebate Fund shall be transferred to the Revenue Fund. (Section 525)

### Holding of Special Deposits

Except as otherwise provided in any Supplemental Resolution, (i) any Grant Receipts held by or for the account of the Authority in connection with the System which are required to be applied under the terms of the applicable Grant Agreement directly to the payment of Costs of acquisition, construction or alteration of a Project which is the subject of such Grant Agreement and (ii) any Grant Receipts or other moneys which have been pledged to the payment of any Special Subordinated Indebtedness issued pursuant to the provisions of the Operating Reserve Fund described in paragraph (a)(i) or (b) under the heading Special Subordinated Indebtedness (including, without limitation, proceeds of any such indebtedness) and (iii) any moneys which are subject to refund by the Authority or held for the account of others including, without limitation, any amounts which, under any agreement by the Authority providing for adequate separation of such amounts from Revenues, are collected by the Authority on behalf of others for services rendered or commodities provided to customers of the System, any amounts deducted by the Authority from wage and salary payments to the employees of the Authority, any amounts contributed by the Authority to any pension or retirement fund or system which amounts are held in trust for the benefit of the employees of the Authority and any amounts held as deposits and (iv) any state debt service assistance which the Authority elects not to include in Revenues, together with any investments of such Grant Receipts or other moneys and interest and profits thereon to the extent such interest and profits are also pledged, segregated or held for the account of others or subject to refund to others, may be held by the Authority in such manner and in such depositories or accounts, outside of the various Funds and Accounts established by the General Resolution, as the Authority may otherwise by resolution provide. At the election of the Authority such Grant Receipts and other moneys may be deposited in separate accounts maintained by the Authority with the Trustee or any other Depository; moneys described in clause (iv) above shall be deposited by the Trustee in the Debt Service Fund or the Subordinated Debt Service Fund upon the instructions of the Authority, which instructions shall specify the timing and amount of each such deposit and the Account or Accounts of such Funds to which the deposits are to be made. (Section 526)

Covenants of the Authority

In the General Resolution, the Authority covenants, among other things, as follows:

Covenant as to Rates and Charges: Debt Service Coverage Ratio

(a) The Authority shall for each Fiscal Year fix and adjust Rates and Charges with respect to its Waterworks and Sewer Operations, which Rates and Charges shall be adopted by the Authority's Board of Directors strictly in accordance with the provisions of the Act as in effect on the original date of adoption of the General Resolution (i.e. January 24, 1990) and which adoption shall be conclusive and final and not subject to supervision or regulation by any office, department, division, commission, board, bureau or agency of the Commonwealth or any of its political subdivisions, so as to provide funds, in the aggregate and separately, with respect to costs and operations allocable to the Waterworks and Sewer Operations at least sufficient with other revenues of the Authority, if any, available therefor (i) to pay all Current Expenses, (ii) to pay all Debt Service on Indebtedness of the Authority as the same becomes due and payable, (iii) to create and maintain all reserves established pursuant to the General Resolution or reasonably required by any other agreement securing Indebtedness of the Authority or as otherwise determined by the Authority to be necessary or desirable, (iv) to pay all costs of maintenance and replacement of the System, and costs of improving, extending and enlarging the System as determined by the Authority to be necessary or desirable, to be funded as Current Expenses in order to carry out the purposes of the Authority, (v) to provide for payments to the Commonwealth for debt service as provided in the Act, and (vi) to pay or provide for all amounts which the Authority may be obligated to pay or provide for by any law or contract including the General Resolution or other agreement securing Indebtedness of the Authority and including any amount to be repaid to the Commonwealth to reimburse the Commonwealth for the debt service paid by the Commonwealth on a bond issued under Section 5(f) of the Act. The charges of the Authority for delivery of water and for sewage collection, disposal and treatment services shall be established as charges of general application to be borne by the local body utilizing such services (provided, however, that the Authority reserves the right to impose charges of special application in accordance with the Act) and shall be established at a level sufficient to meet the revenue requirements of the Authority as described in this paragraph.

(b) Without limiting the provisions described in paragraph (a) above, the Authority shall fix and adjust Rate and Charges, which Rates and Charges shall be adopted by the Authority's Board of Directors strictly in accordance with the provisions of the Act as in effect on the original date of adoption of the General Resolution and which adoption shall be conclusive and final and not subject to supervision or regulation by any office, department, division, commission, board, bureau or agency of the Commonwealth or any of its political subdivisions, sufficient to provide Revenues Available for Bond Debt Service in each Fiscal Year that are (i) at least equal to the Primary Bond Coverage Requirement and (ii) so long as any Parity Subordinated Bonds shall be Outstanding, at least equal to the Secured Bond Coverage Requirement.

(c) Without limiting the provisions described in paragraph (a) or (b) above, the Authority shall fix and adjust Rates and Charges, which Rates and Charges shall be adopted by the Authority's Board of Directors strictly in accordance with the provisions of the Act as in effect on the original date of adoption of the General Resolution and which adoption shall be conclusive and final and not subject to supervision or regulation by any office, department, division, commission, board, bureau or agency of the Commonwealth or any of its political subdivisions, sufficient to provide Revenues Available for Subordinated Debt Service in each Fiscal Year at least equal to the coverage requirement, if any, set forth in a Supplemental Resolution in connection with a Series of Subordinated Bonds.

(d) The Primary Bond Coverage Ratio and the Supplemental Bond Coverage Ratio may be adjusted from time to time by the Authority by the adoption of a Supplemental Resolution provided that: (i) the Authority shall have provided evidence to the Trustee that the details of such adjustment have been provided in writing to each Rating Agency then assigning a rating on Outstanding Secured Bonds and that each such Rating Agency has either (x) confirmed in writing that such adjustment will not adversely affect such ratings or (y) issued a rating on a Series of Bonds to be issued which is not less than the rating assigned by such Rating Agency to Outstanding Bonds of such category, or any other evidence satisfactory to the Trustee that such adjustment will not adversely affect the then current ratings, if any, assigned to any Outstanding Secured Bonds by and Rating Agency; and (ii) the Primary

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Bond Coverage Ratio shall not be less than 1.1; and (iii) no such adjustment shall cause the sum of (x) the Primary Bond Coverage Ratio and (y) the Supplemental Bond Coverage Ratio to be less than 1.2.

(e) If in any Fiscal Year Revenues shall not satisfy the requirements described in paragraph (a) above, or Revenues Available for Bond Debt Service or Revenues Available for Subordinated Debt Service shall not satisfy the requirements described in paragraph (b) or (c) above, respectively, then the Authority shall not be deemed to be in default under the General Resolution so long as it shall have complied or is diligently proceeding to comply with the requirements described in paragraphs (f) and (g) below.

(f) On or before the last day of each Fiscal Year the Authority shall review the adequacy of its rates, fees, rentals and other charges with respect to the System and the Authority's other corporate purposes to satisfy the requirements described under this heading for the next succeeding Fiscal Year. If such review, or any report of a Consulting Engineer or Rate Consultant provided in connection with such review or in accordance with any section hereof, indicates that the rates, fees, rentals and other charges with respect to the System and the Authority's other corporate purposes are, or are likely to be, insufficient to meet the requirements described under this heading for the next succeeding Fiscal Year, or if it otherwise appears at any time during such Fiscal Year that rates, fees, rentals and other charges with respect to the System and the Authority's other corporate purposes are or are likely to be insufficient to meet such requirements, the Authority shall promptly take such steps as are permitted by law and as are necessary to cure or avoid the deficiency.

(g) Within one hundred and eighty (180) days of the close of each Fiscal Year while Bonds are Outstanding, the Authority shall deliver to the Trustee a certificate of an Authorized Representative stating, if such was the case, that the Authority satisfied the requirements described in paragraphs (a), (b) and (c) above in such Fiscal Year or, if such was not the case, specifying in reasonable detail the corrective steps taken by the Authority so that it will comply with such requirements in the then current Fiscal Year. Such certificate shall be accompanied by a Certificate of the Accountant in accordance with the General Resolution setting forth the amounts for the preceding Fiscal Year which are necessary to determine compliance with the requirements described in paragraph (a), (b) or (c) above. If the amounts set forth in the certificate of the accountants indicate that the Authority was not in compliance for such Fiscal Year with the provisions described in paragraph (a), (b) or (c) above, the Consulting Engineer or Rate Consultant shall review the adequacy of the Authority's rates, fees, rentals and other charges with respect to the System and shall recommend changes necessary for the Authority to be in compliance with the provisions described in paragraphs (a), (b) and (c) above by the end of the then current Fiscal Year. The Authority covenants, to the extent permitted by and in accordance with the Act, to use its best efforts to effect such changes as are so recommended by the Consulting Engineer or Rate Consultant. (Section 705)

### Sale, Lease or Encumbrance of Property

(a) Except as provided under this heading and authorized under the Act, no part of the System shall be sold, mortgaged, leased or otherwise disposed of or encumbered.

(b) The Authority may from time to time sell or exchange or otherwise dispose of at any time and from time to time any property or facilities constituting part of the System which either (1) are worn out or obsolete or (2) in the opinion of the Authority are no longer useful in the operation of the System and, if the market value of such property or facilities to be sold or otherwise disposed of in any Fiscal Year, as determined by the Authority, is in excess of one tenth of one percent (.1%) of the book value of the entire System, the Authority delivers to the Trustee a certificate of an Authorized Representative stating, in the opinion of the signer, that the sale, exchange or other disposition of such property or facilities will not impair the ability of the Authority to satisfy the Rates and Charges covenants in the then current or any future Fiscal Year. Any proceeds of such sale, exchange or other disposition not used to replace the property so sold or exchanged shall be deposited by the Authority in the Revenue Fund.

(c) To the extent permitted by the Act, the Authority may mortgage, grant security interests in, or otherwise encumber any real or personal property included in the System, or may lease any real or personal property to be used in the operation of the System, provided that the aggregate annual payments required to be made by the Authority under all such mortgages, security interests, encumbrances and leases shall not in any Fiscal Year exceed twenty-five percent (25%) of the total Current Expenses for such Fiscal Year as shown in the

Current Expense Budget then in effect. The proceeds of sale, if any, of any such property mortgaged or otherwise encumbered, after satisfying the mortgage, security interest or other encumbrance secured by the same, shall be deposited in the Revenue Fund. Until so deposited, such proceeds shall not be deemed Revenues under the General Resolution.

(d) To the extent permitted by the Act, the Authority may lease as lessor or make contracts or grant licenses for the operation of, or grant easements or other rights with respect to, any part of the System if such lease, contract, license, easement or right does not, in its opinion (as evidenced, in the event of any such lease, contract, license, easement or right which extends for more than one year or which is irrevocable, by a Certificate of an Authorized Representative delivered to the Trustee), impede the operation by the Authority of the System. Except as detailed under the heading Special Subordinated Indebtedness, any payments to the Authority under or in connection with any such lease, contract, license, easement or right (except any such payments specifically excluded from the definition of Revenues) shall constitute Revenues under the General Resolution. (Section 706)

#### Operation, Maintenance and Reconstruction

(a) The Authority shall operate, or cause to be operated, the System properly and in a sound, efficient and economical manner and shall maintain, preserve, and keep the same or cause the same to be maintained, preserved, and kept in good repair and operating condition, and shall from time to time make, or cause to be made, all necessary and proper repairs, replacements and renewals so that the operation of the System may be properly and advantageously conducted, and, if any useful part of the System is damaged or destroyed or taken through the exercise of eminent domain, the Authority shall, as expeditiously as practicable, commence and diligently prosecute the replacement or reconstruction of such damaged or destroyed part so as to restore the same to use and the replacement of such part so taken; provided, however, that nothing in the General Resolution shall require the Authority to operate, maintain, preserve, repair, replace, renew or reconstruct any part of the System if there shall have been filed with the Trustee (1) a certificate of an Authorized Representative stating that in the opinion of the signer (a) abandonment of operation of such part is economically justified and (b) failure to operate, maintain, preserve, repair, replace, renew or reconstruct such part will not impair the ability of the Authority to satisfy the Rates and Charges covenants in the current or any future Fiscal Year, and (2) a certificate of a Consulting Engineer concurring in such opinion of the Authorized Representative if the book value of such part of the System exceeds one percent (1%) of the book value of the entire System.

(b) The Authority shall establish and enforce reasonable rules and regulations governing the operation, use and services of the System. All compensation, salaries, fees and wages paid by the Authority in connection with the maintenance, repair and operation of the System shall be reasonable.

(c) Nothing in the General Resolution shall be deemed to preclude the Authority from undertaking such other Projects or exercising such other powers unrelated to the operation of the System as may be permitted from time to time under the Act and approved by its Board of Directors. (Section 707)

#### Insurance and Condemnation

(a) The Authority shall at all times either (i) keep all property which is a part of the System and which is of an insurable nature and of the character usually insured by water or sewer utility systems similar to the Authority insured against loss or damage by fire and from other causes customarily insured against and in such relative amounts, and with such deductibles, if any, as are customary, and also at all times maintain insurance against loss or damage from such hazards and risks to persons and the property of others, and with such deductibles, if any, as are usually insured against by water or sewer utility systems similar to the Authority or (ii) maintain the Insurance Reserve Fund at the Insurance Reserve Fund Requirement. In determining the amounts and types of insurance and deductibles, if any, to be maintained under this Section, the Authority may rely upon the advice of a Consulting Engineer or an insurance consultant of recognized standing selected by the Authority and satisfactory to the Trustee. All policies of insurance shall be payable to the Authority or to the Trustee. On or before the last day of each Fiscal Year, the Authority shall deliver to the Trustee a certificate of an Authorized Representative listing the types and amounts of insurance then maintained by the Authority in accordance with this Section and the insurers therefor.

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(b) All proceeds of insurance maintained pursuant to paragraph (a) above shall be applied as provided in the General Resolution. Such application may include the redemption of Secured Bonds of the Series to which such moneys relate on the first date on which such Secured Bonds may be called without premium (unless the Authority shall elect to call such Secured Bonds earlier at a premium).

(c) If any property or facility comprising part of the System shall be taken through the exercise of the power of eminent domain, the Authority shall apply the proceeds of any award received on account of such taking to the replacement of the property or facility so taken or deposit such proceeds in the Renewal and Replacement Reserve Fund or the Operating Reserve Fund to the extent that the costs of such replacement were paid from the Renewal and Replacement Reserve Fund or the Operating Reserve Fund, unless the Authority determines in accordance with the General Resolution not to replace such property or facility. Any proceeds of such award not applied to such replacement or remaining after such work has been completed shall be deposited in the Revenue Fund, except that any proceeds resulting from the taking of all or substantially all of the System shall be deposited with the Trustee in the Redemption Account of the Debt Service Fund for the purpose of redemption of Secured Bonds or for the defeasance of Secured Bonds as provided in the General Resolution. (Section 708)

### Consulting Engineer; Rate Consultant

The Authority shall, until the Secured Bonds and the interest thereon shall have been paid or provision for such payment shall have been made, for the purpose of performing and carrying out the duties imposed on the Consulting Engineer by the General Resolution, employ an independent engineer or engineering firm having a nationwide and favorable repute for skill and experience in such work and, except in the case of the firm serving as Consulting Engineer at the time of the adoption of the General Resolution, who shall be reasonably acceptable to the Trustee. (Section 710)

The Authority shall, until the Secured Indebtedness and the interest thereon shall have been paid or provision for such payment shall have been made, for the purpose of performing and carrying out the duties imposed on the Rate Consultant by the General Resolution, employ an independent accountant or firm of independent accountants, or a management consultant or management consulting firm, or independent engineer or engineering firm (which may also be the Consulting Engineer), having, in any case, a nationwide and favorable repute for skill and experience in such work and, except in the case of the firm serving as the Rate Consultant at the time of the adoption of the General Resolution, who shall be reasonably acceptable to the Trustee. (Section 711)

### Operating Budget

(a) Not less than thirty (30) days prior to the beginning of each Fiscal Year the Authority shall prepare and deliver to the Trustee a preliminary Operating Budget, and not less than one day prior to the beginning of each Fiscal Year, shall adopt, in accordance with applicable powers, procedures, responsibilities and limitations established by the Act for adoption of the Current Expense Budget, and file with the Trustee a copy of the Operating Budget, duly certified by an Authorized Representative of the Authority, showing on a monthly basis the estimated Operating Expenses to be paid from the Operating Fund and Commonwealth Obligations to be paid from the Commonwealth Obligation Fund, as well as the Revenues or other moneys held under the General Resolution estimated to be available to pay such Operating Expenses and Commonwealth Obligations (including the amount of each item constituting a component thereof) for the ensuing Fiscal Year, together with any other information required to be set forth therein by the General Resolution; provided, however, that the Operating Budget for the Fiscal Year, or portion thereof, in which the first Series of Secured Bonds is issued, may be adopted by any Authorized Officer. Such Operating Budget may set forth such additional information as the Authority may determine. The Authority shall not incur aggregate Operating Expenses and Commonwealth Obligations in any Fiscal Year in excess of the amount budgeted in the Operating Budget, as amended and supplemented for such Fiscal Year, except in case of emergency or as required by law and shall promptly file with the Trustee a written report of any such excess expenditure signed by an Authorized Representative and as soon as practicable thereafter adopt and file with the Trustee an amendment to the Operating Budget.

(b) In conjunction with the adoption and filing, or any amendment, of the Operating Budget, the Authority shall certify the Operating Reserve Fund Requirement for the Fiscal Year to which such Budget relates; provided that (i) the Operating Reserve Fund Requirement shall not be less than one-sixth (1/6) of the annual



Operating Expenses set forth in such Budget and (ii) the Authority's certificate shall be consistent with the latest recommendation of the Consulting Engineer made in conjunction with its report pursuant to the General Resolution. In addition, the Authority shall at the same time certify the Renewal and Replacement Reserve Fund Requirement for the Fiscal Year to which such Budget relates; provided that the Authority's certificate shall be consistent with the latest recommendation of the Consulting Engineer made pursuant to the General Resolution. In addition, the Authority will certify the assumed interest rate on each Series of Variable Rate Indebtedness then Outstanding for which deposits will be required to be made from the Reserve Fund to the Debt Service Fund and the Subordinated Debt Service Fund pursuant to the General Resolution. If the Authority shall not certify the Operating Reserve Fund Requirement or the Renewal and Replacement Reserve Fund Requirements as aforesaid, the requirement for the Fiscal Year shall be the Requirement in effect for the previous Fiscal Year until the new requirement is certified as aforesaid. Notwithstanding the foregoing, the initial Operating Reserve Fund Requirement and Renewal and Replacement Reserve Fund Requirement shall be as set forth in the Supplemental Resolution authorizing the first series of Secured Bonds under the General Resolution.

(c) If for any reason the Authority shall not have adopted the Operating Budget as provided in the General Resolution, the Operating Budget for the then current Fiscal Year shall be deemed to be the Operating Budget for the ensuing Fiscal Year until a new Operating Budget is adopted.

(d) The Authority may at any time adopt an amended Operating Budget for the then current or ensuing Fiscal Year, but no such amended Operating Budget shall supersede any prior Budget until the Authority shall have filed with the Trustee and the Advisory Board a copy of such amended Operating Budget and shall have complied in all respects with the requirements of the Act applicable to the Current Expense Budget in adopting any amended Operating Budget.

(e) In addition to the Authority's right to amend the Operating Budget pursuant to the General Resolution, the Authority may reallocate amounts budgeted to specific items or months within the Operating Budget then in effect at any time by delivery of a Certificate of its Authorized Representative provided that no such reallocation shall result in an increase in the sum of the aggregate Operating Expenses and Commonwealth Obligations for the Fiscal Year covered by such Operating Budget. (Section 712)

#### Capital Budget

(a) Not less than forty-five (45) days prior to the beginning of each Fiscal Year the Authority shall prepare and file with the Trustee a proposed program of Projects to be undertaken by the Authority during such Fiscal Year and the next two ensuing Fiscal Years, identifying the Projects to be carried out, the estimated Costs thereof and the period of construction thereof, together with a proposed Capital Budget for the Projects to be undertaken in at least the first of such Fiscal Years. Not less than one day prior to the beginning of each Fiscal Year the Authority shall adopt and file with the Trustee a final Capital Budget for the Projects or parts thereof to be undertaken by the Authority in such Fiscal Year. The Capital Budget shall show all projected expenditures as well as the sources of moneys projected to be available to meet the same. The Capital Budget shall further identify the Projects to be undertaken, the nature of the work, the estimated Costs thereof and the estimated completion date of each Project.

(b) The Authority may from time to time amend or supplement the Capital Budget for the Fiscal Year then in progress by filing with the Trustee a certificate of an Authorized Representative setting forth the amendment or supplement. (Section 713)

#### Accounts and Reports

(a) The Authority shall maintain its books and accounts in accordance with generally accepted accounting principles applicable to water or sewer utilities such as the Authority and in accordance with such other principles of accounting as the Authority deems appropriate. Said books and accounts shall at all times be subject to the inspection of the Trustee and the Holder or Holders of not less than one percent (1%) in principal amount of Outstanding Secured Bonds of any category or their representatives duly authorized in writing.

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(b) The Authority shall annually, within one hundred eighty (180) days after the close of each Fiscal Year, file with the Trustee a copy of an annual report for such year, accompanied by financial statements, audited by and containing the report of an independent Accountant relating to the operations and properties of the System for such Fiscal Year and setting forth in reasonable detail its financial condition as of the end of such year and the income and expenses for such year, and including a summary of the receipts in and disbursements from the Funds and Accounts maintained under the General Resolution during such Fiscal Year and the amounts held therein at the end of such Fiscal Year. Each report of such accountant or firm of accountants shall state that the financial statements of the Authority were prepared in accordance with generally accepted accounting principles, or shall state in what respects such financial statements do not conform with such generally accepted accounting principles. If in connection with such annual audit such Accountant submits any written recommendations as to internal accounting controls or related matters, such recommendations shall also be filed with the Trustee. Each annual report shall be accompanied by a certificate of the accountant or firm of accountants auditing the same to the effect that in the course of and within the scope of their examination of such financial statements made in accordance with generally accepted auditing standards nothing came to their attention that would lead them to believe that a default had occurred under the General Resolution or, if such is not the case, specifying the nature of the default.

(c) Within one hundred twenty (120) days after the close of every third Fiscal Year following the Fiscal Year in which the initial Series of Bonds under the General Resolution is issued the Authority shall file with the Trustee a copy of a certificate of a Consulting Engineer setting forth in reasonable detail (1) its findings as to whether the properties of the System have been maintained during such three-year period, and are then being maintained, in good repair and sound operating condition, (2) its estimate of the amount, if any, required to be expended to place such properties in such condition and the approximate time required therefor, (3) its recommendations, if any, as to improved management and proper maintenance, repair, and operation of, and capital improvements to, the System during the ensuing three-year period, (4) its recommendations as to the adequacy of the Renewal and Replacement Reserve Fund Requirement to fund emergency repairs and replacements and other expenditures for repairs and replacements not provided for in the Operating Budget and the Capital Budget and (5) its recommendations as to the adequacy of the Authority's rates, fees, rentals and other charges. If such certificate sets forth that the properties of the System are not then being maintained in good repair and sound operating condition, the Authority shall restore the properties to good repair and sound operating condition as promptly as is practicable. (Section 714)

### Rates for Services

So long as any Secured Indebtedness is Outstanding, no free service related to the System shall be furnished by the Authority to any Local Body or to any person, firm, or corporation, except as set forth below. Any service rendered by the System to any Local Body or person, firm, or corporation shall be charged at the same rate and in the same manner in which any other user, within the same classification, is or would be charged for similar service. For purposes of this section, the Authority may make classifications among users of the System as permitted by the Act, which classifications may be based on reasonable distinctions related to the Authority's corporate purposes. The Authority may continue provisions for subsidization of water charges to which any Local Body is entitled in accordance with contract or other lawful obligations assumed by the Authority as successor to the MDC or otherwise entered into by the Authority prior to the adoption of the General Resolution. (Section 715)

### Non-Payment of Rates; Certification to Commonwealth Treasurer

(a) The Authority may in its discretion determine when an overdue payment shall constitute a Local Body Default, and be so certified, until such time as any such payment shall have been overdue for twelve months, whereupon the Authority shall certify such default as a Local Body Default. The Authority may make, with respect to any moneys received from a Local Body, reasonable allocations between its charges to such Local Body for the provision of waterworks or sewer services. The Authority shall notify the Trustee within thirty (30) days of any overdue Payment that remains unpaid, of the existence of such overdue payment and shall promptly notify the Trustee upon the declaration of such default as a Local Body Default. Within five Business Days of the determination of a Local Body Default, the Authority shall send to each Local Body receiving waterworks services, if such default was with respect to waterworks services or sewer services, if such Default was with respect to sewer services from the Authority, including the defaulting Local Body, a notice, a copy of which shall be sent to the Trustee, specifying (i) that a Local Body Default has occurred; (ii) the amount of such Local Body Default; (iii) that

unless such default is cured an allowance equal to such amount, including any interest or late charges on the overdue amount, shall be incorporated into the charges to each Local Body in connection with the Authority's next ensuing rate-setting process; and (iv) the approximate amount by which the Rates and Charges to be assessed against each Local Body shall be increased on account of the inclusion of such allowance in Rates and Charges. Further, the Authority shall by the earlier of (x) eighteen months from the date of such Local Body Default or (y) the next establishment by the Authority of its Rates and Charges following the Local Body Default which can feasibly incorporate the allowance referred to above, provided that the defaulting Local Body shall not have cured its default, assess each Local Body, including the defaulting Local Body, a pro rata share, based on each Local Body's share of total charges for water and sewer services, respectively, of the amount of such Local Body Default, including any interest or charges on the overdue amount, which assessment shall be in addition to the Rates and Charges required to comply with the Rates and Charges covenants of the General Resolution. The Authority shall provide the Trustee with written evidence that such assessment has been made.

(b) In addition to the requirements described in paragraph (a) above, the Authority shall take such steps as may be necessary under the provisions of the Act to collect delinquent rates or charges, and to enforce liens for non-payment of rates or charges, in a practicable and timely manner. Without limiting the foregoing, in the event that any Local Body, which has received a certification of the Authority's charges, shall fail to pay the same to the Authority when due after demand by the Authority, the Authority shall promptly certify to the Treasurer and Receiver General of the Commonwealth the amount owing to the Authority by said Local Body in accordance with Section 10(b) of the Act. The Authority shall promptly certify its charges to each Local Body and, in the event of a Local Body's failure to pay the Authority's charges, shall promptly demand the payment of same. (Section 716)

#### Tax Covenants

The General Resolution includes several covenants by the Authority as to federal and state tax matters, including a general covenant to take, or require to be taken, such action as may from time to time be required to assure the continued exclusion from the federal gross income of holders of any Series of Tax Exempt Indebtedness and the continued exemption from Massachusetts income taxation of the interest on Indebtedness, including, without limitation, the preparation and filing of any statements required to be filed by the Authority in order to establish and maintain such tax exclusion and exemption. In addition, the Authority shall not take, or permit to be taken on its behalf, any action which would adversely affect the exclusion from federal gross income, or the exemption from Massachusetts income taxation, of the interest on any Series of Tax Exempt Indebtedness.

#### Notice to Rating Agencies of Certain Contracts

The Authority shall notify each Rating Agency, prior to executing any interest rate exchange, cap or other hedge agreement of the general terms of such agreement, whether payments under such agreement are payable as Special Payment Obligations or as Operating Expenses. (Section 512)

#### Supplemental Resolutions

##### Supplemental Resolutions Effective Upon Filing with Trustee

For any one or more of the following purposes and at any time or from time to time, a Supplemental Resolution may be adopted by the Authority, which upon the filing with the Trustee of a copy thereof certified by an Authorized Representative, shall be fully effective in accordance with its terms:

(a) to close the General Resolution against, or provide limitations and restrictions in addition to the limitations and restrictions contained in the General Resolution on, the authentication and delivery of Secured Bonds or the issuance of other Indebtedness;

(b) to add to the covenants and agreements of the Authority in the General Resolution other covenants and agreements to be observed by the Authority which are not contrary to or inconsistent with the General Resolution as theretofore in effect including any covenants necessary for compliance with the Code, including without limitation Section 148(f) thereof or regulations promulgated thereunder;

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(c) to add to the limitations and restrictions in the General Resolution other limitations and restrictions to be observed by the Authority which are not contrary to or inconsistent with the General Resolution as theretofore in effect;

(d) to surrender any right, power or privilege reserved to or conferred upon the Authority by the terms of the General Resolution, but only if the surrender of such right, power or privilege is not contrary to or inconsistent with the covenants and agreements of the Authority contained in the General Resolution;

(e) to authorize Secured Bonds of a Series and, in connection therewith specify and determine the matters and things referred to in the General Resolution with respect to conditions precedent to delivery of Secured Bonds, and also any other matters and things relative to such Secured Bonds which are not contrary to or inconsistent with the General Resolution as theretofore in effect, or to amend, modify or rescind any such authorization, specification or determination at any time prior to the first authentication and delivery of such Secured Bonds including, without limiting the generality of the foregoing, provisions amending or modifying the General Resolution to provide for the issuance of Secured Bonds in book-entry form or in coupon form payable to bearer;

(f) to confirm, as further assurance, any pledge under, and the subjection to any lien or pledge created or to be created by, the General Resolution, of the Revenues or of any other moneys, securities or funds;

(g) to modify the Primary Bond Coverage Ratio or the Supplemental Bond Coverage Ratio in accordance with the provisions of the General Resolution;

(h) to modify any of the provisions of the General Resolution in any respect whatsoever, provided that (i) such modification shall be, and be expressed to be, effective only after all Bonds or Subordinated Bonds of any Series affected by the amendment Outstanding at the date of the adoption of such Supplemental Resolution shall cease to be Outstanding, and (ii) such Supplemental Resolution shall be specifically referred to in the text of all Bonds or Subordinated Bonds of any Series authenticated and delivered after the date of the adoption of such Supplemental Resolution and of Bonds or Subordinated Bonds issued in exchange therefor or in place thereof;

(i) to modify the definition of Investment Securities as directed by the Authority's Board of Directors provided that the Authority shall have provided evidence to the Trustee that the details of such modification have been provided in writing to each Rating Agency then assigning a rating on Outstanding Secured Bonds and that each such Rating Agency has either (x) confirmed in writing that such modification will not adversely affect such ratings or (y) issued a rating on a Series of Bonds to be issued which is not lower than the rating assigned by such Rating Agency to Outstanding Bonds prior to such modification, or any other evidence satisfactory to the Trustee that modification will not adversely affect the then current ratings, if any, assigned to the Secured Bonds by any Rating Agency; or

(j) to subject to the General Resolution additional revenues, security or collateral. (Section 801)

### Supplemental Resolutions Effective upon Consent of Trustee

(a) For any one or more of the following purposes and at any time or from time to time, a Supplemental Resolution may be adopted, which, upon (i) the filing with the Trustee of a copy thereof certified by an Authorized Representative, and (ii) the filing with the Authority of an instrument in writing made by the Trustee consenting thereto shall be fully effective in accordance with its terms:

(1) to cure any ambiguity, supply any omission, or cure or correct any defect or inconsistent provision in the General Resolution; or

(2) to insert such provisions clarifying matters or questions arising under the General Resolution as are necessary or desirable and are not contrary to or inconsistent with the General Resolution as theretofore in effect; or

(3) to provide for additional duties of the Trustee.

(b) Any such Supplemental Resolution may also contain one or more of the purposes permitted in Supplemental Resolutions that are effective upon filing with the Trustee, and in that event, the consent of the Trustee required as described under this heading shall be applicable only to those provisions of such Supplemental Resolution as shall contain one or more of the purposes set forth in paragraph (a) above. (Section 802)

#### Supplemental Resolutions Effective with Consent of Bondholders

At any time or from time to time, a Supplemental Resolution may be adopted subject to consent by holders of any Secured Bonds in accordance with and subject to the provisions of the General Resolution relating to amendments, which Supplemental Resolution, upon the filing with the Trustee of a copy thereof certified by an Authorized Representative and upon compliance with the provisions of the General Resolution, shall become fully effective in accordance with its terms as provided in the provisions of the General Resolution relating to amendments. (Section 803)

#### Amendments

##### Mailing of Notice of Amendment

Any provision in the General Resolution for the mailing of a notice or other paper to any holder of the Secured Bonds shall be fully complied with if it is mailed, by first-class mail, postage prepaid only (i) to each owner of Bonds or Subordinated Bonds, respectively, then Outstanding at his address appearing upon the registry books, and (ii) to the Trustee. (Section 901)

##### Powers of Amendment

Any modification or amendment of the General Resolution or of the rights and obligations of the Authority and of the holders of the Secured Bonds under the General Resolution, in any particular, may be made by a Supplemental Resolution, with the written consent given as provided in the General Resolution, (i) of the holders of at least two-thirds in principal amount of the Bonds Outstanding and two-thirds in principal amount of the Subordinated Bonds Outstanding at the time such consent is given and (ii) in case less than all of the several Series of Secured Bonds of then Outstanding are affected by the modification or amendment, of the holders of at least two-thirds in aggregate principal amount of the Secured Bonds the several Series so affected and Outstanding at the time such consent is given; provided, however, that if such modification or amendment will, by its terms, not take effect so long as any Secured Bonds of any specified like Series and maturity remain Outstanding, the consent of the holders of such Secured Bonds shall not be required and such Secured Bonds shall not be deemed to be Outstanding for the purpose of any calculation of Outstanding Secured Bonds as described in this paragraph. No such modification or amendment shall permit a change in the terms of redemption or maturity of the principal of any Outstanding Bond or Subordinated Bonds or of any installment of interest thereon or reduction in the principal amount or the Redemption Price thereof or in the rate of interest thereon without the consent of the holder of such Bond or Subordinated Bond, or shall reduce the percentages or otherwise affect the classes of Secured Bonds the consent of the holders of which is required to effect any such modification or amendment, or shall change or modify any of the rights or obligations of any Fiduciary without its written assent thereto. For the purposes of this paragraph, a Series shall be deemed to be affected by a modification or amendment of the General Resolution if the same adversely affects or diminishes the rights of the holders of Secured Bonds of such Series. The Trustee in its discretion may make a determination, binding on holders of Secured Bonds, as to whether any particular Series or maturity would be affected by any modification or amendment of the General Resolution. For the purposes of this paragraph, the holders of the Secured Bonds may include the initial holders thereof, regardless of whether such Secured Bonds are being held for immediate resale. (Section 902)

*The Amendment Consent Modification would amend the first two sentences of the above paragraph to read as follows:*

*Any modification or amendment of the General Resolution of the rights and obligations of the Authority and of the holders of the Secured Bonds under the General Resolution, in any particular, may be made by a Supplemental Resolution, with the written consent given as provided in the General Resolution, (i) of the*

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*holders of at least 51% of the aggregate principal amount of the Bonds Outstanding at the time such consent is given and at least 51% of the aggregate principal amount of the Subordinated Bonds Outstanding at the time such consent is given and (ii) in case less than all of the several Series of Secured Bonds then Outstanding are affected by the modification or amendment, of the holders of at least 51% of the aggregate principal amount of the Secured Bonds of the several Series so affected Outstanding at the time such consent is given; provided, however, that if such modification or amendment will, by its terms, not take effect so long as any Secured Bonds of any specified like Series and maturity remain Outstanding, the consent of the holders of such Secured Bonds shall not be required and such Secured Bonds shall not be deemed to be Outstanding for the purpose of any calculation of Outstanding Secured Bonds under this section; and provided, further, that in connection with the initial issuance of a Series of Secured Bonds, the underwriters of such Series may give such consent with respect to such Series and such consent shall be binding upon all subsequent holders of such Series; and provided, further, that with respect to any Series of Secured Bonds which is secured by a Credit Facility that is not in default, the consent of the issuer of the Credit Facility shall be effective for the purposes of this sentence in place of the consent of the holders of the aggregate principal amount of the Secured Bonds of such Series Outstanding. No such modification or amendment shall permit a change in the terms of redemption or maturity of the principal of any Outstanding Bond or Subordinated Bond or of any installment of interest thereon or a reduction in the principal amount or the Redemption Price thereof or in the rate of interest thereon without the consent of the holder of such Bond or Subordinated Bond or shall reduce the percentages or otherwise change the classes of Secured Bonds the consent of the holders of (or of the issuers of Credit Facilities for) which is required to effect any such modification or amendment, or shall change or modify any of the rights or obligations of any Fiduciary without its written assent thereto.*

### Modifications by Unanimous Consent

Notwithstanding anything contained in the General Resolution with respect to Supplemental Resolutions and amendments, the terms and provisions of the General Resolution and the rights and obligations of the Authority and of the holders of Secured Bonds may be modified or amended in any respect upon the adopting and filing of a Supplemental Resolution and the consent of the holders of all Secured Bonds then Outstanding, such consent to be given as provided in the General Resolution except that no notice to the holders of Secured Bonds either by mailing or publication shall be required; but no such modification or amendment shall change or modify any of the rights or obligations of any Fiduciary without the filing with the Trustee of the written assent thereto of such Fiduciary in addition to the consent of the holders of Secured Bonds. (Section 904)

### Events of Default

The occurrence of any one or more of the following events shall constitute an Event of Default under the General Resolution:

(a) a default in the due and punctual payment of a Principal Installment or the Redemption Price of any Secured Bonds when and as the same shall become due and payable, whether at maturity or upon earlier redemption, or otherwise; or

(b) a default in the due and punctual payment of any installment of interest on any Secured Bonds, when and as such interest installment shall become due and payable; or

(c) default by the Authority in the performance or observance of any other of the covenants, agreements or conditions on its part or on the part of the Authority in the General Resolution, any Supplemental Resolution or in the Secured Bonds contained, and such default shall continue for a period of forty-five days after written notice thereof stating that such notice is a "Notice of Default" to the Authority by the Trustee or to the Authority and to the Trustee by the holders of not less than a majority in principal amount of the Secured Bonds Outstanding; provided that such forty-five day period shall be extended to such longer period of time as the Trustee may deem appropriate in the event of defaults which by their nature will require such longer period of time to cure if the Authority shall commence such cure within such forty-five day period and pursue the same diligently to completion; or

(d) if the Authority (i) admits in writing its inability to pay its debts generally as they become due, (ii) commences voluntary proceeds in bankruptcy or seeking a composition of indebtedness, (iii) makes an assignment for the benefit of its creditors, (iv) consents to the appointment of a receiver of the whole or any substantial part of the System, or (v) consents to the assumption by any court of competent jurisdiction under any law for the relief of debtors of custody or control of the Authority or of the whole or any substantial part of the System.

Upon the happening and continuance of any Event of Default, the Trustee shall give notice of such occurrence to the registered holders of the Secured Bonds. Upon the happening and continuance of any Event of Default, the Trustee may, and upon the written request of the holders of not less than a majority in principal amount of the Bonds Outstanding, or if no Bonds are Outstanding, Subordinated Bonds Outstanding, the Trustee shall, in any such case, unless the principal of all the Secured Bonds then Outstanding shall already have become due and payable, declare the principal of all Secured Bonds then Outstanding shall already have become due and payable immediately, and upon any declaration the same shall become and be immediately due and payable, anything in the General Resolution or in any of the Secured Bonds contained to the contrary notwithstanding. The right of the Trustee to make any such declaration as aforesaid, however, is subject to the condition that, if at any time after such declaration, but before the Secured Bonds shall have matured by their terms, all overdue installments of principal and interest upon the Secured Bonds, together with the reasonable and proper charges, expenses and liabilities of the Trustee, and all other sums then payable by the Authority under the General Resolution (except the interest accrued since the next preceding interest date on the Bonds due and payable solely by virtue of such declaration) shall either be paid by or for the account of the Authority or provision satisfactory to the Trustee shall be made for such payment, and all defaults under the Secured Bonds or under the General Resolution (other than the payment of principal and interest due and payable solely by reason of such declaration) shall be made good or be secured to the satisfaction of the Trustee or provision deemed by the Trustee to be adequate shall be made therefor, then and in every such case the holders of a majority in principal amount of the Bonds Outstanding, or if no Bonds are Outstanding, Subordinated Bonds Outstanding, by written notice to the Authority and to the Trustee, may rescind such declaration and annul such default in its entirety, or, if the Trustee shall have acted without a direction from the holders of the Secured Bonds as aforesaid at the time of such request, and if there shall not have been theretofore delivered to the Trustee written direction to the contrary by the holders of a majority in principal amount of the Bonds Outstanding or if no Bonds are Outstanding, Subordinated Bonds Outstanding, then any such declaration shall ipso facto be deemed to be rescinded and any such default and its consequences shall ipso facto be deemed to be annulled, but no such rescission and annulment shall extend to or affect any subsequent default or impair or exhaust any right or power consequent thereon. The Trustee shall not be liable for any decision made in good faith as to whether or not to declare all Secured Bonds to be due and payable. (Section 1001)

#### Application of Revenues and Other Moneys After Default

(a) The Authority covenants that if an Event of Default shall happen and shall not have been remedied, the Authority, upon demand of the Trustee, shall pay over or cause to be paid over to the Trustee (i) forthwith, any moneys, securities and funds then held by the Authority, or a Depository in any Fund, Account or Subaccount under the General Resolution and (ii) as promptly as practicable after receipt thereof, the Revenues.

(b) During the continuance of an Event of Default, the Trustee shall apply such Revenues and the income therefrom as follows and in the following order:

(1) to the payment of the reasonable and proper fees, charges and expenses (including reasonable attorneys fees) of the Fiduciaries and of any engineer or firm of engineers or accountants or firm of accountants selected by the Trustee and to the payment of any fees and expenses required to keep any Financial Guaranties or Credit Facilities in full force and effect;

(2) to the payment of the amounts required for reasonable and necessary Operating Expenses, including reasonable and necessary reserves and working capital therefor, and for the reasonable repair and replacement of the System necessary to prevent loss of Revenues or to provide for the continued operation of the System, as certified to the Trustee by an independent engineer or firm of engineers of recognized standing (who may be an engineer or firm of engineers retained by the Authority for other purposes) selected by the Trustee;

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(3) to the payment of the interest and principal or Redemption Price then due on the Bonds as follows:

(i) unless the principal of all of the Bonds shall be due and payable,

First: To the payment to the persons entitled thereto of all installments maturing, and, if the amount available shall not be sufficient to pay in full all installments maturing on the same date, then to the payment thereof ratably, according to the amounts due thereon, to the persons entitled thereto, without any discrimination or preference; and

Second: To the payment to the persons entitled thereto of the unpaid principal or Redemption Price of any Bonds which shall have become due, whether at maturity or by call for redemption, in the order of their due dates, and, if the amount available shall not be sufficient to pay in full all the Bonds due on any date, then to the payment thereof ratably, according to the amounts of principal or Redemption Price due on such date, to persons entitled thereto, without any discrimination or preference;

(ii) if the principal of all of the Bonds shall be due and payable, to the payment of the principal and interest then due and unpaid upon the Bonds without preference or priority of principal over interest or of interest over principal, or of any installment of interest over any other installment of interest, or of any Bond over any other Bond, ratably, according to the amounts due respectively for principal and interest, to the persons entitled thereto without any discrimination of preference;

(4) to the payment of the interest and principal or Redemption Price then due on the Subordinated Bonds in a manner similar to the payment of such amounts with respect to Bonds, as set forth above.

Any amounts on deposit in the Subordinated Debt Service Reserve Fund shall not be applied as set forth above to the payment of principal amount and interest on Bonds and any amounts on deposit in the Debt Service Fund and the Debt Service Reserve Fund shall not be applied as set forth above to the payment of the principal amount and interest on Subordinated Bonds.

(c) If and when all overdue installments of interest on all Secured Bonds, together with the reasonable and proper charges and expenses of the Trustee, and all other sums payable by the Authority under the General Resolution, including the principal and Redemption Price of and accrued unpaid interest on all Secured Bonds which shall then be payable by declaration or otherwise, shall either be paid by or for the account of the Authority, or provision satisfactory to the Trustee shall be made for such payment, and all defaults under the General Resolution or the Secured Bonds shall be made good or secured to the satisfaction of the Trustee or provision deemed by the Trustee to be adequate shall be made therefor, the Trustee shall pay over to the Authority all such Revenues then remaining unexpended in the hands of the Trustee (except Revenues deposited or pledged, or required by the terms of the General Resolution to be deposited or pledged, with the Trustee), and thereupon the Authority and the Trustee shall be restored, respectively, to their former position and rights under the General Resolution, and all Revenues shall thereafter be applied as provided in the General Resolution. (Section 1003)

### Proceedings Brought by Trustee

(a) If an Event of Default shall happen and shall not have been remedied, then and in every such case, the Trustee, by its agents and attorneys, if the Trustee shall deem it advisable, may proceed to protect and enforce its rights and the rights of the holders of the Secured Bonds under the General Resolution forthwith by a suit or suits in equity or at law, whether for the specific performance of any covenant herein contained, or in aid of the execution of any power herein granted, or for an accounting against the Authority as if the Authority were the trustee of an



express trust, or in the enforcement of any other legal or equitable right as the trustee, being advised by counsel, shall deem most effectual to enforce any of its rights or to perform any of its duties under the General Resolution.

(b) The holders of a majority in principal amount of the Bonds at the time Outstanding, or if no Bonds are Outstanding, of Subordinated Bonds Outstanding, may direct by instrument in writing the time, method and place of conducting any proceeding for any remedy available to the Trustee, or exercising any trust or power conferred upon the Trustee, provided that the Trustee shall have the right to decline to follow any such direction if the Trustee shall be advised by counsel that the action or proceeding so directed may not lawfully be taken, or if the Trustee in good faith shall determine that the action or proceeding so directed would involve the Trustee in personal liability or be unjustly prejudicial to the holders of Secured Bonds not parties to such direction.

(c) Upon commencing a suit in equity or upon the commencement of judicial proceedings by the Trustee to enforce any right under the General Resolution, the Trustee shall be entitled to exercise any and all rights and powers conferred in the General Resolution and provided to be exercised by the Trustee upon the occurrence of an Event of Default; and, as a matter of right against the Authority, without notice or demand and without regard to the adequacy of the security for the Secured Bonds, the Trustee shall, to the extent permitted by law, be entitled to the appointment of a receiver of the moneys, securities and funds then held by the Authority in any Fund, Account or Subaccount under the General Resolution and, subject to application of the Revenues, with all such powers as the court or courts making such appointment shall confer; but notwithstanding the appointment of any receiver, the Trustee shall be entitled to retain possession and control of and to collect and receive income from, any moneys, securities and funds deposited or pledged with it under the General Resolution or agreed to provide to be delivered or pledged with it under the General Resolution.

(d) Regardless of the happening of an Event of Default, the Trustee shall have the power to, but (unless requested in writing by the holders of a majority in principal amount of the Secured Bonds then Outstanding, and furnished with reasonable security and indemnity) shall be under no obligation to, institute and maintain such suits and proceedings, including, without limitation, proceedings for declaratory judgment or injunctive or other equitable relief, as it may determine shall be necessary or expedient to prevent any impairment of the security under the General Resolution, any impairment of the ability of the Authority or the Trustee to satisfy any of its agreements or obligations hereunder, or the impairment of any protection provided by the General Resolution of the interests of the holders of Secured Bonds by any acts which may be unlawful or in violation of the General Resolution, and such suits and proceedings, including, without limitation, proceedings for declaratory judgment or injunctive or other equitable relief, as the Trustee may determine shall be necessary or expedient to preserve or protect its interest and the interests of the holders of any Secured Bonds. (Section 1004)

#### Restrictions on Action by Holders of Secured Bonds

No holder of any Secured Bond shall have any right to institute any suit, action or proceeding at law or in equity for the enforcement of any provision of the General Resolution or the execution of any trust under the General Resolution or for any remedy under the General Resolution, unless such holder shall have previously given to the Trustee written notice of the happening of an Event of Default, as provided in the General Resolution, and the holders of at least a majority in principal amount of the Bonds then Outstanding, or if no Bonds are Outstanding of Subordinated Bonds Outstanding, shall have filed a written request with the Trustee, and shall have offered it reasonable opportunity, either to exercise the powers granted as provided under this heading or to institute such action, suit or proceeding in its own name, and unless such holders shall have offered to the Trustee adequate security and indemnity against the costs, expenses and liabilities to be incurred therein or thereby, and the Trustee shall have refused to comply with such request within a reasonable time; it being understood and intended that no one or more holders of Secured Bonds shall have any right in any manner whatever by his or their action to affect, disturb or prejudice the pledge created by the General Resolution, or to enforce any right under the General Resolution, except in the manner therein provided, and that all proceedings at law or in equity to enforce any provision of the General Resolution shall be instituted, had and maintained in the manner provided in the General Resolution and for the equal benefit of all holders of the Outstanding Bonds, in accordance with their rights and interests under the General Resolution and all holders of Outstanding Subordinated Bonds, in accordance with their rights and interests under the General Resolution. (Section 1005)

## APPENDIX C

### The Trustee

#### Resignation of Trustee

The Trustee may at any time resign and be discharged of the duties and obligations created by the General Resolution by giving not less than sixty days' written notice to the Authority and publishing notice thereof, at the Trustee's expense, specifying the date when such resignation shall take effect once in each week for two successive calendar weeks in an authorized newspaper, and such resignation shall take effect upon the day specified in such notice unless previously a successor shall have been appointed by the Authority or the holders of any Secured Bonds as provided in the General Resolutions, in which event such resignation shall take effect immediately on the appointment of such successor. (Section 1107)

#### Removal of Trustee

The Trustee may be removed at any time by an instrument or concurrent instruments in writing, filed with the Trustee, and signed by the holders of a majority in principal amount of the Bonds then Outstanding, or if no Bonds are Outstanding, of the Subordinated Bonds then Outstanding, or their attorneys-in-fact duly authorized, excluding any Secured Bonds held by or for the account of the Authority. The Trustee may be removed at any time for any breach of trust or for acting or proceeding in violation of, or for failing to act or proceed in accordance with, any provision of the General Resolution with respect to the duties and obligations of the Trustee, by any court of competent jurisdiction upon the application of the Authority or the holders of not less than 25% in aggregate principal amount of Bonds Outstanding, or if no Bonds are Outstanding, Subordinated Bonds Outstanding, excluding any Secured Bonds held by or for the account of the Authority. Notwithstanding the foregoing provisions, at the end of the Fiscal Year of the Authority ending June 30, 2006, and at the end of every second Fiscal Year thereafter, the Authority may remove the Trustee, except during the existence of an Event of Default, upon one hundred twenty (120) days written notice to the Trustee by filing with the Trustee an instrument signed by an Authorized Representative of the Authority. (Section 1108)

#### Appointment of Successor Trustee

(a) In case at any time the Trustee shall resign or shall be removed or shall become incapable of acting, or shall be adjudged a bankrupt or insolvent, or if a receiver, liquidator or conservator of the Trustee, or its property, shall be appointed, or if any public offering shall take charge or control of the Trustee, or of its property or affairs, a successor may be appointed by the holder of a majority in principal amount of the Bonds then Outstanding, or if no Bonds are Outstanding of the Secured Bonds then Outstanding, excluding any Secured Bonds held by or for the account of the Authority, by an instrument or concurrent instruments in writing signed and acknowledged by such holders of any Secured Bonds or by their attorneys-in-fact duly authorized and delivered to such successor trustee, notification thereof being given to the Authority and the predecessor Trustee; but (unless a successor trustee shall have been appointed by the holders of the Secured Bonds as aforesaid) the Authority by a duly executed written instrument signed by an Authorized Representative shall forthwith appoint a Trustee to fill such vacancy until a successor Trustee shall be appointed by the holders of the Secured Bonds as authorized in the General Resolution. The Authority shall publish notice of any such appointment made by it once in each week for two consecutive calendar weeks, in an authorized newspaper, the first publication to be made within 20 days after such appointment. Any successor Trustee appointed by the Authority shall, immediately and without further act, be superseded by a Trustee appointed by the holders of the Secured Bonds as authorized in the General Resolution.

(b) If in a proper case no appointment of a successor trustee shall be made pursuant to the foregoing provisions of the General Resolution within forty-five days after the Trustee shall have given to the Authority written notice as provided in the General Resolution or after a vacancy in the office of the Trustee shall have occurred by reason of its inability to act, the Trustee or the holder of any Secured Bond may apply to any court of competent jurisdiction to appoint a successor trustee. Said court may thereupon, after such notice, if any, as such court may deem proper and prescribe, appoint a successor trustee.

(c) Any Trustee appointed under the provisions of the General Resolution in succession to the Trustee shall be a bank or trust company organized under the laws of any state of a national banking association, and having a capital and surplus aggregating at least \$100,000,000, if there be such a bank or trust company or national banking

association willing and able to accept the office on reasonable and customary terms and authorized by law to perform all the duties imposed upon it by the General Resolution. (Section 1109)

#### Defeasance

(a) If the Authority shall pay or cause to be paid to the holders of all Secured Bonds then Outstanding, the Principal Installments and interest and Redemption Price, if any, to become due thereon, at the times and in the manner stipulated therein and in the General Resolution, then, at the option of the Authority, expressed in an instrument in writing signed by an Authorized Representative and delivered to the trustee, the covenants, agreements and other obligations of the Authority to the holders of such Secured Bonds shall be discharged and satisfied. In such event, the Trustee shall, upon the request of the Authority, execute and deliver to the Authority all such instruments as may be desirable to evidence such discharge and satisfaction and the Fiduciaries shall pay over or deliver to the Authority all moneys, securities and funds held by them pursuant to the General Resolution which are not required for the payment or redemption of Secured Bonds not theretofore surrendered for such payment or redemption.

(b) Secured Bonds for the payment or redemption of which moneys shall have been set aside and shall be held in trust by the Trustee (through deposit by the Authority of funds for such payment or redemption or otherwise) at the maturity or redemption date thereof shall be deemed to have been paid within the meaning and with the effect expressed in (a) above. Subject to the provisions described in paragraph (c) below, any Outstanding Secured Bonds shall prior to the maturity or redemption date thereof be deemed to have been paid within the meaning and with the effect expressed in paragraph (a) above if (i) in case any of said Secured Bonds are to be redeemed on any date prior to the maturity, the Authority shall have given to the Trustee irrevocable instructions accepted in writing by the Trustee to publish as provided in the General Resolution notice of redemption of such Secured Bonds (other than the Secured Bonds which have been purchased by the Trustee at the direction of the Authority as hereinafter provided prior to the publication of such notice of redemption) on said date, (ii) there shall have been deposited with the Trustee either moneys in an amount which shall be sufficient, or Defeasance Obligations the principal installments of and/or the interest on which when due, without reinvestment, will provide moneys which, together with the moneys, if any, deposited with the Trustee at the same, time, shall be sufficient, to pay when due the Principal Installments or Redemption Price, if applicable, and interest due and to become due on said Secured Bonds on or prior to the redemption date or maturity date thereof, as the case may be, and (iii) in the event said Secured Bonds are not to be redeemed within the next succeeding 60 days, the Authority shall have given the Trustee in form satisfactory to it irrevocable instructions to publish, as soon as practicable, at least twice, at an interval of not less than seven days between publications, in the authorized newspapers a notice to the holders of such Secured Bonds that the deposit referred to in clause (i) above has been made with the Trustee and that said Secured Bonds are deemed to have been paid as provided under this heading and stating such maturity or redemption date upon which moneys are to be available for the payment of the Principal Installments or Redemption Price, if applicable, on said Secured Bonds (other than Secured Bonds which have been purchased by the Trustee at the direction of the Authority as hereinafter provided prior to the publication of the notice of redemption referred to in clause (i)); provided, however, that in connection with the provision for payment of any Secured Bonds which are then in non-certificated form, the requirements of clause (iii) above shall be deemed satisfied upon mailing of the notice required by said clause (iii) by registered mail to the securities depository which is the registered owner, or whose nominee is the registered owner, of such Secured Bonds. The Trustee shall, as and to the extent necessary, apply moneys held by it as provided under this heading to the retirement of said Secured Bonds in amounts equal to the unsatisfied balances of any Sinking Fund Installments with respect to such Secured Bonds, all in the manner provided in the General Provisions.

The Trustee shall, if so directed by the Authority (x) prior to the maturity date of Secured Bonds deemed to have been paid as provided under this heading which are not to be redeemed prior to the maturity date or (y) prior to the publication of the notice of redemption referred to in clause (i) above with respect to any Secured Bonds deemed to have been paid as provided under this heading which are to be redeemed on any date prior to their maturity, apply moneys deposited with the Trustee in respect of such Secured Bonds and redeem or sell Defeasance Obligations so deposited with the Trustee and apply the proceeds thereof to the purchaser of such Secured Bonds and the Trustee shall immediately thereafter cancel all such Secured Bonds so purchased; provided, however, that the Trustee shall receive a certificate of the Accountant showing that the moneys and Defeasance Obligations remaining on deposit with the Trustee after the purchase and cancellation of such Secured Bonds shall be sufficient to pay when due the

## APPENDIX C

Principal Installment or Redemption Price, if applicable, and interest due or to become due on all Secured Bonds, in respect of which such moneys and Defeasance Obligations are being held by the Trustee on or prior to the redemption date or maturity date thereof, as the case may be, and a Bond Counsel's opinion to the effect that such redemption or sale of such Defeasance Obligations will not adversely affect the exclusion of the interest on such Secured Bonds from gross income of the holders thereof for federal income tax purposes and that such redemption or sale otherwise complies with the provisions of the General Resolution. Except as otherwise described in paragraphs (b) and (c) under this heading, neither Defeasance Obligations nor moneys deposited with the Trustee as described under this heading nor principal or interest payments on any such Defeasance Obligations shall be withdrawn or used for any purpose other than, but shall be held in trust for, the payment of the principal or Redemption Price, if applicable, and interest on said Secured Bonds; provided that any cash received from such principal or interest payments on such Defeasance Obligations deposited with the Trustee (A) to the extent such cash will not be required at any time for such purpose, shall be paid over to the Authority as received by the Trustee, free and clear of any trust, lien or pledged securing said Secured Bonds other otherwise existing under the General Resolution, and (B) to the extent such cash will be required for such purpose at a later date, shall, to the extent practicable, be reinvested at the written direction of an Authorized Representative of the Authority in Defeasance Obligations maturing at times and in amounts sufficient to pay when due the principal or Redemption Price, if applicable, and interest to become due on said Secured Bonds on or prior to such redemption date or maturity date thereof, as the case may be, and interest earned from such reinvestment, shall be paid over to the Authority, as received by the Trustee free and clear of any lien or pledge securing said Secured Bonds or otherwise existing under the General Resolution.

(c) For purposes of determining whether Variable Rate Indebtedness shall be deemed to have been paid prior to the maturity or redemption date thereof, as the case may be, by the deposit of moneys, or Defeasance Obligations and moneys, if any, in accordance with the second sentence of paragraph (b) under this heading, the interest to come due on such Variable Rate Indebtedness on or prior to the maturity date or redemption date thereof, as the case may be, shall be calculated at the maximum rate permitted by the terms thereof; provided, however, that if on any date, as a result of such Variable Rate Indebtedness having borne interest at less than such maximum rate for any period, the total amount of moneys and Investment securities on deposit with the Trustee for the payment of interest on such Variable Rate Indebtedness is in excess of the total amount which would have been required to be deposited with the Trustee on such date in respect of such Variable Rate Indebtedness in order to satisfy the provisions described in the second sentence of paragraph (b) under this heading, the Trustee shall, if requested, by the Authority, pay the amount of such excess to the Authority free and clear of any lien or pledge securing the Secured Bonds or otherwise existing under the General Resolution.

(d) Option Bonds shall be deemed to have been paid in accordance with the provisions described in the second sentence of paragraph (b) under this heading, only if, in addition to satisfying the requirements of clauses (i) and (iii) of such sentence, there shall have been deposited with the Trustee moneys in an amount which shall be sufficient to pay when due the maximum amount of principal of and premium, if any, and interest on such Bonds which could become payable to the holders of such Option Bonds upon the exercise of any options provided to the holders of such Option Bonds; provided, however, that if, at the time a deposit is made with the Trustee pursuant to the provisions described in paragraph (b) under this heading, the options originally exercisable by the holder of an Option Bond are no longer exercisable, such Option Bond shall not be considered an Option Bond for purposes of this paragraph. If any portion of the moneys deposited with the Trustee for the payment of the principal of and premium, if any, and interest on Option Bonds is not required for such purpose the Trustee shall, if requested by the Authority, pay the amount of such excess to the Authority free and clear of any trust, lien or pledge securing said Option Bonds or otherwise existing under the General Resolution.

(e) Anything in the General Resolution to the contrary notwithstanding, any moneys held by a Fiduciary in trust for the payment and discharge of any of the Secured Bonds which remain unclaimed for two years after the date when such Secured Bonds have become due and payable, either at their stated maturity dates or by call for earlier redemption, if such moneys were held by the Fiduciary at such date, or for two years after the date of deposit of such moneys if deposited with the Fiduciary after the said date when such Secured Bonds become due and payable, shall, at the written request of the Authority, be repaid by the Fiduciary to the Authority, as its absolute property and free from trust, and the Fiduciary shall thereupon be released and discharged with respect thereto and the holders of any Secured Bonds shall look only to the Authority for the payment of such Secured Bonds; provided, however, that before being required to make any such payment to the Authority, the Fiduciary may, at the expense

of the Authority, cause to be published at least twice, at an interval of not less than seven days between publications, in an authorized newspaper, a notice that said moneys remain unclaimed and that, after a date named in said notice, which date shall be not less than 30 days after the date of the first publication of such notice, the balance of such moneys then unclaimed will be returned to the Authority. (Section 1201)

Preservation and Inspection of Documents

All documents received by an Fiduciary under the provisions of the General Resolution shall be retained in its possession and shall be subject at all reasonable times to the inspection of the Authority, any other Fiduciary, and any holder of any Secured Bonds and any person that the Trustee can reasonably determine is a beneficial owner of any Secured Bonds held by or on behalf of a securities depository, and their agents and their representatives, any of whom may make copies thereof. Upon the receipt of a written request by any such beneficial owner or any holder of any Secured Bonds, or their agents or their representatives, the Trustee shall provide copies of any reports or certificates delivered to the Trustee pursuant to any provision of the General Resolution. At the direction of the Authority, the Trustee shall require the party requesting such reports or certificates to pay or reimburse the Trustee for the direct costs of reproducing and mailing such reports or certificates. (Section 1204)

No Recourse on the Secured Bonds

No recourse shall be had for the payment of the principal of or interest on the Secured Bonds or for any claim based thereon or on the General Resolution against any member or officer of the Authority or any person executing the Secured Bonds. (Section 1206)

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PROPOSED FORM OF OPINION OF BOND COUNSEL



[Date of Original Issuance]

Massachusetts Water Resources Authority  
Charlestown Navy Yard  
100 First Avenue  
Boston, Massachusetts 02129

Re: \$104,260,000 Massachusetts Water Resources Authority General Revenue Refunding Bonds, 2016 Series D (Green Bonds) (the "Bonds")

Ladies and Gentlemen:

McCarter & English, LLP  
265 Franklin Street  
Boston, MA 02110-3113  
T. 617.449.6500  
F. 617.607.9200  
www.mccarter.com

We have acted as Bond Counsel to the Massachusetts Water Resources Authority (the "Authority") in connection with the authorization, sale, issuance and delivery of the above-captioned Bonds. In that capacity, we have examined the provisions of Chapter 372 of the Acts of 1984 of The Commonwealth of Massachusetts, as amended (the "Act"), the Authority's Amended and Restated General Revenue Bond Resolution effective on April 23, 2015, as amended and supplemented to date (the "General Resolution"), the Seventy-Third Supplemental Resolution Authorizing the Issuance of up to \$150,000,000 Massachusetts Water Resources Authority General Revenue Refunding Bonds, 2016 Series D (Green Bonds) adopted on June 29, 2016 (the "Supplemental Resolution"), and the Issuance Resolution of the Authority adopted on June 29, 2016 (the "Issuance Resolution," and together with the General Resolution and the Supplemental Resolution, the "Resolutions"), and we have examined and are familiar with originals or copies, certified or otherwise identified to our satisfaction, of such records of the Authority, certificates of officers of the Authority and other documents and instruments, and have made such other investigation of facts and examination of Massachusetts and federal law, as we have deemed necessary or proper for the purpose of rendering this opinion. We also have examined a record of proceedings relating to the authorization, sale, issuance and delivery of the Bonds and copies identified to our satisfaction of one Bond of each maturity, as executed. Capitalized terms used herein shall, unless otherwise specified, have the meanings set forth in the Resolutions.

BOSTON

HARTFORD

STAMFORD

NEW YORK

NEWARK

EAST BRUNSWICK

PHILADELPHIA

WILMINGTON

WASHINGTON, DC

The Bonds are being issued by means of a book-entry system, with bond certificates immobilized at or on behalf of The Depository Trust Company, New York, New York ("DTC"), and not available for distribution to the public, evidencing ownership of the Bonds in Authorized Denominations with transfer of beneficial ownership effected on the records of DTC and its participants pursuant to rules and procedures established by DTC and its participants.

## APPENDIX D

Massachusetts Water Resources Authority  
[Date of Original Issuance]  
Page 2

Based upon our examination, we are of the following opinion:

- (a) The Authority is duly organized and validly existing under the Act as a body politic and corporate and a public instrumentality of The Commonwealth of Massachusetts, with the right and power under the Act to adopt the Resolutions, perform the agreements on its part contained therein and issue the Bonds.
- (b) The Bonds are general obligations of the Authority secured by the Resolutions and a pledge of the Revenues received by or for the account of the Authority and moneys on deposit in the funds and accounts pledged as security therefor under the Resolutions, and the Resolutions create the valid pledge and lien which they purport to create for the benefit of the holders of the Bonds, subject to the application of such pledged Revenues and moneys to the purposes and on the conditions permitted by the Resolutions.
- (c) The Bonds have been duly authorized, executed, authenticated and delivered and all conditions required by the Resolutions precedent to the issuance of the Bonds have been met. The Bonds are valid and binding general obligations of the Authority enforceable in accordance with their terms and entitled to the benefits and security of the Resolutions, subject only to applicable bankruptcy, insolvency, moratorium, reorganization or other laws affecting creditors' rights heretofore or hereafter enacted and to general equity principles.
- (d) The Resolutions have been duly and lawfully adopted by the Authority, are in full force and effect and are valid and binding agreements of the Authority enforceable in accordance with their respective terms, subject only to applicable bankruptcy, insolvency, moratorium, reorganization or other laws affecting creditors' rights heretofore or hereafter enacted and to general equity principles.
- (e) Under existing law, interest on the Bonds will not be included in gross income of holders of the Bonds for federal income tax purposes. This opinion is rendered subject to compliance by the Authority, subsequent to the issuance of the Bonds, with various requirements of the Internal Revenue Code of 1986, as amended. Failure to comply with such requirements could cause interest on the Bonds to become subject to federal income taxation retroactive to the date of issuance of the Bonds. Interest on the Bonds will not constitute an item of tax preference for purposes of computing the alternative minimum tax imposed on individuals and corporations. Interest on the Bonds will be taken into account in determining "adjusted current earnings" for the purpose of computing the alternative minimum tax imposed upon certain corporations. We express no opinion as to other federal tax consequences resulting from holding the Bonds.



Massachusetts Water Resources Authority  
[Date of Original Issuance]  
Page 3

- (f) The Bonds, their transfer and the income therefrom, including any profit made on the sale thereof, are exempt from taxes imposed by existing Massachusetts laws, although the Bonds and the interest thereon may be included in the measure of estate and inheritance taxes and of certain corporation excise and franchise taxes. We express no opinion as to the taxability of the Bonds, their transfer and the income therefrom, including any profit made on the sale thereof, under the laws of states other than Massachusetts.

This opinion is expressed as of the date hereof, and we neither assume nor undertake any obligation to update, revise, supplement or restate this opinion to reflect any action taken or omitted, or any facts or circumstances or changes in law or in the interpretation thereof, that may hereafter arise or occur, or for any other reason.

This opinion is limited to the matters expressly set forth herein and no opinion is implied or may be inferred beyond the matters expressly stated herein. Copies of this opinion may not be delivered to and may not be relied upon by any other party without our express prior written consent.

Very truly yours,

McCarter & English, LLP

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**APPENDIX E**

**TABLE OF REFUNDED BONDS**

<b>Bonds</b>	<b>Maturity (August 1)</b>	<b>Refunded Par</b>	<b>CUSIP<sup>†</sup></b>	<b>Interest Rate</b>	<b>Redemption Date</b>	<b>Redemption Price</b>
<b>2002 Series J</b>	2042	\$1,000,000	576051EQ5	5.000%	September 23, 2016	100%
<b>2010 Series A</b>	2029	\$1,555,000	576051AW6	4.000	August 1, 2020	100%
	2030	<u>2,240,000</u>	576051AY2	4.000	August 1, 2020	100
		\$3,795,000				
<b>2011 Series B</b>	2036 <sup>‡</sup>	\$26,825,000	576051PY6	5.000%	August 1, 2021	100%
	2041	<u>41,800,000</u>	576051DD5	5.000	August 1, 2021	100
		\$68,625,000				
<b>2012 Series A</b>	2024	\$ 890,000	576051FE1	3.000%	August 1, 2022	100%
	2025	440,000	576051FF8	3.000	August 1, 2022	100
	2026	300,000	576051FG6	3.125	August 1, 2022	100
	2030	5,135,000	576051FL5	5.000	August 1, 2022	100
	2031	5,395,000	576051FM3	5.000	August 1, 2022	100
	2032	5,395,000	576051FV3	5.000	August 1, 2022	100
	2033	<u>5,940,000</u>	576051FW1	5.000	August 1, 2022	100
		\$23,495,000				
<b>2014 Series D</b>	2025	\$1,775,000	576051JT4	5.000%	August 1, 2024	100%
	2026	1,865,000	576051JU1	5.000	August 1, 2024	100
	2027	<u>1,960,000</u>	576051JV9	5.000	August 1, 2024	100
		\$5,600,000				

<sup>†</sup> The CUSIP numbers have been assigned by an independent company not affiliated with the Authority and are included solely for the convenience of the holders of the Refunded Bonds. Neither the Authority nor the Trustee is responsible for the selection or uses of the CUSIP numbers, and no representation is made as to their correctness on the Refunded Bonds or as indicated in the table above.

<sup>‡</sup> Represents the sinking fund installments due in 2033, 2034, 2035 and 2036 with respect to the 2011 Series B Bonds maturing in 2036.

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## APPENDIX F

### DESCRIPTION OF GREEN BONDS PROJECTS

#### WASTEWATER PROJECTS

<b>Interception and Pumping</b>	Construction and replacement of trunk and relief sewers. Construction and rehabilitation of pump stations in MWRA's north and south systems.
<b>Treatment and Residuals</b>	Deer Island Wastewater Treatment Plant Project: construction of primary and secondary treatment facilities; ancillary modifications and asset protection of the DITP.
<b>Combined Sewer Overflows</b>	Construction of and improvements to CSO treatment facilities, sewer separation projects and a CSO storage tunnel to improve water quality in Boston Harbor, Dorchester Bay, the Charles, Mystic and Neponset Rivers, and Alewife Brook.

#### WATERWORKS PROJECTS

<b>Drinking Water Quality Improvements</b>	Construction and asset protection of John J. Carroll Water Treatment Plant to provide disinfection and corrosion control to the drinking water supplied to the Authority's metropolitan waterworks system. Construction of the William A. Brutsch Water Treatment Plant to provide disinfection to the communities serviced by the Chicopee Valley Aqueduct.
<b>Transmission System</b>	Construction and rehabilitation of aqueducts, including the MetroWest Water Supply Tunnel and the Hultman Aqueduct. Construction and replacement of water supply, connecting and distribution mains.
<b>Distribution and Pumping</b>	Construction and rehabilitation of water pump stations. Construction of covered storage facilities to eliminate the use of open reservoirs.

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