Supplement
dated August 18, 2017

to

Official Statement
dated July 26, 2017

relating to

$174,110,000
CITY OF PHILADELPHIA, PENNSYLVANIA
Water and Wastewater Revenue Refunding Bonds, Series 2017B

Introduction

The Official Statement for the above-captioned bonds is dated July 26, 2017 (the "Official Statement"). The City of Philadelphia (the "City") has prepared this Supplement dated August 18, 2017, to the Official Statement (the "Supplement") to provide updates to certain information included in the Official Statement, as well as to describe certain events that have occurred since the date thereof.

Other than with respect to the information provided and the events described herein, this Supplement is qualified by reference to the Official Statement, including the Appendices thereto. Capitalized terms used herein and not otherwise defined have the meanings given to such terms in the Official Statement.

Update on Labor Agreements

In the Twenty-Sixth Five-Year Plan, the City included a $200 million Labor Reserve for potential costs of anticipated new labor agreements with FOP Lodge No. 5, IAFF Local 22, and AFSCME DC 47, the existing contracts for which expired on June 30, 2017. See APPENDIX IV – "DISCUSSION OF FINANCIAL OPERATIONS – Current Financial Information – *Fiscal Year 2018 Adopted Budget and Twenty-Sixth Five-Year Plan*" in the Official Statement.

On August 15, 2017, a labor arbitration panel awarded FOP Lodge No. 5 a new three-year contract reflecting annual raises of approximately 3%, resulting in a cost to the City of approximately $245 million over the next five years. As set forth in Tables 1 and 2 in APPENDIX IV, at footnotes 16 and 10, respectively, the City had included $20 million of the Labor Reserve in the Fiscal Year 2018 Adopted Budget. In addition, the City included a Federal Funding Reserve of approximately $50.9 million and projected a year-end General Fund balance of approximately $75.5 million for Fiscal Year 2018.

The City is in the process of determining what adjustments it may make to the Fiscal Year 2018 Adopted Budget and the Twenty-Sixth Five-Year Plan to reflect the new labor contract. Once the City has made such determination, the City may amend the Twenty-Sixth Five-Year Plan and resubmit such revised plan to PICA for approval. For Fiscal Year 2018, the City has preliminarily determined that the impact of this new labor contract is an additional cost of approximately $18.2 million.

Quarterly City Manager's Report

On August 15, 2017, the City released its Quarterly City Manager's Report for the period ending June 30, 2017 (the "Fourth Quarter QCMR"). The Fourth Quarter QCMR does not modify the Fiscal Year 2017 Current Estimate as set forth in Tables 1 and 2 in APPENDIX IV. The new labor agreement described above takes effect in Fiscal Year 2018 and is not part of the information included in the Fourth Quarter QCMR.

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NEW ISSUE – BOOK-ENTRY ONLY

RATINGS: Fitch: "A+"
Moody's: "A1"
S&P: "A+"

In the opinions of Co-Bond Counsel, under existing law, interest on the Bonds is excludable from gross income for purposes of federal income tax, assuming continuing compliance by the City with the requirements of the federal tax law. Interest on the Bonds is not a preference item for purposes of either individual or corporate federal alternative minimum tax; however, interest paid to corporate holders of the Bonds may be indirectly subject to alternative minimum tax under circumstances described under "TAX EXEMPTION" herein. Under the laws of the Commonwealth of Pennsylvania, as enacted and construed on the date of initial delivery of the Bonds, the Bonds are exempt from personal property taxes and interest on the Bonds is exempt from Pennsylvania personal income tax and Pennsylvania corporate net income tax. For a more complete discussion of federal and state tax exemptions, see "TAX EXEMPTION" herein.

$174,110,000
CITY OF PHILADELPHIA, PENNSYLVANIA
Water and Wastewater Revenue Refunding Bonds, Series 2017B

Dated: Date of Delivery **Due: November 1, as shown on the inside front cover**

The City of Philadelphia, Pennsylvania, a corporation, body politic and city of the first class existing under the laws of the Commonwealth of Pennsylvania (the "City") is issuing its $174,110,000 Water and Wastewater Revenue Refunding Bonds, Series 2017B (the "Bonds") pursuant to (i) the First Class City Revenue Bond Act and (ii) the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989 (as supplemented and amended, collectively referred to as the "General Ordinance"). The Bonds are being issued for the purpose of providing funds which, together with other available funds of the City, will be used to finance (i) the current refunding of a portion of the City's outstanding Water and Wastewater Revenue Refunding Bonds, Series 2007B, (ii) the advance refunding of a portion of the City's outstanding Water and Wastewater Revenue Bonds, Series 2010C and a portion of its Water and Wastewater Revenue Refunding Bonds, Series 2012, and (iii) the costs of issuance relating to the Bonds. See "PLAN OF REFUNDING" and "ESTIMATED SOURCES AND USES OF FUNDS" herein. Capitalized terms used but not otherwise defined in this Official Statement have the meanings ascribed to them in APPENDIX III hereof.

The Bonds are special obligations of the City secured, equally and ratably, with the City's outstanding Water and Wastewater Revenue Bonds (other than Subordinated Bonds, of which there are none outstanding on the date hereof) in the aggregate principal amount of $1,882,086,283 (as of August 10, 2017) issued under the General Ordinance and all Water and Wastewater Revenue Bonds hereafter issued under the General Ordinance (the "Water and Wastewater Revenue Bonds"). All Water and Wastewater Revenue Bonds are secured by a pledge of and security interest in all Project Revenues derived from the City's Water and Wastewater Systems (the "System") and by monies deposited in the funds and accounts (other than the Rebate Fund) established by the City under the General Ordinance (the "Water and Wastewater Funds"). Project Revenues means: (i) all rents, rates, fees and charges imposed or charged for connection to, or use or product of or services generated by the System to the ultimate users thereof, (ii) all payments under bulk contracts with municipalities, governmental instrumentalities or other bulk users, (iii) all subsidies or payments payable by federal, state or local governments or governmental agencies on account of the cost of operation of, or the payment of the principal of or interest on monies borrowed to finance costs chargeable to the System, (iv) all grants, payments and contributions made in aid or on account of the System exclusive of grants and similar payments and contributions solely in aid of construction and (v) all accounts, contract rights and general intangibles representing the foregoing "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS."

THE BONDS ARE PAYABLE SOLELY FROM PROJECT REVENUES AND MONIES DEPOSITED IN THE WATER AND WASTEWATER FUNDS. THE BONDS ARE SPECIAL OBLIGATIONS OF THE CITY AND DO NOT PLEDGE THE FULL FAITH, CREDIT OR TAXING POWER OF THE CITY, OR CREATE ANY DEBT OR CHARGE AGAINST THE TAX OR GENERAL REVENUES OF THE CITY, OR CREATE ANY LIEN OR CHARGE AGAINST ANY PROPERTY OF THE CITY OTHER THAN AGAINST THE PROJECT REVENUES AND AMOUNTS, IF ANY, AT ANY TIME ON DEPOSIT IN THE WATER AND WASTEWATER FUNDS.

The Bonds will be issued only as fully registered bonds and, when issued, will be registered in the name of Cede & Co., as nominee of The Depository Trust Company, New York, New York ("DTC"), which will act as securities depository for the Bonds. Purchasers will not receive certificates representing their ownership interests in the Bonds purchased. Disbursements of principal, interest or redemption payments are the responsibility of DTC.

The Bonds will be dated and will bear interest from the date of delivery thereof. Interest on Bonds will be payable semiannually on May 1 and November 1 of each year, beginning November 1, 2017. The Bonds are subject to optional and mandatory sinking fund redemption prior to maturity as described herein.

This cover page contains information for quick reference only. It is not a summary of this issue. Investors must read the entire Official Statement, including the Appendices, which are an integral part hereof, to obtain information essential to making an informed investment decision regarding the Bonds.

The Bonds are offered when, as and if issued and delivered to and received by the Underwriters (defined herein), and subject to the legal opinions of Ballard Spahr LLP and Ahmad Zaffarese LLC, both of Philadelphia, Pennsylvania, Co-Bond Counsel. Certain legal matters will be passed upon for the Underwriters by Duane Morris LLP, Philadelphia, Pennsylvania. Certain legal matters will be passed upon for the City by the City Solicitor. Certain other legal matters respecting the Bonds will be passed upon for the City by Greenberg Traurig, LLP and Turner Law, P.C., both of Philadelphia, Pennsylvania, Co-Disclosure Counsel. It is expected that the Bonds will be available for delivery through the facilities of DTC on or about August 10, 2017.

BARCLAYS **SIEBERT CISNEROS SHANK & CO., L.L.C.**

Raymond James **RBC Capital Markets, LLC** **Stern Brothers & Co.** **The Williams Capital Group, L.P.**

The date of this Official Statement is July 26, 2017

$174,110,000
CITY OF PHILADELPHIA, PENNSYLVANIA
Water and Wastewater Revenue Refunding Bonds,
Series 2017B

MATURITIES, PRINCIPAL AMOUNTS, INTEREST RATES, PRICES, YIELDS AND CUSIPS†

Maturity Date (November 1)	Principal	Interest Rate	Price	Yield	CUSIP Numbers†
2017	$2,905,000	2.000%	100.263	0.820%	717893D57
2020	5,980,000	5.000	112.017	1.190	717893D65
2021	3,140,000	5.000	115.027	1.330	717893D73
2022	6,590,000	5.000	117.578	1.490	717893D81
2023	7,895,000	5.000	119.804	1.640	717893D99
2024	7,325,000	5.000	121.586	1.800	717893E23
2025	7,160,000	5.000	122.645	2.000	717893E31
2026	9,365,000	5.000	123.635	2.160	717893E49
2027	9,835,000	5.000	124.473	2.300	717893E56
2028	4,390,000	5.000	122.835*	2.460	717893E64
2029	31,750,000	5.000	121.624*	2.580	717893E72
2030	32,495,000	5.000	120.824*	2.660	717893E80
2031	34,425,000	5.000	120.228*	2.720	717893E98
2032	3,390,000	5.000	119.538*	2.790	717893F22
2033	3,615,000	5.000	118.852*	2.860	717893F30
2034	3,850,000	5.000	118.268*	2.920	717893F48

* Priced to the first optional redemption date of November 1, 2027.

† The above CUSIP (Committee on Uniform Securities Identification Procedures) numbers have been assigned by an organization not affiliated with the City or the Underwriters, and such parties are not responsible for the selection or use of the CUSIP numbers. The CUSIP numbers are included solely for the convenience of bondholders and no representation is made as to the correctness of such CUSIP numbers. CUSIP numbers assigned to securities may be changed during the term of such securities based on a number of factors including, but not limited to, the refunding or defeasance of such issue or the use of secondary market financial products. Neither the City nor the Underwriters have agreed to, and there is no duty or obligation to, update this Official Statement to reflect any change or correction in the CUSIP numbers set forth above. CUSIP is a registered trademark of the American Bankers Association (the "ABA"). CUSIP data is provided by CUSIP Global Services, which is managed on behalf of the ABA by S&P Global Market Intelligence, a part of S&P Global, Inc.

CITY OF PHILADELPHIA, PENNSYLVANIA

MAYOR
Honorable James F. Kenney

MAYOR'S CHIEF OF STAFF
Jane Slusser

MAYOR'S CABINET

Michael DiBerardinis	Managing Director
Rob Dubow	Director of Finance
Sozi Pedro Tulante, Esq.	City Solicitor
Nina Ahmad	Deputy Mayor for Public Engagement
Nolan Atkinson	Chief Diversity & Inclusion Officer
James Engler	Deputy Mayor for Policy & Legislation
Harold Epps	Commerce Director
Anne Fadullon	Director of Planning & Development
Otis Hackney	Chief Education Officer
Sheila Hess	City Representative
Ellen Kaplan	Chief Integrity Officer
Amy Kurland	Inspector General
Richard Lazer	Deputy Mayor for Labor Relations
Deborah Mahler	Deputy Mayor for Intergovernmental Affairs
Christine Derenick-Lopez	Chief Administrative Officer

CITY TREASURER
Rasheia Johnson

CITY CONTROLLER
Alan L. Butkovitz

PHILADELPHIA WATER DEPARTMENT
Aramark Tower at One Reading Center
Philadelphia, Pennsylvania 19107

Debra A. McCarty, Water Commissioner
Michelle L. Bethel, Deputy Revenue Commissioner
Marc Cammarata, Deputy Water Commissioner
Joanne Dahme, General Manager, Public Affairs
Stephen J. Furtek, General Manager, Engineering and Construction
David A. Katz, Deputy Water Commissioner
Melissa LaBuda, Deputy Water Commissioner
Gerald D. Leatherman, Deputy Water Commissioner
Sarah Stevenson, Assistant Deputy Water Commissioner
Donna Schwartz, Deputy Water Commissioner
Scott J. Schwarz, General Counsel to the Water Department
Alicia Robertson, Assistant Deputy Water Commissioner

Financial Consultant
Raftelis Financial Consultants, Inc.

Financial Advisors
Acacia Financial Group, Inc. and
PFM Financial Advisors LLC

No dealer, broker, salesperson or other person has been authorized by the City or the Underwriters (defined herein) to give any information or to make any representations with respect to the Bonds other than those contained in this Official Statement, and, if given or made, such other information or representations must not be relied upon. 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 Bonds by any person in any jurisdiction in which it is unlawful for such person to make such offer, solicitation or sale.

This Official Statement is not to be construed as a contract with the purchasers of the Bonds. The information set forth herein has been obtained from the City and other sources believed to be reliable and has been reviewed by the Underwriters in accordance with and as part of their responsibilities to investors under the federal securities laws as applied to the facts and circumstances of this transaction but is not guaranteed as to accuracy or completeness by the Underwriters who provided this sentence for inclusion here. This information and expressions of opinions herein are subject to change without notice, and neither delivery of this Official Statement nor any sale made hereunder shall, under any circumstances, create any implication that there has been no change in the affairs of the City or the Water Department since the date hereof.

Statements contained in this Official Statement, including the Appendices hereto, which involve estimates, forecasts or other matters of opinion, whether or not expressly so described herein, are intended solely as such and are not to be construed as representations of fact. 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 and 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 which could affect the amount of revenue collected by the City or the Water Department include, among others, changes in economic conditions and various other events, conditions and circumstances, many of which are beyond the control of the City and the Water Department. Such forward-looking statements speak only as of the date of this Official Statement. The City disclaims any obligation or undertaking to release publicly any updates or revisions to any forward-looking statement contained herein to reflect any changes in the City's expectations with regard thereto or any change in events, conditions or circumstances on which any such statement is based.

Upon issuance, the Bonds will not be registered under the Securities Act of 1933, as amended, will not be listed on any stock or other securities exchange and neither the Securities and Exchange Commission nor any other federal, state, municipal or other governmental entity, other than the City (subject to the limitations set forth herein), will have passed upon the accuracy or adequacy of this Official Statement.

This Official Statement is submitted in connection with the sale of the securities referred to herein and may not be reproduced or used, in whole or in part, for any other purpose.

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 importance, and this Official Statement, including the Appendices, must be considered in its entirety.

IN MAKING AN INVESTMENT DECISION, INVESTORS MUST RELY ON THEIR OWN EXAMINATION OF THE CITY, THE WATER DEPARTMENT AND THE TERMS OF THE OFFERING, INCLUDING THE MERITS AND RISKS INVOLVED. THESE SECURITIES HAVE NOT BEEN RECOMMENDED BY ANY FEDERAL OR STATE SECURITIES COMMISSION OR REGULATORY AUTHORITY. FURTHERMORE, THE FOREGOING AUTHORITIES HAVE NOT CONFIRMED THE ACCURACY OR DETERMINED THE ADEQUACY OF THIS DOCUMENT. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

IN CONNECTION WITH THE OFFERING OF THE BONDS, THE UNDERWRITERS MAY OVER-ALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF THE BONDS AT A LEVEL ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME WITHOUT PRIOR NOTICE.

This Official Statement speaks only as of the date printed on the cover page hereof. This Official Statement, and any supplement or amendment thereto, will be delivered to the Municipal Securities Rulemaking Board through the Electronic Municipal Market Access System.

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OFFICIAL STATEMENT SUMMARY

This summary is furnished to provide limited introductory information regarding the terms of the Bonds and is qualified by the more detailed descriptions appearing in this Official Statement and the appendices hereto. The offering of the Bonds is made only by means of this entire Official Statement, and no person is authorized to make offers to sell or solicit offers to buy the Bonds unless the entire Official Statement is delivered. Certain terms used in this summary are defined elsewhere in this Official Statement.

The City	The City of Philadelphia, Pennsylvania (the "City") is a political subdivision and city of the first class of the Commonwealth of Pennsylvania.
The Bonds	$174,110,000 City of Philadelphia, Pennsylvania Water and Wastewater Revenue Refunding Bonds, Series 2017B ("Bonds"), as shown on the inside cover page of this Official Statement.
Use of Proceeds	The Bonds are being issued for the purpose of providing funds which, together with other available funds of the City, will be used to finance (i) the current refunding of a portion of the City's outstanding Water and Wastewater Revenue Refunding Bonds, Series 2007B, (ii) the advance refunding of a portion of the City's outstanding Water and Wastewater Revenue Bonds, Series 2010C and a portion of its Water and Wastewater Revenue Refunding Bonds, Series 2012, and (iii) the costs of issuance relating to the Bonds. See "PLAN OF REFUNDING" and "ESTIMATED SOURCES AND USES OF FUNDS" contained herein.
Maturity	The Bonds mature on the dates in the principal amounts set forth in the inside cover page hereof.
Interest	Interest on the Bonds accrues from their date of delivery and is payable on May 1 and November 1, commencing November 1, 2017, until maturity or earlier redemption.
Redemption	The Bonds are subject to optional and mandatory sinking fund redemption prior to maturity as described herein. See "THE BONDS – Redemption Provisions" contained herein.
Ratings	Fitch Ratings, Inc. ("Fitch"), Moody's Investors Service, Inc. ("Moody's") and S&P Global Ratings ("S&P") have assigned credit ratings of "A+", "A1" and "A+", respectively, to the Bonds. See "RATINGS" contained herein.
Security for the Bonds	The Bonds, together with other Water and Wastewater Revenue Bonds currently outstanding or hereafter issued under the General Ordinance, are revenue bonds secured by and payable from (i) all rents, rates, fees and charges imposed or charged for connection to, or use or product of or services generated by the System to the ultimate users thereof, (ii) all payments under bulk contracts with municipalities, governmental instrumentalities or other bulk users, (iii) all subsidies or payments payable by Federal, State or local governments or governmental agencies on account of the cost of operation of, or the payment of the principal of or interest on monies borrowed to finance costs chargeable to the System, (iv) all grants, payments and contributions made in aid or on account of the System exclusive of grants and similar payments and contributions solely in aid of construction and (v) all accounts, contract rights and general intangibles representing the foregoing (collectively referred to as, the "Project Revenues"). The City pledges, assigns and grants to the Fiscal Agent, in trust for the security and

payment of all Water and Wastewater Revenue Bonds, a lien on and security interest in all Project Revenues and all amounts on deposit in or standing to the credit of the Water and Wastewater Funds, for the equal and ratable benefit of all present and future holders of Water and Wastewater Revenue Bonds issued under the General Ordinance. See "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS" contained herein.

Debt Reserve Account On the date of issuance of the Bonds, the outstanding balance in the Debt Reserve Account will be sufficient to meet the Debt Reserve Requirement for all Water and Wastewater Revenue Bonds outstanding after the issuance of the Bonds. If at any time and for any reason, the monies in the Debt Service Account of the Sinking Fund are insufficient to pay as and when due, the principal of (and premium, if any) or interest on any Water and Wastewater Revenue Bond, the Fiscal Agent is authorized and directed to withdraw from the Debt Reserve Account and pay over the amount of such deficiency for deposit in the Debt Service Account. As of June 30, 2017, the balance of cash and investments in the Debt Reserve Account was $221,437,772, which is in excess of the Debt Reserve Requirement. See "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Debt Reserve Account."

Parity Bonds All Water and Wastewater Revenue Bonds are equally and ratably secured under the General Ordinance.

Rate Covenant The City covenants to Bondholders that it will establish rents, rates, fees and charges for the use of the System sufficient to yield Net Revenues in each Fiscal Year at least equal to 1.20 times the Debt Service Requirements for such Fiscal Year. In addition, the City covenants with Bondholders that Net Revenues, in each Fiscal Year, will be at least equal to 1.00 times the following, referred to as "total debt service" for such Fiscal Year: (i) the Debt Service Requirements; (ii) amounts required to be deposited into the Debt Reserve Account; (iii) debt service payable on General Obligation Bonds issued for the System; (iv) debt service due on Interim Debt; and (v) the Capital Account Deposit Amount, less any amounts transferred from the Residual Fund to the Capital Account. As of the date hereof, no General Obligation Bonds issued for the System are outstanding, and no Interim Debt is outstanding. See "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Rate Covenant" contained herein.

Financial Consulting and Engineer's Report Raftelis Financial Consultants, Inc. (in association with Peer Consultants, P.C.) has performed engineering evaluations of the current condition and financial operations of the System providing the basis for the required findings that Net Revenues are sufficient to comply with the Rate Covenant and that the System is in good operating condition. See "INTRODUCTORY STATEMENT – Financial Consulting and Engineer's Report" and APPENDIX II for copies of the Financial Consulting and Engineer's Report of October 6, 2016 and the Supplemental Evaluation by Feasibility Consultants Related to City of Philadelphia, Pennsylvania Water and Wastewater Revenue Refunding Bonds, Series 2017B, dated July 17, 2017.

Book-Entry Only System The Bonds are initially issuable only to Cede & Co., the nominee of The Depository Trust Company, New York, New York ("DTC"), pursuant to a book-entry only system. No physical delivery of the Bonds will be made to the beneficial owners of the Bonds. Principal of and interest on the Bonds will be paid to Cede & Co., which will distribute such payments to the participating members of DTC for remittance to the beneficial owners of the Bonds. See APPENDIX VIII herein.

No Payment Defaults	The City has never failed to make a payment of principal of or interest on its Water and Wastewater Revenue Bonds.
Fiscal Agent/Registrar	The Fiscal Agent and registrar for the Bonds is U.S. Bank National Association, Philadelphia, Pennsylvania.
Tax Exemption	In the opinions of Co-Bond Counsel, interest on the Bonds is excludable from gross income for purposes of federal income tax, assuming continuing compliance by the City with the requirements of the federal tax laws. Interest on the Bonds is not a preference item for purposes of either individual or corporate federal alternative minimum tax; however, interest paid to corporate holders of the Bonds may be indirectly subject to alternative minimum tax under certain circumstances described under "TAX EXEMPTION" herein. Under the laws of the Commonwealth of Pennsylvania, the Bonds are exempt from personal property taxes and interest on the Bonds is exempt from Pennsylvania personal income tax and Pennsylvania corporate net income tax. For a more complete discussion of federal and state tax exemptions, see "TAX EXEMPTION" contained herein.
Investment Considerations	For certain investment considerations relating to the decision to purchase the Bonds, see "INVESTMENT CONSIDERATIONS."

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OFFICIAL STATEMENT
relating to

$174,110,000
City of Philadelphia, Pennsylvania
Water and Wastewater Revenue Refunding Bonds,
Series 2017B

INTRODUCTORY STATEMENT

General

This Official Statement, including the cover page and appendices attached hereto, sets forth certain information in connection with the issuance by the City of Philadelphia, Pennsylvania, a corporation, body politic and city of the first class existing under the laws of the Commonwealth of Pennsylvania (the "City") of its Bonds. Capitalized terms used but not otherwise defined in this Official Statement have the meanings ascribed to them in APPENDIX III – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Certain Definitions."

The Bonds are being issued for the purpose of providing funds which, together with other available funds of the City, will be used to finance (i) the current refunding of a portion of the City's outstanding Water and Wastewater Revenue Refunding Bonds, Series 2007B (the "Refunded 2007B Bonds"), (ii) the advance refunding of a portion of the City's outstanding Water and Wastewater Revenue Bonds, Series 2010C and a portion of its Water and Wastewater Revenue Refunding Bonds, Series 2012 (collectively, the "Advance Refunded Bonds" and together with the Refunded 2007B Bonds, the "Refunded Bonds"), and (iii) the costs of issuance relating to the Bonds. See "PLAN OF REFUNDING" and "ESTIMATED SOURCES AND USES OF FUNDS" herein.

The Bonds are being issued under (i) The First Class City Revenue Bond Act, P.L. 955, Act No. 234 of the General Assembly of the Commonwealth of Pennsylvania, approved October 18, 1972 (the "Act") and (ii) the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989, approved by the Mayor June 24, 1993 (the "Restated General Ordinance"), as supplemented and amended from time to time, including the Sixteenth Supplemental Ordinance approved by the Mayor on April 24, 2013 (the "Sixteenth Supplemental Ordinance") and the Nineteenth Supplemental Ordinance approved by the Mayor on December 8, 2015 (the "Nineteenth Supplemental Ordinance"), which authorized the issuance of the Bonds. The Restated General Ordinance, as supplemented or amended from time to time, is referred to as the "General Ordinance." All bonds issued under the General Ordinance (whether prior to or following the date hereof) are referred to herein as "Water and Wastewater Revenue Bonds." U.S. Bank National Association, Philadelphia, Pennsylvania, is acting as Fiscal Agent (the "Fiscal Agent") for the Water and Wastewater Revenue Bonds.

The Water Department

Pursuant to the Philadelphia Home Rule Charter (the "Charter"), the City's Water Department (the "Water Department") has the power and duty to operate, maintain, repair and improve the City's water system (the "Water System") and the City's wastewater system (the "Wastewater System" and together with the Water System, the "Water and Wastewater Systems" or the "System"). The Water Department, which began water service in the 1800's, supplies water and wastewater services to customers within the City and has one wholesale water contract and ten wholesale wastewater contracts with entities outside the City. Under the General Ordinance, the Water and Wastewater Systems are treated as one combined utility for the purpose of revenue bond financing. See "THE WATER DEPARTMENT" herein.

Rate Covenant Under the General Ordinance

Under the General Ordinance, the City must set rates and charges at levels that provide sufficient revenue to meet Operating Expenses (defined herein) of the System, including Interfund Charges (defined herein) for services provided to the Water Department, and Debt Service Requirements on all obligations issued for the Water Department, as well as to meet other specific covenants contained in the General Ordinance. For a more detailed discussion, see "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Rate Covenant" and "RATES" contained herein.

Rate Ordinance and Ratemaking Board

Ordinance No. 130251-A (the "Rate Ordinance") amended the Philadelphia Code to establish an independent rate-making body known as the Philadelphia Water, Sewer, and Stormwater Rate Board (the "Board") responsible for fixing and regulating rates and charges for supplying water, sewer and stormwater services. For a further discussion of the Rate Ordinance, see "RATES – Charter Amendment and Rate Ordinance."

Security and Sources of Payment for the Bonds

The Bonds, equally and ratably with all Water and Wastewater Revenue Bonds (other than Subordinated Bonds), are payable from and secured by a pledge of all Project Revenues and amounts on deposit in the Water and Wastewater Funds. See "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS" herein and APPENDIX III – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance."

Under the General Ordinance, a Debt Reserve Account of the Sinking Fund has been established to secure the Water and Wastewater Revenue Bonds, other than Subordinated Bonds (of which none are currently outstanding). On the date of issuance of the Bonds, the outstanding balance in the Debt Reserve Account will be sufficient to meet the Debt Reserve Requirement for all Water and Wastewater Revenue Bonds outstanding after the issuance of the Bonds. For a discussion of the Debt Reserve Account, see "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Debt Reserve Account" herein.

Financial Consulting and Engineer's Report

Raftelis Financial Consultants, Inc. (the "Financial Consultant"), in association with Peer Consultants, P.C., has delivered to the City its Financial Consulting and Engineer's Report of October 6, 2016 (the "Original Report") and a Supplemental Evaluation by Feasibility Consultants Related to City of Philadelphia, Pennsylvania Water and Wastewater Revenue Refunding Bonds, Series 2017B, dated July 17, 2017 (the "Supplement" and together with the Original Report, the "Financial Consulting and Engineer's Report"), copies of which are attached hereto and incorporated herein by reference as APPENDIX II. The assessments concerning the condition and current and future financial operations of the System contained in the Financial Consulting and Engineer's Report provide the basis for the following findings: (i) that Project Revenues will be sufficient to meet payment or deposit requirements of the operation, maintenance, repair and replacement of the System, reserve funds, and principal or redemption price of and interest on outstanding Water and Wastewater Revenue Bonds (including the Bonds); (ii) that Net Revenues (including projected revenue increases as indicated in the Financial Consulting and Engineer's Report) are currently sufficient to comply with the Rate Covenant and are projected to be sufficient to comply with the Rate Covenant for each of the two Fiscal Years following the Fiscal Year in which the Bonds are issued; and (iii) that the System is in good operating condition or that adequate steps are being taken to return it to good operating condition. The findings above mirror the findings made by the Director of Finance in connection with the adoption by City Council of the Sixteenth Supplemental Ordinance and the Nineteenth Supplemental Ordinance, pursuant to which the Bonds are authorized and issued, based upon the financial and operating condition of the System at the time each Supplemental Ordinance was adopted.

Capital Improvement Program

As required by the Charter, the Water Department has adopted a six-year capital improvement program to plan and manage the capital investments necessary to fulfill the Water Department's service missions, comply with regulatory requirements and preserve and upgrade the System (the "Water Capital Improvement Program"). The Water Department updates the Water Capital Improvement Program annually as part of its yearly budget process, based on a detailed project review by engineering staff, external engineering consultants, and senior management. For a more detailed discussion of the Water Capital Improvement Program and the Water Department's capital budgeting process, see "CAPITAL IMPROVEMENT PROGRAM" herein.

Financial Information

The operations of the Water Department are accounted for in the Water Fund, which is an enterprise fund of the City. The Water Fund is an accounting convention established pursuant to the Charter to account for the assets, liabilities, revenues, expenses of, and to measure Rate Covenant compliance for, the Water and Wastewater System.

The City is required by the Charter to issue, within 120 days after the close of each Fiscal Year, a statement as of the end of the Fiscal Year showing the balances in all funds of the City, the amounts of the City's known liabilities, and such other information as is necessary to furnish a true picture of the City's financial condition (the "Annual Financial Report"). The Annual Financial Report, which is released on or about October 28 of each year, is intended to meet these requirements and is unaudited. The Annual Financial Report contains financial statements for all City governmental funds and blended component units presented on the modified accrual basis. The Annual Financial Report also contains a budgetary comparison schedule for the Water Fund in the supplementary information. The Annual Financial Report for Fiscal Year 2016 was released on or about October 28, 2016.

The City reports its financial performance for each Fiscal Year on a consolidated basis in its audited Comprehensive Annual Financial Report ("CAFR"), which is published not later than February 28 of each year. The City's CAFR for Fiscal Year 2016, which includes audited financials of and other information relating to the Water Fund, was filed on the Electronic Municipal Market Access System of the Municipal Securities Rulemaking Board ("MSRB") on February 24, 2017 and is available at http://www.emma.msrb.org. The City Controller has examined and expressed opinions on the basic financial statements of the City contained in the CAFR for Fiscal Year 2016. See APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – City Finances and Financial Procedures – Independent Audit and Opinion of the City Controller."

The financial statements of the Water Fund for the Fiscal Year ended June 30, 2016, attached hereto as APPENDIX I, are derived from the CAFR for the Fiscal Year ended June 30, 2016. The financial statements pertaining to the Water Fund are derived from the CAFR in order to present the financial condition of the Water Fund separately from the financial condition of the City and its other funds and units as a whole. The City Controller has neither examined nor expressed an opinion on the financial statements of the Water Fund contained in APPENDIX I to this Official Statement or on any other financial data contained in this Official Statement, except as noted in the preceding paragraph as to the CAFR.

The City Controller has neither participated in the preparation of this Official Statement nor in the preparation of the budget estimates and projections and cash flow statements and forecasts set forth in various tables contained in this Official Statement except as noted regarding the CAFR. The City Controller expresses no opinion with respect to any of the data contained in this Official Statement.

Miscellaneous

Brief descriptions of the Water Department, the Bonds and the security therefor, and certain information about the City are included herein. All references herein to the Act, the Charter, the General Ordinance and the Financial Consulting and Engineer's Report are qualified in all respects by reference to each such document in its entirety. The Annual Financial Report, the CAFR, and the financial statements of the Water Fund are available on the City's Investor Website at http://www.phila.gov/investor (the "City's Investor Website").

The "Terms of Use" statement of the City's Investor Website, which applies to all users of the City's Investor Website, provides, among other things, that the information contained therein is provided for the convenience of the user, that the City is not obligated to update such information, and that the information may not provide all information that may be of interest to investors. The information contained on the City's Investor Website does not constitute an offer to buy or sell securities, nor is it a solicitation therefor. The information contained in the City's Investor Website is not incorporated by reference in this Official Statement and persons considering the purchase of the Bonds should rely only on information contained in this Official Statement or incorporated by reference herein.

The foregoing statement as to filing or furnishing of additional information reflects the City's current practices but is not a contractual obligation to the holders of the City's bonds. The foregoing information is furnished solely to provide limited introductory information with respect to the Bonds and does not purport to be comprehensive or definitive. All such information is qualified in its entirety by reference to the more detailed descriptions appearing elsewhere in this Official Statement, inclusive of the Appendices, which should be read in its entirety, and to the complete documents referenced herein. The sale of the Bonds is made only by means of this entire Official Statement.

The financial statements of the Water Fund, are attached hereto as APPENDIX I. The Financial Consulting and Engineer's Report is attached hereto as APPENDIX II. Summaries of certain provisions of the Act, the General Ordinance, the Sixteenth Supplemental Ordinance and the Nineteenth Supplemental Ordinance, (including definitions of certain terms), are attached hereto as APPENDIX III. A description of the Government and Financial Information of the City is attached hereto as APPENDIX IV. The City of Philadelphia Socioeconomic Information is attached hereto as APPENDIX V. The form of approving opinion of Co-Bond Counsel to be delivered in connection with the issuance and delivery of the Bonds is attached hereto as APPENDIX VI. The form of Continuing Disclosure Agreement relating to the Bonds is attached hereto as APPENDIX VII. Information relating to the Depository Trust Company is attached hereto as APPENDIX VIII.

PLAN OF REFUNDING

The City is issuing the Bonds to provide funds which, together with other available funds of the City, will be used to finance (i) the current refunding of the Refunded 2007B Bonds, (ii) the advance refunding of the Advance Refunded Bonds, and (iii) the costs of issuance relating to the Bonds.

A portion of the proceeds of the Bonds will be deposited in an escrow fund established under an Escrow Deposit Agreement dated August 10, 2017 between the City and U.S. Bank National Association, as escrow agent (the "Escrow Agreement"), invested in Qualified Escrow Securities, and applied to the payment of the redemption price of and interest on (i) the Refunded 2007B Bonds to and including November 1, 2017, which is the date fixed for redemption of the Refunded 2007B Bonds and (ii) the Advance Refunded Bonds to and including November 1, 2022, which is the last date fixed for redemption of the Advance Refunded Bonds. See "VERIFICATION" below.

VERIFICATION

Amtec Corp. (the "Verification Agent") will deliver to the City, on or before the date of the delivery of the Bonds, its report (the "Verification Report") indicating that it has verified the mathematical accuracy of the information provided by the City and its representatives with respect to the refunding requirements of the Refunded Bonds. Included within the scope of its engagement will be a verification of (a) the mathematical accuracy of the computations of the adequacy of the cash and maturing principal of the securities to be placed in an escrow account to meet the scheduled payment of interest on the Refunded Bonds until redemption and the payment of the redemption price of the Refunded Bonds on their respective redemption dates, as set forth in the Escrow Agreement; and (b) the mathematical accuracy of the computations supporting the conclusion of Co-Bond Counsel that the Bonds are not "arbitrage bonds" under the Code and the regulations promulgated thereunder.

ESTIMATED SOURCES AND USES OF FUNDS

The following table sets forth estimated sources and uses of the proceeds of the Bonds.

Sources of Funds	**Total**
Principal Amount of the Bonds	$174,110,000.00
Original Issue Premium	35,388,394.65
Funds from Debt Reserve Account	19,000,000.00
Total Sources of Funds	$228,498,394.65
Uses of Funds	
Deposit to Escrow Fund for Refunded Bonds	$227,196,095.06
Costs of Issuance†	1,302,299.59
Total Uses of Funds	$228,498,394.65

†Includes Underwriters' discount; legal, printing, rating agency, consultant, Fiscal Agent, Verification Agent and financial advisor fees; and other expenses of the issuance and offering of the Bonds.

THE BONDS

General

The Bonds will be issued in the aggregate principal amount, will be dated, will bear interest at the rates and will mature on the dates and in the amounts shown on the inside front cover page of this Official Statement. The Bonds will be issued in fully-registered form, registered in the name of Cede & Co., as nominee of The Depository Trust Company ("DTC") pursuant to DTC's Book-Entry Only System. See APPENDIX VIII herein.

The Bonds will be issued in denominations of $5,000 or any integral multiple thereof. Interest on the Bonds, calculated on the basis of a 360-day year comprised of twelve 30-day months, will be payable semiannually on May 1 and November 1 of each year, commencing November 1, 2017 (each, an "Interest Payment Date"). The Record Date for the Bonds will be each April 15 and October 15.

Redemption Provisions

Optional Redemption. The Bonds maturing on or after November 1, 2028 are subject to optional redemption prior to maturity on or after November 1, 2027, at the option of the City, as a whole at any time or in part from time to time in the maturities selected by the City and within a maturity and a given interest rate, if applicable, by lot as determined by the Fiscal Agent at the redemption price of 100% of the principal amount of the Bonds to be redeemed, plus accrued interest to the redemption date.

Notice of Redemption

Notice of the call for any redemption of Bonds prior to maturity shall be given in the name of the City and shall contain the following information: "CUSIP" number; and, in the case of a partial redemption of any Bond, the certificate number and the respective principal amounts of the Bonds to be redeemed; the publication date; the redemption date; the redemption price and the name and address of the redemption agent, and shall further identify the Bonds by date of issue, interest rate and maturity date. Such notice shall be given by the Fiscal Agent by depositing a copy of the notice of redemption in the United States mail, first-class, postage prepaid, at least 20 days and not more than 60 days prior to the date fixed for redemption, to the registered owner of each such Bond to be redeemed at the address shown on the registration books kept by the Fiscal Agent, provided, however, that notice of redemption shall be given by certified mail, return receipt requested, to each owner of at least $1,000,000 aggregate principal amount of Bonds.

Notice having been so given and provisions having been made for redemption from funds on deposit with the Fiscal Agent, all interest on Bonds called for redemption accruing after the date fixed for redemption shall cease, and the holders or registered owners of the Bonds called for redemption shall have no security, benefit or lien under the General Ordinance or any right except to receive payment of the redemption price.

If at the time of mailing notice of redemption the City shall not have deposited with the Fiscal Agent monies sufficient to redeem the Bonds called for redemption, such notice may state that it is conditional in that it is subject to the deposit of the redemption monies with the Fiscal Agent not later than the redemption date, and such notice shall be of no effect unless such monies are so deposited.

Debt Service Requirements

The table on the following page sets forth the Debt Service Requirements for the Bonds and the aggregate Debt Service Requirements for all Outstanding Water and Wastewater Revenue Bonds following the issuance of the Bonds. The table includes the Bonds, excludes the Refunded Bonds and takes into consideration the principal and interest paid on all Outstanding Water and Wastewater Revenue Bonds through August 10, 2017. For information on maximum annual Debt Service Requirements, see " – Debt Reserve Requirement" below.

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Table 1
Debt Service Requirements for Fiscal Years ending June 30
for Water and Wastewater Revenue Bonds

FY Ending June 30	Aggregate Debt Service on Water and Wastewater Revenue Bonds Outstanding(1)	The Bonds Principal	The Bonds Interest	Aggregate Debt Service
2018	$111,491,339	$2,905,000	$6,219,254	$120,615,592
2019	178,072,636	--	8,560,250	186,632,886
2020	166,210,047	--	8,560,250	174,770,297
2021	138,672,934	5,980,000	8,410,750	153,063,684
2022	132,129,894	3,140,000	8,182,750	143,452,644
2023	128,335,036	6,590,000	7,939,500	142,864,536
2024	103,007,500	7,895,000	7,577,375	118,479,875
2025	104,158,858	7,325,000	7,196,875	118,680,733
2026	103,592,888	7,160,000	6,834,750	117,587,638
2027	101,498,324	9,365,000	6,421,625	117,284,949
2028	86,294,494	9,835,000	5,941,625	102,071,119
2029	106,802,607	4,390,000	5,586,000	116,778,607
2030	72,752,732	31,750,000	4,682,500	109,185,232
2031	73,688,807	32,495,000	3,076,375	109,260,182
2032	70,498,115	34,425,000	1,403,375	106,326,490
2033	82,581,688	3,390,000	458,000	86,429,688
2034	82,383,188	3,615,000	282,875	86,281,063
2035	82,328,619	3,850,000	96,250	86,274,869
2036	87,676,163	--	--	87,676,163
2037	85,867,000	--	--	85,867,000
2038	85,861,750	--	--	85,861,750
2039	85,866,000	--	--	85,866,000
2040	85,867,375	--	--	85,867,375
2041	91,310,375	--	--	91,310,375
2042	83,297,950	--	--	83,297,950
2043	83,294,881	--	--	83,294,881
2044	64,896,500	--	--	64,896,500
2045	54,128,125	--	--	54,128,125
2046	54,130,000	--	--	54,130,000
2047	19,082,375	--	--	19,082,375
2048	19,085,250	--	--	19,085,250
2049	19,085,656	--	--	19,085,656
2050	19,085,631	--	--	19,085,631
2051	19,083,406	--	--	19,083,406
2052	19,081,794	--	--	19,081,794
2053	19,083,550	--	--	19,083,550
Total(2)	$2,920,283,487	$174,110,000	$97,430,379	$3,191,823,866

(1) As of July 31, 2017, the interest rate on the Series 1997B bonds is calculated at 0.419508%, the average interest rate of the bonds during the 24 consecutive calendar months preceding the date of calculation, per the General Ordinance.
(2) Totals may not add due to rounding.

SECURITY AND SOURCES OF PAYMENT FOR THE BONDS

Parity Bonds

All Water and Wastewater Revenue Bonds (other than Subordinated Bonds) are equally and ratably secured under the General Ordinance. As of the date of this Official Statement, no Subordinated Bonds are Outstanding under the General Ordinance.

Pledge of Project Revenues

Pursuant to the General Ordinance, the City pledges and assigns to the Fiscal Agent, in trust, for the security and payment of all Water and Wastewater Revenue Bonds (other than Subordinated Bonds) issued under or subject to the General Ordinance, and grants to the Fiscal Agent, in trust, a lien on and security interest in all Project Revenues and amounts on deposit in or standing to the credit of the Water and Wastewater Funds (other than the Rebate Fund). The Fiscal Agent must hold and apply the security interest in and lien on Project Revenues and funds and accounts, in trust, for the equal and ratable benefit and security of all present and future holders of Water and Wastewater Revenue Bonds (other than Subordinated Bonds). The General Ordinance provides that such pledge also may be for the benefit of the provider of a Credit Facility or a Qualified Swap (as defined therein), or any other person who undertakes to provide monies for the account of the City for the payment of principal or redemption price of and interest on any series of Water and Wastewater Revenue Bonds (other than Subordinated Bonds), on an equal and ratable basis with the holders of Water and Wastewater Revenue Bonds (other than Subordinated Bonds).

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Priority and Application of Project Revenues

The priority and application of Project Revenues under the terms of the General Ordinance and other amounts deposited into the Revenue Fund are set forth in the waterfall below:

1 (a) Payment of Operating Expenses;

2 (b) Payment of the principal or redemption price of and interest on Water and Wastewater Revenue Bonds issued under the General Ordinance (except Subordinated Bonds), regularly scheduled payments under any parity Swap Agreement, payments under any parity Credit Facility to repay advances thereunder to pay any of the foregoing and payments with respect to fees and expenses in respect of

3 (c) if the transfers in (a) and (b) are made when due, payments into the Debt Reserve Account to the extent necessary to cure a deficiency therein;

4 (d) if the transfers in (a) and (b) are made when due, and following any transfer required under (c), payments into any debt reserve account established within the Sinking Fund and not held for the equal and ratable benefit of all Water and Wastewater Revenue Bonds (other than Subordinated Bonds) to the extent necessary to cure a deficiency therein;

5 (e) if the transfers in (a) and (b) are made when due, and following any transfers required under (c) and (d), payment of principal or redemption price of and interest on any Subordinated Bonds and payments due under any Swap Agreement or Credit Facility respecting Subordinated Bonds;

6 (f) if the transfers in (a) and (b) are made when due, and following any transfers required under (c) through (e), all payments due under a Qualified Swap, other than regularly scheduled swap payments, including, without limitation, any payments due to a Swap Provider upon the early termination of a Swap Agreement;

7 (g) if the transfers in (a) and (b) are made when due, and following any transfers required under (c) through (f), transfer to the City of the amount necessary to pay General Obligation Bonds issued for the System;

8 (h) if the transfers in (a) and (b) are made when due, and following any transfers required under (c) through (g), transfer to the Rate Stabilization Fund of the amount determined by the Water Commissioner;

9 (i) if the transfers in (a) and (b) are made when due, and following any transfers required under (c) through (h), transfer to the Capital Account of the Construction Fund the sum of the Capital Account Deposit Amount, the Debt Service Withdrawal and the Operating Expense Withdrawal, less any amounts transferred to the Capital Account from the Residual Fund; and

10 (j) if the transfers in (a) and (b) are made when due, and following any transfers required under (c) through (i), after providing for repayment of any inter-Fund loans, transfer to the Residual Fund of any amount remaining on deposit in the Revenue Fund.

The General Ordinance permits the application of Project Revenues to pay Interfund Charges (defined herein) and permits monies to be transferred in each Fiscal Year from the Residual Fund to the City's General Fund in an amount not to exceed the lesser of (A) all Net Reserve Earnings (as defined below) and (B) $4,994,000. "Net Reserve Earnings" means the amount of interest earnings during the Fiscal Year on amounts in the Debt Reserve Account and the Subordinated Bond Fund less the amount of interest earnings during the Fiscal Year on amounts in any such reserve funds and accounts giving rise to a rebate obligation pursuant to Section 148(f) of the Internal Revenue Code of 1986, as amended. In Fiscal Years 2015 and 2016, the Water Department transferred $754,585.12 and $1,555,702.46, respectively, from the Residual Fund to the City's General Fund. The estimated transfer to the City's General Fund for Fiscal Year 2017 is approximately $1,200,000. The budgeted transfer to the City's General Fund for Fiscal Year 2018 is approximately $1,500,000. For a brief discussion of the Residual Fund, see " – Residual Fund" below.

Water and Wastewater Funds

Funds and Accounts. The Act and the General Ordinance establish the following funds and accounts to be held by the Fiscal Agent:

(a) Revenue Fund;

(b) Sinking Fund and within such fund a Debt Service Account, a Charges Account and a Debt Reserve Account;

(c) Subordinated Bond Fund;

(d) Rate Stabilization Fund;

(e) Construction Fund and within such fund an Existing Projects Account, a Bonds Proceeds Account and a Capital Account; and

(f) Residual Fund and within such fund a Special Water Infrastructure Account.

The foregoing funds are referred to herein as the "Water and Wastewater Funds." The Water and Wastewater Funds are required under the General Ordinance to be held separate and apart from all other funds and accounts of the City and the Fiscal Agent, and the funds and accounts therein shall not be commingled with, loaned or transferred among themselves or to any other City funds or accounts except as expressly permitted by the General Ordinance. The General Ordinance also establishes a Rebate Fund, which is not held for the benefit of the holders of the Water and Wastewater Revenue Bonds, and provides that the City can direct transfers to the Rebate Fund at the times and in the amounts necessary to pay any amounts required to be rebated pursuant to Section 148(f) of the Code.

Project Revenues. The City is required by the General Ordinance to cause all Project Revenues received by it on any date to be deposited into the Revenue Fund upon receipt thereof by the City, and the Fiscal Agent shall, upon receipt of Project Revenues, deposit such Project Revenues into the Revenue Fund. The City and the Fiscal Agent also shall cause to be deposited into the Revenue Fund such portion of the proceeds of the Bonds as are designated by Supplemental Ordinance or Bond Committee Determination and any other funds directed to be deposited into the Revenue Fund by the City. The City has covenanted in the General Ordinance that it will not direct the Fiscal Agent to transfer, loan or advance proceeds of the Bonds or Project Revenues from the Water and Wastewater Funds to any City account for application other than as permitted under the General Ordinance.

Project Revenues include, among other things, rents, rates, fees and charges from users of the products and services generated by the System (collectively, "rates and charges"). Collection and accounting of rates and charges are administered by the Water Revenue Bureau within the City's Department of Revenue. See

"THE WATER DEPARTMENT – Administration" herein. Historically, all rates and charges collected by the Water Revenue Bureau, whether by cashier, mail, or electronic payment, are recorded upon receipt, and are held temporarily by the City's fiscal agent in a consolidated cash account of the City. The City generates a report of rates and charges collected at each day's end and transfers, typically on the next day, all rates and charges so held to one or more accounts controlled by the Fiscal Agent for the Water and Wastewater Funds for deposit by the Fiscal Agent into the Revenue Fund. The City continues to examine the collection and accounting process with a view towards causing rates and charges to be deposited with the Fiscal Agent into the Revenue Fund as and when received.

See APPENDIX I – "FINANCIAL STATEMENTS OF THE WATER FUND DERIVED FROM THE CITY'S AUDITED COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR FISCAL YEAR ENDED JUNE 30, 2016" and APPENDIX III – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance" for additional information concerning the priority and application of Project Revenues and further description of the funds and accounts established under the General Ordinance and their purposes.

Interfund Loans. If at any time sufficient monies are not available in the Revenue Fund to pay both Operating Expenses (defined below) and to make the transfers described above under "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Priority and Application of Project Revenues," then amounts on deposit in the Construction Fund, Rate Stabilization Fund and/or Residual Fund may be loaned temporarily, at the written direction of the City, to the Revenue Fund, for the payment of such Operating Expenses until such loaned amounts are required by the Water Department for purposes of the Fund making the loan. Such interfund loans permit the Water Department then to use Project Revenues for the other transfers described above under " – Priority and Application of Project Revenues." "Operating Expenses" means all costs and expenses of the Water Department necessary to operate and maintain the System in good operating condition, including, without limitation, salaries and wages, purchases of services by contract, costs of materials, supplies and expendable equipment, maintenance costs, costs of any property or the replacement thereof or for any work or project, related to the System (that is not properly chargeable to property, plant and equipment), pension and welfare plan and workers' compensation requirements, provisions for claims, refunds and uncollectible receivables and services performed for the Water Department by other City departments or commissions or required to be charged to the Water Department under the Charter. If a similar deficiency exists in the Construction Fund, amounts on deposit in any of the Revenue Fund, Rate Stabilization Fund and Residual Fund may be loaned temporarily, at the written direction of the City, to the Construction Fund, to the extent of the deficiency, until required by the Water Department for purposes of the Fund making the loan.

The Water Department typically makes an interfund loan in each Fiscal Year from the Rate Stabilization Fund to the Revenue Fund, which loan is typically repaid at the end of such Fiscal Year. The loan for Fiscal Year 2017 in the amount of $45 million was repaid on May 3, 2017. At this time, the Water Department does not intend to make a loan from the Rate Stabilization Fund to the Revenue Fund for Fiscal Year 2018.

Debt Reserve Account

General. The General Ordinance establishes within the Sinking Fund a Debt Reserve Account that will be funded (if required to be funded) with the proceeds of each series of Water and Wastewater Revenue Bonds; provided, however, that if the Supplemental Ordinance authorizing a series of Water and Wastewater Revenue Bonds shall so authorize, the deposit to the Debt Reserve Account in respect of such Water and Wastewater Revenue Bonds may be accumulated from Project Revenues over a period of not more than three Fiscal Years after the issuance and delivery of the related Water and Wastewater Revenue Bonds. The monies and investments in the Debt Reserve Account will be held and maintained in an amount equal at all times to the Debt Reserve Requirement. "Debt Reserve Requirement" means, with respect to all Water and Wastewater Revenue Bonds, an amount equal to the lesser of (i) the greatest amount of Debt Service Requirements payable in any one Fiscal Year (except that such Debt Service Requirement will be computed as if any Qualified Swap did not exist and the Debt Service Requirements attributable to any Variable Rate Bonds may be based upon the fixed rate of interest as set forth in the Supplemental Ordinance or Bond Committee Determination for such bonds), determined as of any particular date and (ii) the maximum amount to be financed with proceeds of bonds permitted by Section 148(d)(1) of the Code. Debt Service Requirements, with reference to a specified period, means: (a) amounts required to be paid into any mandatory sinking fund established for the benefit of each series of Water and Wastewater Revenue Bonds during such period; (b) amounts needed to pay the principal or redemption price of such Water and Wastewater Revenue Bonds maturing during such period and not to be redeemed at or prior to maturity through any sinking fund established for the benefit of such series of Water and Wastewater Revenue Bonds; (c) interest payable on such series of Water and Wastewater Revenue Bonds during such period, with adjustment for capitalized interest or redemption through any sinking fund established for the benefit of such Water and Wastewater Revenue Bonds; and (d) all net amounts, if any, due and payable by the City under a Qualified Swap during such period.

If at any time the monies in the Debt Service Account of the Sinking Fund are insufficient to pay as and when due the principal of (and premium, if any) or interest on any series of Water and Wastewater Revenue Bonds or other obligations payable from the Debt Service Account (including obligations arising in connection with Qualified Swap Agreements and Credit Facilities), the Fiscal Agent is required to transfer from the Debt Reserve Account the amount of such deficiency for deposit in the Debt Service Account.

With respect to any issue of Water and Wastewater Revenue Bonds, in lieu of the required deposit into the Debt Reserve Account, the City may cause to be deposited into the Debt Reserve Account a surety bond, an insurance policy or an irrevocable letter of credit. In addition, the General Ordinance authorizes the City to apply monies on deposit in the Debt Reserve Account to purchase a surety bond, an insurance policy or an irrevocable letter of credit. Under the terms of the General Ordinance, any surety bond, insurance policy or letter of credit provided by the City in lieu of required deposits within the Debt Reserve Account would, at the time of issuance thereof, be required to meet the credit quality requirements of the General Ordinance as described in APPENDIX III – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance – Debt Reserve Account."

Amounts on deposit on the Debt Reserve Account include proceeds of Water and Wastewater Revenue Bonds, other funds of the Water Department, earnings on investments in the Debt Reserve Account and a surety policy issued on November 26, 2007 by Assured Guaranty Municipal Corp. ("AGM") in the aggregate principal amount of $67,000,000 (the "AGM Surety Policy"). The AGM Surety Policy expires on July 1, 2035. In the event of a draw on the Debt Reserve Account, the AGM Surety Policy requires that cash available in the Debt Reserve Account be applied first, before the AGM Surety Policy is drawn upon.

Debt Reserve Requirement. As of June 30, 2017, the Debt Reserve Requirement for all Outstanding Water and Wastewater Revenue Bonds based on maximum annual Debt Service Requirements prior to the issuance of the Bonds was approximately $218,723,227. The balance of cash and investments credited to the Debt Reserve Account as of June 30, 2017 was $221,437,772. The AGM Surety Policy remains in effect, but it does not meet the rating requirements of the General Ordinance. **Thus, the value of the AGM Surety Policy is excluded in calculating the amount on deposit in the Debt Reserve Account.** On the date of issuance of the Bonds, $19 million will be released from the Debt Reserve Account to finance a portion of the refunding of the Refunded Bonds. The amount remaining on deposit in the Debt Reserve Account will satisfy the Debt Reserve Requirement for all Water and Wastewater Revenue Bonds outstanding after the issuance of the Bonds. In addition, as authorized in the General Ordinance, the City intends to transfer a portion of estimated Net Reserve Earnings from the Debt Reserve Account to the Residual Fund as part of the fiscal year end closing process, as described in (j) of the waterfall contained in " – Priority and Application of Project Revenues" above.

Rate Stabilization Fund

Pursuant to the General Ordinance, as of June 30 of each Fiscal Year, the City may transfer (i) from the Rate Stabilization Fund to the Revenue Fund or (ii) from the Revenue Fund to the Rate Stabilization Fund, the amount determined by the Water Commissioner to be transferred for such Fiscal Year. For purposes of calculating Net Revenues, transfers from the Rate Stabilization Fund to the Revenue Fund are included in the calculation, whereas transfers from the Revenue Fund to the Rate Stabilization Fund are excluded from Net Revenues. As discussed above under "Water and Wastewater Funds – Interfund Loans," amounts on deposit in the Rate Stabilization Fund also may be loaned temporarily to the Revenue Fund to pay Operating Expenses under certain conditions. See APPENDIX III – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance – Rate Stabilization Fund."

In connection with the rate proceeding that occurred in June of 2016, the Water Department instituted a policy to maintain at least $110 million in the Rate Stabilization Fund, adjusted for inflation. There is no requirement in the General Ordinance or the Act to maintain such policy, and no assurance can be given that the policy will be retained.

Residual Fund

Amounts on deposit in the Residual Fund may be used at the written direction of the City (i) to pay Operating Expenses; (ii) to fund transfers to any fund or account established under the General Ordinance or under a Supplemental Ordinance (other than the Revenue Fund and the Rate Stabilization Fund); (iii) to make payments required under any Exchange Agreement; (iv) for the payment of principal, redemption premium, if any, and interest on any revenue bonds or notes (the proceeds of which were applied in respect of the System) issued under the Act but not under the General Ordinance; (v) for the payment of principal, redemption premium, if any, and interest on any General Obligation Bonds; (vi) for the payment of principal, redemption premium, if any, and interest on other general obligation debt issued in respect of the System; (vii) for the payment of amounts due under capitalized leases or similar obligations relating to the System; and (viii) to fund a transfer to the City's "General Fund" in an amount not to exceed the lower of (A) all Net Reserve Earnings or (B) $4,994,000. See APPENDIX III – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance – Residual Fund." In addition, as discussed above under "Water and Wastewater Funds – Interfund Loans," amounts on deposit in the Residual Fund also may be loaned temporarily to the Revenue Fund to pay Operating Expenses under certain conditions.

In connection with the rate proceeding that occurred in June of 2016, the Water Department instituted a policy to maintain at least $15 million in the Residual Fund, adjusted for inflation. There is no requirement in the General Ordinance or the Act to maintain such policy, and no assurance can be given that the policy will be retained.

Additional Sources of Funds for Deficiencies in Sinking Fund

At the written direction of the City, the General Ordinance permits monies on account in the Capital Account of the Construction Fund and in the Residual Fund to be utilized to cure deficiencies in the Sinking Fund. See APPENDIX III – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance – Construction Fund" and " – Residual Fund."

Rate Covenant

The General Ordinance contains a number of covenants (collectively, the "Rate Covenant") concerning the City's imposition of rates and charges sufficient to support the System. The Rate Covenant requires, while any Water and Wastewater Revenue Bonds remain outstanding, the City to establish rents, rates, fees and charges for the use of the Water and Wastewater Systems sufficient to yield Net Revenues in each Fiscal Year at least equal to 1.20 times the Debt Service Requirements for such Fiscal Year (recalculated to exclude principal and interest payments in respect of Subordinated Bonds, of which none exist). In addition, Net Revenues (defined herein), in each Fiscal Year, must be at least equal to 1.00 times the sum of the following for such Fiscal Year: (i) the Debt Service Requirements (including Debt Service Requirements in respect of Subordinated Bonds); (ii) amounts required to be deposited into the Debt Reserve Account; (iii) debt service payable on General Obligation Bonds issued for the System; (iv) debt service due on Interim Debt; and (v) the Capital Account Deposit Amount, less any amounts transferred from the Residual Fund to the Capital Account. As of the date hereof, neither General Obligation Bonds issued for the System nor Interim Debt is outstanding.

"Net Revenues" for any period means: the Project Revenues collected during such period and deposited into the Revenue Fund plus (x) the amounts, if any, transferred from the Rate Stabilization Fund into the Revenue Fund as of the end of such period and (y) interest earnings during such period on monies in any of the funds or accounts established under the General Ordinance to the extent such interest earnings are credited to the Revenue Fund pursuant to the General Ordinance, and minus the sum of (a) Operating Expenses incurred during such period and (b) the amounts, if any, transferred from the Revenue Fund to the Rate Stabilization Fund as of the end of such period; provided, however that in determining such Net Revenues, the Initial Deposit (as defined in Appendix III) shall not reduce such Net Revenues. To ensure compliance with the Rate Covenant, the General Ordinance requires that the City review its rents, rates, fees and charges promptly upon any material change in the circumstances which were contemplated at the time such rents, rates, fees and charges were reviewed, but not less frequently than once each Fiscal Year. For a discussion of the Water Department's experience in meeting the Rate Covenant, see "HISTORICAL AND PROJECTED FINANCIAL INFORMATION – Compliance with Rate Covenant" herein. Notwithstanding any future changes in the rate-making process, while any Water and Wastewater Bonds remain outstanding, the City is required to comply with the Rate Covenant.

Insurance Covenants

In addition to the Rate Covenant, the City has covenanted to AGM that for each Fiscal Year while the Series 2005B Bonds or portions of the Series 2010A Bonds or the Series 2010C Bonds insured by AGM are outstanding, the City will establish rates and charges for the use of the Water and Wastewater Systems sufficient to yield Net Revenues (excluding amounts transferred from the Rate Stabilization Fund into the Revenue Fund as of the end of such Fiscal Year) at least equal to 90% of the Debt Service Requirements (excluding debt service due on any Subordinated Bonds) in such Fiscal Year. The City also has covenanted that in addition to the conditions described below under " – Additional Bonds," any calculation by a consulting engineer of the City's projected compliance with the Rate Covenant in connection with the proposed issuance of Additional Bonds must state that Net Revenues (excluding amounts transferred from the Rate Stabilization Fund to the Revenue Fund as of the end of such Fiscal Year) for such Fiscal Year included in the projection period are projected to be at least equal to 90% of the Debt Service Requirements (excluding debt service due on any Subordinated Bonds) for such Fiscal Year. The foregoing agreement is for the benefit of AGM only and may be amended or waived by AGM in its sole discretion without the consent of holders of the Wastewater and Wastewater Bonds, including the Bonds.

The Water Department has met these additional rate covenants for each of the Fiscal Years for which such covenants have been in effect.

Additional Bonds

The General Ordinance permits the issuance of additional bonds, which may be secured on a parity basis with the outstanding bonds issued thereunder. The General Ordinance imposes certain conditions precedent (which conditions have been met in connection with the issuance of the Bonds) to the issuance of additional bonds, including the delivery of the Financial Consulting and Engineer's Report showing sufficient debt service coverage ratios. Such conditions precedent to the issuance of additional bonds are described in

APPENDIX III – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance – Covenants of the City – Conditions of and Provisions Relating to Issuing Bonds."

Limitations on Effectiveness of Pledge of Project Revenues and Water and Wastewater Funds

The effectiveness of the pledge of the Project Revenues and the Water and Wastewater Funds may be limited because, although the Fiscal Agent will have custody of the Water and Wastewater Funds, the City will have complete control of deposits into and expenditures from the Water and Wastewater Funds, except for amounts on deposit in the Sinking Fund, including the Debt Reserve Account. While the City has covenanted not to direct the Fiscal Agent to transfer Project Revenues other than as permitted under the General Ordinance, no requisition procedure or other similar procedure will be established for the expenditure of monies by the City from the Water and Wastewater Funds (other than the Sinking Fund, including the Debt Reserve Account), and no consent or approval of the Fiscal Agent is required to be obtained by the City as a condition of the City's expenditure of such monies. The Fiscal Agent will not monitor deposits into or withdrawals from the Water and Wastewater Funds (other than the Sinking Fund, including the Debt Reserve Account) or the purposes for which such monies are utilized.

The General Ordinance provides that if the City fails to make a deposit of Project Revenues as required under the General Ordinance, the Fiscal Agent is authorized to and shall seek, by mandamus or other suit, action or proceeding at law or in equity, the specific enforcement or performance of the obligation of the City to cause the Project Revenues to be transferred to the Revenue Fund.

No daily, monthly or other periodic deposits are required to be made into the Sinking Fund prior to the dates on which debt service payments on the Water and Wastewater Revenue Bonds are due.

REMEDIES OF BONDHOLDERS

Remedies under the Act and the General Ordinance available to Bondholders and to any trustee for Bondholders appointed by the holders of 25% of the outstanding principal amount of any series of Water and Wastewater Revenue Bonds in default are described in APPENDIX III – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Defaults and Remedies." In addition to the remedies therein described, Bondholders or a trustee therefor are entitled under the Pennsylvania Uniform Commercial Code to remedies as secured parties with respect to the Project Revenues and the funds on deposit in the Water and Wastewater Funds. See "INVESTMENT CONSIDERATIONS – Limited Recourse on Default."

Enforcement of Bondholders' rights may be limited by and is subject to the provisions of the Federal Bankruptcy Code, as now or hereafter enacted, and to other laws or legal or equitable principles which may affect the enforcement of creditors' rights. References to the Federal Bankruptcy Code should not be construed as implying that the City expects to resort to the provisions of such statute or that, if it did, any proposed restructuring would include a dilution of the sources of payment of and security for the Bonds. See "INVESTMENT CONSIDERATIONS – Bankruptcy" herein.

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OUTSTANDING INDEBTEDNESS AND OTHER LONG-TERM AGREEMENTS

Outstanding Indebtedness

As set forth in the table below, as of August 10, 2017, $1,882,086,283 aggregate principal amount of Water and Wastewater Revenue Bonds will be outstanding. This amount takes into consideration the issuance of the Bonds, the refunding of the Refunded Bonds and principal payments made through such date.

Table 2
Outstanding Indebtedness
as of August 10, 2017

Series of Bonds	Original Principal Amount	Outstanding Principal Amount	Fixed/ Variable Rate	Year of Maturity
1997B	$100,000,000	$49,400,000	Variable	2027
Pennvest 1999	6,700,000	147,559	Fixed	2019
2005B	86,105,000	165,000	Variable	2018
2007B	153,595,000	275,000	Fixed	2017
2009A	140,000,000	8,980,000	Fixed	2019
Pennvest 2009B	42,886,000	18,934,161	Fixed	2025
Pennvest 2009C	57,268,000	35,330,136	Fixed	2032
Pennvest 2009D	84,759,000	55,399,013	Fixed	2028
2010A	396,460,000	69,880,000	Fixed	2019
Pennvest 2010B	30,000,000	23,445,414	Fixed	2032
2010C	185,000,000	61,970,000	Fixed	2040
2011A	135,000,000	135,000,000	Fixed	2041
2011B	49,855,000	44,220,000	Fixed	2026
2012	70,370,000	38,785,000	Fixed	2028
2013A	170,000,000	166,575,000	Fixed	2043
2014A	123,170,000	110,975,000	Fixed	2043
2015A	275,820,000	275,820,000	Fixed	2045
2015B	141,740,000	141,740,000	Fixed	2035
2016	192,680,000	191,070,000	Fixed	2035
2017A	279,865,000	279,865,000	Fixed	2052
2017B	174,110,000	174,110,000	Fixed	2034
TOTAL	**$2,895,383,000**	**$1,882,086,283**		

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On May 15, 2013, in connection with the purchase of the Series 2005B Bonds by Banc of America Preferred Funding Corporation ("Banc of America") the City and Banc of America entered into a Continuing Covenants Agreement dated as of May 1, 2013 (the "Continuing Covenants Agreement"). To review the events of default contained in the Continuing Covenants Agreement and certain remedies available to Banc of America upon the occurrence of such an event of default, please refer to the Municipal Securities Rulemaking Board's Electronic Municipal Market Access System (http://www.emma.msrb.org), where a redacted version of the Continuing Covenants Agreement has been made available to the public.

Swap Agreement

Pursuant to an ISDA Master Agreement, Schedule and a Confirmation (collectively, the "Swap Agreement"), between the City and Citigroup Financial Products Inc. (the "Swap Provider"), the City pays to the Swap Provider a fixed rate of 4.53% and receives from the Swap Provider a floating rate equal to the variable interest rate due on the Series 2005B Bonds, less a spread of 65 basis points. As of June 30, 2017, the outstanding notional amount of the swap was $18,180,000. The stated termination date of the Swap Agreement is August 1, 2018. As of June 30, 2017, if the Swap Agreement were to be terminated early, the City would be required to pay a termination payment to the Swap Provider in the approximate amount of $356,283. The City has no other swap agreements outstanding for the Water Department.

Other Obligations

Contract for Biosolids Treatment with Philadelphia Biosolids Services, LLC

In 2008, the City entered into a long-term contract and lease with the Philadelphia Municipal Authority (the "PMA") for the PMA to operate the Water Department's existing Biosolids Recycling Center (the "Biosolids Recycling Center"). The PMA and Philadelphia Biosolids Services, LLC ("Philadelphia Biosolids") entered into a Service Agreement (the "Biosolids Service Contract"), pursuant to which Philadelphia Biosolids designed and built, and currently operates, a facility at the Biosolids Recycling Center to heat, dry and dispose of biosolids captured during wastewater treatment, and the PMA pays Philadelphia Biosolids for operating such Biosolids Recycling Center. Pursuant to a Service Agreement between the PMA and the City (the "City Service Contract"), the City assumed all of PMA's obligations under the Biosolids Service Contract. The obligations under the City Service Contract constitute Operating Expenses of the Water Department. In Fiscal Years 2015 and 2016, the City paid to PMA, from revenues generated from the Water Department, $20,496,326 and $20,074,514, respectively. The Water Department's estimated obligation for Fiscal Year 2017 is expected to be $22,450,000. The Water Department's budgeted obligation for Fiscal Year 2018 is the same as Fiscal Year 2017. The City Service Contract contains adjusters for the Consumer Price Index, Producer Price Index and fluctuations in fuel prices, among others; thus, expenditures under the City Service Contract may vary over time. The contract expires on October 13, 2028, and contains the possibility of a five-year renewal term at the option of the City. In addition to facilitating compliance with various state and federal environmental regulations, including the Clean Air Act, the Biosolids Service Contract has produced cost savings for the Water Department. See "THE SYSTEM – Wastewater System – Environmental Compliance – Clean Air Act and – Biosolids Treatment and Utilization."

Northeast Water Pollution Control Plant Cogeneration Facility

In 2011, the City entered into a long-term contract and lease with the PMA for the PMA to arrange the construction, financing, maintenance and sublease of a digester gas cogeneration facility at the Northeast Water Pollution Control Plant. The PMA entered into a lease (the "Lease") with BAL Green Biogas I, LLC, a special purpose entity of Bank of America (the "Lessor"), which requires the PMA to make certain lease payments to the Lessor. Pursuant to a sublease dated December 23, 2011 (the "Sublease"), the City assumed all of the PMA's obligations under the Lease. The obligations under this contract constitute Operating Expenses of the Water Department. In Fiscal Year 2015 and Fiscal Year 2016, the City paid to the Lessor from revenues generated from the Water Department, $4,886,570.40 and $5,556,547, respectively. The Water

Department's estimated obligation for Fiscal Year 2017 is expected to be $5,980,000. The Water Department's budgeted obligation for Fiscal Year 2018 is the same as Fiscal Year 2017. Expenditures, including maintenance fees, may vary during the term of the contract. The Sublease expires on September 25, 2029, unless renewed by PMA for an additional term of eighteen months.

Contract for Automatic Meter Reading System with ITRON

In 1997, the City, through the PMA, entered into a long-term contract with ITRON for the replacement of residential water meters with new meters equipped with radio transmitter devices and for services and materials required to implement, operate and maintain the Water Department's Automatic Meter Reading System. The Water Department paid ITRON, through the PMA, $1,689,812 and $1,971,888 in Fiscal Years 2016 and 2015, respectively, for meter reading services. This obligation constitutes an Operating Expense of the Water Department. Additionally, the Water Department paid ITRON, through the PMA, $2,745,478 and $2,158,001 in Fiscal Years 2016 and 2015, respectively, for the purchase of new water meters. This obligation constitutes a capital expenditure of the Water Department. The Water Department's estimated obligation to ITRON for Fiscal Year 2017 is expected to be $2,000,000 for meter reading services and $2,500,000 for the purchase of new water meters. The Water Department's budgeted obligation for Fiscal Year 2018 is the same as Fiscal Year 2017. The agreement with ITRON expires in September of 2017. The Water Department has two, one-year renewal options and currently is seeking the first extension. For information on the Water Department's plans for advanced metering technology, see "RATES – Automatic Meter Reading System and Advanced Meter Reading Infrastructure" herein.

Laurel Street Combined Sewer Overflow Project

In 2011, the City entered into an Amended and Restated Development and Tax and Claim Settlement Agreement (the "Sugarhouse Agreement") with Sugarhouse HSP Gaming, L.P. ("HSP"). Under the terms of the Sugarhouse Agreement, HSP is required to fund the development and expansion of the Laurel Street Combined Sewer Overflow Project. As compensation for the development and expansion of the project, HSP has been allotted a five-year credit against real estate taxes and settlement payments otherwise due to the City. The amount of the credit corresponds to the amount expended by HSP on the Laurel Street Combined Sewer Overflow Project. The Laurel Street Combined Sewer Overflow Project is a capital asset of the Water Department, and the credit awarded to HSP is a capital expenditure of the Water Department payable to the City. The Water Department paid the City $7,028,842 for Fiscal Years 2014 and 2015 combined and $3,514,421 for Fiscal Year 2016. The Water Department paid the City $7,028,842 in Fiscal Year 2017, which sum included its payment obligations for both Fiscal Years 2017 and 2018 combined.

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THE WATER DEPARTMENT

General

The City established the Water Department to operate, maintain, repair and improve the Water and Wastewater Systems. The Charter requires that rates and charges for supplying water and for wastewater treatment be fixed and regulated in accordance with standards established by City Council. Such standards must enable the City to realize from rates and charges an amount at least equal to operating expenses and Debt Service Requirements on any debt incurred or to be incurred for the Water and Wastewater System, including general obligations and revenue bond obligations, and proportionate charges for all services performed for the Water Department by all officers, departments, boards or commissions of the City. See "HISTORICAL AND PROJECTED FINANCIAL INFORMATION – Compliance with Rate Covenant" below. The Charter also authorizes the Water Department, with the approval of City Council, to enter into contracts for supplying water service and sewer and sewage disposal service to users outside the limits of the City.

The operations of the Water Department are accounted for in the Water Fund, which is an enterprise fund of the City. The Water Fund is an accounting convention established pursuant to the Charter for the purpose of accounting for the assets, liabilities, revenues, expenses of and Rate Covenant compliance for, the Water and Wastewater Systems. See APPENDIX I – "FINANCIAL STATEMENTS OF THE WATER FUND DERIVED FROM THE CITY'S AUDITED COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR FISCAL YEAR ENDED JUNE 30, 2016" attached hereto.

Relationship to the City

The Water Department is one of the City's operating departments and is overseen by the Office of the Managing Director. Various City departments and agencies provide operational support to the Water Department, for which they receive a direct appropriation at the beginning of each Fiscal Year (a "Direct Appropriation"), which provides a portion of the funding for such department or agency from the Water Department's operating budget. The departments that receive Direct Appropriations from the Water Department are: the Revenue Department (Water Revenue Bureau) for meter reading, billing and collection services; the Law Department for legal services; the Department of Public Property for the rental of office space and parking; the Office of Fleet Management for vehicle acquisition, fuel, and vehicle maintenance; the Office of Innovation and Technology for communications and computer support services; the Procurement Department for services related to the acquisition of goods and services; the Office of the Director of Finance for fringe benefits, indemnities and support services; the Sinking Fund Commission for the payment of debt service; the Office of Sustainability for energy procurement services; and the Office of Transportation and Infrastructure. The Board also receives a Direct Appropriation.

In addition, approximately 15 City departments and agencies, including the Revenue Department and the Department of Public Property, provide services to the Water Department for which they bill the Water Department at the close of each Fiscal Year ("Interfund Charges"). These services are distinct from the ones discussed in the previous paragraph and include, but are not limited to, cash management (City Treasurer); auditing (City Controller); debt management (City Treasurer); testing and hiring (Human Resources and Labor Relations); and other support services (Managing Director's Office, Civil Service Commission, Department of Licenses & Inspections, and Police Department).

All Direct Appropriations and Interfund Charges are accounted for in the historical operating results in Table 9 and factored into the forecast in Table 11. See also "HISTORICAL AND PROJECTED FINANCIAL INFORMATION – The Water Department's Budget."

The City is the largest customer of the Water Department. The City, through the General Fund and the Aviation Fund, pays the Water Department for water and wastewater services, operation and maintenance of the fire system (consisting of hydrants and pumping stations), inlet cleaning and snow removal. Such payments are credited to the Water Fund for each Fiscal Year as of the last day of such Fiscal Year, and payment occurs on or before October 31 in the same calendar year. See "THE SYSTEM – The City and Other Large Customers" and APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA."

Administration

The Water Department is managed by a Commissioner appointed by the Managing Director of the City with the approval of the Mayor. The Commissioner then appoints deputies with the approval of the City's Managing Director. Substantially all other employees of the Water Department are hired pursuant to the City's Civil Service Regulations.

Under the Charter, the City's Department of Revenue performs all functions relating to meter reading, customer accounts and collections for the Water Department through the Water Revenue Bureau. The Department of Revenue and the Water Revenue Bureau are under the direction of the Director of Finance. The Director of Finance, as the chief financial, accounting and budget officer of the City, has overall responsibility for the fiscal administration of all City departments, including the Water Department. Audits of all City departments, including the Water Department, are performed annually by the Office of the City Controller. The Law Department of the City, headed by the City Solicitor, handles all legal matters affecting the Water Department.

The following are brief biographical descriptions of the Commissioner, her deputies and the senior management of the Water Department:

Debra A. McCarty was appointed Water Commissioner in January, 2016. She has served the Water Department for 34 years in various capacities, including Deputy Water Commissioner. Ms. McCarty is responsible for oversight of the whole Water Department. As Deputy Water Commissioner, she was principally responsible for managing the Water Department's Operations Division. She received a Bachelor of Engineering Sciences in Environmental Engineering from Johns Hopkins University. After serving in a private engineering firm for a few years, she began her employment with the Water Department in 1982. Since her initial appointment, Ms. McCarty has held a number of increasingly responsible engineering and managerial positions, such as holding the position of Chief of Wastewater, which included responsibility for the operation of the City's three large wastewater treatment plants. She also served as plant manager of the Southwest Water Pollution Control Plant and Process Manager for the Northeast Water Pollution Control Plant.

Donna Schwartz was appointed Deputy Water Commissioner in March, 2016. She is principally responsible for managing the Water Department's Operations Division. She has served the Water Department for 34 years in various capacities. Since her initial appointment with the Water Department in 1982, Ms. Schwartz has held a number of increasingly responsible engineering and managerial positions, such as program manager in industrial waste and plant manager in water treatment. She has a BS in chemical engineering from Drexel University, a professional engineer's license from Pennsylvania and is a certified plant operator.

David A. Katz was appointed Deputy Water Commissioner in June, 2001, managing the Water Department's environmental compliance efforts. Previously, Mr. Katz had served as Divisional Deputy City Solicitor. He has been with the City's Law Department since 1987 and has served as the General Counsel to the Water Department since April, 1992. He holds a B.S. in Economics from the Wharton School, University of Pennsylvania and a J.D. from the Washington College of Law, American University. Prior to joining the Law Department, Mr. Katz served in a variety of public and private legal positions.

Scott J. Schwarz was appointed as Divisional Deputy City Solicitor and General Counsel to the Philadelphia Water Department in March, 2013. He joined the City's Law Department in 2009, serving as a Senior Attorney in the Law Department's Regulatory Affairs Unit. Prior to that, he spent over 25 years working in the environmental law divisions of law firms in Philadelphia and Washington, D.C. and gained government experience working for the State of Alabama's Office of the Attorney General and the U.S. Environmental Protection Agency. Mr. Schwarz received a B.S. in biology from Bucknell University and a J.D. from George Washington University.

Gerald D. Leatherman was appointed Deputy Water Commissioner for Human Resources & Administration in April, 2013. Since March 2008, Mr. Leatherman was Divisional Deputy City Solicitor and General Counsel to the Water Department. He joined the City's Law Department in 2003, serving as a Deputy City Solicitor in the Housing Code Enforcement and Neighborhood Transformation Divisions. Prior to that, Mr. Leatherman worked in the General Counsel's Office of the Philadelphia Housing Development Corporation and in private practice. Mr. Leatherman received a B.A. from American University and a J.D. from the Temple University Beasley School of Law.

Joanne Dahme was appointed General Manager of the Public Affairs Division in January, 2009. She holds a B.C.E. degree in Civil Engineering from Villanova University and an M.J. in Journalism and a Masters in Creative Writing, both from Temple University. Ms. Dahme joined the Water Department in 1980 and served as the Manager of the Public Affairs Division from 1994 to 1999. She later served as a Watersheds Programs Manager for the Water Department's Office of Watersheds until returning to assume her current position in Public Affairs. She currently serves on the board of the Tookany/Tacony-Frankford Watershed Partnership in addition to the board of her local community center and several regional watershed planning committees.

Melissa LaBuda was appointed Deputy Commissioner in August, 2014 and Assistant Deputy Commissioner in October, 2013. Melissa has overall responsibility for the Water Department's financial management including: accounting operations and financial reporting; budget formulation and execution; and financial planning. Ms. LaBuda joined the Water Department from a global financial institution where she was an investment banker to Public Power and Combined Utility systems. Previously, Ms. LaBuda worked for Public Financial Management, Inc. (now PFM Financial Advisors LLC) as both a financial advisor and a fixed income trader. In these roles, Ms. LaBuda has raised in excess of $25 billion in the capital markets. Melissa received her B.S. from Bloomsburg University in 1995.

Stephen J. Furtek was appointed General Manager of Planning and Engineering (now Engineering and Construction) in March, 2005. Mr. Furtek is a registered Professional Engineer and holds a B.S. in Civil and Urban Engineering from the University of Pennsylvania. He has held a number of increasingly responsible positions since joining the Water Department in 1982, including Supervisor of the Water and Sewer Design Section and Manager of the Design Branch.

Michelle L. Bethel was appointed Deputy Revenue Commissioner in charge of the Water Revenue Bureau in July, 2008. She holds a B.S. in Accounting with a Minor in Public Relations from Kutztown University and an M.B.A. in Human Resource Management from the University of Phoenix. Prior to her appointment as Deputy Revenue Commissioner, Ms. Bethel worked for the Commonwealth of Pennsylvania Department of Revenue in Harrisburg for 14 years. Ms. Bethel has extensive knowledge of and experience with customer service, collections, and compliance issues gained through working in increasingly responsible management positions.

Marc Cammarata was appointed Deputy Water Commissioner for Planning and Environmental Services in November of 2016. His responsibilities include the integration, direction and management of numerous aspects of the Water Department's planning initiatives, including strategic environmental and sustainability programming, water quality and quantity modeling, wet weather compliance, flood mitigation, both green and traditional infrastructure planning, stream and wetland restoration, watershed and source water protection, laboratory services, and climate mitigation and adaptation efforts. He has over 18 years of experience in water resources engineering and environmental planning. He is a Professional Environmental

Engineer with a B.S. in Civil and Environmental Engineering from Villanova University and a M.S. in Environmental Engineering, Water Resources from Drexel University.

Sarah E. Stevenson was appointed Director of Government Affairs & Policy in January 2016 and Assistant Deputy Commissioner in March 2017. Prior to her current position, Ms. Stevenson served for nearly two years as the Water Department's Enforcement Director and five years in the City of Philadelphia Law Department, primarily representing the Water Department. She received her undergraduate degree from the University of Pennsylvania in 2003 and her JD/MPA from Villanova University in 2007. Prior to joining the City, Ms. Stevenson worked for a government watchdog non-profit organization where she focused on municipal policy and election law. She is licensed to practice law in Pennsylvania and New York.

Alicia Robertson was appointed Assistant Deputy Water Commissioner in October 2016. Since joining the Water Department in 2006, she has held increasingly responsible fiscal and managerial positions. Prior to her tenure at the Water Department, Ms. Robertson worked for the City Controller's office as an auditor for seven years. She holds a BBA in Accounting from Temple University and a Masters in Public Administration from Villanova University.

Personnel Information

As of December 31, 2016, the Water Department employed approximately 2,067 full-time employees (this figure excludes seasonal workers), of whom 1,506 are represented by District Council 33 and 374 by District Council 47, both of the American Federation of State, County and Municipal Employees. The balance (187 full-time employees) represents the Water Department's upper management, supervisory and senior engineering and administrative personnel who are not eligible for union membership. The wages and salaries of approximately 241 employees in the Water Revenue Bureau are funded by the Water Department. Water Revenue Bureau employee participation in unions parallels that of the Water Department. For information on the status of arbitration awards and labor contract settlements and certain retirement plan information, see APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Expenditures of the City – Overview of Current Labor Situation."

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THE SYSTEM

The Water Department provides water and wastewater services, inclusive of stormwater services to residents and businesses located in the City. Additionally, the Water Commissioner is authorized to enter into agreements with municipalities, townships, authorities and entities outside the limits of the City to provide for the sale of fresh water or the receipt, conveyance, treatment and disposal of wastewater. The Water Department currently has ten wholesale wastewater contracts and one wholesale water contract. The following sections describe the largest customers of the Water Department, the Water Department's wholesale contracts and the System, including certain environmental matters.

Large Customers

The ten largest customers of the Water Department for water and wastewater services, which include stormwater services, for Fiscal Year 2016 are set forth in Table 3 below. The Water Department does not charge itself or include in revenue the retail value of the water and wastewater services (including stormwater services) used by the Water Department.

The City is the largest customer of the Water Department. In addition to charges for general service customers, which are based on metered water consumption, the Water Department charges the City for water and wastewater services provided to City properties and for operation and maintenance of the fire system (consisting of hydrants and pumping stations).

Table 3
Top 10 Customers
Fiscal Year Ending June 30, 2016

	Customer	Revenue ($)	% Total Revenue
1	City of Philadelphia*	$24,127,537	3.55%
2	Philadelphia Housing Authority	11,332,252	1.67
3	School District of Philadelphia	5,034,957	0.74
4	Veolia Energy Philadelphia	4,879,489	0.72
5	University of Pennsylvania	4,849,992	0.71
6	Honeywell Resin & Chemicals LLC	4,642,126	0.68
7	SEPTA	3,967,639	0.58
8	Federal Government	3,727,326	0.55
9	Temple University	2,531,417	0.37
10	Paperworks Industries Inc.	2,518,650	0.37
	TOTALS	$67,701,386**	9.94%

*The total above for the City of Philadelphia includes, among others, charges for water, wastewater and stormwater services as follows: (i) $18,074,519 – General Fund; (ii) $3,883,527 – Aviation Fund; and (iii) $2,169,491 – Philadelphia Zoo.
**Totals may not add due to rounding.

Wholesale Customers. The Water Department generates approximately 5% of total revenues from wholesale wastewater and water customers ("Wholesale Customers"). Table 4 on the following page presents revenues as of June 30, 2016 from Wholesale Customers and describes certain terms of the Water Department's wholesale contracts for water and wastewater services. The last column on Table 4 sets forth each wholesale customer's proportional share of the Water Department's expenditures ("COA Expenditures") relating to its Consent Order and Agreement (the "COA") with the Pennsylvania Department of Environmental Protection (the "PaDEP"). For more information regarding the Water Department's COA and its associated costs, see "THE SYSTEM – The Wastewater System – Environmental Compliance – Combined Sewer Overflow Program." Revenues in Fiscal Year 2015 from wholesale wastewater contracts and the wholesale water contract were approximately $33.7 million and $3.7 million, respectively. Revenues in Fiscal Year 2016 from wholesale wastewater contracts and the wholesale water contract were approximately $31.8 million and $3.6 million, respectively. Estimated total wholesale revenues for Fiscal Year 2017 and budgeted revenues for Fiscal Year 2018, are approximately $36 million and $37 million, respectively.

Table 4
Wholesale Water and Wastewater Customer Revenues and Contract Terms
Fiscal Year Ending June 30, 2016

	Total Revenue	% Total Revenue	Contract End Date	COA %
Wastewater				
1. Delcora[(1)]	$ 7,595,414	1.12%	4/1/2028	9.44%
2. Bucks County Water & Sewer Authority (BCWSA)	7,330,114	1.08	3/31/2038	N/A
3. Cheltenham Township	3,105,390	0.46	6/30/2025	2.43
4. Lower Southampton Township	3,055,409	0.45	6/30/2024	0.96
5. Upper Darby Township	2,620,282	0.39	8/8/2023	N/A
6. Lower Merion Township	2,089,501	0.31	N/A	N/A
7. Springfield Township				
Erdenheim [(2)]	1,811,441	0.27	6/30/2023	0.79
Wyndmoor[(2) (3)]	308,353	0.05	6/30/2023	N/A
8. BCWSA (for Bensalem)[(2)]	1,884,725	0.28	6/30/2023	N/A
9. Abington Township	1,253,583	0.18	6/30/2023	0.58
10. Lower Moreland Township[(4)]	706,083	0.10	6/30/2025	0.36
Sub-total	**$31,760,293**	**4.67%**		**14.57%**
Water				
1. Aqua Pennsylvania	$ 3,561,306	0.52%	3/1/2026	N/A
Sub-total	3,561,306	0.52		
Total Wholesale Revenues	**$35,321,599**	**5.19%**		

Note: The Water Department includes capital charges within operation and maintenance charges for all customers except Bensalem, Lower Merion, and Upper Darby.

(1) Delcora allocated capital is based on assets in service after July 4, 2011.
(2) Bucks County Water and Sewer Authority maintains and operates the Bensalem Township Sewer System and the Springfield Township System.
(3) The total amount of the COA for Springfield Township – Wyndmoor is contained in the Springfield Township – Erdenheim amount.
(4) During Fiscal Year 2016, Lower Moreland renewed its wholesale wastewater contract, which now includes its proportional share of the Water Department's COA Expenditures and will expire in Fiscal Year 2025.

The Water System

General

The Water System's service area includes the City. The Water System has one wholesale water service contract (see Table 4 – Wholesale Water and Wastewater Customer Revenues Fiscal Year Ending June 30, 2016 on the preceding page). Based on the 2015 U.S. Census Bureau estimate, the Water System served 1,567,442 individuals.

As of June 30, 2016, the Water System served approximately 480,000 active customer accounts using approximately 3,100 miles of mains and approximately 25,000 fire hydrants. Customer accounts have been stable the past several years and are expected to remain consistent for Fiscal Year 2018.

The City obtains approximately 59% of its water from the Delaware River and the balance from the Schuylkill River. The City is authorized by the PaDEP to withdraw up to 423 million gallons per day ("MGD") from the Delaware River and up to 258 MGD from the Schuylkill River. On September 27, 2016, the PaDEP issued the Water Department new water allocation permit, which expires on September 27, 2041. Under the new permit, the amount the City is authorized to withdraw from each river has not changed. The Water Department will begin discussions with the Delaware River Basin Commission to ratify the new permit.

Water treatment is provided by the Samuel S. Baxter Water Treatment Plant on the Delaware River and by the Belmont and Queen Lane Water Treatment Plants on the Schuylkill River. The combined rated treatment capacity of these plants under the Water Department's Partnership for Safe Water procedures is 546 MGD. The combined maximum source water withdrawal capacity from the two rivers that supply these plants is 680 MGD. The excess source water capacity enables higher than normal withdrawal from either river should conditions limit withdrawals from one. The storage capacity for treated and untreated water in the combined plant and distribution system totals 1,065.5 million gallons ("MG"). In Fiscal Year 2016, the Water System distributed 81,687 MG of water at an average daily rate of 223.8 MGD. In Fiscal Year 2016, the maximum water production experienced by the Water System in one day was 258.2 MGD.

The following sections include a discussion of upgrades to the Baxter Plant, a description of the wholesale contract for water service and an overview of environmental matters with respect to the Water System.

Baxter Water Treatment Plant Clear Well

The Baxter Plant is the Water Department's largest water treatment facility. Its clear water basin (the "CWB") contains 50 million gallons of water, which it supplies to the Lardner's Point Pump Station. The Water Department will replace the CWB with four 5MG basins and associated piping in two phases. The first phase has a contract budget limit of $102.3 million. Construction commenced in February, 2017 and is expected to take two and a half years to complete. The second phase is not expected to start until the first phase is completed.

Wholesale Contracts

The Water Department has a wholesale contract for water services with Aqua Pennsylvania, Inc. ("AP") under which the Water Department has agreed to provide wholesale water service through March 1, 2026. For wholesale water customer revenues for Fiscal Year 2016, see Table 4 on the preceding page.

Environmental Compliance

Drinking Water Regulatory Matters

The water provided by the Water System meets all physical, chemical, radiological and bacteriological water quality standards established by the United States Environmental Protection Agency (the "EPA") under the federal Safe Drinking Water Act and by the PaDEP. The EPA required a second round of source water sampling beginning in April 2015 to measure the concentration of cryptosporidium present at the intakes of the three water treatment plants. As a result of samples collected over two years, the Baxter Water Treatment Plant is now classified in the BIN 2 category, which is the same classification that the Queen Lane Water Treatment Plant has had for years. Consequently, a source water protection plan for the Delaware River may be required. The Water Department currently has a source water protection in place for the Schuylkill River.

The Water Department continues to prepare for possible future regulations regarding the distribution system using a variety of tools that allow the Water Department to track water through the Water System. The Water Department also is actively involved in monitoring, commenting on, and implementing practices to respond to rules and regulations for distribution systems enacted by the PaDEP and the EPA.

Lead and Copper Rule

Pursuant to the federal Safe Drinking Water Act, the Water Department is required to conduct Lead and Copper Rule ("LCR") monitoring every three years (the "Required LCR Testing"). On February 29, 2016, the EPA re-issued guidance for public water systems regarding LCR tap sampling procedures, and in May 2016, the PaDEP endorsed the EPA's guidance. The Water Department follows such EPA guidance. The Required LCR Testing is currently underway and will be completed in September 2017. In order to increase the number of homes tested, the Water Department offers a $50 water bill credit for participating properties.

In addition to the Required LCR Testing, the Water Department tested Tier 1 homes, which are homes with lead service lines that are considered more likely to have elevated lead in the water. Of the 263 customers the Water Department contacted, 68 had lead service lines that were verified and all 68 completed the required sampling. Only one home had lead that exceeded the EPA's Action Level of 15 ppb, recording 25 ppb. During extensive follow-up sampling at this home, lead was detected below 5 ppb.

On June 2, 2016, a class action lawsuit was filed in the Philadelphia Court of Common Pleas on behalf of all residents of the City who have resided in an area where the Water Department has replaced water mains or meters between January 1, 2006 and the present. The complaint alleged causes of action for medical monitoring, negligence and inverse condemnation. The plaintiff sought to establish a medical monitoring trust fund for the costs of replacing lead service lines connecting the City's water mains to buildings throughout the City on the grounds that: (1) the City's water main repairs allegedly disturbed lead in the service lines, consequently exposing the residents of the adjacent buildings to unspecified increased levels of lead in their drinking water, and (2) the City's methods of testing lead levels in the City's water supply were allegedly manipulated to enable the City to misrepresent the quality of the drinking water. The City filed preliminary objections to the complaint on August 8, 2016, and on November 4, 2016, the Court ordered the class action dismissed without prejudice to the plaintiff.

Clean Streams Law

The Water System is subject to various environmental laws and regulations, and from time to time, receives notices of violations of such environmental laws and regulations. As a result of such violations, the Water Department has incurred minor fines from time to time.

The Wastewater System

General

The Wastewater System's service area includes the City. The Water Department has ten wholesale wastewater service contracts (see Table 4 – Wholesale Water and Wastewater Customer Revenues Fiscal Year Ending June 30, 2016). Based on the 2015 U.S. Census Bureau estimate, the Wastewater System served 1,567,442 individuals that live in the City and ten wholesale contracts.

As of June 30, 2016, the Wastewater System served approximately 545,000 accounts, including approximately 50,000 stormwater-only accounts (see "THE SYSTEM – Stormwater Management" below), and ten wholesale contracts with neighboring municipalities and authorities. Customer accounts have been stable the past several years and are expected to remain consistent for Fiscal Year 2018.

The Wastewater System consists of three water pollution control plants, the Northeast, Southwest and Southeast water pollution control plants (the "WPCPs"), 19 pumping stations, approximately 3,700 miles of sewers, and a privately managed centralized biosolids handling facility. It includes approximately 1,850 miles of combined sewers, 760 miles of sanitary sewers, 740 miles of stormwater sewers, 13 miles of force mains (sanitary and storm) and 349 miles of appurtenant piping. The three WPCPs processed a combined average of 379 MGD of wastewater in Fiscal Year 2016, have a 522 MGD combined average daily design capacity and a peak capacity of 1,059 MGD.

The following sections include a discussion of wastewater regulation and permits, descriptions of stormwater management services and wholesale contracts for wastewater service and treatment and an overview of environmental matters respecting the Wastewater System.

Stormwater Management Services

The Water Department delivers many of the City's stormwater management services, including maintenance of the City's approximately 760 miles of separate storm sewers, 1,850 miles of combined sewers and 72,000 stormwater inlets. In recent years, changes in work practices and investment in new equipment have enabled the Water Department to steadily increase the number of inlets cleaned annually.

Wastewater Regulation and Permits

The Clean Water Act requires cities, like Philadelphia, whose separate storm sewer systems serve a population of over 100,000 to obtain a permit from the National Pollutant Discharge Elimination System ("NPDES") for their discharges. The EPA has delegated the NPDES program for the Commonwealth to the PaDEP. In addition to the Clean Water Act, the City and its WPCPs also are subject to regulation by the PaDEP, which exercises regulatory authority over municipal sewage treatment operations, and by the Delaware River Basin Commission, which exercises regulatory authority over withdrawals from and discharges into the Delaware and Schuylkill Rivers. The City's NPDES permits require reduction of pollution from commercial and residential areas, illicit connections, industrial facilities and construction sites. The NPDES permits also require the City to manage and treat the excess stormwater and wastewater mix that discharges directly into local waterways during certain precipitation events. See – Environmental Compliance – Combined Sewer Overflow Program" below.

Current NPDES permits for the Northeast, Southeast and Southwest WPCPs expired on August 31, 2012. The facilities are operating under an extension of the expired permits, as dictated by the policies of the PaDEP. The expired NPDES permits will remain in place until new permits are issued. Applications for renewals were submitted to the PaDEP, as required, in February of 2012. The renewal permit for the Northeast WPCP has been fully negotiated, and the Water Department expects that negotiations for the other two permits will proceed on similar terms. See the Financial Consulting and Engineer's Report contained in

APPENDIX II, specifically the section labeled "Series 2016 Bonds – Wastewater System Planning and Compliance" within the PEER Engineering Report.

In 2016, the Water Department's three WPCPs were selected to receive Platinum Awards from the National Association of Clean Water Agencies ("NACWA"). NACWA's Peak Performance Awards Program recognizes excellence in wastewater treatment as measured by compliance with NPDES permits. Platinum Awards pay special tribute to facilities that have been awarded 5 or more consecutive Gold Awards, which recognize 100% compliance for the calendar year. The Northeast and Southeast WPCPs have achieved 100% compliance for the past 11 years and 16 years, respectively. The Southwest WPCP received the Platinum Award for 100% compliance for the past five years.

Wholesale Contracts

Contracts for wastewater treatment service with ten neighboring municipalities and authorities provide for charges based on operating costs attributable to the volume and strength of the wastewater received from each of these customers. Capital costs for wholesale wastewater customers are recovered by one of two methods. Seven customers are billed monthly for depreciation and return on investment on allocated wastewater conveyance and treatment facilities. Three customers make capital contributions to the Water Department for an allocated share of the investment in facilities related to the provision of services to such customers. Revenues for Fiscal Years 2016 and 2015 were $31,760,293 and $33,747,029, respectively. Revenues for wholesale wastewater customers for Fiscal Year 2017 are $32,500,000, and budgeted revenues for Fiscal Year 2018 are $33,500,000. For wholesale wastewater customer revenues for Fiscal Year 2016, see Table 4 – Wholesale Water and Wastewater Customer Revenues Fiscal Year Ending June 30, 2016.

The Water Department has implemented certain changes to the existing long-term wholesale contracts presented in Table 4. Such changes include extending the terms of the various contracts, increasing management fees from 10% to 12%, and requiring wholesale wastewater customers to assume their respective proportionate share of COA Expenditures. As demonstrated in Table 4, the Water Department currently charges six wholesale wastewater customers for their respective share of COA Expenditures.

Environmental Compliance

Combined Sewer Overflow Program

The current NPDES permits require the Water Department to implement a program to manage combined system overflows. In certain sections of the City, both wastewater and stormwater are collected and conveyed in a single pipe to the sewage treatment plant. During certain precipitation events, the additional stormwater produced exceeds the capacity of the Wastewater System, resulting in a combined system overflow that discharges directly into local waterways ("CSOs").

The PaDEP and the Water Department signed the COA on June 1, 2011 that allowed the Water Department to implement its Combined Sewer Overflow Program known as the "Green City, Clean Waters Program." Under the program, the City will invest in green and traditional infrastructure, including wastewater treatment facility enhancements, interceptor pipe lining and collection system improvements, to mitigate CSOs and enhance the quality of local waterways.

As required under the COA, by the year 2036 (year 25 of the COA), the City's Combined Sewer Overflow Program seeks to eliminate and remove the mass of pollutants that otherwise would be removed by the capture of 85% by volume, city-wide, of CSOs. The COA requires interim milestones at the end of the fifth, tenth, fifteenth and twentieth years in four categories: (1) Total Greened Acres; (2) Overflow Reduction Volume; (3) Miles of Interceptor Lined; and (4) Wastewater Treatment Plant Upgrades: Design and Construction. The COA also includes significant penalties for non-compliance with the various 5-year milestones. Penalties start at $25,000 per month for each violation (for the first 6 months) and increase up to $100,000 monthly for uncured violations of 13 months or more.

The Water Department has completed its fifth year of the 25-year COA and met applicable fifth year milestones. An additional 1,310 greened acres and 334 million gallons of CSO reduction are required over the next 5 years for a total of 2,148 greened acres and 2,044 million gallons of CSO reduction by the end of year 10. The City may petition the PaDEP for an extension of time to satisfy the requirements of the COA if the wastewater component of a customer's bill were to exceed 2.27% of median household income. For more information regarding the COA, see the Original Report contained in APPENDIX II – Financial Consulting and Engineer's Report.

On December 31, 2015, the Water Department received a request from the EPA, pursuant to Section 308 of the Clean Water Act, for information related to its COA. On November 9, 2016, the Water Department received a revised information request obligating the Water Department to perform an analysis that is inconsistent with its approved COA. For example, the revised information request directs the Water Department to analyze the controls necessary to achieve 85% capture in each of its CSO receiving streams, rather than 85% capture based on a city-wide average, as stated in the Water Department's approved COA. The Water Department currently is evaluating whether such information request exceeds the EPA's authority and whether a challenge is warranted. It also intends to seek reconsideration and withdrawal of the request from the newly appointed head of Region III of the EPA. Should that be unsuccessful, the Water Department will request a meeting with EPA officials in Washington, D.C. Once these meetings have concluded and depending on the outcome, the Water Department will determine whether to challenge the Section 308 information request in federal court, among other courses of action. On March 16, 2017, the Water Department sent a letter to the Acting Administrator at EPA Region III asking that it reconsider its Section 308 information request and stating its intent to seek relief from EPA Headquarters and, if necessary, federal court. On April 10, 2017, the EPA responded in writing by stating that they will stay the obligation to respond to the Section 308 information request and schedule a meeting with the Water Department to discuss the issue further. That meeting has yet to be scheduled.

The Water Department anticipates that over the next 20 years, compliance with the COA will significantly increase capital and operating expenditures related to its Combined Sewer Overflow Program. Moreover, any resulting changes to the COA as a result of the EPA's Section 308 information request could further increase the costs of compliance. Looking ahead to the 10th-year milestone, the Water Department continues to review program cost and delivery in an effort to optimize the program while satisfying the necessary regulatory requirements. As of the most recent projections, the total cost of the 25-year program is approximately $4.5 billion, of which approximately $3.5 billion are capital related costs and $1 billion are operation and maintenance costs. For Fiscal Year 2017, the City budgeted $55 million for capital COA Expenditures. The Fiscal Year 2018 budget for capital COA Expenditures is $76 million. See Table 5 – Fiscal 2018-2023 Water Capital Improvement Program and COA Budget.

Clean Streams Law

The Wastewater System is subject to environmental laws and regulations, and from time to time, receives notices of violations of such environmental laws and regulations. As a result of such violations, the Water Department has incurred minor fines from time to time.

Clean Air Act

The federal Clean Air Act sets forth requirements for the regulation of certain air emissions. The PaDEP, pursuant to the Clean Air Act's mandates, issued regulations for the control of Volatile Organic Compounds ("VOC") and Nitrogen Oxide ("NOx") emissions from major stationary sources. The Northeast and Southwest WPCPS and the Biosolids Recycling Center were found to be major sources of VOC and Nox emissions, while the Southeast WPCP is a minor source. From time to time, the Water Department has incurred minor fines for violation of the Clean Air Act.

Polychlorinated Biphenyls (PCBs)

Pursuant to Section 303(d) of the Clean Water Act, the Delaware River has been declared impaired because of the levels found in the water of an organic chemical known as polychlorinated biphenyls ("PCBs"). As a result, the Delaware River Basin Commission is performing a Total Maximum Daily Load ("TMDL") analysis that will define the magnitude of PCBs and set forth a plan to reduce loadings of PCBs into the river. The current understanding is that the river exceeds its allowable loadings by 1,000 times its allowance. Loadings come from virtually every source, e.g., sediments, air, runoff from land, contaminated sites and the Water Department's three WPCPs. The Water Department's NPDES permits require implementation of a pollutant minimization plan, which involves tracking down sources of PCBs and referring them to the appropriate agency for remediation. This involves additional staff to track the sources of PCBs and to devise programs to reduce the loadings. The level and extent of clean up that will be required by each source category in the future is currently being evaluated by the Delaware River Basin Commission, the EPA and the states comprising the Delaware River Basin Commission.

Biosolids Treatment and Utilization

The City is required by federal and state law administered by the EPA and the PaDEP to treat and dispose of biosolids captured during wastewater treatment at the City's WPCPs. Under the Biosolids Service Contract, Philadelphia Biosolids treats biosolids from the City's three WPCPs and produces and disposes of Class A pellets to be used as fertilizer and potentially fuel. For more information on the Biosolids Service Contract, see "OUTSTANDING INDEBTEDNESS AND OTHER LONG-TERM AGREEMENTS – Other Obligations" – Contract for Biosolids Treatment with Philadelphia Biosolids Services, LLC.

Stormwater Management

The Water Department's Municipal Separate Storm Sewer NPDES Permit was issued in 2005 and expired in 2010. As required under PaDEP regulations, the Water Department submitted an application for renewal to the PaDEP in 2010 and is in negotiations with the PaDEP to determine the final permit requirements. The Water Department most recently submitted a draft permit to the PaDEP in 2014 and is awaiting the PaDEP's response. The Water Department continues operating under an extension of the expired permit, as dictated by the policies of the PaDEP, which will remain in place until a new permit is issued.

From June through August 2015, the EPA conducted an audit of the City's compliance with the requirements of its Municipal Separate Storm Sewer NPDES permit, and on February 14, 2017, the EPA sent the City a proposed Consent Agreement and Final Order ("CAFO") and a proposed Administrative Order for Compliance on Consent ("AOCC"). On June 1, 2017, the City signed the CAFO and AOCC, which require the City to pay a nominal fine, conduct additional stormwater inspections at certain facilities and develop standard operating procedures for maintaining best management practices on municipal properties. The EPA will submit the CAFO and AOCC for public notice and the Water Department expects both documents to be fully executed within 60 days of submission.

CAPITAL IMPROVEMENT PROGRAM

The Charter requires City Council to adopt annually, on or prior to May 31, a one-year capital budget for the ensuing Fiscal Year and a six-year budget showing the capital expenditures planned for that year and each of the five ensuing Fiscal Years known as the 'City Capital Improvement Program.' The Water Capital Improvement Program is included in the City Capital Improvement Program. The City Capital Improvement Program is prepared annually by the City Planning Commission to present the capital expenditures planned for each of the five ensuing Fiscal Years, including the estimated total cost of each project and the estimated sources of funding (local, state, federal, and private) for each project. The City Capital Improvement Program is reviewed by the Mayor and transmitted to City Council for adoption with his recommendation. The capital budget ordinance, authorizing in detail the capital expenditures to be made or incurred in the ensuing Fiscal Year from City Council appropriated funds, is adopted by City Council concurrently with the City Capital Improvement Program. The one-year capital budget must be in full conformity with the City Capital Improvement Program applicable to the Fiscal Year that it covers. City Council approved the City Capital Improvement Program for Fiscal Years 2018 through 2023 on June 15, 2017. The Fiscal Year 2018 budget for the Water Capital Improvement Program is $353,658,000.

For a discussion of the Water Capital Improvement Program, see "– Capital Improvement Plan" in the Supplement contained in APPENDIX II – Financial Consulting and Engineer's Report.

Table 5, summarizing the budget for the Water Capital Improvement Program from Fiscal Year 2018 through Fiscal Year 2023, including its budget for expected COA Expenditures, follows on the next page. A list of the Water Department's top fifteen capital projects in terms of estimated cost and expected financing sources also are presented in Tables 6 and 7, respectively. The Water Department may change the elements of the Water Capital Improvement Program at any time and from time to time, including the proposed financing vehicles and/or schedules associated therewith.

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Table 5
Fiscal Years 2018-2023
Water Capital Improvement Program and COA Budget

Capital Budget Summary	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Total FY 2018-2023**
Collector System/Flood Relief	$ 51,560,000	$ 51,560,000	$ 51,560,000	$ 66,560,000	$ 66,560,000	$ 66,560,000	$ 354,360,000
Collector System (*CSO COA)*	56,340,000	56,340,000	56,340,000	61,600,000	77,390,000	77,390,000	385,400,000
Conveyance System	75,060,000	77,060,000	79,060,000	61,060,000	63,060,000	65,060,000	420,360,000
Engineering Administration & Material Support	50,698,000	51,769,000	52,872,000	54,008,000	55,178,000	56,384,000	320,909,000
Water & Wastewater Facilities	100,000,000	100,000,000	100,000,000	100,000,000	100,000,000	100,000,000	600,000,000
Wastewater Treatment Facilities (*CSO COA)*	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	120,000,000
Total	**$353,658,000**	**$356,729,000**	**$359,832,000**	**$363,228,000**	**$382,188,000**	**$385,394,000**	**$2,201,029,000**
Budget - Non-CSO COA versus CSO COA							
Subtotal Non-CSO COA	277,318,000	280,389,000	283,492,000	281,628,000	284,798,000	288,004,000	1,695,629,000
Subtotal CSO COA*	76,340,000	76,340,000	76,340,000	81,600,000	97,390,000	97,390,000	505,400,000
Total	**$353,658,000**	**$356,729,000**	**$359,832,000**	**$363,228,000**	**$382,188,000**	**$385,394,000**	**$2,201,029,000**

* COA Expenditures represent 22.96% of the Water Capital Improvement Program budget for Fiscal Years 2018 through 2023.
Source: City Capital Improvement Program budget.

The following table presents the Water Department's top fifteen projects in terms of estimated cost. Such projects are included in the Water Capital Improvement Program and are constructed and paid over a number of Fiscal Years.

Table 6
Philadelphia Water Department
Top Fifteen Capital Projects by Estimated Cost

Project Title	Status	Estimated Cost	FY Construction Commencement
New 10 Million Gallon Clear Water Basin at Baxter Water Treatment Plant	Under Construction	$100,298,286	2017
Two 30 Million Gallon Storage Tanks at East Park Reservoir	Under Construction	79,321,850	2016
Advanced Metering Infrastructure (AMI)	Starting in FY 2018	60 - 90,000,000	2018
New Preliminary Treatment Building at NE WPCP	Design 70% Complete	70,877,177	2018*
Baxter Clear Water Basin – Phase 3	Design Started	57,100,100	2020
New Lardner's Point Pump Station	Design Started	56,100,211	2020*
Water Main Replacements	Ongoing Replacement	46,000,000	2017
New Gravity Thickeners at NE WPCP	Under Construction	38,534,475	2015
Queen Lane Raw Water Pump Station Rehabilitation	Design Started	37,500,000	2022*
Sewer Main Replacements	Ongoing Replacement	35,000,000	2017
Dredging of Raw Water Basin and Closing of Lagoon at Queen Lane	Design 70% Complete	30,713,592	2018*
East/West Raw Water Basin at Belmont Water Treatment Plant	Under Construction	21,069,913	2013
Northern Liberties Flood Relief	Under Construction	23,959,311	2014
Dredging of Raw Water Basin at Baxter	Design Started	20,000,000	2020*
Construction of Sewer Maintenance Yard in West Philadelphia	Under Construction	18,207,173	2017
TOTAL		**$709,681,990****	

* Reflects current projection for start of construction.
** Total assumes $75,000,000 for Advanced Metering Infrastructure project.

Capital Improvement Program Financing Sources

The Water Department expects to finance the Water Capital Improvement Program using revenue bonds, pay-as-you-go financing, and possibly alternate sources of funding, including loans or grants. A significant portion of the costs of the Water Capital Improvement Program is expected to be funded with the proceeds of debt as indicated below. The City expects most of such debt to be in the form of new money revenue bonds issued in several transactions, as necessary. The emphasis of the Water Capital Improvement Program is on: (i) renewal and replacement of the water conveyance and sewage collection systems, (ii) improvements to water and wastewater treatment plants and (iii) CSO mitigation projects consistent with the Water Department's COA.

As described in the Financial Consulting and Engineer's Report, the Water Department anticipates additional borrowings for Fiscal Years 2018 through 2022 as follows:

Table 7
Anticipated Future Borrowings for Water Capital Improvement Program

Fiscal Year	Estimated Principal Amount
2018	$220,000,000
2019	313,000,000
2020	321,000,000
2021	383,000,000
2022	344,000,000

City Council has preauthorized by supplemental ordinance approximately half of the debt that will finance a majority of the projects contained in the Water Capital Improvement Program. The Water Department may change the financing elements of the Water Capital Improvement Program, including the financing vehicles utilized and the timing thereof, at any time and from time to time.

Capital Planning Initiatives

The Water Department's Operations, Planning and Environmental Services, and Engineering and Construction Divisions develop capital programs to better anticipate future needs for infrastructure maintenance and upgrades and to manage long-term capital expenditures. Included in these efforts are a sewer assessment program, a geographic information system based records viewer, a capital facilities assessment program, and a standardized planning process for all large capital projects.

The Water Department has enhanced its planning process for capital projects that have an initial estimated design and construction cost of $2 million or more. As part of such initiative, the Water Department will focus on and document the following three project planning steps: Project Need Identification, Project Alternatives Identification, and Project Alternatives Evaluation. A prioritization system is utilized to capture the primary driving factors associated with a wide range of project types. The desired timing of capital projects also is documented through this process. The improved planning process also will help inform the Water Department's future critical strategic planning efforts, in addition to improving communication and coordination among units within the Water Department. Below is a discussion of a few of the Water Department's capital planning initiatives.

Water Main Replacement

The Water Department's five-year average of 26.3 breaks per 100 miles/year is better than the national average of 27.0 breaks per 100 miles/year. The Water Department assesses its water main break rate against the optimal level of 15 breaks per 100 miles/year as defined by the Distribution System Optimization

Program under the American Waterworks Association (the "AWWA") Partnership for Safe Water. The Water Department closely monitors water main conditions to determine that adequate capital investment is made, to predict long-term water main replacement needs and refine the criteria for replacement selection. Over the last 20 years, the Water Department has replaced on average 18 miles of water mains per year. In Fiscal Year 2017, the Water Department budgeted $46 million for water main replacement in order to accelerate its water main replacement program with a new goal of replacing 28 miles of water mains annually. The Water Department is expanding the budget by $4 million in Fiscal Year 2018, for a total budget of $50 million. For Fiscal Years 2019-2023, the Water Department intends to increase the annual budget by $2 million per year.

Linear Asset Management Program

The Linear Asset Management Program ("LAMP") evaluates the Water Department's water and sewer assets. LAMP is leveraging several information systems, existing programs and statistical tools to evaluate non-capital options for extending an asset's useful life and assess the risk of pipeline failure for the water distribution system and the sewer collector system, the costs of replacement, ancillary damages and operations and maintenance history. With this information, a new long-term plan for water pipeline renewal was developed in Fiscal Year 2016, under which the Water Department has begun to prepare for the replacement of additional miles of failure prone leadite joint piping, a cohort that has the highest statistical likelihood of failure.

Distribution System Reservoir Planning Initiative

The reservoir team was created to better manage the strategic and capital planning and operations and maintenance functions of the Water Department's finished water reservoirs. Initially, the team updated all standard operating procedures and improved as-built facility documentation and has since strategically focused on the East Park Reservoir, where the floating cover is at the end of its useful life. The costs and construction status of the East Park Reservoir project are detailed in the preceding Table 6 – Top Fifteen Capital Projects by Estimated Cost.

Sewer Replacement and Renewal Program

Over the last 20 years, the Water Department has reconstructed and/or rehabilitated, on average, approximately 8 miles of sewer annually. The Water Capital Improvement Program currently includes reconstructing or relining from six to ten miles of sewers per year based upon results of the Sewer Infrastructure Assessment Program and other reports, including data from LAMP. Some sewers are scheduled for reconstruction as a result of programmed water main replacement. As infrastructure is studied further, it is likely that annual sewer renewal will increase. The Fiscal Year 2017 budget for sewer replacement and/or rehabilitation was $30 million per year, which generally yields 8 to 10 miles of sewers per year depending on their size and location. The Fiscal Year 2018 budget is $35 million, which will generally yield replacement of 9 to 12 miles of sewers annually.

Sewer Infrastructure Assessment Program

The Water Department has incorporated a sewer assessment program to evaluate the condition of its sewer system. Data collected from the program is used to determine necessary repairs and capital and operating costs of such repairs. The program has helped to identify sewers in immediate need of repair, and it is anticipated that over time it will result in a reduction of costly and disruptive emergency sewer repairs. The sewer assessment program also is used to schedule repairs for sewers that have reached the end of their useful life. Such sewers will be reconstructed as part of the Water Capital Improvement Program.

HISTORICAL AND PROJECTED FINANCIAL INFORMATION

Historical Comparative Statement of Net Position

The Water Department's financial statements are prepared in accordance with accounting principles promulgated by the Governmental Accounting Standards Board ("GASB"). The statement of net position presents the financial position of the Water Department. It presents information on the Water Department's assets, deferred outflows of resources, and liabilities with the difference between the three reported as net position. A three year condensed summary of the Water Department's net position as of June 30 for Fiscal Years 2014-2016 is presented below:

Table 8
Condensed Statement of Net Position as of June 30
(Thousands of Dollars)

	FY 2016	FY 2015*	FY 2014*
Assets:			
Current Assets	$ 233,821	$ 240,216	$ 230,330
Capital Assets	2,230,233	2,149,680	2,070,492
Restricted Assets	772,376	889,928	690,596
Total Assets	3,236,430	3,279,824	2,991,418
Deferred Outflows of Resources	108,809	83,507	66,586
Total Assets and Deferred Outflows	3,345,239	3,363,331	3,058,004
Liabilities:			
Current Liabilities	238,542	225,234	214,671
Bonds Payable	1,842,386	1,974,073	1,809,952
Other Non-Current Liabilities	496,344	454,445	62,898
Total Liabilities	2,577,272	2,653,752	2,087,521
Deferred Inflows of Resources	2,863	-	-
Total Liabilities and Deferred Inflows	2,580,135	2,653,752	2,087,521
Net Position:			
Net Investment in Capital Assets	523,367	385,721	336,980
Restricted	499,916	559,802	506,669
Unrestricted	(258,179)	(235,944)	126,834
Total Net Position, as Restated	$ 765,104	$ 709,579	$ 970,483

*The net position of fiscal year 2014 was not restated for GASB Statement No. 68. The capital asset balances and net position of fiscal years 2015 and 2014 were not restated for a reclassification of expense. For more information on the restatements, see Note 23 and Note 24 to the financial statement of the Water Fund in APPENDIX I.

The Water Fund's net position at June 30, 2016 was approximately $765.1 million, a $55.5 million or 7.8% increase from June 30, 2015. Total assets and deferred outflows of resources decreased by $18.1 million, or 0.5%, to $3.3 billion, and total liabilities and deferred inflows of resources decreased $73.6 million, or 2.8%, to $2.6 billion.

The following is a discussion of the more significant changes in assets and deferred outflows of resources, liabilities and deferred inflows of resources, and net position in fiscal year 2016:

- After restatement capital assets, net of depreciation and amortization, increased by $102.6 million to $2.2 billion, or 4.8% as a result of capital additions of $278.8 million, offset by depreciation of $101.7 million and net retirements of $74.5 million.

- Current assets decreased by \$6.4 million to \$233.8 million, or 2.7%, due to decreases in accounts receivable.
- Restricted assets decreased by \$117.6 million to \$772.4 million, or 13.2%, due to decreases in the Water Capital Fund primarily due to capital expenses.
- Deferred outflows of resources increased by \$25.3 million to \$108.8 million, or 30.3%, due to deferred outflows of resources related to the Water Fund's net pension liability being recognized during fiscal year 2016, which was partially offset by amortization of the unamortized loss on refunded debt.
- Current liabilities increased by \$13.3 million to \$238.5 million, or 5.9%, primarily due to an increase in the amount of construction contracts payable.
- Bonds payable decreased by \$131.7 million to \$1.8 billion, or 6.7%, primarily due to the maturity (pay down) of revenue bonds.
- Other non-current liabilities increased by \$41.9 million to \$496.3 million, or 9.2%, primarily due to an increase in net pension liability of \$40.5 million.
- Deferred inflows of resources increased by \$2.9 million to \$2.9 million, or 100.0%, due to deferred inflows of resources related to the Water Fund's net pension liability being recognized during fiscal year 2016.
- The Water Fund's net position increased by \$55.5 million to \$765.1 million, or 7.8%, as a result of fiscal year 2016 operations and capital contributions.
- Net investment in capital assets increased by \$137.6 million, or 35.7%, to \$523.4 million.
- Unrestricted net position decreased by \$22.2 million, or 9.4%, to a deficit of \$258.2 million. The unrestricted component of net position represents the net amount of total assets, deferred outflows of resources, total liabilities, and deferred inflows of resources that are not included in the determination of net investment in capital assets or restricted components of net position. The \$22.2 million change is primarily due to a prior period adjustment of \$22.0 million, which relates to items that were capitalized and should have been expensed in prior years.

Historical Operating Results (Legally Enacted Basis)

For purposes of rate setting, calculating compliance with the Rate Covenant and debt service coverage and budgeting, the Water Fund accounts are maintained on the modified accrual basis of accounting, also referred to as the "Legally Enacted Basis." Under this basis, revenues are recorded on a receipts basis, except revenues from other governments and interest, which are accrued as earned. A 100% reserve is provided for all doubtful non-governmental receivables. With respect to governmental receivables, a 100% reserve is provided when the City has reason to believe that no appropriation has been made by other governments to finance these receivables. The Water Department does not account for payments for water and sewer service from its governmental contract customers as "revenues from other governments."

Expenditures are recognized and recorded as expenses at the time they are paid or encumbered, except expenditures for debt service, which are recorded when paid. A reserve is maintained for encumbrances at the close of the Fiscal Year intended to pay expenses incurred in such Fiscal Year.

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Table 9
Philadelphia Water Department Historical Operating Results
(Thousands of Dollars)

	FY16	FY15	FY14
Operating Revenues:			
Sales to General Customers	$587,572	$585,911	$557,396
Service (Sales) to Other Municipalities	32,389	33,222	31,642
Services to Other Philadelphia Agencies (Includes Fire Protection)	34,810	35,251	33,621
Private Fire Connections	2,737	2,374	2,236
Industrial Sewer Surcharge	7,375	3,407	4,252
Other Operating Revenue	5,158	5,033	4,480
Total Operating Revenue	**$670,041**	**$665,198**	**$633,627**
Non-Operating Revenues			
Interest on Investments	20	270	422
Operating Grants	745	1,083	1,946
Other Non-Operating Revenues	8,100	10,295	7,024
Total Non-Operating Revenues	**$8,865**	**$11,648**	**$9,392**
Total Revenues	**$678,906**	**$676,846**	**$643,019**
Operating Expenses	**$433,026**	**$426,767**	**410,797**
Deduct: Commitments Cancelled – Net*	24,088	19,389	37,436
Net Operating Expenses	**$408,938**	**$407,378**	**$373,361**
Adjustment between Debt Service and Net Operating Expenses (due to timing differences)**	**340**	**4,470**	**-**
Excess of Operating Revenues over Operating Expenses	**261,443**	**262,290**	**260,266**
Excess of Revenues over Expenses before Interest Expenses and Principal Payments on Bonded Indebtedness	**270,308**	**273,938**	**269,658**
Interest Expenses:			
Revenue Bonds	82,594	79,975	74,701
Total Interest Expenses	**$82,594**	**$79,975**	**$74,701**
Excess of Revenues over Expenses Exclusive of Debt Principal Payments	**187,714**	**193,963**	**194,957**
Deduct: Debt Principal Payments on Bonded Indebtedness During Fiscal Year	136,710	125,295	127,009
Net Unapplied Project Revenues	**51,004**	**68,668**	**67,948**
Deduct: Funds Transferred to Residual Fund	31,136	26,507	24,829
Deduct: Funds Transferred to Capital Account	21,497	20,705	20,194
Transfer (TO)/FROM The Rate Stabilization Fund	$1,629	$(21,456)	$(22,925)
Coverage Ratios***			
Total Debt Service and Other Transfers	1.13x	1.12x	1.11x
Senior Revenue Bond Debt Service	1.24x	1.23x	1.22x

* Commitments Cancelled represent the liquidation of encumbrances and offset operating expenses. An encumbrance is an expense that is anticipated to be charged to the Water Fund. Table 11 – Forecast Statement of Revenues, Expenses, Debt, & Debt Service Coverage Fiscal Year Ending June 30, treats commitments cancelled as a contra-expense (see Note 5 to Table 11).
**Per Section 5.01 of the General Ordinance, debt service is adjusted, if necessary, to reflect the principal of and interest on Water and Wastewater Revenue Bonds required to be paid during the period, plus the net amount due and payable on Qualified Swaps during such period. At times, an adjustment to debt service may be needed to reflect timing differences that may occur if the Sinking Fund is pre-funded in the current year for a portion of the following year's Debt Service Requirements.
***See Table 10 – Philadelphia Water Department Rate Covenant Compliance for methods of calculation of Coverage Ratios.

As discussed above, the Water Department is required to comply with the Rate Covenant under the General Ordinance. For a discussion of the Rate Covenant, see "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Rate Covenant" herein. All Water Fund expenditures are included in the Rate Covenant calculation under the General Ordinance. See "HISTORICAL AND PROJECTED FINANCIAL INFORMATION – Historical Operating Results (Legally Enacted Basis)" above. Historically, the Water Department has used the Rate Stabilization Fund to manage compliance with the Rate Covenant each year. See Note 1 to the financial statement of the Water Fund contained in APPENDIX I. See also Table 10 – System Fund Balances within the Supplement contained in Appendix II.

In Fiscal Years 2015 and 2016, the Water Department complied with the Rate Covenant with a revenue bond debt service coverage ratio of at least 1.20 each year, and a total debt service coverage ratio of at least 1.00 each year. In Fiscal Year 2015, the Water Department complied with the Rate Covenant with a revenue bond debt service coverage ratio of 1.23 and a total coverage ratio of 1.12, after taking into account a deposit to the Rate Stabilization Fund of $21,456,000. In Fiscal Year 2016, the Water Department complied with the Rate Covenant with a revenue bond debt service coverage ratio of 1.24 and a total coverage ratio of 1.13, after taking into account a withdrawal from the Rate Stabilization Fund of $1,629,000. The Water Department's current financial plan calls for gradually increasing debt service coverage ratios as noted in the section titled "Projected Revenues, Expenses and Debt Service." Table 10 below sets forth the Water Department's Rate Covenant compliance over the last three Fiscal Years.

Table 10
Philadelphia Water Department
Rate Covenant Compliance
(Thousands of Dollars)

	FY16	FY15	FY14
Coverage A[(1)]:			
Net Revenues	$271,937	$252,482	$246,733
/Revenue Bonds Debt Service	219,304	205,270	201,710
= Coverage A	1.24x	1.23x	1.22x
Coverage B[(2)]:			
Net Revenues	$271,937	$252,482	$246,733
/Total Debt Service + Transfer to Capital Fund	240,801	225,975	221,904
= Coverage B	1.13x	1.12x	1.11x
Coverage C[(3)]:			
Net Revenues +/-Transfer (To) From Rate Stabilization Fund	$270,308	$273,938	$269,658
/Revenue Bonds Debt Service	219,304	205,270	201,710
= Coverage C	1.23x	1.33x	1.34x

(1) Coverage A: The Rate Covenant requires the City to establish rates and charges for the use of the Water and Wastewater Systems sufficient to yield Net Revenues, as defined therein, in each Fiscal Year at least equal to 120% of the Debt Service Requirements for such Fiscal Year (excluding debt service due on any Subordinated Bonds).

(2) Coverage B: Net Revenues, in each Fiscal Year, must equal at least 100% of: (i) the Debt Service Requirements (including Debt Service Requirements in respect of Subordinated Bonds) payable in such Fiscal Year; (ii) amounts required to be deposited for Subordinated Bonds payable in such Fiscal Year; (iii) amounts required to be deposited into the Debt Reserve Account during such Fiscal Year; (iv) debt service on all General Obligations Bonds issued for the Water and Wastewater Systems payable is such Fiscal Year; (v) debt service payable on Interim Debt in such Fiscal Year; and (vi) the Capital Account Deposit Amount for such Fiscal Year, less amounts transferred from the Residual Fund to the Capital Account during such Fiscal Year. To ensure compliance with the Rate Covenant, the General Ordinance requires that the City review its rates, rents, fees, and charges at least annually.

(3) Coverage C: As long as the Insured Bonds are outstanding, the City covenants to establish rates and charges for the use of the System sufficient to yield Net Revenues (excluding amounts transferred from the Rate Stabilization Fund into the Revenue Fund during, or as of the end of, such Fiscal Year) at least equal to 90% of the Debt Service Requirements (excluding debt service on any Subordinated Bonds) in such Fiscal Year.

The Water Department's Budget

At least 90 days before the end of the Fiscal Year, the operating budget for the next Fiscal Year is prepared by the Mayor and submitted to City Council for adoption. The budget, as adopted, must be balanced and provide for discharging any estimated deficit from the current Fiscal Year and make appropriations for all items to be funded with City revenues. At least 30 days before the end of the Fiscal Year, City Council must adopt by ordinance an operating budget.

Fiscal Year 2018 Budget

The City's Fiscal Year 2018 operating budget was presented to City Council on March 2, 2017, approved by City Council on June 15, 2017, and signed by the Mayor on June 21, 2017. The Water Fund budget for Fiscal Year 2018 is $826,233,000, which excludes cancelled commitments from the prior year. See footnote to Table 9 above regarding cancelled commitments. Fiscal Year 2018 Water Fund budgeted revenues total $801,233,000, inclusive of the transfer from the Rate Stabilization Fund in the amount of $83,358,000. The amount of such transfer from the Rate Stabilization Fund is calculated solely for purposes of the budget to provide additional appropriations to balance the budget, but it does not represent the Water Department's expected transfer at the end of Fiscal Year 2018. See Note 4 to Table 11 – Forecast Statement of Revenues, Expenses, Debt, & Debt Service Coverage for a description of the Financial Consultant's calculation of the operating budget and transfer from the Rate Stabilization Fund, which differs from how the City calculates the transfer from the Rate Stabilization Fund for purposes of the budget. For more information on the City's budget procedure, see APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Discussion of Financial Operations – Budget Procedure."

Pension Obligations of the Water Department

As of the date of this Official Statement, the Water Fund has made its scheduled payments for the Municipal Pension Fund (defined herein) and its allocable share of the City's Pension Bonds (as defined in Appendix IV) for Fiscal Year 2017. The City maintains a single employer defined-benefit pension program (the "Municipal Pension Fund"), which provides benefits to police officers, firefighters, non-uniformed employees, and non-represented appointed and elected officials, including employees of the Water Department. Contributions are made by the City to the Municipal Pension Fund from (i) the City's General Fund, (ii) funds that are received by the City from the Commonwealth for deposit into the Municipal Pension Fund, and (iii) various City inter-fund transfers, representing amounts contributed, or reimbursed, to the City's General Fund for pension payments for employees of the Water Fund, Aviation Fund, and certain other City funds or agencies. An additional source of expected funding is that portion of the 1% sales tax rate increase that is required under Pennsylvania law to be deposited to the Municipal Pension Fund. See APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Revenues of the City – Sales and Use Tax" and APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Pension System."

Prior to Fiscal Year 2018, payments from the Water Fund to the City's General Fund for the Municipal Pension Fund were comprised of two components: (i) payments from the Revenue Fund for employees paid from such account, which are treated as Operating Expenses and (ii) payments from the Capital Account for employees paid from such account. Similarly, the Water Department makes payments from the Revenue Fund and the Capital Account for the Water Fund's allocable share of principal and interest payments on the City's Pension Bonds. Commencing in Fiscal Year 2018 and onward, all pension obligations of the Water Fund will be paid exclusively from the Revenue Fund as Operating Expenses.

Payments from the Water Fund to the City's General Fund for the Municipal Pension Fund were approximately $48.3 million (approximately $40.9 million from the Revenue Fund and $7.4 million from the Capital Account) and $55.1 million (approximately $46.6 million from the Revenue Fund and $8.5 million from the Capital Account) for Fiscal Years 2015 and 2016, respectively. See APPENDIX IV –

“GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Pension System – Annual Contributions – Table 29.” Payments for Fiscal Year 2017 are estimated to be $59.6 million (approximately $54.1 million from the Revenue Fund and $5.5 million from the Capital Account). Payments for Fiscal Year 2018 are proposed to be $60.5 million, which will solely be paid from the Revenue Fund.

Payments from the Water Fund to the City’s General Fund for the Water Fund’s allocable share of principal and interest payments on the City’s Pension Bonds were approximately $12.6 million (approximately $11.4 million from the Revenue Fund and $1.2 million from the Capital Account) and $13.7 million (approximately $12.5 million from the Revenue Fund and $1.2 million from the Capital Account) for Fiscal Years 2015 and 2016, respectively. See APPENDIX IV – “GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Pension System – Annual Contributions – Table 30.” Payments for Fiscal Year 2017 are estimated to be $13.5 million (approximately $12.1 million from the Revenue Fund and $1.4 million from the Capital Account). Payments for Fiscal Year 2018 are proposed to be $13.7 million , which will solely be paid from the Revenue Fund.

Projected Revenues, Expenses and Debt Service

On the following page, Table 11 – Forecast Statement of Revenues, Expenses, Debt, & Debt Service Coverage, extracted from the Supplement, presents a statement of projected revenues and revenue requirements for the operation of the Water and Wastewater Systems for Fiscal Years Ending June 30, 2017 through June 30, 2022, consistent with the requirements of the General Ordinance. See APPENDIX II – “FINANCIAL CONSULTING AND ENGINEER’S REPORT” herein for the full text of the Financial Consulting and Engineer’s Report. The Financial Consulting and Engineer’s Report should be read in its entirety. As stated in the Financial Consulting and Engineer’s Report, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that actually occur and are unknown at this time and/or which are beyond the control of the Financial Consultant.

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Table 11
Philadelphia Water Department
Forecast Statement of Revenues, Expenses, Debt, & Debt Service Coverage
Fiscal Year Ending June 30 (Thousands of Dollars)

Line No.	Description	FY 2017 *Projected*	FY 2018 *Forecast*	FY 2019 *Forecast*	FY 2020 *Forecast*	FY 2021 *Forecast*	FY 2022 *Forecast*
	Project Revenues						
	User Charges (1)						
1.	Water User Charges	$261,305	$270,023	$282,152	$289,844	$304,820	$321,101
2.	Wastewater User Charges	214,025	223,312	234,355	247,814	259,563	273,488
3.	Stormwater User Charges	159,028	163,988	169,624	177,525	185,709	195,631
4.	*Total User Charge Revenue*	634,357	657,322	686,131	715,183	750,092	790,220
	Other Income						
5.	Wholesale Revenue	36,405	38,145	40,307	42,778	45,019	47,720
6.	Other Operating Revenue (2)	23,574	1,661	1,194	458	(99)	(1,304)
7.	Revenue from Other Gov. & Grants	1,594	1,000	1,000	1,000	1,000	1,000
8.	Interest Income	1,056	1,060	955	898	839	851
9.	Debt Reserve Account Reduction (3)	11,000	19,000	-	-	-	-
10.	**Total Project Revenues**	**$707,986**	**$718,188**	**$729,587**	**$760,318**	**$796,851**	**$838,486**
	Operating Expenses (4)						
11.	Personal Services & Benefits	$(239,758)	$(261,731)	$(270,024)	$(278,846)	$(286,852)	$(295,092)
12.	All Other Expenses	(235,388)	(235,842)	(247,404)	(255,436)	(264,542)	(271,692)
13.	Liquidated Encumbrances (5)	25,334	25,313	25,946	26,595	27,259	27,941
14.	*Total Operating Expenses*	(449,812)	(472,260)	(491,482)	(507,687)	(524,135)	(538,843)
15.	**Net Rev. Available for Debt Service**	258,174	245,928	238,105	252,631	272,717	299,643
16.	Transfers From/(To) Rate Stabilization Fund (6)	(1,026)	29,246	15,795	16,325	(3,210)	(6,018)
17.	**Adj. Net Rev. Available for Debt Service**	**$ 257,148**	**$ 275,174**	**$ 253,900**	**$ 268,955**	**$ 269,507**	**$ 293,625**
	Debt Service						
	Senior Debt Service						
18.	Outstanding Revenue Bonds	$(193,841)	$(200,010)	$(169,510)	$(157,699)	$(130,167)	$(126,940)
19.	Pennvest Parity Bonds	(11,877)	(11,500)	(11,682)	(11,636)	(11,636)	(11,636)
20.	Series 2017B Bonds	-	(6,882)	(5,618)	(5,618)	(10,795)	(5,352)
21.	Future Revenue Bonds (7)	-	-	(11,550)	(31,937)	(54,715)	(81,938)
22.	*Total: Senior Debt Service (8)*	(205,718)	(218,392)	(198,359)	(206,889)	(207,313)	(225,865)
23.	Transfer to Escrow Account to Redeem Bonds (3)	(11,000)	(19,000)	-	-	-	-
	Subordinate Debt Service						
24.	Outstanding GO Bonds	-	-	-	-	-	-
25.	Pennvest Subordinate Bonds	-	-	-	-	-	-
26.	*Total: Subordinate Debt Service*	-	-	-	-	-	-
27.	**Total Debt Service & Escrow Account Deposit**	**$(216,718)**	**$(237,392)**	**$(198,359)**	**$(206,889)**	**$(207,313)**	**$(225,865)**
28.	**Debt Service Coverage (Line 17/22)**	**1.25**	**1.26**	**1.28**	**1.30**	**1.30**	**1.30**
	Other Capital Expenditures						
29.	Capital Account Deposit (10)	(22,142)	(22,806)	(23,490)	(24,195)	(24,921)	(25,668)
30.	**Total Debt Service Coverage (9) (Line 17(22+29))**	**1.12**	**1.13**	**1.14**	**1.16**	**1.16**	**1.16**
31.	**Revenue Fund Surplus/(Deficit)**	**$ 18,288**	**$ 14,976**	**$ 32,050**	**$ 37,872**	**$ 37,273**	**$ 42,091**
	Residual Fund (11)						
32.	Beginning Balance	$ 15,189	$ 15,179	$ 15,822	$ 15,825	$ 15,955	$ 16,613
33.	Revenue Fund Surplus/(Deficit)	18,288	14,976	32,050	37,872	37,273	42,091
34.	Transfer to Capital Fund (PAYGO)	(18,358)	(14,394)	(32,110)	(37,805)	(36,679)	(42,132)
35.	Interest Earnings	61	61	63	63	64	66
36.	**Ending Residual Fund Balance**	**$ 15,179**	**$ 15,822**	**$ 15,825**	**$ 15,955**	**$ 16,613**	**$ 16,639**
	Rate Stabilization Fund (6)						
37.	Beginning Balance	$ 205,601	$ 206,627	$ 177,380	$ 161,585	$ 145,260	$ 148,470
38.	Deposit From/(To) Fund	$ 1,026	$ (29,246)	$ (15,795)	$ (16,325)	$ 3,210	$ 6,018
39.	Funds From/(To) Residual Fund	-	-	-	-	-	-
40.	**Ending Rate Stabilization Fund Balance**	**$ 206,627**	**$ 177,380**	**$ 161,585**	**$ 145,260**	**$ 148,470**	**$ 154,488**

Notes to Table 11 – Philadelphia Water Department Forecast Statement of Revenues, Expenses, Debt, & Debt Service Coverage Fiscal Year Ending June 30 (Thousands of Dollars)

(1) User charge revenues are based on calculated customer billings and are adjusted to estimate the resulting annual cash receipts. For Fiscal Year 2017, revenues have been projected using actual amounts through May 31, 2017 and annualized amounts for the remaining period. The adjustment process is described in detail in Section 4 of the Supplement.

(2) Other operating revenues include penalties, license and permit fees, and other miscellaneous charges. Additional detail on the sources and amounts of other operating revenues can be found in Section 4 of the Supplement. The other operating revenues also include an offset for a new income-based water revenue assistance program beginning in Fiscal Year 2018 and continuing through Fiscal Year 2022. Section 4 of the Supplement describes the program and its financial impact.

(3) Estimated based on the surplus balance above the Debt Reserve Requirement. The Fiscal Year 2017 reduction consists of Water and Wastewater Bond proceeds that were applied to refund and defease the Water and Wastewater Bonds to which such proceeds are allocable during the Water Department's most recent debt refunding in October of 2016. The Fiscal Year 2018 reduction consists of Water and Wastewater Bond proceeds that will be applied to refund and defease the Water and Wastewater Bonds to which such proceeds are allocable. The Debt Service Reserve account reduction is included as Project Revenues for the purposes of calculating debt service coverage. The transfer of these funds to an escrow account to redeem bonds is excluded as a debt service payment in the calculation of coverage.

(4) The Fiscal Year 2018 operating budget is adjusted to reflect historical differences in budgeted versus actual utility costs. In aggregate, the total spending factor adjustment is approximately 93%. Similarly, the Water Department's Capital Improvement Plan ("CIP") includes a net cash flow adjustment designed to recognize timing issues associated with projects that are encumbered in one year but do not become a cash expenditure until a subsequent year. The net cash financing required assumed in this forecast is 90% of the inflation-adjusted CIP. Additional information is provided in Sections 5 and 6 of the Supplement.

(5) Liquidated encumbrances have been included as an offset to operating expenses and projected based on estimated actual results from Fiscal Year 2017. For Fiscal Years 2018 – 2022, liquidated encumbrances are estimated based on 15% of the projected services and materials & supplies budget classes less the cost of commodities.

(6) Per the General Ordinance, the Water Department can transfer funds from the Rate Stabilization Fund to the Revenue Fund for the purpose of calculating debt service coverage.

(7) Future debt issues have been assumed for Fiscal Years 2018 – 2022. The assumed issuance amounts and terms can be found in Section 7 of the Supplement.

(8) Does not include debt service or redemption price on bonds expected to be redeemed in such fiscal year, prior to maturity.

(9) The Rate Covenant requires that the Water Department will, at a minimum, impose, charge, and collect in each Fiscal Year such water and wastewater rents, rates, fees, and charges as shall yield Net Revenues which shall be equal to at least 1.20 times the Debt Service Requirements for such Fiscal Year (recalculated to exclude therefrom principal and interest payments in respect to Subordinate Bonds); provided that such water and wastewater rents, rates, fees, and charges shall yield Net Revenues which shall be at least equal to 1.00 times the sum of (i) the Debt Service Requirements for such Fiscal Year (including Debt Service Requirements in respect of Subordinated Debt); (ii) amounts required to be deposited into the Debt Reserve Account of the Sinking Fund during such Fiscal Year; (iii) the principal or redemption price of and interest on General Obligation Bonds payable during such Fiscal Year; (iv) debt service requirements on Interim Debt payable during such Fiscal Year; and (v) the Capital Account Deposit Amount for such Fiscal Year (less any amounts transferred from the Residual Fund to the Capital Account of the Construction Fund during such Fiscal Year).

(10) Per the General Ordinance, the Water Department is required to make an annual deposit to the Capital Account of the Capital Account Deposit Amount, which is equal to 1% of the depreciated value of property, plant and equipment of the System or such greater amount as shall be certified as sufficient, for the purpose of infrastructure renewal and replacement. More information on this deposit and the Capital Account is provided in Sections 6 and 8 of the Supplement.

(11) Amounts deposited in the Residual Fund may be used at the written direction of the City for a variety of purposes as outlined in Section 4.12 of the General Ordinance. For purposes of Table 11, it is assumed certain funds will be transferred annually from the Residual Fund to the Capital Account to finance capital improvements.

RATES

Current Rates

Pursuant to the Rate Ordinance, the Board instituted rate increases effective July 1, 2016 and July 1, 2017. Rates will remain in effect until new rates are authorized by the Board in accordance with the requirements of the General Ordinance, the Philadelphia Code and the standards promulgated by the Board. See "– Charter Amendment and Rate Ordinance" below.

Water rates for general service customers of the Water Department consist of a service charge related to the size of the meter, plus a schedule of quantity charges for water use. Sewer rates for general service customers are similar. In order to more fairly reflect the burden on the System, stormwater charges are calculated based on a customer's property size and its relative imperviousness. A uniform stormwater charge based on the average size and imperviousness of residential properties is billed to residential customers. Charges to non-residential and condominium customers are based on each property's specific size and impervious area.

Special rates are established pursuant to the Water Department's regulations for the following customers: (1) public and private schools which provide instruction up to or below the twelfth grade; (2) institutions of "purely public charity;" (3) places used for religious worship; (4) residences of eligible senior citizens; (5) universities and colleges; and (6) public housing properties of the Philadelphia Housing Authority. Some real estate also is exempt from stormwater charges, including, cemeteries, residential sideyards, City-owned or City-controlled vacant lots or improvements, portions of Fairmount Park, streets, medians, sidewalks, and rights-of-way. In September 2016, the Water Department commenced a rate proceeding to establish a 100% stormwater rate discount for approved community gardens, which was approved by the Board in December, 2016. While the City cannot project the costs of the discount at this time, it believes that any discount awarded to approved community gardens would not result in a material loss of revenue to the City.

In addition to the special rates referenced above, the Water Department offers additional assistance and incentive programs to customers, which constitute either an Operating Expense of the Water Department or contra-revenue in the form of credits or reductions to customers' bills. Certain information regarding some of the programs is set forth in Table 12 on the following page.

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Table 12
Stormwater Incentives and Assistance Program

Program	FY 2015	FY 2016	FY 2017*	FY 2018**
SMIP[(1)] and GARP[(2)]	$13,598,134[(3)]	$11,450,000	$15,000,000	$15,000,000
Phase in Program (CAP)[(4)]	4,164,073	3,282,654	3,417,000	3,317,000
Stormwater Credits[(4)]	12,262,191	12,864,862	15,110,000	17,262,000
Tiered Assistance Program (TAP)[(5)]	-	-	-	17,900,000
Total	**$30,024,398**	**$27,597,516**	**$33,527,000**	**$53,479,000**

(*) Budgeted.
(**) Projected.
(1) Stormwater Management Incentives Program.
(2) Grant and Greened Acres Retrofit Program.
(3) In Fiscal Year 2015, SMIP and GARP were partially funded with grants.
(4) Amounts are credits against certain customers' bills.
(5) TAP is a low-income assistance program slated to commence in July of 2018. It will reduce customers' bills and result in a reduction in revenue for the Water Department.

Rates

Table 13 below shows monthly water and sewer bills for Fiscal Years 2016 through 2018 and is based, in each case, on a typical residential customer with a 5/8 inch meter using 600 cubic feet or 4,488 gallons per month (7,200 cubic feet per year) and a typical residential customer that is also an income eligible senior citizen, who receives a 25% discount, with a 5/8 inch meter using 500 cubic feet or 3,740 gallons per month.

Table 13
Typical Residential
Monthly Water and Sewer Rate Charges

	Effective Date	Water	Sewer*	Total	Percentage Increase
5/8" Meter Residential 600 Cu. Ft. Monthly	07/01/17	$32.46	$41.60	$74.06	4.5%
	07/01/16	31.25	39.62	70.87	5.1
	07/01/15	29.89	37.54	67.43	-
5/8" Meter Residential 500 Cu. Ft. monthly Senior Citizen (25% Discount)	07/01/17	$21.11	$28.76	$49.87	4.3%
	07/01/16	20.36	27.43	47.79	4.9
	07/01/15	19.49	26.05	45.54	-

* Sewer charges include stormwater costs.
Note: The Water Department did not increase water or sewer rates in Fiscal Year 2015.

Billing and Collections

Under the Charter, the Water Revenue Bureau is directly responsible for the billing, metering and collection of revenues for the Water Fund. Since February 2003, oversight of the Water Revenue Bureau has been under the City's Revenue Commissioner, who reports directly to the Finance Director. The Water Revenue Bureau uses outside collection agencies to collect delinquent accounts.

The Water Department's collection factor was approximately 95% for Fiscal Year 2016, including collections realized in the current and past fiscal year. The City is pursuing a multifaceted strategy for improving collections while decreasing delinquencies, key compliance strategies of which include revocation of commercial licenses and sequestration. Although these efforts have concentrated primarily on general fund revenues, certain improvements in processes and equipment may affect Water Fund revenues. The financial projections provided herein do not include any additional revenue or acceleration of revenue as a result of these initiatives.

In addition to compliance efforts, the City is engaged in two active projects to implement technology solutions for its cashier and payment processing systems and to develop an integrated data warehouse and case management system. These initiatives are designed to improve operational efficiencies by providing tools currently unavailable to the City. See also "OTHER OBLIGATIONS – Contract for Automatic Meter Reading System with ITRON."

Automatic Meter Reading System and Advanced Meter Reading Infrastructure

The Water Department's Automatic Meter Reading System has produced a number of positive results, including more accurate meter reading and billing, fewer billing disputes, better customer service and increased revenue collection, including collection of delinquent accounts. From 2011-2013, the Water Department replaced the batteries in the vast majority of radio transmitter devices, thereby extending their life to approximately the year 2025. See also "OTHER OBLIGATIONS – Contract for Automatic Meter Reading System with ITRON."

The City, through the Procurement Department, Water Department and the Water Revenue Bureau, is soliciting proposals from qualified vendors to provide an advanced metering infrastructure system for water meters. The project will include: installation of new units; software to manage data and make it available to the City's customer information and billing system; integration of software with the City's existing systems; training, documentation, and product support. The City does not intend to replace all of the water meters during the initial installation phase of the new system. The Water Department expects the installation period to be approximately 24 months. The project is part of the Water Capital Improvement Program and included in Table 6 – Top Fifteen Capital Projects by Estimated Cost.

Charter Amendment and Rate Ordinance

In November 2012, Philadelphia voters approved an amendment to the Charter to allow City Council to establish an independent rate-making body responsible for fixing and regulating rates and charges for water and sewer services. The Rate Ordinance became effective January 20, 2014, and the Board was formed, promulgated regulations governing the rate review process in December 2015, and completed its first rate proceeding in June 2016.

The Charter still mandates that the standards pursuant to which rates and charges are fixed shall be such as to yield to the City at least an amount equal to operating expenses and interest and sinking fund charges on any debt incurred or about to be incurred for water supply, sewage and sewage disposal purposes. In computing operating expenses, proportionate charges for all services performed for the Water Department by all officers, departments, boards or commissions of the City also are included.

While any Water and Wastewater Bonds are outstanding, the Board also will be required to set rates and charges in amounts sufficient for the City to comply with the provisions of the General Ordinance. The Rate Ordinance subjects the Board to certain standards when making a rate determination in addition to those set forth in the General Ordinance. The Rate Ordinance also requires the Water Department to develop a comprehensive plan, pursuant to which the Water Department forecasts capital and operating costs and expenses and corresponding revenue requirements.

See "— Philadelphia Water, Sewer and Stormwater Rate Board" and "— Rate Setting" below. A copy of the Rate Ordinance is available at the Office of the Director of Finance, 1300 Municipal Services Building, 1401 JFK Boulevard, Philadelphia, Pennsylvania 19102 and must be read in conjunction with the Philadelphia Code.

Philadelphia Water, Sewer and Stormwater Rate Board

The Board consists of five members serving staggered terms. The members are appointed by the Mayor and confirmed by City Council, and the Mayor has sole discretion to remove members for cause, including conflicts of interest and neglect of duty. Members who resign or are removed may be replaced by a mayoral appointee confirmed by City Council, and such successor may serve for the remaining term of the replaced member. Members are not compensated for their services, but are entitled to reasonable expenses consistent with their duties. The Board receives an appropriation sufficient to allow it to carry out its responsibilities.

The Rate Ordinance requires that Board members be City residents with a minimum of five years professional experience in one or more of the following fields: (1) public or business administration, (2) finance, (3) utilities, (4) engineering or (5) water resources management. At least one member must have experience as a consumer advocate in utility rate cases, and one member must be a commercial and/or industrial ratepayer with knowledge and experience related to stormwater management and rates. Currently, one Board position is vacant. Brief biographical descriptions of the remaining members of the Board are set forth below.

Lee Huang – As Senior Vice President and Principal at Econsult Solutions, Mr. Huang provides business and public policy makers with economic consulting services in public infrastructure, development, public policy, public finance, and community and neighborhood development. Mr. Huang's original term expired July 1, 2016, and his reappointment through July 1, 2021 was confirmed on June 8, 2017.

Folasade A. Olanipekun-Lewis – Appointed Chief Administrative Officer to the Philadelphia International Airport effective January 28, 2016, Ms. Folasade (Sade) A. Olanipekun-Lewis has worked in many areas of Philadelphia government for over 20 years. Previously, she served as the Chief Financial Officer for City Council; Deputy Commerce Director for Finance and Administration; Chief Financial Officer for the School District; and also as City Treasurer, where her responsibilities included overseeing the issuance of debt and other financing instruments and managing the investment of cash reserves of the city totaling about $2 billion. (Term expires July 1, 2020.)

Sonny Popowsky – Mr. Popowsky previously served as the Consumer Advocate of Pennsylvania from 1990 to 2012 and was a member of the Keystone Energy Board and the U.S. Department of Energy and Electricity Advisory Committee. Mr. Popowsky satisfies the requirement of a consumer advocate in utility rate cases. (Term expires July 1, 2018.)

Wendell Anthony Ewing – Vice President of Leasing and Development at Liberty Property Trust, a commercial real estate development firm. Mr. Ewing satisfies the requirement of a commercial and/or industrial rate payer with knowledge and experience related to stormwater management and rates. (Term expires July 1, 2022.)

MANAGEMENT INITIATIVES

The Water Department has implemented several initiatives designed to increase the efficiency of its operations and reduce costs.

Water Accountability

The Water Department has been successful in developing and implementing programs to recover uncaptured revenue through reduction in the loss of finished water from the distribution system. The Water Department's non-revenue water has averaged 85-95 MGD from Fiscal Year 2014 to Fiscal Year 2016, remained stable for Fiscal Year 2017 and is expected to remain stable for Fiscal Year 2018. The Water Department accounts for all finished water as either consumption or losses. Losses are accounted for in two ways: (i) apparent losses are calculated losses, due to customer meter inaccuracies, billing errors or unauthorized consumption that cause water utilities to lose a portion of consumption-based revenue, (ii) real losses are physical losses, largely leakage, that cause excess production costs for water utilities.

Over recent years the Water Department has implemented a host of programs to reduce and control water and revenue losses. The Water Department operates a Customer Meter Management Program and a Revenue Protection Program, which have increased billing by approximately $5.0 million in Fiscal Year 2014, $3.8 in Fiscal Year 2015 and $4.4 million in Fiscal Year 2016. See also "RATES – Automatic Meter Reading System and Advanced Meter Reading Infrastructure" for more information on the program.

The Water Department conducts a variety of activities to proactively contain leakage losses, including (i) the Leak Detection Program, (ii) the district metered area and (iii) the hydrant tracking program. The Water Department was one of the first water utilities in the United States to employ such techniques to mitigate leakage and lessen the occurrence of water main breaks. Through the Leak Detection Program, the Water Department also contracts for in-line leak detection in active large-diameter transmission water piping. This service has added another highly effective tool to minimize lost water. The small pilot district metered area has achieved up to 90% reduction in the leakage rate through installed instrumentation to control leakage by advanced pressure management. Finally, the hydrant tracking program has resulted in hydrant availability remaining significantly above 99% through initiatives such as routine inspection, repair and painting.

Wastewater Master Planning

The Wastewater Planning Program developed a 25-year Master Plan that incorporates the regulatory requirements contained in the COA, connecting the collection system and treatment facilities holistically, and looks beyond current regulatory drivers to envision the future of the utility. The Master Plan is expected to be updated every 5 years to ensure that the wastewater system meets regulatory requirements and any changes in population projections. The Wastewater Master Planning Program's data and findings will help refine the Water Capital Improvement Program, prioritize capital projects and inform facility planning as it relates to potential water quality regulations, resource recovery, and process renewal technologies. Facility major asset inspection programs are under development to ensure that the condition of infrastructure is known and that related costs are reflected in the Water Capital Improvement Program.

The Master Plan concluded that the current facilities are adequate for projected population growth and established a wet weather facility plan to meet the COA requirements through 2036. The wet weather facility plan was delivered to the EPA in June 2016.

Water Master Planning

The Water Planning Program is currently developing a 25-year Water Master Plan that will document existing conditions and evaluate Water System data and trends and is expected to be completed in the Spring of 2018. The Water Sustainability Plan will assist the Water Department in developing the Water Capital Improvement Program and prioritizing capital projects and related water planning work.

Security of Water Department Facilities and Water Supply

The Water Department has performed a vulnerability analysis of its entire potable water system and has extensive water quality monitoring, protection and security plans in place. All finished water basins are completely covered; all plants are fenced in and topped by barbed wire; main entrances and gates are secured; video surveillance equipment has been installed; and the Water Department continues to draw and conduct nearly one thousand tests on water samples from various locations each day. Online water quality monitors provide continuous testing during all stages of the treatment process. The City also has implemented a surveillance and response system, a source water protection program and early warning systems for the Schuylkill and Delaware Rivers and surrounding areas. Additional upgrades are planned to enhance security at the three WPCPS and the pumping stations. This project is expected to be bid sometime in Fiscal Year 2018.

To further ensure the safety of the City's drinking water, the Water Department will continue to monitor water quality using online instrumentation that allows real-time tracking of water conditions at strategic locations throughout the City's water distribution system.

CERTAIN INVESTMENT CONSIDERATIONS

Introduction

The purchase of the Bonds involves numerous investment risks, some of which are referred to in this Official Statement. No representation is made that the risks described or referred to in this Official Statement constitute all of the risks associated with investing in the Bonds. Accordingly, prior to making a decision to invest in the Bonds, each prospective purchaser thereof should make an independent evaluation of all of the information presented in this Official Statement, including the Appendices, and should review other pertinent information.

System Revenues, Expenditures, Financing and Capital Assets

Actual operation, maintenance and repair expenses of the System may be greater or less than currently projected. Factors such as damages to facilities and infrastructure, changes in technology, regulatory standards, and increased costs of material, energy, labor and administration can substantially affect the expenses of the Water Department. Although the City has covenanted to set rates and charges in amounts sufficient to pay debt service on all Water and Wastewater Revenue Bonds in accordance with the provisions of the General Ordinance, there can be no assurance that amounts will be so sufficient or that sufficient amounts will be collected. Furthermore, increases in rates and charges could result in a decrease in demand for usage and result in a decrease in revenues.

Operation of the System requires significant capital expenditures that are partially dependent on the City's ability to secure appropriate financing. Disruptions in the capital and credit markets may limit the City's access to capital. Without sufficient capital, or if the cost of borrowing increases, it may materially and adversely affect the business, financial condition, and results of operations of the Water Department.

Water and wastewater operations entail specific risks and may impose significant costs. Wastewater collection and treatment and septage pumping and sludge hauling involve various unique risks. If collection or treatment systems fail or do not operate properly, or if there is a spill, untreated or partially treated wastewater could discharge onto property or into nearby streams and rivers, causing various damages and injuries, including environmental damage. These risks are most acute during periods of substantial rainfall or flooding, which are the main causes of CSO and system failure. Any failure of water and wastewater treatment plants, networks of water and wastewater pipes, or water reservoirs could result in losses and damages that may adversely affect the business, financial condition, and results of operations of the Water Department.

General Economic Conditions

General economic conditions may affect the Water Department's financial condition and results of operations. A general economic downturn may lead to a reduction in discretionary and recreational water use. General economic turmoil also may lead to an investment market downturn, which may result in asset market values (including pension plan assets) suffering a decline and significant volatility. For instance, a decline in the City's pension plans' asset market values could increase required cash contributions to these plans from the Water Fund and increased pension expenses in subsequent years.

Environmental Regulations

The City is subject to state and federal environmental laws and regulations applicable to the System. These laws and regulations are subject to change, and the City may be required to expend substantial funds to meet the requirements of such changing laws and regulations in the future. Failure to comply with these laws and regulations may result in the imposition of administrative, civil and criminal penalties, or the imposition of an injunction requiring the City to take or refrain from taking certain actions. In addition, the City may be required to remediate contamination on properties owned or operated by the City or on properties owned by others, but contaminated as a result of City operations.

Water and wastewater services are governed by various federal and state environmental protection and health and safety laws and regulations, including the federal Safe Drinking Water Act, the Clean Water Act and similar state laws, and federal and state regulations issued under these laws by the EPA and PaDEP. These laws and regulations establish, among other things, criteria and standards for drinking water and for discharges into the waters of the United States and nearby states. Pursuant to these laws, the Water Department is required to obtain various environmental permits for operations. Violations or noncompliance could result in fines or other sanctions by regulators and/or such violations or noncompliance could result in civil suits. Environmental laws and regulations are complex and change frequently. These laws, and the enforcement thereof, have tended to become more stringent over time. While the Water Department has budgeted for future capital and operating expenditures to comply with these laws and permitting requirements, it is possible that new or stricter standards could be imposed that will require additional capital expenditures or raise operating costs.

Climate change is receiving ever increasing attention worldwide. Because of the uncertainty of future climate change regulatory requirements, the Water Department cannot predict the potential effects of future laws and regulations on operations.

Weather and Seasonal Fluctuations

The Water Department's operations are affected by weather conditions and are subject to seasonal fluctuations, which could adversely affect demand for services and revenues and earnings.

The Water Department depends on an adequate water supply to meet the present and future demands of customers. Drought conditions could interfere with sources of water supply and could reduce demand due to the implementation of the Water Department's drought emergency restrictions, which could adversely affect the Water Department's ability to supply water in sufficient quantities to existing and future customers. An interruption in water supply could have a material adverse effect on the operations of the Water Department.

Security of the System

Damage to the System resulting from vandalism, sabotage, or terrorist activities may adversely affect the operations and finances of the System. There can be no assurance that the City's security, emergency preparedness and response plans will be adequate to prevent or mitigate such damage, or that the costs of maintaining such security measures will not be greater than currently anticipated. See "MANAGEMENT INITIATIVES – Security of Water Department Facilities and Water Supply" for efforts the Water Department has taken to secure the System.

The Water Department is increasingly dependent on the continuous and reliable operation of information technology systems, and a disruption of these systems, resulting from cyber security attacks or other events, including material disasters or severe weather events, could adversely affect its business. The Water Department relies on information technology systems with respect to customer service and billing, accounting and, in some cases, the monitoring and operation of treatment, storage and pumping facilities. In addition, the Water Department relies on these systems to track utility assets and to manage maintenance and construction projects, materials and supplies. Any major problems with the operation of these systems could adversely affect operations and have a material adverse effect on the financial condition and results of operations of the Water Department.

Although the Water Department does not believe that its systems are at a materially greater risk of cyber security attacks than other similar utilities, its information technology systems may be vulnerable to damage or interruption from cyber security attacks or other events or actions, and such incidents or other events may go undetected for a period of time.

Limited Recourse on Default

The rights of Bondholders are limited in the event the City defaults on its obligation to pay debt service on the Bonds. The ultimate enforcement of Bondholders' rights upon any default by the City in the performance of its obligations under the Act, the General Ordinance and the Bonds will depend upon the application of remedies provided in the Act, the General Ordinance and other applicable laws. Litigation may be necessary to obtain relief in accordance with these remedies. Such litigation may be protracted and costly. Remedies such as mandamus, specific performance or injunctive relief are equitable remedies, which are subject to the discretion of the court. See "REMEDIES OF BONDHOLDERS" and APPENDIX III – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance – Remedies to be Enforced Only Against Project Revenues" herein.

Bankruptcy

The rights of the owners of the Bonds are subject to the limitations on legal remedies against the City, including applicable bankruptcy, moratorium, insolvency or other laws affecting creditor's rights or remedies and are subject to general principles of equity (regardless of whether such enforceability is considered in equity or at law), to the exercise of judicial discretion in appropriate cases and to the limitations on legal remedies against governmental entities in the Commonwealth of Pennsylvania. Bankruptcy proceedings, or the exercise of powers by the federal or state government, if initiated, could subject the owners of the Bonds to judicial discretion and interpretation of their rights in bankruptcy or otherwise, and consequently may entail risks of delay, limitation, or modification of their rights or the modification of City covenants affecting the System or Project Revenues.

The Pennsylvania Intergovernmental Cooperation Authority Act for Cities of the First Class (the "PICA Act") prevents the City from filing a petition for relief under Chapter 9 of the Federal Bankruptcy Code ("Chapter 9") as long as the Pennsylvania Intergovernmental Cooperation Authority ("PICA") has outstanding any bonds issued pursuant to the PICA Act ("PICA Bonds"). In order to file for bankruptcy under Chapter 9 after the PICA Bonds have been repaid in full, the City must obtain the written approval of the Governor of the

Commonwealth. As of June 30, 2017, the principal amount of PICA Bonds outstanding was $213,945,000. The final maturity date of the PICA Bonds is June 15, 2023. See APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – The Government of the City of Philadelphia – Local Government Agencies – Non-Mayoral-Appointed or Nominated Agencies – PICA and Debt of the City – PICA Bonds."

The filing of a petition under Chapter 9 operates as an automatic stay of the commencement or continuation of any judicial or other proceeding against the debtor or its property. However, a petition filed under Chapter 9 does not operate as a stay of the application of pledged special revenues to the payment of indebtedness secured by such revenues. Special revenues include receipts derived from the ownership or operation of systems that are primarily used or intended to be used primarily to provide transportation, utility or other services, including the proceeds of borrowings to finance such systems. The Federal Bankruptcy Code further provides that special revenues acquired by the debtor after the commencement of a Chapter 9 case shall remain subject to any lien resulting from any security agreement entered into by the debtor before the commencement of the case. However, the lien on special revenues derived from a system will be subject to the payment of the necessary operating expenses of that system. Therefore, Project Revenues acquired by the City after the filing of a Chapter 9 petition would remain subject to the lien created by the General Ordinance in favor of the Bondholders, but will be subject to the payment of Operating Expenses of the System, which are priority payments. A bankruptcy court's interpretation of 'necessary operating expenses' under the Federal Bankruptcy Code could differ from the definition of Operating Expenses of the System under the General Ordinance. The Federal Bankruptcy Code also provides that a pre-bankruptcy transfer of property of a debtor to or for the benefit of a bondholder, on account of such bond, may not be avoided as a preferential transfer. Although Project Revenues appear to satisfy this definition, no assurance can be given that a court would hold that Project Revenues are special revenues. If Project Revenues were determined not to be "special revenues," then there is a risk that Project Revenues collected after the commencement of the bankruptcy case would not be subject to the lien of the General Ordinance, such that the recovery by holders of the Bonds could be negatively affected.

Unless the debtor consents or the plan proposed under Chapter 9 so provides, the bankruptcy court may not interfere with any of the property or revenues of a Chapter 9 debtor or with such debtor's use or enjoyment of any income-producing property. Accordingly, the City may be able to defer the application of Bond proceeds, Project Revenues or the pledged Water and Wastewater Funds to payment of the Bondholders during the pendency of the bankruptcy case, but the lien on such funds and revenues would remain, and would continue to encumber such funds and revenues (subject again to payment of 'necessary operating expenses' and Operating Expenses of the System, to the extent these differ from 'necessary operating expenses' as determined by a bankruptcy court under the Federal Bankruptcy Code). Even if a bankruptcy court had the power to compel immediate payment, the court, in the exercise of its equitable powers, could decline to require the City to use Bond proceeds, Project Revenues and the Water and Wastewater Funds to pay Bondholders during the pendency of the case.

The debtor may file a plan for the adjustment of its debts that may include provisions modifying or altering the rights of creditors generally, or any class of them, secured or unsecured. The plan, when confirmed by the court, binds all creditors that have had notice or knowledge of the plan and discharges all claims against the debtor provided for in the plan. No plan may be confirmed unless certain conditions are met, among which are that the plan is in the best interests of creditors, is feasible and has been accepted by each class of claims impaired thereunder. Even if the plan is not so accepted, it may be confirmed if the court finds that the plan is fair and equitable with respect to each class of non-accepting creditors impaired thereunder and does not discriminate unfairly. Thus, under the above described "cram-down" provisions of the Federal Bankruptcy Code, a plan of adjustment could be imposed on the Bondholders that would give them less than their anticipated rate of interest on the Bonds or possibly even less than a full return of their principal under certain circumstances, and/or extend the time for payment of principal of or interest on the Bonds.

The foregoing references to the Federal Bankruptcy Code should not be construed as implying that the City expects to resort to the provisions of such statute or that, if it did, any proposed restructuring would include a dilution of the sources of payment of and security for the Bonds.

Loss of Tax Exemption

In order to maintain the exclusion from gross income for federal income tax purposes of the interest on the Bonds, the City has covenanted to comply with the applicable requirements of the Internal Revenue Code of 1986, as amended. Interest on the Bonds could become includable in gross income for purposes of federal income taxation retroactive to the date of issuance of such Bonds as a result of acts or omissions of the City in violation of this or other covenants applicable to the Bonds. See "TAX EXEMPTION." The Bonds are not subject to redemption or any increase in interest rates in the event of an event of taxability and will remain outstanding until maturity or prior redemption in accordance with the provisions contained in the General Ordinance.

Tax legislation, administrative actions taken by tax authorities, and court decisions may cause interest on the Bonds to be subject, directly or indirectly, to federal income taxation or state income taxation, or otherwise prevent the beneficial owners of the Bonds from realizing the full current benefit of the tax status of such interest. For example, future legislation to resolve certain federal budgetary issues may significantly reduce the benefit of, or otherwise affect, the exclusion from gross income for federal income tax purposes of interest on all state and local obligations, including the Bonds. In addition, such legislation or actions (whether currently proposed, proposed in the future or enacted) could affect the market price or marketability of the Bonds. Prospective purchasers of the Bonds should consult their own tax advisors regarding any pending or proposed federal or state tax legislation, regulations or litigation, and its impact on their individual situations.

Water Conservation

Decreased customer water consumption as a result of water conservation efforts may adversely affect demand for water services and may reduce revenues and earnings. There may be declines in water usage per customer as a result of an increase in conservation awareness, and the structural impact of an increased use of more efficient plumbing fixtures and appliances. Difficulty obtaining future rate increases to offset decreased customer water consumption to cover investments and expenses, may adversely affect the business, financial condition, and results of operations of the Water Department.

Limitations on Effectiveness of Pledge of Project Revenues and Water and Wastewater Funds

The effectiveness of the pledge of the Project Revenues and the Water and Wastewater Funds may be limited because, although the Fiscal Agent will have custody of the Water and Wastewater Funds, the City will have complete control of deposits into and expenditures from the Water and Wastewater Funds, except for amounts on deposit in the Sinking Fund, including the Debt Reserve Account. While the City has covenanted not to direct the Fiscal Agent to transfer Project Revenues other than as permitted under the General Ordinance, no requisition procedure or other similar procedure will be established for the expenditure of monies by the City from the Water and Wastewater Funds (other than the Sinking Fund, including the Debt Reserve Account), and no consent or approval of the Fiscal Agent is required to be obtained by the City as a condition of the City's expenditure of such monies. For more information on the limitations of the pledge, see "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Limitations on Effectiveness of Pledge of Project Revenues and Waste and Wastewater Funds."

Other Considerations

Debt Covenants. The City is obligated to comply with the Rate Covenant and other debt covenants under certain agreements, including its insurance contracts. Failure to comply with such covenants, which if not cured or waived, could result in the City's being required to repay or finance the related borrowings before their due date, limit future borrowings, cause cross default issues, and increase borrowing costs. If forced to repay or refinance (on less favorable terms) these borrowings, the Water Department's business, financial condition, and results of operations could be adversely affected by increased costs and rates.

Variable Rate Bonds and Qualified Swap Agreement. The City has two series of variable rate bonds outstanding for the Water Department, which are subject to fluctuation in interest rates. The City has entered into the Swap Agreement with respect to the Series 2005B Bonds, which terminates on August 1, 2018. If the Swap Agreement, were terminated early, the City might be required to pay a termination payment to the Swap Provider. See "OUTSTANDING INDEBTEDNESS AND OTHER LONG-TERM AGREEMENTS – Swap Agreement" and APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Other Financing Related Matters – Swap Policy."

LITIGATION AND CLAIMS

Claims against the City relating to the Water Department are paid out of the Water and Wastewater Funds and only secondarily out of the City's General Fund, in the event cash balances in the Water and Wastewater Funds are insufficient at the time of payment of the claim. The General Fund is then reimbursed by the Water and Wastewater Funds for any such advance. The following discussion concerning litigation and claims, which has been prepared based on information supplied by the Law Department of the City and has been reviewed by the Law Department of the City, relates to litigation and claims against the City chargeable to the Water Fund. A discussion of other litigation affecting the City is set forth under the caption in APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Litigation." See also "THE SYSTEM – The Water System – Environmental Compliance – Lead and Copper Rule" for a discussion of the class actions suit filed against the City and dismissed without prejudice to the plaintiff.

Various claims have been asserted against the City respecting the Water Department and in some cases lawsuits have been initiated. The City may be liable if these claims are reduced to judgment or otherwise settled in a manner requiring payment by the City.

The City, from the Water and Wastewater Funds, paid \$3.8 million in Fiscal Year 2015 and \$5.44 million in Fiscal Year 2016, in judgments and settlements for claims. The Water Department's budget for Fiscal Year 2017 was \$6.5 million, and the Fiscal Year 2018 budget is \$6.5 million.

TAX EXEMPTION

Federal Taxation

In the opinions of Ballard Spahr LLP and Ahmad Zaffarese LLC, both of Philadelphia, Pennsylvania, Co-Bond Counsel, interest on the Bonds is excludable from gross income for purposes of federal income tax under existing laws as enacted and construed on the date of initial delivery of the Bonds, assuming the accuracy of the certifications of the City and continuing compliance by the City with the requirements of the Internal Revenue Code of 1986, as amended (the "Code"). Interest on the Bonds is not an item of tax preference for purposes of either individual or corporate federal alternative minimum tax; however, interest on Bonds held by a corporation (other than an S corporation, regulated investment company, or real estate investment trust) may be indirectly subject to federal alternative minimum tax because of its inclusion in the adjusted current earnings of a corporate holder. Co-Bond Counsel express no opinion regarding other federal tax consequences of ownership or disposition of, or the accrual or receipt of interest on, the Bonds.

The opinion of Co-Bond Counsel will assume the accuracy of certifications made by the City and will be subject to the condition that the City comply with all requirements of the Code that must be satisfied subsequent to the issuance of the Bonds in order that the interest thereon be, and continue to be, excludable from gross income for federal income tax purposes. The City has covenanted to comply with all such requirements, which include, among others, restrictions upon the yield at which proceeds of the Bonds and other money held for the payment of the Bonds and deemed to be proceeds thereof may be invested, the requirement to calculate and rebate any arbitrage that may generated with respect to investments allocable to the Bonds, and restrictions regarding the use of the facilities financed or refinanced with the proceeds of the Bonds. Failure to comply with such requirements could cause interest on the Bonds to be includible in gross income retroactive to the date of issuance of the Bonds.

Original Issue Premium. The Bonds being offered at a premium ("original issue premium") equal generally to the excess of their public offering price over their principal amount are referred to herein as the "Premium Bonds." For federal income tax purposes, original issue premium is amortizable periodically over the term of a Premium Bond through reductions in the holder's tax basis for such Premium Bond for determining taxable gain or loss from sale or from redemption prior to maturity. Amortization of premium does not create a deductible expense or loss. Holders should consult their tax advisors for an explanation of the amortization rules.

Commonwealth of Pennsylvania Taxation

The Bonds are exempt from personal property taxes in Pennsylvania, and interest on the Bonds is exempt from Pennsylvania personal income tax and Pennsylvania corporate net income tax, under the laws of the Commonwealth of Pennsylvania as enacted and construed on the date of issuance and delivery of the Bonds.

Changes in Federal and State Tax Law

From time to time, there are presidential proposals, proposals of various federal committees, and legislative proposals in the Congress and in the states that, if enacted, could alter or amend the federal and state tax matters referred to herein or adversely affect the marketability or market value of the Bonds or otherwise prevent holders of the Bonds from realizing the full benefit of the tax exemption of interest on the Bonds. Further, such proposals may impact the marketability or market value of the Bonds simply by being proposed. It cannot be predicted whether or in what form any such proposals may be enacted or whether if enacted such proposals would apply to bonds issued prior to enactment. In addition, regulatory actions are from time to time announced or proposed and litigation is threatened or commenced which, if implemented or concluded in a particular manner, could adversely affect the market value, marketability or tax status of the Bonds. It cannot be predicted whether any such regulatory action will be implemented, how any particular litigation or judicial action will be resolved, or whether the Bonds would be impacted thereby.

Purchasers of the Bonds should consult their tax advisors regarding any pending or proposed legislation, regulatory initiatives or litigation. The opinions expressed by Co-Bond Counsel are based upon existing legislation and regulations as interpreted by relevant judicial and regulatory authorities as of the date of issuance and delivery of the Bonds, and Co-Bond Counsel have expressed no opinion as of any date subsequent thereto or with respect to any proposed or pending legislation, regulatory initiatives or litigation.

The foregoing is only a general summary of certain provisions of the Code as enacted and in effect on the date hereof and does not purport to be complete. Holders of the Bonds should consult their own tax advisors as to the effects, if any, of the Code in their particular circumstances.

See APPENDIX VI hereto for the Form of Approving Opinion of Co-Bond Counsel.

NEGOTIABLE INSTRUMENTS

The Act provides that bonds issued thereunder shall have all the qualities and incidents of securities under the Uniform Commercial Code of the Commonwealth of Pennsylvania and shall be negotiable instruments.

FINANCIAL CONSULTING AND ENGINEER'S REPORT

As discussed above, the Original Report has been updated by the Supplement in connection with the issuance of the Bonds. The Financial Consulting and Engineer's Report, which is comprised of the Original Report and the Supplement, is included in APPENDIX II of this Official Statement in reliance upon the authority of the respective firms in engineering and related financial matters. Potential purchasers of the Bonds should read the Financial Consulting and Engineer's Report in its entirety. As stated in the Financial Consulting and Engineer's Report, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that actually occur that are unknown at this time and/or which are beyond the control of the Financial Consultant.

UNDERWRITING

The Bonds are being purchased by the underwriters listed on the front cover page of the Official Statement (collectively, the "Underwriters") pursuant to a Bond Purchase Agreement between the City and Barclays, on behalf of itself and as representative of the other Underwriters, at a purchase price of $208,786,175.12, which equals the principal amount of the Bonds, plus original issue premium of $35,388,394.65 and less an aggregate Underwriters' discount of $712,219.53. The Underwriters will purchase all of the Bonds if any such Bonds are not purchased. The obligation of the Underwriters to purchase the Bonds is subject to certain terms and conditions set forth in the Bond Purchase Agreement.

The initial public offering prices of the Bonds set forth on the inside front cover page hereof may be changed without notice by the Underwriters. The Underwriters may offer and sell Bonds to certain dealers (including dealers depositing Bonds into investment trusts, certain of which may be sponsored or managed by one or more of the Underwriters) and others at prices lower than the offering prices set forth on the inside front cover page hereof.

Certain of the Underwriters have entered into distribution agreements with other broker-dealers (that have not been designated by the City as Underwriters) for the distribution of the Bonds to retail investors 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 sales and trading, commercial and investment banking, advisory, investment management, investment research, principal investment, hedging, market making, brokerage and other financial and non-financial activities and services. Certain of the Underwriters and their respective affiliates have provided, and may in the future provide, a variety of these services to the issuer and to persons and entities with relationships with the issuer, 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, officers, directors and employees may purchase, sell or hold a broad array of investments and actively trade securities, derivatives, loans, commodities, currencies, credit default swaps and other financial instruments for their own account and for the accounts of their customers, and such investment and trading activities may involve or relate to assets, securities and/or instruments of the City (directly, as collateral securing other obligations or otherwise) and/or persons and entities with relationships with the City. The Underwriters and their respective affiliates may also communicate independent investment recommendations, market color or trading ideas and/or publish or express independent research views in respect of 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.

RATINGS

Fitch, Moody's and S&P have assigned to the Bonds municipal bond ratings of "A+", "A1" and "A+", respectively. Certain information was supplied by the City and the Water Department to the rating agencies to be considered in evaluating the Bonds. Such ratings express only the views of the respective rating agencies and are not a recommendation to buy, sell or hold the Bonds.

Any desired explanation of the significance of such ratings should be obtained from the rating agency furnishing the same, at the following addresses: Moody's, 7 World Trade Center, 250 Greenwich Street, New York, New York 10007; S&P, 55 Water Street, New York, New York 10041; and Fitch, One State Street Plaza, New York, New York 10004. Generally, a rating agency bases its rating on the information and materials furnished to it and on investigations, studies and assumptions of its own. There is no assurance such ratings will not be revised downward or withdrawn entirely by the rating agencies, if in the judgment of such rating agencies, circumstances so warrant. Any such downward revision or withdrawal of such ratings may have an adverse effect on the market price of the Bonds.

The Underwriters have not assumed responsibility to advise the owners of the Bonds of any change in any rating on the Bonds and neither the City nor the Underwriters have undertaken any responsibility to maintain any particular rating on the Bonds. The City has agreed, in the Continuing Disclosure Agreement, to report actual rating changes on the Bonds. See "CONTINUING DISCLOSURE" herein and APPENDIX VII. Any downward change in or withdrawal of a credit rating may have an adverse effect on the marketability or market price of the Bonds.

LEGAL MATTERS

Certain legal matters incident to the authorization, issuance and sale of the Bonds will be passed upon by Ballard Spahr LLP and Ahmad Zaffarese LLC, both of Philadelphia, Pennsylvania, Co-Bond Counsel. The proposed form of such legal opinion is included herein as APPENDIX VI. Certain legal matters will be passed upon for the City by the City Solicitor. Certain legal matters will be passed upon for the City by Greenberg Traurig, LLP and Turner Law, P.C., both of Philadelphia, Pennsylvania, Co-Disclosure Counsel. Certain legal matters relating to the information contained in APPENDIX IV and APPENDIX V will be passed upon for the City by Hawkins Delafield & Wood LLP of Washington, D.C. and Law Office of Ann C. Lebowitz of Philadelphia, Pennsylvania. Certain legal matters will be passed upon for the Underwriters by Duane Morris LLP of Philadelphia, Pennsylvania.

FINANCIAL ADVISORS

PFM Financial Advisors LLC, of Philadelphia, Pennsylvania and Acacia Financial Group, Inc., of Marlton, New Jersey, have been retained by the City as Co-Financial Advisors in connection with the issuance of the Bonds and, in such capacity, have assisted the City in the preparation of Bond-related documents. The Co-Financial Advisors' fee for services rendered with respect to the sale of the Bonds is contingent upon the issuance and delivery of the Bonds. Although the Co-Financial Advisors have read and participated in the preparation of this Official Statement, they have not independently verified any of the information set forth herein. The information contained in this Official Statement has been obtained primarily from the City's records and from other sources that are believed to be reliable, including financial records of the City, reports of consultants and other entities that may be subject to interpretation. No guarantee is made as to the accuracy or completeness of any such information. No person, therefore, is entitled to rely upon the participation of the Co-Financial Advisors as an implicit or explicit expression of opinion as to the completeness and accuracy of the information contained in this Official Statement.

NO LITIGATION OPINION

Upon the delivery of the Bonds, the City Solicitor will furnish an opinion, in form satisfactory to Co-Bond Counsel and the Underwriters, to the effect that, among other things, and except as disclosed in this Official Statement, there is no litigation or other legal proceeding pending, or, to the best of his knowledge after customary inquiry, threatened in writing against the City, to restrain or enjoin the issuance or delivery of the Bonds or challenging the validity of the proceedings of the City taken in connection therewith or the pledge or application of any monies provided for the payment of the Bonds, or contesting the powers of the City with respect to any of the foregoing.

CERTAIN REFERENCES

All summaries of the provisions of the Bonds and the security therefor, the Act and the General Ordinance set forth herein and in APPENDIX III and all summaries and references to other materials not purported to be quoted in full, are only brief outlines of certain provisions thereof and do not constitute complete statements of such documents or provisions. Reference is made hereby to the complete documents relating to such matters for the complete terms and provisions thereof or for the information contained therein. All estimates, assumptions and statistical information contained herein, while taken from sources considered reliable, are not guaranteed. So far as any statements are made in this Official Statement involving matters of opinion, or projections or estimates, whether or not expressly so stated, they are made merely as such and not as representations of fact.

The attached Appendices are integral parts of this Official Statement and should be read in their entireties together with all foregoing statements in this Official Statement.

The agreement between the City and holders of Bonds is fully set forth in the Bonds and the General Ordinance. Neither this Official Statement nor any advertisement for the Bonds is to be construed as constituting an agreement with purchasers of the Bonds.

CONTINUING DISCLOSURE

In order to assist the Underwriters in complying with the requirements of Rule 15c2-12 promulgated by the Securities and Exchange Commission under the Securities Exchange Act of 1934, as amended (the "Rule"), the City (i) will enter into a Continuing Disclosure Agreement with Digital Assurance Certification, L.L.C., as dissemination agent for the benefit of the holders of the Bonds, to be dated the date of original delivery and payment for the Bonds, the form of which is annexed hereto as APPENDIX VII, and (ii) has provided the disclosure in the following paragraphs.

During the previous five years, the City has failed on occasion to timely file event notices related to certain changes to enhanced ratings assigned to bonds issued by or on behalf of the City (related to changes to the credit quality of banks providing credit and liquidity enhancement or support for certain variable rate bonds). In one other instance, the City timely filed notice of a rating change, but did not associate the notice with all specific relevant outstanding obligations and filed the notice through incorporation by reference of information in an offering document. The foregoing description of instances of non-compliance by the City with its continuing disclosure undertakings should not be construed as an acknowledgement by the City that any such instance was material.

The City has reviewed and updated its disclosure policies and procedures to assist the City in complying with its continuing disclosure undertakings in the future.

CERTAIN RELATIONSHIPS

Ballard Spahr LLP, Co-Bond Counsel, and Greenberg Traurig, LLP, Co-Disclosure Counsel, represent some of the Underwriters of the Bonds, from time to time, in matters unrelated to the issuance of the Bonds.

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This Official Statement has been duly executed and delivered by the following officer on behalf of the City of Philadelphia, Pennsylvania.

THE CITY OF PHILADELPHIA

By: /s/ Rob Dubow

Rob Dubow, Director of Finance

APPENDIX I

FINANCIAL STATEMENTS OF THE WATER FUND
DERIVED FROM THE CAFR
FOR FISCAL YEAR ENDED JUNE 30, 2016

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City Of Philadelphia
Philadelphia Water Department
Financial Statements
Fiscal Years Ended June 30, 2016 And 2015

CITY OF PHILADELPHIA WATER DEPARTMENT

YEAR ENDED JUNE 30, 2016 AND 2015

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The City of Philadelphia Water Department Management Discussion and Analysis

The Philadelphia Water Department is one of the City's ten operating departments and serves under a dedicated Water Fund established pursuant to the Philadelphia Home Rule Charter. Pursuant to the Charter, the Water Department has the power and duty to operate, maintain, repair, and improve the City's water system (the "Water System") and the City's wastewater system (the "Wastewater System"); together with the Water System, the "Water and Wastewater Systems" or the "Combined System").

The Water Department's primary mission is to plan for, operate, and maintain both the infrastructure and the organization necessary to purvey high-quality drinking water, to provide an adequate and reliable water supply for all household, commercial, and community needs, and to sustain and enhance the region's watersheds and quality of life by managing wastewater effectively.

The Water Department serves the City of Philadelphia and also provides wastewater services to ten wholesale customers and water services to one wholesale water customer. The Water Department operates three drinking water plants which have the capacity to treat and deliver about 522 million gallons per day of top quality drinking water that meets or exceeds all federal, state, and local regulations. Additionally, it operates three water pollution control plants that have the capacity to treat over 1 billion gallons of wastewater per day at a level that meets or exceeds federal and state standards.

The operations of the activity of the Water Department are accounted for with a separate set of balancing accounts that comprise the assets, deferred outflows of resources, liabilities, deferred inflows of resources, net position, revenues, and expenses. The activity of the Water Department is grouped in the financial statements into the broad category referred to as an enterprise fund (the "Water Fund").

2016 Financial Highlights

The Water Fund met its bond coverage ratios for the year with a revenue bond coverage ratio of 1.24, a total debt service coverage ratio of 1.13, and a net operating revenue bond coverage ratio of 1.23 prior to the inclusion of the transfer from the Rate Stabilization Fund.

At the end of the current fiscal year, the Water Fund's net position totaled $765.1 million resulting from an excess of its assets and deferred outflows of resources over its liabilities and deferred inflows of resources; its unrestricted net position showed a deficit of $258.2 million. This deficiency will have to be funded from resources generated in future years.

The Water Fund's net position showed an increase of $55.5 million during the current Fiscal Year compared with a decrease of $260.9 million for the prior fiscal year.

Overview of the Financial Statements

This section serves as an introduction to the Basic Financial Statements. It represents management's examination and analysis of the Water Fund's financial condition and performance.

The Financial Statements report information about the Water Fund using the Full Accrual Accounting method as used by similar business activities in the private sector.

The Water Fund's basic financial statements include the statements of net position, statements of revenues, expenses, and changes in net position, statements of cash flows, and notes to the financial statements.

The financial statements are prepared in accordance with accounting principles promulgated by the Governmental Accounting Standards Board (GASB).

> **Statement of Net Position:** The statement of net position presents the financial position of the Water Fund. It presents information on the assets, deferred outflows of resources, liabilities, and deferred inflows of resources with the difference between them reported as net position. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position of the Water Fund is improving or deteriorating.
>
> **Statement of Revenues, Expenses, and Changes in Net Position:** The statement of revenues, expenses, and changes in net position presents information showing how the net position changed during the most recent fiscal year. All changes in net position are reported as soon as the underlying event giving rise to the change occurs, regardless of the timing of related cash flows. Revenues are recognized when earned, not when they are received. Expenses are recognized when incurred, not when they are paid. Thus, revenues and expenses are reported in this statement for some items that will result in cash flows in future fiscal periods (e.g. salary and wages payable).
>
> **Statement of Cash Flows:** The statement of cash flows presents information on the effects changes in assets, liabilities, and operations have on cash during the course of the fiscal year.

The Water Fund's financial statements can be found following the Management Discussion and Analysis. The Notes provide additional information that is essential to a full understanding of the data provided in the Water Fund financial statements. In addition to the basic financial statements and accompanying notes, government accounting standards require presentation of required supplementary information ("RSI"). Following the RSI, the Fund has presented other supplementary information ("OSI").

Please see the Comprehensive Annual Financial Report of the City of Philadelphia for complete financial information for the City and its component units, which can be found at http://www.phila.gov/investor/CAFR.html.

Financial Analysis

Net Position

A three year condensed summary of the Water Fund's net position as of June 30 of each year is presented as follows:

Condensed Statement of Net Position
(Thousands of Dollars)
June 30

	2016	2015*	2014*
Assets:			
Current Assets	$ 233,821	$ 240,216	$ 230,330
Capital Assets	2,230,233	2,149,680	2,070,492
Restricted Assets	772,376	889,928	690,596
Total Assets	3,236,430	3,279,824	2,991,418
Deferred Outflows of Resources	108,809	83,507	66,586
Total Assets and Deferred Outflows	3,345,239	3,363,331	3,058,004
Liabilities:			
Current Liabilities	238,542	225,234	214,671
Bonds Payable	1,842,386	1,974,073	1,809,952
Other Non-Current Liabilities	496,344	454,445	62,898
Total Liabilities	2,577,272	2,653,752	2,087,521
Deferred Inflows of Resources	2,863	-	-
Total Liabilities and Deferred Inflows	2,580,135	2,653,752	2,087,521
Net Position:			
Net Investment in Capital Assets	523,367	385,721	336,980
Restricted	499,916	559,802	506,669
Unrestricted	(258,179)	(235,944)	126,834
Total Net Position, as Restated	$ 765,104	$ 709,579	$ 970,483

*The net position of fiscal year 2014 was not restated for GASB Statement No. 68. The capital asset balances and net position of fiscal years 2015 and 2014 were not restated for a reclassification of expense. For more information on the restatements, see Note 23 and Note 24 to the financial statements.

The Water Fund's net position at June 30, 2016 was approximately $765.1 million, a $55.5 million or 7.8% increase from June 30, 2015. Total assets and deferred outflows of resources decreased by $18.1 million, or 0.5%, to $3.3 billion, and total liabilities and deferred inflows of resources decreased $73.6 million, or 2.8%, to $2.6 billion.

The following is a discussion of the more significant changes in assets and deferred outflows of resources, liabilities and deferred inflows of resources, and net position in fiscal year 2016:

- After restatement (see Note 5 and Note 24), capital assets, net of depreciation and amortization, increased by $102.6 million to $2.2 billion, or 4.8% as a result of capital additions of $278.8 million, offset by depreciation of $101.7 million and net retirements of $74.5 million.

- Current assets decreased by $6.4 million to $233.8 million, or 2.7%, due to decreases in accounts receivable.

- Restricted assets decreased by $117.6 million to $772.4 million, or 13.2%, due to decreases in the Water Capital Fund primarily due to capital expenses.

- Deferred outflows of resources increased by $25.3 million to $108.8 million, or 30.3%, due to deferred outflows of resources related to the Water Fund's net pension liability being recognized during fiscal year 2016, which was partially offset by amortization of the unamortized loss on refunded debt.

- Current liabilities increased by $13.3 million to $238.5 million, or 5.9%, primarily due to an increase in the amount of construction contracts payable.

- Bonds payable decreased by $131.7 million to $1.8 billion, or 6.7%, primarily due to the maturity (pay down) of revenue bonds.

- Other non-current liabilities increased by $41.9 million to $496.3 million, or 9.2%, primarily due to an increase in net pension liability of $40.5 million.

- Deferred inflows of resources increased by $2.9 million to $2.9 million, or 100.0%, due to deferred inflows of resources related to the Water Fund's net pension liability being recognized during fiscal year 2016.

- The Water Fund's net position increased by $55.5 million to $765.1 million, or 7.8%, as a result of fiscal year 2016 operations and capital contributions.

- Net investment in capital assets increased by $137.6 million, or 35.7%, to $523.4 million.

- Unrestricted net position decreased by $22.2 million, or 9.4%, to a deficit of $258.2 million. The unrestricted component of net position represents the net amount of total assets, deferred outflows of resources, total liabilities, and deferred inflows of resources that are not included in the determination of net investment in capital assets or restricted components of net position. The $22.2 million change is primarily due to a prior period adjustment (see Note 24) of $22.0 million, which relates to items that were capitalized and should have been expensed in prior years.

Changes in Net Position

A condensed summary of the Water Fund's Statement of Revenues, Expenses, and Changes in Net Position for the years ended June 30 is presented as follows:

Condensed Statement of Revenues, Expenses, and Changes in Net Position
(Thousands of Dollars)
Year Ended June 30

	2016	2015*	2014*
Operating Revenues:			
Charges for Goods and Services	$ 659,583	$ 667,699	$ 630,429
Miscellaneous Operating Revenues	10,367	8,261	8,146
Operating Grants	870	907	1,399
Total Operating Revenues	670,820	676,867	639,974
Operating Expenses:			
Operating Expenses excluding Depreciation and Amortization	382,272	376,528	354,686
Depreciation and Amortization	101,711	103,763	90,523
Total Operating Expenses	483,983	480,291	445,209
Operating Income (Loss)	186,837	196,576	194,765
Nonoperating Revenues (Expenses):			
Federal, State, & Local Grants	250	-	-
Interest Income	5,600	3,732	4,207
Net Pension Obligation	-	-	(17,712)
Debt Service – Interest	(82,659)	(65,933)	(77,561)
Other Expenses	(2,339)	(3,993)	(2,971)
Total Nonoperating Revenues (Expenses)	(79,148)	(66,194)	(94,037)
Increase in Net Position before Transfers	107,689	130,382	100,728
Transfers Out	(31,622)	(30,258)	(28,333)
Capital Contributions	1,506	1,337	-
Change in Net Position	77,573	101,461	72,395
Net Position – Beginning of Period, Before Restatement	709,579	970,483	898,088
Cumulative Effect of Change in Accounting Principle	-	(362,365)	-
Reclassification of Expense	(22,048)	-	-
Net Position – Beginning of Period, as Restated*	687,531	608,118	898,088
Net Position – Ending of Period	$ 765,104	$ 709,579	$ 970,483

*The net position of fiscal year 2014 was not restated for GASB Statement No. 68. The net position of fiscal years 2015 and 2014 was not restated for a reclassification of expense. For more information on the restatements, see Note 23 and Note 24 to the financial statements.

- Operating revenues decreased by $6.0 million to $670.8 million due to a reduction in charges for goods and services.
- Operating expenses increased by $3.7 million to $484.0 million due primarily to increases in employee benefits and indemnities, partially offset by a reduction in purchased services, materials and supplies, and depreciation expense.
- Non-operating expenses increased by $13.0 million to $79.1 million. The increase in non-operating expenses is due primarily to the debt service interest expense increase of $16.7 million, partially offset by the $1.7 million decrease in other expenses and $1.9 million increase in interest income.

Capital Assets and Debt Administration

Capital Assets

Investment in capital assets, net of accumulated depreciation, amounted to $2.2 billion as of June 30, 2016. This represented an increase of $102.6 million, or 4.8% over the previous year's total of $2.1 billion. Capital assets consist primarily of land, infrastructure, construction in progress, buildings, and equipment. Infrastructure consists of water and wastewater transmission and distribution lines. The following is a summary of capital assets as of June 30:

Capital Asset Activity
(Thousands of Dollars)
June 30

	2016	2015*	2014*
Land	$ 5,919	$ 5,919	$ 5,919
Construction in Progress	296,254	303,005	361,592
Infrastructure	2,466,451	2,422,387	2,269,015
Buildings and Equipment	1,768,387	1,667,810	1,623,520
Accumulated Depreciation	(2,306,778)	(2,249,441)	(2,189,554)
Total Capital Assets, net	$ 2,230,233	$ 2,149,680	$ 2,070,492

*The capital assets of 2015 and 2014 were not restated for a reclassification of expense. For more information on the restatements, see Note 23 and Note 24 to the financial statements.

Long-Term Debt

As of June 30, 2016, the Water Fund had $2.3 billion of non-current liabilities outstanding. This was a decrease of $89.8 million or 3.7% from the previous year. The following is a summary of the non-current liability outstanding as of June 30:

Non-Current Liability Activity
(Thousands of Dollars)
June 30

	2016	2015	2014
Revenue Bonds – Net	$ 1,842,386	$ 1,974,073	$ 1,809,952
Derivative Instrument	1,508	3,289	5,711
Other Non-Current Liabilities	38,995	35,829	30,514
Net Pension Obligation	455,841	415,327	26,673
Total Non-Current Liabilities	$ 2,338,730	$ 2,428,518	$ 1,872,850

The following details activity to debt during 2016:

	(Thousands of Dollars)
Beginning balance at July 1, 2015	$ 2,110,797
Debt issued	5,823
Less principal payments and amortization	(149,506)
Ending balance at June 30, 2016	$ 1,967,114

More detailed information concerning long-term debt activity and capital asset activity is disclosed in Note 14 and Note 5, respectively, of the financial statements.

Budgetary Highlights

Please see the supplementary Budgetary Comparison Schedule located in the Required Supplementary Information section.

Requests for Information

This financial report is designed to provide a general overview of the City of Philadelphia Water Department’s finances for all interested parties. Questions concerning any of the information provided in this report, or requests for additional information, should be addressed to the Philadelphia Water Department, Finance Division, Aramark Tower, 5th Floor, 1101 Market Street, Philadelphia, Pennsylvania 19107.

STATEMENTS OF NET POSITION
JUNE 30, 2016 AND 2015 (Thousands of Dollars)

	June 30 2016	June 30 2015*
ASSETS:		
Current Assets:		
Cash on Deposit and on Hand	$ 30	$ 30
Equity in Treasurer's Account	79,044	80,040
Due from Other Governments	125	-
Accounts Receivable	152,588	158,975
Allowance for Doubtful Accounts	(13,007)	(12,399)
Inventories	14,915	13,323
Receivables	126	247
Total Current Assets	233,821	240,216
Noncurrent Assets:		
Restricted Assets:		
Equity in Treasurer's Account	550,746	668,043
Sinking Funds and Reserves	220,890	221,198
Receivables	740	687
Total Restricted Assets	772,376	889,928
Capital Assets:		
Land	5,919	5,919
Infrastructure	2,466,451	2,422,387
Construction in Progress	296,254	303,005
Buildings and Equipment	1,768,387	1,667,810
Accumulated Depreciation	(2,306,778)	(2,249,441)
Total Capital Assets	2,230,233	2,149,680
Total Noncurrent Assets	3,002,609	3,039,608
Total Assets	**3,236,430**	**3,279,824**
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred Outflow - Fin. Instruments	1,508	3,289
Deferred Outflow - Net Pension Liability	59,042	24,374
Deferred Outflow - Unamortized Loss on Refunded Debt	48,259	55,844
Total Deferred Outflows of Resources	**108,809**	**83,507**
LIABILITIES:		
Current Liabilities:		
Vouchers Payable	6,635	10,798
Accounts Payable	11,939	12,339
Salaries & Wages Payable	6,598	5,582
Construction Contracts Payable	42,880	21,911
Accrued Expenses	33,215	23,554
Due to Other Components	918	3,041
Due to Other Funds	103	-
Unearned Revenue	9,785	8,905
Funds Held in Escrow	1,741	2,380
Current Portion of Long Term Obligations	124,728	136,724
Total Current Liabilities	238,542	225,234
Noncurrent Liabilities:		
Bond Payable - Net	1,842,386	1,974,073
Derivative Instrument Liability	1,508	3,289
Other Noncurrent Liabilities	38,995	35,829
Net Pension Liability	455,841	415,327
Total Noncurrent Liabilities	2,338,730	2,428,518
Total Liabilities	**2,577,272**	**2,653,752**
DEFERRED INFLOWS OF RESOURCES:		
Deferred Inflow - Net Pension Liability	2,863	-
Total Deferred Inflows of Resources	**2,863**	**-**
NET POSITION:		
Net Investment in Capital Assets	523,367	385,721
Restricted For:		
Capital Projects	73,266	132,157
Debt Service	220,889	221,198
Rate Stabilization	205,761	206,447
Unrestricted	(258,179)	(235,944)
Total Net Position	**$ 765,104**	**$ 709,579**

* The capital asset balances and the net position of fiscal year 2015 were not restated for a reclassification of expense.

STATEMENTS OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
FOR FISCAL YEAR ENDED JUNE 30, 2016 AND 2015

(Thousands of Dollars)

	Year Ended June 30	
	2016	**2015***
Operating Revenues:		
Charges for Goods and Services	$ 659,583	$ 667,699
Miscellaneous Operating Revenues	10,367	8,261
Operating Grants	870	907
Total Operating Revenues	670,820	676,867
Operating Expenses:		
Personal Services	122,873	121,770
Purchase of Services	97,409	104,444
Materials and Supplies	36,376	37,382
Employee Benefits	117,394	108,914
Indemnities and Taxes	8,220	4,018
Depreciation and Amortization	101,711	103,763
Total Operating Expenses	483,983	480,291
Operating Income	186,837	196,576
Nonoperating Revenues (Expenses):		
Federal, State, & Local Grants	250	-
Interest Income	5,600	3,732
Debt Service - Interest	(82,659)	(65,933)
Other Expenses	(2,339)	(3,993)
Total Nonoperating Expenses	(79,148)	(66,194)
Increase in Net Position before Transfers	107,689	130,382
Transfers Out	(31,622)	(30,258)
Capital Contributions	1,506	1,337
Change in Net Position	77,573	101,461
Net Position - Beginning of Year, Before Restatement	709,579	970,483
Cumulative Effect of Change in Accounting Principle	-	(362,365)
Reclassification of Expense	(22,048)	-
Net Position - Beginning of Year, as Restated (Note 23)	687,531	608,118
Net Position - End of Year	**$ 765,104**	**$ 709,579**

* The net position of fiscal year 2015 was not restated for a reclassification of expense.

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

STATEMENTS OF CASH FLOWS
FOR FISCAL YEAR ENDED JUNE 30, 2016 AND 2015

(Thousands of Dollars)

	Year Ended June 30 2016	2015
Cash Flows from Operating Activities:		
Receipts from Customers	$ 677,061	$ 675,466
Payments to Suppliers	(143,758)	(141,177)
Payments to Employees	(230,376)	(222,723)
Claims Paid	(5,441)	(4,018)
Net Cash Provided by Operating Activities	**297,486**	**307,548**
Cash Flows from Non-Capital Financing Activities:		
Operating Grants Received	1,120	907
Operating Subsidies and Transfers to Other Funds	(31,622)	(30,258)
Net Cash Used by Non-Capital Financing Activities	**(30,502)**	**(29,351)**
Cash Flows from Capital & Related Financing Activities:		
Proceeds from Capital Debt	5,823	300,758
Acquisition and Construction of Capital Assets	(175,797)	(174,135)
Interest Paid on Capital Debt	(82,250)	(78,951)
Principal Paid on Capital Debt	(136,712)	(121,848)
Other Receipts (Payments)	33	-
Net Cash Used by Non-Capital Financing Activities	**(388,903)**	**(74,176)**
Cash Flows from Investing Activities:		
Interest and Dividends	3,626	2,186
Net Cash Provided by Investing Activities	3,626	2,186
Net (Decrease) Increase in Cash & Cash Equivalents	(118,293)	206,207
Balances - Beginning of the Year	748,113	541,906
Balances - End of the Year	**$ 629,820**	**$ 748,113**
Reconciliation of Operating Income to Net Cash Provided by Operating Activities:		
Operating Income	186,837	196,576
Adjustments to Reconcile Operating Income to Net Cash Provided (Used) by Operating Activities:		
Depreciation and Amortization Expense	101,711	103,763
Change in Assets and Liabilities:		
Receivables, Net	4,220	(1,382)
Inventories	(1,593)	100
Accounts and Other Payables	2,265	3,196
Accrued Expenses	3,166	5,314
Unearned Revenue	880	(19)
Net Cash Provided by Operating Activities	**$ 297,486**	**$ 307,548**
Reconciliation of Cash and Cash Equivalents to Statement of Net Position		
Cash on Deposit and on Hand	30	30
Equity in Treasurer's Account - Current Portion	79,044	80,040
Equity in Treasurer's Account - Noncurrent Portion	550,746	668,043
Total Cash and Cash Equivalents	**$ 629,820**	**$ 748,113**

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

PHILADELPHIA WATER DEPARTMENT
NOTES TO THE FINANCIAL STATEMENTS
JUNE 30, 2016 AND 2015

NOTE 1: REPORTING ENTITY

The City of Philadelphia was founded in 1682 and was merged with the county in 1854. Since 1951 the City has been governed largely under the Philadelphia Home Rule Charter. However, in some matters, including the issuance of short-term and long-term debt, the City is governed by the laws of the Commonwealth of Pennsylvania.

The Philadelphia Water Department serves the City of Philadelphia by providing an integrated water and wastewater system. The utility's primary mission is to plan for, operate and maintain both the infrastructure and the organization necessary to purvey high quality drinking water, to provide an adequate and reliable water supply for all household, commercial, and community needs, and to sustain and enhance the region's watersheds and quality of life by managing wastewater and stormwater effectively.

In order to accomplish its mission, the Water Department has the power and duty to operate, maintain, repair and improve the City's water and wastewater systems. The Water Department is managed by a Commissioner who is appointed by the City's Managing Director with the approval of the Mayor.

The operations of the Water Department are accounted for in separate balancing accounts that comprise its assets, deferred outflows of resources, liabilities, deferred inflows of resources, net position, revenues and expenses. The activity of the Water Department is grouped in the financial statements into the broad category referred to as an enterprise fund ("Water Fund"). Such activities are used to account for operations (1) that are financed and operated in a manner similar to private business enterprises – where the intent of the government body is that costs (expenses, including depreciation) of providing goods and services to the general public on a continuous basis be recovered primarily through user charges or (2) where the government body has decided that periodic determination of revenues earned, expenses occurred, and/or net income is appropriate for capital maintenance, public policy, management's control of accountability, and other purposes.

The activities of the Water Fund are segregated as follows:

- The Operating Fund is used to account for the operations of the water and wastewater systems.
- The Revenue Bond Sinking Fund is used to account for the payment of interest of the outstanding debt.

NOTE 1: REPORTING ENTITY (CONTINUED)

- The Debt Reserve Fund is funded from the proceeds of each series of Water and Wastewater Revenue Bonds; provided, however, that if the Supplemental Ordinance authorizing a series of Water and Wastewater Revenue Bonds shall so authorize, the deposit to the Debt Reserve Account in respect of such Water and Wastewater Revenue Bonds may be accumulated from project revenues over a period of not more than three fiscal years after the issuance and delivery of such Water and Wastewater Revenue Bonds. The moneys and investments in the Debt Reserve Account are held and maintained in an amount equal at all times to the Debt Reserve Requirement. If at any time the moneys in the Debt Service Account of the Sinking Fund shall be insufficient to pay as and when due the principal of (and premium, if any) or interest on any Water and Wastewater Revenue Bonds or other obligations payable from the Debt Service Account (including obligations arising in connection with Qualified Swap Agreements and Credit Facilities), the fiscal agent is required to pay over from the Debt Reserve Account the amount of such deficiency for deposit in the Debt Service Account. With respect to any issue of Water and Wastewater Revenue Bonds, in lieu of the required deposit into the Debt Reserve Account, the City may cause to be deposited into the Debt Reserve Account a surety bond, an insurance policy or an irrevocable letter of credit meeting the requirements of the General Ordinance and the Bond Committee Determination relating to such issue.

  The Debt Reserve Account Amendment authorizes (i) the Director of Finance to apply moneys currently on deposit in the Debt Reserve Account to purchase a surety bond or insurance policy complying with the terms of the General Ordinance (described below), (ii) the transfer of the resulting excess moneys in the Debt Reserve Fund to the Revenue Fund and from there, upon compliance with the provisions of the General Ordinance to a new account in the Residual Fund called the Special Water Infrastructure Account and (iii) the application of the moneys deposited in the Special Water Infrastructure Account to the cost of renewals, replacements and improvements to the water and wastewater systems.

- The Rate Stabilization Fund was created with the sale of the Series 1993 Revenue Bonds on August 20, 1993. The purpose of the Fund is to maintain assets to be drawn down to offset future deficits (and corresponding rate increase requirements) in the Water Department Operating Fund.

  During Fiscal 2016, the fund had the following activity:

Balance at July 1, 2015	$ 206,446,966
Transfer to Operating Fund	(1,629,332)
Interest Earnings	942,994
Balance at June 30, 2016	$ 205,760,628

NOTE 1: REPORTING ENTITY (CONTINUED)

During Fiscal 2015, the fund had the following activity:

Balance at July 1, 2014	$184,795,581
Deposit from Operating Fund	21,456,199
Interest Earnings	195,186
Balance at June 30, 2015	$206,446,966

- The Residual Fund was created with the sale of the Series 1993 Revenue Bonds on August 20, 1993. The purpose of the Fund is to maintain the remaining assets after payment of all operating expenses, payment of all debt service obligations including payments under a swap agreement, scheduled transfers to the Rate Stabilization Fund, and required deposits to the Capital Account of the Construction Fund. The balance of the Residual Fund was $15,188,580 at June 30, 2016 and $14,993,329 at June 30, 2015.

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accompanying financial statements include all funds which are controlled by the City of Philadelphia, on behalf of the Water Fund. The financial statements have been prepared in accordance with Generally Accepted Accounting Principles as they apply to governmental units. The Governmental Accounting Standards Board (GASB) of the American Institute of Certified Public Accountants is the accepted standard setting body for establishing governmental accounting and financial reporting principles. The following is a summary of the significant accounting policies.

A. Basis of Accounting

The financial statements are reported using the economic resources measurement focus and the accrual basis of accounting. Revenues are recorded when earned and expenses are recorded when a liability is incurred, regardless of timing of related cash flows. Grants and similar items are recognized as revenues as soon as all eligibility requirements imposed by the provider have been met.

Operating revenues and expenses are distinguished from non-operating items in the statement of revenues, expenses and changes in net position. Operating revenues and expenses result from providing services in connection with the Water Department’s principle ongoing operations. Principal operating revenues of the Water Department are charges to customers for water use and wastewater collection, transmission and treatment. When calculating user fees charged to customers, the Water Department includes a component for the repayment of principal on the Water Department’s outstanding debt.

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

A. Basis of Accounting (Continued)

Operating expenses include the cost of providing water and watershed services, administrative expenses and depreciation on capital assets. All revenues and expenses not meeting this definition are reported as non-operating revenues and expenses. The principal non-operating revenues of the Water Department are interest and grants. The principal non-operating expenses of the Water Department include interest expense and other miscellaneous expenses.

B. Capital Assets

Capital assets are defined by the City as assets with an initial individual cost of more than $5,000 and an estimated useful life in excess of three years. Capital assets are reported at cost including any liability for contract retainage and construction costs payable. Assets acquired by gift or bequest are recorded at their acquisition price at the date of the gift. Upon sale or retirement, the cost of the assets and the related accumulated depreciation, if any, are removed from the accounts. Maintenance and repair costs are charged to operations. Renewals and betterments are capitalized and depreciated based upon the expected life of such improvements.

The Water Fund transfers construction in progress to one or more of the major asset classes when they are considered substantially complete.

Cost of construction includes all direct contract costs plus overhead charges. Overhead costs include direct and indirect engineering costs and interest incurred during the construction period on projects financed with tax-exempt debt. The amount of interest to be capitalized is calculated by offsetting interest expense incurred from the date of the borrowing until completion of the project with interest on invested proceeds over the same period. Capitalization of interest during construction for Fiscal Year 2016 was $6,212,946 and for Fiscal Year 2015 was $7,685,673.

Depreciation on the capital assets is provided on the straight-line method over their estimated useful lives: computer equipment – 3 years; automotive – 5 years; leasehold improvements – 8 years; general and monitoring equipment – 10 - 20 years; buildings – 40 years; reconstructed transmission and distribution lines – 40 years; and new transmission and distribution lines – 50 years.

C. Bonds and Related Premiums, Discounts, and Issuance Costs

Bond premiums and discounts are deferred and amortized over the life of the bonds using the effective interest method. For financial reporting purposes, bond discounts and premiums are offset against bonds payable. Bond issuance costs are recognized as an expense and reported in the period incurred.

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

D. Inventories

The materials and supplies inventory is priced using the "moving average cost" method.

E. Accounts Receivables

Accounts receivable consist of billed retail and wholesale water and sewer charges that have not been collected as of June 30. The City evaluates the collection of individual account balances and if necessary, records an allowance for doubtful accounts. The City's policy is to file a lien against the respective property for delinquent water, sewer, and storm water customers. The City's policy regarding its water customers is to discontinue services for those that refuse to pay, but only as a last resort. As of June 30, 2016 and 2015 the allowance for doubtful accounts was $13,006,803 and $12,399,107 respectively.

F. Unbilled Revenue

The City bills residential water and sewer customers on a monthly basis and wholesale water and sewer customers on a monthly basis. Revenue earned for services provided through June 30 but unbilled is included in accounts receivable on the accompanying financial statements.

G. Insurance

The City, except for the Airport and certain other properties, is self-insured for most fire and casualty losses to its structures and equipment and provides statutory workers' compensation, unemployment benefits, and health and welfare to its employees through a self-insured plan. Construction contractors are required to carry protective general liability insurance indemnifying the City and the Contractor.

H. Cash and Investments

The Water Fund's cash and investments are held in segregated operating and capital accounts. Sinking funds and reserves are maintained in segregated investment accounts to comply with reserve and other requirements of the bond covenants.

All highly liquid investments (except for Repurchase Agreements) with a maturity of three months or less when purchased are considered to be cash equivalents.

The investments of the City are reported at fair value. Short-term investments are reported at cost, which approximates fair value. Securities traded on national or international exchanges are valued at the last reported sales price. The fair value of real estate investments is based on independent appraisals. Investments, which do not have an established market, are reported at estimated fair value.

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

H. Cash and Investments (Continued)

Statutes authorize the City to invest in obligations of the Treasury, agencies, and instruments of the United States, repurchase agreements, collateralized certificates of deposit, bank acceptance or mortgage obligations, certain corporate bonds, and money market funds. The Pension Trust Fund also is authorized to invest in corporate bonds rated AA or better by Moody's Bond Ratings, common stocks, and real estate.

I. Restricted Assets

Restricted assets represent revenues set-aside for liquidation of specific obligations, as detailed in Note 8.

J. Unearned Revenues

Unearned revenues represent funds received in advance of being earned. In the Water Fund, unearned revenues relate principally to over paid water and sewer bills.

K. Payment to City

In accordance with an agreement between the Finance Director and the Water Department, the Finance Director may transfer to the General Fund up to a limit of $4,994,000 in any fiscal year in "excess interest earnings" as defined by the Rate Covenants under the Ordinance. In Fiscal Years 2016 and 2015, excess interest earnings of $1,555,702 and $745,585, respectively, were transferred to the General Fund of the City.

L. Transfers for Long Term Contracts

In addition to the transfer of funds to the General Fund of the City, the Water Fund had operating transfers of $30,066,352 and $29,512,785 in Fiscal Years 2016 and 2015, respectively, to the Philadelphia Municipal Authority ("PMA") for the long-term contracts described in Notes 19 A, B, and C.

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

M. Net Position

GASB requires the classification of net position into three components – net investment in capital assets; restricted; and unrestricted. These classifications are defined as follows:

Net Investment in Capital Assets – This component of net position consists of capital assets, net of accumulated depreciation, reduced by the outstanding balances of bonds, mortgages, notes, or other borrowings that are attributable to the acquisition, construction, or improvement of those assets. Deferred outflows of resources and deferred inflows of resources that are attributable to the acquisition, construction, or improvement of those assets or related debt are included.

Restricted – This component of net position consists of restricted assets and deferred outflows of resources reduced by liabilities and deferred inflows of resources related to those assets. The restrictions would be imposed by external parties including creditors, grantors, contributors, or laws or regulations of other governments and restrictions imposed by law through constitutional provisions or enabling legislation.

Unrestricted – This component of net position consists of the net amount of the assets, deferred outflows of resources, liabilities, and deferred inflows of resources that are not included in the determination of net investment in capital assets or the restricted component of net position.

When both restricted and unrestricted resources are available for use, it is the City's policy to use restricted resources first, then unrestricted resources, as needed.

N. Deferred Outflows / Inflows of Resources

The statement of net position reports a separate section for deferred outflows of resources. This separate financial statement element represents a consumption of net position that applies to future period(s) and so will not be recognized as an outflow of resources (expense) until then. The Water Fund has three items that qualify for reporting in this category. The statement of net position reports a deferred outflow for refunded debt, a deferred outflow related to pensions, and a deferred outflow from its hedging derivative instrument.

The deferred outflows of resources related to the hedging derivative instrument represent the cumulative change in fair value. Deferred outflows of resources on refunded debt is the result of differences in the carrying value of refunded debt and its reacquisition price. The amount is deferred and amortized over the shorter of the life of the refunded and refunding debt. Deferred outflows of resources related to pensions are discussed in Note 16.

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

N. Deferred Outflows / Inflows of Resources (Continued)

The statement of financial position will sometimes report a separate section for deferred inflows of resources. This separate financial statement element, deferred inflows of resources, represents an acquisition of net position that applies to future period(s) and so will not be recognized as an inflow of resources (revenue) until that time. The Water Fund has one item that qualifies for reporting in this category, a deferred inflow related to pensions. Deferred inflows of resources related to pensions are discussed in Note 16.

O. Accounting Estimates

The preparation of financial statements, in conformity with accounting principles generally accepted in the United States of America, requires management to make estimates and assumptions that affect the reported amounts of assets, deferred outflows of resources, liabilities, deferred inflows of resources and net position and disclosures at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results may differ from those estimates.

P. Adoption of Governmental Accounting Standards Board Statements

The Water Fund adopted the requirements of GASB Statement No. 72, "*Fair Value Measurement and Application*". As a result of the adoption of GASB Statement No. 72, the Water Fund has determined and disclosed all fair value measurements.

The Water Fund adopted the requirements of GASB Statement No. 73, "*Accounting and Financial Reporting for Pensions and Related Assets That Are Not within the Scope of GASB Statement 68, and Amendments to Certain Provisions of GASB Statements 67 and 68*". The adoption of this statement had no effect on previously reported amounts.

The Water Fund adopted the requirements of GASB Statement No. 76, "*The Hierarchy of Generally Accepted Accounting Principles for State and Local Governments*". The adoption of this statement had no effect on previously reported amounts.

Q. Pending Changes in Accounting Principles

In June 2015, the GASB issued Statement No. 74, "*Financial Reporting for Postemployment Benefits Plans Other Than Pension Plans*". The Water Fund is required to adopt the provisions of GASB Statement No. 74 for its fiscal year 2017 financial statements.

In June 2015, the GASB issued Statement No. 75, "*Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*". The Water Fund is required to adopt the provisions of GASB Statement No. 75 for its fiscal year 2018.

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

Q. Pending Changes in Accounting Principles (Continued)

In August 2015, the GASB issued Statement No. 77, "*Tax Abatement Disclosures*". The Water Fund is required to adopt the provisions of GASB Statement No. 77 for its fiscal year 2017 financial statements.

In December 2015, the GASB issued Statement No. 78, "*Pensions Provided through Certain Multiple-Employer Defined Benefit Pension Plans*". The Water Fund is required to adopt the provisions of GASB Statement No. 78 for its fiscal year 2017 financial statements.

In January 2016, the GASB issued Statement No. 79, "*Certain External Investment Pools and Pool Participants*". The Water Fund is required to adopt the provisions of GASB Statement No. 79 for its fiscal year 2017 financial statements.

In January 2016, the GASB issued Statement No. 80, "*Blending Requirements for Certain Component Units – an amendment of GASB Statement No. 14*". The Water Fund is required to adopt the provisions of GASB Statement No. 80 for its fiscal year 2017 financial statements.

In March 2016, the GASB issued Statement No. 81, "*Irrevocable Split-Interest Agreements*". The Water Fund is required to adopt the provisions of GASB Statement No. 81 for its fiscal year 2018 financial statements.

In March 2016, the GASB issued Statement No. 82, "*Pension Issues – an amendment of GASB Statements No. 67, No. 68, and No. 73*". The Water Fund is required to adopt the provisions of GASB Statement No. 82 for its fiscal year 2017 financial statements.

In November 2016, the GASB issued Statement No. 83, "*Certain Asset Retirement Obligations*". The Water Fund is required to adopt the provisions of GASB Statement No. 83 for its fiscal year 2019 financial statements.

In January 2017, the GASB issued Statement No. 84, "*Fiduciary Activities*". The Water Fund is required to adopt the provisions of GASB Statement No. 84 for its fiscal year 2020 financial statements.

The Water Fund has not yet completed the various analyses required to estimate the financial statement impact of these new pronouncements.

NOTE 3: DEPOSITS AND INVESTMENTS

A. Deposits

State statutes require banks to collateralize City deposits at amounts equal to or in excess of the City's balance. Such collateral is to be held by the Federal Reserve Bank or the trust department of a commercial bank other than the pledging bank. At year end, the bank balances were $621.3 million and $996.5 million for 2016 and 2015, respectively.

NOTE 3: DEPOSITS AND INVESTMENTS (CONTINUED)

B. Investments

The City has established a comprehensive investment policy that covers all funds other than the Municipal Pension Fund, the Philadelphia Gas Works Retirement Reserve, and the Fairmount Park and Free Library Trust Funds. Those funds have separate investment policies designed to meet the long-term goals of the funds.

The City's investments include all operating, capital, debt service, and debt service reserve accounts of the City's General Fund, Water Fund, and Aviation Division. All city investments must be in compliance with applicable provisions of the City Code and City bond resolutions, as well as the City's Investment Policy. The City's Investment Policy is meant to supplement the applicable provisions supplement the applicable provisions of the City Code and City bond resolutions, and is reviewed and adopted by the City's Investment Committee. The City's Investment Committee consists of the Director of Finance, the City Treasurer, and a representative from the Water Department, Aviation Division, and the Philadelphia Gas Works.

As of June 30, 2016 the fair values of the Water Fund's investments consist of the following:

(Thousands of Dollars)

Classifications	Fair Value	Percent of Total
U.S. Government Securities	$ 366,587	53.97%
U.S. Government Agency Securities	236,884	34.88%
Corporate Bonds	24,642	3.63%
Other Bonds and Investments	51,081	7.52%
Grand Total	$ 679,194	100.00%

As of June 30, 2015, the fair values of the Water Fund's investments consist of the following:

(Thousands of Dollars)

Classifications	Fair Value	Percent of Total
U.S. Government Securities	$ 272,600	57.98%
U.S. Government Agency Securities	155,901	33.15%
Corporate Bonds	23,947	5.09%
Other Bonds and Investments	17,754	3.78%
Grand Total	$ 470,202	100.00%

NOTE 3: DEPOSITS AND INVESTMENTS (CONTINUED)

B. Investments (Continued)

Interest Rate Risk: The City's investment portfolio is managed to accomplish preservation of principal, maintenance of liquidity, and to maximize the return on investments. To limit its exposure to fair value losses from rising interest rates, the City's investment policy limits fixed income investments to maturities of no longer than 2 years, except in Sinking Fund Reserve Portfolios.

As of June 30, 2016 the maturities of the Water Fund's fixed income investments were as follows:

(Thousands of Dollars)

Classifications	Less Than 1 Year	1 - 2 Years
U.S. Government Securities	$ 131,486	$ 235,101
U.S. Government Agency Securities	130,035	106,849
Corporate Bonds	7,013	17,629
Other Bonds and Investments	31,931	19,150
Grand Total	$ 300,465	$ 378,729

As of June 30, 2015 the maturities of the Water Fund's investments were as follows:

(Thousands of Dollars)

Classifications	Less Than 1 Year	1 - 2 Years
U.S. Government Securities	$ 258,719	$ 13,881
U.S. Government Agency Securities	26,352	129,549
Corporate Bonds	18,937	5,010
Other Bonds and Investments	11,817	5,937
Grand Total	$ 315,825	$ 154,377

NOTE 3: DEPOSITS AND INVESTMENTS (CONTINUED)

B. Investments (Continued)

Credit Risk: The City's policy is to limit credit risk by limiting the type of allowable investments, as well as setting a maximum percent of the portfolio for each type of investment.

The City's investments in US Government securities (34.75%) or US Government Agency obligations (29.86%) are allowable up to 100% of the portfolio. The US Government Agency obligations must be rated AAA by Standard & Poor's Corp. ("S&P") or Aaa by Moody's Investor Services ("Moody's"). All US Government Securities meet the criteria.

The City's investment in Commercial Paper (18.90%) is limited to 25% of the portfolio, and must be rated A1 by S&P and/or M1G1 by Moody's and the senior long-term debt of the issuer must not be rated lower than A by S&P and/or Moody's. All commercial paper investments meet the criteria.

The City's investments in corporate bonds (10.45%) are limited to 25% of the portfolio, and have a S&P rating of AAA or AA or Moody's rating of Aa2 or better.

Short Term Investment Pools are rated AAA by S&P and Aaa by Moody's. The Short Term Investment Pools' amortized cost-based net asset value per share is the same as the value of the pool shares. Cash accounts are swept nightly and idle cash is invested in money market funds (short term investment pools).

The City limits its foreign currency risk by investing in certificates of deposits and banker's acceptances issued or endorsed by non-domestic banks that are denominated in US dollars, providing that the banking institution has assets of not less than $100 million and has a Thompson's Bank Watch Service "Peer Group Rating" not lower than II. At the end of the fiscal year, the City did not have any investments of that nature.

To minimize custodial credit risk, the City's policy is to select custodian banks that are members of the Federal Reserve System to hold its investments. Delivery of the applicable investment documents to the City's custodian is required for all investments.

As of June 30, 2016 the fixed income investments of the Water Fund had the following ratings by Moody's:

Classifications	Credit Quality Rating	Percent of Investment Type
U.S. Government Securities	AAA	100%
U.S. Government Agency Securities	AAA	100%
Corporate Bonds	AAA	18%
Corporate Bonds	AA1	29%
Corporate Bonds	AA2	53%
Other Bonds and Investments	AA1	23%
Other Bonds and Investments	AA2	65%
Other Bonds and Investments	AA3	12%

NOTE 3: DEPOSITS AND INVESTMENTS (CONTINUED)

B. Investments (Continued)

As of June 30, 2015 the fixed income investments of the Water Fund had the following ratings by Moody's:

Classifications	Credit Quality Rating	Percent of Investment Type
U.S. Government Securities	AAA	100%
U.S. Government Agency Securities	AAA	100%
Corporate Bonds	AAA	42%
Corporate Bonds	A1	37%
Corporate Bonds	AA2	21%
Other Bonds and Investments	AA2	100%

C. Fair Value Measurement

The City measures and records its investments using fair value measurement guidelines established by generally accepted accounting principles. These guidelines recognize a three-tiered fair value hierarchy, as follows:

- Level 1: Observable inputs that reflect quoted prices (unadjusted) for identical assets or liabilities in active markets.
- Level 2: Inputs other than quoted prices included in Level 1 that are observable for the asset or liability through corroboration with observable market data.
- Level 3: Unobservable inputs for an asset or liability.

The Water Fund has the following recurring fair value measurements as of June 30, 2016:

- U.S. Treasury securities of $366.6 million are valued using quoted prices from active markets (Level 1).
- U.S. Agency securities of $236.9 million are valued using quoted prices from identical securities that are traded in active markets (Level 2).
- Corporate bonds of $24.6 million and other bonds and investments of $51.1 million are valued using quoted prices for similar securities in active markets and via matrix pricing models (Level 2).

NOTE 4: ACCOUNTS RECEIVABLE

Balances of accounts receivable and allowance for doubtful accounts consisted of the following:

FISCAL YEAR ENDED JUNE 30, 2016	
Accounts Receivable	
Billed in the Last Twelve Months	$ 135,402,994
Billed in 15-year Cycle Billing	9,113,657
Penalties on Receivables	7,321,722
Other Receivables	18,736,616
Subtotal	$ 170,574,989
Bad Debt Written Off	17,986,820
Total	$ 152,588,169
Allowance for Doubtful Accounts	$ 13,006,803

FISCAL YEAR ENDED JUNE 30, 2015	
Accounts Receivable	
Billed in the Last Twelve Months	$ 138,612,875
Billed in 15-year Cycle Billing	17,768,214
Penalties on Receivables	22,714,526
Other Receivables	13,524,265
Subtotal	$ 192,619,880
Bad Debt Written Off	33,644,769
Total	$ 158,975,111
Allowance for Doubtful Accounts	$ 12,399,107

PHILADELPHIA WATER DEPARTMENT
NOTES TO THE FINANCIAL STATEMENTS
JUNE 30, 2016 AND 2015

NOTE 5: PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment at June 30, 2016 and 2015 consisted of the following:

	Beginning Balance*	Additions	Dispositions	Ending Balance
Fiscal Year Ended June 30, 2016				
Capital Assets Not Being Depreciated				
Land	$ 5,919,160	$ -	$ -	$ 5,919,160
Construction in Progress	284,357,128	195,326,061	(183,429,659)	296,253,530
Total Capital Assets Not Being Depreciated	$ 290,276,288	$ 195,326,061	$ (183,429,659)	$ 302,172,690
Capital Asssets Being Depreciated				
Buildings and related improvements	1,590,656,309	102,294,925	(7,938,661)	1,685,012,573
Intangible Assets	14,441,712	741,216	-	15,182,928
Equipment	77,153,927	25,282,377	(19,061,957)	83,374,347
Infrastructure	2,407,945,075	138,637,147	(95,314,493)	2,451,267,729
Total Capital Assets Being Depreciated	$ 4,090,197,023	$ 266,955,665	$ (122,315,111)	$ 4,234,837,577
Less Accumulated Depreciation For:				
Buildings and related improvements	(953,842,551)	(45,229,475)	5,014,662	(994,057,364)
Intangible Assets	(8,760,351)	(1,481,232)	-	(10,241,583)
Equipment	(66,265,555)	(4,055,849)	735,985	(69,585,419)
Infrastructure	(1,223,971,858)	(50,944,974)	42,022,956	(1,232,893,876)
Total Accumulated Depreciation	(2,252,840,315)	(101,711,530)	47,773,603	(2,306,778,242)
Total Capital Assets, Being Depreciated, Net	1,837,356,708	165,244,135	(74,541,508)	1,928,059,335
Total Capital Assets	$ 2,127,632,996	$ 360,570,196	$ (257,971,167)	$ 2,230,232,025

	Beginning Balance	Additions	Dispositions	Ending Balance
Fiscal Year Ended June 30, 2015				
Capital Assets Not Being Depreciated				
Land	$ 5,919,160	$ -	$ -	$ 5,919,160
Construction in Progress	361,591,950	176,436,388	(235,023,251)	303,005,087
Total Capital Assets Not Being Depreciated	$ 367,511,110	$ 176,436,388	$ (235,023,251)	$ 308,924,247
Capital Asssets Being Depreciated				
Buildings and related improvements	1,551,979,787	54,426,060	(15,749,538)	1,590,656,309
Intangible Assets	12,973,506	1,468,206	-	14,441,712
Equipment	71,540,266	24,424,780	(18,811,119)	77,153,927
Infrastructure	2,256,041,472	181,231,429	(29,327,826)	2,407,945,075
Total Capital Assets Being Depreciated	$ 3,892,535,031	$ 261,550,475	$ (63,888,483)	$ 4,090,197,023
Less Accumulated Depreciation For:				
Buildings and related improvements	(922,843,619)	(45,120,983)	14,482,856	(953,481,746)
Intangible Assets	(7,389,590)	(1,370,761)	-	(8,760,351)
Equipment	(63,231,630)	(3,153,513)	119,588	(66,265,555)
Infrastructure	(1,196,089,278)	(54,117,370)	29,273,624	(1,220,933,024)
Total Accumulated Depreciation	(2,189,554,117)	(103,762,627)	43,876,068	(2,249,440,676)
Total Capital Assets, Being Depreciated, Net	1,702,980,914	157,787,848	(20,012,415)	1,840,756,347
Total Capital Assets	$ 2,070,492,024	$ 334,224,236	$ (255,035,666)	$ 2,149,680,594

*Fiscal year 2016 beginning balances have been restated; see Note 24 for additional information.

NOTE 6: LEASES

The Water Fund enters into various operating leases to finance the purchase of photocopier and computer equipment. Leases are defined by the Financial Accounting Standard Board in Statement 13, Accounting for Leases. Lease payments consisted of $1,899,734 in fiscal year 2016, and $1,951,900 in fiscal year 2015. The assets acquired through the leases are shown as equipment within the Capital Asset Note (See Note 5).

NOTE 7: IMPAIRED ASSETS

Government Accounting Standards Board (GASB) Statement 42 requires the disclosure of the impairment of any major capital assets. Over the years, there have been a number of the Water Fund's assets that were either damaged or destroyed, were abandoned or became functionally obsolete.

No asset impairments occurred during fiscal year 2016 and 2015.

NOTE 8: RESTRICTED ASSETS

Assets whose use is limited to a specific purpose have been classified as "restricted" in the Statement of Fund Net Position. Restricted assets as of June 30, 2016, are comprised of the following:

	(Thousands of Dollars)	
	Cash and Investments	**Accrued Interest**
Amounts Reserved for:		
Capital Projects	$ 329,957	$ 20
Rate Stabilization	205,600	160
Residual	15,189	14
Debt Service Reserve	220,890	546
Total	$ 771,636	$ 740

NOTE 8: RESTRICTED ASSETS (CONTINUED)

Restricted assets as of June 30, 2015, are comprised of the following:

(Thousands of Dollars)	Cash and Investments	Accrued Interest
Amounts Reserved for:		
Capital Projects	$ 446,755	$ 106
Rate Stabilization	206,298	150
Residual	14,990	6
Debt Service Reserve	221,198	425
Total	$ 889,241	$ 687

NOTE 9: VACATION LEAVE

Employees are credited with vacation at rates which vary according to length of service. Vacation may be taken or accumulated up to certain limits until paid upon retirement or termination. Employees' vacation time accrued under Other Noncurrent Liabilities on the Statement of Net Position in Fiscal Year 2016 was $10,793,406 and in Fiscal Year 2015 was $10,133,491. The expense for vacation pay is recognized in the year earned.

NOTE 10: SICK LEAVE

Employees are credited with varying amounts of sick leave according to type of employee and/or length of service. Employees may accumulate unused sick leave to predetermined balances. Non-uniformed employees (upon retirement only) and uniformed employees (upon retirement or in case of death while on active duty) are paid varying amounts ranging from 25% to 50% of unused sick time, not to exceed predetermined amounts. Employees, who separate for any reason other than indicated above, forfeit their entire sick leave. The City budgets for and charges the cost of sick leave as it is taken.

NOTE 11: ACCOUNTING FOR THE NEW RIVER CITY PROJECT FUNDS – WATER SINKING FUND RESERVE SUBSTITUTION

Pursuant to the Water Department's General Bond Ordinance, the Sinking Fund Reserve provides a reserve against default of the payment of principal and interest on Water Revenue Bonds when due.

NOTE 11: ACCOUNTING FOR THE NEW RIVER CITY PROJECT FUNDS – WATER SINKING FUND RESERVE SUBSTITUTION (CONTINUED)

The New River City Ordinance dated January 23, 2007 (Bill No 060005) authorized the purchase and deposit of a surety bond that meets the requirements of the General Ordinance to replace $67,000,000 of the Sinking Fund reserve Balance. The $67,000,000 was used as follows:

Cost of the surety bond	$2,010,000
Legal and financial services	290,000
Management fees	375,000
Costs of certain water and sewer infrastructure components of the New River City Program	64,325,000
Total	$67,000,000

The prepaid surety bond was recorded as an asset in the Sinking Fund Reserve and amortized over the lives of the outstanding bonds.

In connection with the New River City Program, the City executed a program agreement with Philadelphia Authority for Industrial Development ("PAID") to provide program management and oversight for the program. To date, twelve projects totaling $83,697,833 have been executed (disbursements were limited to the $64,325,000). As of June 30, 2016, all projects were completed and all of the project funds have been disbursed. The transfer of the water and sewer utilities at Philadelphia Naval Business Center from PAID to the Water Department, including the projects outlined above, and occurred in November, 2009.

NOTE 12: DEFERRED COMPENSATION PLAN

The City offers its employees a deferred compensation plan in accordance with Internal Revenue Code section 457. As required by the Internal Revenue Code and Pennsylvania laws in effect at June 30, 2014, the assets of the plan are held in trust for the exclusive benefit of the participants and their beneficiaries. In accordance with GASB Statement No. 32, *Accounting and Financial Reporting for Internal Revenue Code Section 457 Deferred Compensation Plans*, the City does not include the assets or activity of the plan in its financial statements.

NOTE 13: ARBITRAGE REBATE

The City has issued Water and Waste Water Revenue Bonds subject to Federal arbitrage requirements. Federal tax legislation requires the accumulated net excess of interest income on the proceeds of these issues over interest expense paid on the bonds be paid to the federal government at the end of a five- year period. The arbitrage liability was zero as of June 30, 2016 and 2015.

NOTE 14: DEBT PAYABLE

A summary of changes in long-term debt obligations as of June 30, 2016 follows:

(In Thousands)

	Beginning Balance	Additions	Reductions	Ending Balance	Amounts Due Within One Year
Water and Sewer Revenue Bonds	$ 1,847,625	$ -	$ (126,040)	$ 1,721,585	$ 113,985
Pennvest Loans	143,583	5,823	(10,667)	138,739	10,743
Unamortized Bond Premium	119,589	-	(12,799)	106,790	-
Derivative Instrument Liability	3,289	-	(1,781)	1,508	-
Net Pension Liability	415,327	40,514	-	455,841	-
Other Non-Current Liabilities:					
Accrued Worker's Compensation	21,990	3,770	(4,042)	21,718	-
Accrued Legal Claims	3,706	8,178	(5,400)	6,484	-
Compensated Absences	10,133	2,505	(1,845)	10,793	-
Total Non-Current Liabilities	$ 2,565,242	$ 60,790	$ (162,574)	$ 2,463,458	$ 124,728

A summary of changes in long-term debt obligations as of June 30, 2015 follows:

(In Thousands)

	Beginning Balance, as Restated (See Note 23)	Additions	Reductions	Ending Balance	Amounts Due Within One Year
Water and Sewer Revenue Bonds	$ 1,698,060	$ 417,560	$ (267,995)	$ 1,847,625	$ 126,040
Pennvest Loans	153,385	758	(10,560)	143,583	10,684
Unamortized Bond Premium	83,807	52,895	(17,113)	119,589	-
Derivative Instrument Liability	5,711	-	(2,422)	3,289	-
Net Pension Liability	389,038	26,289	-	415,327	-
Other Non-Current Liabilities:					
Accrued Worker's Compensation	16,814	9,038	(3,862)	21,990	-
Accrued Legal Claims	3,529	3,977	(3,800)	3,706	-
Compensated Absences	10,171	2,144	(2,182)	10,133	-
Total Non-Current Liabilities	$ 2,360,515	$ 512,661	$ (307,934)	$ 2,565,242	$ 136,724

NOTE 14: DEBT PAYABLE (CONTINUED)

An analysis of debt service requirements to maturity on the long-term obligations follows:

(In Millions)

Year Ended June 30:	Principal Requirements	Interest Requirements	Total Debt Service Requirements
2017	$ 124.8	$ 81.4	$ 206.2
2018	131.4	76.6	208.0
2019	86.7	72.1	158.8
2020	79.5	68.4	147.9
2021	83.4	65.0	148.4
2022 - 2026	338.7	276.6	615.3
2027 - 2031	300.9	212.8	513.7
2032 - 2036	238.5	148.9	387.4
2037 - 2041	257.2	92.5	349.7
2042 - 2046	219.2	25.1	244.3
	$ 1,860.3	$ 1,119.4	$ 2,979.7

Pertinent information regarding long-term debt obligations outstanding is presented below:

Date of Issue	Amount of Original Issue	Purpose	Balance Outstanding at: June 30, 2016	Balance Outstanding at: June 30, 2015
1997	$78,500,000	Water and Wastewater Revenue Bonds, Variable Rate Series of 1997B, issued for various capital projects, to fund the Debt Reserve Account, and to pay the costs of issuance related to the bond issue at a variable rate.	$56,900,000	$60,400,000
1999	6,700,000	Pennsylvania Infrastructure Investment Authority Loan of 1999, issued for various capital projects at a rate of 1.41% - 2.73%.	246,933	329,633

NOTE 14: DEBT PAYABLE (CONTINUED)

Date of Issue	Amount of Original Issue	Purpose	Balance Outstanding at: June 30, 2016	June 30, 2015
2005	$250,000,000	Water and Wastewater Revenue Bonds, Series of 2005A, issued for various capital projects, to fund the Debt Reserve Account of the Sinking Fund, and to pay the costs of issuance related to the bond issue at a rate of 3% - 5.25%.	$ -	$ 5,810,000
2005	83,665,000	Water and Wastewater Revenue Refunding Bonds, Variable Rate Series of 2005B, issued for defeasing a portion of the Series of 1995 Bonds, and to pay the costs of issuance related to the bond issue at a variable rate.	35,325,000	51,640,000
2007	345,035,000	Water and Wastewater Revenue Refunding Bonds, Series of 2007A and 2007B, issued for defeasing the Series of 1997A and Series of 2001A Bonds, and to pay the costs of issuance related to the bond issue at a rate of 4% - 5%.	241,375,000	241,630,000
2009	140,000,000	Water and Wastewater Revenue Bonds, Series of 2009A, issued for various capital projects, issued for funding the Debt Reserve Account of the Sinking Fund, and to pay the costs of issuance related to the bond issue at a rate of 4% - 5.75%.	140,000,000	140,000,000
2009	22,828,000	Pennsylvania Infrastructure Investment Authority Loan of 2009 (B), issued for various capital projects at a rate of 1.193% - 2.107%.	21,464,949	22,966,665
2009	35,667,000	Pennsylvania Infrastructure Investment Authority Loan of 2009 (C), issued for various capital projects at a rate of 1.193% - 2.107%.	35,528,947	33,427,837
2009	64,380,000	Pennsylvania Infrastructure Investment Authority Loan of 2009 (D), issued for various capital projects at a rate of 1.193% - 2.107%.	56,396,744	60,356,734

NOTE 14: DEBT PAYABLE (CONTINUED)

Date of Issue	Amount of Original Issue	Purpose	Balance Outstanding at: June 30, 2016	June 30, 2015
2010	$ 8,111,000	Pennsylvania Infrastructure Investment Authority Loan of 2010 (B), issued for various capital projects at a rate of 1.193% - 2.107%.	$ 25,101,563	$ 26,502,897
2010	396,460.000	Water and Wastewater Revenue Refunding Bonds, Series of 2010A, issued for defeasing the Series of 2003 Bonds, issued for funding a payment to terminate the Series of 2003 Swap Agreement, for funding the required deposit into the Debt Reserve Account of the Sinking Fund, and to pay the costs of issuance related to the bond issue at a rate of 2% - 5%.	102,395,000	202,555,000
2010	185,000,000	Water and Wastewater Revenue Bonds, Series of 2010C, issued for funding a payment to terminate the Series of 2007 Swap Agreement, fund the required deposit into the Debt Reserve Account of the Sinking Fund, and to pay the costs of issuance related to the bond issue at a rate of 3% - 5%.	185,000,000	185,000,000
2011	184,855,000	Water and Wastewater Revenue Bonds, Series of 2011A, and Water and Wastewater Revenue Refunding Bonds, Series of 2011B, issued for partially defeasing the Series of 2001A and Series of 2007A Bonds, for various capital projects, for funding of capitalized interest, for financing any required deposit into the Debt Reserve Account of the Sinking Fund, and to pay the cost of issuance related to the bond issue at a rate of 4% - 5%.	184,855,000	184,855,000
2012	70,370,000	Water and Wastewater Revenue Refunding Bonds, Series of 2012, issued for defeasing the Series of 2001A and 2001B Bonds and to pay the cost of issuance related to the bond issue at a rate of 1% - 5%.	65,005,000	65,005,000

NOTE 14: DEBT PAYABLE (CONTINUED)

Date of Issue	Amount of Original Issue	Purpose	Balance Outstanding at: June 30, 2016	June 30, 2015
2013	$170,000,000	Water and Wastewater Revenue Bonds, Series of 2013A, issued to finance capital improvements, finance a deposit to the Debt Reserve Account, and to pay the cost of issuance related to the bond issue at a rate of 3% to 5.125%.	$ 170,000,000	$ 170,000,000
2014	123,170,000	Water and Wastewater Revenue Bonds, Series of 2014A, issued to advance refund a portion of the Series of 2005A Bonds, to finance capital improvements, finance a deposit to the Debt Reserve Account, and to pay the cost of issuance related to the bond issue at a rate of 3% to 5%.	123,170,000	123,170,000
2015	417,560,000	Water and Wastewater Revenue Bonds, Series of 2015A and 2015B, issued to finance capital improvements, finance a deposit to the Debt Reserve Account, current refund a portion of the Series of 2005 A Bonds, advance refund a portion of the Series of 2007A Bonds, and pay the cost of issuance related to the bond issue at a rate of 3.45% to 5.00%.	417,560,000	417,560,000
			$1,860,324,136	$1,991,208,766

The Water Fund has defeased certain bonds by placing the proceeds of new bonds in irrevocable trusts to provide for all future debt service payments on old bonds. Accordingly, the trust account assets and the liability for the defeased bonds are not included in the Water Fund's financial statements. As of June 30, 2016, $70.3 million of bonds outstanding were considered defeased. As of June 30, 2015 $283.2 million of bonds outstanding were considered defeased.

NOTE 14: DEBT PAYABLE (CONTINUED)

Pennvest Loans

In July 2010, the Water Department received approval from the Pennsylvania Infrastructure Investment Authority ("PENNVEST") for the Green Infrastructure Project (Series 2010B), bringing the total financing from PENNVEST to $214.9 million. During fiscal year 2016 and 2015, PENNVEST drawdowns totaled $5,823,347 and $758,160, respectively, which represent an increase in bond issuances. The funding is through low interest loans of 1.193% during the construction period and for the first five years of amortization (interest only payment are due during the construction period up to three years) and 2.107% for the remaining fifteen years.

Individual loan information as of June 30, 2016 is as follows:

Date	Series	Maximum Loan Amount	Approved Project Costs	Amount Requested through 6/30/16	Amount Received Yes/No
October 2009	2009B	$ 42,886,030	$ 42,339,199	$ 29,432,930	Yes
October 2009	2009C	57,268,193	56,264,382	46,699,887	Yes
March 2010	2009D	84,759,263	84,404,754	71,956,891	Yes
July 2010	2010B	30,000,000	31,376,846	28,500,000	Yes
	Totals	$214,913,486	$214,385,181	$176,589,708	

Individual loan information as of June 30, 2015 is as follows:

Date	Series	Maximum Loan Amount	Approved Project Costs	Amount Requested through 6/30/15	Amount Received Yes/No
October 2009	2009B	$ 42,886,030	$ 42,339,199	$ 28,790,697	Yes
October 2009	2009C	57,268,193	56,264,382	41,771,895	Yes
March 2010	2009D	84,759,263	84,404,754	71,703,769	Yes
July 2010	2010B	30,000,000	31,376,846	28,500,000	Yes
	Totals	$214,913,486	$214,385,181	$170,766,361	

NOTE 15: DERIVATIVE INSTRUMENT

City of Philadelphia, 2005 Water & Sewer Swap

Objective: In December 2002, the City entered into a swaption that provided the City with an up-front payment of $4.0 million. As a synthetic refunding of all or a portion of its 1995 Bonds, this payment approximated the present value savings, as of December 2002, of a refunding on May 4, 2005. The swaption gave Citigroup (formerly of Salomon Brothers Holding Company, Inc.), the option to enter into an interest rate swap to receive fixed amounts and pay variable amounts.

Terms: Citigroup exercised its option to enter into a swap May 4, 2005, and the swap commenced on that date. Under the terms of the swap, the City pays a fixed rate of 4.53% and receives a variable payment computed as the actual bond rate or the alternatively, 68.5% of one month LIBOR, in the event the average rate on the Bonds as a percentage of the average of one month LIBOR has exceeded 68.5% for a period of more than 180 days. Citigroup is currently paying 68.5% of one month LIBOR under the swap. The payments are based on an amortizing notional schedule (with an initial notional amount of $86.1 million), and when added to an assumption for remarketing, liquidity costs and cost of issuance were expected to approximate the debt service of the refunded bonds at the time the swaption was entered into.

In May 2013, the City and Water Department converted the original variable rate bonds associated with the swap to an index-based rate, terminating the existing letter of credit in the process.

As of June 30, 2016, the swap had a notional amount of $35.33 million and the associated variable rate bond had a $35.33 million principal amount. The bonds' variable rate coupons are based on the same index as the receipt on the swap. The bonds mature on August 1, 2018 and the related swap agreement terminates on August 1, 2018.

Fair value: As of June 30, 2016, the swap had a negative fair value of ($1.51 million). This means that the Water Department would have to pay this amount if the swap terminated. The fair value of the swap was measured using the income approach and is categorized within Level 2 of the fair value hierarchy.

Risk: As of June 30, 2016, the City is not exposed to credit risk because the swap had a negative fair value. Should interest rates change and the fair value of the swap become positive, the City would be exposed to credit risk in the amount of the swap's fair value. Since the City is now receiving 68.5% of one month LIBOR, and paying 68.5% of one month LIBOR plus a fixed spread, the City is no longer exposed to basis risk or tax risk. The swap includes an additional termination event based on credit ratings. The swap may be terminated by the City if the ratings of Citigroup or its Credit Support Provider fall below A3 or A-, or by Citigroup if the rating of the City's Water and Wastewater Revenue Bonds falls below A3 or A-. There are 30-day cure periods to these termination events. However, because the City's swap payments are insured by Assured Guaranty Municipal Corporation (formerly FSA), no termination event based on the City's Water and Wastewater Revenue Bond ratings can occur as long as Assured is rated at least A or A2.

NOTE 15: DERIVATIVE INSTRUMENT (CONTINUED)

As of June 30, 2016, rates were as follows:

	Terms	Rates
Interest Rate Swap		
Fixed payment to Citi under swap	Fixed	4.53000 %
Variable rate payment from Citi under swap	68.5% of 1-month Libor	(0.31856)%
Net interest rate swap payments		4.21144 %
Variable rate bond coupon payments	68.5% of 1-month Libor + fixed spread	0.31856 %*
Synthetic interest rate on bonds		4.53000 %

**Excludes fixed spread, which is similar to the City's expected Letter of Credit costs on a comparable variable rate bond*

As of June 30, 2015, rates were as follows:

	Terms	Rates
Interest Rate Swap		
Fixed payment to Citi under swap	Fixed	4.53000 %
Variable rate payment from Citi under swap	68.5% of 1-month Libor	(0.12604)%
Net interest rate swap payments		4.40396 %
Variable rate bond coupon payments	68.5% of 1-month Libor + fixed spread	0.12604 %*
Synthetic interest rate on bonds		4.53000 %

**Excludes fixed spread, which is similar to the City's expected Letter of Credit costs on a comparable variable rate bond*

Swap payments and associated debt: As of June 30, 2016, debt service requirements of the variable rate debt and net swap payments for their term, assuming current interest rates remain the same, were as follows:

Fiscal Year Ending	Variable Rate Bonds		Interest Rate	
June 30	Principal	Interest	Swaps, Net	Total Interest
2017	17,145,000	112,531	1,487,691	1,600,222
2018	18,015,000	57,914	765,640	823,554
2019	165,000	526	6,949	7,475
Total	$ 35,325,000	$ 170,971	$2,260,280	$2,431,251

NOTE 16: CITY PENSION PLAN

The City maintains two single employer defined benefit plans for its employees and several of its component units. The two plans maintained by the City are the City Plan and the Philadelphia Gas Works (the "PGW") Plan. In addition to the City, the three other quasi-governmental agencies that participate in the City Plan are the Philadelphia Parking Authority (the "PPA"), the Philadelphia Municipal Authority (the "PMA"), and the Philadelphia Housing Development Corporation (the "PHDC").

The Water Fund is included within the City's pension plan. The Water Fund represents 7.44 percent of the City's net pension liability, deferred outflows of resources, and deferred inflows of resources under the plan. This is based on the pensionable salaries related to the Water Fund.

Effective with Fiscal Year 2015, the City implemented GASB Statement No. 68, "*Accounting and Financial Reporting for Pensions – an amendment of GASB Statement No. 27"*. This statement revises existing standards for measuring and reporting pension liabilities for pension plans. GASB Statement No. 68 defines a single employer as the primary government and its component units. All three quasi-governmental agencies that participate in the City Plan were determined to be component units of the City. Therefore, the City Plan meets the definition of a single employer plan.

The note disclosures and Required Supplementary Information required by GASB Statement No. 67, "*Financial Reporting for Pension Plans – an amendment of GASB Statement No. 25*", are presented in separately issued audited financial statements of the City plan and PGW plan. Copies of these financial statements may be obtained by contacting the Director of Finance of the City of Philadelphia.

A. Plan Administration

The Philadelphia Board of Pensions and Retirement (the "Board") administers the City of Philadelphia Municipal Pension Fund (the "Pension Fund"), a single employer defined benefit pension plan with a small but increasing defined contribution component, which provides pensions for all officers and employees of the City, as well as those of three quasi-governmental agencies (per applicable enabling legislation and contractual agreements). The Board was established by section 2-308 of the 1952 Philadelphia Home Rule Charter. Its actions in administering the Retirement System are governed by Title 22 of the Philadelphia Code.

The Board consists of nine voting members – four elected by the active members within the civil service, and the City's Controller, Solicitor, Managing Director, Personnel Director, and Director of Finance, who serves as the Chair.

NOTE 16: CITY PENSION PLAN (CONTINUED)

B. Plan Membership

At July 1, 2015, the date of the most recent actuarial valuation, pension plan membership consisted of the following:

Actives	27,951
Terminated Vested	1,334
Disabled	4,016
Retirees	22,245
Beneficiaries	8,566
DROP	1,784
Total City Members	65,896
Annual Salaries	$1,597,848,869
Average Salary per Active Member	$57,166
Annual Retirement Allowances	$719,580,951
Average Retirement Allowance	$20,662

C. Contributions

Per Title 22 of the Philadelphia Code, members contribute to the System at various rates based on bargaining unit, uniform status, and entry date into the System. As of July 1, 2015 members contribute at one of the following rates:

Employee Class	Plan 67	Plan 87	Plan 10
Uniform	6.00%	5.00% or 6.00%	5.50%
Non-Uniform	3.75, 4.25%, 5.62%, 6.00%, or 6.50%	1.97%, 2.47%, 2.64%, 3.14%, 3.29%, 3.47%, or 4.14%	3.16%
Elected Officials	N/A	8.48%, 9.11%, 9.48%, or 10.11%	3.16%

Employer contributions are made by the City throughout each fiscal year (which ends June 30) and by three (3) quasi-governmental agencies on a quarterly basis. These contributions, determined by an annual actuarial valuation report ("AVR"), when combined with plan member contributions, are expected to finance the cost of benefits earned by plan members during the year, with an additional amount to finance any unfunded accrued liability.

Within the AVR, two contribution amounts are determined based upon two different sets of rules for determining the way the unfunded actuarial liability is funded.

NOTE 16: CITY PENSION PLAN (CONTINUED)

C. Contributions (Continued)

The first method is defined in accordance with Act 205 and defines the Minimum Municipal Obligation ("MMO"), which is the City's minimum required contribution under Pennsylvania state law.

The second method is in accordance with the City's Funding Policy which predates the Act 205 rules and calls for contributions that are greater than the MMO until the initial unfunded liability determined in 1984 is fully funded.

Under both funding methods there are two components: the normal cost and the amortized unfunded actuarial liability. The actuarial unfunded liability is the amount of the unfunded actuarial liability that is paid each year based upon the given or defined amortization periods. The amortization periods are different under the MMO and City's Funding Policy.

D. Funding Policy

The initial July 1, 1985 unfunded actuarial liability ("UAL") is amortized over 34 years ending June 30, 2019 with payments increasing at 3.3% per year, the assumed payroll growth. Other charges in the actuarial liability are amortized in level-dollar payments as follows:

- Actuarial gains and losses – 20 years beginning July 1, 2009. Prior gains and losses were amortized over 15 years.
- Assumptions changes – 15 years beginning July 1, 2010. Prior changes were amortized over 20 years.
- Plan changes for active members – 10 years.
- Plan changes for inactive members – 1 year.
- Plan changes mandated by the State – 20 years.

In fiscal year 2016, the City and other employers' contributions of $660.2 million was less than the actuarially determined employer contribution (ADEC) of $846.2 million. In the event that the City contributes less than the funding policy, an experience loss will be created that will be amortized in accordance with funding policy over 20 years.

The Schedule of Employer Contributions (based on the City's Funding Policy) is included as Required Supplemental Information and provides a 10-year presentation of employer contributions.

E. Minimum Municipal Obligation

For the purposes of the MMO under Act 205 reflecting the fresh start amortization schedule, the July 1, 2009 UAL was "fresh started" to be amortized over 30 years ending June 30, 2039. This is a level dollar amortization of the UAL. All future amortization periods will follow the City's Funding Policies as outlined above.

NOTE 16: CITY PENSION PLAN (CONTINUED)

E. Minimum Municipal Obligation (Continued)

In fiscal year 2016, the City and other employers' contributions of $660.2 million exceeded the Minimum Municipal Obligation of $598.5 million.

The Schedule of Employer Contributions (based on the MMO Funding Policy) is included as Required Supplemental Information and provides a 10-year presentation of employer contributions.

F. Investment Policy

The Pension Board's Investment Policy Statement provides, in part:

The overall investment objectives and goals should be achieved by use of a diversified portfolio, with safety of principal a primary emphasis. The portfolio policy should employ flexibility by prudent diversification into various asset classes based upon the relative expected risk-reward relationship of the asset classes and the expected correlation of their returns.

The Fund seeks an annual total rate of return of not less than 7.75% over a full market cycle. It is anticipated that this return standard should enable the Fund to meet its actuarially assumed earnings projection (currently 7.75%) over a market cycle. The investment return assumption was reduced by the Board from 7.80% to 7.75%. The Fund's investment program will pursue its afore-stated total rate of return by a combination of income and appreciation, relying upon neither exclusively in evaluating a prospective investment for the Fund.

All investments are made only upon recommendation of the Fund's Investment Committee and approval by a majority of the Pension Board. In order to document and communicate the objectives, restrictions, and guidelines for the Fund's investment staff and investments, a continuously updated Investment Policy Statement will be maintained. The Investment Policy Statement will be updated (and re-affirmed) each year at the January Board meeting.

NOTE 16: CITY PENSION PLAN (CONTINUED)

F. Investment Policy (Continued)

The following was the Board's approved asset allocation policy as of June 30, 2016:

Asset Class	Target Allocation
US Equity	29.8%
Non-US Equity – Developed	16.8%
Non-US Equity – Emerging	5.2%
Fixed Income – Investment Grade	19.0%
Fixed Income – Non-Investment Grade	7.5%
Real Assets – Private Real Estate	2.6%
Real Assets – Public Real Estate	1.4%
Real Assets – MLP's	1.9%
Private Equity	9.1%
Private Debt	1.9%
Hedge Funds	3.7%
Cash & Other	1.1%
Total	100.0%

Money Weighted Rate of Return: For the year ended June 30, 2016, the annual money-weighted of return on pension plan investments, net of pension plan investment expense, was -3.20%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for changing amounts actually invested.

G. Benefits

The Pension Fund provides retirement, disability, and death benefits according to the provisions of Title 22 of the Philadelphia Code. These provisions prescribe retirement benefit calculations, vesting thresholds, and minimum retirement ages, that vary based on bargaining unit, uniform/non-uniform status, and entry date into the System.

Non-uniform employees may retire at either age 55 with up to 80% of average final compensation ("AFC") or may retire at either age 60 with up to 100% or 25% of AFC, depending on entry date into the System. Uniform employees may retire at either age 45 with up to 100% of AFC or age 50 with up to either 100% or 35% of AFC, depending on entry date into the System. Survivorship selections may result in an actuarial reduction to the calculated benefit.

Members may qualify for service-connected disability benefits regardless of length of service. Service-connected disability benefits are equal to 70% of a member's final rate of pay, and are payable immediately without an actuarial reduction. These applications require approval by the Board.

NOTE 16: CITY PENSION PLAN (CONTINUED)

G. Benefits (Continued)

Eligibility to apply for non-service-connected disability benefits varies by bargaining unit and uniform/non-uniform status. Non-service connected disability benefits are determined in the same manner as retirement benefits, and are payable immediately.

Service connected death benefits are payable to:

1) surviving spouse/life partner at 60% of final rate of pay plus up to 2 children under age 18 at 10% each of final rate of pay (maximum payout: 80%);
2) if no surviving spouse/life partner, up to 3 children under age 18 at 25% each of final rate of pay (maximum payout 75%); or
3) if no surviving spouse/life partner or children under age 18, up to 2 surviving parents at 15% each of final rate of pay (maximum payout 30%).

Non-service connected deaths are payable as a lump sum payment, unless the deceased was either vested or had reached minimum retirement age for their plan, in which case the beneficiary(s) may instead select a lifetime monthly benefit, payable immediately with an actuarial reduction.

A Pension Adjustment Fund ("PAF") is funded with 50% of the excess earnings that are between 1% and 6% above the actuarial assumed earnings rate. Each year within sixty days of the end of the fiscal year, by majority vote of its members, the Board of Directors of the Fund (the "Board") shall consider whether sufficient funds have accumulated in the PAF to support an enhanced benefit distribution (which may include, but is not limited to, a lump sum bonus payment, monthly pension payment increases, ad-hoc cost-of-living adjustments, continuous cost-of-living adjustments, or some other form of increase in benefits as determined by the Board) to retirees, their beneficiaries and their survivors. As of July 1, 2015, the date of the most recent actuarial valuation, there was $38,198,762 in the PAF and the Board voted to make distributions of $30,004,292 during the fiscal year ended June 30, 2016.

The Fund includes a Deferred Retirement Option Plan (DROP Plan). The DROP Plan allows a participant to declare that they will retire within 4 years. During the 4-year period, the City will make no further contributions for the participant. The participant would continue to work and to receive their salary; however, any increases would not be counted towards their pension benefit. During the 4-year period the individual participates in the DROP Plan, their pension benefits will be paid into an escrow account in the participant's name. After the 4-year period, the participant would begin to receive their pension benefits and the amount that has been accumulated in the escrow account in a lump sum payment. The balance in the DROP Plan as of June 30, 2016 is $113.9 million.

NOTE 16: CITY PENSION PLAN (CONTINUED)

H. Net Pension Liability

The components of the net pension liability for the pension plan as of June 30, 2016 were as follows:

Total Pension Liability	$10,877,209,958
Plan Fiduciary Net Position	4,357,975,073
Net Pension Liability	$ 6,519,234,885

Plan Fiduciary Net Position as a Percentage of the Total Pension Liability is 40.1%.

I. Actuarial Assumptions

The total pension liability was determined by an actuarial valuation as of July 1, 2015 and was rolled forward to June 30, 2016. The July 1, 2015 actuary valuation used the following actuarial assumptions, applied to all periods including the measurement period:

Actuarial Cost Method: Entry Age Normal
Investment Rate of Return: 7.75% compounded annually, net of expenses
Salary Increases: Age Based Table

* The investment return assumption was changed from 7.80% from the prior year valuation to 7.75 percent for the current year valuation.

*To recognize the expense of the benefits payable under the Pension Adjustment Fund, the actuarial liabilities have been increased 0.54%. This estimate is based on the statistical average expected value of the benefits.

*The mortality rates were based on the RP 2000 Healthy Annuitant Mortality Table for males and females with adjustments for mortality improvements using Scale AA with five years set-back for Municipal males and females and a 2 year set-back for Police and Fire males and females.

The measurement date for the net pension liability is June 30, 2016. Measurements are based on the fair value of assets as of June 30, 2016 and the Total Pension Liability as of the valuation date, July 1, 2015 updated to June 30, 2016. The roll-forward procedure included the addition of service cost and interest cost offset by actual benefit payments. There were actuarial experience losses during the year of approximately $152 million, which includes the loss due to the Pension Adjustment Fund payment of $30 million. In addition, the Board adopted recommended assumption changes, including:

Decrease in the expected long-term return on assets from 7.80% to 7.75%
Increase the load on valuation pay from 4% to 6% for Police participants to account for stress pay and for Fire participants to account for premium pay.

The combined effect of these assumption changes increased the total pension liability by approximately $85 million as a year-end value. The pension plan’s fiduciary net position has been determined on the same basis used by the pension plan.

NOTE 16: CITY PENSION PLAN (CONTINUED)

I. Actuarial Assumptions (Continued)

The long-term 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 geometric real rates of return for each major asset class included in the pension plan's target asset allocation as of June 30, 2016 (see discussion of pension plan's investment policy) are summarized in the following table:

Asset Class	Long-Term Expected Real Rate of Return
US Equity	7.90%
Non-US Equity – Developed	7.60%
Non-US Equity – Emerging	7.20%
ACWI Ex-US	7.30%
Broad Fixed Income	2.80%
Global Aggregate	1.70%
Emerging Market Debt	5.80%
High Yield	5.20%
Universal	3.20%
91 Day T-bills	0.20%
Bank Loans	4.70%
Opportunistic Credit	2.05%
Real Assets – Public REITS	7.20%
Real Assets – Private Real Estate	12.70%
Real Assets – MLP's	7.80%
Private Equity	10.95%
Hedge Funds	5.50%

The above table reflects the expected (7-10 year) real rate of return for each major asset class. The expected inflation rate is projected 0.84% for the same time period.

The discount rate used to measure the total pension liability was 7.75 percent. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made at the current contribution rate and the participating governmental entity contributions will be made at rates equal to the difference between the actuarial determined contribution rates and the member rate. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all on project benefit payment to determine the total pension liability.

NOTE 16: CITY PENSION PLAN (CONTINUED)

J. Sensitivity of the Collective Net Pension Liability to Changes in the Discount Rate

The following presents the net pension liability of the System, calculated using the discount rate of 7.75%, as well as what the System's net pension liability would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current rate:

	1% Decrease (6.75%)	Discount Rate (7.75%)	1% Increase (8.75%)
Total Pension Liability	$ 11,968,855,837	$ 10,877,209,958	$ 9,946,862,734
Plan Fiduciary Net Position	4,357,975,073	4,357,975,073	4,357,975,073
Collective Net Pension Liability	$ 7,610,880,764	$ 6,519,234,885	$ 5,588,887,661
Plan Fiduciary Net Position as a percentage of the total pension liability	36.4%	40.1%	43.8%

K. Changes in Collective Net Pension Liability

The following table shows the changes in total pension liability (TBL), the plan fiduciary net position (i.e., fair value of the System assets) (FNP), and the net pension liability (NPL) during the measurement period ending June 30, 2016:

Change in Collective Net Pension Liability

	Increase (Decrease)		
	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)
Balances at June 30, 2015	$ 10,578,457,204	$ 4,674,252,000	$ 5,904,205,204
Changes for the Year:			
Service Cost	148,370,075	-	148,370,075
Interest	802,659,333	-	802,659,333
Change in Benefits	-	-	-
Differences Between Expected and Actual Experience	151,918,733	-	151,918,733
Changes in Assumptions	85,147,737	-	85,147,737
Contributions - Employer	-	660,246,511	(660,246,511)
Contributions - Member	-	67,055,003	(67,055,003)
Net Investment Income	-	(145,681,480)	145,681,480
Benefit Payments	(889,343,124)	(889,343,124)	-
Administrative Expense	-	(8,553,837)	8,553,837
Net Changes	298,752,754	(316,276,927)	615,029,681
Balances at June 30, 2016	$ 10,877,209,958	$ 4,357,975,073	$ 6,519,234,885

NOTE 16: CITY PENSION PLAN (CONTINUED)

L. Employers' Proportionate Share

GASB 68 requires that the proportionate share for each employer be determined based upon the employer's projected long-term contribution effort to the pension, as compared to the total long-term contribution effort of all employers. In addition to the City, three quasi-governmental agencies currently participate in the system, PHDC, PPA, and PMA. The method of allocation is based on the ratio of quasi-governmental agency contributions in proportion to total contributions of the plan.

The following schedule presents the pension amounts for each participating employer: Philadelphia Parking Authority (PPA), Philadelphia Municipal Authority (PMA), Philadelphia Housing Development Corporation (PHDC), and the City of Philadelphia (City):

Schedule of Pension Amounts by Employer

	For the Year Ended	PPA	PMA	PHDC	City	Total
Collective Pension Expense		$ 25,387,890	$ 358,942	$ 2,451,900	$ 760,854,021	$ 789,052,753
Change in Proportion		10,414,416	282,118	712,826	(11,409,360)	-
Contribution Difference		2,932,864	18,215	204,649	(3,155,728)	-
Employer Pension Expense		38,735,170	659,275	3,369,375	746,288,933	789,052,753
Net Pension Liability	06/30/15	145,684,531	1,486,220	15,315,633	5,741,718,820	5,904,205,204
Net Pension Liability	06/30/16	209,757,354	2,965,619	20,257,849	6,286,254,060	6,519,234,882
Change in Net Pension Liability		64,072,823	1,479,399	4,942,216	544,535,240	615,029,678
Deferred Outflows	06/30/15	12,276,927	106,529	1,161,645	340,540,743	354,085,844
Deferred Outflows	06/30/16	65,741,046	1,275,353	5,267,031	806,510,385	878,793,815
Change in Deferred Outflows		53,464,119	1,168,824	4,105,386	465,969,642	524,707,971
Deferred Inflows	06/30/15	-	-	-	(3,908,051)	(3,908,051)
Deferred Inflows	06/30/16	-	-	-	(42,392,584)	(42,392,584)
Change in Deferred Inflows		-	-	-	(38,484,533)	(38,484,533)
Employer Contributions		28,126,464	348,700	2,532,545	629,238,802	660,246,511
Employer Pension Expense		38,735,170	659,275	3,369,375	746,288,933	789,052,753

NOTE 16: CITY PENSION PLAN (CONTINUED)

M. Reconciliation of Net Pension Liability

The following table reconciles the Collective Net Pension Liability to the amount reported in the Statement of Net Position included in the City of Philadelphia's Comprehensive Annual Financial Report:

Reconciliation of Collective Net Pension Liability to the Primary Government Net Pension Liability

(Amounts in Thousands of USD)

Municipal Pension Fund	Proportionate Share of NPL	Discretely Presented Component Units	City and Blended Component Units
City	$ 6,286,254	$ -	$ 6,286,254
PPA	209,757	209,757	-
PMA	2,966	-	2,966
PHDC (1)	20,258	20,258	-
Collective Net Pension Liability	6,519,235	230,015	6,289,220
State Pension Fund			
PICA			1,236
City's Primary Government Net Pension Liability			$ 6,290,456

(1) PHDC does not appear in the Component Unit Financial Statements (Exhibit XI Statement of Net Position and Exhibit XII Statement of Activities) in the City of Philadelphia's Comprehensive Annual Financial Report due to immateriality.

N. Deferred Outflows and Inflows by Employer

The following table summarizes the deferred outflows allocated to each employer for experience, assumption changes, investment returns, and contribution differences:

Schedule of Employers' Deferred Outflows

	PPA	PMA	PHDC	City	Total
Proportionate Shares	3.22%	0.05%	0.31%	96.43%	100.00%
Experience	$ 4,227,615	$ 59,771	$ 408,293	$ 126,698,103	$ 131,393,782
Assumption Changes	2,829,290	40,001	273,246	84,791,466	87,934,003
Investment Returns	19,854,430	280,709	1,917,492	595,020,815	617,073,446
Proportion Change	31,243,249	846,353	2,138,476	-	34,228,078
Contribution Differences	7,586,463	48,519	529,524	-	8,164,506
	$ 65,741,047	$ 1,275,353	$ 5,267,031	$ 806,510,384	$ 878,793,815

NOTE 16: CITY PENSION PLAN (CONTINUED)

N. Deferred Outflows and Inflows by Employer (Continued)

The following table summarizes the deferred inflows allocated to each employer for experience, assumptions changes, investment return, and contribution differences:

Schedule of Employers' Deferred Inflows

	PPA	PMA	PHDC	City	Total
Proportionate Shares	3.22%	0.05%	0.31%	96.43%	100.00%
Experience	$ -	$ -	$ -	$ -	$ -
Assumption Changes	-	-	-	-	-
Investment Returns	-	-	-	-	-
Proportion Change	-	-	-	(34,228,078)	(34,228,078)
Contribution Differences	-	-	-	(8,164,506)	(8,164,506)
	$ -	$ -	$ -	$ (42,392,584)	$ (42,392,584)

The following table shows the net amount of deferred outflows and inflows to be recognized by each participating employer in each of the next five years and the total thereafter:

Schedule of Employers' Recognition of Deferred Outflows and Inflows

For Year Ending	PPA	PMA	PHDC	City	Total
2017	$ 21,464,807	$ 415,101	$ 1,701,446	$ 228,710,459	$ 252,291,813
2018	21,464,807	415,102	1,701,447	228,710,457	252,291,813
2019	19,584,595	399,528	1,552,498	209,991,227	231,527,848
2020	3,226,838	45,622	311,640	96,705,657	100,289,757
2021	-	-	-	-	-
Thereafter	-	-	-	-	-
Total	$ 65,741,047	$1,275,353	$ 5,267,031	$ 764,117,800	$ 836,401,231

O. Summary of Significant Accounting Policies

Basis of Presentation

Financial statements of the Fund are prepared using the accrual basis of accounting. Member contributions are recognized in the period in which the contributions are due. Employer contributions are recognized when due and the employer has made a formal commitment to provide the contributions. Benefits and refunds of contributions are recognized when due and payable in accordance with the terms of the Fund.

NOTE 16: CITY PENSION PLAN (CONTINUED)

O. Summary of Significant Accounting Policies (Continued)

New GASB Pronouncement

In February 2015, the GASB issued Statement No. 72, "*Fair Value Measurement and Application*". This Statement addresses accounting and financial reporting issues related to fair value measurements, and provides guidance for determining a fair value measurement for financial reporting purposes. This Statement also provides guidance for applying fair value to certain investments and disclosures related to all fair value measurements. The requirements of this Statement become effective for fiscal periods beginning after June 15, 2015.

Methods Used to Value Investments

The Pension Fund's investments are reported at fair value. Fair value is the amount that the Pension Fund can reasonably expect to receive for an investment in a current sale between a willing buyer and a willing seller, that is, other than in a forced or liquidation sale. Fixed income securities and common and preferred stocks are generally valued based on published market prices and quotations from national security exchange or security pricing services. Securities which are not traded on a national security exchange are valued by the respective fund manager or other third parties based on similar sales.

Directly-owned real estate investments are primarily valued based on appraisals performed by independent appraisers and for properties not appraised, the present value of the projected future net income stream is used.

For private market investments which include private equity, private debt, venture capital, hedge funds and equity real estate investments where no readily ascertainable market value exists, management, in consultation with the general partner and investment advisors, has determined the fair values for the individual investments based upon the partnership's most recent available financial information. Futures contracts, foreign exchange contracts, and options are marked-to-market daily with changes in market value recognized as part of net appreciation/depreciation in the fair value of investments. Initial margin requirements for such financial instruments are provided by investment securities pledged as collateral or by cash.

Investment expenses consist of investment manager fees and investment consultant fees related to the traditional investments only, and not those fees related to the alternative investments. Unsettled investment sales are reported as Accrued Interest and Other Receivable, and unsettled investment purchases are included in Accrued Expenses and Other Liabilities.

Dividend income is recorded on the ex-dividend date. Interest income is recorded as earned on an accrual basis.

NOTE 16: CITY PENSION PLAN (CONTINUED)

O. Summary of Significant Accounting Policies (Continued)

Income Taxes

The Pension Fund qualifies under Section 401(a) of the Internal Revenue Code (IRC) and is exempt from income taxation as allowed by Section 501(a) of the IRC.

Related Parties

The City's Department of Finance provides cash receipt and cash disbursement services to the Pension Fund. The City's Solicitor's office provides legal services to the Pension Fund. Other administrative services are also provided by the City.

Use of Estimates in Preparing Financial Statements

The preparation of financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities and changes therein, and disclosure of contingent assets and liabilities. Actual results could differ from those estimates.

Risks and Uncertainties

The Fund invests in various investment securities. Investment securities are exposed to various risks such as interest rate, market, and credit risks. Due to the level of risk associated with certain investment securities, it is at least reasonably possible that changes in the values of investment securities will occur in the near term and that such changes could materially affect the amounts reported in the Pension Fund’s Statement of Fiduciary Net Position.

Contributions are calculated based on certain assumptions pertaining to interest rates, inflation rates, and employee demographics, all of which are subject to change. Due to uncertainties inherent in the estimation and assumption process, it is at least reasonably possible that changes in these statements and assumptions in the near term would be material to the financial statements.

Administrative Expenses

Administrative expenses of the Pension Fund are paid for by the Pension Fund.

P. Cash Deposits, Investments, and Securities Lending

Legal Provisions

The Pension Fund is authorized to invest in "prudent investments," including obligations of the U.S. Treasury, agencies and instrumentalities of the United States, investment grade corporate bonds, common stock, real estate, private market, etc. City ordinances contain provisions which preclude the Pension Fund from investing in organizations that conduct business in certain countries and also impose limitations on the amounts invested in certain types of securities.

NOTE 16: CITY PENSION PLAN (CONTINUED)

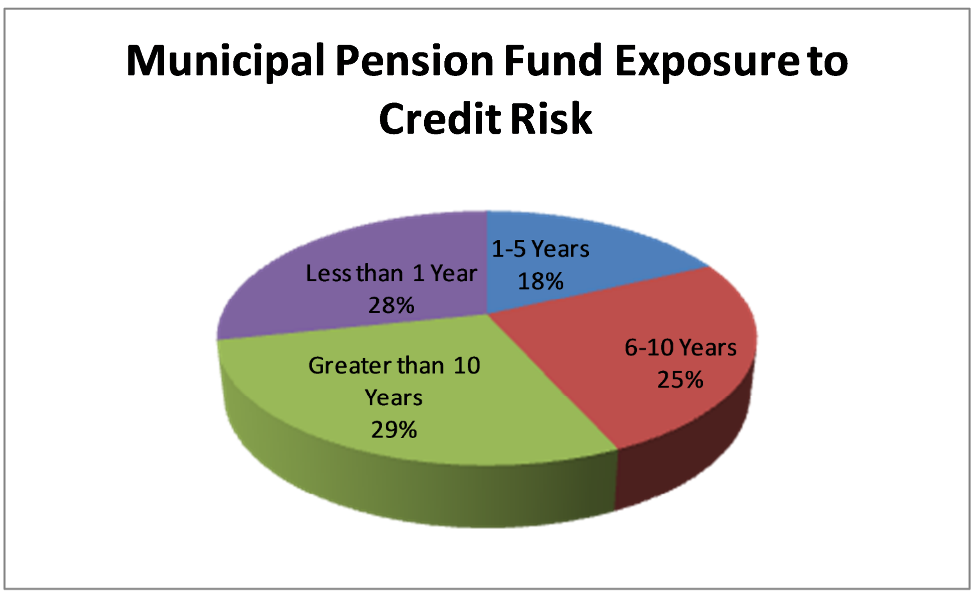
P. Cash Deposits, Investments, and Securities Lending (Continued)

Interest Rate Risk

Interest rate risk is the largest risk faced by an investor in the fixed income market. The price of a fixed income security generally moves in the opposite direction of the change in interest rates. Securities with long maturities are highly sensitive to interest rate changes.

Duration is a measure of the approximate sensitivity of a bond's value to interest rate changes. The higher the duration, the greater the changes in fair value when interest rates change. The Pension Fund measures interest rate risk using option-adjusted duration, which recognizes the fact that yield changes may change the expected cash flows due to embedded options.

This chart details the exposure to interest rate changes based on maturity dates of the fixed income securities:



Custodial Credit Risk

In the event of counter-party failure, the Pension Fund may not be able to recover the value of its investment or collateral securities that are in the possession of an outside party. Investment securities are exposed to custodial credit risk if the securities held by the counterparty or counterparty's trust department, are uninsured and are not registered in the name of the Pension Fund. The Pension Fund requires that all investments be clearly marked as to ownership, and to the extent possible, be registered in the name of the Pension Fund. Certain investments may be held by the managers in the Pension Fund's name.

NOTE 16: CITY PENSION PLAN (CONTINUED)

P. Cash Deposits, Investments, and Securities Lending (Continued)

Concentration of Credit Risk

Concentration of credit risk is the risk of substantial loss if investments are concentrated in one issuer. As of June 30, 2016, the Pension Fund has no single issuer that exceeds 5% of total investments. Investments issued or explicitly guaranteed by the U.S. government and investments in mutual funds, external investment pools, and other pooled investments are excluded.

Credit Risk

Credit Risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligation. The Pension Fund's rated debt investments as of June 30, 2016 were rated by S&P, a nationally recognized statistical rating agency and are presented below using S&P rating scale:

		Credit Rating										
2016 (in thousands)	Total Fair Value	AAA	AA	A	BBB	BB	B	CCC	CC	C	D	NR
Asset Backed Securities	$ 14,240	$ 5,016	$ 879	4,067	1,738	-	-	-	$ -	$ -	$ -	2,540
CMO/REMIC	3,235	64	1,871	157	235	65	226	304	-	-	214	99
Commercial Mortgage-Backed Securities	17,944	5,998	7,521	2,217	555	-	65	-	-	-	-	1,588
Corporate Bonds	303,817	488	11,072	39,918	83,895	47,006	49,177	19,658	-	651	110	51,842
Government Bonds	346,418	10,656	246,212	30,129	17,608	25,097	4,554	1,010	-	-	-	11,152
Mortgage Backed Securities	79,798	-	79,798	-	-	-	-	-	-	-	-	-
Municipal Bonds	7,404	-	4,855	2,488	61	-	-	-	-	-	-	-

NOTE 16: CITY PENSION PLAN (CONTINUED)

P. Cash Deposits, Investments, and Securities Lending (Continued)

Foreign Currency Risk

The Pension Fund's exposure to foreign currency risk derives from its position in foreign currency-denominated cash and investments in fixed income, equities, and derivatives. The foreign currency investment in equity securities is 36% of the total investment in equities.

Municipal Pension Fund - Assets subject to foreign currency risk *(in thousands)*

Currency	Cash	Fixed Income	Equities	Derivatives	Total
Euro	$ 2,052	$ 8,774	$ 191,517	$ (345)	$ 201,998
Japanese Yen	12,120	-	138,058	-	150,178
Pound Sterling	878	8,604	129,033	1	138,516
Hong Kong Dollar	149	-	69,215	-	69,364
Swiss Franc	349	-	65,112	-	65,461
Canadian Dollar	5,553	206	45,669	(13)	51,415
Australian Dollar	183	11,102	36,791	-	48,076
South Korean Won	-	-	42,867	-	42,867
Mexican Peso	8	24,391	8,292	(20)	32,671
Brazilian Real	9	9,611	14,855	(23)	24,452
South African Rand	-	5,310	13,870	21	19,201
Malaysian Ringgit	7	6,832	6,814	-	13,653
Indonesian Rupiah	22	7,115	5,922	-	13,059
Swedish Krona	142	-	11,929	(404)	11,667
Danish Krone	58	-	8,540	-	8,598
Singapore Dollar	578	-	6,234	-	6,812
New Zealand Dollar	28	5,578	879	-	6,485
Polish Zloty	2	3,590	2,419	-	6,011
Philippine Peso	-	919	4,824	-	5,743
Hungarian Forint	-	4,838	579	(5)	5,412
Thai Baht	2	-	5,340	-	5,342
Chilean Peso	-	-	3,298	276	3,574
All Others	2,572	4,694	11,673	(90)	18,849
	$ 24,712	$ 101,564	$ 823,730	$ (602)	$ 949,404

NOTE 16: CITY PENSION PLAN (CONTINUED)

P. Cash Deposits, Investments, and Securities Lending (Continued)

Derivatives

The Pension Fund may invest in derivatives as permitted by guidelines established by the Pension Board. Pursuant to such authority, the Pension Fund may invest in foreign currency forward contracts, options, futures (S&P Fund) and swaps. No derivatives were purchased with borrowed funds.

Derivatives are generally used to provide market exposure in the equity portfolio and to hedge against foreign currency risk and changes in interest rates, improve yield and adjust the duration of the Pension Fund's fixed income portfolio. These securities are subject to changes in value due to changes in interest rates or currency valuations. Credit risk for derivatives results from the same considerations as other counterparty risk assumed by the Pension Fund, which is the risk that the counterparty might be unable to meet its obligations.

Derivative instruments such as swaps, options, futures and forwards are often complex financial arrangements used by governments to manage specific risks or to make investments. By entering into these arrangements, governments receive and make payments based on market prices without actually entering into the related financial or commodity transactions. Derivative instruments associated with changing financial and commodity prices result in changing cash flows and fair values that can be used as effective risk management or investment tools. Derivative instruments, however, also can expose governments to significant risks and liabilities.

The Pension Fund enters into a variety of financial contracts, which include options, futures, forwards and swap agreements to gain exposure to certain sectors of the equity and fixed income markets; collateralized mortgage obligations (CMOs); other forward contracts, and U.S. treasury strips. The contracts are used primarily to enhance performance and reduce the volatility of the portfolio. The Pension Fund is exposed to credit risk in the event of non-performance by counterparties to financial instruments. The Pension Fund generally enters into transactions only with high quality institutions. Legal risk is mitigated through selection of executing brokers and review of all documentation. The Pension Fund is exposed to market risk, the risk that future changes in market conditions may make an instrument less valuable. Exposure to market risk is managed in accordance with risk limits set by senior management, through buying or selling instruments or entering into offsetting positions. The notional or contractual amounts of derivatives indicate the extent of the Pension Fund's involvement in the various types and uses of derivative financial instruments and do not measure the Pension Fund's exposure to credit or market risks and do not necessarily represent amounts exchanged by the parties. The amounts exchanged are determined by reference to the notional amounts and the other terms of the derivatives.

NOTE 16: CITY PENSION PLAN (CONTINUED)

P. Cash Deposits, Investments, and Securities Lending (Continued)

Derivative Instruments

The following table summarizes aggregate notional or contractual amounts for the Pension Fund's derivative financial instruments at June 30, 2016 in addition to the fair value and change in the fair value of derivatives.

List of Derivatives Aggregated by Investment Type

Classification	Change in Fair Value			Fair Value at June 30, 2016			Notional	
Investment Derivatives:								
Forwards Currency Contracts	Net appreciation/(depreciation) in Investments	$	(1,280,269)	Accrued interest and other receivables	$	(588,465)	$	105,832,201
Futures	Net appreciation/(depreciation) in	$	(93,192)	Accrued expenses	$	(141,531)	$	113
Grand Totals		$	(1,373,461)		$	(729,996)	$	105,832,314

A Derivatives Policy Statement identifies and allows common derivative investments and strategies, which are consistent with the Investment Policy Statement of the City of Philadelphia Municipal Pension Fund. The guidelines identify transaction-level and portfolio-level risk control procedures and documentation requirements. Managers are required to measure and monitor exposure to counterparty credit risk. All counterparties must have credit ratings available from nationally recognized rating institutions such as Moody, Fitch, and S&P. The details of other risks and financial instruments in which the Fund involves are described below:

Credit risk. The Fund is exposed to credit risk on hedging derivative instruments that are in asset positions. To minimize its exposure to loss related to credit risk, it is the Fund's policy to require counterparty collateral posting provisions in its non-exchange-traded hedging derivative instruments. These terms require full collateralization of the fair value of hedging derivative instruments in asset positions (net of the effect of applicable netting arrangements) should the counterparty's credit rating fall below AA as issued by Fitch Ratings and Standard & Poor's or Aa as issued by Moody's Investors Service. Collateral posted is to be in the form of U.S. Treasury securities held by a third-party custodian. The city has never failed to access collateral when required.

It is the Fund's policy to enter into netting arrangements whenever it has entered into more than one derivative instrument transaction with counterparty. Under the terms of these arrangements, should one party become insolvent or otherwise default on its obligations, close-out netting provisions permit the non-defaulting party to accelerate and terminate all outstanding transactions and net the transactions' fair values so that a single sum will be owed by, or owed to, the non-defaulting party.

NOTE 16: CITY PENSION PLAN (CONTINUED)

P. Cash Deposits, Investments, and Securities Lending (Continued)

Derivative Instruments (Continued)

Swap agreements. These derivative instruments provide for periodic payments at predetermined future dates between parties based on the change in value of underlying securities, indexes or interest rates. Under fixed interest rate type swap arrangements, the Pension Fund receives the fixed interest rate on certain equity or debt securities or indexes in exchange for a fixed charge. There were not any total receive fixed interest Swaps during 2016. On its pay-variable, received-fixed interest rate swap, as LIBOR increases, the Fund's net payment on the swap increases. Alternatively, on its pay-fixed, receive-variable interest rate swap, as LIBOR or the SIFMA swap index decreases, the Pension Fund's net payment on the swap increases.

Futures contracts. These derivative instruments are types of contracts in which the buyer agrees to purchase and the seller agrees to make delivery of a specific financial instrument at a predetermined date and price. Gains and losses on futures contracts are settled daily based on a notional (underlying) principal value and do not involve an actual transfer of the specific instrument. Futures contracts are standardized and are traded on exchanges. The exchange assumes the risk that counterparty will not pay and generally requires margin payments to minimize such risk. In addition, the Pension Fund enters into short sales, sales of securities it does not presently own, to neutralize the market risk of certain equity positions. Initial margin requirements on futures contracts and collateral for short sales are provided by investment securities pledged as collateral and by cash held by various brokers. Although the Pension Fund has the right to access individual pledged securities, it must maintain the amount pledged by substituting other securities for those accessed. The realized gain from Futures contracts was ($425,537). The Pension Fund has cash collateral of $971,025. Futures contracts are valued using a matrix pricing model (Level 2 inputs).

Forward contracts. The Pension Fund is exposed to basis risk on its forward contracts because the expected funds purchase being hedged will price based on a pricing point different than the pricing point at which the forward contract is expected to settle. The realized gain from Forward contracts was $944,312.

Termination risk. The Pension Fund or its counterparties may terminate a derivative instrument if the other party fails to perform under the terms of the contract. In addition, the Pension Fund is exposed to termination risk on its receive-fixed interest rate swap. The Pension Fund is exposed to termination risk on its rate cap because the counterparty has the option to terminate the contract if the SIFMA swap index exceeds 12 percent. If at the time of termination, a hedging derivative instrument is in a liability position, the City would be liable to the counterparty for a payment equal to the liability, subject to netting arrangements.

NOTE 16: CITY PENSION PLAN (CONTINUED)

P. Cash Deposits, Investments, and Securities Lending (Continued)

Derivative Instruments (Continued)

Rollover risk. The Pension Fund is exposed to rollover risk on hedging derivative instruments that are hedges of debt that mature or may be terminated prior to the maturity of the hedged debt. When these hedging derivative instruments terminate, or in the case of a termination option, if the counterparty exercises its option, the Pension Fund will be re-exposed to the risks being hedged by the hedging derivative instrument.

Fair Value Measurement

The Municipal Pension Fund has the following recurring fair value measurement as of June 30, 2016:

		Fair Value Measurements Using		
	6/30/2016	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by fair value level				
U.S. Treasury Securities	$ 174,835,825	$ -	$ 174,835,825	$ -
Agency Bonds	40,428,452	-	40,428,452	-
Asset Backed Securities	14,241,090	-	14,241,085	5
Corporate Bonds	304,026,106	-	303,847,733	178,373
Government Bonds	118,483,977	-	118,483,977	-
Mortgage Backed Securities	100,998,630	-	98,931,992	2,066,638
Municipal Bonds	7,403,777	-	7,403,777	-
Sovereign Debt	12,438,505	-	12,438,505	-
Equity	2,257,989,112	2,256,503,492	-	1,485,620
Total Investments by fair value level	$ 3,030,845,474	$ 2,256,503,492	$ 770,611,346	$ 3,730,636
Investments measured at the net asset value (NAV)				
Credit Distressed Hedge Fund	65,082,999			
Equity Long/Short hedge funds	21,306,534			
Real Estate	229,875,204			
Private Equity	437,907,757			
Fixed Income Funds	337,486,107			
Equity Funds	75,354,026			
Total Investments measured at the NAV	1,167,012,627			
Total Investments measured at fair value	$ 4,197,858,101			
Investment derivative instruments				
Equity index Futures (Liabilities)	$ (141,531)	$ (141,531)	$ -	
Forward Currency Contracts (Assets)	368,133	-	368,133	
Forward Currency Contracts (Liabilities)	(956,598)	-	(956,598)	
Total Investment derivative instruments	$ (729,996)	$ (141,531)	$ (588,465)	

Equity securities classified in Level 1 of the fair value hierarchy are valued using quoted market prices. Debt securities classified in Level 2 of the fair value hierarchy are valued using a matrix pricing technique. Mortgage and Asset backed securities and Corporate bonds in Level 3 are valued using discounted cash flow techniques.

NOTE 16: CITY PENSION PLAN (CONTINUED)

P. Cash Deposits, Investments, and Securities Lending (Continued)

Fair Value Measurement (Continued)

Derivative instruments classified in Level 1 of the fair value hierarchy are valued using quoted market prices. Cash collateral for Futures classified in Level 2 are valued using a matrix pricing model. Derivative instruments classified in Level 2 are valued using a market approach that considers benchmark for foreign exchange rates.

The valuation method for investments measured at the net asset value (NAV) per share (or its equivalent) is presented on the following table.

		Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Investments Measured at the net asset value (NAV)				
Credit Distressed Hedge Fund	$ 65,082,999	-	Quarterly	90 days
Equity Long/Short hedge funds	21,306,534	-	Quarterly	90 days' notice
Real Estate	229,875,204	69,324,702	N/A	N/A
Private Equity	437,907,757	210,080,552	N/A	N/A
Fixed Income	337,486,107	-	Quarterly	90-120 days
Equity	75,354,026	-	Quarterly	90-120 days
Total Investments measured at the NAV	$ 1,167,012,627			

1. Credit distressed hedge funds. The Funds seek to identify and exploit event driven opportunities both on the long and short side in the stressed and distressed corporate debt markets. Investments are generally driven by fundamental, value-oriented analysis and specific credit events. The Funds maintain the flexibility to invest globally and across capital structures of stressed and distressed companies. Investments generally target secondary U.S. credit opportunities across all tranches of a company's debt capital structure. The Funds may also invest opportunistically in certain equities, long and short. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. Investment can be redeemed with a 90 days' notice.

2. Equity long/short hedge funds. This Fund will typically hold 40-50 long positions and 10-15 short positions in U.S. common stocks. Management has the ability to shift investments from value to growth strategies, from small to large capitalization stocks, and from a net long position to a net short position. The Fund mitigates market risk by utilizing short positions. In periods of extreme volatility, the Fund may hold a significant portion of its assets in cash. The fair values of the investments in this type have been determined using the NAV per share of the investments. Investment can be redeemed with a 90 days' notice.

NOTE 16: CITY PENSION PLAN (CONTINUED)

P. Cash Deposits, Investments, and Securities Lending (Continued)

Fair Value Measurement (Continued)

3. Real estate funds. This type includes funds that invest in U.S. and Non-U.S. commercial and residential real estate. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the Plan's ownership interest in partners' capital. These investments can never be redeemed with the funds. Distributions from each fund will be received as the underlying investments of the funds are liquidated. However, the individual investments that will be sold have not yet been determined. Because it is not probable that any individual investment will be sold, the fair value of each individual investment has been determined using the NAV per share (or its equivalent) of the Plan's ownership interest in partners' capital. Once it has been determined which investments will be sold and whether those investments will be sold individually or in a group, the investments will be sold in an auction process. The investee fund's management is required to approve of the buyer before the sale of the investments can be completed. It is expected that the underlying assets of the funds will be liquidated over the next seven to 10 years.

4. Private equity funds. The primary goal of these Funds is to generate returns for investors that exceed private equity industry benchmarks and are commensurate with asset class risk through the construction of a portfolio of opportunistic, highly performing private equity investments. Investments that the fund may undertake include early-stage venture capital, later-stage growth financings, leveraged buyouts of medium and large-sized companies, mezzanine investments, PIPES and investments in companies that are being taken private. These investments can never be redeemed with the funds. Instead, the nature of the investments in this type is that distributions are received through the liquidation of the underlying assets of the fund. If these investments were held, it is expected that the underlying assets of the fund would be liquidated over five to 10 years. The fair values of the investments in this type have been determined using recent observable transaction information for similar investments and nonbinding bids received from potential buyers of the investments. Once a buyer has been identified, the investee fund's management is required to approve of the buyer before the sale of the investments can be completed.

5. Fixed Income funds. The primary goal of these Funds is to create alpha by sourcing proprietary opportunities, avoiding capital loss, buying securities below their intrinsic value and selling securities above their intrinsic value. Firms look for opportunities that are currently mispriced, based on fundamentals or potentially an event that may improve the price of the holding.

6. Equity funds. The primary goal of these Funds is employ a private equity approach to public market investing which seeks to deliver superior returns through a value-oriented investment strategy focusing on companies that are (or should be) implementing strategic change.

NOTE 16: CITY PENSION PLAN (CONTINUED)

P. Cash Deposits, Investments, and Securities Lending (Continued)

Securities Lending Program

The Pension Fund, pursuant to a Securities Lending Authorization Agreement, has authorized J.P. Morgan Bank and Trust Company (J.P. Morgan) to act as the Pension Fund's agent in lending the Pension Fund's securities to approved borrowers. J.P. Morgan, as agent, enters into Securities Loan Agreements with borrowers.

During the fiscal year, J.P. Morgan lent, on behalf of the Pension Fund, certain securities of the Pension Fund held by J.P. Morgan chase bank, N.A. as custodian and received cash or other collateral including securities issued or guaranteed by the United States, U.K., and Eurozone governments. J.P. Morgan does not have the ability to pledge or sell collateral securities delivered absent a borrower default. Borrowers were required to deliver collateral for each loan equal to at least 102% or 105% of the market value of the loaned securities.

Pursuant to the Securities Lending Authorization Agreement, J.P. Morgan had an obligation to indemnify the Pension Fund in the event of default by a borrower. There were no failures by any borrowers to return loaned securities or pay distributions thereon during the fiscal year that resulted in a declaration or notice of default of the borrower.

During the fiscal year, the Pension Fund and the borrowers maintained the right to terminate securities lending transactions upon notice. The cash collateral received on each loan was invested in a separately managed account based upon the investment guidelines established by the Pension Fund. As of June 30, 2016 the weighted average maturity was 48 days and the final maturity was 351 days.

Because the securities lending transactions were terminable at will, their duration did not generally match the duration of the investments made with the cash collateral received from the borrower.

On June 30, 2016, the Pension Fund had no credit risk exposure to borrowers.

As of June 30, 2016, the fair value of securities on loan was $323.5 million. Associated collateral totaling $331.3 million was comprised of cash which was invested in a separately managed account based upon the investment guidelines established by the Pension Fund. As of June 30, 2016, the invested cash collateral was $331.0 million and is valued at amortized cost.

Q. Investment Advisors

The Pension Fund utilizes investment advisors to manage long-term debt, real estate, private market, and equity portfolios. To be eligible for consideration, investments must meet criteria set forth in governing laws and regulations.

NOTE 16: CITY PENSION PLAN (CONTINUED)

R. Guarantee of Benefits

Benefits under the Pension Fund are guaranteed by statute. In the event that employee contributions do not equal required benefits, the City's General Fund must provide any shortfall.

S. Participation in the Pension Fund

The trustees for the Pension Fund are also members of the Pension Fund and as such, are subject to the provisions of the Pension Fund as described in the notes to these financial statements.

T. Subsequent Events

Management evaluated subsequent events through January 11, 2017 the date the financial statements were available to be issued. Events or transactions occurring after June 30, 2016, but prior to January 11, 2017 that provided, additional evidence about conditions that existed at June 30, 2016, have been recognized in the financial statements for the year ended June 30, 2016. Events or transactions that provided evidence about conditions that did not exist at June 30, 2016, but arose before the financial statements were available to be issued have not been recognized in the financial statements for the year ended June 30, 2016.

NOTE 17: OTHER POST EMPLOYMENT BENEFITS

A. Plan description

The City of Philadelphia self-administers a single employer, defined benefit plan and provides health care for five years subsequent to separation for eligible retirees. Certain union represented employees may defer their coverage until a later date, but the amount that the City pays for their health care is limited to the amount that the City would have paid at the date of their retirement. The City also provides lifetime insurance coverage for all eligible retirees. Firefighters are entitled to $7,500 coverage and all other employees receive $6,000 in coverage. The plan does not issue stand alone financial statements, and the accounting for the plan is reported within the financial statements of the City of Philadelphia.

B. Funding Policy

The City funding policy is to pay the net expected benefits for the current retirees. To provide health care coverage, the City pays a negotiated monthly premium for retirees covered by union contracts and is self insured for non-union employees. The City's contributions are estimated to be about $107.2 million for fiscal year ending June 30, 2016.

NOTE 17: OTHER POST EMPLOYMENT BENEFITS (CONTINUED)

C. Annual OPEB Cost and Net OPEB Obligation

The City's annual other post employment benefit (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, which if paid on an ongoing basis, is projected to cover normal cost each year and amortize any unfunded actuarial liabilities over a period not to exceed thirty (30) years. The following table shows the components of the City's annual OPEB cost for the year, the amount actually contributed to the plan, and changes in the net OPEB obligation:

	(Thousands of Dollars)
Annual Required Contribution	$ 136,268
Interest on Net OPEB Liability	11,317
Adjustment to Annual Required Contribution	(10,197)
Annual OPEB Cost	137,388
Payments Made	(107,200)
Increase in Net OPEB Obligation	30,188
Net OPEB Obligation - beginning of year	266,286
Net OPEB Obligation - end of year	$ 296,474

The City of Philadelphia's annual OPEB cost, the percentage of annual OPEB cost contributed to the Plan, and the net OPEB obligation for the fiscal year ended June 30, 2016 was as follows:

(Thousands of Dollars)

Fiscal Year Ended	Annual OPEB Cost	Percentage of Annual OPEB Contributed	Net OPEB Obligation
6/30/2016	$ 137,388	78%	$ 296,474
6/30/2015	133,052	72%	266,286
6/30/2014	129,318	52%	228,533

D. Funded Status and Funding Progress

As of July 1, 2015, the most recent actuarial valuation date, the City is funding OPEB on a pay as you go basis and accordingly, the unfunded actuarial accrued liability for benefits was $1.77 billion. The covered annual payroll was $1.54 billion and the ratio of the UAAL to the covered payroll was 114.8%.

NOTE 17: OTHER POST EMPLOYMENT BENEFITS (CONTINUED)

D. Funded Status and Funding Progress (Continued)

The required schedule of funding progress immediately following the notes to the financial statements presents multi-year trend information about whether the actuarial value of the plan assets is increasing or decreasing over time relative to the actuarial accrued liability for benefits.

The projections of future benefit payments for an ongoing plan obligation involves estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Amounts determined regarding the funded status of the obligation and the 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.

E. Actuarial Methods and Assumptions

Projections of costs for financial reporting purposes are based on the types of benefits provided under the terms of the substantive plan at the time of each valuation and on the pattern of sharing costs between the employer and plan members to that point.

Costs were determined according to the individual entry age actuarial cost method with the attribution period ending at each decrement age. This is consistent with the cost method used for the City of Philadelphia Municipal Retirement System. The City uses a level percent open approach as its method of amortization. Unfunded liabilities are funded over a 30 year period as a level percentage of payroll, which is assumed to increase at a compound annual rate of 4.25% per year. The current plan incorporates the following assumptions: a 3.30% Rate of Salary increases and a 4% Ultimate Rate of Medical Inflation.

NOTE 18: CLAIMS, LITIGATION, AND CONTINGENCIES

Generally, claims against the City are payable out of the General Fund, except claims against the City Water Department, City Aviation Division, or Component Units which are paid out of their respective funds and only secondarily out of the General Fund which is then reimbursed for the expenditure. Unless specifically noted otherwise, all claims hereinafter discussed are payable out of the Water Fund.

The Act of October 5, 1980, P.L. 693, No. 142, known as the “Political Subdivision Tort Claims Act,” established a $500,000 aggregate limitation on damages arising from the same cause of action, transaction, occurrence, or series of causes of action, transactions or occurrences with respect to governmental units in the Commonwealth such as the City. The constitutionality of that aggregate limitation has been upheld by the United States Supreme Court. There is no such limitation under federal law.

NOTE 18: CLAIMS, LITIGATION, AND CONTINGENCIES (CONTINUED)

Various claims have been asserted against the Water Department and in some cases lawsuits have been instituted. Many of these claims are reduced to judgment or otherwise settled in a manner requiring payment by the Water Department. As of June 30, 2016 and 2015, the aggregate estimate of loss deemed to be probable is $28.2 million and $25.7 million, respectively. This amount has been included on the Statement of Net Position under Other Long-Term Liabilities.

In addition to the above, there are certain lawsuits against the City for which an additional loss is reasonably possible. These lawsuits relate to General Fund and Enterprise Fund operations. The aggregate estimate of the loss, which could result if unfavorable legal determinations were rendered against the City with respect to these lawsuits is approximately $63.5 million to the General Fund and $9.7 million to the Enterprise Funds as of June 30, 2016, and approximately $72.9 million to the General Fund and $9.6 million to the Enterprise Funds as of June 30, 2015.

NOTE 19: LONG TERM AGREEMENTS

The City has entered into several long term agreements with third parties through the Philadelphia Municipal Authority as follows:

A. Automatic Meter Reading

In September 1997, the Water Department and the Water Revenue Bureau began the implementation of the Automatic Meter Reading Program (the “AMR Program”) involving the replacement of all residential water meters with new meters equipped with radio transmitter endpoint reading devices (“ERT”). Installation commenced on schedule on September 11, 1997. By June 30, 2012, more than 482,841 new meters had been installed. From 2011 through 2013, as required in the long-term meter reading contract, the service provider (ITRON) conducted battery replacement of the vast majority of customer ERTs, thus enabling the battery capability of the existing population through 2025. The Water Department is also working on the purchase and installation of upgraded AMR devices for all commercial customers that have ERTs. The AMR Program agreement term ends in 2017. The Department has two one-year renewal options, and is in the process of exercising the first one year extension.

Under the agreement ITRON is paid a fixed amount for each monthly meter reading actually obtained. The Water Department paid ITRON, through the Philadelphia Municipal Authority (“PMA”), $1,689,812 and $1,971,888 in Fiscal Year 2016 and Fiscal Year 2015, respectively for meter reads. Additionally, the Water Department paid ITRON, through PMA, $2,158,001 and $2,745,479 in Fiscal Year 2015 and Fiscal Year 2016, respectively, for the purchase of meters.

NOTE 19: LONG TERM AGREEMENTS (CONTINUED)

B. Biosolids Treatment and Utilization

In 2008, the City entered into a long-term contract and lease with the Philadelphia Municipal Authority (the “PMA”) for the PMA to operate the Water Department’s existing Biosolids Recycling Center (the “BRC”). The PMA and Philadelphia Biosolids Services, LLC (“PBS”) entered into a Service Agreement (the “PBS Service Contract”), pursuant to which PBS designed and built, and currently operates, a facility at the BRC to heat dry and dispose of biosolids captured during wastewater treatment. The PMA is required to make annual payments to PBS for operating the BRC. Pursuant to a Service Agreement between the PMA and the City (the “City Service Contract”), the City assumed all of PMA’s obligations under the PBS Service Contract. The obligations under the City Service Contract constitute operating expenses of the Water Department. In Fiscal Years 2015 and 2016, the City paid to PMA, from revenues generated by the Water Department, \$20,496,326 and \$20,074,514, respectively. The City Service Contract contains adjusters for the Consumer Price Index, Producer Price Index, and fluctuations in fuel prices, among others; thus, expenditures under the City Service Contract may vary over time. The contract expires on October 13, 2028, and contains the possibility of a five-year renewal term at the option of the City. In addition to facilitating compliance with various state and federal environmental regulations, including the Clean Air Act, the PBS Service Contract has produced cost savings for the Water Department.

C. Northeast Water Pollution Control Plant Digester Gas Cogeneration Facility

In 2011, the City entered into a long-term contract and lease with the PMA for the PMA to arrange the construction, financing, maintenance and sublease of a digester gas cogeneration facility at the Northeast Water Pollution Control Plant. The PMA entered into a lease (the “Lease”) with BAL Green Biogas I, LLC, a special purpose entity of Bank of America (the “Lessor”), which requires the PMA to make certain lease payments to the Lessor. Pursuant to a sublease dated December 23, 2011 (the “Sublease”), the City assumed all of the PMA’s obligations under the Lease. The obligations under this contract constitute operating expenses of the Water Department. In Fiscal Year 2015 and Fiscal Year 2016, the City paid to the Lessor from revenues generated from the Water Department, \$4,886,570 and \$5,556,547, respectively. The Sublease expires on September 25, 2029, unless renewed by PMA for an additional term of eighteen months.

D. Laurel Street Combined Sewer Overflow

On June 7, 2011 the City of Philadelphia entered into an Amended and Restated Development and Tax and Claim Settlement Agreement (the “agreement”) with Sugarhouse HSP Gaming, L.P. (HSP). In accordance with the agreement, HSP is required to fund development and expansion of the Laurel Street combined sewer overflow. As compensation, HSP is allotted a five year credit against its real estate taxes and settlement payments otherwise due to the City of Philadelphia. This credit is equal to 28 percent of the amount expended on the Laurel Street Combined Sewer Overflow project. If the credit exceeds the amount of real estate taxes and settlement payments due to the City, the credit carries over to the following year.

NOTE 19: LONG TERM AGREEMENTS (CONTINUED)

D. Laurel Street Combined Sewer Overflow (Continued)

As the Laurel Street Combined Sewer Overflow is a capital asset of the Water Department, the Water Department is required to make payments to the General Fund of the City in the amount of the credit allotted to HSP. The credit is approximately $3.5 million per year during fiscal year 2014 through 2018. During fiscal year 2015, the Water Department made payments to the General Fund of the City totaling $7,028,842, of which $3,514,421 represents a payment for fiscal year 2014. The fiscal year 2016 payment totaled $3,514,421.

NOTE 20: COMBINED SEWER OVERFLOW PROGRAM

The PaDEP and the City signed the Consent Order and Agreement on June 1, 2011 that allowed the City to officially to embark on the implementation of its strategy known as the Green City, Clean Waters Program to use green and traditional infrastructure investments to substantially mitigate combined sewer overflows ("CSOs") and enhance the quality of local waterways over 25 years.

The Water Department anticipates that over the next twenty years, compliance with the COA will significantly increase capital expenditures related to the Green City, Clean Waters Program.

In its current form, the COA adopts the presumption approach to the management of CSOs. The goal under the presumption approach is to eliminate and remove by 2036 (year 25 of the COA) the mass of pollutants that otherwise would be removed by the capture of 85% by volume city-wide of the combined sewage otherwise collected in the City's combined sewer system during precipitation events. To ensure this ultimate goal is met, the COA requires interim milestones at the end of the fifth, tenth, fifteenth and twentieth years. The interim milestones require the City to achieve specific targets in four categories: (1) Total Greened Acres; (2) Overflow Reduction Volume; (3) Miles of Interceptor Lined; and (4) Wastewater Treatment Plant Upgrades: Design and Construction. The COA includes financial protections in the event that the costs of complying with the COA exceed the Water Department's projections. Should the costs of complying with the COA increase to the extent that the wastewater component of a customer's bill exceeds 2.27% of median household income, the City may petition the PaDEP for an extension of time to satisfy the requirements of the COA so that the financial burden does not become excessive on ratepayers. The COA also includes significant penalties for non-compliance with the various 5-year milestone targets. Penalties start at $25,000 per month for each violation (for the first 6 months) and increase up to $100,000 monthly for uncured violations of 13 months or more.

NOTE 20: COMBINED SEWER OVERFLOW PROGRAM (CONTINUED)

The Water Department has completed its fifth year of the 25 year COA. 1,310 additional greened acres and 334 million gallons of combined sewer overflow reduction are required over the next 5 years for a total of 2,148 greened acres and 2,044 million gallons of combined sewer overflow reduction by the end of year 10.

On December 31, 2015, the Water Department received an information request from the EPA, pursuant to Section 308 of the Clean Water Act, which was revised on November 9, 2016, the Water Department. While the revised information request extends the deadline for submission of the alternative analysis from January 1, 2017 to April 30, 2017 and contains fewer requirements than the prior information request, it obligates the Water Department to perform an analysis that is inconsistent with its approved COA. For example, the revised information request directs the Water Department to analyze the controls necessary to achieve 85% capture in each of its CSO receiving streams, rather than 85% capture based on a citywide average, as stated in the Water Department's approved COA. The Water Department currently is evaluating whether such information request exceeds the EPA's authority and whether a challenge is warranted. The Water Department also intends to seek reconsideration and withdrawal of the request from the newly appointed head of Region III. Should that be unsuccessful, the Water Department will request a meeting with EPA officials in Washington, D.C. Once these meetings have concluded and depending on the outcome, the Water Department will determine whether to challenge the Section 308 request in federal court, among other courses of action.

NOTE 21: PLEDGE OF REVENUES

Section 4.02 and 4.04 of the Water bond ordinance of 1989, as amended in 1993, which authorized the issuance of Water and Sewer Revenue Bonds, pledges and assigns to the Fiscal Agent for the security and payment of all bonds, a lien on and security interest in all project revenues and amounts on deposit in or standing to the credit of the: 1) Revenue Fund; 2) Sinking Fund et.al.; 3) Subordinated Bond Fund: 4) Rate Stabilization Fund; 5) Residual Fund; and 6) Construction Fund et al. The fiscal agent shall hold and apply the security interest granted in trust for the holders of bonds listed above without preference, priority, or distinction; provided however, that the pledge of this ordinance may also be for the benefit of a credit facility and qualified swap, or any other person who undertakes to provide moneys for the account of the City for the payment of principal or redemption price and interest on any series of bonds (other than subordinated bonds), on an equal and ratable basis with bonds, to the extent provided by any Supplemental Ordinance or Determination. The amount of this pledge is the equal to the remaining principal and interest outstanding on the Water and Sewer Revenue Bonds. The purpose for the debt secured by the pledge can be found in Note 14 to the financial statements.

NOTE 21: PLEDGE OF REVENUES (CONTINUED)

The following chart displays information related to the pledge as of June 30, 2016:

	Water and Sewer Revenue Bonds
Pledged Revenue Required for Principal and Interest Payments	$2,979.7 million
Term of Pledge	2046
Percentage of Revenue Pledged	100%
Current Year Pledged Revenue	$676.7 million
Current Year Principal and Interest Paid	$219.3 million

The following chart displays information related to the pledge as of June 30, 2015:

	Water and Sewer Revenue Bonds
Pledged Revenue Required for Principal and Interest Payments	$3,191.5 million
Term of Pledge	2046
Percentage of Revenue Pledged	100%
Current Year Pledged Revenue	$680.6 million
Current Year Principal and Interest Paid	$344.5 million

NOTE 22: RISK MANAGEMENT

The City is exposed to various risks of loss related to torts; theft of, damage to, and destruction of assets; errors and omissions; injuries to employees; and natural disasters. The City (except for Aviation Fund operations, the Municipal Authority, and PICA) is self-insured for fire damage, casualty losses, public liability, Workers' Compensation and Unemployment Compensation. The Aviation Fund is self-insured for Workers' Compensation and Unemployment Compensation and insured through insurance carriers for other coverage. The City is self-insured for medical benefits provided to employees in the Fraternal Order of Police, its city-administered health plan, the International Association of Fire Fighters, and District Council 47.

The City covers all claim settlements and judgments, except for those discussed above, out of the resources of the fund associated with the claim. Claims expenditures and liabilities are reported when it is probable that a loss has occurred and the amount of the loss can be reasonably estimated. These losses include: an estimate of claims that have been incurred but not reported; the effects of specific, incremental claims adjustment expenditures, salvage, and subrogation; and unallocated claims adjustment expenditures.

NOTE 22: RISK MANAGEMENT (CONTINUED)

At June 30, 2016 the amount of these liabilities was $350.3 million for the City. This liability is the City's best estimate based on available information. Changes in the reported liability since June 30, 2014 resulted from the following:

Amounts in Millions of USD

Fiscal Years Ending June 30	Beginning Liability	Current Year Claims and Changes in Estimates	Claim Payments	Ending Liability
2014	$356.1	$244.0	$(250.8)	$349.3
2015	349.3	296.0	(291.7)	353.6
2016	353.6	216.2	(219.5)	350.3

The City's Unemployment Compensation and Workers' Compensation coverages are provided through its General Fund. Unemployment Compensation and Workers' Compensation coverages are funded by a pro rata charge to the various funds. Payments for the year were $2.8 million for Unemployment Compensation claims and $65.3 million for Workers' Compensation claims.

The City's estimated outstanding workers' compensation liabilities are $271.5 million discounted at 3.5%. On an undiscounted basis, these liabilities total $353.1 million. These liabilities include provisions for indemnity, medical and allocated loss adjustment expense (ALAE). Excluding the ALAE, the respective liabilities for indemnity and medical payments relating to workers' compensation total $245.8 million (discounted) and $321.5 million (undiscounted). The Water Fund's accrued liability for workers compensation was $21.7 million and $22.0 million at June 30, 2016 and 2015, respectively.

During the last five (5) fiscal years, no claim settlements have exceeded the level of insurance coverage for operations using third party carriers. None of the City's insured losses have been settled with the purchase of annuity contracts.

NOTE 23: RESTATEMENT OF NET POSITION / CHANGE IN ACCOUNTING PRINCIPLE

In June 2015, the GASB issued Statement No. 68, "*Accounting and Financial Reporting for Pensions – an amendment of GASB Statement No. 27*", an accounting pronouncement that revised existing standards for measuring and reporting of pension liabilities for pension plans. One of the objectives of this accounting standard is to require governmental agencies to recognize the difference between the actuarial total pension liability and the pension plan's fiduciary net position as the net pension liability on the statement of net position. In addition to the benefits earned each year, the annual pension expense will also include interest on the total pension liability and the impacts of changes in benefit terms, projected investment earnings and other plan net position changes. The adoption of this accounting standard had a material impact on recorded pension liabilities compared to the application of prior standards. As a result of this change in accounting principle, a net pension liability was established which required the beginning net position as of July 1, 2014 to be adjusted to reflect the change.

The following reconciliation provides the cumulative effect of the change in accounting principle to the net position at July 1, 2014 for the Water Fund:

	(Thousands of Dollars)
Net Position – July 1, 2014 as originally stated	$ 970,483
Cumulative effect of change in accounting principle	(362,365)
Net Position – July 1, 2014 restated	$ 608,118

NOTE 24: RECLASSIFICATION OF EXPENSE

The following amounts have been restated for fiscal year ending June 30, 2016:

	(Thousands of Dollars)
Net Position – July 1, 2015 as originally stated	$ 709,579
Reclassification of Expense	(22,048)
Net Position – July 1, 2015 restated	$ 687,531
Capital Assets – July 1, 2015 as originally stated	$2,149,680
Reclassification of Capital Asset	(22,048)
Capital Assets – July 1, 2015 as restated	$2,127,632

The 2015 financial statements have not been restated to reflect the changes.

NOTE 25: SUBSEQUENT EVENT

A) In October 2016, the City and the Water Department issued Series 2016 Water and Wastewater Revenue Refunding Bonds in the amount of $192,680,000, to advance refund a portion of the Series 2007A Water and Wastewater Revenue Refunding Bonds, Series of 2009A Water and Wastewater Revenue Bonds, and Series of 2010C Water and Wastewater Revenue Bonds, and to pay the costs related to issuance of the bonds. The debt service requirements of the Water Fund following the issuance of the Series 2016 Water and Wastewater Revenue Refunding Bonds are detailed in the Other Supplementary Information section.

B) Through December 2016, the City and the Water Department had drawdowns totaling $2,457,889, which represent new loans from the Pennsylvania State Infrastructure Financing Authority ("PENNVEST") for water treatment and sewer piping replacement.

C) The City of Philadelphia (the "City"), through the Procurement Department, Water Department ("PWD" or "Department") and the Water Revenue Bureau, are soliciting proposals from qualified vendors to provide an advanced metering infrastructure ("AMI") system for water meters. The project will include: providing project management; installation of new AMI meter interface units ("MIUs"); fixed data collection units or other methods to retrieve the data transmitted from the MIUs; software to manage the data and make it available to the City's Basis2 customer information and billing system as well as City employees and customers; integration of that software with the City's existing systems; training, documentation, and product support. The City does not intend to replace all of the water meters during the initial installation phase of the new AMI system; however, the City may replace some of the existing water meters as needed. PWD expects the initial installation phase to be three years and the field deployment period to take 24 months. The project may also include the provision of hosted and managed services over several years.

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Required Supplementary Information

BUDGETARY COMPARISON SCHEDULE
Water Operating Fund
For the Fiscal Year Ended June 30, 2016
(Legally Enacted Basis)
(Thousands of Dollars)

Revenues	Budgeted Amounts: Original	Budgeted Amounts: Final	Actual	Final Budget to Actual Positive (Negative)
Locally Generated Non-Tax Revenue	$ 630,701	$ 630,979	$ 643,035	$ 12,056
Revenue from Other Governments	975	744	744	-
Revenue from Other Funds	105,638	87,233	36,756	(50,477)
Total Revenues	**$ 737,314**	**$ 718,956**	**$ 680,535**	**$ (38,421)**
Expenditures and Encumbrances				
Personal Services	126,121	126,131	118,415	7,716
Pension Contributions	57,800	59,115	59,115	-
Other Employee Benefits	53,115	51,790	47,276	4,514
Sub-Total Employee Compensation	237,036	237,036	224,806	12,230
Purchase of Services	177,090	177,090	148,989	28,101
Materials and Supplies	49,037	48,849	42,799	6,050
Equipment	5,407	5,595	2,722	2,873
Contributions, Indemnities and Taxes	6,605	6,605	5,441	1,164
Debt Service	227,139	227,139	219,133	8,006
Payments to Other Funds	65,000	65,000	60,733	4,267
Advances and Other Miscellaneous Payments	-	-	-	-
Total Expenditures and Encumbrances	767,314	767,314	704,623	62,691
Operating Surplus (Deficit) for the Year	**$ (30,000)**	**$ (48,358)**	**$ (24,088)**	**$ 24,270**
Fund Balance Available, July 1, 2015	-	-	-	-
Operations in Respect to Prior Fiscal Years				
Commitments Cancelled - Net	30,000	30,000	24,088	(5,912)
Prior Period Adjustments	-	-	-	-
Adjusted Fund Balance, July 1, 2015	30,000	30,000	24,088	(5,912)
Fund Balance Available, June 30, 2016	**$ -**	**$ (18,358)**	**$ -**	**$ 18,358**

CITY OF PHILADELPHIA
OTHER POST EMPLOYMENT BENEFITS
SCHEDULE OF FUNDING PROGRESS
FISCAL YEAR ENDED JUNE 30, 2016

(Amounts in Millions of USD)

Actuarial Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liability (AAL)	Unfunded AAL (UAAL)	Funded Ratio	Covered Payroll	UAAL as a Percentage of Covered Payroll
	(a)	(b)	(b - a)	(a / b)	(c)	(b - a) / c
City of Philadelphia Other Post Employment Benefits						
07/01/2008	-	$ 1,156.0	$ 1,156.0	0.00%	$ 1,456.5	79.37%
07/01/2009	-	1,119.6	1,119.6	0.00%	1,461.7	76.60%
07/01/2010	-	1,169.5	1,169.5	0.00%	1,419.5	82.39%
07/01/2011	-	1,212.5	1,212.5	0.00%	1,469.2	82.53%
07/01/2012	-	1,511.9	1,511.9	0.00%	1,371.6	110.23%
07/01/2013	-	1,703.6	1,703.6	0.00%	1,416.9	120.23%
07/01/2014	-	1,732.1	1,732.1	0.00%	1,495.1	115.85%
07/01/2015	-	1,772.6	1,772.6	0.00%	1,544.5	114.80%

This schedule represents the other post employment benefits plan of the City of Philadelphia. The Water Department is a department of the City of Philadelphia.

Schedule of Changes in Net Pension Liability
Fiscal Year Ending June 30, 2016, 2015, and 2014

Schedule of Changes in Net Pension Liability

	Fiscal Year Ending		
	June 30, 2016	**June 30, 2015**	**June 30, 2014**
Total Pension Liability			
Service Cost (MOY)	$ 148,370,075	$ 143,556,347	$ 136,986,515
Interest (Includes Interest on Service Cost)	802,450,569	791,298,503	774,518,750
Changes of Benefit Terms	-	-	-
Differences Between Expected and Actual Experience	151,918,733	34,909,464	-
Change of Assumptions	85,147,737	48,146,352	213,156,725
Benefit Payments, Including Refund of Member Contributions	(889,343,124)	(881,464,964)	(808,597,357)
Net Change in Total Pension Liability	$ 298,543,990	$ 136,445,702	$ 316,064,633
Total Pension Liability - Beginning	10,578,665,968	10,442,220,266	10,126,155,633
Total Pension Liability - Ending	$ 10,877,209,958	$ 10,578,665,968	$ 10,442,220,266
Plan Fiduciary Net Position			
Contributions - Employer	$ 660,246,511	$ 577,195,412	$ 553,178,927
Contributions - Member	67,055,003	58,657,817	53,722,275
Net Investment Income	(145,681,480)	13,838,367	681,469,584
Benefit Payments, Including Refunds of Member Contributions	(889,343,124)	(881,666,036)	(808,597,357)
Administrative Expense	(8,553,837)	(10,478,541)	(8,291,820)
Net Change in Plan Fiduciary Net Position	$ (316,276,927)	$ (242,452,981)	$ 471,481,609
Plan Fiduciary Net Position - Beginning	4,674,252,416	4,916,705,397	4,445,223,788
Plan Fiduciary Net Position - Ending	$ 4,357,975,073	$ 4,674,252,416	$ 4,916,705,397
Net Pension Liability - Ending	$ 6,519,234,885	$ 5,904,413,552	$ 5,525,514,869
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	40.07%	44.19%	47.08%
Covered-Employee Payroll	$ 1,676,411,925	$ 1,597,848,869	$ 1,556,660,223
Net Pension Liability as a Percentage of Covered-Employee Payroll	388.88%	369.52%	354.96%

This schedule represents the changes in net pension liability of the Municipal Pension Plan. The entities within the Municipal Pension Plan are the City of Philadelphia, the Philadelphia Parking Authority, Philadelphia Municipal Authority, and the Philadelphia Housing Development Corporation. The Water Department is a department of the City of Philadelphia.

Schedules of Collective Contributions - Last 10 Years

Schedule of Collective Contributions (Based on Minimum Municipal Obligation)

Last 10 Fiscal Years

(Thousands of Dollars)

	FYE 2016	FYE 2015	FYE 2014	FYE 2013	FYE 2012	FYE 2011	FYE 2010	FYE 2009	FYE 2008	FYE 2007
Actuarially Determined Contribution	$ 594,975	$ 556,030	$ 523,368	$ 727,604	$ 534,039	$ 463,375	$ 297,446	$ 438,522	$ 412,449	$ 400,256
Contributions in Relation to the Actuarially Determined Contribution	660,246	577,195	553,179	781,823	555,690	470,155	312,556	455,389	426,934	432,267
Contribution Deficiency/(Excess)	$ (65,271)	$ (21,165)	$ (29,811)	$ (54,219)	$ (21,651)	$ (6,780)	$ (15,110)	$ (16,867)	$ (14,485)	$ (32,011)
Covered-Employee Payroll*	$ 1,676,412	$ 1,597,849	$ 1,495,421	$ 1,429,723	$ 1,372,174	$ 1,371,274	$ 1,421,151	$ 1,463,260	$ 1,456,520	$ 1,351,826
Contributions as a Percentage of Covered-Employee Payroll	39.38%	36.12%	36.99%	54.68%	40.50%	34.29%	21.99%	31.12%	29.31%	31.98%

Schedule of Collective Contributions (Based on Funding Policy)

Last 10 Fiscal Years

(Thousands of Dollars)

	FYE 2016	FYE 2015	FYE 2014	FYE 2013	FYE 2012	FYE 2011	FYE 2010	FYE 2009	FYE 2008	FYE 2007
Actuarially Determined Contribution	$ 846,283	$ 798,043	$ 823,885	$ 738,010	$ 722,491	$ 715,544	$ 581,123	$ 539,464	$ 536,874	$ 527,925
Contributions in Relation to the Actuarially Determined Contribution	660,247	577,195	553,179	781,823	555,690	470,155	312,556	455,389	426,934	432,267
Contribution Deficiency/(Excess)	$ 186,036	$ 220,848	$ 270,706	$ (43,813)	$ 166,801	$ 245,389	$ 268,567	$ 84,075	$ 109,940	$ 95,658
Covered-Employee Payroll*	$ 1,676,412	$ 1,597,849	$ 1,495,421	$ 1,429,723	$ 1,372,174	$ 1,371,274	$ 1,421,151	$ 1,463,260	$ 1,456,520	$ 1,351,826
Contributions as a Percentage of Covered-Employee Payroll	39.38%	36.12%	36.99%	54.68%	40.50%	34.29%	21.99%	31.12%	29.31%	31.98%

This schedule represents the collective contributions of the Municipal Pension Plan. The entities within the Municipal Pension Plan are the City of Philadelphia, the Philadelphia Parking Authority, Philadelphia Municipal Authority, and the Philadelphia Housing Development Corporation. The Water Department is a department of the City of Philadelphia.

Schedules of Collective Contributions - Last 10 Years

Notes to Schedules of Collective Contributions

Valuation Date	July 1, 2014
Timing	Actuarially determined contribution rates are calculated based on the actuarial valuation two years prior to the beginning of the plan year

Key Methods and Assumptions Used to Determine Contribution Rates

Actuarial Cost Method	Entry Age
Asset Valuation Method	Ten-year smoothed market
Amortization Method	Gain/Losses are amortized over closed 20-year periods, assumption changes over 15 years, benefit changes for actives over 10 years, benefit changes for inactives members over 1 year, plan changes mandated by the State over 20 years Under the City's Funding Policy, the initial July 1, 1985 unfunded actuarial liability (UAL) is amortized over a 34 year period ending June 30, 2019 with payments increasing 3.3% per year, the assumed payroll growth Under the MMO Funding Policy, the July 1, 2009 unfunded actuarial liability (UAL) was "fresh started" to be amortized over a 30 year period, ending June 30, 2039. This is a level dollar amortization of the UAL.
Discount Rate	7.80%
Amortization Growth Rate	3.30%
Salary Increases	Age based salary scale
Mortality	Sex distinct RP-2000 Combined Mortality with adjustments and improvements using Scale AA

A complete description of the methods and assumptions used to determine contribution rates for the year ending June 30, 2016 can be found in the July 1, 2014 actuarial valuation report.

Other Supplementary Information

BONDED DEBT
WATER AND WASTEWATER REVENUE BONDS
AS OF OCTOBER 31, 2016

Year Ended June 30	Principal Requirements	Interest Requirements	Total Debt Service
2017	125,846,015	79,872,135	205,718,150
2018	130,691,339	75,040,683	205,732,022
2019	84,804,517	70,653,792	155,458,309
2020	77,690,450	66,917,532	144,607,982
2021	81,441,823	63,476,464	144,918,287
2022	74,002,799	59,950,261	133,953,060
2023	78,063,476	56,741,892	134,805,368
2024	57,078,955	53,379,385	110,458,340
2025	59,564,337	51,106,345	110,670,682
2026	59,967,628	48,694,137	108,661,765
2027	62,282,881	46,188,868	108,471,749
2028	49,297,287	43,966,311	93,263,598
2029	61,089,166	41,574,249	102,663,415
2030	63,039,678	38,724,696	101,764,374
2031	65,932,428	35,823,839	101,756,267
2032	68,927,153	32,821,328	101,748,481
2033	38,082,093	30,691,844	68,773,937
2034	39,770,000	28,847,313	68,617,313
2035	41,600,000	27,008,869	68,608,869
2036	43,410,000	25,180,663	68,590,663
2037	43,615,000	23,167,375	66,782,375
2038	45,830,000	20,949,750	66,779,750
2039	48,160,000	18,619,625	66,779,625
2040	50,615,000	16,170,750	66,785,750
2041	69,025,000	13,597,250	82,622,250
2042	54,150,000	10,066,325	64,216,325
2043	56,920,000	7,290,008	64,210,008
2044	41,440,000	4,371,500	45,811,500
2045	32,520,000	2,522,500	35,042,500
2046	34,190,000	854,750	35,044,750
2047	-	-	-
2048	-	-	-
Total	1,839,047,025	1,094,270,439	2,933,317,464

• Interest on the Series 1997B bonds assumes a rate of 0.1694%, the average interest rate of the bonds during the period 24 consecutive calendar months preceding the date of calculation per the Ordinance. (As of October 31, 2016)

• Interest on Series 2005B assumes rate of 4.53%

SUPPLEMENTAL SCHEDULE OF RATE COVENANT COMPLIANCE FOR FISCAL YEARS ENDED JUNE 30, 2016, 2015, AND 2014 (Legally Enacted Basis)

(amounts in thousands)

LINE NO.		YEAR ENDED JUNE 30 2016	2015	2014
1.	Total Revenue	$ 678,906	$ 676,846	$ 643,019
2.	Net Operating Expense	(433,025)	(426,767)	(410,797)
2a	Commitments Cancelled (formerly fund balance)	24,088	19,389	37,436
2b	Adjustment between Debt Service and Net Operating Expenses due to timing differences	339	4,470	-
3.	Transfer (To) From Rate Stabilization Fund	1,629	(21,456)	(22,925)
4.	**Net Revenues**	**271,937**	**252,482**	**246,733**
5.	Revenue Bonds Outstanding	(219,304)	(205,270)	(201,710)
6.	General Obligation Bonds Outstanding	-	-	-
7.	Pennvest Loan	-	-	-
8.	**Total Debt Service**	**(219,304)**	**(205,270)**	**(201,710)**
9.	**Net Revenue after Debt Service**	**52,633**	**47,212**	**45,023**
10.	Transfer to General Fund	-	-	-
11.	Transfer to Capital Fund	(21,497)	(20,705)	(20,194)
12.	Transfer to Residual Fund	(31,136)	(26,507)	(24,829)
13.	**Total Transfers**	**(52,633)**	**(47,212)**	**(45,023)**
14.	**Net Operating Balance for Current Year**	**$ -**	**$ -**	**$ -**

The rate covenant contained in the General Ordinance requires the City to establish rates and charges for the use of the Water and Wastewater Systems sufficient to yield Net Revenues, as defined therein, in each fiscal year at least equal to 120%(coverage A) of the Debt Service Requirements for such fiscal year (excluding debt service due on any Subordinated Bonds). In addition, Net Revenues, in each fiscal year, must equal at least 100%(coverage B) of : (i) the Debt Service Requirements (including Debt Service Requirements in respect of Subordinated Bonds) payable is such fiscal year; (ii) amounts required to be deposited of Subordinated Bonds payable in such fiscal year; (ii) amounts required to be deposited into the Debt Reserve Account during such fiscal year; (iii) debt service on all General Obligations Bonds issued for the Water and Wastewater Systems payable is such fiscal year; (iv) debt service payable on Interim Debt in such fiscal year; and (v) the Capital Account Deposit Amount for such fiscal year, less amounts transferred from the Residual Fund to the Capital Account during such fiscal year. To insure compliance with the rate covenant, the General Ordinance requires that the City review its rates, rents, fees, and charges at least annually.
Additional Rate Covenant. As long as the Insured Bonds are outstanding, the City covenants to establish rates and charges for the use of the System sufficient to yield Net Revenues (excluding amounts transferred from the Rate Stabilization Fund into the Revenue Fund during, or as of the end of, such fiscal year) at least equal to 90% (coverage C) of the Debt Service Requirements (excluding debt service on any Subordinated Bonds) in such fiscal year.

COVERAGE A:

	2016	2015	2014
Line 4	**$ 271,937**	**$ 252,482**	**$ 246,733**
/ Line 5	**$ 219,304**	**$ 205,270**	**$ 201,710**
= COVERAGE A:	**1.24**	**1.23**	**1.22**

COVERAGE B:

	2016	2015	2014
Line 4	**$ 271,937**	**$ 252,482**	**$ 246,733**
/ Line 8 + Line 11	**$ 240,801**	**$ 225,975**	**$ 221,904**
= COVERAGE B:	**1.13**	**1.12**	**1.11**

COVERAGE C:

	2016	2015	2014
Line 4 - Line 3	**$ 270,308**	**$ 273,938**	**$ 269,658**
/ Line 5	**$ 219,304**	**$ 205,270**	**$ 201,710**
= COVERAGE C:	**1.23**	**1.33**	**1.34**

RECONCILIATION OF LEGALLY ENACTED AND GAAP BASIS OPERATING REVENUES AND EXPENSES
JUNE 30, 2016

(amounts in thousands)

Legal Basis of Accounting Revenues		
Legal Basis Revenues	$	680,535
GAAP Adjustments		
Reverse Fiscal Year 2015 Accounts Receivable Accrual		(37,898)
Record Fiscal Year 2016 Accounts Receivable Accrual		38,015
Accounts Receivable Adjustment		(7,919)
Allowance for Doubtful Accounts Adjustment		(72)
Record Fiscal Year 2016 Grants Receivable Accrual		125
Reclassification of Interest Income to Nonoperating Revenue		(1,966)
Total GAAP Adjustments		(9,715)
Total GAAP Basis Operating Revenues	$	670,820
Legal Basis of Accounting Expenses		
Legal Basis Expenses	$	704,623
GAAP Adjustments		
Expense in Fiscal Year 2016, included in Fiscal Year 2015 for Legal Basis		30,526
Encumbrances in Fiscal Year 2016, included in Fiscal Year 2016 for Legal Basis		(59,747)
Depreciation on Capital Assets, not included for Legal Basis		105,111
Payments among Water Department Funds, netted for GAAP Basis		(60,733)
Accrual of Probable Indemnities and Worker's Compensation Expenses		2,507
Reclassification of Transfers Out to Nonoperating Expenses		(27,321)
Allocation of Interfund Activity		8,100
Allocation of Accrued Expenses		(1,425)
Change in Inventory Balance as of June 30, 2016		(1,593)
Elimination of Legal Basis Net Position Adjustments		760
Net Pension Expense, included in GAAP Basis		8,709
Removal of Debt Service Principal Payments, included in Legal Basis		(219,133)
Net Adjustments from Capitalization of Capital Assets		(3,586)
Removal of Legal Basis Compensated Absences Expense and Increase in Compensated Absence Liability		343
Amortization of Prepaid Surety Bond Insurance		180
Refund of Prior Year Revenue (Capital Fund)		62
Total GAAP Adjustments		(217,240)
Total GAAP Basis Operating Expenses	$	487,383

CAPITAL IMPROVEMENT PROGRAM BUDGET FOR FISCAL YEARS ENDED JUNE 30, 2018 THROUGH JUNE 30, 2023 **(Legally Enacted Basis)**

	YEAR ENDED JUNE 30						
Capital Budget Summary	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
Collector System/Flood Relief	$ 51,560,000	$ 51,560,000	$ 51,560,000	$ 66,560,000	$ 66,560,000	$ 66,560,000	$ 354,360,000
Collector System COA LTCP Related	56,340,000	56,340,000	56,340,000	61,600,000	77,390,000	77,390,000	385,400,000
Conveyance System	75,060,000	77,060,000	79,060,000	61,060,000	63,060,000	65,060,000	420,360,000
Engineering Admin. & Material Support	50,698,000	51,769,000	52,872,000	54,008,000	55,178,000	56,384,000	320,909,000
Water & Wastewater Facilities	100,000,000	100,000,000	100,000,000	100,000,000	100,000,000	100,000,000	600,000,000
Wastewater Treatment Facilities COA LTCP Related	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	120,000,000
Sub Total Non COA LTCP	277,318,000	280,389,000	283,492,000	281,628,000	284,798,000	288,004,000	1,695,629,000
Sub Total COA LTCP	76,340,000	76,340,000	76,340,000	81,600,000	97,390,000	97,390,000	505,400,000
Total	**$ 353,658,000**	**$ 356,729,000**	**$ 359,832,000**	**$ 363,228,000**	**$ 382,188,000**	**$ 385,394,000**	**$ 2,201,029,000**

COA = Consent Order & Agreement
LTCP = Long Term Control Plan

HISTORICAL OPERATING RESULTS FOR FISCAL YEARS ENDED JUNE 30, 2016, 2015, AND 2014 (Legally Enacted Basis)

(amounts in thousands)

	YEAR ENDED JUNE 30		
	2016	2015	2014
Operating Revenues:			
Sales to General Customers	$ 587,572	$ 585,911	$ 557,396
Service (Sales) to Other Municipalities	32,389	33,222	31,642
Services to Other Philadelphia Agencies			
(Includes Fire Protection)	34,810	35,251	33,621
Private Fire Connections	2,737	2,374	2,236
Industrial Sewer Surcharge	7,375	3,407	4,252
Other Operating Revenue	5,158	5,033	4,480
Total Operating Revenue	**670,041**	**665,198**	**633,627**
Non-Operating Revenues			
Interest on Investments	20	270	422
Operating Grants	745	1,083	1,946
Other Non-Operating Revenues	8,100	10,295	7,024
Total Non-Operating Revenues	**8,865**	**11,648**	**9,392**
Total Revenues	**$ 678,906**	**$ 676,846**	**$ 643,019**
Operating Expenses	**$ 433,026**	**$ 426,767**	**$ 410,797**
Deduct: Commitments Cancelled - Net	24,088	19,389	37,436
Net Operating Expenses	**$ 408,938**	**$ 407,378**	**$ 373,361**
Adjustment between Debt Service and Net Operating Expenses (due to timing differences)	**$ 340**	**$ 4,470**	**$ -**
Excess of Operating Revenues over Operating Expenses	**261,443**	**262,290**	**260,266**
Excess of Revenues over Expenses before Interest Expenses and Principal Payments on Bonded Indebtedness	**$ 270,308**	**$ 273,938**	**$ 269,658**
Interest Expenses:			
General Obligation Bonds	$ -	$ -	$ -
Revenue Bonds	82,594	79,975	74,701
Less: Interest Capitalized	-	-	-
Pennvest Loan	-	-	-
Total Interest Expenses	**$ 82,594**	**$ 79,975**	**$ 74,701**
Excess of Revenues over Expenses Exclusive of Debt Principal Payments	**$ 187,714**	**$ 193,963**	**$ 194,957**
Add: Unencumbered Funds Available for Appropriation at Beginning of Fiscal Year	-	-	-
Deduct: Debt Principal Payments on Bonded Indebtedness During Fiscal Year	136,710	125,295	127,009
Net Unapplied Project Revenues	**$ 51,004**	**$ 68,668**	**$ 67,948**
Deduct: Funds Transferred to General Fund	-	-	-
Deduct: Funds Transferred to Residual Fund	31,136	26,507	24,829
Deduct: Funds Transferred to Capital Account	21,497	20,705	20,194
Transfer (TO)/FROM The Rate Stabilization Fund	1,629	(21,456)	(22,925)
Unencumbered Funds Available for Appropriation at end of Fiscal Year	**$ -**	**$ -**	**$ -**
Debt Service Coverage Ratio:			
Total Debt Service	1.13	1.12	1.11
Revenue Bond Debt Service	1.24	1.23	1.22

APPENDIX II

FINANCIAL CONSULTING AND ENGINEER'S REPORT OF OCTOBER 6, 2016 AND SUPPLEMENTAL EVALUATION BY FEASIBILITY CONSULTANTS RELATED TO CITY OF PHILADELPHIA, PENNSYLVANIA WATER AND WASTEWATER REVENUE REFUNDING BONDS, SERIES 2017B, DATED JULY 17, 2017

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Philadelphia Water Department
Philadelphia, PA

Financial Consulting and Engineer's Report of Proposed Water and Wastewater Revenue Refunding Bonds, Series 2016

RAFTELIS
FINANCIAL CONSULTANTS, INC.

October 6, 2016

Evaluation by Financial Feasibility Consultants

The City of Philadelphia
Water and Wastewater Revenue Refunding Bonds, Series 2016

Raftelis Financial Consultants, Inc. (RFC) has evaluated the accompanying Forecast Statement of Revenues, Expenses, Debt Service, and Debt Service Coverage (Forecast Statement) for The City of Philadelphia's (City) combined water and wastewater utilities prepared by the Philadelphia Water Department (PWD or Water Department) for the six fiscal years ending June 30, 2016 through June 30, 2021 (forecast period). Our evaluation was conducted in accordance with guidelines for the water and wastewater industry and included such procedures as we considered necessary to evaluate the assumptions of the Water Department.

In evaluating the financial feasibility of the debt issuance, those assumptions and factors that we believe are most significant include:

- Projected growth in customers and demand for water and wastewater services and the resulting impact on the forecast of revenues during the forecast period;
- Projected operating costs for providing water and wastewater services to meet demand during the forecast period;
- Projected water and wastewater rates during the forecast period;
- Adequacy of the current operating condition of water and wastewater assets; and
- Projected capital costs and sources of financing to meet infrastructure investment needs during the forecast period.

The accompanying Forecast Statement is presented on a cash basis consistent with PWD's budgeting process for the water and wastewater utility system (System), and has been presented to be consistent with the specific requirements of the coverage tests identified in the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989 (General Ordinance). The Forecast Statement, together with the Summary of Significant Forecast Assumptions, which is included as an integral part of the forecast, constitutes the "Feasibility Evaluation" for the proposed bond refunding.

In our opinion, the accompanying Forecast Statement is presented in conformity with industry guidelines for presentation of a forecast, and the underlying assumptions provide a reasonable basis for PWD's forecast. Based upon the assumptions in our report, the estimated Project Revenues provide adequate funds to maintain the debt service coverage ratios required by the Rate Covenant in Section 5.01 of the General Ordinance during the forecast period for the issuance of PWD's proposed Water and Wastewater Revenue Refunding Bonds, Series 2016 (Series 2016 Bonds). However, there will usually be differences between the forecast and actual results, because events and circumstances frequently do not occur as expected, and those differences may be material. We have no responsibility to update this report for events and circumstances occurring after the date of this report.

Raftelis Financial Consultants, Inc.

Charlotte, NC — By: Jon Davis
October 6, 2016 — Vice President

Philadelphia Water Department

Forecast Statement of Revenues, Expenses, Debt, & Debt Service Coverage

Fiscal Year Ending June 30 ($000)

Line No.	Description	FY 2016 *Preliminary*	FY 2017 *Forecast*	FY 2018 *Forecast*	FY 2019 *Forecast*	FY 2020 *Forecast*	FY 2021 *Forecast*
	Project Revenues						
	User Charges (1)						
1.	Water User Charges	$ 255,409	$ 266,768	$ 276,103	$ 287,095	$ 297,045	$ 314,713
2.	Wastewater User Charges	206,176	218,597	229,679	238,420	256,409	269,751
3.	Stormwater User Charges	161,388	159,683	164,757	170,720	183,617	193,256
4.	*Total User Charge Revenue*	622,973	645,047	670,539	696,236	737,070	777,720
	Other Income						
5.	Wholesale Revenue	34,744	36,405	38,145	39,773	43,059	45,470
6.	Other Operating Revenue (2)	22,166	21,255	5,155	4,455	3,655	2,855
7.	Revenue from Other Gov. & Grants	744	1,000	1,000	1,000	1,000	1,000
8.	Interest Income	165	954	927	803	871	942
9.	Debt Reserve Account Reduction (3)	-	11,000	-	18,781	-	-
10.	Transfer to Debt Service Account to Redeem Bonds (3)	-	(11,000)	-	-	-	-
11.	**Total Project Revenues**	**$ 680,792**	**$ 704,662**	**$ 715,766**	**$ 761,048**	**$ 785,656**	**$ 827,987**
	Operating Expenses						
12.	Personal Services & Benefits	$ (234,016)	$ (245,471)	$ (252,218)	$ (259,053)	$ (265,986)	$ (272,034)
13.	All Other Expenses	(218,163)	(229,800)	(241,624)	(244,445)	(251,198)	(258,266)
14.	Liquidated Encumbrances (4)	24,088	20,734	21,252	21,784	22,328	22,887
15.	*Total Operating Expenses*	(428,091)	(454,537)	(472,590)	(481,715)	(494,855)	(507,413)
16.	**Net Rev. Available for Debt Service**	252,701	250,124	243,176	279,333	290,801	320,574
17.	Transfers From/(To) Rate Stabilization Fund (5)	19,024	7,550	34,582	(18,972)	(19,779)	(24,736)
18.	**Adj. Net Rev. Available for Debt Service**	**$ 271,725**	**$ 257,675**	**$ 277,758**	**$ 260,361**	**$ 271,021**	**$ 295,838**
	Debt Service						
	Senior Debt Service						
19.	Outstanding Revenue Bonds	$ (206,790)	$ (188,911)	$ (185,320)	$ (125,772)	$ (120,798)	$ (121,116)
20.	Pennvest Parity Bonds	(12,343)	(12,343)	(12,927)	(13,120)	(13,074)	(13,074)
21.	Series 2016 Bonds	-	(4,886)	(8,022)	(17,234)	(11,414)	(11,411)
22.	Future Revenue Bonds (6)	-	-	(14,175)	(36,734)	(55,471)	(73,538)
23.	*Total: Senior Debt Service (7)*	(219,133)	(206,140)	(220,443)	(192,860)	(200,756)	(219,139)
	Subordinate Debt Service						
24.	Outstanding GO Bonds	-	-	-	-	-	-
25.	Pennvest Subordinate Bonds	-	-	-	-	-	-
26.	*Total: Subordinate Debt Service*	-	-	-	-	-	-
27.	**Total Debt Service**	**$(219,133)**	**$(206,140)**	**$(220,443)**	**$(192,860)**	**$(200,756)**	**$(219,139)**
28.	**Debt Service Coverage (Line 18/27) (8)**	**1.24**	**1.25**	**1.26**	**1.35**	**1.35**	**1.35**
	Other Capital Expenditures						
29.	Capital Account Deposit (9)	(21,497)	(21,927)	(22,365)	(22,813)	(23,269)	(23,734)
30.	**Total Debt Service Coverage (8) (Line 18/(27+29))**	**1.12**	**1.12**	**1.14**	**1.20**	**1.20**	**1.21**
31.	**Revenue Fund Surplus/(Deficit)**	**$ 31,095**	**$ 29,608**	**$ 34,950**	**$ 44,688**	**$ 46,996**	**$ 52,965**
	Residual Fund (10)						
32.	Beginning Balance	$ 14,990	$ 14,608	$ 15,601	$ 15,629	$ 15,692	$ 15,720
33.	Revenue Fund Surplus/(Deficit)	31,095	29,608	34,950	44,688	46,996	52,965
34.	Transfer to Capital Fund (PAYGO)	(31,537)	(28,673)	(34,985)	(44,687)	(47,031)	(52,966)
35.	Interest Earnings	60	58	62	63	63	63
36.	**Ending Residual Fund Balance**	**$ 14,608**	**$ 15,601**	**$ 15,629**	**$ 15,692**	**$ 15,720**	**$ 15,782**

Notes to the Forecast Statement:

1) User charge revenues are based on calculated PWD customer billings and are adjusted to estimate the resulting annual cash receipts. The adjustment process is described in detail in Section 6.
2) Other operating revenues include penalties, license and permit fees, and other miscellaneous charges. Additional detail on the sources and amounts of other operating revenues can be found in Section 6. The other operating revenues also include an offset for a new income-based water revenue assistance program beginning in FY 2018 and continuing through FY 2021. Section 6 describes the program and the magnitude of its financial impact.
3) Estimated based on the surplus balance above the Debt Service Reserve Requirement. The FY 2017 reduction consists of Water and Wastewater Bond proceeds that will be applied to refund and defease the Water and Wastewater Bonds to which such proceeds are allocable.
4) Liquidated encumbrances have been included as an offset to operating expenses and projected based on estimated actual results in FY 2016. For FY 2017 – 2021. Liquidated encumbrances are estimated based on 12% of the projected services and materials & supplies budget classes less the cost of commodities.
5) Per the General Ordinance, PWD can transfer funds from the Rate Stabilization Fund to the Revenue Fund for the purpose of calculating debt service coverage.
6) Future debt issues have been assumed for FY 2018 – FY 2021. The assumed issuance amounts and terms can be found in Section 9.
7) Does not include debt service or redemption price on bonds expected to be redeemed in such fiscal year, prior to maturity.
8) The Rate Covenant requires that PWD will, at a minimum, impose, charge, and collect in each Fiscal Year such water and wastewater rents, rates, fees, and charges as shall yield Net Revenues which shall be equal to at least 1.20 times the Debt Service Requirements for such Fiscal Year (recalculated to exclude therefrom principal and interest payments in respect to Subordinate Bonds); provided that such water and wastewater rents, rates, fees, and charges shall yield Net Revenues which shall be at least equal to 1.00 times (i) the Debt Service Requirements for such Fiscal Year (included Debt Service Requirements in respect of Subordinated Debt); (ii) amounts required to be deposited into the Debt Service Reserve Account during such Fiscal Year; (iii) the principal or redemption price of and interest on General Obligation Bonds payable during such Fiscal Year; (iv) debt service requirements on Interim Debt payable during such Fiscal Year; and (v) the Capital Account Deposit Amount for Such Fiscal Year (less any amounts transferred from the Residual Fund to the Capital Account during such Fiscal Year.
9) Per the General Ordinance, PWD is required to make an annual deposit to the Capital Account equal to 1% of the depreciated value of property, plant and equipment of the System for the purpose of infrastructure renewal and replacement. More information on this deposit and the Capital Account is provided in Section 6 and Section 8.
10) Amounts deposited in the Residual Fund may be used at the written direction of the City for a variety of purposes as outlined in Section 4.12 of the General Ordinance. For the purpose of this forecast, it is assumed certain funds will be transferred annually from the Residual Fund to the Capital Fund to finance capital improvements.

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LIST OF TABLES

1. SUMMARY AND OPINIONS

Raftelis Financial Consultants, Inc. (RFC) in association with PEER Consultants, P.C. (PEER) has been engaged by the Philadelphia Water Department (PWD) to prepare a forecast of revenues, expenses, debt service, and debt service coverage to support the City's proposed issuance of Water and Wastewater Revenue Refunding Bonds, Series 2016 (Series 2016 Bonds) and provide an assessment of the adequacy of the operating condition of the water and wastewater utility system (System).

All schedules in the Forecast Statement of Revenues, Expenses, Debt Service, and Debt Service Coverage (Forecast Statement), and the Summary of Significant Forecast Assumptions (taken together, the Feasibility Evaluation), have been presented in accordance with the City's annual accounting cycle, based upon its fiscal year beginning July 1 and ending June 30 (Fiscal Year or FY). Financial data used as a basis for the Feasibility Evaluation was provided by PWD staff and includes estimated financial results in FY 2016 (unaudited) and the approved operating and capital budgets for FY 2016 and FY 2017. The Forecast Statement reflects the Water Department's judgment as of October 6, 2016, the date of this Forecast Statement, of the anticipated conditions and the Water Department's expected course of action during the forecast period (Fiscal Years 2016 through 2021).

The Feasibility Evaluation has been included as a part of the Official Statement for the Water Department's Series 2016 Bonds. The Series 2016 Bonds will be used to defease PWD's Series 2007A and Series 2009A outstanding debt issues.

The Feasibility Evaluation is based upon cost, operating, demographic and other relevant information provided by PWD, and the debt service schedules provided to PWD by their Financial Advisor, Public Financial Management. PWD operates on a modified accrual basis of accounting. Revenues are recorded upon receipt, except revenues from other governments which are accrued as billed and interest which is accrued as earned. Operating expenses are recorded on an encumbrance basis, except debt service and lease payments which are recorded when paid. The Feasibility Evaluation is presented in conformity with the methodology for calculating debt service coverage of the Debt Service Requirement, consistent with the specific requirements of the coverage tests identified the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989 (General Ordinance).

In our opinion, based upon the assumptions described in our Feasibility Evaluation, the System will yield pledged Project Revenues (as defined in the General Ordinance) over the amortization period of the Series 2016 Bonds, sufficient to meet the payment or deposit requirements of: all expenses of operation, maintenance, repair and replacement of the System; all reserve funds required to be established out of such Project Revenues; the principal and redemption price of interest on Bonds (as defined in the General Ordinance), as they become due and payable, for which Project Revenues are pledged; and the Rate Covenant set forth in Section 5.01 of the General Ordinance. Additionally, the Net Revenues (as defined in the General Ordinance) are currently sufficient to comply with the Rate Covenant and are projected to be sufficient (assuming the approved and projected rate increases identified in this report) to comply with the Rate Covenant for each of the two fiscal years following the fiscal year in which the Bonds are issued.

PWD maintains an agreement with Assured Guaranty Municipal Corp. (AGM) that for as long as the Series 2005A, 2005B, and a portion of the 2010A Bonds, which are insured by AGM, are outstanding, the system must maintain Net Revenues, excluding transfers from the Rate Stabilization Fund, of 90% of the annual Debt Service Requirements. Projected Net Revenues (excluding amounts transferred from the Rate Stabilization Fund into the Revenue Fund during, or as of the end of, such fiscal year) are also sufficient to equal at least 90 percent of the Debt Service Requirements (as defined in the General Ordinance, and excluding debt service due on any Subordinated Bonds) in such fiscal year.

In addition, based on the results of interviews and discussions with PWD staff, which are summarized in this report, the System's organization and management structure is sound and adequate to support ongoing operations. Based on the results of PEER's physical inspection of the assets and related facilities, discussions with key personnel, and engineering studies of the records of the Water Department's Capital Improvement Plans, which are described in the attached Appendix, the System is in good operating condition.

2. BACKGROUND OF THE SYSTEM

Pursuant to the Philadelphia Home Rule Charter, the City's Water Department has the power and duty to operate, maintain, repair and improve the City's water system (the "Water System") and the City's wastewater system (the "Wastewater System" and together with the Water System, the "Water and Wastewater Systems" or the "System"). The Water Department, which began water service in 1801, supplies water and wastewater services to the City. Additionally, the Water Department has ten wholesale wastewater service contracts and one wholesale water contract.

PWD serves over 480,000 water customer accounts providing service to approximately 1,567,422 individuals that live in the City. The water system service area encompasses 130 square miles and draws its water mostly from the Delaware River with the rest being drawn from the Schuylkill River.

In terms of wastewater collection and treatment, PWD provides service to approximately 1,567,422 million people. PWD also operates a stormwater system to address water runoff during storm events. PWD's Green City, Clean Waters plan will include a significant investment in public infrastructure over the next 25 years that will fund upgrades to the wastewater treatment plants and the installation of green infrastructure in streets, parks, schools and other public spaces. PWD's stormwater revenues, expenses, and expenditures are consolidated within the Wastewater System.

3. ORGANIZATION AND MANAGEMENT

3.1. ORGANIZATION AND STRUCTURE

PWD is responsible to plan for, operate and maintain both the infrastructure and the organization necessary to purvey high quality drinking water, to provide an adequate and reliable water supply for all household, commercial, and community needs, and to sustain and enhance the region's watersheds and quality of life by managing wastewater and stormwater effectively. The Water Department was established by the Philadelphia Home Rule Charter, approved April 17, 1951 as one of the City's ten departments, and is operated as a self-supporting enterprise fund utility.

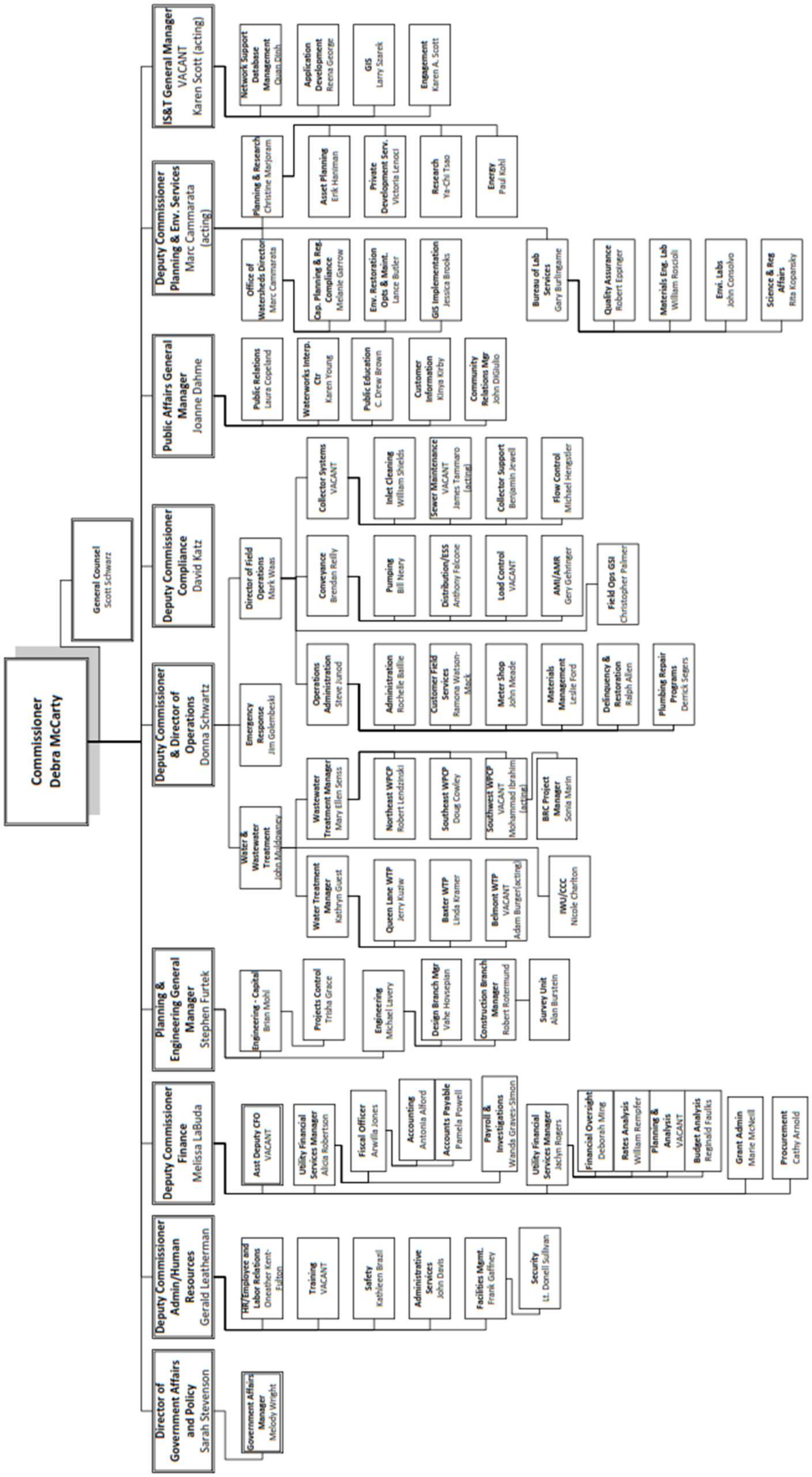
PWD's System serves approximately 1.5 million people in the City. Water services are extended indirectly via wholesale agreement in parts of Bucks County and Delaware Counties, while the wastewater services are extended indirectly via wholesale agreements to ten municipalities located in Montgomery, Delaware, and Bucks counties. Major utility responsibilities include planning, construction, operation, and maintenance of both systems, compliance with regulatory requirements, rate setting and customer engagement; including public outreach and education, budgeting and cost accounting, and preparation of financial statements for the systems.

PWD works in close collaboration with the Water Revenue Bureau (WRB), which is a division within the City's Revenue Department. The WRB is responsible for billing, collections, and customer accounting for the water and wastewater systems. PWD shares some functions with the WRB, including customer care and delinquency enforcement, and depends on the Office of the City Controller for the audit function. Additionally, legal matters affecting the Water Department are handled by the City Solicitor's office - specifically, the Divisional Deputy City Solicitor assigned to PWD.

The Water Department is led by the Water Commissioner, who is appointed by the City's Managing Director, with approval from the Mayor. In January, 2016 Debra McCarty was appointed as the Water Commissioner, after the retirement of former Water Commissioner Howard Neukrug. Prior to being appointed as the Commissioner, Ms. McCarty served as the Deputy Commissioner and Director of Operations, and is the first woman to lead PWD in its more than 200-year history. The Commissioner is assisted in the management of the Water Department by five Deputy Commissioners, who oversee Administration and Human Resources, Finance, Operations, Compliance, and Planning and Environmental Services.

The Water Department consists of six major divisions: Operations, Engineering & Construction, Finance, Human Resources, Public Affairs, and Planning and Environmental Services. Each of these divisions is divided into units and subunits responsible for carrying out specific functions. The senior management team is actively involved in industry associations, as well as developing and documenting best practices for the water, wastewater, and stormwater industries. An organizational chart of the Water Department is shown in Figure 1.

Figure 1: Philadelphia Water Department Organizational Chart (as of 9/8/16)



As of June 30, 2016, the Water Department had a total of approximately 2,032 employees. Of the total number, approximately 73% are represented by District Council 33, and 18% are represented by District Council 47 of the American Federation of State, County, and Municipal Employees Union. The remaining staff are upper management, supervisory, senior engineering, or part-time employees, who are not eligible for union membership. In addition to the employees within the Water Department, there are approximately 232 employees in the WRB whose positions are also funded by the Water Department.

The following sections provide an overview of the Water Department's key divisions and the WRB.

3.1.1. Operations Division

One of the Water Department's most critical objectives is to operate and maintain the water and wastewater treatment plants, the conveyance systems and the pumping stations continuously and cost effectively without adverse impacts to public health and the environment. In order to assure that water and wastewater quality remains high, PWD operates in compliance with numerous regulations, including the Safe Drinking Water Act, the Clean Water Act, Pennsylvania Department of Environmental Protection Regulations, and the pollutant limits and other requirements of each facility's operating permit including the wastewater plants' National Pollutant Discharge Elimination System. The Water Department also participates in the Partnership for Safe Water Treatment Plant and Distribution System Optimization Programs.

Beyond remaining in compliance with current regulations, the Water Department must also plan to meet the infrastructure needs and increasingly stringent regulatory requirements of the future. The Operations Division is a critical voice in planning efforts, working in close collaboration with the Planning and Environmental Services Division, the Engineering and Construction Division, and the Office of Compliance. Specifically, collaboration occurs around the following: long-range planning and engineering; coordinating regulatory agency requirements; demonstrating permit and regulatory compliance; preparing construction documents and facilitating the design and construction processes; and establishing capital budgets; in order to maintain that Capital Improvement Plan (CIP).

The Deputy Commissioner of Operations reports to the Water Commissioner, and oversees the following operating units:

- Water Treatment
- Wastewater Treatment
- Water Conveyance
- Wastewater and Stormwater Collection
- Operations Administration
- Industrial Waste/Backflow Control

The Operations Division and its operating units are discussed in detail in the engineer report prepared by PEER Consultants (PEER), a subcontractor of Raftelis Financial Consultants, Inc. This report is included in the appendix to this feasibility evaluation and includes an assessment of the condition of the assets of the PWD.

3.1.2. **Planning and Environmental Services Division**

The Deputy Commissioner of the Planning and Environmental Services Division oversees three specialty units: Planning and Research, Office of Watersheds, and the Bureau of Laboratory Services. Each of these units supports the overall mission of the Division, and is described in more detail in the next several sections.

3.1.2.1. Planning and Research Unit

The Planning and Research Unit (Unit) is responsible for a myriad of tasks, generally falling within the categories of strategic planning and research activities associated with source water; water and wastewater infrastructure planning; strategic energy management planning; and stormwater management on private property. The Unit also directs and coordinates strategic planning for capital projects, as well as the development of traditional research and technical activities in furtherance of identifying and implementing innovative programs to improve the performance of PWD's assets, programs, and resources.

The Unit currently has 40 full-time equivalents (FTEs) in operating positions. The number of positions is directly impacted by the efforts involved to address the Consent Order, the Agreement for the Combined Sewer Overflow Long-term Control Plans (CSO LTCP), and the Phase 1 MS4 stormwater permit. Many of the FTEs in the Unit are engineers who have obtained their professional engineering licenses. The rest of the employees are planners, architects, or scientists.

The Unit is made up of several sub units, including:

- Capital Planning: This group was formalized in 2011 to increase coordination and asset management, and to ensure projects over $2 million were given proper vetting and oversight. This group recently initiated a process to focus on consistent initiation, documentation, business case analysis and justification, alternative analyses, and tracking for all large capital projects. Moving forward, capital projects will originate from this group or from the Operations Division, and then evolve through this group, as a way to build to a 25-year capital plan for all major facilities.
- Strategic Planning: This group considers the infrastructure needs to address future challenges on a 25-year planning horizon and provides a vision for the future regarding infrastructure needs. This allows PWD to better position itself to take advantage of opportunities that arise. Specifically, this group focuses on Asset Management, by supporting infrastructure condition assessments, prioritizations, and replacement programs.
- Energy Management: This group supports the implementation of the Utility Wide Strategic Energy Plan, including the development of new energy initiatives, conceptual design, and implementation.
- Private Development Services: The Private Development Services group interacts with external stakeholders, particularly developers, to ensure implementation of the City's stormwater regulations through stormwater management plans (SMP) and regular

inspections. This subunit is responsible for reviewing and approving SMPs for proposed private development with a footprint of greater than 15,000 square feet.

- Flood Management Planning: This subunit works collaboratively with the Climate Change Planning unit to focus in City-wide flood management issues. The Flood Management Planning group was created to address flooding concerns raised by customers, and works to mitigate future flood impacts.
- Water Master Planning: In order to ensure that the Water Department is prepared to continue its legacy of providing sustainable drinking water for future generations, the Water Master Planning group coordinates long term activities, including the 2040 Water Master Plan, hydraulic reservoir and water quality modeling, climate change evaluation, etc.
- Wastewater Master Planning: This group was established to provide strategic planning efforts for each of the three pollution control plants, and to ensure that the long term operational and capital needs of the facilities are fully supported. Ultimately, this group will produce long term facility master plans to incorporate holistic and total water approaches in the facility planning efforts.
- Research: Like many 21st century utilities, PWD engages in activities to ensure performance management and continuous improvement to meet future challenges. This program is responsible for identifying new processes and approaches, and also for conducting research for the development and implementation of new technologies to inform the Water Department's operational areas.
- Data Analysis and Planning: The Data Analysis and Planning unit organizes and catalogues the information generated by the Water Department's various planning initiatives. This unit provides data and planning for other sub groups, particularly the Private Development Services, and assists in generating annual reports related to the Water Department's CSO LTCP Update.

3.1.2.2. Office of Watersheds

The Office of Watersheds plans and implements programs associated with CSOs and stormwater management programs, with the goal of allocating resources to these programs in such a way as to maximize the effectiveness of each, while ensuring that the goals and regulatory requirements of both programs are met. Since the Water Department entered into a Consent Order and Agreement (COA) in June of 2011, this Office has worked to implement City-wide green infrastructure projects, along with the resulting compliance tracking and reporting.

This group currently has 59 FTEs in operating positions. Similar to the Planning and Research Unit, the number of positions are directly impacted by the efforts involved to address the COA for the CSO LTCP and the Phase 1 MS4 stormwater permit.

The seven program units within the Office of the Watersheds are described briefly below:

- Policy and Partnerships: The Policy and Partnerships unit oversees interagency coordination, policy initiatives, and watershed information development. This group also identifies and pursues grants for green infrastructure.
- Capital Planning and Regulatory Compliance: This group plans traditional infrastructure improvements and tracks performance toward meeting permit compliance. Hydraulic

modeling is used to measure pollution compliance in the water and sewer systems, and to identify areas where stormflow-related basement flooding has occurred in previous years.

- Green Stormwater Infrastructure Implementation: Responsible for planning, design, and implementation of green infrastructure projects across the City, this group identifies potential projects, manages planning and design contracts, and oversees the construction of green infrastructure projects.
- Surface Water Investigation and Modeling: This group focuses on field-based monitoring activities, including monitoring green stormwater infrastructure, as well as water quality in streams and tidal waters.
- Environmental Restoration Operations and Maintenance: This group is responsible for implementing watershed restoration projects, planning for the operations and maintenance of green infrastructure projects, and management of related maintenance contracts. In areas where development negatively impacts an ecological system, the Environmental Restorations Operations and Maintenance group works with the developer to design and implement an alternative project to offset the impact of the original development.
- Stormwater Billing: The Stormwater Billing group coordinates the development of the stormwater rate structure, parcel data management and processing, generation of monthly stormwater billing and adjustment files, and reviews of applications for credits or appeals.
- Sourcewater Protection: The Sourcewater Protection unit manages watershed compliance for the Long Term 2 Enhanced Surface Water Treatment Rule, and works with the regional watershed groups to monitor and assess the impact of potential contaminants on the region's drinking water sources.
- Climate Change Planning: This group coordinates with the Mayor's Office of Sustainability to better understand the potential impacts of Climate Change on the City and specifically on the Water Department.

3.1.2.3. Bureau of Laboratory Services

The Bureau of Laboratory Services is an environmental laboratory responsible for providing analytic services to support the Water Department's water and wastewater regulatory compliance, as well as other Departmental initiatives. This group responds to increasingly stringent regulations by providing sampling and analytical support at the levels required for modeling and regulatory development. Often, this means that this group participates in cutting edge research initiatives at its state-of-the-art laboratory facility.

The following groups exist within the Bureau of Laboratory Services, and are critical to meeting the high water quality standards, reporting requirements, and assisting with quality construction for capital improvements. Currently, 103 FTEs in operating positions reside among the laboratories and groups.

- Organics laboratory – detects different classes of organic compounds
- Inorganics laboratory – analyzes water samples of pH, metals, nutrients, dissolved oxygen, and other inorganic chemicals
- Aquatic biology laboratory – analyzes samples for microbiological content
- Materials Engineering Laboratory (MEL) – tests quality of materials that are present in infrastructure to ensure infrastructure will perform as expected. The MEL also performs

routine inspection of assets such as concrete structures and pipelines as well as determining the cause of material failures. This laboratory is more than 100 years old and is recognized as a leader in the industry. The engineers from this laboratory founded the American Society for Testing and Materials which sets testing standards for the rest of the county. This laboratory also performs testing services for other city departments including, for example, the Fire Department and the Airport.

- Quality Assurance – ensures all analytical work is performed accurately and safely and is responsible for maintaining the laboratory's certification.
- Scientific and Regulatory Affairs – performs research, administers the Water Department's extensive water quality programs, and coordinates compliance with regulatory agencies (such as the Pennsylvania Department of Environmental Protection and the Environmental Protection Agency) on behalf of all the laboratories. This group guides the Water Department in preparation for compliance with new regulations, ensures water meets or exceeds regulatory standards, and publishes information on compliance annually.

The Bureau of Laboratory Services manages compliance with federal and state water quality monitoring requirements through drinking water quality surveillance and investigations, analysis of samples gathered as a result of customer complaints and targeted water quality investigations and research, and enforcement of the City's Cross Connection Control Program. Additionally, this group monitors urban streams, in conjunction with the Office of Watersheds, with the goal of ultimately enhancing the quality of the Delaware River.

The Bureau of Laboratory Services has been monitoring the possibility of changes to the regulations regarding lead in the Lead and Copper Rule and the National Drinking Water Advisory Council to the EPA and is meeting all current regulations. Should more stringent regulations be mandated, such as requiring service lines on private property to be replaced or additional water sampling, more personnel may be needed to comply with these regulations. PWD will increase staff to meet compliance with any changes in regulations.

3.1.3. Engineering and Construction Division

The Water Department's CIP is implemented by the Engineering and Construction Division, which is comprised of the Design, Projects Control, and Construction units.

3.1.3.1. Design Unit

The Design Unit is responsible for fulfilling any engineering functions associated with the Water Department's CIP, in the areas of design and construction. Operations Division staff will identify projects, which are then entered into the Water Department's Capital Program Integrated Tracking (CAPIT) system. Once the project's design has been completed and approved by Operations, the Projects Control Unit manages the public bidding process. In addition to the Operations Division, the Engineering and Construction Division works with the Planning and Environmental Services Division to add to and enhance the capital budgeting process.

Within the Design Unit, staff members report to either the Plant Design group or the Water and Sewer Design group. Both groups supplement their staff with outside consultants on an as-needed basis.

The Design group evaluates and designs new and rehabilitation projects; provides input for maintenance, renovation, and reconstruction; reviews and administers work performed by design consultants; maintains record plans; and provides assistance to the Operations Division during disruptions in water or wastewater service. This group also coordinates with other agencies and private utilities and reviews plans prepared by private developers, to make sure that they meet PWD standards.

The Design Unit has 85 budgeted capital positions, of which 53 are filled, and 7 budgeted operating positions, which are all currently filled.

3.1.3.2. Projects Control Unit

The Projects Control Unit develops, maintains, monitors, and coordinates the CIP. Facility managers develop projects, receive approval from the section manager and the Deputy Commissioner of Operations, and send them to the Design Unit to prepare plans and specifications. Upon completion of the biddable documents, the Design Unit forwards the project to the Projects Control Unit, which prioritizes the projects and places them in a timeline for completion. The Water Department has developed and implemented a computerized budgeting system to enable each division to independently prepare budget requests, based on historical and current information. Large capital projects go through a comprehensive planning process, with standardized documentation, justification, and alternatives analysis before being prioritized and placed in the CIP.

The Projects Control Unit is also responsible for evaluating contractor qualifications by requiring contractors to submit questionnaires during the bidding process, coordinating with private developers, administering the ACT 537 program, and managing the PA One Call requirements. In addition, since the Records Unit is part of the Project Controls Unit, this unit maintains the as-built records for water conveyance and sewer collection systems, coordinates with plumbers when working in public right-of-ways, and approves all water and sanitary sewer connections. In July of 2016, the records unit will also be responsible for inspecting all sewer lateral connections.

The Projects Control Unit has 8 budgeted capital positions, of which 6 are filled, and 13 budgeted operating positions, of which 12 are currently filled. In addition, the FY 2017 approved Operating Budget included 6 additional positions in the Records Unit to conduct sanitary connection inspections.

3.1.3.3. Construction Unit

Once the Project Control Unit issues a notice-to-proceed, the Construction Unit takes ownership. This includes verifying contractor compliance with design contract documents, processing change orders if necessary, responding to requests for information, and handling payment requests from contractors. During the construction phase of the project, the Construction Unit will facilitate monthly progress meetings that include both the Design Unit and the Operations Division. The

Construction Unit also provides surveying services to facilitate construction site stake out and compliance with surveying procedures.

To monitor projects performed by outside contracts, a full-time inspector is assigned to oversee quality control, problem resolution, coordination with other departments and utilities, and to keep daily logs of manpower, equipment, and work performed. In addition, a construction engineer is also assigned to every project to ensure the project stays on schedule and on budget. A contractor performance evaluation is completed by the inspector and the construction engineer as part of the contract close out process which is kept in the database management system (ProjectWise) for future reference. The Construction Unit is also considering a new program to document contractor complaints that arise during construction so that they can be cross-referenced against the questionnaires required to be submitted by each contractor to the Projects Control Unit during the bidding process.

The Construction Unit has 116 budgeted capital positions, of which 104 are filled. The Survey Unit has 53 budgeted capital positions, of which 34 are filled.

It should be noted that the level of positions within all units of the Engineering and Construction Division have been impacted by the Green City, Clean Waters program, which has caused an increase in the number of projects that are being constructed. The volume of projects is expected to increase as the program is accelerated and therefore staffing adjustments are anticipated in order to accommodate the projects resulting from the program.

3.1.4. Finance Division

The Finance Division's responsibilities are highlighted below.

- Development of water and wastewater revenue requirements and rates
- Preparation and control of the operating budget
- Management of capital financing programs
- Maintenance of inventory control, functionalized cost, and fixed asset accounting systems
- Procurement
- Preparation and supporting documentation of federal and state grants

Through these responsibilities, the Finance Division coordinates with vendors to secure goods and services, calculates fair and equitable rate structures for water and wastewater that allow for continued operating and capital funding, monitors budgetary expenditures, and facilitates performance management through measurement and developing specialized accounting systems. The Finance Division is also committed to providing relevant and timely financial data to its investors, customers, suppliers, and to government entities as required by law and by its bond covenants, contracts, and by Generally Accepted Accounting Principles. Responsibilities associated with rates now require additional authorization from the water, sewer, and stormwater Rate Board.

The Deputy Commissioner of Finance reports directly to the Water Commissioner, and oversees the Finance Division operating units, which include the following.

- Budget Unit: This unit provides oversight of the department's water fund operating budget, coordinates the preparation of the operating budget as well as the target budget and all periodic updates, and reviews and approves all contracts, purchase orders and other obligations.
- Rates Unit: This unit provides oversight of all rates and charges rendered on behalf of the Water fund, coordinates the efforts of the department's Rate Consultants and ensures that cost of services studies are performed timely and comprehensively, serves as the primary contact for ten wholesale wastewater and one wholesale water customer, coordinates all contract matters and disputes with wholesale customers, prepares periodic billings for wholesale customers, and coordinates each rate process to ensure compliance with State law, the City charter and PWD's regulations.
- Accounting Unit: This unit performs the routine accounting required by the department which includes preparation of the annual financial statements, accounting for fixed assets and construction in process, accounting for and inventory of class 400 equipment, and the preparation of periodic reports.
- Accounts Payable Unit: This unit coordinates the payment of vendors for material, supplies and equipment and the maintenance of the required documentation for these activities.
- Capital Payments Unit: This unit coordinates the payment of vendors for public works contracts and professional services contracts and the maintenance of the required documentation for these activities.
- Planning & Analysis: Coordinates special projects, studies and reports related to department wide organization, efficiency and performance measurement; coordinates the development of operational performance goals, and is responsible for the collection and analysis of financial and operational data for the Monthly Managers' Report; and provides oversight of the Department's strategic plan and provides input into the Department's sections of the City's Five Year Financial Plan, the Mayor's Report on City's Services, and other periodic reports and studies.
- Grants Management Unit: This unit provides oversight and coordination for all the Water Department's grants.

In 2016, the Finance Division transferred the responsibility of Facilities Management, the Machine Shop, and the Security Units to the Human Resources and Administration Division.

The Finance Division has 50 budgeted positions and 9 current vacancies. The division actively conducts succession planning and trainings, to mitigate the effects of retirements in key positions. This group is organized to efficiently coordinate with and respond to the financial needs of the other Water Department Divisions, as well as other Departments within the City organization.

3.1.5. Human Resources and Administration Division

The Human Resources Division provides human resource planning, administrative services and facilities management to the other Water Department Divisions and their respective units. The goals of this group include:

- Coordinating traditional personnel functions with management and manpower training initiatives;
- Ensuring that personnel recruitment, placement, training, career development, and safety are aligned with the Water Department's long-term human resources needs and affirmative action goals;
- Initiating human resources management and administrative policy development;
- Facilitating and supporting effective policy and procedure communication throughout the Water Department;
- Coordinating labor management initiatives and employee relations programs with the Water Department's long-term plans; and
- Managing all activities related to the facilities, the machine shop and security.
- Government Affairs Unit: This unit ensures consistent communication and outreach to the City Council, the Mayor's Office, and the State Capital, which then allows the group to monitor legislation at all levels of government. Additionally, the Government Affairs Unit provides customer assistance for commercial groups that have stormwater fee inquiries. This particular unit is a separate office that reports directly to the PWD Water Commissioner.

The Human Resources Division encompasses Safety, Training, Recruitment, Employee/Labor Relations, Facilities Management and Security and has 172 budgeted positions. Currently, there are 22 vacancies.

Major initiatives of the Human Resources Division include the Water Department's Apprenticeship Program, which began in 2006, and is managed by the Training Unit. High school students interested in applicable trades can be hired as apprentices to the Water Department, and work in part-time positions until graduation. Once they graduate, apprentices work full time, complete the requisite training, and become full-time civil service employees. Another initiative, from the Safety Unit, is to build training programs to increase safety and decrease paid days lost. This year, the Water Department implemented Safety Month, with a series of events providing information and experts soliciting lists of training opportunities. The Department is focused on training supervisors to have them better understand their roles relative to safety measures.

3.1.6. **Public Affairs Division**

The Public Affairs Division works in concert with the other Divisions and groups within the Water Department to enhance stakeholder engagement provide outreach activities and provide better service to the public. This group serves as a liaison between the Water Department and the public, and represents the interests of the public to the Water Department. This division is comprised of the groups listed below.

- Public Education Unit: This Unit focuses on bringing information and educational materials and programs to schools, neighborhood groups, community events, and customers. Of particular note is the success of this unit are the materials and programming related to the importance of and community impact on urban watersheds.
- Fairmount Waterworks Interpretive Center (Center): The Center was opened in 2003, and traces the relationship between humans and the Schuylkill River. The Center is staffed by

four environmental educators and features interactive exhibits on the urban watershed, a water laboratory, and a classroom/media center.

- Public Relations Unit: The Public Relations Unit works to ensure that PWD's communications with the media are proactively and effectively delivered (e.g. delivery of seasonal or topical press kits). This unit has also created a communications guide, which serves as an internal reference document, and developed a list of key communication topics, including community relations, construction projects, education/stewardship, rates, source water protection, etc.
- Customer Information Unit: While water and wastewater billing complaints are largely handled by the WRB, the Customer Information Unit handles overflow calls from the WRB and answers all customer calls directed through PWD's hotline regarding water/sewer emergencies, customer service requests, meter appointments, and flooding. The Customer Information Unit is responsible for entering the customer requests into Cityworks (a work-order system) that is directed to the appropriate unit for resolution.

The Public Affairs Division has 51 budgeted FTEs with 7 vacancies: three in Customer Information and 4 in Public Relations. This division works with the Green City, Clean Waters Advisory Committee - a stakeholder-based committee that is tasked with providing PWD feedback on its programs and projects, of which many are related to the Green City, Clean Waters. In addition, the division manages neighborhood based public engagement efforts with civic associations and community development centers (CDC) to specifically address green stormwater infrastructure projects impacting communities and opportunities such as the Adoption Program for groups to partner with PWD. The PA Division also facilitates a stakeholder groups with representatives from public advocacy, billing and housing assistance, realtors, and tenant and landlord organizations. The Residential Customer Assistance and Services Committee (RCAS) provides feedback and advice to PWD and WRB regarding billing and customer service related issues that typically impact low-income customers. In the Fall of 2016, the division will be working with environmental and public health organizations such as Clean Water Action and the Drexel School of Public Health to develop citizen based groups to assist with outreach and education on customer owned lead service lines and general drinking water quality issues.

3.1.7. The Office of Compliance

The Office of Compliance was created in 2001, and is responsible for proactively managing and addressing the various environmental issues applicable to water, wastewater and stormwater operations, including:

- Negotiating and challenging, as necessary, all environmental permits (e.g., NPDES);
- Developing strategies to handle new and emerging regulatory challenges;
- Reviewing and commenting on any new laws and regulations that affect the Water Department;
- Testifying before government agencies and commissions to advance and advocate for the Water Department's position;
- Responding to environmental problems or issues as they arise;
- Developing environmental policies to guide operating and capital budget decision-making;
- Ensuring that environmental reporting to governmental agencies is timely and accurate;

- Negotiating wholesale contracts and resolving any large business complaints such as surcharges or stormwater complaints;
- Negotiating and resolving any environmental violations alleged by regulatory agencies; and
- Responding to formal and informal requests for information from regulatory agencies.

The Office of Compliance works with various PWD divisions and units within the divisions to manage all PWD compliance objectives. The Office of Compliance has 1 FTE.

3.1.8. Information Science and Technology

The Information Science and Technology (IS&T) Unit within the Water Department is part of the City's Office of Innovation and Technology (OIT). As such, the Director of the Unit reports to the OIT, but at a functional level, also reports to the Water Commissioner. IS&T provides Geographic Information Systems (GIS), software, hardware, network support, and other technology-related services for the Water Department. Supervisory Control and Data Acquisition (SCADA) and Distributed Control Systems (DCS) do not fall within this unit's scope.

The IS&T Unit has recently been reorganized into the following four groups, to better delineate roles and responsibilities:

- System Team: Operations, maintenance and planning activities associated with the physical network and server environment, database management, and new technologies.
- GIS Team: Operating and maintaining the utility's ArcGIS database, the Water Department asset layers, and quality control of geolocations in the GIS database.
- Business Team: Focuses on IS&T portfolio management, development and management of business requirements and documentation, and project management.
- Applications Team: Responsible for applications development, maintenance, and production support.

3.1.9. Water Revenue Bureau

The WRB was established under the City's Charter, and reports to the Revenue Commissioner and the Office of the Director of Finance. The WRB is responsible for meter reading, billing, and collection of water and wastewater revenue for services provided by the Water Department, as well as enforcement of payments and customer relations.

The WRB and the Water Department have increasingly collaborated with respect to billing and collections since 1992, when both the Office of the Director of Finance and the Water Commissioner agreed to jointly monitor collection of water and wastewater revenues. Since then, additional collaborations have led to improved reporting in revenue collections, implementation of monthly billing, collections of aged receivables by private collection agencies, and enforcement actions.

In 1997, the Water Department and the WRB implemented an Automatic Meter Reading Program (AMR Program), which involved the replacement of all water meters with new radio-capable meters. This initiative was completed in 2013, and has greatly improved the accuracy of billing, increased revenues, and significantly reduced the costs of meter reading and related support. In 2014, the Planning and Research Unit began to explore Automated Metering Infrastructure (AMI), which provides an array of enhanced customer service and operational capabilities, in addition to regular meter reading.

Additional collaborations include the replacement of a twenty-five-year-old billing system with Basis2 Customer Billing System in 2008. This has greatly improved the billing process, and has allowed the Water Department and WRB to develop, enhance, and validate several new applications and reports related to the new billing system.

3.2 GOVERNANCE

The Water Department is managed by the Water Commissioner appointed by the City's Managing Director with approval of the Mayor. The Water Commissioner appoints deputies with the approval of the Managing Director.

The Philadelphia City Council (City Council) is the legislative branch of City Government and has the authority to enact ordinances that direct the Water Department. Ordinances governing water and sewer are found in Title 13 of City Code and include requirements for setting rates and charges (Chapter 13-100). City Council oversight for the Water Department is through the Property and Public Works Committee.

3.2.1. Budget Approval Process (Operating and Capital)

The City's operating budget is submitted on an annual basis and comprised of a consolidated budget of all the operating obligations and expected revenues of the City. The Home Rule Charter requires the Operating budget to be adopted by City Council at least 30 days before the end of the Fiscal Year. The City's Fiscal Year begins July 1 and ends on June 30th of the following calendar year. The Water Fund is an Enterprise Fund within the City and is subject to an annual operating budget adopted by City Council. City budgets appropriate funds for all City departments, boards and commissions by major class of expenditure within each department. The annual review process for the operating budget has several stages. The process begins with the Budget Call, where City departments are required to submit their budget requests, including previous fiscal year actual expenditures, current estimates, the proposed current budget, and the five-year plan estimates and information on personnel projections. The operating budget for the next Fiscal Year is prepared by the Mayor and must be submitted to City Council for adoption at least 90 days before the end of the Fiscal Year. Once the budget review process is complete, the Mayor's Operating Budget in Brief is assembled, the budget ordinance is introduced in City Council, and the Operating Budget Detail is prepared and distributed in time for the annual City Council budget hearing process.

The Charter requires that at least 30 days before the end of each Fiscal Year, City Council must adopt by ordinance an operating budget and a capital budget for the ensuing Fiscal Year and a capital program for the next six years. The City's capital budget is appropriated by project for each department, including the Water Department. Requests to transfer appropriations between projects must be approved by City Council. Any appropriations that are not obligated at year-end are either lapse or are carried forward to the next Fiscal Year. The capital budget ordinance, authorizing in detail the capital expenditures to be made or incurred in the ensuing Fiscal Year from City Council appropriated funds, is adopted by City Council concurrently with the capital program.

In addition to review by City Council, City budgets and finances, including those of the Water Department, are evaluated and approved by the Pennsylvania Intergovernmental Cooperation Authority (PICA). PICA is a special administrative body created by the Commonwealth of Pennsylvania on June 5, 1991 to review and oversee the finances of the City of Philadelphia.

3.2.2. Approval of Rates and Charges

In November 2012, Philadelphia voters approved an amendment to the Charter to allow City Council to establish, by ordinance, an independent rate-making body responsible for fixing and regulating rates and charges for water, sewer, and stormwater services. Under this Rate Ordinance, the Water Rate Board was established as the entity responsible for setting water, wastewater and stormwater rates. The Rate Ordinance became effective January 20, 2014. The five Water Rate Board members are appointed by the Mayor and approved by City Council.

3.2.3. Relationship to Other City Departments

The Water Department relies on other City departments for support of its operations. Ten departments receive a direct appropriation, known as "interdepartmental direct obligations," from the Water Department's annual operating budget to fund these direct support services. These departments include: the Revenue Department for meter reading, billing and collections; the Law Department for legal services; the Department of Public Property for office space, communications, and parking; the Office of Fleet Management for vehicle acquisition, fuel, and maintenance; the Department of Technology for computer support, the Procurement Department for acquisition of goods and services, the Finance Department for fringe benefits, indemnities, and support services; the Sinking Fund Commission for payment of debt service; the Office of Sustainability for energy procurement services; and the Office of Transportation and Infrastructure for related services. Interdepartmental direct obligations for Fiscal Year 2015 totaled $352.2 million or about half of the operating costs. Of this amount, approximately $200.8 million went for debt service and $100.6 million went for fringe benefits.

Approximately 15 City departments and agencies provide additional services to the Water Department for which they are paid at the close of the fiscal year through "interfund charges." Interfund charges totaled $6.2 million in Fiscal Year 2015. Payments from City departments and agencies for water, wastewater, and stormwater services also occur through interfund revenue. These payments totaled about $35.2 million in Fiscal Year 2015.

The Water Department works particularly closely with the WRB, a division within the City Revenue Department. The WRB is the primary point of contact for Water Department customers and is responsible for account setup, billing, payment application, collections and customer service activity.

4. DEMAND FOR SERVICES

PWD serves as the provider of water and wastewater (including stormwater) services to all of the retail residential, commercial, industrial, and institutional customers within the City limits of Philadelphia. Wholesale water service is provided to Aqua Pennsylvania on a contract basis for up to 9.5 MGD of maximum daily capacity with a term of 25 years, ending in 2026. Wholesale wastewater service is provided to 10 suburban customers on a contract basis including the Delaware County Regional Water Quality Control Authority (DELCORA), the Bucks County Water and Sewer Authority, the Upper Darby Township, the Lower Southhampton Township, the Cheltenham Township, the Lower Merion Township, the Springfield Township, the Bucks County Water and Sewer Authority (Bensalem), the Abington Township, and the Lower Moreland Township. The specific structures of the wholesale wastewater contract agreements vary, but generally include a proportionate allocation of operating expenses and capital costs associated with assets that are used and useful to wholesale customers.

The number of active PWD retail accounts has remained relatively stable over the last five years. Therefore, no growth in customer accounts has been projected for the forecast period. However, similar to most utilities nationwide, PWD has experienced a trend in declining per capita water consumption related to a number of factors including, in particular, the increased prevalence and use of high efficiency fixtures, water resource conservation, and other related factors. As such, the forecast period assumes a reduction in residential water usage of approximately 1.25% to 1.50% per year while non-residential consumption is projected to remain essentially flat. Combined, the overall average decline in water consumption is approximately 0.6% per year, which is consistent with historical consumption patterns over the past five years. The projection of billable impervious area and gross area include a decrease of approximately 0.8% and 1.4% per year in square feet, respectively, to reflect increased participation in PWD's stormwater credit program. The credit program provides an opportunity for customers to receive a credit on their bill by implementing stormwater best management practices.

The following tables, Table 1 and Table 2, show a summary of the projected number of customer accounts and corresponding water and wastewater usage and impervious area, based on detailed billing data provided by PWD staff, for the forecast period.

Table 1: Customer Bills

Description	FY 2016 *Preliminary*	FY 2017 *Forecast*	FY 2018 *Forecast*	FY 2019 *Forecast*	FY 2020 *Forecast*	FY 2021 *Forecast*
Customer Bills						
Water						
Residential	4,894,580	4,894,580	4,894,580	4,894,580	4,894,580	4,894,580
Commercial	412,759	412,759	412,759	412,759	412,759	412,759
Industrial	12,942	12,942	12,942	12,942	12,942	12,942
Public Utilities	1,529	1,529	1,529	1,529	1,529	1,529
All Other Service	426,477	426,477	426,477	426,477	426,477	426,477
Subtotal: Water	5,748,287	5,748,287	5,748,287	5,748,287	5,748,287	5,748,287
% Change		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Sewer						
Residential	4,940,713	4,940,713	4,940,713	4,940,713	4,940,713	4,940,713
Commercial	408,806	408,806	408,806	408,806	408,806	408,806
Industrial	12,546	12,546	12,546	12,546	12,546	12,546
Public Utilities	1,521	1,521	1,521	1,521	1,521	1,521
All Other Service	366,090	366,090	366,090	366,090	366,090	366,090
Subtotal: Sewer	5,729,676	5,729,676	5,729,676	5,729,676	5,729,676	5,729,676
% Change		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Stormwater						
Residential (Incl. Senior Citizen)	5,554,335	5,554,335	5,554,335	5,554,335	5,554,335	5,554,335
Non-Residential & Condo	992,245	992,245	992,245	992,245	992,245	992,245
Subtotal: Stormwater	6,546,580	6,546,580	6,546,580	6,546,580	6,546,580	6,546,580
% Change		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

Table 2: Customer Usage (Billing Units)

Description	FY 2016 *Preliminary*	FY 2017 *Forecast*	FY 2018 *Forecast*	FY 2019 *Forecast*	FY 2020 *Forecast*	FY 2021 *Forecast*
Customer Demand (MCF)						
Water						
Residential	3,281,090	3,239,798	3,198,505	3,162,213	3,130,650	3,098,863
Commercial	1,297,523	1,292,680	1,288,122	1,286,300	1,286,537	1,285,930
Industrial	93,362	93,267	93,177	93,292	93,550	93,758
Public Utilities	9,912	9,905	9,899	9,891	9,885	9,879
All Other Service	1,636,804	1,635,153	1,633,502	1,631,852	1,630,201	1,628,550
Subtotal: Water	6,318,692	6,270,803	6,223,206	6,183,548	6,150,823	6,116,980
% Change		*-0.8%*	*-0.8%*	*-0.6%*	*-0.5%*	*-0.6%*
Sewer						
Residential	3,212,758	3,172,151	3,131,544	3,095,856	3,064,817	3,033,558
Commercial	1,265,593	1,260,765	1,256,222	1,254,405	1,254,642	1,254,036
Industrial	87,274	87,179	87,089	87,204	87,461	87,670
Public Utilities	9,910	9,903	9,897	9,890	9,884	9,878
All Other Service	1,543,810	1,542,178	1,540,545	1,538,912	1,537,279	1,535,646
Subtotal: Sewer	6,119,346	6,072,176	6,025,297	5,986,266	5,954,083	5,920,788
% Change		*-0.8%*	*-0.8%*	*-0.6%*	*-0.5%*	*-0.6%*
Stormwater (1)						
Impervious Area (Square Feet)	677,498,194	672,163,756	666,760,790	661,059,622	655,320,976	649,535,755
% Change		*-0.8%*	*-0.8%*	*-0.9%*	*-0.9%*	*-0.9%*
Gross Area (Square Feet)	1,254,488,002	1,236,942,001	1,219,382,000	1,201,385,001	1,183,453,001	1,165,581,000
% Change		*-1.4%*	*-1.4%*	*-1.5%*	*-1.5%*	*-1.5%*

(1) Includes adjustment for stormwater credits.

5. RATES & CHARGES

PWD maintains separate rates and charges for water, wastewater, and stormwater customers. As noted in Section 3.2.2, rates and charges are determined by the Rate Board, which is comprised of five members that are appointed by the Mayor and approved by City Council.

5.1. EXISTING RATES

PWD's existing water rate structure, applicable to all customer types, includes a fixed monthly base charge by meter size and a declining block volumetric rate structure billed per thousand cubic feet (MCF). The wastewater rates follow a similar structure with a fixed monthly base charge by meter size and a uniform volumetric rate per MCF based on billed water consumption. Stormwater charges are assessed by customer type with single family residential customers receiving the same fixed monthly charge. Nonresidential and Condo, or multifamily, customers receive both a gross surface area charge per 500 square feet (sq. ft.) of total property surface area and an impervious surface area charge per 500 sq. ft. of impervious surface area. The following rate schedule, Table 3, shows the existing rates for PWD.

Table 3: Existing Rates (FY 2017)

Water			FY 2017 *Actual*
Water			
Base Charge			
5/8"			$ 6.58
3/4"			7.54
1"			9.90
1.5"			15.13
2"			22.25
3"			37.91
4"			66.31
6"			127.93
8"			199.07
10"			289.09
12"			502.82
Volume Charge (Per MCF)			
Block 1	Up to	2 MCF	$ 41.11
Block 2	Next	98 MCF	35.91
Block 3	Next	1,900 MCF	27.93
Block 4	Over	2,000 MCF	27.14

Wastewater & Stormwater	FY 2017 *Actual*
Wastewater	
Base Charge	
5/8"	$ 7.17
3/4"	8.76
1"	12.34
1.5"	20.68
2"	31.41
3"	55.65
4"	95.42
6"	186.85
8"	294.17
10"	425.36
12"	763.12
Volume Charge (Per MCF)	
All Usage (Based on Billable Water)	$ 30.55
Stormwater	
Residential (Fixed)	
SWMS Charge	$ 11.91
Billing & Collection	2.21
Non Residential	
GA Charge ($/500 sqft)	$ 0.61
IA Charge ($/500 sqft)	4.70
Billing and Collection (Per Acct)	2.88
Minimum Charge (Acct)	11.91

5.1. RATE FORECAST

On January 8, 2016, PWD submitted a notice with the Rate Board of its proposal to increase rates in both FY 2017 and FY 2018. On June 7, 2016, a final determination on rates was made by the Rate Board identifying an effective date of the changes in rates and charges on July 1, 2016 and July 1, 2017. The existing rates identified in Table 3 reflect the recently effective increase on July 1, 2016. RFC has developed a forecast of anticipated future rate increases needed in order to meet the Water Department's revenue requirements and covenants identified in the General Ordinance. Since the rate increase for FY 2017 is already effective, and the rate increase for FY 2018 has already been approved, RFC has projected increases only for FY 2019 through FY 2021. It should be noted that rate increases in FY 2019 through FY 2021 are applied across-the-board within the water, wastewater, and stormwater rate structures. Table 4 identifies the actual rates for FY 2016 and FY 2017, the approved rate increases for FY 2018, and the projected increases from FY 2019 through FY 2021.

Table 4: Rate Forecast

Line No.	Description			FY 2016 Actual	FY 2017 Actual	FY 2018 Approved	FY 2019 Forecast	FY 2020 Forecast	FY 2021 Forecast
	Water								
	Base Charge								
	5/8"			$ 6.46	$ 6.58	$ 6.61	$ 6.92	$ 7.19	$ 7.69
	3/4"			7.49	7.54	7.59	7.95	8.26	8.83
	1"			9.98	9.90	10.02	10.49	10.90	11.66
	1.5"			15.56	15.13	15.38	16.10	16.74	17.90
	2"			23.05	22.25	22.66	23.73	24.67	26.38
	3"			39.64	37.91	38.70	40.52	42.12	45.04
	4"			69.00	66.31	67.61	70.79	73.59	78.70
	6"			133.60	127.93	130.56	136.70	142.10	151.96
	8"			208.47	199.07	203.32	212.88	221.29	236.65
	10"			302.43	289.09	295.18	309.05	321.26	343.56
	12"			530.00	502.82	514.45	538.63	559.91	598.77
	Volume Charge (Per MCF)								
	Block 1	Up to	2 MCF	$ 39.05	$ 41.11	$ 43.08	$ 45.10	$ 46.88	$ 50.13
	Block 2	Next	98 MCF	31.54	35.91	37.67	39.44	41.00	43.85
	Block 3	Next	1,900 MCF	28.95	27.93	29.31	30.69	31.90	34.11
	Block 4	Over	2,000 MCF	21.98	27.14	28.51	29.85	31.03	33.18
	Wastewater								
	Base Charge								
	5/8"			$ 6.55	$ 7.17	$ 7.41	$ 7.72	$ 8.39	$ 8.85
	3/4"			8.04	8.76	9.08	9.46	10.28	10.84
	1"			11.39	12.34	12.84	13.38	14.54	15.34
	1.5"			19.24	20.68	21.63	22.54	24.49	25.83
	2"			29.31	31.41	32.90	34.29	37.26	39.30
	3"			52.07	55.65	58.40	60.87	66.14	69.76
	4"			89.15	95.42	100.05	104.28	113.31	119.52
	6"			174.77	186.85	196.03	204.32	222.01	234.18
	8"			275.38	294.17	308.78	321.84	349.71	368.87
	10"			398.07	425.36	446.41	465.29	505.58	533.29
	12"			715.77	763.12	801.99	835.91	908.30	958.07
	Volume Charge (Per MCF)								
	All Usage (Based on Billable Water)			$ 28.07	$ 30.55	$ 32.46	$ 33.83	$ 36.76	$ 38.77
	Stormwater								
	Residential (Fixed)								
	SWMS Charge			$ 12.46	$ 11.91	$ 12.49	$ 13.02	$ 14.15	$ 14.93
	Billing & Collection			1.69	2.21	2.22	2.31	2.51	2.65
	Non Residential								
	GA Charge ($/500 sqft)			$ 0.59	$ 0.61	$ 0.63	$ 0.66	$ 0.72	$ 0.76
	IA Charge ($/500 sqft)			4.75	4.70	4.91	5.12	5.56	5.86
	Billing and Collection (Per Acct)			2.19	2.88	2.89	3.01	3.27	3.45
	Minimum Charge (Acct)			14.65	11.91	12.49	13.02	14.15	14.93
	Annual Rate Increases								
	Water						4.70%	3.95%	6.94%
	Wastewater						4.23%	8.66%	5.48%
	Stormwater						4.23%	8.66%	5.48%

6. REVENUES

PWD collects revenues from a number of different sources. Operating revenues consist primarily of retail water, sewer, and stormwater charges and wholesale water and sewer revenues. Other operating revenues include penalties, license and permit fees, and other miscellaneous charges. Non-operating revenues include interest and state and federal grants. Revenues have been estimated for FY 2016 based on the projected number customer accounts and usage and the rates in place as of July 1, 2015. Revenues in FY 2017 and FY 2018 have been estimated using the rates approved by the Board effective July 1, 2016 and July 1, 2017, respectively. The remaining years of the forecast period (FY 2019 through FY 2021) have been estimated using the projected billable units of service and anticipated future rate increases.

6.1. USER CHARGE REVENUES

Retail operating revenues consist of water, sewer, and stormwater charges to retail customers. The general customer types include residential, commercial, industrial, public utilities, senior citizens, charities, schools, and the Philadelphia Housing Authority. Revenue from each of these customer types has been forecasted using projected customer demand and usage over the study period and applying the annual effective rate schedule. Projected customer demand and usage includes billable water sales, number of customers, number of billable parcels, and billable gross and impervious area for each respective customer type (see Section 4). Once user charge revenue is calculated, collection factors are applied that recognize both the timing of customer receipts and uncollectible revenue. Based on a review of historical billing and collections data, the aggregate collection rate is 95.3% of annual gross billings over the forecast period.

User charges also include revenue from public fire protection and the assessment of high strength wastewater surcharges. FY 2016 revenue from these sources are based on estimated actual results while FY 2017 revenue is based on the operating budget. Public fire protection and wastewater high strength surcharges in FY 2018 and beyond are assumed to remain constant. PWD also collects wholesale water and wastewater revenue from other local governments and municipalities. Projected revenues from wholesale customers in FY 2016 are based on estimated actual results. Wholesale revenue projections in FY 2017 and beyond are increased based on the level of increase in retail rates with no increase in demand.

6.2. OTHER OPERATING & NON-OPERATING REVENUES

In addition to user charge revenues, PWD collects revenue from a number of other operating sources. The most significant of these revenues are penalties. Based on historical data, penalty collections have been projected based on 1.4% of retail water and sewer sales, which is approximately $8.5 million in FY 2016. Going forward, and in recognition of PWD's increased efforts to address rate affordability, which is discussed below, the forecast does not assume an increase in revenue from penalties over the planning period. In addition to penalties, PWD also collects revenues from license and permit fees, procurement, and number of other miscellaneous sources. Other operating revenue from these sources are projected based on FY 2016 estimated actual results with no annual increase over the forecast period.

On June 7, 2016, the Board approved a new Income-based Water Rate Assistance Program (iWRAP) in response to a mandate by the City Council to make water affordable for low-income households in Philadelphia. The specific details of the iWRAP program are currently being developed by PWD staff. Future cost projections for the iWRAP include upfront costs, ongoing administrative costs, and ongoing lost revenue from affordable bill adjustments. Upfront costs are one-time costs to design and implement iWRAP. Ongoing administrative costs include additional WRB personnel to enroll customers and support new program technology requirements. The majority of iWRAP costs result from revenue lost due to reductions in monthly bills of enrolled participants. Lost revenue is projected based on an analysis, which was conducted by RFC, that estimated the number of customers enrolling in the program and the level of bill reduction they would receive. For the purpose of the Financial Forecast, the anticipated reduction in revenue is included as a contra other operating revenue. Specifically, the projected revenue reductions are $16,100,000 in FY 2018; $16,800,000 in FY 2019; $17,600,000 in FY 2020; and $18,600,000 in FY 2021.

Non-operating revenues consist primarily of interest earnings and other miscellaneous, non-operating sources. PWD earns interest on five funds including the Revenue Fund, Residual Fund, Rate Stabilization Fund, Capital Account of the Construction Fund, and Debt Reserve Account. Interest earned from the Revenue Fund represents an estimate of earnings generated annually from current assets in the Revenue Fund. The Residual Fund, Rate Stabilization Fund, Capital Account of the Construction Fund, and Debt Reserve Account were created by the General Ordinance. The purpose of each of these funds is described in Section 10. Estimated future interest earnings have been included in the forecast period based on a 0.4% interest rate on assumed future fund balances. The Financial Forecast assumes annual interest earned in the Revenue Fund and Rate Stabilization Fund are transferred to the Revenue Fund. Miscellaneous non-operating revenues include the sale of assets, sale of sludge (pellets), and a number of different other sources. However, due to their variability, only a limited amount of revenue from annual assets sales are included in the Financial Forecast. Non-operating revenues also assume the release of funds from the Debt Reserve Account of the Sinking Fund (as defined in the General Ordinance) based on the estimated surplus balance above the Debt Reserve Requirement (as defined in the General Ordinance) in FY 2019. Table 5 presents projected revenues over the forecast period.

Table 5: Revenue Detail ($000)

Line No.	Description	FY 2016 *Preliminary*	FY 2017 *Forecast*	FY 2018 *Forecast*	FY 2019 *Forecast*	FY 2020 *Forecast*	FY 2021 *Forecast*
	Water Revenues						
	User Charge Revenues						
1.	Water User Charges	$ 247,247	$ 259,151	$ 268,334	$ 279,171	$ 288,963	$ 306,469
2.	Public Fire Charge	8,162	7,617	7,769	7,924	8,082	8,244
3.	Wholesale Water Charges	2,975	3,094	3,219	3,370	3,503	3,746
4.	*Subtotal: User Charge Revenues*	$ 258,384	$ 269,862	$ 279,322	$ 290,465	$ 300,548	$ 318,459
5.	Other Revenues (1)	$ 10,048	$ 9,761	$ 2,700	$ 2,393	$ 2,042	$ 1,691
6.	*Subtotal: Water Revenues*	$ 268,432	$ 279,623	$ 282,021	$ 292,858	$ 302,590	$ 320,150
	Wastewater Revenues						
	User Charge Revenues						
7.	Wastewater User Charges	$ 199,420	$ 214,597	$ 225,679	$ 234,420	$ 252,409	$ 265,751
8.	Stormwater User Charges	161,388	159,683	164,757	170,720	183,617	193,256
9.	High Strength Surcharges	6,756	4,000	4,000	4,000	4,000	4,000
10.	Wholesale Wastewater Charges	31,769	33,310	34,926	36,403	39,556	41,723
11.	*Subtotal: User Charge Revenues*	$ 399,333	$ 411,590	$ 429,362	$ 445,544	$ 479,582	$ 504,730
12.	Other Revenues (1)	$ 12,862	$ 12,494	$ 3,456	$ 3,063	$ 2,614	$ 2,164
13.	*Subtotal: Wastewater Revenues*	$ 412,195	$ 424,084	$ 432,818	$ 448,606	$ 482,195	$ 506,895
	Non-Operating Revenue						
14.	Other Non-Operating Revenue (2)	$ 165	$ 954	$ 927	$ 803	$ 871	$ 942
15.	Debt Reserve Account Reduction	-	11,000	-	18,781	-	-
16.	Transfer to Debt Service Account to Redeem Bonds	-	(11,000)	-	-	-	-
17.	**Total: Project Revenues**	**$ 680,792**	**$ 704,662**	**$ 715,766**	**$ 761,048**	**$ 785,656**	**$ 827,987**

(1) Includes revenue from licenses and permits, penalties, miscellaneous charges, sale of vehicles and equipment, grants, and contra revenues associated with the iWRAP.

(2) Includes interest earned on the Revenue Fund and Rate Stabilization Fund.

7. OPERATING EXPENSES

Operating expenses represent normal, recurring expenses necessary to operate and maintain the System in good condition incurred during PWD's annual accounting cycle based upon its fiscal year ending June 30th. Operating expenses have been projected for the forecast period and are shown in Table 6.

Table 6: Projected O&M Expenses ($000)

Line No.	Description	FY 2016 *Preliminary*	FY 2017 *Forecast*	FY 2018 *Forecast*	FY 2019 *Forecast*	FY 2020 *Forecast*	FY 2021 *Forecast*
	System Operating Expenses						
	Personal Services						
1.	Salaries	$ 126,121	$ 131,865	$ 135,821	$ 140,696	$ 144,917	$ 149,264
2.	Fringe Benefits	49,358	52,636	54,215	55,841	57,516	59,242
3.	Pension Costs	58,537	60,970	62,182	63,316	64,377	64,377
4.	*Subtotal: Personal Services*	$ 234,016	$ 245,471	$ 252,218	$ 259,853	$ 266,810	$ 272,883
	Purchase of Services						
5.	Class 220, 221- Electric and Gas	$ 30,644	$ 27,902	$ 29,298	$ 30,762	$ 32,301	$ 33,916
6.	All Other Class 200 Expenses	131,167	143,417	148,894	151,455	155,109	158,956
7.	*Subtotal: Purchase of Services*	$ 161,811	$ 171,320	$ 178,191	$ 182,218	$ 187,409	$ 192,872
	Materials, Supplies & Equipment						
8.	Class 307 - Chemicals	$ 20,687	$ 20,687	$ 21,370	$ 22,075	$ 22,804	$ 23,556
9.	All Other Class 300 Expenses	29,059	30,787	31,557	32,346	33,155	33,983
10.	*Subtotal: Materials, Supplies & Equipment*	$ 49,747	$ 51,475	$ 52,927	$ 54,421	$ 55,958	$ 57,540
	Other Expenses						
11.	Contributions, Indemnities & Taxes	$ 6,605	$ 7,006	$ 10,506	$ 7,006	$ 7,006	$ 7,006
12.	Payments to Other Funds	-	-	-	-	-	-
13.	*Subtotal: Other Expenses*	$ 6,605	$ 7,006	$ 10,506	$ 7,006	$ 7,006	$ 7,006
14.	*Subtotal: Operating Expenses*	$ 452,179	$ 475,271	$ 493,842	$ 503,499	$ 517,183	$ 530,300
15.	Less: Liquidated Encumbrances	(24,088)	(20,734)	(21,252)	(21,784)	(22,328)	(22,887)
16.	**Total: System Operating Expenses**	**$ 428,091**	**$ 454,537**	**$ 472,590**	**$ 481,715**	**$ 494,855**	**$ 507,413**
	% Change		*6.2%*	*4.0%*	*1.9%*	*2.7%*	*2.5%*

FY 2016 and FY 2017 operating expenses are based on PWD's adopted budget for the respective years. The FY 2016 and FY 2017 budgets are then adjusted to reflect historical differences in budgeted versus actual utility costs by functional operating division and by budget object class; this analysis was developed by PWD staff during its most recent rate filing. In aggregate, the total spending factor adjustment is approximately 96%. Operating expenses are then reduced by estimated liquidated encumbrances, which represent the release of prior year encumbered, unspent funds. Liquated encumbrances have been included as an offset to operating expenses and projected based on estimated actual results in FY 2016. For FY 2017 through FY 2021, liquidated encumbrances are based on 12% of the Purchase of Services and Materials, Supplies and Equipment budget classes less the cost of electricity, natural gas, and chemicals. These adjusted budgets are then used as the basis for the forecast.

In order to account for growing utility costs and inflation, cost escalation rates have been developed for system operating expenses. Based on a review of historical data and input from PWD staff, salaries and employee benefits have been projected to increase at 3%. Utility costs (electricity and gas) and chemical costs have been projected to increase annually at 5% and 3.3%, respectively. All other remaining costs have been escalated at 3%. Additionally, projected operating expense also include certain adjustments to reflect certain one-time costs and incremental needs including, for example, the anticipated cost for supporting iWRAP and PWD's City grants program. The net impact of these cost escalation rates and other adjustments represents a compounded average annual increase in operating expenses of approximately 3.5% over the forecast period.

8. CAPITAL IMPROVEMENT PLAN

PWD's Capital Improvement Plan (CIP) identifies the anticipated capital expenditures for both the Water and Wastewater Systems over the five-year forecast period. As discussed in Section 3.1.2, PWD's Planning and Environmental Services Division oversees a unit called the Capital Planning Program, which is responsible for instituting and managing a formal, well-documented and defensible planning process for large capital projects over $2 million as well as supporting the capital budget process and CIP development. The following table, Table 7, summarizes the CIP for the System over the forecast period.

Table 7: Capital Improvement Plan ($000)

Line No.	Description	FY 2016 *Preliminary*	FY 2017 *Forecast*	FY 2018 *Forecast*	FY 2019 *Forecast*	FY 2020 *Forecast*	FY 2021 *Forecast*	Total
	Waterworks Improvements							
1.	Engineering and Administration	$ 13,859	$ 15,790	$ 16,263	$ 16,751	$ 17,254	$ 17,771	$ 97,687
2.	Water Treatment Plant Improvements	43,073	43,120	44,845	46,639	48,504	50,444	276,625
3.	Distribution System Rehabilitation	44,060	46,060	47,902	49,819	51,811	53,884	293,536
4.	Large Water Meter Replacements	5,000	5,000	26,000	27,040	28,122	5,849	97,011
5.	Vehicles	5,000	4,000	4,160	4,326	4,500	4,679	26,665
6.	Other	-	-	-	-	-	-	-
7.	**Total Waterworks CIP**	$ 110,992	$ 113,970	$ 139,171	$ 144,574	$ 150,190	$ 132,628	$ 791,524
	Wastewater Collection and Treatment							
8.	Engineering and Administration	$ 16,269	$ 18,536	$ 19,092	$ 19,664	$ 20,254	$ 20,862	$ 114,677
9.	Water Pollution Control Plant Improvements	66,820	66,880	69,555	72,337	75,231	78,240	429,064
10.	Storm Flood Relief	15,000	15,000	10,400	10,816	11,249	17,548	80,013
11.	Reconstruction of Old Sewers	34,960	35,000	36,400	37,856	39,370	41,249	224,835
12.	Green Infrastructure	35,000	47,000	54,080	56,243	58,493	72,531	323,348
13.	Vehicles	5,000	4,000	4,160	4,326	4,500	4,679	26,665
14.	**Total Wastewater CIP**	$ 173,049	$ 186,416	$ 193,687	$ 201,243	$ 209,097	$ 235,110	$ 1,198,601
15.	**Total System CIP**	**$ 284,041**	**$ 300,385**	**$ 332,857**	**$ 345,818**	**$ 359,287**	**$ 367,738**	**$1,990,125**
16.	Net Cash Flow Adjustment	(41,488)	(18,385)	(32,857)	(45,818)	(59,287)	(67,738)	(265,572)
17.	**Net Cash Financing Required**	**$ 242,553**	**$ 282,000**	**$ 300,000**	**$ 300,000**	**$ 300,000**	**$ 300,000**	**$1,724,553**

The System's CIP includes projects that relate to regulatory compliance, risk management, increasing performance, and system maintenance and repair. The primary categories of capital expenditures, which are described below, include:

- Engineering and Administration – Represents funding for Engineering and Administrative PWD personnel who are involved with the capital program. The cost projections include both capitalized salary and fringe benefits.
- Treatment Plant Improvements – Includes upcoming improvements to water and wastewater treatment facilities, pumping stations, and finished water reservoirs. This category also includes capacity expansions to the wastewater treatment facilities as contemplated in the COA and CSO LTCP update.
- Distribution System Improvements and Reconstruction of Old Sewers – Includes projects for the renewal of both the water distribution and wastewater collection systems. In 2011, PWD initiated the Long-term Water Pipeline Renewal Program (LTWPRP) to significantly accelerate the scope of water pipeline renewal and replacement. The LTWPRP is a proactive

program that incorporates both the likelihood and consequence of pipeline failure to calculate a risk score. The risk score is then evaluated in conjunction with other non-pipeline factors, such as green infrastructure projects, street and highway work, and economic development, to help prioritize capital projects.

- Storm Flood Relief/Green Infrastructure – Includes construction of new storm flood relief sewers or storage tanks in flood-prone areas, stream restoration, and other green infrastructure initiatives included in the CSO LTCP.
- Vehicles – Funding for the purchase of replacement vehicles. It should be noted that this excludes related vehicle maintenance, which is included as an operating expense.

As seen in Table 8, PWD identified $1.99 billion in capital project costs over the forecast period. Capital projects in FY 2018 and beyond include a 4% adjustment for inflation. The CIP is developed on an appropriation basis. As such, projected annual capital expenditures include a net cash flow adjustment designed to recognize timing issues associated with projects that are encumbered in one year but do not become a cash expenditure until a subsequent year. The net cash flow adjustment is based on PWD historical levels of capital spending compared to budget. The net cash financing required is $1.72 billion, which is equivalent to a capital spending rate of approximately 87%.

The net cash financing required is assumed to be funded through a combination of debt and equity. Specifically, the primary sources of capital funding include revenue-financed capital (Capital Account Deposit and discretionary PAYGO capital), existing revenue bond proceeds, and future revenue bonds. A limited amount of funding is provided through grants. Table 8 summarizes the CIP funding sources and uses.

Table 8: Capital Financing Plan ($000)

Line No.	Description	FY 2016 *Preliminary*	FY 2017 *Forecast*	FY 2018 *Forecast*	FY 2019 *Forecast*	FY 2020 *Forecast*	FY 2021 *Forecast*	Total
	CIP Spending Uses							
1.	Total Waterworks CIP	$ 110,992	$ 113,970	$ 139,171	$ 144,574	$ 150,190	$ 132,628	$ 791,524
2.	Total Wastewater CIP	173,049	186,416	193,687	201,243	209,097	235,110	1,198,601
3.	Net Cash Flow Adjustment	(41,488)	(18,385)	(32,857)	(45,818)	(59,287)	(67,738)	(265,572)
4.	**Total System CIP Uses**	**$ 242,553**	**$ 282,000**	**$ 300,000**	**$ 300,000**	**$ 300,000**	**$ 300,000**	**$1,724,553**
	CIP Spending Sources							
5.	Capital Account Deposit	$ 21,497	$ 21,927	$ 22,365	$ 22,813	$ 23,269	$ 23,734	$ 135,604
6.	Discretionary PAYGO Capital	31,537	28,673	34,985	44,687	47,031	52,966	239,880
7.	Existing Debt Proceeds (Revenue Bonds)	188,999	-	-	-	-	-	188,999
8.	Future Debt (Revenue Bonds)	-	230,880	242,130	231,980	229,180	222,780	1,156,950
9.	Total Grants	520	520	520	520	520	520	3,120
10.	**Total CIP Spending Sources**	**$ 242,553**	**$ 282,000**	**$ 300,000**	**$ 300,000**	**$ 300,000**	**$ 300,000**	**$1,724,553**

As seen in Table 8, the capital financing plan for FY 2016 includes outstanding proceeds remaining from PWD's most recent sale of revenue bonds in 2015 (Series 2015 Bonds). The balance of FY 2016 capital expenditures is financed predominantly with internal sources, including both the required Capital Account Deposit and discretionary PAYGO capital. The balance of funding needs is provided through private, state, and federal grants. A more detailed discussion of the Capital Account Deposit and discretionary PAYGO capital is provided in Section 8.1. The capital financing plan assumes a similar mix of funding sources over the remainder of the forecast period, but requires issuance of new revenue bonds annually from FY 2017 through FY 2021. For the purpose of the Forecast Statement, it is assumed that PWD will sell $270,000,000 in revenue bonds in FY 2017 (second half of fiscal year); $275,000,000 in revenue bonds in FY 2018 (second half of fiscal year); $280,000,000 in revenue bonds in FY 2019 (second half of fiscal year); $270,000,000 in revenue bonds in FY 2020 (second half of fiscal year); and $285,000,000 in revenue bonds in FY 2021 (second half of fiscal year). It should be noted that since the funding sources identified in Table 8 are designed to finance the CIP including a net cash flow, or spending, adjustment, the projected amount of funding from future revenue bonds represents a conservative assumption to absorb potential differences in actual capital expenditures and available funding from discretionary PAYGO capital. Projected debt service payments associated with future revenue bond issuances are discussed in Section 9.

8.1. CAPITAL ACCOUNT DEPOSIT & DISCRETIONARY PAYGO

The Water Department's General Ordinance establishes a Capital Account within the Construction Fund. Each year, PWD is required to make a deposit to the Capital Account of an amount no less than one percent of the total net plant assets or the depreciated value of property, plant and equipment of the System. These funds are then used for annual renewal, replacement, and other System capital improvements. The FY 2016 Capital Account Deposit is based on estimated actual net plant assets. Capital Account Deposit projections in FY 2017 through FY 2021 are based on a 2% annual growth in net plant assets over the forecast period, which is consistent with historical results. In addition to the required Capital Account Deposit, PWD's capital financing plan also includes discretionary deposits of PAYGO capital. Funding for discretionary PAYGO capital is transferred from the Residual Fund to the Capital Account. On a combined basis, approximately 22% of the CIP is funded with revenue financed internally from rates (Capital Account Deposit plus discretionary PAYGO); this is consistent with Water Department's internal financial policy minimum targets.

9. DEBT SERVICE OBLIGATIONS

The Water Department's capital structure includes debt obligations. Outstanding debt obligations include revenue bonds and Pennsylvania Infrastructure Investment Authority (PennVEST) bonds, which are issued to evidence and secure loans to PWD from the Commonwealth of Pennsylvania's State Revolving Funds. PWD's outstanding revenue bonds and PennVEST bonds are considered senior debt and qualify as Bonds per the General Ordinance. PWD does not currently have any subordinated debt. Projected debt service payments identified below in Table 9 are based on schedules provided by PWD staff. It should be noted the projected debt service payments for the Series 2007A Bonds and Series 2009A Bonds reflect the refunding impact of the Series 2016 Bonds. The projected debt service payments on the outstanding variable rate bonds are based on the following assumptions:

- Series 1997 B – Interest rate of 3%
- Series 2005 B – Interest rate of 3%

Table 9: Existing Debt Service ($000)

Line No.	Description	FY 2016 *Preliminary*	FY 2017 *Forecast*	FY 2018 *Forecast*	FY 2019 *Forecast*	FY 2020 *Forecast*	FY 2021 *Forecast*
	Existing Debt Service						
	Revenue Bonds						
1.	Series 1997B	$ 3,644	$ 3,743	$ 3,840	$ 4,036	$ 4,233	$ 4,430
2.	Series 2005A	5,955	-	-	-	-	-
3.	Series 2005B	18,285	18,357	18,431	169	-	-
4.	Series 2007A	4,183	11,780	10,173	-	-	-
5.	Series 2007B	7,168	7,168	7,167	7,166	7,167	14,504
6.	Series 2009A	7,294	8,147	4,868	4,867	-	-
7.	Series 2010A	109,732	37,435	37,443	37,454	-	-
8.	Series 2010C	9,022	39,996	39,996	8,685	8,687	8,687
9.	Series 2011A	6,737	6,737	6,737	6,737	6,737	6,737
10.	Series 2011B	2,461	7,965	9,230	9,441	9,408	2,702
11.	Series 2012	3,250	3,250	3,250	3,250	3,250	3,250
12.	Series 2013A	8,472	11,897	11,760	11,588	38,837	38,334
13.	Series 2014A	5,994	11,835	11,825	11,777	11,770	11,762
14.	Series 2015A	9,769	13,791	13,791	13,791	13,791	13,791
15.	Series 2015B	4,824	6,810	6,810	6,810	16,916	16,919
16.	*Subtotal: Revenue Bonds*	$ 206,790	$ 188,911	$ 185,320	$ 125,772	$ 120,798	$ 121,116
	Pennvest Parity Bonds						
17.	Pennvest 1999	$ 91	$ 91	$ 91	$ 76	$ -	$ -
18.	Pennvest 2009B	2,411	2,411	2,535	2,576	2,576	2,576
19.	Pennvest 2009C	3,220	3,220	3,440	3,440	3,440	3,440
20.	Pennvest 2009D	4,911	4,911	5,152	5,232	5,232	5,232
21.	Pennvest 2010B	1,710	1,710	1,710	1,797	1,827	1,827
22.	*Subtotal: Pennvest Parity Bonds*	$ 12,343	$ 12,343	$ 12,927	$ 13,120	$ 13,074	$ 13,074
	Subordinate Debt Service						
23.	Outstanding GO Bonds	$ -	$ -	$ -	$ -	$ -	$ -
24.	Pennvest Subordinate Bonds	-	-	-	-	-	-
25.	*Subtotal: Subordinate Debt Service*	$ -	$ -	$ -	$ -	$ -	$ -
26.	**Total: Existing Debt Service**	**$ 219,133**	**$ 201,254**	**$ 198,246**	**$ 138,892**	**$ 133,872**	**$ 134,190**
	% Change		*-8.2%*	*-1.5%*	*-29.9%*	*-3.6%*	*0.2%*

As shown above, the Water Department's annual debt service payments decrease significantly between FY 2018 and FY 2020 (from approximately $198 million in FY 2018 to approximately $134 million in FY 2020). Even with the debt service payments associated with the Series 2016 Bonds, which are included in Table 11, future debt issues may be structured around this decrease to ease the impact of new debt service requirements and level payments going forward.

PWD has worked with its financial advisors, underwriters, municipal advisors, and other independent consultants (Financing Team) to evaluate various financing strategies for the Series 2016 Bonds. The Series 2016 Bonds will defease a portion of the Series 2007A Bonds and the Series 2009A Bonds. The Sources and Uses of Funds for the Series 2016 Bonds is provided in Table 10.

Table 10: Sources and Uses of 2016 Refunding Bonds

Sources & Uses of Funds	Series 2016 Bonds
Sources of Funds	
Bond Proceeds	
Par Amount	$ 174,850,000
Premium	29,719,897
	$ 204,569,897
Other Sources of Funds:	
DSRF Release	11,000,000
Total: Sources of Funds	$ 215,569,897
Uses of Funds	
Refunding Escrow Deposits	
Cash Deposit	$ 1
SLGS Purchases	214,167,829
	$ 214,167,830
Delivery Date Expenses	
Cost of Issuance	700,000
Underwriter's Discount	
Total Underwriter's Discount	699,400
Other Uses of Funds	
Additional Proceeds	2,667
Total: Uses of Funds	$ 215,569,897

As mentioned in Section 8, it is expected that the Water Department will need to issue additional debt during the forecast period. The projected assumptions for new debt include:

- $270,000,000 in revenue bonds issued in the second half of FY 2017 (Series 2017 Bonds) at a rate of 5.25% and term of 30 years. The Series 2017 Bonds assume interest only payments in FY 2018 with full repayment (amortization of principal, plus interest) beginning in FY 2019

- $275,000,000 in revenue bonds issued in the second half of FY 2018 (Series 2018 Bonds) at a rate of 5.25% and term of 30 years. Payment of principal and interest on the Series 2018 Bonds are assumed to begin in FY 2019
- $280,000,000 in revenue bonds issued in the second half of FY 2019 (Series 2019 Bonds) at a rate of 5.25% and term of 30 years. Payment of principal and interest on the Series 2019 Bonds are assumed to begin in FY 2020
- $270,000,000 in revenue bonds issued in the second half of FY 2020 (Series 2020 Bonds) at a rate of 5.25% and term of 30 years. Payment of principal and interest on the Series 2020 Bonds are assumed to begin in FY 2021

It should be noted that the capital financing plan also assumes the issuance of $285,000,000 issued in the second half of FY 2021 (Series 2021). However, debt service payments on the Series 2021 Bonds are not expected to occur until FY 2022, which is outside of the six-year forecast period. Table 11 presents PWD's debt service on existing obligations after refunding, the Series 2016 Bonds, and future debt service.

Table 11: Total Debt Service ($000)

Line No.	Description	FY 2016 *Preliminary*	FY 2017 *Forecast*	FY 2018 *Forecast*	FY 2019 *Forecast*	FY 2020 *Forecast*	FY 2021 *Forecast*
1.	**Existing Debt Service**	$ 219,133	$ 201,254	$ 198,246	$ 138,892	$ 133,872	$ 134,190
	Additional Proposed Debt						
2.	Series 2016 Bonds	$ -	$ 4,886	$ 8,022	$ 17,234	$ 11,414	$ 11,411
3.	Series 2017 Bonds	-	-	14,175	18,332	18,332	18,332
4.	Series 2018 Bonds	-	-	-	18,402	18,402	18,402
5.	Series 2019 Bonds	-	-	-	-	18,737	18,737
6.	Series 2020 Bonds	-	-	-	-	-	18,068
7.	*Subtotal: Additional Proposed Debt*	$ -	$ 4,886	$ 22,197	$ 53,968	$ 66,885	$ 84,949
8.	**Total Debt Service**	**$ 219,133**	**$ 206,140**	**$ 220,443**	**$ 192,860**	**$ 200,756**	**$ 219,139**
	% Change		*-5.9%*	*6.9%*	*-12.5%*	*4.1%*	*9.2%*

10. FUND BALANCES

PWD's General Ordinance established several funds for maintaining liquidity and for use in both operating and capital needs. The major funds are described below.

10.1. RESIDUAL FUND

The Residual Fund provides working capital for the Water Department. In general, the Residual Fund can be used to: pay operating expenses; transfers funds to any fund or account other than the Revenue Account and Rate Stabilization fund; pay principal and interest on revenue bonds, revenue notes, and GO debt issued in respect of the System; pay capitalized lease payments or similar obligations; and fund limited transfers to the City's general fund. In terms of transfers to the City's general fund, the General Ordinance permits the transfer annually the lesser of $4,994,000 or the annual interest earnings (Net Reserve Earnings) on the balance in the Debt Reserve Account and the Subordinated Bond Fund.

10.2. RATE STABILIZATION FUND

PWD's Rate Stabilization Fund includes monies used to mitigate fluctuations in operating and capital costs thereby reducing the impacts of those fluctuations on customers. Each year, funds are withdrawn or contributed to the Rate Stabilization Fund in order for PWD to meet its minimum debt service requirement of 1.20, as specified in the PWD's Rate Covenant. The Financial Forecast exceeds the Water Department's minimum fund balance target for the Rate Stabilization Fund of $120 million.

10.3. CAPITAL ACCOUNT OF THE CONSTRUCTION FUND

PWD's Capital Account includes monies to be used for ongoing and future capital projects. In addition to the proceeds from debt issuances and grants, the Capital Account is also funded annually with the Capital Account Deposit, which is transferred from the Revenue Fund, as well as additional funding for PAYGO capital, which is transferred from the Residual Fund. Interest earnings that accrue annually are assumed to remain in the Capital Account.

10.4. DEBT RESERVE ACCOUNT OF THE SINKING FUND

PWD's General Ordinance requires that the Debt Reserve Account be maintained at a level equal to the Debt Reserve Requirement, which is defined as, with respect to all outstanding Bonds, and amount equal to the lesser of (i) the greatest amount of Debt Service Requirements payable in any one Fiscal Year or (ii) the maximum amount to be financed with proceeds of Bonds permitted by Section 148 (d)(1) of the Internal Revenue Code. Funds in the Debt Reserve Account are reserved strictly for debt service payments. Any money in excess of the Debt Reserve Requirement is transferred to the Revenue Fund at the written direction of the City. Typically, funds are contributed in new debt issues and are withdrawn to be used for the final debt service payment of a particular debt obligation.

The following table, Table 12, summarizes PWD's primary reserve funds over the forecast period.

Table 12: System Fund Balances ($000)

Line No.	Description	FY 2016 Preliminary	FY 2017 Forecast	FY 2018 Forecast	FY 2019 Forecast	FY 2020 Forecast	FY 2021 Forecast
	Residual Fund						
1.	Beginning Balance	$ 14,990	$ 14,608	$ 15,601	$ 15,629	$ 15,692	$ 15,720
2.	Revenue Fund Surplus/(Deficit)	31,095	29,608	34,950	44,688	46,996	52,965
3.	Transfer to Capital Account (Discretionary PAYGO)	(31,537)	(28,673)	(34,985)	(44,687)	(47,031)	(52,966)
4.	Interest on Debt Reserve Account	790	790	795	795	727	727
5.	Transfer from/(to) Rate Stabilization Fund	-	-	-	-	-	-
6.	Interest Earnings	60	58	62	63	63	63
7.	Interest Transfer to General Fund (SCOOP)	(790)	(790)	(795)	(795)	(727)	(727)
8.	*Ending Balance*	$ 14,608	$ 15,601	$ 15,629	$ 15,692	$ 15,720	$ 15,782
	Rate Stabilization Fund						
9.	Beginning Balance	$ 206,298	$ 187,274	$ 179,724	$ 145,142	$ 164,114	$ 183,893
10.	Deposit From/(To) Fund	(19,024)	(7,550)	(34,582)	18,972	19,779	24,736
11.	Funds From/(To) Residual Fund	-	-	-	-	-	-
12.	*Ending Balance*	$ 187,274	$ 179,724	$ 145,142	$ 164,114	$ 183,893	$ 208,629
	Capital Account						
13.	Beginning Fund Balance	$ 446,819	$ 259,429	$ 294,693	$ 324,992	$ 370,703	$ 409,420
14.	Transfer From Bond Proceeds	-	266,537	271,368	276,520	266,562	281,658
15.	Grants/Other	520	520	520	520	520	520
16.	Additional PAYGO	31,537	28,673	34,985	44,687	47,031	52,966
17.	Capital Account Deposit	21,497	21,927	22,365	22,813	23,269	23,734
18.	Interest Earnings	1,609	934	1,061	1,170	1,335	1,474
19.	*Subtotal: Capital Account*	$ 501,982	$ 578,020	$ 624,992	$ 670,703	$ 709,420	$ 769,772
20.	Used for Capital Projects	(242,553)	(282,000)	(300,000)	(300,000)	(300,000)	(300,000)
21.	DSR Contribution	-	(1,326)	-	-	-	(18,068)
22.	Other Transfers / Expenses	-	-	-	-	-	-
23.	*Ending Balance*	$ 259,429	$ 294,693	$ 324,992	$ 370,703	$ 409,420	$ 451,704
	Debt Reserve Account						
24.	Beginning Fund Balance	$ 219,397	$ 219,397	$ 220,723	$ 220,723	$ 201,942	$ 201,942
25.	Debt Issue Deposit (From Capital Account) (1)	-	1,326	-	-	-	18,068
26.	Interest Earnings	790	790	795	795	727	727
27.	Retired Debt/Release	-	-	-	(18,781)	-	-
28.	Interest Transfer to Residual Fund	(790)	(790)	(795)	(795)	(727)	(727)
29.	*Ending Balance*	$ 219,397	$ 220,723	$ 220,723	$ 201,942	$ 201,942	$ 220,009
30.	**Total Ending Balance**	$ 478,825	$ 515,416	$ 545,715	$ 572,644	$ 611,361	$ 671,713

(1) Represents an estimated deposit into the Debt Service Reserve Account associated with future borrowings.

Appendix

Engineering Report

CITY OF PHILADELPHIA WATER DEPARTMENT

Engineering Report – Series 2016 Bonds

PHILADELPHIA WATER
EST. 1801

Contract No. 1520309

Prepared for:

Raftelis Financial Consultants, Inc.

RAFTELIS
FINANCIAL CONSULTANTS, INC.

Prepared by:

PEER Consultants, P.C.
409 12th Street SW, Suite 603
Washington, DC 20024

October 6, 2016

Engineers • Scientists • Planners

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1. EXECUTIVE SUMMARY

The City of Philadelphia intends to issue bonds to refund existing outstanding revenue bonds previously issued by the Philadelphia Water Department (PWD). As part of the bond issuance, the City is required to perform a Cost and Rate Analysis and prepare an Engineering Report. PEER Consultants P.C. (PEER) has prepared the Engineering Report for the Fiscal Year (FY), which ended June 30, 2015.

PEER reviewed the management, operation and maintenance of PWD's water and wastewater facilities. In 2016, the team visited each of the six major water and wastewater treatment facilities as well as several pumping stations; interviewed management and plant personnel at each facility; and evaluated FY 2015 operating data and related system information as that was the last full year of information available.

PWD takes a proactive approach towards facility maintenance and strives for continuous improvement in day-to-day operations. The City's water treatment plants (WTP) and water pollution control plants (WPCP) have exemplary records of producing high-quality potable water and treated effluent, respectively, which surpass regulatory requirements. Rehabilitation and replacement of plant facilities that have reached the end of their useful service lives continues to be a main focus for PWD.

Based on the results of the team's evaluation of the facilities, personnel interviews, and observations made during the site visits, the team concluded that PWD has effective leadership that emphasizes long-term cost-effectiveness, productivity, staff participation, and collaborative teamwork. Site visits confirmed that the City's water and wastewater facilities are satisfactorily operated and properly maintained and that projects scheduled for implementation in the previous fiscal years are under construction or have been successfully completed and in operation.

2. INTRODUCTION

2.1. Objective

The purpose of this report is to present and summarize findings of the physical inspection of facilities, discussions with key personnel, and review of the Capital Improvement Plan (CIP) of the Philadelphia Water Department. This report was prepared in accordance with the agreement between the City of Philadelphia and Raftelis Financial Consultants, Inc., for Contract No. 1520309 - Cost and Rate Analysis for the Philadelphia Water Department. This report fulfills the requirements for preparation and submission of an Engineering Report in support of the proposed issuance of Water and Wastewater Revenue Refunding Bonds, Series 2016.

The projections and opinions set forth in this report are based on certain assumptions with respect to conditions, events and circumstances that may occur in the future. The methodologies used follow generally accepted industry practices; however, actual results may differ materially from those projected, as influenced by specific conditions, events, and circumstances. Such conditions may include the PWD's ability to implement the CIP as scheduled and within budget, regional climate and weather conditions affecting the demand for water, and adverse legislative, regulatory or legal decisions (including environmental laws and regulations) affecting the PWD's ability to adequately manage the water and wastewater systems. The report is presented in two sections: water system facilities and wastewater system facilities.

2.2. Background

PEER is a full-service environmental engineering consulting firm, which provides personalized service to our valuable clients, fosters and maintains long-term partnerships, and hires passionate and diverse team members. As environmental stewards, we are always looking out for the best interest of both the natural and built environments.

Since its inception in 1978, PEER's multi-disciplinary team of engineers, scientists and planners has managed the planning, design and implementation of a wide array of water supply, water resources, sanitary and storm sewer system, and water/wastewater treatment projects. We stay abreast of EPA and state and local regulatory requirements as well as the latest advancements in wastewater treatment technology. Our service areas include:

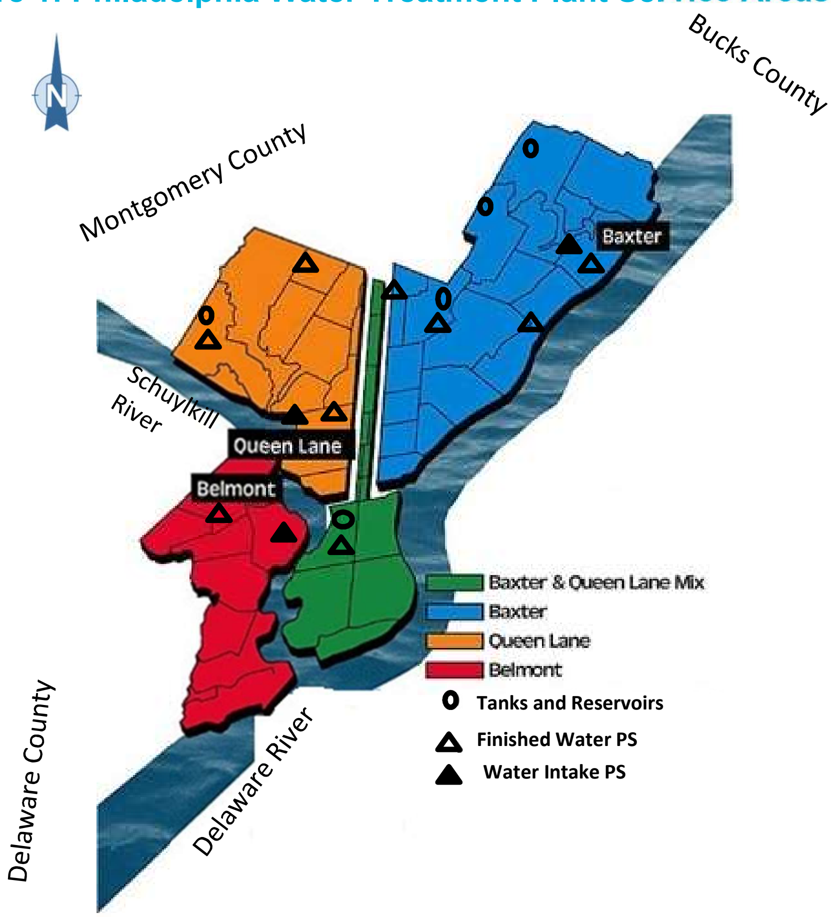
- Construction and Program Management
- Water and Wastewater Infrastructure: Planning, Design, Upgrading, Rehabilitation, Operations and Maintenance, Asset Management, Pipe Condition Assessment
- Domestic/Industrial Wastewater Engineering: Collection, Treatment, Disposal, Recycling, Reuse
- Stormwater Management: Infiltration and Inflow (I&I) Studies; Sewer System Evaluation Services; Best Management Practices; Flow Monitoring
- Water and Wastewater Treatment Residuals Management
- Water Treatment Engineering

3. WATER SYSTEM

3.1. Water System Facilities

The Philadelphia Water Supply system comprises of three intake facilities, three water treatment plants, approximately 400 miles of transmission pipelines and 2,600 miles of distribution mains, 16 pumping stations, and three covered storage reservoirs (Figure 1). The entire system operation is continuously monitored and controlled on a real-time basis from the centrally located Load Control Unit (LCU).

Figure 1: Philadelphia Water Treatment Plant Service Areas



3.2. Water Supply

The primary source of fresh water supply is surface water from the Schuylkill and Delaware Rivers, which is pumped to three water treatment plants. The Queen Lane WTP, located in East Falls, receives raw water from the Schuylkill River. The Belmont WTP is located in Wynnefield, and its raw water is supplied from the Schuylkill River. The Baxter WTP located in Torresdale is supplied from the Delaware River.

The water supply and distribution system covers an area of approximately 130-square miles and serves 1.5 million people through a network of over 3,000 miles of water mains. About 58% of the water supply is from the Delaware River while the remaining 42% is from the Schuylkill River. Withdrawal of water from these rivers is authorized and monitored by the Pennsylvania Department of Environmental Protection (PADEP) and the Delaware River Basin Commission (DRBC). PADEP also sets and controls the water withdrawal limits. The current limits of 423 MGD and 258 MGD from the Delaware and Schuylkill Rivers, respectively, have been determined as adequate to meet the needs of the City and to provide additional flexibility for drought protection.

3.3. Water Treatment Plants

Raw water from the Schuylkill and Delaware Rivers is treated at three water treatment plants: Baxter WTP, Belmont WTP and Queen Lane WTP. The Baxter WTP receives water from the Delaware River while water from the Schuylkill River is treated at the Belmont and Queen Lane WTPs.

The three WTPs utilize similar conventional water treatment processes which in general consist of raw water settling, flocculation and coagulation, sedimentation, filtration, disinfection, corrosion control, fluoridation and taste and odor control. The unit processes include low lift pumping to convey the raw water into the plant for treatment; flocculation, the addition and mixing of chemicals to form a precipitate; and sedimentation, which involves the partial removal of suspended materials and filtration for further removal of suspended solids. Chemicals are also added for pH adjustment or taste and odor control as needed. Disinfection, which involves the addition of chemicals to kill harmful organisms, occurs prior to flocculation and prior to filtration usually but can occur elsewhere. Finally, orthophosphate and fluoride are added for corrosion control and fluoridation, respectively. Using a high lift pumping system the treated water is transferred into the transmission and distribution system.

The water treatment plants are designed and operated in compliance with industry standards and regulations as established by the Safe Drinking Water Act (SDWA), the American Water Works Association (AWWA), the National Sanitation Foundation (NSF), the Pennsylvania Department of Environmental Protection (PADEP), the USEPA and other applicable agencies.

Each of the water treatment plants is equipped with its own operational laboratory facilities to maintain process control and enable PWD to comply with all current monitoring requirements of the SDWA. PWD also has a central laboratory facility to provide additional analyses and comply with current monitoring requirements. If additional laboratory capacity is needed as a result of new regulations, then it is anticipated that the PWD may contract services to certified private laboratories.

PWD is a member of the Partnership for Safe Water, which is a voluntary optimization program conceived and initiated by the EPA, the American Water Works Association, the Association of Metropolitan Water Agencies and advocated by the Pennsylvania Department of Environmental Protection. The Partnership offers self-assessment and optimization programs that provide water system operators, managers and administrators with the tools to achieve water quality standards that are more stringent than state and federal water quality regulatory requirements.

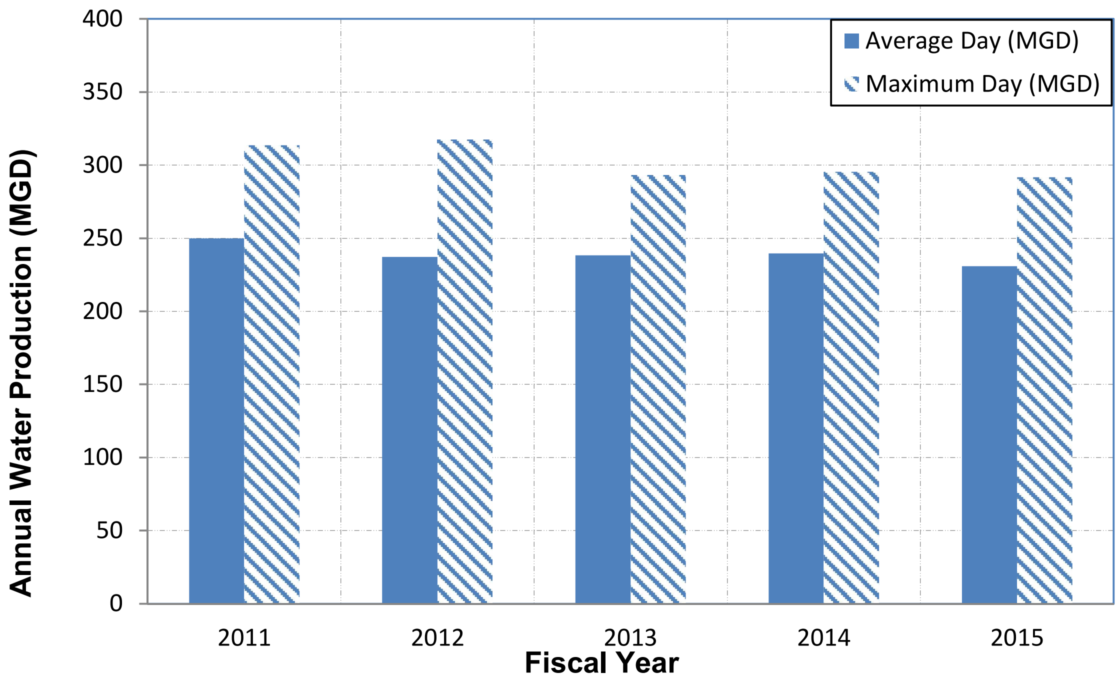
The rated treatment capacities and water production figures for the three treatment plants for the past five years (2011-2015) are listed in Table 1 and annual water production is illustrated graphically in Figure 1. The largest facility, Baxter WTP, produced between 50 and 55 percent of the total system average day demand during this period. During the same period, the maximum day demand on the plants was in the range of 39% to 60% of their rated capacities.

Table 1 shows a slight decreasing trend in total water production since 2012. As discussed in the annual FY 2015 report for the Load Control Unit, This trend may be attributed to the reduction in water consumption as well as the reduction in water leakage in the distribution system.

Table 1: Summary of Water Treatment Plant Production

Treatment Plant	Capacity (MGD)	Water Production (MGD)				
		FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Baxter						
Average Day	320	146	141	139	141	132
Maximum Day	420	190	203	189	185	162
Belmont						
Average Day	86	43.4	44.3	43.7	44.9	44.8
Maximum Day	110	68.1	54.1	53.9	54.1	55.1
Queen Lane						
Average Day	140	65.4	60.1	62.1	61.8	60.8
Maximum Day	150	88.9	93.7	84.6	91.8	89.8

Figure 2: PWD Annual Water Production 2011-2015



3.4. Site Visits

In April and May 2016, the consultant team made several site visits to the three WTPs to observe, characterize and evaluate the general physical conditions of the treatment facilities and related systems. During the site visits, discussions were held with plant operators and PWD management personnel. Based on the site visits and discussions, the facilities were ranked as good, adequate or poor as defined below:

Good: This rating indicates that the facility is in a condition to provide reliable operation in accordance with design parameters and service needs with routine maintenance and capital improvements.

Adequate: This rating indicates that the facility is operating at or near design levels; however, non-routine renovation, upgrading, and repairs are needed to ensure continued reliable operation. Significant expenditures for these improvements may be required.

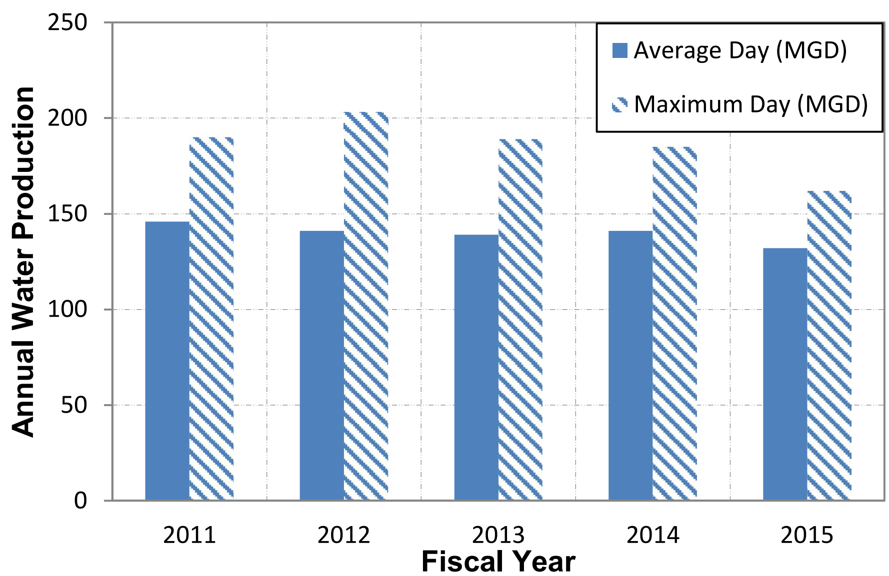
Poor: This rating indicates that the facility is not being operated within design parameters. Major renovations are required to restore the facility and assure reliable operation. Major expenditures for these improvements may be required.

3.5. Baxter Water Treatment Plant

The Samuel S. Baxter WTP, located in Torresdale, is the largest of the three water treatment plants with a design capacity of 320 MGD and a peak hydraulic capacity of 420 MGD. Commissioned in 1909 as the Torresdale Plant, it was upgraded to a rapid sand filtration plant in 1959 and in 1982 was renamed the Samuel S. Baxter WTP.

The Baxter WTP supplies potable water to service areas in the northern and central parts of the city, which constitute almost 60% of the City's population. Treated water production for FY 2011 through 2015 is shown in Figure 3. During this period, the average water production rate shows a gradual declining trend from 145 MGD in FY 2011 to 132 MGD in FY 2015, a decrease of approximately 9%; correspondingly, the peak water production rate decreased by 19% from 200 MGD in FY 2012 to 162 MGD in FY 2015.

Figure 3: Samuel S. Baxter WTP Annual Water Production FY 2011-2015



Raw water from the Delaware River is conveyed through a tidal intake structure into a 170 MG raw water-settling basin at the Baxter WTP. Carbon is added as water flows into the raw water basin for organics removal, taste and odor control as well as for contaminant removal. The raw water is pumped up to the WTP via the Torresdale raw water pump station. The pumping rates vary from a minimum of 60 MGD to a maximum pumping capacity of 480 MGD. Both minimum and maximum pump rates fluctuate based on headloss and sedimentation basin elevation. Pre-treatment consists of addition of ferric chloride, chlorine, and lime at the rapid mixing chamber before gravity feed to the flocculation and sedimentation basins. Treatment is achieved through two parallel treatment process trains each comprising of identical coagulation, flocculation, sedimentation and filtration processes. The treatment system consists of eight flocculation tanks with individual capacity of about 1 MG; four sedimentation tanks of capacity 7.44 MG each; ninety-four dual media filters with a filter detention time of about 1 hour. Twelve finished water basins and one clearwell basin with a total capacity of 193 MG are used for storing the treated water. Coagulant doses are monitored and adjusted daily based on results of real-time online analyzer, round the clock lab analysis data and jar testing. Powdered activated carbon is applied seasonally in the raw water basin, for total organic carbon (TOC) reduction and as needed to address river spills or contamination. Carbon dosages for TOC removal are based on daily monitored UV254 levels as a surrogate parameter of TOC concentrations. The finished water is then supplied via the Torresdale and Lardners Point pumping station to the City's water distribution system.

Residuals generated from the flocculation and sedimentation processes are discharged to one of the three PWD water pollution control plants via the sanitary sewer system. The Northeast Water Pollution Control Plant (NEWPCP) receives flocculation/sedimentation (floc/sed) residuals from the Baxter WTP; an average of 21.93 tons/day of residuals was produced in 2015. The quantity and characteristics of these residuals are monitored and reported annually to the PADEP in the compliance with Residual Waste Regulations. Baxter WTP is the only facility, which returns filter backwash water onsite to the influent side of the Raw Water Basin in full compliance with PADEP Recycled Backwash Regulations.

Electric power for plant operation is supplied by two Philadelphia Electric Company (PECO) 14 KVA feeders. The plant is also equipped with a standby backup generator capable of supplying power to the entire plant.

In 2015, a number of Capital Improvement Plan (CIP) projects were initiated. These projects are listed below:

- Demolition of pre-filter area and site pre work, in preparation for construction of failed clear water basin
- Installation of new ferric tanks and chemical feed system (Figure 5)
- Sedimentation basin improvements; clarifier painting and installation of new railings (Figure 4)
- Rehabilitation of raw water basin river berm and pier
- Replacements of clarifier gears
- Improvements of ammonia feed system
- Replacement of 12 dual media filters
- Installation of carbon dosing lines and diffuser at the intake

In coordination with Torresdale raw water pumping station, LCC and Queen Lane WTP, the north side of the Baxter treatment train was shut down for valve replacement capital work at the Torresdale water pump station.

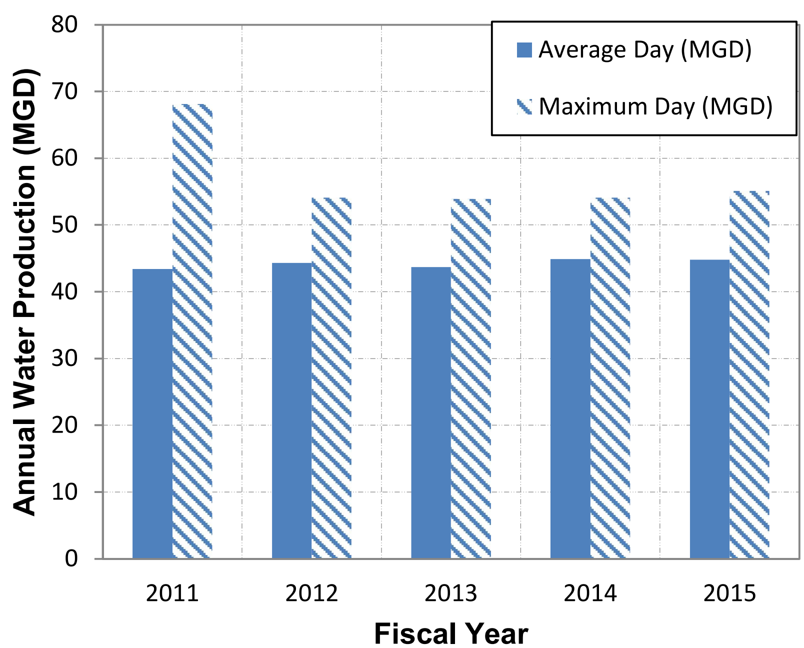
Figure 5: New Ferric Tanks and Chemical Feed system

Figure 4: Sedimentation Basin Improvements

3.6. Belmont Water Treatment Plant

Belmont WTP is located in Wynnefield and has a design capacity of 86 MGD. It receives water from the Schuylkill River and serves the western part of Philadelphia. Figure 6 shows Belmont WTP annual water production; average water production appears to remain constant about 55 MG over the last five years. A similar trend is observed in maximum water produced after a sharp decline in FY 2011 to FY 2012.

Figure 6: Belmont WTP Annual Water Production 2011-2015



Similar to the Baxter WTP, water treatment at the Belmont plant consists of raw water settling, flocculation and coagulation, sedimentation, filtration, taste and odor control, and disinfection. Residuals from the flocculation and sedimentation basins are sent to the Southwest WPCP, as is the filter backwash. The Belmont WTP faced a number of challenges during FY 2015 but it has been proactive in researching and implementing innovative technologies and practices to address these challenges. The plant experienced algae growth in the raw water basin, which required the application of potassium permanganate, copper sulfate and polymers in the latter part of 2015 (Figure 7). This appears to have mitigated the problem. The east raw water basin is currently undergoing rehabilitation, which includes addition of a carbon feed system and relining of the basin (Figure 8). These modifications will help improve treatment performance and reliability. Furthermore, the plant experienced post backwash turbidity spikes, which resulted in shortened filter run times. To address these operational challenges, the backwash operation was fine-tuned and turbidity meters were installed in the filter beds (Figure 10). In addition, ultrasonic devices were installed in the sedimentation basins to disrupt algae growth and the sedimentation basin weirs were coated to discourage algae growth and improve surface concrete stability.

In 2013, the Water Department's three water treatment plants received the 15-year Director's Award marking fifteen consecutive years of achieving the Partnership for Safe Water - Phase III goals.

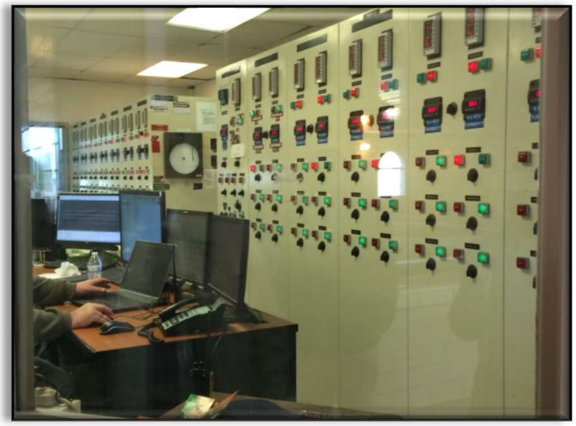
Belmont WTP logged over 6,500 hours of maintenance activities, ranging from repair of leaks; replacement of pumps and ancillaries; repair and replacement of air release valves, isolation valves; inspection and cleaning of tanks; upgrade of Distribution Control System (DCS) (Figure 9), among others. The lime system for pH control continues to be the most problematic of the chemical feed systems at Belmont WTP. However, various repairs and upgrades made during FY 2015 have resulted in satisfactory system operation. The plant operators regularly undergo training, including refresher and certification courses to keep them current and abreast of advances in the industry.

Figure 7: Algae Growth Control, Addition of Ferric Chloride at Sedimentation Tank

Figure 8: Rehabilitated West Raw Water Basin at Belmont WTP

Figure 9: Upgraded Distributed Control System

Figure 10: Optimization Tests of Turbidimeters for Filter Beds



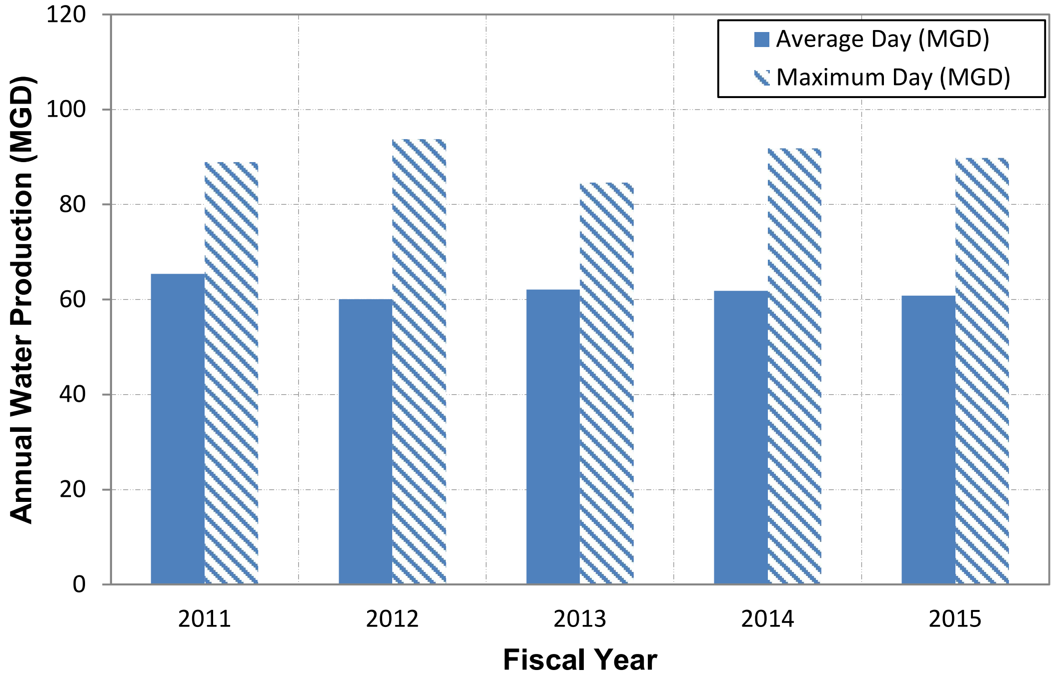
A list of Capital Improvement Plan (CIP) projects undertaken during the 2015 fiscal year at the Belmont WTP includes:

- Rehabilitation of the asphalt driveway
- Repair of crack at finished water basin
- Rehabilitation of East and West raw water basins
- Upgrade of Distribution Control System (DCS) to the Symphony Plus
- Installation of security fencing
- Construction of south filter building egress
- Automation of the filter-to-waste process enabling remote removal of filter effluent to a removal drain

3.7. Queen Lane Water Treatment Plant

The Queen Lane Water Treatment Plant is located in East Falls. It draws raw water from the Schuylkill River through an intake located 12 miles from the mouth of the river and directly downstream of its confluence with the Wissahickon Creek. It began operation in 1912 as a 70 MGD slow sand filter plant and has since undergone a number of renovations, including a complete renovation in 1960. The plant has a design capacity rating of 140 MGD. Figure 11 shows water production rates for the last five years with an annual average daily flow of approximately 60 MGD and an average maximum daily flow of approximately 89 MGD.

Figure 11: Queen Lane WTP Annual Water Production



The Queen Lane WTP and the Belmont WTP together supply water to 40% of the City's population. The Queen Lane WTP supplies water to residents in the City center and northwest Philadelphia, west of Broad Street and east of the Schuylkill River.

Similar to the other two WTPs, the Queen lane WTP aims to achieve the goals of the Partnership for Safe Water. During FY 2015, turbidity readings for all 5,837-combined filter effluent were less than the target of 0.1 NTU, the eleventh time in the last 12 years this was achieved. Overall, the 2015 Partnership for Safe Water data indicate that Queen Lane WTP continues to maintain excellent control of the plant's coagulation and flocculation/sedimentation process. Residuals from the flocculation and sedimentation basin and filter backwash are sent to the Southwest WPCP. Electricity supply is via two PECO lines and the WTP is also equipped with a standby generator capable of supplying the full plant load.

As part of its ongoing initiatives to achieve optimal operation, the plant is performing an air scour demonstration study to quantify the technical and economic benefits of using air scour technology and documenting measurable reductions in filter backwash discharge (Figure 12) over a one-year period. Measures identified in vulnerability assessments conducted in 2002 will be implemented as part of capital improvements scheduled for FY 2017. These security improvements include installation of new fencing, lighting and security cameras. Implementation of recommended security measures has been discussed with the neighboring community.

Figure 13: Air Scour Experimentation Studies at Filter Beds

Figure 12: Completed Emergency Spillway & Security Fence Around Raw Water Basin

CIP projects undertaken during FY 2015 at the Queen Lane WTP include:

- Concrete repair in filters and rebuilding of two filters
- Construction of emergency spillway in the raw water basin and slope stabilization of raw water basin (Figure 12).
- Replacement of the main plant 15 KV switchgear and new emergency generator
- Plugging of the raw water bypass to the filter building

3.8. Common Issues Related to Water Treatment

3.8.1. Washwater Disposal & Residuals Handling

Baxter WTP is the only PWD facility where the filter washwater is recycled to the head of the raw water basin at the plant. Filter washwater from the Belmont and Queen Lane WTPs is discharged directly into the sewer system along with daily discharges of floc/sed residuals and solids from annual cleaning of the sedimentation basins. Baxter WTP routinely discharges daily floc/sed residuals and solids from annual sedimentation basin cleaning to the sanitary sewer system. Residuals from the Baxter WTP are conveyed via the sewer system to the Northeast WPCP (NEWPCP); the Queen Lane WTP residuals are conveyed to the Southeast WPCP (SEWPCP) and the Belmont WTP residuals are conveyed to the Southwest WPCP (SWWPCP). At the SEWPCP and

NEWPCP, phosphoric acid is utilized to address phosphorus deficiency created by the water treatment residuals.

3.8.2. Treated Water Quality

Environmental regulations continue to mandate improvements to finished water quality. All of PWD's treatment plants produce finished water of exceptional quality, as evidenced by the low turbidity readings and the absence of water quality violations. The treatment facilities comply with current Federal and State drinking water regulations. It is impossible to predict what future regulations will dictate, but PWD actively monitors regulatory developments and is in a good position to comply with future water quality requirements.

3.8.3. Staffing and Personnel Issues

The treatment plants are operated by knowledgeable and highly trained personnel who stay abreast of technical advances and regulatory changes in the water industry. The three water treatment plants do experience high turnover rate for shift workers including operators and process chemists. The rotating shift vacancies in-plant operations are covered by full-time staff utilizing overtime work. Overall, staffing levels have decreased from past years due primarily to retirement of experienced personnel with invaluable institutional knowledge of the system and its operations. For example, Belmont WTP lost its plant manager and several other key personnel within a relatively short period of time. The Deferred Retirement Option Plan ("DROP") which allows retainment of experienced staff for a couple of years until qualified new staff are employed or knowledge is adequately transferred to replacement staff, has helped mitigate this issue.

The Queen Lane WTP had four vacancies at the end of the FY 2015 after numerous personnel changes during the year. Seven employees retired during the fiscal year including several key, long-time employees in the DROP program. The plant lost experienced staff but hired new staff to replace the retirees and those who left due to promotion. The Belmont WTP has 53 budgeted positions and recorded the retirement of two long-time employees at the end of FY 2015. At the Baxter WTP, retirement of a large group of DROP employees began during FY 2015 and is expected to continue into FY 2016. Ten key staff out of 56 budgeted staff positions left the WTP due to promotion and retirement.

There is a department-wide training and development program supported and managed by the Department's Training Office. Individual plant managers are responsible for ensuring that plant specific operator training required by law is provided. The plants also conduct more formalized equipment or function specific on-the-job training. Written Standard Operating Procedures (SOPs) are effectively used to transfer knowledge from the experienced staff. With the installation of more modern state-of-the-art process control and instrumentation systems, it is essential that each plant be staffed with operators and technicians with specialized skills in operating and maintaining these systems. Treatment Headquarters provides contract training in OSHA HazMat Response for all water & wastewater emergency response team personnel. Right to Know, Safety, Confined Space Entry & Lock Out- Tag Out courses are provided through the PWD Safety Office.

3.8.4. Disinfection Alternatives

Although there are no major concerns about the formation of carcinogenic compounds in the treatment system resulting from the chlorination process, PWD is considering alternative options to address the formation of disinfection-by products (DBP). Experimentation, which started in 2008 led to the conversion of part of the clearwell at the Belmont Plant to a post-filtration chlorine contact chamber. Preliminary results from this experiment have shown promise in reducing DBP, and plans are currently underway to demonstrate algae control methods, which will be critical to future adoption and standardization of post filter chlorination operations.

3.8.5. Standby Power Generation

As part of the contingency plan and to provide long-range power reliability, PWD has installed standby power generators at three treatment facilities and at seven critical booster pump stations. With the installation of these power generator units, PWD currently has adequate capacity to respond to any extended power outage while maintaining minimum supply pressure at the distribution system. In addition, PWD had initiated extensive upgrades of the control systems associated with these generators to ensure faster and automatic response to power outages as well as allow for periodic exercising of these generators to ensure their readiness.

The standby power capacity at each of the treatment facilities was designed to meet average day demands, and therefore cannot supply power to accommodate water production at maximum treatment capacity.

3.8.6. Security Improvements

PWD has recently improved and upgraded security at the majority of its facilities. Currently, each water treatment facility is equipped with twenty-four-hour security personnel, motion detectors, and motion sensor systems on security fences. Infrared and video surveillance cameras are also operational along fence lines and in critical areas. Electronic card readers and access control to critical assets within the facilities will be fully implemented once the security upgrade project planned for bid in FY 2017 is completed.

Most booster pump stations and system reservoirs are equipped with mechanical security gates, motion sensor systems on security fences, and infrared cameras and are currently under daily perimeter security surveillance. The current CIP includes a security systems upgrade project to further enhance security at the water treatment plants and to minimize the frequency of false alarms.

3.8.7. Needs Assessment

PWD has recently completed a needs assessment study at the three WTPs to determine and prioritize the short-term needs of each facility. The current CIP primarily reflects those identified needs at the three facilities. In addition, where required, the Department has initiated supplemental studies to address any new concerns of these plants.

A more formalized and in depth assessment will need to be completed for each WTP to assess conditions and prioritize replacement of critical processes and associated support systems as part of the PWD Water Sustainability 25-year Plan. This needs assessment study will identify specific improvements required to address the concerns of each plant and will also form the basis for developing an overall plan to adequately address these needs in a future CIP.

The treatment plants, which are approximately 50 years old, are constantly being upgraded to address structural issues and incorporate advancements in water treatment technologies and in response to changes in regulations. The management teams from the three plants meet monthly to collaboratively address ongoing issues at each plant as well as discuss plans and strategic goals.

3.8.8. System Operation and Monitoring

With the completion of a hydraulic model for each city pressure district, as a city-wide transmission system model, PWD is equipped with a highly sophisticated control system capable of monitoring and controlling all critical parts of the system from a centralized load control unit.

Except for certain areas of each WTP, the entire water supply system including all pump stations and the high lift pumps are currently being monitored and controlled from the central location at the Load Control Unit. In addition, to meet any contingency due to communication failure, the control system has been designed such that these facilities can be controlled locally either at individual equipment or from a dedicated control station located at each of these facilities.

3.8.9. Redundancy

One of the most critical aspects of the WTPs and Pump Stations is their ability to maintain normal levels of operation when certain critical components are out of service. During our site visits, plant personnel indicated that all critical equipment such as pumps, valves, chemical feed system, air compressors and major electrical equipment are provided with 'N+1' level of redundancy which is intended to allow the facilities to be operated at the desired level during the loss of service of any key equipment.

Each WTP is provided with two PECO primary electric feed lines to ensure an adequate level of redundancy. Queen Lane WTP is provided with an additional third standby power feed line with commitment from PECO to make the physical connection if either of the existing feeds goes down. This additional power backup was implemented as a result of a total power loss experienced at the plant during Hurricane Sandy in 2012. All booster-pumping stations are provided with dual power feeds from PECO with each feed capable of supporting the pump station's operation at the designed capacity.

In addition, utility feeds at each water treatment plant are supplemented by banks of emergency generators with the sufficient capacity to maintain the plant operation at the desired level during complete power outage events. Critical booster pumping stations are equipped with emergency generators of adequate capacity.

3.8.10. Source Water Protection Plans

The Schuylkill and Delaware River Source Water Protection Plans provide a comprehensive framework for implementing a watershed-wide effort to improve source water quality and quantity. The plans prioritize and outline several approaches to reduce sources of contamination to Philadelphia's raw water supply. PWD has made significant progress in accomplishing these goals. The Schuylkill Action Network, a regional partnership in the Schuylkill River watershed, has prioritized land for permanent protection. PWD also advocates for policies to protect and preserve source waters and forested lands, and collaborates with the Commonwealth of Pennsylvania to ensure regulations are enforced for wastewater treatment plants and industries that discharge upstream of Philadelphia.

As part of the Source Water Protection Program, PWD works diligently to address potential threats to the water supply within Philadelphia's own boundaries. Educational campaigns promoting proper disposal of unused pharmaceuticals and outreach efforts to mark storm drains in the City that drain directly to surface waters, emphasize the relationship between river water quality and drinking water quality. Projects such as improved stream buffers in Fairmount Park, geese determent programs at parks, and stormwater management at local schools are designed to reduce the amount of contaminants entering the local waterways.

PWD also conducts research to better define watershed protection priorities and to identify and address other potential concerns related to Philadelphia's water supply. Recent and on-going studies include analyzing flows needed to protect PWD's drinking water intakes on both the Schuylkill and the Delaware Rivers. Additional studies include evaluation of upstream development policies and activities to ensure continued protection of the drinking water supply; tracking of major sources of human infectious pathogens such as *Cryptosporidium*; developing water quality trends; and assessing anticipated risks due to climate change.

In 2015, PWD completed its third year of implementation of a 5-year Watershed Control Plan to reduce *Cryptosporidium* in the Schuylkill River watershed. The Watershed Control Plan helps ensure PWD's compliance with the EPA's Long-Term 2 Enhanced Surface Water Treatment Rule at the Queen Lane Drinking Water Treatment Plant.

PWD has also made significant progress toward upgrading, expanding and improving upon the Delaware Valley Early Warning System (EWS), a mass communication network used to notify water suppliers and industrial users throughout the watershed of any spills or other water quality concerns via email and telephone. PWD continues to further enhance this system with advanced technological upgrades and improvements like a tidal spill modeling component that was a recipient of a 2015 Governor's Award for Environmental Excellence. PWD continues to work closely with the City's Office of Emergency Management and state and federal agencies to ensure that they are ready and able to respond to any water-related emergency event.

3.9. Summary

Overall, the System's water treatment facilities are in good condition. The Baxter WTP provides an enhanced level of reliability to the overall system. Under the current CIP, there are major projects planned at the three WTPs to address the concerns over the deteriorating condition of various systems as identified in the needs assessment report.

However, it is anticipated that additional expenditures may be required to complete the rehabilitation work necessary to maintain the integrity of the water treatment plants. The needs assessment studies for Belmont WTP have established the benchmark and overall plan for needed improvements at the three WTPs. Progress on these overall plans will continue to be monitored by PWD, and it is anticipated that the CIP will be modified, if necessary, to reflect the capital expenditures necessary to ensure continued reliable operation of the plants. Successful completion of the projects in the CIP should continue to result in an adequate to good evaluation for the overall condition of the water treatment plants. Because of the age of the WTPs, these facilities may continue to require non-routine renovation, upgrading, and repairs outside those identified in the needs assessment report to ensure continued reliable operation.

Based on the foregoing discussions, it is our opinion that the major facilities of the Water System are in good operating conditions or adequate steps are being taken to maintain it.

4. WATER PLANNING AND COMPLIANCE

4.1. Introduction

Philadelphia Water Department (PWD) has continued to undertake necessary measures to protect public health and to comply with the requirements of the Safe Drinking Water Act. This section describes PWD's water initiatives and presents the status of compliance with applicable regulatory requirements for the water supply system. This discussion considers the state and federal requirements imposed on the water supply system under the Federal Safe Drinking Water Act, the Pennsylvania Department of Environmental Protection (PDEP) and other pertinent laws and regulations.

Also as a member of the Partnership for Safe Water since 1996, PWD focuses on improvement of the quality of water delivered to its customers by setting operational goals for optimizing water systems operations. One such goal is to produce filtered water turbidity that is below 0.1 NTU and to keep individual filter backwash turbidity peaks below 0.3 NTU while not exceeding 0.1 NTU for more than 15 minutes. In 2015, Philadelphia's drinking water turbidity was 84% lower than the maximum 0.30 NTU allowed by state and federal regulations and 50% less than the Partnership's maximum turbidity goal of 0.10 NTU.

In 2013, the Baxter, Queen Lane and Belmont Water Treatment Plants were honored by EPA and PADEP with the Partnership for Safe Water 15-Year Director's Award in recognition of PWD's decade-long commitment to achieving and maintaining the highest possible drinking water quality. PWD extended its participation in the Partnership for Safe Water initiative by becoming a charter member in the new Distribution System Optimization Program. This self-assessment initiative extends its focus beyond the treatment process to ensuring delivery of high quality water by maintaining distribution system integrity.

4.2. Regulatory Requirements

Regulation of the PWD water supply system is governed by the requirements of the Safe Drinking Water Act (SDWA), which was originally passed in 1974 to protect public health by regulating the nation's public drinking water supply. The 1974 law was amended in 1986 and 1996. The 1986 law amongst other things set drinking water standards contaminant levels and banned the use of lead-containing materials in distribution and home plumbing systems. Under the 1986 statue, U.S EPA established national limits on the contaminant levels in drinking water, which are referred to as Maximum Contaminant Levels (MCLs). To date, MCLs have been promulgated for microorganisms, disinfectants, 11 disinfection byproducts, 16 inorganic chemicals, 53 organic chemicals and several radionuclides, for a total of 91 regulated contaminants. In some cases, EPA has established mandatory treatment techniques in lieu of an MCL as the mechanism to control contaminant levels in the water supply. The 1996 amendments greatly enhanced the existing law by recognizing source water protection, operator training, funding of water system improvements, and public information as important components of safe drinking water.

In addition, EPA also promulgated the Surface Water Treatment Rules (SWTRs) to improve the quality of drinking water supply. This rule is applicable to PWD's water supply because the City of Philadelphia relies exclusively on surface water as the source of drinking water. These regulations provide protection against disease-causing pathogens, such as *Giardia lamblia*, *Legionella,* and *Cryptosporidium* as well as protection against contaminants that can form during drinking water treatment. Other applicable rules that govern the source, treatment and distribution of PWD's water and PWD's compliance status are discussed below.

4.3. Lead & Copper Rule (LCR)/Corrosion Control Program

Under the SDWA, water systems serving more than 50,000 people (large water systems) are required to monitor lead and copper levels in drinking water at customer taps. If lead concentrations exceed an action level of 15 ppb or copper concentrations exceed an action level of 1.3 ppm in more than 10% of customer taps sampled, PWD must undertake a number of additional actions to control corrosion. If the action level for lead is exceeded, PWD must also inform the public about steps they should take to protect their health. If the cause of the exceedance is determined to be related to lead service lines, then PWD may have to replace the portion of the lead service lines under its control (i.e., between the main and the curb stop).

PWD Compliance Status: PWD is in full compliance with the LCR regulations. PWD is on a reduced monitoring schedule based on the low lead and copper results obtained in prior years of testing. Last round of triennial testing for LCR was conducted in 2014 90% of PWD tested customers' homes had less than 5 ppb and 0.31 ppm concentration of lead and copper, respective In addition to the aggressive public outreach effort to inform customers on ways to minimize the corrosion of lead from lead pipes, PWD adds zinc orthophosphate to the water to control corrosion in the water supply network. Current PWD corrosion control practices aid in reducing corrosion and lead levels and ensures PWD's compliance with its Optimized Corrosion Control Treatment (OCCT) permit. This permit is approved by PADEP and requires that the concentration of phosphate be greater than 0.12 mg/L as phosphorus and pH be between 6.8 and 7.8 for finished water.

4.4. Total Coliform Rule (TCR)

The TCR was promulgated in 1989 to monitor total and fecal coliform at specific locations throughout the distribution system for presence of total coliform. In 2013, the EPA revised this rule and PWD participated in the technical review. The Revised Total Coliform Rule (RTCR) took effect April 1, 2016. The TCR sets a treatment technique for total coliforms, which allows no more than 5% of monthly samples to test positive for total coliforms and sets an MCL for E. Coli. Under the TCR, if a system has two consecutive total coliform positive samples, and one is positive for E. coli, then the system has an acute MCL violation. The RTCR replaced the MCL for total coliform and uses detection of total coliform as a means of identifying and addressing potential contamination.

PWD Compliance Status: PWD is in full compliance with the RTCR. Over 380 samples are collected throughout the City each month and the highest percentage of monthly positive samples is recorded.

These values for the FY 2015 ranged from 0 - 1.2% for total coliform and zero/no positive samples for E.coli.

4.5. Disinfection/Disinfection By-Products Rule

The Stage 1 and Stage 2 Disinfection and Disinfection By-Product Rule (DBPRs) contain maximum residual disinfectants levels (MRDL), MCLs for disinfection by-products and a treatment technique for total organic carbon (TOC) removal. The Stage 1 DBPR reduces drinking water exposure to disinfection byproducts Total Trihalomethanes (TTHM) and Haloacetic acids (HAA5). The Rule applies to community water systems and non-transient non-community systems, including those serving fewer than 10,000 people that add a disinfectant to the drinking water during any part of the treatment process. PWD applies hypochlorite as part of its disinfection process. The Stage 2 DBPR strengthens public health protection by tightening compliance monitoring requirements for TTHM and HAA5.

Both Stage 1 and Stage 2 DBPR set MCLs for TTHM and HAA5 at 80 µg/l and 60 µg/l, respectively. In addition, Stage 2 changes the method for calculating the system compliance from running annual averages to locational running annual averages (LRAAs).

PW Compliance Status: PW is in compliance with the Disinfection By-Products Rule Stage 2. Running annual average for 2015 was 49 ppb for TTHMs and 44 ppb for HAA5. System wide ranges of results for TTHMs are 16-89 ppb and 16-96 ppb for HAA5. Monitoring is conducted at 16 locations throughout the City of Philadelphia.

The established requirement for residuals are residual chlorine continuously monitored in WTP (>0.2 mg/l at entry point in the distribution system), chloramine residual in distribution system with Maximum Residual Disinfectant Level (MRDL) <4 mg/l and a requirement to maintain a detectable residual in the distribution system. Over 450 samples are collected throughout the distribution system every month; monthly average values reported for FY 2015 ranged from 1.52 - 2.08 ppm.

4.6. Enhanced Surface Water Treatment Rule

The Interim Enhanced Surface Water Treatment Rule (IESWTR) builds on the requirements of the SWTR rule. The IESWTR specifies treatment requirements to address *Cryptosporidium* and other microbial contaminants in public water systems serving 10,000 or more persons. The IESWTR sets a maximum turbidity of 1.0 NTU in finished water. It also requires the installation of individual turbidimeters at each filter and subsequent remedial actions if turbidity limits are not attained. The IESWTR also stipulates that additional treatment be provided based upon the concentration of *Cryptosporidium* or *E. coli* in the source water of individual treatment plants, which are classified in "bins" with varying removal and/or inactivation credit requirements. Higher influent *Cryptosporidium* levels (and corresponding higher bin numbers) require greater removal and/or inactivation and hence additional treatment requirements.

PWD Compliance Status: The water department is in full compliance with ESWTR rule. As a member of the Partnership for Safe Water, PWD meets and exceeds this rule. Effluent turbidity equal to or less than 0.1 NTU was achieved in more than 99.9% of the time in 2015. Furthermore, PWD is one of the nation's leaders in *Cryptosporidium* research and one of the first utilities to monitor for the organism. Collaborative research work with Lehigh University and proactive approach in identifying sources of *Cryptosporidium* in the watershed helps improve water quality.

Average values of *Cryptosporidium* for FY 2015 at the source water locations to the Baxter, Belmont and Queen Lane WTPs prior to treatment were 0.028 count/L, 0.033 count/L and 0.05 count/L, respectively. Twenty-four months of sampling data are required to determine a Bin classification. Belmont and Baxter WTPs are currently classified as Bin 1 facilities, meaning that no additional treatment is required. The first year 2015 results show an improvement for Queen Lane WTP compared to results of FY 2014 when it was placed in Bin 2, as *Cryptosporidium* raw water intake measured levels exceeded 0.075 count/L.

4.7. Consumer Confidence Report Rule

Consistent with the requirements of SDWA, PWD prepares and distributes an annual water quality report to its customers describing the quality of water being distributed by the system. This report also contains educational materials and information on the sources of contaminant in drinking water.

PWD Compliance Status: PWD complies with the 2015 reporting requirements for the Consumer Confidence Report (CCR). PWD started submitting CCR reports electronically starting with the 2014 report. The reports for the last 16 years are available on PWD's website.

4.8. Filter Backwash Recycling Rule

The Filter Backwash Recycling Rule (FBRR) addresses a statutory requirement of the 1996 SDWA Amendments to promulgate a regulation that governs the recycling of filter backwash water within the treatment process of public water systems. The purpose of the FBRR is to require public water systems to review their recycle practices and where appropriate work with the state primary agency to make any necessary changes to recycle practices that may compromise microbial control. The recycle streams regulated by the FBRR are filter backwash water, sludge thickener, supernatant, and liquids from dewatering process. This rule requires the return of recycled streams prior to or concurrent with the point of primary coagulant addition and requires that records related to the wastewater streams generated at each treatment plant be maintained.

PWD Compliance Status: The department is in compliance with this regulation, all filter backwash and settling basin waste streams are sent to the wastewater plants for treatment with the exception of backwash water generated at Baxter WTP. For this WTP the backwash is recycled to the raw water basin before the point of application of coagulants.

4.9. Source Water Assessment Program

The SDWA 1996 Amendment required public water systems to identify and prioritize potential sources of contamination to their raw water supply. This comprehensive characterization, known as a Source Water Assessment, informs the development of Source Water Protection Plans. PWD's

Schuylkill and Delaware River Source Water Protection Assessments identified vulnerabilities to the quality and quantity of Philadelphia's drinking water supply and informed protection measures detailed in the Source Water Protection Plans. PWD's Source Water Protection Plans provide a comprehensive framework for implementing a watershed-wide effort to improve source water quality and quantity. PWD has worked collaboratively with the Commonwealth of Pennsylvania to ensure regulations are enforced for wastewater treatment plants and industries that discharge upstream of Philadelphia. Progress has also been made in addressing potential threats to water supplies within Philadelphia's own boundaries.

PWD Compliance Status: Source Water Assessments for the Queen Lane and Belmont intakes on the Schuylkill River and the Baxter intake on the Delaware River were completed in 2002. The Source Water Protection Plans based on Philadelphia's Source Water Assessments were completed in 2006 and 2007 for the Schuylkill and Delaware River intakes, respectively. These documents continue to inform PWD's ongoing source water protection initiatives and ensure PWD's continued role as an industry leader in source water protection.

4.10. Chemical Contaminant Rules

The chemical contaminant rules were promulgated in phases collectively called the Phase II/V Rules or the Chemical Contaminant Rules. These rules regulate over 65 contaminants in three contaminant groups namely: Inorganic Contaminants (IOCs), Volatile Organic Contaminants (VOCs) and Synthetic Organic Contaminants (SOCs). The rule applies to all public water systems and the particular public water system type, size, and water source type determine which contaminants require monitoring for that system. The Chemical Contaminants Rules provide health protection through the reduction of chronic, or long-term, risk from cancer, organ damage, circulatory system disorders, nervous system disorders, and reproductive system disorders. EPA sets a Maximum Contaminant Level (MCL) for each contaminant. Maximum Contaminant Level Goal (MCLG) which is the level at which no known or anticipated adverse effect on the health of a person would occur, is also set for each contaminant.

PWD Compliance Status: PWD monitors for Chemical Contaminants more often than required by the EPA and is in compliance with all established MCLs.

4.11. Radionuclides Rule

The current rule requires the MCL for combined radium-226 and 228 to be 5 pCi/L and gross alpha particle radioactivity to be 15 pCi/L, and beta particle and photon activity to be 4 mrem/yr or 50 pCi/L. The rule also regulates uranium at 30 μg/L

PWD Compliance Status: The Department is in compliance with the radionuclide rule; no concentrations were detected for alpha, beta and combined uranium. Required monitoring was conducted in 2014. The highest beta concentration recorded was 17.5 pCi/L, which is well below the MCL of 50 pCi/L.

4.12. Unregulated Contaminant Monitoring Rule (UCMR)

The SDWA amendments of 1996 require that once every five years, the EPA issue a new list of no more than 30 unregulated contaminants to be monitored by public water treatment plants. The latest rule (UCMR 3) was promulgated in 2012, which listed 28 chemicals and 2 viruses. All public water treatment plants serving more than 10,000 people are required to monitor for these additional chemicals, which provide the basis for future regulatory actions to protect public health.

PWD Compliance Status: PWD conducted the UCMR 3 compliance test in 2013 with no reported detection of listed chemical. PWD is in compliance with this rule.

4.13. Water Security and Accountability

In 2002, a water system-wide Vulnerability Assessment was performed by PWD. The recommendations from this assessment are currently being implemented at the three water treatment plants. Installation of physical security measures such as cameras, fencing and alarm systems have been completed. Discussions are also conducted with communities within the vicinity of these facilities on proactive community-friendly security measures. Also, emergency generators and real-time monitoring of water quality have also been implemented. PWD also undertakes cyber security measures to prevent any compromises in SCADA or computer software. The SCADA systems are not connected to the Internet.

As a member of the Delaware Valley Intelligence Center (DVIC), Local Emergency Planning Committee (LEPC) and the Southeastern Pennsylvania Regional Task Force (SEPATF), PWD continues to be an active participant in the City's emergency preparedness. PWD also works closely with other agencies such as the City's Office of Emergency Management (OEM) and Health Department on developing emergency plans such as possible train derailment, demolition site implosion, debris management plans for major catastrophes, and plague outbreak.

In addition, during FY 2015, PWD conducted a vulnerability assessment of the Baxter Plant SCADA system. The results were satisfactory but recommendations for improvements were identified. Also, together with OEM and the United States Army Corps of Engineers a citywide electrical disruption plan was initiated. The purpose of this plan was to determine the electrical needs of all facilities so that supply backup generators can be provided if there was a sustained outage. This plan is scheduled to be completed in 2016. PWD also currently runs a Consequence Management Plan, which delineates how to respond to a contamination event. This plan was developed in collaboration with city, state and federal agencies and has been viewed as a success by the EPA. Collection of water quality data assists PWD to effectively monitor and address emergencies. Furthermore, through the EPA Region 3 Laboratory Response Plan for Drinking Water, PWD can access federal, state and local laboratories resources for analytical support during water quality contamination events.

5. WATER STORAGE, CONVEYANCE & PUMPING SYSTEMS

This section discusses the functions, initiatives and challenges of the PWD divisions primarily responsible for the supply of finished water to the City of Philadelphia. The divisions are the water conveyance division, the storage division, and the pumping division.

5.1. Water Conveyance Division

The water conveyance division is made up of the Load Control Unit, the Distribution Unit and the Pumping Unit. These Units are described below.

5.1.1. Load Control Unit

The Load Control Unit (LCU) is responsible for water conveyance. In order to provide reliable supply of water to meet all community needs, the LCU operates the water transmission system Load Control Center and maintains the SCADA system. The LCU also conducts hydraulic investigations, maintains a current hydraulic model and assists in long-term planning for responsible management of the City's water supply infrastructure.

The LCU is divided into four divisions.

- The Operations division develops standard operating procedures for safe, reliable water delivery. This division also manages electric power demands and coordinates maintenance and rehabilitation schedules for the WTPs and pump stations
- The Hydraulic Investigations division oversees all work related to the testing of the water distribution system, transmission system disinfection, low pressure and water quality investigations
- The Water System Modeling and Analysis division is responsible for the development and effective use of the hydraulic model for the city water system
- The Systems and Special Projects division oversees Electronics and Instrumentation work and is tasked with maintenance of the SCADA system and all instrumentation used to monitor system operation

In terms of staffing, the LCU experienced a reduction of 10% in staffing for FY 2015 compared to FY 2014. These vacancies tend to be cyclical in nature, arising from promotions or transfers, and eventually reduce to entry-level positions. Nevertheless, the LCU is fortunate to have a number of skilled and experienced staff who can seamlessly assume responsibilities. It is anticipated that all positions will be filled by the end of FY 2016.

Figure 14 displays the average water delivered, annual power usage and cost of pumping over the last 5 years. The reduction in water delivered in FY 2015 compared to FY 2014 is attributed to the fact that sale of water to Bucks County Water and Sewer (BCWAS) was halted, resulting in a reduction of approximately 5.2%. The LCU is challenged to identify operational cost savings to match the decline in delivery rate, while using pumping systems that are designed for higher demands. At most pumping stations, the smallest pump is in service during periods of peak usage (typically 8 am to 8 pm). Future CIP plans for the pumping facilities will address this disparity; in the meantime, the LCU works collaboratively with the Pumping Unit to implement cost-saving measures such as trimming of impellers to enhance hydraulic efficiency.

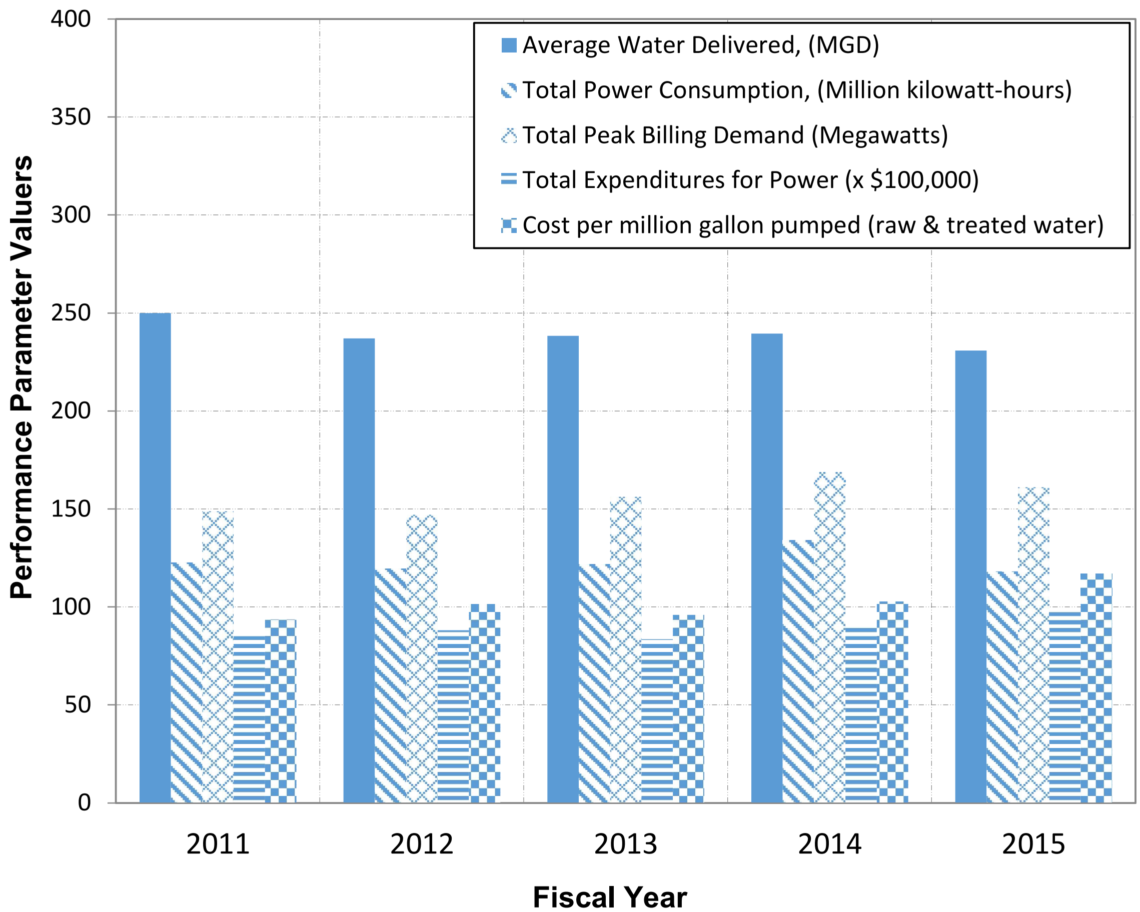


Figure 14: Load Control Unit: Performance Index 2011-2015

The LCU also runs a citywide hydraulic model for all city pressure districts. This model, which was developed in collaboration with CH2M Hill, is used to simulate operational changes, size pumps, plan water main relays and investigate water quality issues. Accuracy of the model is maintained by periodic updates to Geographic Information System (GIS) data, flow measurements, SCADA and billing data. Improvements based on use of the hydraulic model are being planned; this will comprise the addition of the Linear Asset Management Program (LAMP) to include use and application of the hydraulic model as well as preventive maintenance of pipelines using a risk-based scheduling of pipeline repair and replacement. The risk assessment takes into account the pipe age, material and inspection results as well as the proximity and type of nearby infrastructure.

The LCU assumed responsibility for the corrosion control program in FY 2016; this program monitors and maintains the existing pipe corrosion control systems. According to information presented in the LCU reports, it has been determined that 90% of the corrosion problems in PWD's pipe network systems originate from stray traction currents from Philadelphia's transit system, the Southeastern Pennsylvania Transportation Authority (SEPTA). In collaboration with SEPTA, PWD has initiated remedial action to address these corrosion issues. The LCU provides other services related to the distribution system including system optimization, design, construction, and reservoir operation and maintenance support. For example, in the Fall of 2015, the Lower Roxborough Reservoir was taken out of service for installation of a mag-meter and replacements of effluent valves by PWD staff. Additional tasks undertaken by the LCU include water quality investigations, fire flow testing and asset management in support of CIP projects.

In FY 2016, the LCU has continued to improve system operation, monitor hydraulic data and coordinate scheduling of major transmission system projects. CIP projects include construction and startup of a new East Park Reservoir tank, planning of a replacement clearwell at the Baxter WTP, installation of a new switchgear and new suction flume division valve at the Torresdale Raw Water Pump Station.

5.1.2. Distribution Unit (Pipelines)

The Distribution Unit is responsible for repairing and maintaining the water distribution infrastructure, installing service connections, providing emergency response for local control of distribution and transmission systems. In addition to these tasks, the Distribution Unit identifies and corrects system irregularities, and maintains water quality in a cost-effective manner, while continuing to be stewards for the environment and responding to customers' needs.

At the end of the FY 2015, this 258-employee unit had five vacancies. To assist in its operation, semi-skilled workforce workers are typically recruited from Water Operations Repair Helpers, (WORHs) which over the years have been beneficial for the unit.

The Distribution Unit is responsible for maintaining approximately 3,200 miles of pipelines, 92,000 valves and 25,400 fire hydrants. During the FY 2015, the unit recorded roughly 916 water main breaks, which is a decrease of about 57 when compared to the prior year. This reduction is attributed to the milder winter experienced in 2015 compared to previous years. In addition, measures are continually put in place to prioritize and repair the aging distribution infrastructure. The results of these measures are evident by the lower main breaks, (about 240 per 1,000 miles) experienced by PWD in comparison to the national average of 270 breaks per 1,000 miles.

As part of the maintenance activities undertaken by the Distribution Unit, condition assessments of pipelines are regularly performed via onsite physical pipe inspections, leak surveys, and corrosion studies. In addition, condition assessments of active pipelines are also performed using an in-line leak detection technology as part of the SAHARA program. The data are recorded and stored in the asset management program, CapPlan, and are used as inputs to the CapPlan model which forms the basis for an effective water main replacement program.

Additionally, other services performed by the distribution unit in FY 2015; was the repair of 4.141 fire hydrants, resulting in a year-round fire hydrant availability of 99.56%. Daily inspections of hydrant standard pressure were performed by four hydrant repair crews year round. Other tasks undertaken by the fire hydrant crews included color code painting of hydrants to match the diameter of the service pipeline and installation of lock features on the hydrants, which has helped reduce misuse of the hydrants. The Distribution Unit also maintains a 24-hr emergency crew sub-unit that attends to routine leaks, operate valves, and provide service to water construction contractors. This has helped reduced complaints and enhanced the Unit's ability to address more critical needs.

The Distribution Unit ensures that workers are effectively trained and are knowledgeable about various compliance acts. For example, during repairs the unit ensures compliance with the PA Clean Streams Act by placing de-chlorination mats at storm drains to protect waterways from chlorinated potable waters.

5.1.3. Pumping Unit

The Pumping Unit is responsible for the maintenance and repair of all raw and potable water pumping units as well as maintenance of raw water intakes, finished water reservoirs, system tanks and standpipes. At the end of FY 2015, the Pumping Unit had six vacancies of the 50 available positions. Table 2 lists the PWD pumping stations based on the source river intake:

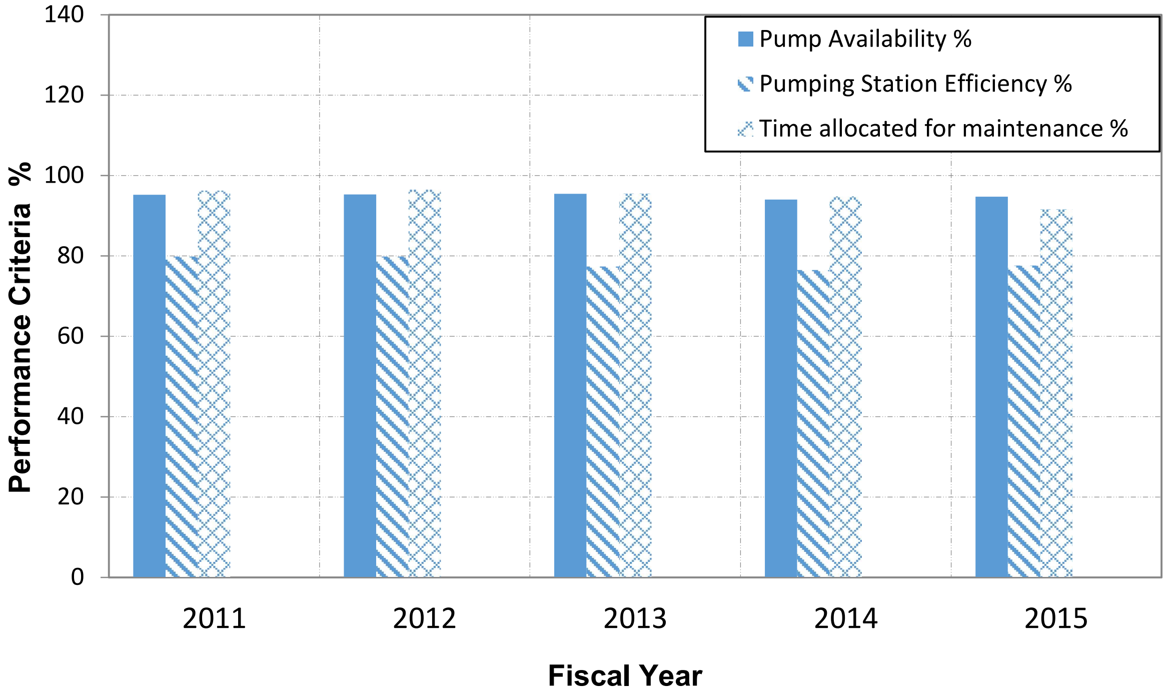
Table 2: Philadelphia Water Pumping Stations

Delaware Pumping Units	Schuylkill Pumping Units
East Oak Lane	Belmont High Service
Fox Chase Booster	Belmont Raw Water
Lardners Point	Chestnut Hill
Torresdale Low Service	East Park Booster
Torresdale High Service	Queen Lane High Service
Torresdale Raw Water	Queen Lane to Roxborough
West Oak Lane	Queen Lane Raw Water
	Roxborough High Service
	Navy Pumping Station

Most of the pumping stations in the PWD system were built in the early 20th century but have been well maintained and updated. The performance of the pump stations is rated using the Key Performance Indicators (KPIs). The availability of pumps for service or use is a criterion used for assessing performance. There was a slight increase in pump availability compared to FY 2014, 94.03% to 94.67% (Figure 15). In addition to regular and proactive maintenance approaches, this increase in availability is attributed to a number of operational improvements and changes in the pump stations across the PWD system. Time spent on planned maintenance expressed as a percentage of total maintenance time represents a measure of productivity of the Pumping Unit maintenance staff. This measure reflects the effectiveness of the preventative maintenance program.

An additional KPI is the wire-to-water efficiency; this efficiency rating compares the amount of water pumped to the electricity used to operate the pumps. As shown in Figure 15: Pump Station Performance 2011-2015, over the last five years there was a slight reduction in overall efficiency from 79.8% to 77.6% although a slight increase in efficiency was observed during FY 2015.

Figure 15: Pump Station Performance 2011-2015



In-house projects completed by the Delaware and Schuylkill Pumping Units in FY 2015 included:

- Complete overhauls of four main pumps at the Torresdale High PS.
- Replacement of discharge valve and installation of suction flume division gates at Torresdale Raw Water PS (Figure 16).
- Installation of one main pump at the West Oak Lane PS.
- Installation of two main pumps at the East Oak Lane PS.
- Installation of two main pumps at Lardner's Point PS.
- Repair of a broken shaft and complete overhaul of surface wash pump at the Baxter WTP.
- Complete overhaul of several main pumps including two at the Belmont High Service PS and one each at the Belmont Raw Water PS; the East Park PS; the Philadelphia Naval Business Center PS; the Queen Lane High PS; the Queen Lane Raw Water PS; and the Roxborough High Service PS.

In addition, capital projects completed in FY 2015 included replacement of sixteen 36-inch discharge header valves at the Torresdale Raw Water PS, the design of replacement switchgears, and the installation of a backup generator at the East Oak Lane PS.

Figure 16: Rehabilitation Work at Torresdale Raw Water Pump Station

The brief but severe winter experienced in early 2015 caused some operational challenges during the year; at the Baxter WTP, a combination of ice and low tides made it difficult to keep the emergency intake bar screens clear which adversely affected pumping rates. De-icing crews were deployed on a 12-hour rotation shift to mitigate the situation. A similar scenario was experienced at the Queen Lane intake and was effectively mitigated.

The Pumping Unit technicians perform most of the equipment maintenance work in-house using labor and skills within and across the Department, which helps to keep costs down and optimize performance due to their familiarity with the equipment. However, in cases where skills and labor needed cannot be sourced from within the Department, reliable contractors are brought in. The annual KPI productivity provides a performance ratio to determine the amount of time used for maintenance activities versus the time used for corrective repairs in a fiscal year. A corrective repair ratio below six percent is set as the goal for PWD. During the FY 2015, 8.4% was used for corrective repairs. Proactive plans are being put in place to ensure a reduction in corrective repairs.

The Pumping Unit together with the Load Control Unit is working on a 25-year pumping facilities plan that will involve integrating all pumps stations as part of a system. This holistic approach will help address the need to right-size overall pumping capacity to better match current and future demands.

5.2. Water Storage and Reservoirs

PWD has three major covered storage reservoirs to meet the needs of the City of Philadelphia. These are the East Park (147.2 MG), Oak Lane (72.8 MG), and Upper and Lower Roxborough (28.5 MG) reservoirs. Additional storage capacity is provided by Fox Chase tank (1.5 MG) and two Somerton and two Roxborough standpipes with capacities of 10 MG and 11 MG, respectively. The responsibility of managing the reservoir primarily falls under the Reservoir Maintenance Group (ROMG). This team is comprised of representatives from BLS, Treatment, Pumping and Load Control Unit. They work to optimize the operation and maintenance of the reservoirs in the PWD system.

During FY 2015, this team monitored and maintained the cover and liner of the East Oak Lane reservoir, which had reached its end-of-service life. In FY 2016, the Water Department bid a project to replace the East Park Reservoir with two 30MG concrete tanks. The $78M project is currently under construction with a planned completion of May 2019. In May 2010, the Water Department discovered a failed 4-foot by 6-foot section in the vegetated roof cover of the clear water basin ("CWB") at the Baxter Plant. The CWB contains 50 million gallons of finished water from the Baxter Plant and supplies the Lardner's Point Pump Station. The Water Department temporarily repaired and covered the breach and continuously monitors water quality at the influent and effluent of the CWB. No adverse effects have been observed and access to the failed roof area has been closed-off to prevent further damage to the basin in operation.

The Water Department has completed a thorough underwater inspection and condition assessment of the basin, the outlet chamber and the influent valves. Structural improvements were made to the CWB outlet structure and stoplog chamber and new aluminum stoplog panels were constructed, installed and tested in January and March 2012. The successful test of the stoplog panels and operation of the influent valves confirmed the Water Department's capability to isolate the CWB in case of an emergency. The Water Department has sufficient storage upstream of the CWB and a permanent by-pass conduit as a viable emergency alternative to the CWB.

The Water Department also repaired, re-commissioned and demonstrated the "A-stage" pumps at Lardner's Point Pump Station that would need to be put into service in the event of a CWB outage. The Water Department will replace the CWB with four 5MG basins and associated piping. This project will be completed in two phases. In the first phase, two 5MG basins (10MG total storage) estimated at approximately $75 million will be installed. Construction bids for the first phase are expected to be advertised in 2016. The second phase is not expected to start until the first phase is complete.

5.3. Summary

The water storage, conveyance and pumping systems appear to be operated efficiently and upgrades are performed as needed. Regular proactive in-house maintenance and repairs of these systems have contributed to the extension of their service lives. Based on the foregoing discussions, it is our opinion that the water storage, conveyance and pumping systems are in good operating conditions or adequate steps are being taken to maintain it.

6. WASTEWATER SYSTEM

The Philadelphia Water Department's wastewater system currently serves the City of Philadelphia. The Wastewater System's service area is the City of Philadelphia and ten wholesale contracts with municipalities in the Philadelphia metropolitan area. Based on the 2015 U.S Census Bureau estimate, the Wastewater System served approximately 1,567,500 individuals that live in the City and ten wholesale contracts. The service area covers 130 square miles in the City of Philadelphia and 230 square miles in the suburban areas surrounding the City.

The wastewater collection system consists of approximately 3,700 miles of total collector system piping, 19 pumping stations, 94,116 manholes, 26 storm relief structures, 72,000 stormwater inlets, and 56 flow-metering stations. There are approximately 760 miles of sanitary sewer, 740 miles of storm sewer, 1,900 miles of combined sanitary and storm sewers, 13 miles of force mains (sanitary and storm) and 350 miles of appurtenant piping. The sewers range in size from 8-inch diameter to 21 feet by 24 feet arch-shaped conduits and are constructed primarily of brick, vitrified clay, or reinforced concrete. The wastewater system is divided into three drainage districts: Northeast, Southeast, and Southwest, each served by a treatment plant as shown in Figure 17. The treatment plants responsible for these districts are correspondingly named Northeast, Southeast and Southwest Water Pollution Control Plants (WPCP). These WPCPs are discussed in detail in subsequent sections of this report.

Similar to the Water Treatment Division, PWD operates a number of programs to provide effective planning, design, construction, operation and maintenance of its wastewater conveyance, treatment and disposal systems to ensure compliance with all applicable federal, state, and local regulations. Discussed below is the wastewater system planning and compliance program.

6.1. Wastewater System Planning and Compliance

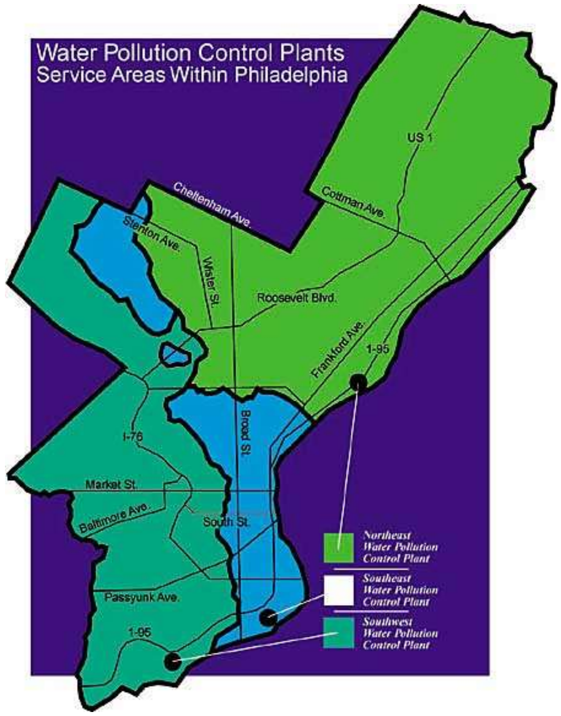
6.1.1. Regulatory Permits

The PWD WPCPS are regulated by the following permits: The National Pollutant Discharge Elimination (NPDES) Permit; the Municipal Separate Storm Sewer System Permit (MS4); and the Title V Major Source Operating Permit (for the Northeast and Southwest WPCPs only).

National Pollutant Discharge Elimination (NPDES) Permit

The Northeast, Southeast, and Southwest WPCPs have been operating under a continuation of their NPDES permits that expired August 31, 2012. PWD made timely renewal submittals for each of the three WPCPs in March 2012 and has since been negotiating a new NPDES permit for the Northeast WPCP with the PADEP. The PADEP and PWD have mutually agreed that when the new permit for the Northeast WPCP is finalized PADEP and PWD will use the Northeast WPCP permit a basis for the Southeast and Southwest WPCP permit development. These permits will incorporate the requirements of the Long Term Plan Update and Consent Order Agreement.

Figure 17: Water Pollution Control Plants Service Areas within Philadelphia



Several key components of the NPDES permits and other considerations under negotiations with PADEP include effluent limits on dissolved oxygen and nutrients. However, PWD does not anticipate permit modifications related to these analyses in the next permit cycle.

Municipal Separate Storm Sewer System Permit (MS4)

PADEP has the authority to regulate municipal stormwater through the MS4 program. PWD currently operates under an extended permit that expired in September 2010. PWD is currently negotiating a new MS4 permit and seeks significant modifications to the permit to allow more focus on techniques that will provide measurable water quality improvements. With the MS4 permit and the three WPCP permits up for renewal, PWD is hopeful that the issuance and expiration dates of the new NPDES and MS4 permits for the WPCPs will coincide to facilitate overall watershed planning and reporting.

Title V Major Source Operating Permits

The Federal Clean Air Act (CAA), as amended, sets forth requirements for the regulation of certain air emissions. In January 1994, the PADEP published regulations pursuant to the Clean Air Act's mandate for the control of Volatile Organic Compounds (VOC) and NOx` emissions from major stationary sources. These regulations require, in part, quantification of VOC and NOx emissions from stationary sources, which include the three WPCPs. Under CAA, a Title V Major Source Operating Permit is required for operation of two of the three facilities.

In June 2001, Title V Major Source Operating Permits were issued for the Northeast WPCP and the combined site of the Southwest WPCP and the Biosolids Recycling Center (BRC). In January 2013, PWD entered into a Title V consent order agreement to address odor issues at the Northeast WPCP by constructing gravity sludge thickeners and associated facility for odor control by 2018. With respect to revising the Title V permits for the Northeast and Southwest WPCPs, PWD completed negotiations with the City of Philadelphia's Air Management Services and has received its permit for the Northeast WPCP in January 2014. As the operator of the BRC, the Philadelphia Biosolids Services, LLC ("PBS") is responsible for the Title V permit for the BRC facility. With the removal of the BRC from the Southwest WPCP’s Title V permit, PWD anticipates that the Southwest WPCP will be permitted as a minor facility that is no longer subject to the requirements of Title V. Since 2008, no odor violations have been reported at the Northeast, Southeast and Southwest WPCP. The Southeast WPCP is not subject to the requirements of Title V.

PWD also has an Industrial Waste Unit (IWU), which is responsible for ensuring compliance with federal industrial pretreatment standards. Under its NPDES permit, PWD is required to regulate industrial waste flows discharged to the wastewater collection system to ensure compliance with all applicable regulations. Other responsibilities of the IWU include monitoring wastewater characteristics from townships; determining industrial surcharges; investigating spill incidents; and managing the Department’s hazardous chemical storage tanks compliance program.

6.1.2. Consent Order and Agreement (COA) for Combined Sewer Overflows

The purpose of the Consent Order and Agreement (COA) is to improve the overall water quality of the city's rivers and streams by reducing combined sewer overflows ("CSOs") from PWD's combined sewer system. PWD's primary means for complying with the consent order is the approved Long Term Control Plan Update ("LTCPU"), also known as the Green City Clean Waters ("GCCW") program, which began in 2011. The LTCPU outlines PWD's strategy for implementing traditional and non-traditional improvements that will focus on eliminating or removing no less than the mass of pollutants (including biochemical oxygen demand ("BOD"), total suspended solids ("TSS"), and fecal coliform bacteria) that otherwise would be removed by the capture of 85 percent by volume of combined sewage collected in the combined sewer system (CSS) during rainfall events on a system-wide annual average basis. To track progress toward this goal and determine compliance with the COA, Water Quality Based Effluent Limits ("WQBEL") with performance standards will be included in PWD's renewed NPDES permits.

This COA is particularly significant because it is the first of its kind and represents a shift from typical CSO programs and agreements. PWD's LTCPU will address CSOs through citywide implementation of large-scale green stormwater infrastructure. Installation of more traditional “gray" infrastructure improvements in the form of treatment plant capacity increases and collection system improvements will be minimized. This approach focuses on controlling pollution at its source and improving water quality by restoring the natural hydrologic cycle in the urban environment. The approach is consistent with EPA's strategy for addressing wet weather impacts. PWD will be in the spotlight and under scrutiny as regulators and other utilities observe their progress during the implementation of this program.

As discussed above, the overall goal of the COA is for PWD to eliminate or remove no less than the mass of pollutants (Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), and fecal coliform bacteria) that otherwise would be removed by the capture of 85 percent by volume of the combined sewage collected in the combined sewer system (CSS) during precipitation events on a system-wide annual average basis. To track the progress toward this goal and determine compliance with the COA, a Water Quality Based Effluent Limit (WQBEL) Table with performance standards will be included in PWD's renewed NPDES permits.

6.1.3. Site Visits

In April and May 2016, the PEER engineering consultant team made several site visits to the three WPCPs to observe, characterize and evaluate the general physical conditions of the treatment facilities and related systems. During the site visits, discussions were held with plant operators and PWD management personnel. Based on the site visits and discussions, the facilities were rated as good, adequate or poor as defined below.

Good: This rating indicates that the facility is in a condition to provide reliable operation in accordance with design parameters and service needs with routine maintenance and capital improvements.

Adequate: This rating indicates that the facility is operating at or near design levels; however, non-routine renovation, upgrading, and repairs are needed to ensure continued reliable operation. Significant expenditures for these improvements may be required.

Poor: This rating indicates that the facility is not being operated within design parameters. Major renovations are required to restore the facility and assure reliable operation. Major expenditures for these improvements may be required.

The following section describes each of the water pollution control plants.

6.2. Water Pollution Control Plants (WPCP)

6.2.1. Northeast WPCP

The Northeast WPCP was built in 1927 and was later expanded to include four diffused aeration tanks. It was further expanded in the 1950's, 1960 and in 1980 to its current design capacity of 210 MGD at average flow and 435 MGD at peak flow. It treats wastewater from northeast Philadelphia and from portions of southeast Bucks and eastern Montgomery counties. In addition, the Northeast WPCP receives residuals from the Baxter WTP, as part of the influent. The characteristics of the influent are monitored by the central and on-site laboratories and the Industrial Waste Unit.

The plant is comprised of preliminary treatment including eight bar screens, six influent pumps and a grit removal facility. Screenings and grit are sent to the Southwest WPCP for stabilization by mixing them with lime and they are transported to local landfill for disposal. Primary treatment consists of two sets of primary sedimentation tanks (PST Set 1 and Set 2). PST Set 1 contains eight concrete tanks, while PST set 2 contains four concrete tanks. Both sets of PSTs have the same volumetric capacity. Typically, seven of the eight PST Set 1 tanks are in service and three are used at PST Set 2. Secondary treatment is comprised of a conventional activated sludge process with seven aeration tanks and two sets of final sedimentation tanks (FST). The first set of FST is comprised of eight tanks while the second set is further divided into two sets, each made up of four tanks, for a total of 16 FSTs. Unlike the other two WPCPs, the configuration of the treatment process is not linear and plant expansion was determined by available land space. The secondary process is typically operated with a sludge re-aeration zone and an anoxic selector in the feed zone. Air is supplied by two of the six available blowers with an average air flow rate capacity of 70,800 standard cubic feet per minute. Sodium hypochlorite is added in the Chlorine Contact Tank for disinfection before discharge of the effluent to the Delaware River at a location approximately five miles south and downstream of the Baxter WTP intake.

The solids handling system consists of seven Dissolved Air Flotation Thickener tanks that thicken excess secondary sludge to an average float sludge concentration of 4.2% and solids capture of 96%. The solids handling system also consists of eight anaerobic digesters. These digesters are operated in the mesophilic temperature range (95-98^{o}F) and produce over 1.2 million cubic feet of gas per day. Most of the digester gas is used to generate electricity and hot water at the Combined Heat and Power facility as well as to heat the boilers that provide digester heating. Approximately 90 tons per day of sludge with a solid concentration of about 2.5 % produced at the Northeast WPCP are barged to the BRC.

As stated above, located on the Northeast WPCP is a combined heat and power (CHP) facility, which makes use of the methane produced at the digesters and generates 5.6 mega-watt capacity combined heat and power. Prior to the construction of this facility in 2011, one half of the methane gas was usually flared and the remaining half used for heating the digesters and some of the buildings. The CHP facility is owned by Bank of America and maintained by AMERESCO, while Northeast WPCP staff operates the CHP facility. Power supply to the Northeast WPCP is via two PECO mains from two dedicated lines, in addition to the supplemental supply from the cogeneration CHP facility.

As shown in Table 3, the Northeast WPCP's monthly operational parameters in FY2015 were well within its NPDES permit requirements. For the past ten years, the Northeast WPCP has received the National Association of Clean Water Agencies (NACWA) Platinum Award for stellar compliance with its NPDES permit. The plant also has had no odor violations since October 2008.

Table 3: Northeast WPCP Fiscal Year 2015 Plant Summary

Monthly parameter	Average	Permit requirement
Flow (MGD)	163	N/A
Suspended Solids Concentration (mg/l)	8	30
Suspended Solids % Removal	95	85
Suspended Solids Loading (lb./day)	12,253	52,540
$CBOD_5$ Concentration (mg/l)	7	30
$CBOD_5$ % Removal	95	85
$CBOD_5$ Loading (lb./day)	9,906	36,430
Cl_2 Residual (mg/l)	0.27	0.5
Fecal Coliform (colonies / 100 ml)	22	200

Under an internal discharge permit issued by PWD's Industrial Waste Unit, residuals from Baxter WTP are discharged to the Northeast WPCP for treatment. These residuals reduce available phosphorus in the activated sludge process which necessitates the addition of phosphoric acid, as needed, to maintain proper phosphorus levels and mitigate nutrient deficiency.

Ongoing design and construction projects include:

- Construction of two bypass conduits designed to take excess wet weather flow from the primary Settling Tank Set 1 effluent directly to the influent of the Chlorine Contact tank began in FY 2015 (Figure 18). This project along with several other projects will eventually increase the plant's wet weather treatment capacity to 650 MGD.

Figure 18: Ongoing Construction of Two Bypass Conduits to Expand Wet Weather Handling Capacity of Northeast WPCP

- Reactivation of the Frankford High Level piping system and sealing of manholes and diversion chamber.
- Replacement of hydrogritter units, which after several construction delays, is expected to be completed in FY 2016.
- Replacement of process Air Valves and Actuators. This work is scheduled to be completed in FY 2016.

- Construction of four gravity sludge thickeners to thicken primary sludge to approximately 4-6% prior to digestion began in FY 2015, with a completion date of January 2018. This will help mitigate odors and improve process performance under high flow conditions. The estimated construction cost is $36M.

At the end of FY 2015, Northeast WPCP reported 17 vacant positions out of 132 authorized plant staff; vacancies during the year being as low as 27. The plant management is proactive in searching for new hires and training current staff, especially in the Instrumentation Group, which has suffered significant loss of experienced staff over the years.

6.2.2. Southeast WPCP

The Southeast WPCP is located on Pattison Avenue near Front Street, Philadelphia, PA. It began operation in 1957 as a primary treatment plant and was expanded to full secondary treatment in the early 1980s. The plant is designed to treat an average flow of 112 MGD and a peak flow of 224 MGD. The plant treats wastewater from portions of eastern Center City, eastern South Philadelphia, North Philadelphia, central Germantown/Chestnut Hill, the Springfield Township of Montgomery County, a majority of Kensington/Richmond, and the Philadelphia Naval Base. In addition, the Southeast WPCP receives water plant residuals from the Queen Lane WTP. The characteristics of the plant influent are monitored by the central and on-site laboratories and the Industrial Waste Unit.

The preliminary treatment at the Southeast WPCP consists of bar racks located where the influent sewer enters the plant about 40 feet below grade prior to the influent pumps. The bar racks, which have a 3" spacing between bars, are designed to protect the pumps from large debris or excessive amounts of smaller pieces of trash. The influent pumping station contains six pumps, which pump influent wastewater to the screening facility. The screening facility consists of six bar screens and six grit channels that remove trash, screenings and grit from the wastewater before it enters the flocculation tanks. A total of 1,290 tons of grit and screenings were removed during FY 2015. The collected screenings and grit are sent to the Southwest WPCP where screenings and grit from the three WPCPs are mixed with lime for stabilization before being disposed of at a local landfill.

Primary treatment comprises of two flocculation tanks and four primary sedimentation tanks. Typically, all four primary sedimentation tanks are in continuous use except for maintenance or repair.

Secondary treatment consists of a conventional activated sludge system with eight aeration tanks and twelve final sedimentation tanks. Air is supplied by eight tank mounted, single stage centrifugal blowers. The secondary treatment process operates in two identical parallel train configurations identified as East and West, which provides redundancy and operational flexibility. Each train configuration contains four aeration tanks and six final sedimentation tanks each. Typically, six aeration tanks are in service and all twelve final tanks are in service except when maintenance or repairs are being performed. Scum from the primary and final sedimentation tanks is sent to a scum concentration building, the concentrated scum is then removed and transported to the Southwest

WPCP for lime stabilization and transported to a local landfill for disposal. A total of 183 tons of scum were removed during FY 2015.

Waste Activated Sludge (WAS) and primary sludge are stored in separate tanks at the sludge handling building located on site, after which they are separately pumped to the Southwest WPCP for processing with the respective Southwest WPCP sludges. Primary sludge produced averaged 26 tons per day with a 3.61% solids concentration, while waste activated sludge was about 14 tons per day with a 0.46% solids concentration during FY 2015.

Sodium hypochlorite is added in the mixing chamber for disinfection before discharge of the effluent to the Delaware River. The Southeast has five effluent pumps available for use as needed to overcome high river conditions during major wet weather events. An outfall sampling station is located just prior to the discharge to monitor the quality of effluent discharged. Power supply to the Southeast WPCP is via two redundant PECO mains from two separate sources.

During FY 2015, one major capital improvement project was in process at the Southeast WPCP. This involved replacement of the Influent Bar Racks (Figure 19). The flexible electrical power cable that provides both power controls to the rake was severed by debris on several occasions. An enclosure was installed around the cable to protect it from damage along with a new cable carrier. The original cable carrier was replaced with a one-piece, metal-enforced hydraulic hose. The old West Bar Rack will be demolished after the changes to the East Bar Rack are proven reliable.

Figure 19: CIP Project: Installed East Influent Bar Rack at Influent Pumping Station

The designs for the following CIP projects are currently underway:

- Replacement of the 59-year-old twin sludge force mains located under the Schuylkill River.
- Rehabilitation of final sedimentation tanks
- Paving repair/replacement and repairs to the perimeter fence

The SCADA program is in the process of being upgraded to a new program from the current SCADA program provider. This improvement is being performed and paid for with operating funds and is being managed with Southeast WPCP staff.

At the end of FY 2015, the Southeast WPCP had three vacant positions out of the 67 plant staff. The plant management is proactive in searching for new hires and training of current staff to help mitigate the effects of the staffing shortfall.

As shown in Table 4, the Southeast WPCP's monthly operational parameters in FY 2015 were within the NPDES permit requirements. The WPCP's perfect compliance record (which has been uninterrupted for fifteen calendar years) was once again recognized with the NACWAs' Platinum Award in 2014.

Table 4: Southeast WPCP Fiscal Year 2015 Plant Summary

Monthly parameter	Average	Permit requirement
Flow (MGD)	78	N/A
Suspended Solids Concentration (mg/l)	6	30
Suspended Solids % Removal	96	85
Suspended Solids Loading (lb./day)	4,754	28,025
BOD_5 Concentration (mg/l)	8	30
BOD_5 % Removal	92	86
BOD_5 Loading (lb./day)	5,540	19,650
Cl_2 Residual (mg/l)	0.23	0.5
Fecal Coliform (colonies / 100 ml)	12	200

6.2.3. Southwest WPCP

Southwest WPCP is on a 96-acre site located at 8200 Enterprise Avenue, Philadelphia. It started out as a sewage pumping station in 1924, and later became a treatment plant in 1954. Full secondary treatment was put in service in the early 1980's. It is designed to treat an average flow of 200 MGD of wastewater and a peak flow of 400 MGD. The plant treats wastewater from western Philadelphia along with several suburban townships in eastern Delaware and southeastern Montgomery counties, a service area of about 162 square miles. In addition, the Southwest WPCP receives water plant residuals from the Belmont WTP and the characteristics of the influent are monitored by the central and on-site laboratories and the Industrial Waste Unit.

The low level influent pumping station consists of three, two-stage screw pumps each with a discharge capacity of 34 MGD. Preliminary treatment consists of six bar screens with a flow-through capacity of 95 MGD. The screens are 13 feet deep, 30 feet long and 8 feet wide with 1-inch openings. About ½ ton of screenings are removed daily. The wastewater then flows to the grit removal process. There are four grit tanks, two of which are typically in operation. Washing and dewatering of grit is achieved via six grit separators. The screenings and grit are taken to the grit pad for further processing prior to disposal. After grit removal, the wastewater is sent to two flocculation (floc) tanks identified as East and West floc tanks. The east floc tank is 380 feet long and serves three primary sedimentation tanks, while the west floc tank is 250 feet long and serves two sedimentation tanks.

Primary treatment consists of five sedimentation tanks each 125 feet wide by 250 feet long and 12 feet deep.

Secondary treatment involves the use of high purity oxygen (HPO) generated from a cryogenic facility located at the Southwest WPCP site. This facility provides oxygen for the activated sludge process, which consists of ten 1.7 MG aeration tanks. During normal operations six to eight tanks are in service. The effluent from the aeration tanks is discharged to 20 final sedimentation tanks each 76 feet wide by 250 feet long. Each secondary treatment train consists of five aeration tanks and ten sedimentation tanks. About 2-3 tons of scum is collected daily from the sedimentation tanks and are disposed of in a landfill. Five effluent pumps are used to pump the treated effluent to a chlorine mixing chamber where it is disinfected with sodium hypochlorite to kill harmful bacteria prior to eventual discharge to the Delaware River.

Screenings, grit and scum from each WPCP are trucked to the Southwest WPCP grit pad. The combined grit, scum and screenings are mixed with lime prior to being transported to a local landfill via trucks. Waste activated sludge (WAS) produced during treatment is sent to eight dissolved air floatation (DAF) units located on the premises of Southwest WPCP for thickening. WAS from the Southwest plant is combined with WAS from the Southeast WPCP in the sludge thickening building and sent to the DAF tanks for thickening. The DAF thickened WAS is combined with primary sludge from both the Southwest and Southeast plants. Thickening increases the solids ratio from 0.5% to about 4%. The blended sludge is delivered to anaerobic digesters for solids stabilization. The digested sludge is pumped to the BRC for final processing. The digesters produce a total 1.5 to 2 million cubic feet per day of digester gas, which is used for process heat and supplemental heating of 22 buildings on the plant site. Excess digester gas is conveyed to the BRC for operating the dryer facility, while the remaining gas is flared. Discussions with permitting agencies are currently under way to increase the amount of gas supplied to the BRC, which will minimize or eliminate gas flaring. Power supply to the Southwest WPCP is via two separate dedicated PECO feeders.

During FY 2015, several capital improvement projects were undertaken at the Southwest WPCP to improve operations and maintenance. These projects included the following:

- Replacement of the aeration system in the flocculation tanks and mixed liquor channels was completed in late November 2014, but has not been put into full service due to several issues that have not been resolved. The new aeration system is designed to utilize excess compressed air available from the Main Air Compressors used for oxygen generation in lieu of the two existing 400 hp process air blowers. This reduces the blower capacity to 650 hp with corresponding reduction in aeration power consumption. The Southwest plant staff is collaborating with the Design and Construction Unit to resolve several issues related to frequent equipment mal-functions and performance reliability.
- Renewal/recoating of roofs of the Preliminary Treatment Building, Administration Building, and Grit/Ash Building with polyurethane and elastomeric silicone.
- Replacement of aging Influent Screw Pumps and associated equipment with more efficient components (Figure 20 and 21).

Figure 21: New Influent Screw Pumps Awaiting Installation

Figure 20: Influent Screw Pump Scheduled to be Replaced

In addition, several capital projects for which planning and design were completed in FY 2015 are in various stages of the construction bidding process. These include:

- Replacement of the elevators at the Preliminary Treatment Building (PTB).
- Addition of a sixth effluent pump to handle frequent wet weather events that occurred during FY 2015 resulting in flows greater than 500 MGD (Figure 22).
- Rehabilitation of DAF tanks due to aging and worn out parts.
- Replacement of return sludge piping to eliminate leaks in deteriorating pipe currently in service.

Figure 22: Effluent Pump Station Prior to Installation of Sixth Pump

As discussed previously, loss of experienced staff due to retirement has continued to affect the PWD departments and the Southwest WPCP is no exception. In FY 2015, an average of 15 positions or 12% of the 125 plant staff positions were vacant. The plant management is proactive in searching for new hires and training of current staff to help mitigate these issues.

As shown in Table 5, the WPCP's monthly operational parameters in FY 2015 were within the NPDES permit requirements. The WPCP, which has had a perfect compliance record since 2011, was once again recognized in 2014 with the NACWAs' Gold Award. Standard Operating procedures are updated annually and are subject to review by the PADEP through the NPDES permit.

Table 5: Southwest WPCP Fiscal Year 2015 Plant Summary

Monthly parameter	Average	Permit requirement
Flow (MGD)	165	N/A
Suspended Solids Concentration (mg/l)	5	30
Suspended Solids (% Removal)	97	85
Suspended Solids Loading (lb./day)	7,313	50,400
$CBOD_5$ Concentration (mg/l)	4	25
$CBOD_5$ (% Removal)	96	89
$CBOD_5$ Loading (lb./day)	5,515	19,800
Cl_2 Residual (mg/l)	0.10	0.5
Fecal Coliform (colonies / 100 ml)	21	200

Source: Southwest WPCP Fiscal Year 2015 Operations and Maintenance Report

6.3. Common Issues Related to Wastewater Treatment

6.3.1. Phosphoric Acid Addition

The Northeast and Southeast WPCPs add phosphorus in the form of phosphoric acid to maintain adequate nutrient levels for microbial activities in the activated sludge process. As discussed earlier, this phosphorus deficiency is attributed to the high ferric concentration contained in the residuals discharged from the water treatment plants. The Southwest WPCP has not experienced issues related to phosphorus deficiency; presumably because the quantity of iron in the WTP residuals discharged to the WPCP is not adequate to make all of the phosphorus in the wastewater unavailable to the microorganisms.

6.3.2. Staffing

Similar to the water division, the wastewater division has also suffered the loss of experienced staff due to retirements or promotions. The DROP program has continued to help ease the challenges experienced during plant operations and shift positions are typically covered through overtime. The plant managers work closely with HR to fill vacancies and provide training for new staff. Standard

Operating Procedures and Plant manuals provide standards and guidelines for new staff, which assists with the transfer of knowledge.

6.3.3. Back Up Power Generation

All three WPCPs are equipped with backup power sources in case of power failure. The backup generators are located prior to the headworks of the plants to shut down the intake gates in case of a power loss. At the Northeast and Southwest WPCPs, there are generators that power the influent gates. At the Southeast WPCP, there is a battery backup that will close the gates in the event of a power failure. Two separate PECO power lines provide power to operate the WPCP; these, however, are not supplemented by backup power generators.

6.3.4. Gas Flaring

The Northeast and Southwest WPCPs consistently meet the Title V permits issued by the Air Management Services (AMS). Under the guidelines of the AMS permits, excess digester gas is sometimes flared as necessary. Discussions are currently undertaken with the energy cogeneration facility and also the BRC to increase methane gas supplied to these facilities.

6.3.5. Summary

Overall, the System's water pollution control plants are in good condition. A proactive (rather than reactive) rehabilitation and maintenance program has been instrumental in avoiding costly emergency response situations resulting from system failures. These initiatives allow the City to continue to meet its goals of having an efficiently operated and effectively maintained wastewater system. An annual CIP to upgrade/rehabilitate the WPCPs is critical to maintaining system integrity and increasing reliability.

Based on the foregoing discussions, it is our opinion that the major facilities of the Wastewater System are in good operating conditions or adequate steps are being taken to maintain them.

6.4. Biosolids Recycling Center (BRC)

6.4.1. Overview

The BRC is located at 7800 Penrose Ferry Road, Philadelphia. The Center is responsible for producing pelletized materials from biosolids generated at the wastewater treatment facilities. PWD ended all ocean dumping of sludge by 1980. Sludge dewatering was performed locally at the Northeast, and Southwest WPCP plants while the centralized dewatering, and composting facility was being constructed. The new composting facility was fully on-line by 1988 and the new Dewatering facility including the barging operation from the Northeast WPCP was on-line by 1990. In 2008, PWD privatized the BRC through Philadelphia Biosolids Services (PBS) and handed over operation to Synagro Technologies under a 20-year contract. Under this joint venture led by Synagro, PBS that is now known as the Philadelphia Renewable Bio-Fuels LLC (PRBF) leases a portion of the property and assumes responsibility for the operations consisting of dewatering the sludge from the wastewater, drying the sludge to produce pellets and utilizing the pellets as fertilizers or biofuel. Class A pathogen free pellets are produced at the Center and this will facilitate PWD's long-term strategy to produce Class A materials at the BRC. Currently all air compliance regulations under the AMS permit and PADEP regulations are the responsibility of PBS. PWD maintains an engineer at the BRC that monitors PRBF performances and compliance with the contract. Monthly meetings are jointly held with all stakeholders to discuss pertinent issues as well as share information.

Digested biosolids are pumped from the Southwest WPCP while biosolids from Northeast WPCP are delivered via barges to the BRC. The liquid sludge from Southeast WPCP is sent to Southwest WPCP where it is combined with the respective Southwest sludge for thickening and digestion. The digested sludge from the Northeast and Southwest WPCP are centrifuged and processed into class "A" pellets. All of the centrate streams are sent to the Southwest WPCP.

During FY 2015, the biosolids from the Northeast and Southwest WPCP averaged 25.62 MG and 29.76 MG monthly. A 95% overall recovery was achieved leading to an annual production of 49,066 tons of Class A pellets. These pellets are applied as fertilizers to farms across Pennsylvania and Maryland and are transported by rail to citrus farmers in Florida. Also pellets are used as an alternative energy source for a cement producing company.

BRC met all energy requirements needed for the production of pellets, the 78.2 therms per dry ton is less than the contract amount of 85 therms of natural gas per ton for the year. This is attributed to the efficient and optimal use of digester gas generated at the Southwest WPCP which supplements energy consumption at the BRC.

6.4.2. Summary

The BRC appears to be operated efficiently and maintenance and upgrades are performed as needed. Based on the foregoing discussions, it is our opinion that the BRC is in good operating conditions or adequate steps are being taken to maintain the BRC.

7. WASTEWATER COLLECTION SYSTEM

7.1. Overview

The wastewater collection system consists of the following components:

- 3,700-miles sewer system (760 miles sanitary, 1,900 miles combined sanitary and storm sewers, 13 miles force mains and 350 miles appurtenant sewers and piping).
- 19 pumping stations
- 94,000 manholes
- 26 storm relief structures
- 56 metering chambers
- 72,000 storm inlets

The operation of the wastewater collection system is located at the intersection of Fox Street and Abbotsford Avenue, Philadelphia. The system is collaboratively run by the Collector System Support (CSS) Unit and the Collector System Division (CSD). One of the primary responsibilities of the CSS is to provide technical expertise to CSD including engineering evaluations and studies such as the Sewer Assessment Program (SAP). The CSS is also involved in developing corrective actions due to complex drainage and flooding problems in the City of Philadelphia; coordinating ongoing construction and maintenance project to prevent work schedule conflicts, as well as monitoring work progress. In addition, the CSS provides technical expertise to various city, state and federal agencies, on projects related to wastewater and stormwater collection.

The CSS is further divided into three units, namely: the Sewer Maintenance Unit; the Inlet Cleaning Unit and the Flow Control Unit. These units are described in the following sections.

7.2. Sewer Maintenance Unit

The Sewer Maintenance (SM) Unit is responsible for the operation and maintenance of the sanitary, storm, and combined sewer systems. A major aspect of this work includes flushing and cleaning of sewers using high pressure and vacuum equipped trucks; sewer excavation and point repairs, storm inlet resets and repairs and examination of sewers. Over the years the responsibility of this unit has grown to include waterways restoration, which covers activities such as debris removal, culvert cleaning, and bank stabilization. Other tasks performed by this unit include the detection of defective laterals and illicit sanitary connections to prevent sanitary wastewater from entering local streams and rivers. Since its inception in 1994, the Detective Connection group of this unit has detected and abated over 1,300 illicit sanitary connections, including 43 detected in 2015. To date, it is estimated that approximately 190 million gallons per year of polluted water has been prevented from entering the stormwater system, including 6 million gallons per year prevented during FY 2015. During FY 2015 The Sewer Maintenance Unit had an authorized staff of 209 and a vacancy of 33. Personnel are assigned to different crews deployed across three sewer maintenance locations:

1) West Philadelphia Yard which serves the 1st and 2nd Highway Districts

2) Fox Street Headquarters which serves the 3rd and 4th Highway Districts
3) Lardners Point Yard serving the 5th and 6th Highway Districts

To more effectively provide service, the Sewer Maintenance Unit personnel are assigned to different crews determined by job requirements. Crew sizes have been reduced and crew skills set selected to suit the six major work functions namely; sewer inspections, sewer cleaning, inlet repairs, sewer excavation and repair, streams and waterways maintenance and defective laterals inspections. The reorganization has also allowed the unit to dedicate two crews full time to planned work. These crews perform proactive inspections to uncover and identify problems prior to closed circuit television (CCTV) video inspections. The inspection crews have recently further increased their diagnostic capabilities by utilizing quick view cameras. These cameras are lowered in the manhole and provide valuable information without the need for a confined space entry. The Sewer Maintenance unit utilities a number of safety equipment combined with ample training classes to ensure both workers' and public's safety. The confined space entry program and various training courses are undertaken by workers.

Additional tasks performed by the sewer maintenance unit in FY 2015 are the installation of steel plates to protect concrete inlet slabs from being crushed by trucks and buses on City roadways; and the initiation of a sustainable maintenance schedule for wastewater pump station wet well and combined sewer dry weather flushing and cleaning. Finally, the Waterways Restoration Team (WRT) was created by the Sewer Maintenance Unit in collaboration with the Fairmount Park Commission (FPC) to take responsibility for mowing and landscaping over 200 acres of land that is under City's control for stormwater purposes. The WRT also is charged with removing large trash such as cars, shopping carts and other dumped debris from the 100 miles of stream systems within the City's neighborhood. Additionally, the WRT repairs eroded stream banks around the City's storm water outfall pipes. To help deal with the increased work backlog and reduced manpower during FY 2015, sewer maintenance utilized contractors to compliment in-house sewer cleaning and emergency excavation crews.

7.3. Inlet Cleaning Unit

The Inlet Cleaning (IC) Unit is responsible for the inspection and cleaning of approximately 72,000 stormwater inlets within the city. In 2015, IC unit became a part of the Sewer Maintenance unit. This consolidation is believed will result in greater efficiencies within Wastewater Collection System The IC unit is responsible for: retrieving, replacing and installing inlet covers, missing covers, and locking covers; clearing choked inlet traps and outlet pipes; and alleviating flooded streets due to open hydrants, broken water mains, rain storms and during major fires.

The IC unit seeks to be customer-focused, in delivering services in a prompt, fair, equitable, and cost effective manner. This effort is relevant to additional responsibilities the unit undertakes such as responding to citizens reports of flooding, assisting in police request searches of inlets, and citizens requested searches for dropped keys or personal items.

During FY 2015, the IC Unit had a vacancy of 19% out of 106 authorized positions. Typically a day time cleaning unit consists of 16-20 crews while a night shift crew is made up of 5. These crews work citywide to clean inlets in high traffic areas. The IC unit applies computerized routing to maximize crew utilization and efficiency. To adequately cover the City's entire 130 square miles, the IC unit makes use of approximately 58 different inlet cleaning fleet vehicles which is consists of Freightliners and Peterbuilt combos, trucks and sport utility vehicles. The Water Department recently purchased smaller inlet cleaning trucks. It is anticipated that this equipment will have the dual benefit of allowing better access to smaller streets and reducing fuel consumption.

The Sewer Maintenance and the IC Units are also assigned responsibilities for maintaining the Green Stormwater Infrastructure that is being installed City- wide as part of GCCW. One of such responsibility is to control the discharge of solids and floatables by cleaning City inlets and catch basins, a task which is already in line with the IC functions. During FY 2015, the IC unit conducted approximately 120,000 inlet inspections and cleaned 98,150 inlets, removing an average of 200 Ibs per inlet. In addition to this, 190 inlet covers were replaced and 50 retrieved a significant reduction compared to prior years. This reduction is attributed to newly introduced chaining and locking of inlet covers. Additional task performed by the IC unit under the GCCW is the street cleaning program; here mechanical sweepers are used for daily sweeping of City streets in order to prevent debris and trash from entering water ways. In FY 2015, a total of 725 miles were cleaned and 104 tons of debris removed.

7.4. Flow Control Unit

The Flow Control Unit is responsible for the operation and maintenance of the combined sewer overflow system, the remote wastewater and stormwater pumping stations, the remote odor control facilities, the wastewater metering chambers, and the rain gauge network. The unit also performs all CCTV sewer inspections and contracted seasonal operation of the Water Department's floatables removable boat. In FY 2015 the Flow Control Unit had an authorized staff 90. There are 21 current vacancies; the critical vacancies include electronic technicians, and interceptor service workers.

The Flow Control Unit is continually updating their equipment to allow for the most efficient capture of CSOs, and to provide the most accurate and up-to-date information. Solar power is used for approximately one-third of the units' remotely monitored stations. The FC unit has also updated all stations to use cellular data transmission; and this reduced their transmission costs, as compared to traditional hard-wire transmission, while allowing for more frequent data transmission.

The Flow Control (FC) unit is divided into four subgroups:

(1) The Combined Sewer Overflow (CSO) Regulator Maintenance group is responsible for the operation, maintenance, inspection and cleaning of 175 combined sewer-regulating chambers, 89 tide gate chambers, 26 storm relief chambers, five siphons and related wastewater control devices. This group uses Real Time Control (RTC) to monitor the CSO points within the collection system. Combined systems are designed such that during dry weather all wastewater is conveyed to the sewage treatment plant. However, during certain wet weather events, the additional stormwater flow may exceed the capacity of the collection

system and/or WPCP, in which case the excess flow is discharged directly to the receiving bodies of water. These overflow events also occur during dry weather and eliminating the resulting dry weather overflows is a key objective of this group.

The Flow Control Unit continues to aggressively control and minimize these dry weather overflows by utilizing the latest technology-based controls such as the remote monitoring of over 320 sites which are equipped with 720 individual level and flow measurements. The CSO maintenance performed approximately 5,130 inspections of regulating chambers in FY 2015. This work included frequent visual inspections of the equipment and observation of flow patterns. In FY 2015, the FC unit was able to provide information to remove debris in 160 regulators blockages before they developed in a CSO dry weather discharge; leading to four dry weather discharges during that FY. Training of the CSO maintenance personnel in the use of the system's computer programs for analyzing the trend data has developed a comprehensive understanding of individual CSO sites and their distinctive flow pattern. This familiarity helps them to recognize abnormal conditions quickly at a location to respond before the conditions develop into a dry weather CSO discharge.

(2) The Wastewater Pumping Station Maintenance group is responsible for the operation and maintenance of 16 wastewater pumping stations, three stormwater pumping stations, two sodium hypochlorite dosing stations, 10 computer controlled CSO regulators and several CSO inflatable dams. The pump stations range in capacity from 0.2 to 832 MGD and all have standby by generators. On average, the availability of the pumps during FY 2015 was 98.1%. This group consists of 24 maintenance personnel whose primary responsible is responding to and repairing of pump breakdowns. In FY 2015, five main wastewater pumps were overhauled, which included maintenance activities ranging from repair and replacement of worn pumps and motor components. Additionally, this group is responsible for maintain adequate supply of chemicals at the two sodium hypochlorite dosing stations and checking downstream hydrogen sulfide levels. The group also fabricates and repairs bar screens, debris grills and other equipment for the Collector System.

(3) The Collector System Instrumentation Maintenance group is responsible for calibrating and maintaining the network of permanent remote level and flow monitors. The network currently consists of 258 level and flow monitors, 35 rain gauges and 56 township metering sites. They also provide personal gas meter repair and calibration services and temporary flow and level monitoring installations for various units in the Water Department. This 14 man group ensures that remote site equipment is communicating and downloading data to the PWD server. Acquisition of data is used for a wide variety of critical PWD functions such as the generation of township sewage flows for billing and for planning and engineering studies.

(4) The CCTV Technical Inspections group under the Sewer Assessment Program operates and maintains seven CCTV camera trucks. The group has several functions, which include the inspection of sewers in response to sewer complaints, special inspection requests from the Water / Sewer Design group and post construction sewer inspection program. They also

work with the Defective Connections group for identification of defective lateral connections. In FY 2015, the group performed over 36 miles of CCTV inspection as part of its annual maintenance. The Technical Inspection group consists of one supervisor, one group leader and 14 technicians who operate and maintain seven CCTV camera trucks.

7.5. Summary

Based on the foregoing discussions, it is our opinion that the major facilities of the Wastewater Collection System are in good operating condition or adequate steps are being taken to maintain the facilities in good operating conditions.

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Philadelphia Water Department
Philadelphia, PA

Supplemental Evaluation By Feasibility Consultants Related to City of Philadelphia, Pennsylvania Water and Wastewater Revenue Refunding Bonds, Series 2017B

RAFTELIS
FINANCIAL CONSULTANTS, INC.

July 17, 2017

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Supplemental Evaluation by Financial Feasibility Consultants
Relating to The City of Philadelphia
Water and Wastewater Revenue Refunding Bonds, Series 2017B

In connection with the proposed issuance and sale of the above referenced bonds, Raftelis Financial Consultants, Inc. (RFC) has evaluated the accompanying Forecast Statement of Revenues, Expenses, Debt Service, and Debt Service Coverage (Forecast Statement) for The City of Philadelphia's (City) water and wastewater system [prepared by RFC for the Philadelphia Water Department (PWD or Water Department)] for the six fiscal years ending June 30, 2017 through June 30, 2022 (forecast period). Our evaluation was conducted in accordance with guidelines for the water and wastewater industry and included such procedures as we considered necessary to evaluate the assumptions of the Water Department. This supplemental evaluation represents a bring-down of the financial components from the Financial Consulting and Engineer's Report of Proposed Water and Wastewater Revenue Refunding Bonds, Series 2016, provided by RFC on October 6, 2016 (2016 Engineering Report). The Forecast Statement has been updated for the forecast period (FY 2017 – FY 2022) in connection with the offering and sale of the Water and Wastewater Revenue Refunding Bonds, Series 2017B (Series 2017B Bonds).

In evaluating the financial feasibility of the debt issuance, those assumptions and factors that we believe are most significant include:

- Projected growth in customers and demand for water and wastewater services and the resulting impact on the forecast of revenues during the forecast period;
- Projected operating costs for providing water and wastewater services to meet demand during the forecast period;
- Projected water and wastewater rates during the forecast period;
- Projected capital costs and sources of financing to meet infrastructure investment needs during the forecast period.

The accompanying Forecast Statement is presented on a modified accrual basis consistent with PWD's budgeting process for the water and wastewater system (System), and has been presented to be consistent with the specific requirements of the coverage tests identified in the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989 (General Ordinance). Capitalized terms used but not defined in this Feasibility Evaluation have the meanings assigned to such terms in the General Ordinance. The Forecast Statement, together with the supporting summary of significant forecast assumptions, which is included as an integral part of the forecast, constitutes the "Feasibility Evaluation" for the proposed bond refunding.

In our opinion, the accompanying Forecast Statement is presented in conformity with industry guidelines for presentation of a forecast, and the underlying assumptions provide a reasonable basis for the forecast. Based upon the assumptions in our report, the estimated Project Revenues during the forecast period provide adequate funds to maintain the debt service coverage ratios required by the Rate Covenant in Section 5.01 of the General Ordinance (Rate Covenant) for the issuance of the City's proposed Series 2017B Bonds. However, there will be differences between the forecast and actual results, because events and circumstances frequently do not occur as expected, and those differences may be material. We have no responsibility to update this report for events and circumstances occurring after the date of this report.

Raftelis Financial Consultants, Inc.

Charlotte, NC
July 17, 2017

By: Jon Davis
Vice President

Philadelphia Water Department
Forecast Statement of Revenues, Expenses, Debt, & Debt Service Coverage
Fiscal Year Ending June 30 ($000)

Line No.	Description	FY 2017 Projected	FY 2018 Forecast	FY 2019 Forecast	FY 2020 Forecast	FY 2021 Forecast	FY 2022 Forecast
	Project Revenues						
	User Charges (1)						
1.	Water User Charges	$ 261,305	$ 270,023	$ 282,152	$ 289,844	$ 304,820	$ 321,101
2.	Wastewater User Charges	214,025	223,312	234,355	247,814	259,563	273,488
3.	Stormwater User Charges	159,028	163,988	169,624	177,525	185,709	195,631
4.	Total User Charge Revenue	634,357	657,322	686,131	715,183	750,092	790,220
	Other Income						
5.	Wholesale Revenue	36,405	38,145	40,307	42,778	45,019	47,720
6.	Other Operating Revenue (2)	23,574	1,661	1,194	458	(99)	(1,304)
7.	Revenue from Other Gov. & Grants	1,594	1,000	1,000	1,000	1,000	1,000
8.	Interest Income	1,056	1,060	955	898	839	851
9.	Debt Reserve Account Reduction (3)	11,000	19,000	-	-	-	-
10.	Total Project Revenues	$ 707,986	$ 718,188	$ 729,587	$ 760,318	$ 796,851	$ 838,486
	Operating Expenses (4)						
11.	Personal Services & Benefits	$ (239,758)	$ (261,731)	$ (270,024)	$ (278,846)	$ (286,852)	$ (295,092)
12.	All Other Expenses	(235,388)	(235,842)	(247,404)	(255,436)	(264,542)	(271,692)
13.	Liquidated Encumbrances (5)	25,334	25,313	25,946	26,595	27,259	27,941
14.	Total Operating Expenses	(449,812)	(472,260)	(491,482)	(507,687)	(524,135)	(538,843)
15.	Net Rev. Available for Debt Service	258,174	245,928	238,105	252,631	272,717	299,643
16.	Transfers From/(To) Rate Stabilization Fund (6)	(1,026)	29,246	15,795	16,325	(3,210)	(6,018)
17.	Adj. Net Rev. Available for Debt Service	$ 257,148	$ 275,174	$ 253,900	$ 268,955	$ 269,507	$ 293,625
	Debt Service						
	Senior Debt Service						
18.	Outstanding Revenue Bonds	$ (193,841)	$ (200,010)	$ (169,510)	$ (157,699)	$ (130,167)	$ (126,940)
19.	Pennvest Parity Bonds	(11,877)	(11,500)	(11,682)	(11,636)	(11,636)	(11,636)
20.	Series 2017B Bonds	-	(6,882)	(5,618)	(5,618)	(10,795)	(5,352)
21.	Future Revenue Bonds (7)	-	-	(11,550)	(31,937)	(54,715)	(81,938)
22.	Total: Senior Debt Service (8)	(205,718)	(218,392)	(198,359)	(206,889)	(207,313)	(225,865)
23.	Transfer to Escrow Account to Redeem Bonds (3)	(11,000)	(19,000)	-	-	-	-
	Subordinate Debt Service						
24.	Outstanding GO Bonds	-	-	-	-	-	-
25.	Pennvest Subordinate Bonds	-	-	-	-	-	-
26.	Total: Subordinate Debt Service	-	-	-	-	-	-
27.	Total Debt Service & Escrow Account Deposit	$(216,718)	$(237,392)	$(198,359)	$(206,889)	$(207,313)	$(225,865)
28.	Debt Service Coverage (Line 17/22) (9)	1.25	1.26	1.28	1.30	1.30	1.30
	Other Capital Expenditures						
29.	Capital Account Deposit (10)	(22,142)	(22,806)	(23,490)	(24,195)	(24,921)	(25,668)
30.	Total Debt Service Coverage (9) (Line 17/(22+29)	1.12	1.14	1.14	1.16	1.16	1.16
31.	Revenue Fund Surplus/(Deficit)	$ 18,288	$ 14,976	$ 32,050	$ 37,872	$ 37,273	$ 42,091
	Residual Fund (11)						
32.	Beginning Balance	$ 15,189	$ 15,179	$ 15,822	$ 15,825	$ 15,955	$ 16,613
33.	Revenue Fund Surplus/(Deficit)	18,288	14,976	32,050	37,872	37,273	42,091
34.	Transfer to Capital Fund (PAYGO)	(18,358)	(14,394)	(32,110)	(37,805)	(36,679)	(42,132)
35.	Interest Earnings	61	61	63	63	64	66
36.	Ending Residual Fund Balance	$ 15,179	$ 15,822	$ 15,825	$ 15,955	$ 16,613	$ 16,639
	Rate Stabilization Fund (6)						
37.	Beginning Balance	$ 205,601	$ 206,627	$ 177,380	$ 161,585	$ 145,260	$ 148,470
38.	Deposit From/(To) Fund	1,026	(29,246)	(15,795)	(16,325)	3,210	6,018
39.	Funds From/(To) Residual Fund	-	-	-	-	-	-
40.	Ending Rate Stabilization Fund Balance	$ 206,627	$ 177,380	$ 161,585	$ 145,260	$ 148,470	$ 154,488

Notes to the Forecast Statement:

1) User charge revenues are based on calculated PWD customer billings and are adjusted to estimate the resulting annual cash receipts. For FY 2017, revenues have been projected using actual amounts through May 2017 and annualized for the remaining period. The adjustment process is described in detail in Section 4.

2) Other operating revenues include penalties, license and permit fees, and other miscellaneous charges. Additional detail on the sources and amounts of other operating revenues can be found in Section 4. The other operating revenues also include an offset for a new income-based water revenue assistance program beginning in FY 2018 and continuing through FY 2022. Section 4 describes the program and its financial impact.

3) Estimated based on the surplus balance above the Debt Reserve Requirement. The FY 2017 reduction consists of Water and Wastewater Bond proceeds that were applied to refund and defease the Water and Wastewater Bonds to which such proceeds are allocable during PWD's most recent debt refunding in October of 2016. The FY 2018 reduction consists of Water and Wastewater Bond proceeds that will be applied to refund and defease the Water and Wastewater Bonds to which such proceeds are allocable. The Debt Service Reserve account reduction is included as Project Revenues for the purposes of calculating debt service coverage. The transfer of these funds to an escrow account to redeem bonds is excluded as a debt service payment in the calculation of coverage.

4) The FY 2018 operating budget is adjusted to reflect historical differences in budgeted versus actual utility costs. In aggregate, the total spending factor adjustment is approximately 93%. Similarly, PWD's Capital Improvement Plan includes a net cash flow adjustment designed to recognize timing issues associated with projects that are encumbered in one year but do not become a cash expenditure until a subsequent year. The net cash financing required assumed in this forecast is 90% of the inflation-adjusted CIP. Additional information is provided in Sections 5 and 6.

5) Liquidated encumbrances have been included as an offset to operating expenses and projected based on estimated actual results from FY 2017. For FY 2018 – 2022, liquidated encumbrances are estimated based on 15% of the projected services and materials & supplies budget classes less the cost of commodities.

6) Per the General Ordinance, PWD can transfer funds from the Rate Stabilization Fund to the Revenue Fund for the purpose of calculating debt service coverage.

7) Future debt issues have been assumed for FY 2018 – FY 2022. The assumed issuance amounts and terms can be found in Section 7.

8) Does not include debt service or redemption price on bonds expected to be redeemed in such fiscal year, prior to maturity.

9) The Rate Covenant requires that PWD will, at a minimum, impose, charge, and collect in each Fiscal Year such water and wastewater rents, rates, fees, and charges as shall yield Net Revenues which shall be equal to at least 1.20 times the Debt Service Requirements for such Fiscal Year (recalculated to exclude therefrom principal and interest payments in respect to Subordinate Bonds); provided that such water and wastewater rents, rates, fees, and charges shall yield Net Revenues which shall be at least equal to 1.00 times the sum of (i) the Debt Service Requirements for such Fiscal Year (including Debt Service Requirements in respect of Subordinated Debt); (ii) amounts required to be deposited into the Debt Reserve Account of the Sinking Fund during such Fiscal Year; (iii) the principal or redemption price of and interest on General Obligation Bonds payable during such Fiscal Year; (iv) debt service requirements on Interim Debt payable during such Fiscal Year; and (v) the Capital Account Deposit Amount for such Fiscal Year (less any amounts transferred from the Residual Fund to the Capital Account of the Construction Fund during such Fiscal Year).

10) Per the General Ordinance, PWD is required to make an annual deposit to the Capital Account of the Capital Account Deposit Amount, which is equal to 1% of the depreciated value of property, plant and equipment of the System or such greater amount as shall be certified as sufficient for the purpose of

infrastructure renewal and replacement. More information on this deposit and the Capital Account is provided in Section 6 and Section 8.

11) Amounts deposited in the Residual Fund may be used at the written direction of the City for a variety of purposes as outlined in Section 4.12 of the General Ordinance. For the purpose of this forecast, it is assumed certain funds will be transferred annually from the Residual Fund to the Capital Account to finance capital improvements.

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1. SUMMARY AND OPINIONS

Raftelis Financial Consultants, Inc. (RFC) was engaged by the Philadelphia Water Department (PWD) to prepare a forecast of revenues, expenses, debt service, and debt service coverage to support the City's proposed issuance of Water and Wastewater Revenue Refunding Bonds, Series 2017B (Series 2017B Bonds).

All schedules in the Forecast Statement of Revenues, Expenses, Debt Service, and Debt Service Coverage (Forecast Statement), and the Summary of Significant Forecast Assumptions (taken together, the Feasibility Evaluation), have been presented in accordance with the City's annual accounting cycle, based upon its fiscal year beginning July 1 and ending June 30 (Fiscal Year or FY). Financial data used as a basis for the Feasibility Evaluation was provided by PWD staff and includes projected operating and capital costs for FY 2017 and the proposed operating and capital budget for FY 2018. The Forecast Statement reflects the Water Department's judgment as of July 17, 2017, the date of the Forecast Statement, of the anticipated conditions and the Water Department's expected course of action during the forecast period (Fiscal Years 2017 through 2022). The Feasibility Evaluation will be included as a part of the Official Statement for the City's Series 2017B Bonds.

The Feasibility Evaluation is based upon cost, operating, demographic and other relevant information provided by PWD, and the debt service schedules provided to PWD by their Financial Advisors, PFM Financial Advisors LLC and Acacia Financial Group, Inc. PWD operates on a modified accrual basis of accounting. Revenues are recorded upon receipt, except revenues from other governments (which are accrued as billed). Operating expenses are recorded on an encumbrance basis, except debt service, salary, fringe, pension and other minor direct expenses which are recorded when paid. The Feasibility Evaluation is presented in conformity with the methodology for calculating debt service coverage of the Debt Service Requirements, consistent with the specific requirements of the coverage tests identified in the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989 (General Ordinance).

In our opinion, based upon the assumptions described in our Feasibility Evaluation, the System will yield pledged Project Revenues (as defined in the General Ordinance) over the amortization period of the Series 2017B Bonds, sufficient to meet the payment or deposit requirements of: all expenses of operation, maintenance, repair and replacement of the System; all reserve funds required to be established out of such Project Revenues; the principal and redemption price of and interest on Bonds (as defined in the General Ordinance), as they become due and payable, for which Project Revenues are pledged; and the Rate Covenant set forth in Section 5.01 of the General Ordinance. Additionally, the Net Revenues (as defined in the General Ordinance) are currently sufficient to comply with the Rate Covenant and are projected to be sufficient (assuming the approved and projected rate increases identified in this report) to comply with the Rate Covenant for each of the two fiscal years following the fiscal year in which the Series 2017B Bonds are issued.

PWD maintains an agreement with Assured Guaranty Municipal Corp. (AGM) that for as long as the Series 2005B, Series 2010C and a portion of the 2010A Bonds, which are insured by AGM, are outstanding, the system must maintain Net Revenues, excluding transfers from the Rate Stabilization Fund, of 90% of the annual Debt Service Requirements. Projected Net Revenues (excluding amounts transferred from the Rate Stabilization Fund into the Revenue Fund during, or as of the end of, such fiscal year) are also sufficient to equal at least 90 percent of the Debt Service Requirements (as defined in the General Ordinance, and excluding debt service due on any Subordinated Bonds) each fiscal year during the forecast period (FY 2017 – FY 2022).

2. DEMAND FOR SERVICES

PWD serves as the provider of water and wastewater (including stormwater) services to all of the retail residential, commercial, industrial, and institutional customers within the City limits of Philadelphia. Wholesale water service is provided to Aqua Pennsylvania on a contract basis for up to 9.5 MGD of maximum daily capacity with a term of 25 years, ending in 2026. Wholesale wastewater service is provided to 10 suburban customers on a contract basis: the Delaware County Regional Water Quality Control Authority (DELCORA), Bucks County Water and Sewer Authority, Upper Darby Township, Lower Southampton Township, Cheltenham Township, Lower Merion Township, Springfield Township, Bucks County Water and Sewer Authority (Bensalem), Abington Township, and Lower Moreland Township. The specific structures of the wholesale wastewater contract agreements vary, but generally include a proportionate allocation of operating expenses and capital costs associated with assets that are used and useful to wholesale customers.

The number of active PWD retail accounts has remained relatively stable over the last five years. Therefore, no growth in customer accounts has been projected for the forecast period. However, similar to most utilities nationwide, PWD has experienced a trend in declining per capita water consumption related to a number of factors including, in particular, the increased prevalence and use of high efficiency fixtures, water resource conservation, and other related factors. As such, the forecast period assumes a reduction in residential water usage of approximately 1.25% to 1.50% per fiscal year while non-residential consumption is projected to remain essentially flat. Combined, the overall average decline in water consumption is approximately 0.6% per fiscal year, which is consistent with historical consumption patterns over the past five fiscal years. The projection of billable impervious area and gross area include a compound annual decrease in square feet of approximately 2.0% and 1.5%, respectively, to reflect increased participation in PWD's stormwater credit program. The credit program provides an opportunity for customers to receive a credit on their bill by implementing stormwater best management practices.

Compared to the most recent Supplemental Evaluation By Feasibility Consultant Related to the City's Water and Wastewater Revenue Bonds, Series 2017A (Prior Supplemental Evaluation), the amount of stormwater credits have increased due to several changes. First, PWD expects it will see a small reduction in revenue from the City for additional credits on municipal properties. Additionally, the projected impact of PWD's Stormwater Management Incentives Program (SMIP) and Green Acre Retrofit Program (GARP) has increased, and the cost of these programs is ultimately reflected as a credit against a customer's stormwater charge. As such, the incremental impact of an expansion in program participation has been reflected as a further reduction in stormwater billable units. The adjustment for the additional SMIP and GARP participation begins in FY 2019.

3. RATES & CHARGES

PWD maintains separate rates and charges for water, wastewater, and stormwater service. Rates and charges are determined by the Rate Board, which is comprised of five members that are appointed by the Mayor and approved by City Council.

3.1. EXISTING RATES

PWD's existing water rate structure, applicable to all customer types, includes a fixed monthly base charge by meter size and a declining block volumetric rate structure billed per thousand cubic feet (MCF). The wastewater rates follow a similar structure with a fixed monthly base charge by meter size and a uniform volumetric rate per MCF based on billed water consumption. Stormwater charges are assessed by customer type with single family residential customers receiving the same fixed monthly charge. Nonresidential and Condo, or multifamily, customers receive both a gross surface area charge per 500 square feet (sq. ft.) of total property surface area and an impervious surface area charge per 500 sq. ft. of impervious surface area. The following rate schedule, Table 1, shows the existing rates for PWD.

Table 1: Existing Rates (FY 2017)

Water				FY 2017 Actual
Water				
Base Charge				
5/8"			$	6.58
3/4"				7.54
1"				9.90
1.5"				15.13
2"				22.25
3"				37.91
4"				66.31
6"				127.93
8"				199.07
10"				289.09
12"				502.82
Volume Charge (Per MCF)				
Block 1	Up to	2 MCF	$	41.11
Block 2	Next	98 MCF		35.91
Block 3	Next	1,900 MCF		27.93
Block 4	Over	2,000 MCF		27.14

Wastewater & Stormwater		FY 2017 Actual
Wastewater		
Base Charge		
5/8"	$	7.17
3/4"		8.76
1"		12.34
1.5"		20.68
2"		31.41
3"		55.65
4"		95.42
6"		186.85
8"		294.17
10"		425.36
12"		763.12
Volume Charge (Per MCF)		
All Usage (Based on Billable Water)	$	30.55
Stormwater		
Residential (Fixed)		
SWMS Charge	$	11.91
Billing & Collection		2.21
Non Residential		
GA Charge ($/500 sqft)	$	0.61
IA Charge ($/500 sqft)		4.70
Billing and Collection (Per Acct)		2.88
Minimum Charge (Acct)		11.91

3.2. RATE FORECAST

On January 8, 2016, PWD submitted a notice with the Rate Board of its proposal to increase rates in both FY 2017 and FY 2018. On June 7, 2016, a final determination on rates was made by the Rate Board identifying an effective date of the changes in rates and charges on July 1, 2016 and July 1, 2017. The existing rates identified in Table 1 reflect the effective increase on July 1, 2016. RFC has developed a forecast of anticipated future rate increases needed in order to meet the Water Department's revenue requirements and covenants identified in the General Ordinance. Since the rate increase for FY 2017 is already effective, and the rate increase for FY 2018 has already been approved, RFC has projected increases for FY 2019 through FY 2022. It should be noted PWD has begun the process for its next rate proposal. As such, the rate increases projected in this Forecast Statement are subject to change based on the results of future rate proceedings. Table 2 identifies the actual rates for FY 2017, the approved rate increases for FY 2018, and the projected increases from FY 2019 through FY 2022.

Table 2: Rate Forecast

Description	FY 2017 Actual	FY 2018 Approved	FY 2019 Forecast	FY 2020 Forecast	FY 2021 Forecast	FY 2022 Forecast
Annual Rate Increases						
Water	n/a	n/a	5.32%	3.00%	6.11%	6.00%
Wastewater	n/a	n/a	5.70%	6.42%	5.16%	6.00%
Stormwater	n/a	n/a	5.70%	6.42%	5.16%	6.00%

4. REVENUES

PWD collects revenues from a number of different sources. Operating revenues consist primarily of retail water, sewer, and stormwater charges and wholesale water and sewer revenues. Other operating revenues include penalties, license and permit fees, and other miscellaneous charges. Non-operating revenues include interest and state and federal grants. Revenues have been estimated for FY 2017 based on projected, full-year operating results. These results were projected by using actual revenues through May 2017 annualized for the remaining period. Revenues in FY 2018 have been estimated using the projected number of customer accounts and usage as well as rates approved by the Board effective July 1, 2017. The remaining years of the forecast period (FY 2019 through FY 2022) have been estimated using the projected billable units of service and anticipated future rate increases.

4.1. USER CHARGE REVENUES

Retail operating revenues consist of water, sewer, and stormwater charges to retail customers. The general customer types include residential, commercial, industrial, public utilities, senior citizens, charities, schools, and the Philadelphia Housing Authority. Revenue from each of these customer types has been forecasted using projected customer demand and usage over the study period and applying the annual effective rate schedule. Projected customer demand and usage includes billable water sales, number of customers, number of billable parcels, and billable gross and impervious area for each respective customer type (see Section 2). Once user charge revenue is calculated, collection factors are applied that recognize both the timing of customer receipts and uncollectible revenue. Based on a review of historical billing and collections data, the aggregate collection rate is 94.4% of annual gross billings over the forecast period.

User charges also include revenue from public fire protection and the assessment of high strength wastewater surcharges. FY 2017 revenue from these sources are based on projected operating results for FY 2017. Public fire protection and wastewater high strength surcharges in FY 2018 and beyond are assumed to remain constant. PWD also collects wholesale water and wastewater revenue from other local governments and municipalities. Wholesale revenue projections in FY 2017 and beyond are increased based on the level of increase in retail rates with no increase in demand.

4.2. OTHER OPERATING & NON-OPERATING REVENUES

In addition to user charge revenues, PWD collects revenue from a number of other operating sources. The most significant of these revenues are penalties. Penalty collections for FY 2017 of approximately $9.8 million are based on estimated fiscal year-end results. Going forward, and in recognition of PWD's increased efforts to address rate affordability, which is discussed below, the forecast assumes a decrease in revenue from penalties to approximately $8.8 million; this amount remains constant over the planning period. In addition to penalties, PWD also collects revenues from license and permit fees, procurement, and a number of other miscellaneous sources. Other operating revenue from these sources are estimated for FY 2017 based on projected fiscal year-end results. For FY 2018 and the remainder of the forecast period, the other operating revenues are projected based on the operating budget with no annual increase over the forecast period.

On June 7, 2016, the Board approved a new Income-based Tiered Assistance Program (TAP) in response to a mandate by the City Council to make water affordable for low-income households in Philadelphia. The specific details of the TAP program are currently being developed by PWD staff. Future cost projections for the TAP include upfront costs, ongoing administrative costs, and ongoing lost revenue from affordable bill adjustments. Upfront costs are one-time costs to design and implement TAP. Ongoing administrative costs include additional Water Revenue Bureau personnel to enroll customers and support new program technology requirements. The majority of TAP costs result from revenue lost due to reductions in monthly bills of enrolled participants. Lost revenue is projected based on an analysis, which was conducted by RFC, that estimated the number of customers enrolling in the program and the level of bill reduction they would receive. For the purpose of the Forecast Statement, the anticipated reduction in revenue is included as a contra other operating revenue beginning in July (FY 2018). The estimates are increased annually by the overall effective rate increases for FY 2018 – FY 2022. Specifically, the projected revenue reductions are $17.9 million in FY 2018; $18.4 million in FY 2019; $19.1 million in FY 2020; $20.1 million in FY 2021; and $21.3 million in FY 2022.

Non-operating revenues consist primarily of interest earnings and other miscellaneous, non-operating sources. PWD earns interest on five funds including the Revenue Fund, Residual Fund, Rate Stabilization Fund, Capital Account of the Construction Fund, and Debt Reserve Account. Interest earned from the Revenue Fund represents an estimate of earnings generated annually from current assets in the Revenue Fund. The Residual Fund, Rate Stabilization Fund, Capital Account of the Construction Fund, and Debt Reserve Account were created by the General Ordinance. The purpose of each of these funds is described in Section 8. Estimated future interest earnings have been included in the forecast period based on a 0.4% interest rate on assumed future fund balances. The Forecast Statement assumes annual interest earned in the Revenue Fund and Rate Stabilization Fund are transferred to the Revenue Fund. Miscellaneous non-operating revenues include the sale of assets, sale of sludge (pellets), and a number of different other sources. However, due to their variability, only a limited amount of revenue from annual assets sales is included in the Forecast Statement. Table 3 presents projected revenues over the forecast period.

Table 3: Revenue Detail ($000)

Line No.	Description	FY 2017 Projected	FY 2018 Forecast	FY 2019 Forecast	FY 2020 Forecast	FY 2021 Forecast	FY 2022 Forecast
	Water Revenues						
	User Charge Revenues						
1.	Water User Charges	$ 253,658	$ 262,223	$ 274,196	$ 281,729	$ 296,543	$ 312,658
2.	Public Fire Charge	7,647	7,800	7,956	8,115	8,277	8,443
3.	Wholesale Water Charges	3,094	3,219	3,390	3,492	3,705	3,927
4.	Subtotal: User Charge Revenues	$ 264,399	$ 273,241	$ 285,542	$ 293,336	$ 308,525	$ 325,028
5.	Other Revenues (1)	$ 11,038	$ 9,034	$ 9,034	$ 9,034	$ 9,209	$ 9,209
6.	Tiered Assistance Program Offsets (2)	-	(7,892)	(8,097)	(8,421)	(8,842)	(9,373)
7.	Subtotal: Water Revenues	$ 275,438	$ 274,383	$ 286,479	$ 293,948	$ 308,892	$ 324,865
	Wastewater Revenues						
	User Charge Revenues						
8.	Wastewater User Charges	$ 208,504	$ 219,211	$ 230,355	$ 243,814	$ 255,563	$ 269,488
9.	Stormwater User Charges	159,028	163,988	169,624	177,525	185,709	195,631
10.	High Strength Surcharges	5,521	4,101	4,000	4,000	4,000	4,000
11.	Wholesale Wastewater Charges	33,310	34,926	36,917	39,287	41,314	43,793
12.	Subtotal: User Charge Revenues	$ 406,363	$ 422,226	$ 440,896	$ 464,626	$ 486,586	$ 512,912
13.	Other Revenues (1)	$ 14,129	$ 11,563	$ 11,563	$ 11,563	$ 11,788	$ 11,788
14.	Tiered Assistance Program Offsets (2)	-	(10,044)	(10,306)	(10,718)	(11,254)	(11,929)
15.	Subtotal: Wastewater Revenues	$ 420,492	$ 423,745	$ 442,153	$ 465,471	$ 487,120	$ 512,771
	Non-Operating Revenue						
16.	Other Non-Operating Revenue (3)	$ 1,056	$ 1,060	$ 955	$ 898	$ 839	$ 851
17.	Debt Reserve Account Reduction	11,000	19,000	-	-	-	-
18.	Total: Project Revenues	$ 707,986	$ 718,188	$ 729,587	$ 760,318	$ 796,851	$ 838,486

(1) Includes revenue from licenses and permits, penalties, miscellaneous charges, sale of vehicles and equipment, and grants.
(2) Represents contra revenues associated with the TAP.
(3) Includes interest earned on the Revenue Fund and Rate Stabilization Fund.

5. OPERATING EXPENSES

Operating expenses represent normal, recurring expenses necessary to operate and maintain the System in good condition incurred during PWD's annual accounting cycle based upon its fiscal year ending June 30th. Operating expenses have been projected for the forecast period and are shown in Table 4.

Table 4: Projected O&M Expenses ($000)

Line No.	Description	FY 2017 Projected	FY 2018 Forecast	FY 2019 Forecast	FY 2020 Forecast	FY 2021 Forecast	FY 2022 Forecast
	System Operating Expenses						
	Personal Services						
1.	Salaries	$ 121,515	$ 134,937	$ 140,525	$ 146,221	$ 152,828	$ 157,412
2.	Fringe Benefits	53,383	56,857	59,208	61,924	64,755	67,612
3.	Pension Costs	64,860	69,937	71,831	73,767	74,648	75,607
4.	Subtotal: Personal Services	$ 239,758	$ 261,731	$ 271,564	$ 281,912	$ 292,230	$ 300,631
	Purchase of Services						
5.	Class 220, 221- Electric and Gas	$ 23,369	$ 26,913	$ 27,990	$ 29,110	$ 30,274	$ 31,485
6.	All Other Class 200 Expenses	149,819	139,617	146,796	150,365	154,125	157,979
7.	Subtotal: Purchase of Services	$ 173,188	$ 166,531	$ 174,786	$ 179,474	$ 184,399	$ 189,464
	Materials, Supplies & Equipment						
8.	Class 307 - Chemicals	$ 19,853	$ 19,524	$ 20,168	$ 20,834	$ 21,522	$ 22,232
9.	All Other Class 300 Expenses	25,880	31,682	32,474	33,286	34,118	34,971
10.	Subtotal: Materials, Supplies & Equipment	$ 45,733	$ 51,206	$ 52,643	$ 54,120	$ 55,640	$ 57,203
	Other Expenses						
11.	Contributions, Indemnities & Taxes	$ 7,467	$ 7,105	$ 7,105	$ 7,105	$ 7,105	$ 7,105
12.	Payments to Other Funds	9,000	11,000	11,330	11,670	12,020	12,381
13.	Subtotal: Other Expenses	$ 16,467	$ 18,105	$ 18,435	$ 18,775	$ 19,125	$ 19,486
14.	Subtotal: Operating Expenses	$ 475,146	$ 497,573	$ 517,428	$ 534,282	$ 551,394	$ 566,784
15.	Less: Liquidated Encumbrances	(25,334)	(25,313)	(25,946)	(26,595)	(27,259)	(27,941)
16.	Total: System Operating Expenses	$ 449,812	$ 472,260	$ 491,482	$ 507,687	$ 524,135	$ 538,843
	% Change		5.0%	4.1%	3.3%	3.2%	2.8%

FY 2017 and FY 2018 operating expenses are based on PWD's projected results for FY 2017 and preliminary budget for FY 2018. FY 2017 projected operating results were estimated based on actual costs through May 2017 annualized for the remaining period. The FY 2018 budget is adjusted to reflect historical differences in budgeted versus actual utility costs by functional operating division and by budget object class; this analysis was developed by PWD staff. In aggregate, the total spending factor adjustment is approximately 93%. Operating expenses are then reduced by estimated liquidated encumbrances, which represent the release of prior year encumbered, unspent funds. Liquidated encumbrances have been included as an offset to operating expenses and projected based on 15% of the Purchase of Services and Materials, Supplies and Equipment budget classes less the cost of electricity, natural gas, and chemicals. These adjusted budgets are used as the basis for the forecast.

Compared to the Prior Supplemental Evaluation, estimated actual operating expenses in FY 2017 are lower than previously projected. The reduction in costs relates to various operating efficiencies achieved in FY 2017. Projected operating expenses in FY 2018 and beyond are higher than previously projected. The increase in operating expenses is attributable to changes occurring after the Prior

Supplemental Evaluation. Specifically, the City has determined it will now account for fringe and benefit expenditures previously included in the Capital Improvement Plan (CIP) as operating expenses. This is reflected in the Personal Services class in Table 4.

In order to account for growing utility costs and inflation, cost escalation rates have been developed for system operating expenses. Based on a review of historical data and input from PWD staff, salaries have been projected to increase at 3%. Fringe and benefit costs have been escalated based on information provided by PWD staff. In aggregate, these Class 100 (Personal Services) costs increase by a compounded annual rate of 3.1%. Class 200 (Purchase of Services) expenses, including electricity and gas, are projected to increase at a compounded annual rate of 3.3% per year. Class 300 (Materials, Supplies, & Equipment) are projected to increase at a compounded annual rate of 2.8% per year. All other remaining costs have been escalated at 3% except for contributions, indemnities, and taxes which are projected to remain flat. Additionally, projected operating expenses also include adjustments to reflect certain one-time costs and incremental needs including, for example, the anticipated cost for supporting TAP and additional staffing needs related to the CIP. The net impact of these cost escalation rates and other adjustments represents a compounded annual increase in operating expenses of approximately 3.4% over the forecast period.

6. CAPITAL IMPROVEMENT PLAN

PWD's CIP identifies the anticipated capital expenditures for both the Water and Wastewater Systems over the five-year forecast period. PWD's Planning and Environmental Services Division oversees a unit called the Capital Planning Program, which is responsible for instituting and managing a formal, well-documented and defensible planning process for large capital projects over $2 million as well as supporting the capital budget process and CIP development. The following table, Table 5, summarizes the CIP for the System over the forecast period.

Table 5: Capital Improvement Plan ($000)

Line No.	Description	FY 2017 Projected	FY 2018 Forecast	FY 2019 Forecast	FY 2020 Forecast	FY 2021 Forecast	FY 2022 Forecast	Total
	Waterworks Improvements							
1.	Engineering and Administration	$ 15,790	$ 16,421	$ 16,914	$ 17,421	$ 17,944	$ 18,482	$ 102,971
2.	Water Treatment Plant Improvements	38,416	40,717	42,293	43,930	45,630	47,395	258,380
3.	Distribution System Rehabilitation	46,060	51,997	56,167	60,582	65,255	70,198	350,261
4.	Large Water Meter Replacements	5,000	25,968	50,000	50,000	50,000	6,045	187,013
5.	Vehicles	4,000	7,790	8,092	8,405	8,730	9,068	46,085
6.	Other	-	-	-	-	-	-	-
7.	Total Waterworks CIP	$ 109,266	$ 142,893	$ 173,466	$ 180,338	$ 187,558	$ 151,189	$ 944,710
	Wastewater Collection and Treatment							
8.	Engineering and Administration	$ 18,536	$ 19,277	$ 19,855	$ 20,451	$ 21,064	$ 21,696	$ 120,879
9.	Water Pollution Control Plant Improvements	75,924	88,435	91,857	95,412	99,407	97,693	548,729
10.	Storm Flood Relief	25,000	10,387	10,789	11,207	29,101	30,227	116,710
11.	Reconstruction of Old Sewers	30,660	48,130	49,760	51,454	59,033	61,085	300,121
12.	Green Infrastructure	38,244	48,819	50,708	52,671	54,709	81,479	326,630
13.	Vehicles	4,000	7,790	8,092	8,405	8,730	9,068	46,085
14.	Total Wastewater CIP	$ 192,364	$ 222,838	$ 231,062	$ 239,599	$ 272,044	$ 301,248	$ 1,459,153
15.	Total System CIP	$ 301,629	$ 365,731	$ 404,527	$ 419,937	$ 459,602	$ 452,437	$ 2,403,863
16.	Net Cash Flow Adjustment	(30,163)	(36,573)	(40,453)	(41,994)	(45,960)	(45,244)	(240,386)
17.	Net Cash Financing Required	$ 271,466	$ 329,158	$ 364,075	$ 377,943	$ 413,642	$ 407,193	$ 2,163,477

As seen in Table 5, PWD identified approximately $2.4 billion in capital project costs over the forecast period. Capital projects in FY 2018 and beyond include a 3.9% adjustment for inflation. The CIP is developed on an appropriation basis. As such, projected annual capital expenditures include a net cash flow adjustment designed to recognize timing issues associated with projects that are encumbered in one year but do not become a cash expenditure until a subsequent year. The net cash flow adjustment is based on PWD historical levels of capital spending compared to budget. The net cash financing required is approximately $2.16 billion, which is equivalent to a capital spending rate of 90%.

The net cash financing required is assumed to be funded through a combination of debt and equity. Specifically, the primary sources of capital funding include revenue-financed capital (Capital Account Deposit and discretionary PAYGO capital), existing revenue bond proceeds, and future revenue bonds. A limited amount of funding is provided through grants.

Table 6 summarizes the CIP funding sources and uses.

Table 6: Capital Financing Plan ($000)

Line No.	Description	FY 2017 Projected	FY 2018 Forecast	FY 2019 Forecast	FY 2020 Forecast	FY 2021 Forecast	FY 2022 Forecast	Total
	CIP Spending Uses							
1.	Total Waterworks CIP	$ 109,266	$ 142,893	$ 173,466	$ 180,338	$ 187,558	$ 151,189	$ 944,710
2.	Total Wastewater CIP	192,364	222,838	231,062	239,599	272,044	301,248	1,459,153
3.	Net Cash Flow Adjustment	(30,163)	(36,573)	(40,453)	(41,994)	(45,960)	(45,244)	(240,386)
4.	Total System CIP Uses	$ 271,466	$ 329,158	$ 364,075	$ 377,943	$ 413,642	$ 407,193	$ 2,163,477
	CIP Spending Sources							
5.	Capital Account Deposit	$ 22,142	$ 22,806	$ 23,490	$ 24,195	$ 24,921	$ 25,668	$ 143,222
6.	Discretionary PAYGO Capital	18,358	14,394	32,110	37,805	36,679	42,132	181,478
7.	Capital Account	230,446	75,000	-	-	-	-	305,446
8.	Future Debt (Revenue Bonds)	-	216,438	307,955	315,423	351,522	338,873	1,530,211
9.	Total Grants	520	520	520	520	520	520	3,120
10.	Total CIP Spending Sources	$ 271,466	$ 329,158	$ 364,075	$ 377,943	$ 413,642	$ 407,193	$ 2,163,477

As seen in Table 6, the capital financing plan for FY 2017 and FY 2018 includes proceeds available from PWD's most recent sale of revenue bonds in 2017 (Series 2017A Bonds) that are included in the Capital Account. The remaining capital expenditures in FY 2017 are financed with internal sources, including both the required Capital Account Deposit and discretionary PAYGO capital, as well as private, state, and federal grants. A more detailed discussion of the Capital Account Deposit and discretionary PAYGO capital is provided in Section 6.1. The capital financing plan assumes a similar mix of funding sources over the remainder of the forecast period, including the issuance of new revenue bonds annually from FY 2018 through FY 2022. For the purpose of the Forecast Statement, it is assumed that PWD will sell $220,000,000 in revenue bonds in FY 2018 (second half of fiscal year); $313,000,000 in revenue bonds in FY 2019 (second half of fiscal year); $321,000,000 in revenue bonds in FY 2020 (second half of fiscal year); $383,000,000[1] in revenue bonds in FY 2021 (second half of fiscal year); and $344,000,000 in revenue bonds in FY 2022 (second half of fiscal year). Future revenue bonds include estimated issuance costs and contributions to the Debt Reserve Account (when necessary) and are rounded to the nearest million. Projected debt service payments associated with future revenue bond issuances are discussed in Section 7.

6.1. CAPITAL ACCOUNT DEPOSIT & DISCRETIONARY PAYGO

The Water Department's General Ordinance establishes a Capital Account within the Construction Fund. Each year, PWD is required to make a deposit to the Capital Account of an amount no less than one percent of the total net plant assets or the depreciated value of property, plant and equipment of the System. These funds are then used for annual renewal, replacement, and other System capital improvements. The FY 2017 Capital Account Deposit is based on estimated actual net plant assets. Capital Account Deposit projections in FY 2018 through FY 2022 are based on a 2% annual growth in net plant assets over the forecast period, which is consistent with historical results. In addition to the required Capital Account Deposit, PWD's capital financing plan also includes discretionary deposits of PAYGO capital. Funding for discretionary PAYGO capital is transferred from the Residual Fund to the Capital Account. On a combined basis, approximately 15% of the CIP is funded with revenue financed internally from rates (Capital Account Deposit plus discretionary PAYGO).

[1] Includes estimated contribution to the Debt Reserve Account.

7. DEBT SERVICE OBLIGATIONS

The Water Department's capital structure includes debt obligations. Outstanding debt obligations include revenue bonds and Pennsylvania Infrastructure Investment Authority (PennVEST) bonds, which are issued to evidence and secure loans to PWD from the Commonwealth of Pennsylvania's State Revolving Funds. PWD's outstanding revenue bonds and PennVEST bonds are considered senior debt and qualify as Bonds per the General Ordinance. PWD does not currently have any subordinated debt. Projected debt service payments identified below in Table 7 are based on schedules provided by PWD staff. It should be noted the projected debt service payments for the Series 2007B Bonds reflect the refunding impact of the Series 2017B Bonds. The projected debt service payments on the outstanding variable rate bonds are based on the following assumptions:

- Series 1997 B – Interest rate of 3%
- Series 2005 B – Interest rate of 3%

Table 7: Existing Debt Service ($000)

Line No.	Description	FY 2017 Projected	FY 2018 Forecast	FY 2019 Forecast	FY 2020 Forecast	FY 2021 Forecast	FY 2022 Forecast
	Existing Debt Service						
	Revenue Bonds						
1.	Series 1997B	$ 3,792	$ 3,946	$ 4,135	$ 4,322	$ 4,510	$ 4,696
2.	Series 2005B	18,357	18,431	169	-	-	-
3.	Series 2007A	11,780	10,173	-	-	-	-
4.	Series 2007B	7,168	-	-	-	-	-
5.	Series 2009A	8,147	4,868	4,867	-	-	-
6.	Series 2010A	37,435	37,443	37,454	-	-	-
7.	Series 2010C	39,543	39,090	7,779	7,781	7,781	7,780
8.	Series 2011A	6,737	6,737	6,737	6,737	6,737	6,737
9.	Series 2011B	7,965	9,230	9,441	9,408	2,702	9,788
10.	Series 2012	3,250	3,250	3,250	3,250	3,250	3,250
11.	Series 2013A	11,897	11,760	11,588	38,837	38,334	27,835
12.	Series 2014A	11,835	11,825	11,777	11,770	11,762	11,758
13.	Series 2015A	13,791	13,791	13,791	13,791	13,791	13,791
14.	Series 2015B	6,810	6,810	6,810	16,916	16,919	16,920
15.	Series 2016	5,334	9,011	18,095	12,269	12,265	12,266
16.	Series 2017A	-	13,646	33,616	32,616	12,116	12,116
17.	Subtotal: Revenue Bonds	$ 193,841	$ 200,010	$ 169,510	$ 157,699	$ 130,167	$ 126,940
	Pennvest Parity Bonds						
18.	Pennvest 1999	$ 91	$ 91	$ 76	$ -	$ -	$ -
19.	Pennvest 2009B	2,411	2,535	2,576	2,576	2,576	2,576
20.	Pennvest 2009C	2,754	2,775	2,775	2,775	2,775	2,775
21.	Pennvest 2009D	4,911	4,389	4,458	4,458	4,458	4,458
22.	Pennvest 2010B	1,710	1,710	1,797	1,827	1,827	1,827
23.	Subtotal: Pennvest Parity Bonds	$ 11,877	$ 11,500	$ 11,682	$ 11,636	$ 11,636	$ 11,636
	Subordinate Debt Service						
24.	Outstanding GO Bonds	$ -	$ -	$ -	$ -	$ -	$ -
25.	Pennvest Subordinate Bonds	-	-	-	-	-	-
26.	Subtotal: Subordinate Debt Service	$ -	$ -	$ -	$ -	$ -	$ -
27.	Total: Existing Debt Service	$ 205,718	$ 211,510	$ 181,192	$ 169,334	$ 141,803	$ 138,575
	% Change		2.8%	-14.3%	-6.5%	-16.3%	-2.3%

As shown above, the Water Department's existing annual debt service payments decrease significantly between FY 2018 and FY 2022 (from approximately $211 million in FY 2018 to approximately $138 million in FY 2022). Even with the debt service payments associated with the Series 2017B Bonds, which are included in Table 9, future debt issues may be structured around this decrease to ease the impact of new debt service requirements and level payments going forward.

PWD has worked with its financial advisors, underwriters, municipal advisors, and other independent consultants (Financing Team) to evaluate various financing strategies for the Series 2017B Bonds. The estimated Sources and Uses of Funds for the Series 2017B Bonds is provided in Table 8.

Table 8: Estimated Sources and Uses of 2017B Revenue Refunding Bonds

Sources & Uses of Funds	Series 2017B Bonds (1)
Sources of Funds	
Bond Proceeds	
Par Amount	$ 115,145,000
Premium	21,106,566
	$ 136,251,566
Other Sources of Funds:	
DSRF Release	19,000,000
Total: Sources of Funds	$ 155,251,566
Uses of Funds	
Refunding Escrow Deposits	
Cash Deposit	$ 1,068.75
Open Market Purchases	154,260,513
	$ 154,261,581
Delivery Date Expenses	
Cost of Issuance	$ 500,000
Underwriter's Discount	487,836
	$ 987,836
Other Uses of Funds	
Contingency	$ 2,149
Total: Uses of Funds	$ 155,251,566

(1) Represents the current refunding only.

As noted in this Section 7, it is expected that the Water Department will need to issue additional debt during the forecast period. The projected assumptions for new debt include:

- $220,00,000 in revenue bonds issued in the second half of FY 2018 (Series 2018 Bonds) at a rate of 5.25% and term of 30 years. The Series 2018 Bonds assume interest only payments in FY 2019 with full repayment (amortization of principal, plus interest) beginning in FY 2020.
- $313,000,000 in revenue bonds issued in the second half of FY 2019 (Series 2019 Bonds) at a rate of 5.50% and term of 30 years. The Series 2019 Bonds assume interest only payments in FY 2020 with full repayment beginning in FY 2021.
- $321,000,000 in revenue bonds issued in the second half of FY 2020 (Series 2020 Bonds) at a rate of 5.75% and term of 30 years. The Series 2020 Bonds assume interest only payments in FY 2021 with full repayment beginning in FY 2022.
- $383,000,000 in revenue bonds issued in the second half of FY 2021 (Series 2021 Bonds) at a rate of 6.00% and term of 30 years. The Series 2021 Bonds assume interest only payments in FY 2022 with full repayment beginning in FY 2023.

It should be noted that the capital financing plan also assumes the issuance of $344,000,000 issued in the second half of FY 2022 (Series 2022). However, debt service payments on the Series 2022 Bonds are not expected to occur until FY 2023, which is outside of the six-year forecast period. Table 9 presents PWD's debt service on existing obligations, the Series 2017B Bonds, and future debt service.

Table 9: Total Debt Service ($000)

Line No.	Description	FY 2017 Projected	FY 2018 Forecast	FY 2019 Forecast	FY 2020 Forecast	FY 2021 Forecast	FY 2022 Forecast
1.	Existing Debt Service	$ 205,718	$ 211,510	$ 181,192	$ 169,334	$ 141,803	$ 138,575
	Additional Debt Service on Proposed Debt						
2.	Series 2017B Bonds (1)	$ -	$ 6,882	$ 5,618	$ 5,618	$ 10,795	$ 5,352
3.	Series 2018 Bonds	-	-	11,550	14,722	14,722	14,722
4.	Series 2019 Bonds	-	-	-	17,215	21,536	21,536
5.	Series 2020 Bonds	-	-	-	-	18,458	22,700
6.	Series 2021 Bonds	-	-	-	-	-	22,980
7.	Subtotal: Additional Debt Service on Proposed Debt	$ -	$ 6,882	$ 17,168	$ 37,554	$ 65,510	$ 87,290
8.	Total Debt Service	$205,718	$218,392	$198,359	$206,889	$207,313	$225,865
	% Change		6.2%	-9.2%	4.3%	0.2%	8.9%

(1) Represents projected debt service on the Series 2017B Bonds based on preliminary pricing.

8. FUND BALANCES

PWD's General Ordinance established several funds for maintaining liquidity and for use in both operating and capital needs. The major funds are described below.

8.1. RESIDUAL FUND

The Residual Fund provides working capital for the Water Department. In general, the Residual Fund can be used to: pay operating expenses; transfers funds to any fund or account other than the Revenue Account and Rate Stabilization fund; pay principal and interest on revenue bonds, revenue notes, and GO debt issued in respect of the System; pay capitalized lease payments or similar obligations; and fund limited transfers to the City's general fund. In terms of transfers to the City's general fund, the General Ordinance permits the transfer annually of the lesser of $4,994,000 or the annual interest earnings (Net Reserve Earnings) on the balance in the Debt Reserve Account and the Subordinated Bond Fund.

8.2. RATE STABILIZATION FUND

PWD's Rate Stabilization Fund includes monies used to mitigate fluctuations in operating and capital costs thereby reducing the impacts of those fluctuations on customers. Each year, funds are withdrawn or contributed to the Rate Stabilization Fund in order for PWD to meet its minimum debt service requirement of 1.20, as specified in the Rate Covenant. The Forecast Statement exceeds PWD's minimum fund balance target for the Rate Stabilization Fund of $120 million.

8.3. CAPITAL ACCOUNT OF THE CONSTRUCTION FUND

PWD's Capital Account includes monies to be used for ongoing and future capital projects. In addition to the proceeds from debt issuances and grants, the Capital Account is also funded annually with the Capital Account Deposit, which is transferred from the Revenue Fund, as well as additional funding for PAYGO capital, which is transferred from the Residual Fund. Interest earnings that accrue annually are assumed to remain in the Capital Account.

8.4. DEBT RESERVE ACCOUNT OF THE SINKING FUND

The General Ordinance requires that the Debt Reserve Account be maintained at a level equal to the Debt Reserve Requirement, which is defined, with respect to all outstanding Bonds, as an amount equal to the lesser of (i) the greatest amount of Debt Service Requirements payable in any one Fiscal Year or (ii) the maximum amount to be financed with proceeds of Bonds permitted by Section 148 (d)(1) of the Internal Revenue Code. Funds in the Debt Reserve Account are reserved strictly for debt service payments. Any money in excess of the Debt Reserve Requirement is transferred to the Revenue Fund at the written direction of the City. Typically, funds are contributed in connection with new debt issues and are withdrawn to be used for the final debt service payment of a particular debt obligation.

Table 10 summarizes PWD's primary reserve funds over the forecast period.

Table 10: System Fund Balances ($000)

Line No.	Description	FY 2017 Projected	FY 2018 Forecast	FY 2019 Forecast	FY 2020 Forecast	FY 2021 Forecast	FY 2022 Forecast
	Residual Fund						
1.	Beginning Balance	$ 15,189	$ 15,179	$ 15,822	$ 15,825	$ 15,955	$ 16,613
2.	Revenue Fund Surplus/(Deficit)	18,288	14,976	32,050	37,872	37,273	42,091
3.	Transfer to Capital Account (Discretionary PAYGO)	(18,358)	(14,394)	(32,110)	(37,805)	(36,679)	(42,132)
4.	Interest on Debt Reserve Account	787	790	722	722	722	814
5.	Transfer from/(to) Rate Stabilization Fund	-	-	-	-	-	-
6.	Interest Earnings	61	61	63	63	64	66
7.	Interest Transfer to General Fund (SCOOP)	(787)	(790)	(722)	(722)	(722)	(814)
8.	Ending Balance	$ 15,179	$ 15,822	$ 15,825	$ 15,955	$ 16,613	$ 16,639
	Rate Stabilization Fund						
9.	Beginning Balance	$ 205,601	$ 206,627	$ 177,380	$ 161,585	$ 145,260	$ 148,470
10.	Deposit From/(To) Fund	1,026	(29,246)	(15,795)	(16,325)	3,210	6,018
11.	Funds From/(To) Residual Fund	-	-	-	-	-	-
12.	Ending Balance	$ 206,627	$ 177,380	$ 161,585	$ 145,260	$ 148,470	$ 154,488
	Capital Account						
13.	Beginning Fund Balance	$ 329,957	$ 388,810	$ 315,525	$ 317,087	$ 319,075	$ 320,891
14.	Transfer From Bond Proceeds	300,000	216,753	308,381	316,269	377,727	338,917
15.	Grants/Other	520	520	520	520	520	520
16.	Additional PAYGO	18,358	14,394	32,110	37,805	36,679	42,132
17.	Capital Account Deposit	22,142	22,806	23,490	24,195	24,921	25,668
18.	Interest Earnings	1,188	1,400	1,136	1,142	1,149	1,155
19.	Subtotal: Capital Account	$ 672,164	$ 644,683	$ 681,162	$ 697,018	$ 760,070	$ 729,283
20.	Used for Capital Projects	(271,466)	(329,158)	(364,075)	(377,943)	(413,642)	(407,193)
21.	DSR Contribution	(11,888)	-	-	-	(25,538)	-
22.	Other Transfers / Expenses	-	-	-	-	-	-
23.	Ending Balance	$ 388,810	$ 315,525	$ 317,087	$ 319,075	$ 320,891	$ 322,090
	Debt Reserve Account						
24.	Beginning Fund Balance	$ 218,617	$ 219,439	$ 200,439	$ 200,439	$ 200,439	$ 225,977
25.	Debt Issue Deposit (From Capital Account) (1)	11,888	-	-	-	25,538	-
26.	Interest Earnings	787	790	722	722	722	814
27.	Retired Debt/Release	(11,000)	(19,000)	-	-	-	-
28.	Interest Transfer to Residual Fund	(787)	(790)	(722)	(722)	(722)	(814)
29.	Adjustment	(66)	-	-	-	-	-
30.	Ending Balance	$ 219,439	$ 200,439	$ 200,439	$ 200,439	$ 225,977	$ 225,977
31.	Total Ending Balance	$ 830,055	$ 709,167	$ 694,937	$ 680,730	$ 711,951	$ 719,194

(1) Represents a deposit into the Debt Reserve Account associated with Series 2017A Bonds.

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APPENDIX III

SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS

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APPENDIX III

SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS

The following are summaries of certain provisions of The First Class City Revenue Bond Act (the "Act"), the Restated General Water and Wastewater Revenue Bond Ordinance of 1989, as amended and supplemented (the "General Ordinance"), the Sixteenth Supplemental Ordinance to the General Ordinance (the "Sixteenth Supplemental Ordinance"), and the Nineteenth Supplemental Ordinance to the General Ordinance (the "Nineteenth Supplemental Ordinance"). The summaries are not, and should not be regarded as, complete statements of the provisions of these documents and legislation. Reference is made to the Act, the General Ordinance, the Sixteenth Supplemental Ordinance and the Nineteenth Supplemental Ordinance, copies of which are available from the Office of the Director of Finance, 1300 Municipal Services Building, 1401 J. F. Kennedy Boulevard, Philadelphia, Pennsylvania 19102, for the complete terms and provisions thereof.

THE FIRST CLASS CITY REVENUE BOND ACT (Act 234 of the General Assembly of the Commonwealth, approved October 18, 1972, P.L. 955; 53 P.S. §§ 15901-15924)

The City of Philadelphia Water and Wastewater Revenue Refunding Bonds, Series 2017B (the "Series 2017B Bonds") are being issued under the terms of the Act, the General Ordinance and pursuant to the Sixteenth Supplemental Ordinance and Nineteenth Supplemental Ordinance. The following summarizes the terms of the Act. All capitalized terms used in the following summary of the Act are defined as in the Act and may be differently referenced in other portions of this Official Statement.

General Authorization; Definition of Project; Bonds to be Special Obligations

The Act is intended to provide a comprehensive authorization to the City of Philadelphia (the "City") and any other Pennsylvania cities of the first class to issue revenue bonds ("Bonds") to finance various types of projects.

The Act defines "Project" to include, among other things, any buildings, structures, facilities or improvements of a public nature, the related land, rights or leasehold estates in land and the related furnishings, machinery, apparatus or equipment of a capital nature, which the City is authorized to own, construct, acquire, improve, lease, operate, maintain or support; any item of construction, acquisition or extraordinary maintenance or repair thereof, the City's share of the cost of any of the foregoing or any combination thereof undertaken jointly with others; and any combination of any of or all of the foregoing or any undivided portion of the cost of any of the foregoing as may be designated as a "Project" by the City for financing purposes and in respect of which the City may reasonably be expected to receive Project Revenues.

Bonds issued under the Act are required to be payable solely from Project Revenues and to be secured solely by such revenues and by any reserve funds which may be created or funded in connection with the Bonds. The Bonds are not permitted to pledge the credit or taxing power of the City to create any debt or charge against the tax or general revenues of the City, or create any lien against any of the City property other than the Project Revenues pledged therefore and reserve Funds established in respect of the Bonds. The Bonds do not constitute a debt of the City, and are excluded from the calculation of the City's debt-incurring capacity under the Pennsylvania Constitution.

Estimates of Future Revenues

To establish that Project Revenues will be sufficient to amortize all Bonds outstanding, the Act requires a finding to be made in the ordinance authorizing the issuance of the Bonds that the pledged Project Revenues will be sufficient to pay any prior parity charges thereon and the principal of and interest on the Bonds. This finding is to be based on a report of the chief fiscal officer of the City filed with the City Council and supported by appropriate schedules and summaries. The report of the chief fiscal officer of the City may be based on a report of consulting engineers employed by the City to evaluate the project.

For the purpose of estimating future Project Revenues, the Act provides that only the following shall be included: (i) those rents, rates, tolls or charges to the general public which, under existing authorizations, will be reasonably collectible in such year under the schedule or rate of rents, rates or charges which are or will be in effect during such year in accordance with such ordinance, resolutions or rate schedule or which may be imposed by administrative action without further legislation; (ii) those bulk payments which may be imposed under subsisting legislation or which are provided under subsisting agreements or which are the subject of an expression of intent by the prospective obligor deemed reliable by the chief fiscal officer of the City; and (iii) those governmental subsidies or payments which, under subsisting legislation, are subject to reasonably precise calculation and, unless stated in such legislation or authorization to be of an annually or more frequently recurring nature, are payable in such year.

Detail of Bonds and City Covenants

The Act provides that the ordinance authorizing the issuance of the Bonds shall fix the aggregate amounts of the Bonds to be issued from time to time and determine, or designate officers of the City to determine, the form and details of the Bonds. The City may include in its Bond ordinance various covenants with Bondholders, including covenants governing the imposition, collection and disbursement of Project Revenues, Project operation and maintenance, the establishment, segregation, maintenance, custody, investment and disbursement of sinking funds and reserves, the issuance of additional priority or parity bonds, the redemption of the Bonds and such other provisions as the City deems necessary or desirable in the interest or for the protection of the City or of such Bondholders. Under the Act the covenants, terms and provisions of the Bond ordinance made for the benefit of Bondholders constitute contractual obligations of the City, but such covenants (within limitations, if any, fixed by the Bond ordinance) may be modified by agreement with a majority in interest of the Bondholders or such larger portion thereof as may by provided in the Bond ordinance.

Sinking Fund

The Act requires that the Bond ordinance shall provide for the establishment of a sinking fund for the payment of the principal of and interest (including Qualified Swap payments) on the Bonds. Payment into such sinking fund shall be made in annual or more frequent installments and shall be sufficient to pay or accumulate for payment all principal of and interest on the Bonds for which the sinking fund is established as and when the same shall become due and payable. The sinking fund shall be managed by the chief fiscal officer of the City and moneys therein to the extent not currently required, shall be invested, subject to limitations established by the Bond ordinance and the Act. Interest and profits from investment of moneys in the sinking fund shall be added to such fund and may be applied in reduction of or to complete required deposits into the sinking fund. Excess moneys in the sinking fund shall be repaid to the City for its general purposes or may be applied as may be provided in the Bond ordinance. All moneys deposited in the sinking fund are subjected to a perfected security interest for the benefit of the holders of the Bonds, for which the fund is established, until property disbursed. This perfected security interest also applies, under the terms of the Act, to moneys in the sinking fund reserve created as part of the sinking fund by the General Ordinance.

Refunding

Any outstanding Bonds issued under the Act or other bonds issued for purposes for which Bonds are issuable under the Act, whether issued before or after the effective date of the Act, may from time to time be refunded by Bonds issued under the Act and are subject to the same protections and provisions required for the issuance of an original issue of Bonds. The last stated maturity date of the refunding Bonds may not be later than ten years after the last stated maturity date of the Bonds to be refunded. If outstanding Bonds are refunded in advance of their maturity or redemption date, the principal thereof and interest thereon to payment or redemption date, and redemption premium payable, if any, will no longer be deemed to be outstanding obligations when the City shall have deposited with a bank, bank and trust company or trust company, funds irrevocably pledged to the purpose, which are represented by demand deposits, interest-bearing time accounts, savings deposits, certificates of deposit (insured or secured as public funds) or specified obligations of the United States or of the Commonwealth of Pennsylvania sufficient to effect such redemption or payment or, if interest on the deposited funds to the time of disbursement is also pledged, sufficient, together with such interest, for such purpose and, in the case of redemption, shall have duly called the Bonds for redemption or given irrevocable instructions to give notice of such call.

Validity of Proceedings; Suits and Limitations Thereon

Prior to the delivery of any Bonds, the City is required to file with the Court of Common Pleas of Philadelphia County (the "Court") a transcript of the proceedings authorizing the issuance of the Bonds. If no action is brought on or before the twentieth day following the date of recording of the transcript, or when the proceedings have been approved finally by the Court, then notwithstanding any defect or error in such proceedings, the validity of the proceedings, the City's right to issue the Bonds, the lawful nature of the purpose for which the Bonds are issued, and the validity and enforceability of the Bonds in accordance with their terms may not thereafter be inquired into judicially, in equity, at law, or by civil or criminal proceedings, or otherwise, either directly or collaterally except where a constitutional question is involved.

Negotiable Instruments

The Act provides that Bonds issued thereunder shall have the qualities and incidents of securities under Article 8 of the Uniform Commercial Code of the Commonwealth and shall be negotiable instruments.

Exemption from State Taxation

The Commonwealth pledges with the holders from time to time of Bonds issued under the Act that such Bonds, and interest thereon, shall at all times be free from taxation within and by the Commonwealth, but this exemption does not extend to underwriting profits or to gift, succession or inheritance taxes or any other taxes not levied directly on the Bonds and the receipt of interest thereon.

Defaults and Remedies

If the City should fail to pay the principal of or interest on any Bond when the same shall be due and payable, the remedy provisions of the Act permit the holder of such Bond, subject to the limitations described below, to recover the amount due in an action in Philadelphia Common Pleas Court; but a judgment rendered in favor of the Bondholder in such an action is collectible only from Pledged Amounts. The holders of 25% or more in aggregate principal amount of the Bonds of such series then outstanding which are in default, whether because of failure of timely payment which is not cured in 30 days, or failure of the City to comply with any other provisions of the Bonds or any Bond ordinance, may appoint a trustee to represent them. On being appointed, the trustee shall be the exclusive representative for the affected Bondholders and the individual rights of action described above shall no longer be available. The trustee may, and upon written request of the holders of 25% or more in aggregate principal amount of Bonds in default, and on being furnished with indemnity satisfactory to it, shall, take one or more of the following actions, which, if taken, shall preclude similar action, whether previously or subsequently initiated, by individual holders of Bonds; enforce, by proceedings at law or in equity, all rights of the holders of the Bond; bring suit on the Bonds; bring in suit in equity to require the City to make an accounting for all pledged Project Revenues received and to enjoin unlawful action or action in violation of the holders' rights; and, after 30 days' written notice to the City, and subject to any limitations in the Bond ordinance, declare the unpaid principal of the Bonds to be immediately due and payable, together with interest thereon at the rates stated in the Bonds until final payment, and upon the curing of all defaults, to annul such declaration. In any suit, action or proceeding by or on behalf of holders of defaulted Bonds, trustee fees and expenses, including operating costs of a project and reasonable counsel fees, shall constitute taxable costs, and all such costs and expenses allowed by the Court shall be deemed additional principal due on the Bonds and shall be paid in full from any recovery prior to any distribution to the holders of the Bonds. The General Ordinance limits any such recovery to Pledged Amounts. The trustee shall make distribution of any sums so collected in accordance with the Act.

Refunding with General Obligation Bonds

Upon certification by the City's chief fiscal officer that Project Revenues pledged for the payment of Bonds have become insufficient to meet the requirements of the ordinance or ordinances under which the Bonds were issued, the City Council is empowered, but not required, subject to applicable Pennsylvania constitutional debt limitations, to authorize the issuance and sale of general obligation refunding bonds of the City, without limitation as to rate of interest and in such principal amount (subject to the aforesaid limitations on indebtedness) as may be required, together with other available funds, to pay and redeem such Bonds including principal, interest to the date fixed for redemption or payment and premium, whether or not the principal of or interest on the refunding bonds shall exceed the principal of or interest on the bonds to be refunded.

THE RESTATED GENERAL WATER AND WASTEWATER REVENUE BOND ORDINANCE OF 1989

(Ordinance of the City Council approved June 24, 1993 - Bill No. 544)

The following is a summary of certain terms defined in the Restated General Water and Wastewater Revenue Bond Ordinance of 1989 (the "General Ordinance") used in this Official Statement. Reference should be made to the General Ordinance for a full and complete statement of its terms and any capitalized terms used herein but not otherwise defined. The Series 2017B Bonds are being issued under the terms of the General Ordinance, as supplemented by the Sixteenth Supplemental Ordinance and the Nineteenth Supplemental Ordinance. The Sixteenth Supplemental Ordinance and the Nineteenth Supplemental Ordinance (see below) set forth the specific terms of the Series 2017B Bonds. The following summarizes the terms of the General Ordinance, prior to being supplemented pursuant to the Sixteenth Supplemental Ordinance and the Nineteenth Supplemental Ordinance. All capitalized terms used in the following summary of the General Ordinance are defined as in the General Ordinance, prior to being *supplemented pursuant to the Sixteenth Supplemental Ordinance and the Nineteenth Supplemental Ordinance, and may be differently referenced in other portions of this Official Statement.*

Certain Definitions

Accreted Value means, with respect to Capital Appreciation Bonds, the amount to which, as of any specified time, the Original Value of any such Bond has been increased by accretion, all as may be provided in an applicable Supplemental Ordinance.

Act means The First Class City Revenue Bond Act, approved October 18, 1972 (Act No. 234, 53 P.S. §15901 to 15924), as from time to time amended.

Bond or *Bonds* means, upon and after issuance of the first series of bonds under the General Ordinance, if and to the extent Outstanding at any time, (i) the Existing Bonds and (ii) all series of bonds authorized and issued under one or more supplemental ordinances amending and supplementing the General Ordinance.

Bond Committee means the Mayor, City Controller and City Solicitor or a majority thereof.

Bond Counsel means a firm of nationally recognized bond counsel selected by the City.

Bondholder or *Holder* means any registered owner of Bonds or holder of Bonds issued in coupon form at the time Outstanding.

Capital Account means the Capital Account within the Construction Fund.

Capital Account Deposit Amount means an amount equal to one percent (1%) of the depreciated value of property, plant and equipment of the System or such greater amount as shall be annually certified to the City in writing by a Consulting Engineer as sufficient to make renewals, replacements and improvements in order to maintain adequate water and wastewater service to the areas served by the System.

Capital Appreciation Bonds means any Bonds issued under the General Ordinance which do not pay interest either until maturity or until a specified date prior to maturity, but whose Original Value increases periodically by accretion to a final Maturity Value.

Charges Account means the Charges Account within the Sinking Fund established to provide for the payment of fees under any Credit Facility to the extent payment of such fees are not otherwise provided.

City Controller means the head of the City's auditing department as provided by the Philadelphia Home Rule Charter.

City Solicitor means the head of the City's law department as provided by the Philadelphia Home Rule Charter.

Code means the Internal Revenue Code of 1986, as amended.

Construction Fund means the Construction Fund established pursuant to the General Ordinance.

Consulting Engineer means a nationally recognized Independent registered consulting engineer or a nationally recognized Independent firm of registered consulting engineers, in either case having experience in the design and analysis of the operation of water and wastewater systems of the magnitude and scope of the System.

Credit Facility means any letter of credit, standby bond purchase agreement, line of credit, surety bond, insurance policy or other insurance commitment or similar agreement (other than a Qualified Swap or an Exchange Agreement) that is provided by a commercial bank, insurance company or other institution, with a current long term rating (or whose obligations thereunder are guaranteed by a financial institution with a long term rating) from Moody's and S&P not lower than the credit rating of any Series of Bonds which has no Credit Facility, to provide support for a Series of Bonds or for any issue of Subordinated Bonds, and shall include any Substitute Credit Facility.

Debt Reserve Account means the Debt Reserve Account within the Sinking Fund established pursuant to the General Ordinance.

Debt Reserve Requirement means with respect to all Bonds, an amount equal to the lesser of (i) the greatest amount of Debt Service Requirements payable in any one Fiscal Year (except that such Debt Service Requirement will be computed as if any Qualified Swap did not exist and the Debt Service Requirements attributable to any Variable Rate Bonds may be based upon the fixed rate of interest as set forth in the Supplemental Ordinance or Determination for such Bonds), determined as of any particular date or (ii) the maximum amount to be financed with proceeds of Bonds permitted by Section 148(d)(1) of the Code (or any successor provision).

Debt Service Account means the Debt Service Account within the Sinking Fund established pursuant to the General Ordinance.

Debt Service Requirements, with reference to a specified period, means:

(a) amounts required to be paid into any mandatory sinking fund established for the benefit of Bonds during the period;

(b) amounts needed to pay the principal or redemption price of Bonds maturing during the period and not to be redeemed at or prior to maturity through any sinking fund established for the benefit of Bonds;

(c) interest payable on Bonds during the period, with adjustment for capitalized interest or redemption through any sinking fund established for the benefit of Bonds; and

(d) all net amounts, if any, due and payable by the City under a Qualified Swap during such period.

For purposes of estimating Debt Service Requirements for any future period, (i) any Option Bond outstanding during such period shall be assumed to mature on the stated maturity date thereof, except that the principal amount of any Option Bond tendered for payment and cancellation before its stated maturity date shall be deemed to accrue on the date required for payment pursuant to such tender; and (ii) Debt Service Requirements on Bonds for which the City has entered into a Qualified Swap shall be calculated assuming that the interest rate on such Bonds shall equal the stated fixed or variable rate on the Qualified Swap or, if applicable and if greater than such stated rate, the applicable rate for any Bonds issued in connection with the Qualified Swap adjusted, in the case of a variable rate obligation, as provided in the General Ordinance.

Calculation of Debt Service Requirements with respect to Variable Rate Bonds shall be subject to adjustment as permitted by the General Ordinance.

Debt Service Withdrawal means the aggregate amount withdrawn from the Capital Account during a Fiscal Year and applied toward the payment of principal or redemption price of or interest on Bonds or toward the elimination of a deficiency in any reserve fund established for the benefit of Bonds.

Determination means a determination by the Bond Committee regarding certain matters relating to the issuance of a Series of Bonds, made pursuant to the General Ordinance or the Supplemental Ordinance providing for the issuance of such Series of Bonds.

Director of Finance means the chief financial officer of the City as established by the Philadelphia Home Rule Charter.

Effective Date means when (but only when) all Prior Bonds issued under the Prior Ordinance have been paid or defeased as set forth in Section 10 of the Act.

Exchange Agreement means, to the extent from time to time permitted by applicable law, any interest exchange agreement, interest rate swap agreement, currency swap agreement or other contract or agreement, other than a Qualified Swap, authorized, recognized and approved by a Supplemental Ordinance or Determination as an Exchange Agreement and providing for (i) certain payments by the City from the Residual Fund and (ii) payments by an entity whose senior long term debt obligations, other senior unsecured long term obligations or claims paying ability, or whose obligations under an Exchange Agreement are guaranteed by an entity whose senior long term debt obligations, other senior unsecured long term obligations or claims paying ability are rated not less than "A3" by Moody's, "A-" by S&P or "A-" by Fitch, or the equivalent thereof by any successor thereto as of the date the Exchange Agreement is entered into; which payments by the City and counterparty are calculated by reference to fixed or variable rates and constituting a financial accommodation between the City and such counterparty.

Existing Bonds means the bonds originally issued under the Prior Ordinance other than Prior Bonds, which Existing Bonds shall be specified in a certificate of the Director of Finance on the Effective Date and thereafter shall be secured by the General Ordinance.

Financial Consultant means a firm of investment bankers, a financial consulting firm, a firm of certified public accountants or any other firm which is qualified to calculate amounts required to be rebated to the United States pursuant to Section 148(f) of the Code.

Fiscal Agent means a bank or other entity designated as such pursuant to the General Ordinance or its successor.

Fiscal Year means the fiscal year of the City.

Fitch means Fitch Ratings and any successor thereto.

General Obligation Bonds means the general obligation bonds of the City issued and outstanding from time to time to finance improvements to the System and adjudged, pursuant to the Constitution and laws of the Commonwealth of Pennsylvania, to be self-sustaining on the basis of expected Project Revenues.

General Ordinance means the Restated General Water and Wastewater Revenue Bond Ordinance of 1989.

Government Obligations means direct obligations of, or obligations the principal of and interest on which are unconditionally guaranteed by, the United States of America, including but not limited to interest obligations of the Resolution Funding Corporation or any successor thereto.

Independent means a person who is not a salaried employee or elected or appointed official of the City; provided, however, that the fact that such person is retained regularly by or transacts business with the City shall not make such person an employee within the meaning of this definition.

Initial Deposit means the initial, one time, deposit to be made by the City from any source into the Rate Stabilization Fund upon the establishment of such Rate Stabilization Fund.

Interdepartmental Charges means the proportionate charges for services performed for the Water Department by all officers, departments, boards or commissions of the City which are required by the Philadelphia Home Rule Charter to be included in the computation of operating expenses of the Water Department.

Interim Debt means any bond anticipation notes or other temporary borrowing which the City anticipates permanently financing with Bonds or other long term indebtedness under the General Ordinance or otherwise.

Maturity Value with respect to Capital Appreciation Bonds means the amount due on the maturity date.

Moody's means Moody's Investors Service and any successor thereto.

Net Revenues for any period means the Project Revenues collected during such period and deposited into the Revenue Fund plus (x) the amounts, if any, transferred from the Rate Stabilization Fund into the Revenue Fund during, or as of the end of, such period and (y) interest earnings during such period on moneys in any of the funds or accounts established under the General Ordinance to the extent such interest earnings are credited to the Revenue Fund pursuant to the General Ordinance minus the sum of (a) Operating Expenses incurred during such period and (b) the amounts, if any, transferred from the Revenue Fund to the Rate Stabilization Fund during, or as of the end of, such period; provided, however that in determining such Net Revenues the Initial Deposit shall not reduce such Net Revenues.

Operating Expense Withdrawal means the aggregate amount withdrawn from the Capital Account during a Fiscal Year and applied toward the payment of Operating Expenses.

Operating Expenses for any period means all costs and expenses of the Water Department necessary and appropriate to operate and maintain the System in good operating condition, and shall include, without limitation, salaries and wages, purchases of services by contract, costs of materials, supplies and expendable equipment, maintenance costs, costs of any property or the replacement thereof or for any work or project, related to the System, which is not properly chargeable to property, plant and equipment, pension and welfare plan and worker's compensation requirements, provisions for claims, refunds and uncollectible receivables and for Interdepartmental Charges, all in accordance with generally accepted accounting principles consistently applied, but Operating Expenses shall exclude depreciation, amortization, interest and sinking fund charges.

Option Bond means any Bond which by its terms may be tendered by and at the option of the Holder thereof for payment by the City prior to its stated maturity date or the maturity date of which may be extended by and at the option of the Holder thereof.

Ordinance means the General Ordinance, as amended from time to time in accordance with the provisions of the General Ordinance.

Original Value with respect to Capital Appreciation Bonds means the principal amount paid by the initial purchasers on the date of original issuance.

Outstanding, when used with reference to Bonds, means, as of any date, all Bonds theretofore or thereupon being authenticated and delivered under the General Ordinance except (i) any Bonds cancelled by the Fiscal Agent at or prior to such date; (ii) Bonds (or portion of Bonds) for the payment or redemption of which moneys, equal to the principal amount, Accreted Value or redemption price thereof, as the case may be, with interest (except to the extent of any Capital Appreciation Bonds) to the date of maturity or redemption date, shall be held in trust under the General Ordinance and set aside for such payment or redemption (whether at or prior to the maturity or redemption date), provided that if such Bonds (or portions of Bonds) are to be redeemed, notice of such redemption shall have been given as provided in the General Ordinance or provision satisfactory to the Fiscal Agent shall have been made for the giving of such notice; (iii) Bonds in lieu of or in substitution for which other Bonds shall have been authenticated and delivered pursuant to the General Ordinance; and (iv) Bonds deemed to have been paid as provided in the General Ordinance.

Philadelphia Home Rule Charter means the Philadelphia Home Rule Charter, as amended or superseded by any new home rule charter, adopted pursuant to authorization of the First Class City Home Rule Act approved April 21, 1949, P.L. 665 §l, *et seq*. (53 P.S. §13101, *et seq*.).

Prior Bonds means the bonds issued under the Prior Ordinance designated as Water and Sewer Revenue Bonds (i) the First Series through Ninth Series, and the Eleventh Series and Twelfth Series, and (ii) to the extent the following bonds are defeased on the Effective Date, the Tenth Series and the Thirteenth Series through Sixteenth Series.

Prior Ordinance means the General Water and Sewer Revenue Bond Ordinance of 1974 approved May 16, 1974, as amended and supplemented from time to time.

Project Revenues means all rents, rates, fees and charges imposed or charged for the connection to, or use or product of or services generated by the System to the ultimate users or customers thereof, all payments under bulk contracts with municipalities, governmental instrumentalities or other bulk users, all subsidies or payments payable by Federal, State or local governments or governmental agencies on account of the cost of operation of, or the payment of the principal of or interest on moneys borrowed to finance costs chargeable to the System, all grants, payments and contributions made in aid or on account of the System exclusive of grants and similar payments and contributions solely in aid of construction and all accounts, contract rights and general intangibles representing the foregoing.

Qualified Escrow Securities means funds which are represented by (a) demand deposits, interest-bearing time accounts, savings deposits or certificates of deposit, but only to the extent such deposits or accounts are fully insured by the Federal Deposit Insurance Corporation or any successor United States governmental agency, or to the extent not insured, fully secured and collateralized by Government Obligations having a market value (exclusive of accrued interest) at all times at least equal to the principal amount of such deposits or accounts, (b) if at the time permitted under the Act, obligations of any state or political subdivision thereof or any agency or instrumentality of such state or political subdivision for which cash, Government Obligations or a combination thereof have been irrevocably pledged to or deposited in a segregated escrow account for the payment when due of principal or redemption price of and interest on such obligations, and any such cash or Government Obligations pledged and deposited are payable as to principal or interest in such amounts and on such dates as may be necessary without reinvestment to provide for the payment when due of the principal or redemption price of and interest on such obligations, and such obligations are rated by any Rating Agency in the highest rating category assigned by each such rating service to obligations of the same type, or (c) noncallable Government Obligations. In each case such funds (i) are subject to withdrawal, maturing or payable at the option of the holder, at or prior to the dates needed for disbursement, provided such deposits or accounts, whether deposited by the City or by such depository, are insured or secured as public deposits with securities having at all times a market value exclusive of accrued interest equal to the principal amount thereof, (ii) are irrevocably pledged for the payment of such obligations and (iii) are sufficient, together with the interest to disbursement date payable with respect thereto, if also pledged, to meet such obligations in full.

Qualified Rebate Fund Securities means either:

(a) Government Obligations; or

(b) rights to receive the principal of or the interest on Government Obligations through (i) direct ownership, as evidenced by physical possession of such Government Obligations or unmatured interest coupons or by registration as to ownership on the books of the issuer or its duly authorized paying agent or transfer agent, or (ii) purchase of certificates or other instruments evidencing an undivided ownership interest in payments of the principal of or interest on Government Obligations.

Qualified Swap or *Swap Agreement* means, with respect to a Series of Bonds, any financial arrangement that (i) is entered into by the City with an entity that is a Qualified Swap Provider at the time the arrangement is entered into; (ii) provides that (a) the City shall pay to such entity an amount based on the interest accruing at a fixed rate on an amount equal to the principal amount of the Outstanding Bonds of such Series, and that such entity shall pay to the City an amount based on the interest accruing on a principal amount initially equal to the same principal amount as such Bonds, at either a variable rate of interest or a fixed rate of interest computed according to a formula set forth in such arrangement (which need not be the same as the actual rate of interest borne by the Bonds) or that one shall pay to the other any net amount due under such arrangement or (b) the City shall pay to such entity an amount based on the interest accruing on the principal amount of the Outstanding Bonds of such Series at a variable rate of interest as set forth in the arrangement and that such entity shall pay to the City an amount based on interest accruing on a principal amount equal to the Outstanding Bonds of such Series at an agreed fixed rate (which shall not be the same as the rate on the Bonds) or that one shall pay to the other any net amount due under such arrangement; and (iii) which has been designated in writing to the Fiscal Agent by the City as a Qualified Swap with respect to the Bonds.

Qualified Swap Provider means, with respect to a Series of Bonds, an entity whose senior long term debt obligations, other senior unsecured long term obligations or claims paying ability, or whose payment obligations under a Qualified Swap are guaranteed by an entity whose senior long term debt obligations, other senior unsecured long term obligations or claims paying ability, are rated (at the time the subject Qualified Swap is entered into) at least as high as Aa by Moody's, and AA by S&P, or the equivalent thereof by any successor thereto.

Rate Covenant means the rate covenant contained in the General Ordinance.

Rate Stabilization Fund means the Rate Stabilization Fund established pursuant to the General Ordinance.

Rating Agency means Moody's, S&P or Fitch, to the extent that any of such rating services have issued a credit rating on the Bonds or, upon discontinuance of any of such rating services, such other nationally recognized rating service or services if any such rating service has issued a credit rating on the Bonds.

Rebate Bond Year, for purposes of the General Ordinance and in order to facilitate compliance with the arbitrage rebate requirements of the Code, shall mean the period or periods specified in a Supplemental Ordinance or Determination for a Series of Bonds.

Rebate Fund means the Rebate Fund established pursuant to the General Ordinance.

Remarketing Agent means a Remarketing Agent appointed in the manner provided in the applicable Supplemental Ordinance or Determination authorizing the issuance of Variable Rate Bonds.

Remarketing Agreement means an agreement providing for the remarketing of tendered Variable Rate Bonds by a Remarketing Agent, as more fully set forth and defined in the Supplemental Ordinance authorizing any Series of Variable Rate Bonds.

Residual Fund means the Residual Fund established pursuant to the General Ordinance.

Revenue Fund means the Revenue Fund established pursuant to the General Ordinance.

S&P means S & P Global Ratings and any successor thereto.

Series when applied to Bonds means, collectively, all of the Bonds of a given issue authorized by Supplemental Ordinance, as provided in the General Ordinance, and may also mean, if appropriate, a subseries of any Series if, for any reason, the City should determine to divide any Series into one or more subseries of Bonds.

Sinking Fund means the Sinking Fund established pursuant to the General Ordinance.

Sinking Fund Installment means an amount so designated which is established pursuant to the General Ordinance.

Special Water Infrastructure Account means the Special Water Infrastructure Account of the Residual Fund established in the General Ordinance.

Standby Agreement with respect to a Series of Bonds, means an irrevocable letter of credit and related reimbursement agreement, line of credit, standby bond purchase agreement or similar agreement providing for the purchase of all or a portion of the Bonds of such Series, as amended, supplemented or extended from time to time.

Standby Purchaser, with respect to a Series of Bonds, means the provider of the Standby Agreement for such Series of Bonds.

Subordinated Bond means any Bond referred to in, and complying with the provisions of the General Ordinance with respect to Subordinated Bonds.

Subordinated Bond Fund means the Subordinated Bond Fund established in the General Ordinance.

Substitute Credit Facility means any letter of credit, standby bond purchase agreement, line of credit, surety bond, insurance policy or other insurance commitment or similar agreement (other than a Qualified Swap or an Exchange Agreement) that replaces a Credit Facility and is provided by a commercial bank, insurance company or other financial institution with a current long term credit rating (or whose obligations thereunder are guaranteed by a financial institution with a long term rating) from Moody's and S&P not lower than the credit rating of any Series of Bonds which has no Credit Facility.

Supplemental Ordinance means an ordinance supplemental to the General Ordinance enacted pursuant to the Act and the General Ordinance by the Council of the City.

System means the entire combined water system and wastewater system of the City, now existing and hereafter acquired by lease, direct control, purchase or otherwise or constructed by the City, including any interest or participation of the City in any facilities in connection with said System, together with all additions, betterments, extensions and improvements to said System or any part thereof hereafter constructed or acquired and together with all lands, easements, licenses and rights of way of the City and all other works, property or structures of the City and contract rights and other tangible and intangible assets of the City now or hereafter owned or used in connection with or related to said System.

Tender Agent, with respect to a Series of Bonds, means any commercial bank or trust company organized under the laws of any state of the United States or any national banking association designated as a tender agent for such Series of Bonds, and its successor or successors hereafter appointed in the manner provided in the applicable Supplemental Ordinance or Determination.

Uncertificated Bond means any Bond which is fully registered as to principal and interest and which is not represented by an instrument.

Variable Rate Bond means any Bond, the rate of interest on which is subject to change prior to maturity and cannot be determined in advance of such change.

Water and Wastewater Funds means, collectively, the Revenue Fund, the Sinking Fund, the Subordinated Bond Fund, the Rate Stabilization Fund, the Residual Fund and the Construction Fund.

Water Commissioner means the head of the Water Department as provided by the Philadelphia Home Rule Charter.

Water Department means the Water Department of the City created pursuant to Section 3-100 of the Philadelphia Home Rule Charter.

SUMMARY OF OPERATIVE PROVISIONS OF THE GENERAL ORDINANCE

The following is a summary of certain operative provisions of the General Ordinance. Reference should be made to the General Ordinance for a full and complete statement of its provisions and the meaning of any capitalized terms used herein but not otherwise defined.

Form and Terms of Bonds

All Bonds shall be in substantially such form as may be approved by the City and set forth in the Supplemental Ordinance or Determination providing for the issuance thereof. Bonds shall be generally designated as Water and Wastewater Revenue Bonds of the City and shall be issued in such Series and within such Series in such subseries as the City may from time to time determine. The aggregate principal amount of Bonds which may be issued, authenticated and delivered under the General Ordinance is unlimited, but prior to the issuance of such Series of Bonds, the City shall enact a

Supplemental Ordinance authorizing such Series and the maximum aggregate principal amount of such Series.

The Bonds shall be issued in fully registered form, except as provided in the General Ordinance and, such Bonds shall be issued upon and contain such additional terms as may be set forth in the supplemental Ordinance and Determination providing for the issuance of the Bonds in question. As required by Section 5 of the Act, all Bonds shall contain a brief statement of the Project Revenues pledged as security therefor and the priority or priorities, if any, in the application of such pledged Project Revenues and shall contain a covenant of the City to pay from the pledged Project Revenues on the respective due dates the amounts required to pay the interest on and principal or redemption price of the Bonds. Bonds may be designated as of such Series by date, number, letter or otherwise and may also have such individual letters, identifying numbers or other marks, and such descriptive panels, registration panels, legends or endorsements placed thereon as may, consistent with the General Ordinance and the Act, be determined by a Supplemental Ordinance, Determination or the Director of Finance. The Bonds may also have printed thereon or on the reverse thereof the text of an approving legal opinion with respect thereto. Any portion of the text of any Bond may be set forth on the reverse thereof with an appropriate reference on the face of the Bond.

The Bonds of each Series shall be issued in such aggregate principal amount, shall be in such denominations, shall mature or be subject to mandatory redemption in such principal amounts, on such dates and at such places, shall have such Sinking Fund Installments for Bonds of like maturity and interest rate, shall bear interest from such date or dates and at such rate or rates (including variable, adjustable, convertible or other rates), shall be subject to optional redemption at such times and upon such terms, shall (if such Bonds are Option Bonds) be subject to optional or mandatory tender, and shall contain such other terms and conditions not inconsistent with the General Ordinance or the Act, all as shall be determined by the City and set forth in the Supplemental Ordinance or Determination under which such Bonds are issued, or as shall be determined by a designated officer or officers of the City thereunto authorized by the Supplemental Ordinance, or in the absence of such provisions or designation, as shall be determined by the Director of Finance as specified below.

If permitted by applicable law, any Series of Bonds may be issued as Uncertificated Bonds and the foregoing provisions specifying the form of Bonds shall be inapplicable to such Series.

A Series of Bonds may be secured by a Credit Facility meeting the requirements of the General Ordinance and the applicable Supplemental Ordinance. In connection with the issuance of its Bonds or at any time thereafter so long as a Series of Bonds remains Outstanding, the City also may enter into Qualified Swaps or Exchange Agreements if the Bond Committee determines that such Qualified Swap or Exchange Agreement will assist the City in more effectively managing its interest costs. The City's payment obligation under any Qualified Swap shall be made from the Sinking Fund and its payment obligation under any such Exchange Agreement shall be made from the Residual Fund created pursuant to the General Ordinance. Unless otherwise acknowledged by each Rating Agency by virtue of its confirmation of the existing credit ratings on the City's Outstanding Bonds, the City will not enter into any Qualified Swap or Exchange Agreement unless it gives at least fifteen (15) day's advance notice of its intention to do so to each of the Rating Agencies, which notice shall specify the identity of the Qualified Swap Provider or Exchange Agreement counterparty, as the case may be.

Sale of Bonds; Taxes Not to be Assumed; Authority of Director of Finance

Bonds may be sold by the City at public, private, or invited sale upon such terms not inconsistent with the Act and at such prices as the City may determine. To the extent that the Supplemental Ordinance authorizing any Series of Bonds and the Determination relating to such Series shall not otherwise provide:

(a) all Bonds shall be sold at competitive public sale to the purchaser or purchasers submitting the highest and best bid upon such terms and conditions of the bidding as shall be specified in an official notice of sale issued in the name of the City by the Director of Finance;

(b) no covenant to pay or assume any taxes shall be included in such Bonds; and

(c) subject to the foregoing, the terms upon which are the prices for which the Bonds are to be sold or exchange, and the form, terms or provisions of the Bonds including, without limitation, the matters referred to in Section 5 of the Act, shall be determined by the Director of Finance who is designated in the General Ordinance as the officer of the City authorized to make such determinations based, to the extent applicable, on the prices, interest rates or other terms set forth in the highest and best proposal conforming to the bidding specifications, as ascertained and accepted on behalf of the City by the Director of Finance.

Payments of Principal, Redemption Price and Interest; Date of Bonds

Unless otherwise provided in any Bond or the Supplemental Ordinance or Determination relating thereto:

(a) The principal or redemption price of each Bond shall be payable upon surrender thereof at the principal Philadelphia office of the Fiscal Agent in Philadelphia, Pennsylvania or at the principal office of a paying agent designated in such Bonds.

(b) The interest due on any Bond in fully registered form shall be payable by check or draft mailed to the Holder thereof, or at the request of a Holder of $1,000,000 or more in principal amount or maturity value of Bonds by wire transfer to an account at a financial institution in the United States, designated in writing to the Fiscal Agent or the paying agent, subject to such provisions concerning record dates as may be contained in such Bond and in the Supplemental Ordinance and Determination providing for the issuance and terms thereof.

(c) The principal or redemption price of and the interest on each Bond shall be payable in any coin or currency of the United States of America which, at the time of payment, is legal tender for the payment of public and private debts, or Bonds of a Series may be payable in such foreign currency as may be specified in the Supplemental Ordinance authorizing such Series of Bonds, if applicable law permits.

(d) Fully registered Bonds of each Series shall be dated as of the date six months preceding the interest payment date next following the date of execution thereof by the Fiscal Agent, unless such date of execution shall be an interest payment date, in which case they shall be dated as of such date of execution; provided, however, that if, as shown by the records of the Fiscal Agent, interest on the Bonds of any Series shall be in default, fully registered Bonds of such Series issued in lieu of Bonds surrendered for transfer or exchange may be dated as of the date to which interest has been paid in full on the Bonds surrendered. Fully registered Bonds of each Series shall bear interest from their date.

Notwithstanding any other provision in The General Ordinance to the contrary, the foregoing provisions are subject to the express understanding that the principal of and interest on all Bonds issued under the General Ordinance and the premium, if any, payable on redemption thereof, shall be payable only from Project Revenues and other funds provided for the payment of Bonds. The Bonds are not general obligations of the City and do not pledge the general credit or taxing power or create any debt or charge against the general revenues of the City, or create any lien against any property of the City other than pledged Project Revenues.

Execution of Bonds

The Bonds shall be executed on behalf of the City by the Fiscal Agent by the manual signatures of two of its duly authorized officers or signers, under the seal of the City which shall be either affixed or reproduced thereon in facsimile and shall be countersigned and attested by the manual or facsimile signature of the City Controller, or in such other manner as shall be authorized by law and prescribed by Supplemental Ordinance. Any such Bonds may be executed, issued and delivered notwithstanding that one or more of the officers or signers signing such Bonds or whose facsimile signature shall be upon such Bonds shall have ceased to be such officers or signers at the time when such Bonds shall actually be delivered, and although at the nominal date of the Bond any such person shall not have been such officer or signer.

Bond Registrar and Bond Register

The City shall designate one or more persons to act as “Bond Registrar” for the Bonds provided that the Bond Registrar appointed for the Bonds shall be either the Fiscal Agent or a person which would meet the requirements for qualification as a Fiscal Agent imposed by the General Ordinance. Any person other than the Fiscal Agent undertaking to act as Bond Registrar shall first execute a written agreement, in form satisfactory to the City and the Fiscal Agent, to perform the duties of a Bond Registrar under the General Ordinance, which agreement shall be filed with the Fiscal Agent.

The Bond Registrar shall act as registrar and transfer agent for the Bonds. The City shall cause the Bond Registrar to designate, by a written notification to the Fiscal Agent, a specific office location at which the Bond Register is kept. The principal corporate trust office of the Fiscal Agent shall be such office in respect of the Bonds for which the Fiscal Agent is acting as Bond Registrar.

The Bond Registrar shall, in any case where it is not also the Fiscal Agent, forthwith following each regular record date and at any other time as reasonably requested by the Fiscal Agent, certify and furnish to the Fiscal Agent and any paying agent as the Fiscal Agent shall specify, the names, addresses, and holdings of Bondholders and any other relevant information reflected in the Bond Register, and the Fiscal Agent and any such paying agent shall for all purposes be fully entitled to rely upon the information so furnished to it and shall have no liability or responsibility in connection with the preparation thereof.

Interchangeability of Bonds

Fully registered Bonds, upon surrender thereof at the office of Bond Registrar with a written instrument of transfer satisfactory to the Bond Registrar, duly executed by the registered owner or his duly authorized attorney may at the option of the registered owner thereof, and upon payment by such registered owner of any charges, which the City or Bond Registrar may make, be exchanged for an equal aggregate principal amount of fully registered Bonds of the same Series, maturity and interest rate of any other authorized denominations.

Negotiability, Transfer and Registry

Fully registered Bonds shall be transferable only by the registered owner thereof in person or by his attorney duly authorized in writing, upon surrender thereof together with a written instrument of transfer satisfactory to the Bond Registrar duly executed by the registered owner or his duly authorized attorney. Upon the transfer of any such fully registered Bonds the City shall issue and the Bond Registrar shall execute in the name of the transferee a new fully registered Bond or Bonds of the same aggregate principal amount and Series, maturity and interest rate as the surrendered Bonds.

The City, the Fiscal Agent and any paying agent designated in the Bonds may deem and treat the person in whose name any Bond shall be registered in the Bond Register as the absolute owner of such Bond, whether such Bond shall be overdue or not, for the purpose of receiving payment of, or on account of, the principal and redemption price of and interest on such Bond and for all other purposes, and all such payments so made to any such registered owner or upon his order shall be valid and effectual to satisfy and discharge the liability upon such Bond to the extent of the sum or sums so paid, and neither the City, the Fiscal Agent nor any paying agent designated in the Bond shall be affected by any notice to the contrary.

Any consent, waiver or other action taken by the registered owner of any Bond pursuant to the provisions of the General Ordinance shall be conclusive and binding upon such Holder, his heirs, successors or assigns, and upon all transferees of such Bond whether or not notation of such consent, waiver or other action shall have been made on such Bond or on any Bond issued in exchange therefor.

Regulations With Respect to Exchanges and Transfers

In all cases in which the privilege of exchanging Bonds or transferring registered Bonds is exercised, the City shall execute and deliver Bonds in accordance with the General Ordinance. All Bonds surrendered in any such exchanges or transfers shall forthwith be delivered to the Bond Registrar and cancelled or retained by the Bond Registrar. For every such exchange or transfer of Bonds, whether temporary or definitive, the City or the Bond Registrar may make a charge sufficient to reimburse it for any tax, fee or other governmental charge imposed by a governmental unit other than the City in connection with said exchange, transfer or registration and for any charge of insuring Bonds during the delivery thereof. Neither the City nor the Bond Registrar shall be required to transfer or exchange Bonds of any Series for a period of 20 days next preceding any selection of Bonds to be redeemed or thereafter until after the first mailing of any notice of redemption, or to transfer, exchange or register any Bonds called for redemption.

Credit Enhancement; Exchange Agreements; Qualified Swaps

As provided by Supplemental Ordinance or Determination relating to any Series of Bonds and subject to the requirements of the General Ordinance, the City may provide for a Credit Facility, Exchange Agreement or Qualified Swap with respect to any Series of Bonds.

Purpose of Bonds; Combination or Projects for Financing Purposes

The Bonds issued under the General Ordinance shall be issued for the purpose (i) of paying the costs of Projects (as such term is defined in the Act) relating to the System, (ii) of reimbursing any fund of the City from which such costs shall have been paid or advanced, (iii) of funding any of such costs for which the City shall have outstanding bond anticipation notes or other obligations, (iv) of refunding any Bonds or bonds of the City issued for the foregoing purposes or (v) of financing anything else relating to the System permitted under the Act. The water and wastewater systems of the City (referenced in the definition of "System" above) are combined as a Project for the purpose of capital financing but the separate accounts or subaccounts required by the Philadelphia Home Rule Charter shall be maintained within the funds and accounts established under the General Ordinance in accordance with the Philadelphia Home Rule Charter.

Pledge or Revenues; Grant of Security Interest; Limitation on Recourse

The City pledges, and assigns to the Fiscal Agent, its successors in trust and its assigns, for the security and payment of all Bonds (other than Subordinated Bonds) and grants to said Fiscal Agent, its successors in trust and its assigns, a lien on and security interest in (i) all Project Revenues and (ii) all amounts on deposit in or standing to the credit of the funds and accounts (other than the Rebate Fund) established in the General Ordinance together with interest earnings on amounts in such funds and accounts (other than the Rebate Fund). The Fiscal Agent shall hold and apply the security interest granted in the General Ordinance and the pledged revenues and funds described therein, in trust, for the equal and ratable benefit and security of all present and future Holders of Bonds (other than Subordinated Bonds) issued pursuant to the provisions of the General Ordinance and each Supplemental Ordinance, without preference, priority or distinction of any one Bond over any other Bond (other than Subordinated Bonds); provided however, that the pledge of the General Ordinance may also be for the benefit of a Credit Facility and Qualified Swap, or any other person who undertakes to provide moneys for the account of the City for the payment of principal or redemption price of and interest on any Series of Bonds (other than Subordinated Bonds), on an equal and ratable basis with Bonds, to the extent provided by any Supplemental Ordinance or Determination.

For the purpose of compliance with the filing requirements of the Uniform Commercial Code in order to perfect the security interest granted by the General Ordinance, the Fiscal Agent shall be deemed to be, and the City recognizes the Fiscal Agent as, the representative of Bondholders to execute financing statements as the secured party.

Neither the Bonds nor the City's reimbursement or other contractual obligations under any Credit Facility, Qualified Swap or Exchange Agreement shall constitute a general indebtedness or a pledge of the full faith and credit of the City within the meaning of any constitutional or statutory provision or limitation of indebtedness. No Bondholder or beneficiary of any of the foregoing agreements shall ever have the right, directly or indirectly, to require or compel the exercise of the ad valorem taxing power of the City for the payment of the principal and redemption price of or interest on the Bonds or the making of any payments under the General Ordinance. The Bonds and the obligations evidenced thereby and by the foregoing agreements, shall not constitute a lien on any property of or in the City, other than the Project Revenues and amounts on deposit in or standing to the credit of the Water and Wastewater Funds and interest earnings on amounts in such funds.

Parity Bonds

All Bonds issued under the General Ordinance (other than Subordinated Bonds) shall be parity Bonds equally and ratably secured by the pledge of and grant of the security interest in the Project Revenues and the amounts on deposit in or standing to the credit of the funds and accounts (other than the Rebate Fund), together with interest earnings on amounts in such funds and accounts (other than the Rebate Fund) without preference, priority or distinction as to lien or otherwise, except as otherwise provided, of any one Bond over any other Bond or as between principal and interest.

The City reserves the right, and nothing in the General Ordinance shall be construed to impair such right, to finance improvements to the System by the issuance of its general obligation bonds or by the issuance, under ordinances other than Supplemental Ordinances, of water and/or wastewater revenue bonds or notes for the payment of which Project Revenues may be used or pledged subject and subordinate to the payment from such Project Revenues of the payments described below under "Transfers From Revenue Fund" and subject to the elimination of any deficiency in any fund or account established under the General Ordinance or under any Supplemental Ordinance.

Establishment of Funds and Accounts

The following funds and accounts are established by the General Ordinance and shall be held by the Fiscal Agent:

(a) Revenue Fund;

(b) Sinking Fund and within such Fund a Debt Service Account, a Charges Account and a Debt Reserve Account;

(c) Subordinated Bond Fund;

(d) Rate Stabilization Fund;

(e) Residual Fund and within such Fund a Special Water Infrastructure Account;

(f) Construction Fund, and within the Construction Fund, separate accounts designated as follows:

   (i) the Existing Projects Account, into which existing proceeds, if any, of revenue bonds heretofore issued under the Act in respect of the System shall be deposited,

   (ii) the Bond Proceeds Account, into which proceeds of Bonds issued under the General Ordinance shall be deposited, and

   (iii) the Capital Account;

(g) Rebate Fund.

Nothing in the General Ordinance shall be construed to prevent the City from establishing, in connection with the issuance of one or more Series of Bonds, additional funds or accounts to be held for the benefit of one or more Series of Bonds issued under the General Ordinance, as set forth in Supplemental Ordinances; provided that, no such additional funds or accounts shall be established unless, in the opinion of Bond Counsel, establishment of additional funds or accounts would not adversely affect the exclusion of interest on Bonds, if any, from gross income for federal income tax purposes.

Segregation of Water and Wastewater Funds; Deposit of Project Revenues into Revenue Fund

(a) The Water and Wastewater Funds shall be held separate and apart from all other funds and accounts of the City and the Fiscal Agent and the funds and accounts therein shall not be commingled with, loaned or transferred among themselves or to any other City funds or accounts except as expressly permitted by the General Ordinance.

(b) The City shall cause all Project Revenues received by it on any date to be deposited into the Revenue Fund upon receipt thereof by the City and the Fiscal Agent shall, upon receipt of Project Revenues, deposit such Project Revenues into the Revenue Fund. The City and Fiscal Agent also shall cause to be deposited into the Revenue Fund such portion of proceeds of Bonds as designated by Supplemental Ordinance or Determination and any other funds directed to be deposited into the Revenue Fund by the City. The Fiscal Agent shall, at the written direction of the City, disburse from the Revenue Fund the amounts and at the times specified below under “Transfers From Revenue Fund.”

(c) If at any time sufficient moneys are not available in the Revenue Fund to pay Operating Expenses and to make transfers required pursuant to the General Ordinance, then amounts on deposit in the Construction Fund, Rate Stabilization Fund and Residual Fund may be loaned temporarily, at the written direction of the City, to the Revenue Fund for the payment of such Operating Expenses to the extent of the deficiency, until such loaned amounts are required by the Water Department for purposes of the Fund making the loan. If a similar deficiency exists in the Construction Fund, amounts on deposit in the Revenue Fund, Rate Stabilization Fund and Residual Fund may be loaned temporarily, at the written direction of the City, to the Construction Fund, to the extent of the deficiency, until required by the Water Department for purposes of the Fund making the loan.

Transfers From Revenue Fund

Amounts on deposit in the Revenue Fund shall be applied by the Fiscal Agent, at the written direction of the City, in the following manner and in the following order of priority:

(a) to the City or its designees to pay such sums as are necessary to meet Operating Expenses in a timely manner;

(b) (i) on or before the dates that the principal or redemption price of and interest on Bonds (other than Subordinated Bonds) or payments under a Swap Agreement or Credit Facility are due, to deposit in the Debt Service Account of the Sinking Fund the amount necessary to provide for the timely payment of the principal or redemption price of and interest on such Bonds (other than Subordinated Bonds), any payments under any Swap Agreement and any amounts under a Credit Facility to repay advances thereunder to pay any of the foregoing, and (ii) on or before the dates that other payments are due under any Credit Facility with respect to Bonds (other than Subordinated Bonds) to deposit in the Charges Account of the Sinking Fund the amount necessary to make such payments;

(c) if the transfers in paragraphs (a) and (b) above are being made according to schedule, for deposit in the Debt Reserve Account, the amount, if any, required to eliminate any deficiency therein;

(d) if the transfers in paragraphs (a) and (b) above are being made according to schedule, and following any transfer required pursuant to paragraph (c) above, to deposit in any debt reserve account established within the Sinking Fund and not held for the equal and ratable benefit of all Bonds (other than Subordinated Bonds), the amount, if any, required to eliminate any deficiency therein;

(e) if the transfers in paragraphs (a) and (b) above are being made according to schedule, and following any transfer then required to be made pursuant to paragraphs (c) and (d) above, to deposit in the Subordinated Bond Fund the amount necessary to provide for the timely payment of the principal or redemption price of and interest on Subordinated Bonds, and forward to the paying agent in respect of bond anticipation notes (payable by exchange for, or out of the proceeds of the sale of Subordinated Bonds) the amount necessary to provide for the timely payment of interest thereon (to the extent not capitalized);

(f) if the transfers in paragraphs (a) and (b) above are being made according to schedule, and following any transfer then required to be made pursuant to paragraphs (c), (d) and (e) above to pay to the City the amount necessary to provide for the timely payment of the principal or redemption price of and interest on General Obligation Bonds;

(g) if the transfers in paragraphs (a) and (b) above are being made according to schedule, and following any transfer then required to be made pursuant to paragraphs (c), (d), (e) and (f) above, to transfer to the Rate Stabilization Fund such amount as the Water Commissioner may determine, the first such determination to be made on the Effective Date and to include the balance on that date in the Renewal and Replacement Fund created under the Prior Ordinance and the unencumbered operating balance of the Water Department as of the end of the Fiscal Year immediately preceding the Effective Date;

(h) if the transfers in paragraphs (a) and (b) above are being made according to schedule, and following any transfer then required to be made pursuant to paragraphs (c) , (d) , (e), (f) and (g) above, to transfer to the Capital Account of the Construction Fund on June 20, of each Fiscal Year (or the first business day following June 20 if June 20 is not a business day) an amount equal to the sum of (i) the Capital Account Deposit Amount, (ii) the Debt Service Withdrawal for the preceding Fiscal Year and (iii) the Operating Expense Withdrawal for the preceding Fiscal Year, less any amounts transferred during the Fiscal Year to such Capital Account from the Residual Fund; and

(i) if the transfers in paragraphs (a) and (b) above are being made according to schedule, and following any transfer then required to be made pursuant to paragraphs (c), (d), (e), (f), (g) and (h) above and after providing for the repayment of any inter-Fund loans, to transfer as of June 30 of each year all remaining amounts to the Residual Fund.

Notwithstanding the foregoing, nothing in the General Ordinance shall prevent the City from directing the transfer of amounts on deposit in any fund or account established under the General Ordinance into the Rebate Fund in the amounts and at the times specified below under "Funds and Accounts — Rebate Fund."

Sinking Fund

The Sinking Fund is to be a consolidated fund for the equal and proportionate benefit of the Holders of all Bonds (other than Subordinated Bonds) from time to time Outstanding and each account therein may be invested and reinvested on a consolidated basis.

The Fiscal Agent, as directed by the City by Supplemental Ordinance, Determination or other written direction, shall pay out of the Debt Service Account of the Sinking Fund to the designated paying agent or agents (i) on or before each interest payment date for any of the Bonds (other than Subordinated Bonds) the amount required for the interest payable on such date; and (ii) on or before each principal, redemption or prepayment date for any Bonds (other than Subordinated Bonds), the amount required for the principal, redemption or prepayment payable on such date, and (iii) on or before the respective due dates the amounts, if any, due under any Swap Agreements. Such amounts shall be applied by the designated paying agent or agents on the due dates thereof. The Fiscal Agent shall also pay out of the Debt Service Account of the Sinking Fund the accrued interest included in the purchase price of Bonds purchased for retirement and on or before the due dates any amounts owing by the City under any Credit Facility on account of advances to pay principal of or interest or redemption premium on Bonds (other than Subordinated Bonds).

Amounts accumulated in the Debt Service Account with respect to any Sinking Fund Installment (together with amounts accumulated therein with respect to interest on the Bonds for which such Sinking Fund Installment was established) if so directed by the City, shall be applied by the Fiscal Agent, on or prior to the 60th day preceding the due date of such Sinking Fund Installment, to the purchase of Bonds of the Series, maturity and interest rate within each maturity for which such Sinking Fund Installment was established. All purchases of Bonds pursuant to this provision shall be made at prices not exceeding the applicable sinking fund redemption price of such Bonds plus accrued interest, and such purchases shall be made by the Fiscal Agent as directed by the City. As soon as practicable after the 42nd day preceding the due date of any such Sinking Fund Installment, the Fiscal Agent shall proceed to call for redemption, by giving notice as provided in the General Ordinance, on such due date Bonds of the Series, maturity and interest rate within each maturity for which such Sinking Fund Installment was established (except in the case of Bonds maturing on a Sinking Fund Installment date) in such amount as shall be necessary to complete the retirement of the unsatisfied balance of such Sinking Fund Installment after making allowance for any Bonds purchased with moneys held in the Subordinated Bond Fund which the City has directed the Fiscal Agent to apply as a credit against such Sinking Fund Installment. The Fiscal Agent shall pay out of the Sinking Fund to the appropriate paying agent or agents, on or before such redemption date (or maturity date) the amount required for the redemption of the Bonds so called for redemption (or for the payment of such Bonds then maturing) and such amount shall be applied by such paying agent or agents to such redemption (or payment). All expenses in connection with the purchase or redemption of Bonds shall be paid by the City from Project Revenues.

In the event of the refunding of any Bonds, the Fiscal Agent shall, if the City so directs, withdraw from the Sinking Fund all, or any portion of, the amounts accumulated therein with respect to principal or interest on the Bonds being refunded and deposit such amounts with itself or another financial institution serving as escrow agent to be held for the payment of the principal or redemption price, if applicable, and interest on the Bonds being refunded; provided that such withdrawal shall not be made unless immediately thereafter the Bonds being refunded shall be deemed to have been paid as described below under "Deposit of Funds for Payment of Bonds." In the event of a refunding, the City may also direct the Fiscal Agent to withdraw from the Sinking Fund all, or a portion of, the amounts accumulated therein with respect to principal and interest on the Bonds being refunded and deposit such amounts in any fund or account established under the General Ordinance.

If any Bond shall not be presented for payment when the principal thereof becomes due, either at maturity or otherwise or at the date fixed for redemption thereof, if moneys sufficient to pay such Bond shall have been deposited with the Fiscal Agent, it shall be the duty of the Fiscal Agent to hold such moneys, without liability to the City, any Bondholder or any other person for interest thereon, for the benefit of the owner of such Bond. Notwithstanding the foregoing, any moneys in the Sinking Fund for the payment of the interest, principal or redemption premium of Bonds unclaimed for two (2) years after the due date shall be repaid to the City but such repayment shall not discharge the obligation, if any, for which such moneys were previously held in the Sinking Fund; provided, however, that such repayment shall not be made unless, at the time of such repayment, there shall exist no deficiency in any fund or account established under the General Ordinance or any Supplemental Ordinance.

The Fiscal Agent shall pay out of the Charges Account to the appropriate payees any fees, expenses and other amounts due under any Credit Facility with respect to Bonds (other than Subordinated Bonds), to the extent such amounts are not paid from the Debt Service Account.

Credits Against Sinking Fund Installments

If at any time Bonds of any Series or maturity for which Sinking Fund Installments shall have been established are purchased or redeemed other than (i) from amounts accumulated in the Debt Service Account or (ii) Bonds deemed to have been paid as described under "Deposit of Funds for Payment of Bonds" below, and, with respect to such Bonds which have been deemed paid, irrevocable instructions have been given to the Fiscal Agent to redeem or purchase the same on or prior to the due date of the Sinking Fund Installment to be credited under this paragraph, the City may from time to time and at any time by written notice to the Fiscal Agent specify the portion, if any, of such Bonds so purchased, redeemed or deemed to have been paid and not previously applied as a credit against any Sinking Fund Installment which are to be credited against future Sinking Fund Installments. Such notice shall specify the amounts of such Bonds to be applied as a credit against such Sinking Fund Installment or Installments and the particular Sinking Fund Installment or Installments against which such Bonds are to be applied as a credit; provided, however that none of such Bonds may be applied as a credit against a Sinking Fund Installment to become due less than 42 days after such notice is delivered to the Fiscal Agent. All such Bonds to be applied as a credit shall be surrendered to the Fiscal Agent for cancellation on or prior to the due date of the Sinking Fund Installment against which they are being applied as a credit. The portion of any such Sinking Fund Installment remaining after the deduction of any such amounts credited toward the same (or the original amount of any such Sinking Fund Installment if no such amounts shall have been credited toward the same) shall constitute the unsatisfied balance of such Sinking Fund Installment for the purpose of calculation of Sinking Fund Installments due on a future date.

Debt Reserve Account

Unless otherwise provided in the applicable Supplemental Ordinance, the City is required, under direction of the Director of Finance, to deposit in the Debt Reserve Account from the proceeds of sale of each Series of Bonds issued under the General Ordinance, an amount which, when added to the existing balance in the Debt Reserve Account, will be equal to the Debt Reserve Requirement immediately after the issuance of such Series of Bonds. The money and investments in the Debt Reserve Account shall be held and maintained in an amount equal at all times to the Debt Reserve Requirement provided that if the Supplemental Ordinance authorizing a Series of Bonds shall authorize the accumulation from Project Revenues of a reserve of such amount in respect of such Bonds over a period of not more than three Fiscal Years after the issuance and delivery of such Bonds, then the full payment of the annual deposits required under such Supplemental Ordinance will meet the Debt Reserve Requirements of the General Ordinance in respect of such Bonds.

If at any time and for any reason, the moneys in the Debt Service Account of the Sinking Fund are insufficient to pay as and when due, the principal of (and premium, if any) or interest on any Bond or Bonds or other obligations payable from the Debt Service Account then due (including under Swap Agreements and Credit Facilities), the Fiscal Agent is authorized and directed to withdraw from the Debt Reserve Account and pay over the amount of such deficiency for deposit in the Debt Service Account. If by reason of such withdrawal or for any other reason there shall be a deficiency in the Debt Reserve Account, the City covenants to restore such deficiency promptly from Net Revenues.

Any moneys in the Debt Reserve Account in excess of the Debt Reserve Requirement is required to be transferred to the Revenue Fund at the written direction of the City.

Notwithstanding the foregoing provisions, in lieu of the required deposits into the Debt Reserve Account, the City may cause to be deposited into the Debt Reserve Account a surety bond or an insurance policy payable to the Fiscal Agent for the account of the Bondholders and any Qualified Swap or an irrevocable letter of credit in an amount equal to the difference between the Debt Reserve Requirement and the remaining sums, if any, then on deposit in the Debt Reserve Account. The surety bond, insurance policy or letter of credit shall be payable (upon the giving of notice as required thereunder) on any interest payment date on which moneys will be required to be withdrawn from the Debt Reserve Account and applied to the payment of debt service on the Bonds and such withdrawal cannot be met by amounts on deposit in the Debt Reserve Account or provided from any other Fund under the General Ordinance. The insurer providing such surety bond or insurance policy shall be an insurer whose municipal bond insurance policies insuring the payment, when due, of the principal of and interest on municipal bond issues results in such issues being rated in not lower than the second highest rating category (without regard to rating subcategories) by either Moody's or S&P. The letter of credit issuer shall be a bank or trust company which is rated not lower than the second highest rating category (without regard to ratings sub-categories) by either Moody's or S&P. If a disbursement is made pursuant to a surety bond, an insurance policy or a letter of credit provided pursuant to this paragraph, the City shall be obligated either (i) to reinstate the maximum limits of such surety bond, insurance policy or letter of credit or (ii) to deposit into the Debt Reserve Account, funds in the amount of the disbursement made under such surety bond, insurance policy or letter of credit, or a combination of such alternatives, as shall provide that the amount in the Debt Reserve Account equals the Debt Reserve Requirement within a time period not longer than would be required to restore the Debt Reserve Account by operation of this provision and from the same source of funds as provided in the General Ordinance. Upon the occurrence of any reduction or suspension or any credit rating with respect to such surety bond, insurance policy or letter of credit (or the provider thereof) required by the General Ordinance, the City shall so notify the provider of the surety bond, insurance policy or letter of credit and prior to the effective date of such cancellation shall either provide a substitute surety bond, insurance policy or letter of credit meeting the above-described requirements or shall deposit cash in the Debt Reserve Account so that the amount in such Account shall equal the Debt Reserve Requirement. The Director of Finance may use funds already held in the Debt Reserve Account to purchase appropriate surety bonds or insurance policies for deposit in the Debt Reserve Account in lieu of some or all of the current cash or other deposits therein, which surety bonds or insurance policies shall satisfy the requirements described in this paragraph.

Subordinated Bond Fund

Subject to the third paragraph under this heading, the Fiscal Agent shall apply amounts in the Subordinated Bond Fund to the payment of the principal of, redemption premium, if any, and interest on Subordinated Bonds of a Series and to payments due under any Credit Facilities and Exchange Agreements with respect to Subordinated Bonds in accordance with the provisions of, and subject to the priorities and limitations and restrictions provided in, the Supplemental Ordinance and Determination authorizing such Series of Subordinated Bonds.

At any time and from time to time the City may deposit in the Subordinated Bond Fund for the payment of the principal of, redemption premium, if any, and interest on Subordinated Bonds amounts received from any source other than Project Revenues which is not inconsistent with the General Ordinance or any Supplemental Ordinance or Determination.

If at any time the amounts in the Sinking Fund shall be less than the current requirement of such fund pursuant to paragraphs (b) and (c) under "Transfers from Revenue Fund" above and there shall not be on deposit in the Debt Reserve Account, the Capital Account or the Residual Fund available moneys sufficient to cure such deficiency, then the Fiscal Agent shall withdraw from the Subordinated Bond Fund and deposit in the Sinking Fund the amount necessary (or all the moneys in said fund, if less than the amount necessary) to eliminate such deficiency.

Any moneys in the Subordinated Bond Fund for the payment of the interest, principal or redemption premium of Subordinated Bonds unclaimed for two years after the due date are to be repaid to the City but such repayment shall not discharge the obligation, if any, for which such moneys were previously held in the Subordinated Bond Fund; provided, however, that such repayment shall not be made unless, at the time of such repayment, there shall exist no deficiency in any fund or account established under the General Ordinance or any Supplemental Ordinance.

Construction Fund

Proceeds of Bonds issued for capital purposes are to be deposited into the Bond Proceeds Account of the Construction Fund and disbursed according to established procedures of the City.

The Fiscal Agent shall on the Effective Date deposit in the Existing Projects Account proceeds of Prior Bonds as directed by a Supplemental Ordinance or Determination; deposit in the Bond Proceeds Account the proceeds of Bonds as directed by a Supplemental Ordinance or Determination; and deposit in the Capital Account any amounts transferred pursuant to paragraph (h) under "Transfers from Revenue Fund" above. Amounts in the Existing Projects Account and Bond Proceeds Account shall be applied as directed in writing by the City for purposes permitted by the Act and the Bonds and such other purposes as are permitted under the General Ordinance.

Amounts deposited in the Capital Account may be applied at the written direction of the City to (i) payments for the cost of renewals, replacements and improvements to the System; (ii) payments into the Sinking Fund or into the Subordinated Bond Fund to cure a deficiency in one of the foregoing; or (iii) the purchase of Bonds if a Consulting Engineer shall first have certified to the City that amounts remaining on deposit in the Capital Account following the proposed purchase of Bonds will be sufficient to pay the cost of renewals, replacement and improvements to the System projected to be payable during such Fiscal Year; provided, however, that no Bond shall be purchased at a price in excess of the principal amount and redemption price which would be applicable if the Bond were redeemed at the time such Bond was first subject to redemption.

As described the section titled "Segregation of Water and Wastewater Funds; Deposit of Project Revenues into Revenue Fund" , the General Ordinance requires that, if at any time sufficient moneys are not available for the payment of Operating Expenses, then amounts on deposit in the Capital Account may be used for the payment of Operating Expenses to the extent of the deficiency.

Residual Fund

Amounts on deposit in the Residual Fund may be used at the written direction of the City (i) to pay Operating Expenses; (ii) to fund transfers to any fund or account established under the General Ordinance or under a Supplemental Ordinance (other than the Revenue Fund and the Rate Stabilization Fund); (iii) to make payments required under any Exchange Agreement; (iv) for the payment of principal, redemption premium, if any, and interest on any revenue bonds or notes (the proceeds of which were applied in respect of the System) issued under the Act but not under the General Ordinance; (v) for the payment of principal, redemption premium, if any, and interest on any General Obligation Bonds; (vi) for the payment of principal, redemption premium, if any, and interest on other general obligation debt issued in respect of the System; (vii) for the payment of amounts due under capitalized leases or similar obligations relating to the System; and (viii) to fund a transfer to the City's "General Fund" in an amount not to exceed the lower of (A) all "Net Reserve Earnings" as defined below or (B) $4,994,000. "Net Reserve Earnings" shall mean the amount of interest earnings during the Fiscal Year on amounts in the Debt Reserve Account and the Subordinated Bond Fund less the amount of interest earnings during the Fiscal Year on amounts in any such reserve funds and accounts giving rise to a rebate obligation pursuant to Section 148(f) of the Code.

The General Ordinance provides that the City establish expenditure authority from the Residual Fund to enable it to pay Operating Expenses and the other items permitted by the General Ordinance. In the event that there is a substitution of appropriate surety bonds or insurance policies from some or all of the deposits held in the Debt Reserve Account, a transfer of resulting excess money in the Debt Reserve Account to the Revenue Fund and, following compliance with the provisions described under "Transfers From Revenue Fund" above, a transfer of remaining amounts of such excess to the Residual Fund, such remaining amount shall be deposited into the Special Water Infrastructure Account. Any amounts deposited in the Special Water Infrastructure Account may be used to finance water-related infrastructure projects.

Rate Stabilization Fund

Pursuant to the General Ordinance, as of the effective date of the General Ordinance and as of June 30 of each Fiscal Year, the City may transfer (i) from the Rate Stabilization Fund to the Revenue Fund or (ii) from the Revenue Fund to the Rate Stabilization Fund, the amount determined by the Water Commissioner to be transferred for such Fiscal Year.

Rebate Fund

The General Ordinance provides that the Rebate Fund shall be maintained for so long as any Series of Bonds is Outstanding, and for 60 days thereafter (or such other period as may be specified by the Code and applicable regulations), for the purpose of paying to the United States Treasury the amount required to be rebated pursuant to Section 148(f) of the Code. All amounts in the Rebate Fund, including income earned from investment of amounts in the Rebate Fund, shall be held by the City free and clear of the lien created by the General Ordinance.

Management of Funds and Accounts

The General Ordinance provides that the moneys on deposit in the funds and accounts established under the General Ordinance, to the extent not currently required, shall be invested and secured as required by Section 9 of the Act, all at the direction and under the management of the Director of Finance or such other chief fiscal officer of the City as may hereinafter be established.

Investment of Funds and Accounts

All moneys deposited in any fund or account established under the General Ordinance or under any Supplemental Ordinance may be invested by the City or by the Fiscal Agent, at the oral or written direction of the City, in any investments permitted by law (except as otherwise provided in the General Ordinance with respect to the Debt Reserve Account and Rebate Fund); provided that any investments with respect to amounts on deposit in the funds (other than the Debt Reserve Account) and accounts established under the General Ordinance shall mature or shall be subject to redemption by the holder thereof upon demand at par no later than the date when such amounts are needed for the purposes of such funds or accounts. Interest earnings on amounts on deposit (i) in the Revenue Fund are to be credited to the Revenue Fund; (ii) in the Sinking Fund (except as provided in (iii) below) are to be credited to the Sinking Fund to the extent needed to meet Debt Service Requirements in respect of Bonds (other than Subordinated Bonds) and additional interest earnings shall be credited to the Revenue Fund; (iii) in the Debt Reserve Account shall be credited to the Debt Reserve Account until such account is fully funded and shall then be credited to the Residual Fund up to the maximum amount to be transferred to the City's General Fund and any excess is to then be transferred to the Revenue Fund; (iv) in the Subordinated Bond Fund are to be credited to the Subordinated Bond Fund to the extent needed to meet Debt Service Requirements in respect of Subordinated Bonds and additional interest earnings shall be credited to the Revenue Fund or to such other fund or account established under the General Ordinance as the City may direct pursuant to a Supplemental Ordinance; (v) in the Residual Fund, shall be credited to the Residual Fund; (vi) in the Rate Stabilization Fund shall be credited to the Revenue Fund; (vii) in the Construction Fund shall be credited to the appropriate account of the Construction Fund or to the Revenue Fund, as the City shall direct; and (viii) in the Rebate Fund shall be credited to the Rebate Fund.

Valuation of Funds and Accounts

In computing the assets of any fund or account established under the General Ordinance, investments and accrued interest thereon are to be deemed a part thereof. Such investments shall be valued on June 30 of each Fiscal Year at the lower of the cost or current market value thereof if the applicable maturity is more than one year and at par if the applicable maturity is equal to or less than one year plus accrued interest, or at the redemption price thereof, if then redeemable at the option of the holder; provided that investments in any reserve fund or reserve account of the Sinking Fund established pursuant to a Supplemental Ordinance may be valued as provided in the Supplemental Ordinance establishing it. The annual valuation is to apply for all purposes of the General Ordinance except if

Bonds are issued or a fund deficit occurs based on the annual valuation, in which cases a valuation is to be made on the date Bonds are issued or the deficit is eliminated, as the case may be.

Covenants of the City

Rate Covenant: Pursuant to the General Ordinance, the City covenants with the Bondholders that it will, at a minimum, impose, charge and collect in each Fiscal Year such water and wastewater rents, rates, fees and charges as shall yield Net Revenues which shall be equal to at least 1.20 times the Debt Service Requirements for such Fiscal Year (recalculated to exclude therefrom principal and interest payments in respect of Subordinated Bonds); provided that such water and wastewater rents, rates, fees and charges shall yield Net Revenues which shall be at least equal to 1.00 times (i) the Debt Service Requirements for such Fiscal Year (including Debt Service Requirements in respect of Subordinated Bonds); (ii) amounts required to be deposited into the Debt Reserve Account during such Fiscal Year; (iii) the principal or redemption price of and interest on General Obligation Bonds payable during such Fiscal Year; (iv) debt service requirements on Interim Debt payable during such Fiscal Year; and (v) the Capital Account Deposit Amount for such Fiscal Year (less any amounts transferred from the Residual Fund to the Capital Account during such Fiscal Year). In estimating debt service requirements on any Interim Debt for the purposes of projecting compliance with this covenant, the City is entitled to assume that such Interim Debt will be amortized over a period of up to the maximum term permitted by the Act, provided however, such period shall not be in excess of the useful life of the assets to be financed, on an approximately level debt service basis and bear interest at the average interest rate on bonds of a similar maturity and credit rating (without any credit enhancement) as the Bonds outstanding under the General Ordinance. Promptly upon any material change in the circumstances which were contemplated at the time such rents, rates, fees and charges were most recently reviewed, but not less frequently than once in each Fiscal Year, the City is required to review the rents, rates, fees and charges as necessary to enable the City to comply with the foregoing requirements; provided that such rents, rates, fees and charges shall in any event produce moneys sufficient to enable the City to comply with its covenants in the General Ordinance.

In estimating Debt Service Requirements on any Variable Rate Bonds for purposes of projecting compliance with this covenant or funding the Debt Reserve Account, the City is entitled to assume that such Variable Rate Bonds will bear interest at a rate equal to (i) the average interest rate on the Variable Rate Bonds during the period of 24 consecutive calendar months preceding the date of calculation or (ii) if the Variable Rate Bonds were not Outstanding during the entire 24-month period, the average interest rate on the Variable Rate Bonds since their date of issue or (iii) such other rate as may be specified in a Supplemental Ordinance or Determination.

Pursuant to the General Ordinance, the City represents that it has, by its Code of General Ordinances, as amended, authorized the imposition of rents, rates, fees and charges by the Water Department sufficient from time to time to comply with the Rate Covenant and covenants with the Holders of Bonds that it will not repeal or materially adversely dilute or impair such authorization.

Timely Payment of Principal, Redemption Premium and Interest: Pursuant to the General Ordinance, the City covenants with the Holders of all Bonds Outstanding under the General Ordinance that so long as such Bonds shall remain Outstanding it will pay or cause the Fiscal Agent or a paying agent to pay from the Project Revenues deposited in the Sinking Fund and the Subordinated Bond Fund the principal of, redemption premium, if any, and interest on all Bonds as the same shall become due and payable and as more particularly set forth in the Bonds and to pay the amounts due with respect to any and all Credit Facilities (including the reimbursement agreement or similar related agreement) and Qualified Swaps.

Operation of System: Pursuant to the General Ordinance, the City covenants with the Holders of all Bonds Outstanding under the General Ordinance that so long as such Bonds shall remain Outstanding it will continuously maintain the System or cause the System to be maintained in good condition and will continuously operate the System or cause the System to be operated.

Conditions of and Provisions Relating to Issuing Bonds: The City covenants with the Holders of all Bonds Outstanding under the General Ordinance that so long as any such Bonds shall remain Outstanding it will not issue any Series of Bonds under the General Ordinance without first complying with certain conditions stated in the General Ordinance including, without limitation, (a) the enactment of a Supplemental Ordinance, (b) the filing with the Fiscal Agent of a transcript of the proceedings relating to the issuance of such Series of Bonds, (c) the delivery to the City Council of a Consulting Engineer's Report, (d) the filing with the Fiscal Agent of certain opinions of counsel and (e) the execution of appropriate documents.

The Consulting Engineer's Report referred to in the preceding paragraph shall state that the Net Revenues are currently sufficient to comply with the Rate Covenant and are projected to be sufficient to comply with the Rate Covenant for each of the two Fiscal Years following the Fiscal Year in which the Bonds are to be issued; provided that if interest on such Bonds or a portion thereof has been capitalized, the projection shall extend to the two Fiscal Years following the Fiscal Year up to which interest has been capitalized on the Bonds or a portion thereof.

The General Ordinance provides that upon compliance with the conditions enumerated in the preceding paragraph and unless otherwise provided in the applicable Supplemental Ordinance or Determination, accrued interest on Bonds (other than Subordinated Bonds) shall be deposited in the Sinking Fund, accrued interest on Subordinated Bonds shall be deposited in the Subordinated Bond Fund, an amount sufficient to satisfy the requirements concerning the Debt Reserve Account shall be deposited in the Debt Reserve Account and the balance of the proceeds of the Bonds shall be deposited in the Bond Proceeds Account of the Construction Fund and shall be disbursed therefrom, in accordance with established procedures of the City; provided, however, that if such Bonds shall be issued for the purpose of funding or refunding Bonds previously issued by the City such proceeds shall, unless otherwise directed by the Supplemental Ordinance, be deposited in a special fund or account to be established with and held by the Fiscal Agent or another entity acting as an escrow agent and invested (if appropriate) and disbursed under the direction of the Director of Finance for the purpose of retiring the Bonds being funded or refunded.

Refunding Bonds

If the City shall, by Supplemental Ordinance, authorize the issuance of refunding Bonds pursuant to Section 10 of the Act, in the absence of specific direction or inconsistent authorization in the Supplemental Ordinance, the Director of Finance is authorized in the name and on behalf of the City to take all such action, including the irrevocable pledge of proceeds and the income and profit from the investment thereof for the payment and redemption of the funded or refunded Bonds, bonds or notes and, if there shall have been provided a Qualified Swap with respect to the Bonds to be refunded, provision for the payment, if any, of all amounts due and payable by the City under such Qualified Swap, and including the publication of all required redemption notices or the giving of irrevocable instructions therefor, as may be necessary or appropriate to accomplish the funding or refunding and to comply with the requirements of Section 10 of the Act.

Subordinated Bonds

The City may, at any time, or from time to time, issue Subordinated Bonds for any purpose permitted under the General Ordinance and under the Act. Subordinated Bonds shall be payable out of, and may be secured by a security interest in and a pledge and assignment of, Project Revenues and amounts on deposit in the Subordinated Bond Fund; provided, however, that any such security interest in and pledge and assignment of Project Revenues and amounts on deposit in the Subordinated Bond Fund shall be, and shall be expressed to be, subordinate in all respects to the security interest in, and pledge and assignment of, the Project Revenues and the amounts on deposit in the funds and accounts (other than the Rebate Fund but including the Subordinated Bond Fund) established under the General Ordinance for the security of the Bonds (other than Subordinated Bonds).

Annual Reports

The City covenants with the Holders of all Bonds Outstanding under the General Ordinance that so long as such Bonds shall remain Outstanding it will, within 120 days following the close of each Fiscal Year of the City or as soon thereafter as is practicable (not exceeding 150 days following the close of each Fiscal Year), file with the Fiscal Agent a report of the operation of the System, setting forth, among other things, in reasonable detail financial data concerning, and consolidated for, the water and wastewater components of the System for such Fiscal Year, including a balance sheet and a statement of income, expenses, and surplus (in each case not inconsistent with the statement of income, expenses, and other accounts of the City audited by the City Controller) prepared by the Water Department in accordance with generally accepted accounting principles consistently applied, showing compliance with the Rate Covenant, accompanied by a certificate of the Water Commissioner that the water and wastewater components of the System are in good operating condition and by a certificate of the Director of Finance that as of the date of such report the City has complied with all of the covenants in the General Ordinance and in all Supplemental Ordinances on its part to be performed. Such report shall be furnished to the Fiscal Agent in such reasonable number of copies as shall be required to meet the written requests of Bondholders therefor on a first come first served basis.

Disposition of Insurance Proceeds and Proceeds from the Sale of Assets

In the event that any assets of the System are destroyed or the City shall sell any assets of the System (except in the event of the sale or transfer of all or substantially all of the assets of the System to a municipal authority), the City shall, if the insurance proceeds or the proceeds from the sale of assets exceed 1.5% of the depreciated value of property, plant and equipment of the System, as shown on the financial statements of the City for the preceding Fiscal Year, apply such amounts, at the direction .of the Director of Finance or such other chief fiscal officer of the City as may hereinafter be established (i) to the retirement of the principal amount of debt incurred in respect to the System; (ii) to the reconstruction, repair or replacement of assets of the System; or (iii) to the making of capital additions or improvements to the System.

Bonds Not to Become Arbitrage Bonds

The General Ordinance provides that the City covenants for the benefit of the Bondholders that, notwithstanding any other provision of the General Ordinance or any other instrument, it will neither make nor instruct the Fiscal Agent to make any investment or other use of amounts on deposit in the funds and accounts established by the General Ordinance or other proceeds of the Bonds which would cause any Series of Bonds issued under the General Ordinance as tax-exempt to be arbitrage bonds under Section 148 of the Code and the regulations thereunder to the extent that the same are applicable at the time of such investment; it will file any reports required to be filed pursuant to the Code; and it will not take or fail to take any action so as to render any Series of Bonds issued under the General Ordinance as tax-exempt to be arbitrage bonds under Section 148 of the Code.

Prohibition Against Certain Uses of Funds; Enforcement

The City covenants that while any Bonds are Outstanding under the General Ordinance, it will not direct the Fiscal Agent to transfer, loan or advance proceeds of the Bonds or Project Revenues from the Water and Wastewater Funds to any City account for application other than for Water Department purposes.

If, on any date when a deposit is required to be made of the Project Revenues, the City fails to comply with any provision of the General Ordinance, the Fiscal Agent is authorized to and shall seek, by mandamus or other suit, action or proceeding at law or in equity, the specific enforcement or performance of the obligation of the City to cause the Project Revenues to be transferred to the Revenue Fund, and shall have any and all other rights and remedies of a fiscal agent under the General Ordinance, any Supplemental Ordinance, the Act or otherwise at law or in equity.

Credit Facilities and Qualified Swaps

All or any of the foregoing covenants of the City for the benefit of the Bondholders may also be for the benefit of the providers of any Credit Facility and any Qualified Swap to the extent provided in a Supplemental Ordinance or Determination.

Bonds May Be Subject to Redemption

Bonds of any Series may be subject to either optional or mandatory redemption at the times, in the order, in the amounts, at the redemption prices, and under such terms, conditions and restrictions, ail as may be set forth in the Supplemental Ordinance authorizing the issuance of such Series of Bonds or in the Determination relating to such Series of Bonds or, in the absence of such provisions, as may be set forth in the Bonds of such Series, at the direction of the Director of Finance. Notwithstanding or in limitation of the foregoing, a Supplemental Ordinance or Determination for a Series of Bonds may contain provisions for optional redemption of a Series of Bonds which may be retained by the City as a call option or may be held by the City or sold simultaneously with such Series of Bonds or at future dates as determined by such Supplemental Ordinance or Determination.

Effect of Redemption, Payment

Upon compliance with certain notice requirements stated in the General Ordinance, or upon irrevocable instructions to give such notice having been delivered to the Fiscal Agent, irrevocable instruction having been delivered to the Fiscal Agent to pay said Bonds or portions thereof and to pay the amount, if any, due and payable under any Qualified Swap related to said Bonds, and funds having been deposited in the Sinking Fund or the Subordinated Bond Fund (as the case may be) prior to the date fixed for redemption, the Bonds or portions thereof so called for redemption shall become due and payable on the redemption date so designated, and interest on such Bonds or portions thereof shall cease from such redemption date, whether such Bonds be presented for redemption or not. The principal amount of all Bonds or portions thereof so called for redemption, together with the premium, if any, and accrued interest thereon, shall be paid by the Fiscal Agent or any other paying agent designated in the Bonds, upon presentation and surrender thereof in negotiable form.

Partial Redemption

Upon presentation of any Bond which is to be redeemed in part only, the City and the Fiscal Agent shall execute and deliver to the Holder thereof, at the expense of the City, a new Bond or Bonds of authorized denominations in a principal amount equal to and of the same Series and maturity as the unredeemed portion of the Bond or Bonds so presented.

Fiscal Agent

The Fiscal Agent under the Prior Ordinance or its successor, shall be Fiscal Agent as of the Effective Date for the General Ordinance. The City may appoint a successor Fiscal Agent by Supplemental Ordinance to act as Fiscal Agent under the General Ordinance, and in connection with the Bonds issued under the General Ordinance. The Fiscal Agent shall also act as depository of the Sinking Fund and the Subordinated Bond Fund, and may act as paying agent and bonds registrar.

Nothing in the General Ordinance is to be construed to prevent the City, in accordance with law, from engaging other Fiscal Agents from time to time or to engage other paying agents of the Bonds or any Series thereof in addition to, or as a successor to the Fiscal Agent. Any entity appointed by the City as Fiscal Agent under the General Ordinance shall be a trust company or national or state bank having trust powers and combined capital and surplus of at least $50,000,000 and be qualified to serve pursuant to the Act. Any entity appointed by the City as Fiscal Agent under the General Ordinance as a successor to the Fiscal Agent shall assume all rights and obligations of the Fiscal Agent under the General Ordinance.

Subject to the foregoing, the General Ordinance provides that the proper officers of the City are authorized to enter into contracts or to confirm existing agreements governing the maintenance of funds and accounts and records, the disposal of cancelled Bonds, the rights, duties, privileges and immunities of the Fiscal Agent, and such other matters as are authorized by the Act and as are customary and appropriate and to confirm the agreement of the Fiscal Agent, in its several capacities, to comply with the provisions of the Act and of the General Ordinance.

The Fiscal Agent shall keep on file a copy of each report and its accompanying certificates delivered to it pursuant to the General Ordinance for a period of ten years and shall exhibit the same to, and permit the copying thereof by, any Bondholder or his authorized representative at all reasonable times.

Resignation of Fiscal Agent

The Fiscal Agent may resign and be discharged of the duties created by the General Ordinance by written resignation filed with the Director of Finance not less than 60 days before the date when such resignation is to take effect. Such resignation shall take effect on the day specified in such notice provided that a successor Fiscal Agent is appointed. If a successor Fiscal Agent is appointed prior to the date specified in the notice, the resignation shall take effect immediately on the appointment of such successor, and the City shall give the required notices described under "Appointment of Successor Fiscal Agent" below.

Appointment of Successor Fiscal Agent

If the Fiscal Agent or any successor Fiscal Agent resigns, is replaced, or is dissolved or if its property or business is taken under the control of any state or federal court or administrative body, a vacancy shall exist in the office of the Fiscal Agent, and the City shall appoint a successor within 30 days of such vacancy and shall mail notice of such appointment to the Bondholders and to the registered depositories at their registered addresses by first class mail, postage prepaid, within 30 days of such appointment.

Defaults and Statutory Remedies; Notice to Bondholders

If the City shall fail or neglect to pay or to cause to be paid the principal of, redemption premium, if any, or interest on any Bond or any Series of Bonds issued under the General Ordinance, whether at stated maturity or upon call for prior redemption, or if the City, after written notice to it, shall fail or neglect to make any payment owed by it as a result of a Credit Facility or Qualified Swap entered into with respect to Bonds and the provider of the Credit Facility or the Qualified Swap Provider provides written notification to the Fiscal Agent of such failure or neglect, or if the City shall fail to comply with any provision of any Bonds or with any covenant of the City contained in the General Ordinance, then, under and subject to the terms and conditions stated in the Act, the Holder or Holders of any Bond or Bonds shall be entitled to all of the rights and remedies, including the appointment of a trustee, provided in the Act; provided, however, that the remedy provided in Section 20(b)(4) of the Act may be exercised only upon the failure of the City to pay, when due, principal and redemption price (including principal due as a result of a scheduled mandatory redemption) and interest on a Series of Bonds.

Upon the occurrence of the event of default described above, or if an event occurs which could lead to a default with the passage of time and of which the Fiscal Agent has notice, the Fiscal Agent is required to, within 30 days, give written notice thereof by first-class mail to all Bondholders.

Remedies Not Exclusive; Effect of Delay in Exercise of Remedies

No remedy contained in the General Ordinance or in the Act conferred upon or reserved to the trustee, if any, or to the Holder of any Bond is intended to be exclusive (except as specifically provided in the Act) of any other remedy or remedies, and each and every such remedy shall be cumulative, and shall be in addition to every other remedy given under the General Ordinance or now or hereafter existing at law or in equity or by statute.

No delay or omission of a trustee, if one be appointed pursuant to Section 20 of the Act, or of any Holder of the Bonds to exercise any right or power accruing upon any default shall impair any such right or power or shall be construed to be a waiver of any such default, or an acquiescence therein; and every power and remedy provided with respect to an event of default under the General Ordinance, by the Act or otherwise may be exercised from time to time, and as often as may be deemed expedient.

Remedies to be Enforced Only Against Project Revenues

Any decree or judgment for the payment of money against the City by reason of default under the General Ordinance shall be enforceable only against the Project Revenues and the investments thereof and amounts on deposit in the funds and accounts (other than the Rebate Fund) established under the General Ordinance, and no decree or judgment against the City upon an action brought under the General Ordinance shall order or be construed to permit the occupation, attachment, seizure, or sale upon execution of any other property of the City.

Conveyance of System and Assignment, Assumption and Release

The General Ordinance provides that nothing in the General Ordinance is to prevent the City from conveying and assigning to a municipal authority created pursuant to the Municipality Authorities Act of 1945, as amended, or an authority created pursuant to any other applicable statute or to another entity (the "Authority") all or substantially all (or less than substantially all, as provided below) of its right, title and interest in the System and thereupon becoming released from all of its obligations under the General Ordinance, under any Supplemental Ordinance and under the Bonds and related obligations, including, but not limited to, Credit Facilities, Qualified Swaps and Exchange Agreements, (i) if the Authority assumes in writing the City's obligations (1) to operate or cause the System to be operated and to maintain or cause the System to be maintained in good condition; and (2) to pay the principal, redemption premium, if any, and interest on all Bonds issued, and all payments due under Credit Facilities, Qualified Swaps and Exchange Agreements entered into, pursuant to the General Ordinance and then outstanding according to the terms thereof; and (ii) if the instrument of assumption provides the Bondholders or the trustee or entity serving in a similar capacity and acting on behalf of the Bondholders with the substantial equivalent of all of the rights and remedies provided in the General Ordinance and the Act; provided, however, that before the City may consummate such a conveyance and assignment and obtain a release of its obligations under the General Ordinance, under any Supplemental Ordinance and under the Bonds, certain conditions are required to have been satisfied, including, without limitation, (a) the receipt by the City and the Fiscal Agent of certain opinions of counsel, (b) the granting of a security interest by the Authority to the trustee or entity serving in a similar capacity on behalf of the Bondholders, (c) a report of a Consulting Engineer detailing, among other things, continued compliance with covenants relating to Debt Service Requirements and (d) the conveyance and assignment to the Authority of amounts in the funds and accounts established under the General Ordinance. Upon a conveyance of all or substantially all of the assets of the System to the Authority, the General Ordinance provides that the provisions of the General Ordinance are to cease being enforceable against the City.

Amendments and Modifications

In addition to the enactment of Supplemental Ordinances supplementing or amending the General Ordinance in connection with the issuance of successive Series of Bonds, the General Ordinance provides that the General Ordinance and any Supplemental Ordinance may be further supplemented, modified or amended: (a) to cure any ambiguity, formal defect or omission therein or to make such provisions in regard to matters or questions arising thereunder which shall not be inconsistent with the provisions thereof and which shall not adversely affect the interests of Bondholders; (b) to grant to or confer upon Bondholders, or a trustee, if any, for the benefit of Bondholders any additional rights, remedies, powers, authority, or security that may be lawfully granted or conferred; (c) to incorporate modifications requested by any Rating Agency to obtain or maintain a credit rating on any Series of Bonds; (d) to comply with any mandatory provision of state or federal law or with any permissive provision of such law or regulation which does not substantially impair the security or right to payment of the Bonds but no amendment or modification shall be made with respect to any Outstanding Bonds to alter the amount, rate or time of payment, respectively, of the principal thereof or the interest thereon or to alter the redemption provisions thereof without the written consent of the Holders of all affected Outstanding Bonds; and (e) except as aforesaid, in such other respect as may be authorized in writing by the Holders of 67% in principal amount or Original Value in the case of Capital Appreciation Bonds of the Bonds Outstanding and affected. In the case of a Credit Facility or Qualified Swap, if and to the extent provided in the Supplemental Ordinance and Determination of Bonds related thereto, the provider thereof may be the representative of the Bondholders of such Series or portion of such Series for purposes of Bondholder consent, approval or authorization. The written authorization of Bondholders of any supplement to or modification or amendment of the General Ordinance or any Supplemental Ordinance need not approve the particular form of any proposed supplement, modification or amendment but only the substance thereof. Bonds, the payment for which has been provided for upon the redemption thereof, are to be deemed to be not Outstanding.

Deposit of Funds for Payment of Bonds

When interest on, and principal or redemption price (as the case may be) of, all Bonds issued under the General Ordinance, and all amounts owed under any Credit Facility, Qualified Swap and Exchange Agreement entered into under the General Ordinance, have been paid, or there shall have been deposited with the Fiscal Agent or an entity which would qualify as a Fiscal Agent under the General Ordinance an amount, evidenced by moneys or Qualified Escrow Securities the principal of and interest on which, when due, will provide sufficient moneys to fully pay the Bonds at the maturity date or date fixed for redemption thereof, and all amounts owed under any Credit Facility, Qualified Swap and Exchange Agreement entered into under the General Ordinance, the pledge and grant of a security interest in the Project Revenues made under the General Ordinance shall cease and terminate, and the Fiscal Agent and any other depository of funds and accounts established under the General Ordinance shall turn over to the City or to such person, body or authority as may be entitled to receive the same all balances remaining in any such funds and accounts established under the General Ordinance.

If the City deposits with the Fiscal Agent or such other qualified entity moneys or Qualified Escrow Securities sufficient to pay the principal or redemption price of any particular Bond or Bonds becoming due, either at maturity or by call for redemption or otherwise, together with all interest accruing thereon to the due date, interest on the Bond or Bonds shall cease to accrue on the due date and all liability of the City with respect to such Bond or Bonds shall likewise cease, except as provided in the following paragraph. Thereafter such Bond or Bonds shall be deemed not to be outstanding under the General Ordinance and shall have recourse solely and exclusively to the funds so deposited for any claims of whatsoever nature with respect to such Bond or Bonds, and the Fiscal Agent or such other qualified entity shall hold such funds in trust for such Holder or Holders.

Moneys deposited with the Fiscal Agent or such other qualified entity pursuant to the preceding paragraphs which remain unclaimed two years after the date payment thereof becomes due shall, upon written request of the City, if the City is not at the time to the knowledge of the Fiscal Agent or such other qualified entity (the Fiscal Agent having no responsibility to independently investigate), in default with respect to any covenant in the General Ordinance or the Bonds contained, be paid to the City; and the Holders of the Bonds for which the deposit was made shall thereafter be limited to a claim against the City; provided, however, that before making any such payment to the City, the Fiscal Agent or such other qualified entity shall, at the expense of the City, publish in a newspaper of general circulation published in Philadelphia, Pennsylvania, 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 publication of such notice, the balance of such moneys then unclaimed will be paid to the City.

The provisions regarding the deposit of funds for the payment of Bonds stated above are not be construed to limit the procedure set forth in Section 10 of the Act for calculating the principal or redemption price of and interest on any Bonds for the purpose of ascertaining the sufficiency of revenues for the purpose of Sections 7(a)(5) and 8(a)(iii) of the Act and for the purpose of determining the outstanding net debt of the City if General Obligation Bonds of the City are refunded pursuant to the Act.

Maintenance of Tax Exempt Status of Bonds

No deposit of funds for the payment of bonds shall be made if, in the opinion of Bond Counsel, such action shall cause the interest on any Series of Bonds initially issued as tax exempt Bonds, to become subject to Federal income tax.

Nothing contained in the General Ordinance shall require any Series of Bonds to be structured so that interest on such Bonds will be excluded from income of the Holders thereof for the purpose of calculating Federal income tax; provided that the provisions contained in the General Ordinance are satisfied.

Interested Parties

The General Ordinance provides that nothing in the General Ordinance expressed or implied is intended or is to be construed to confer upon, or to give to, any person or corporation, other than the City, the Owners of the Bonds, the Fiscal Agent, each provider of a Credit Facility, and Qualified Swap, Standby Agreement and Remarketing Agreement, any right, remedy or claim under or by reason of the General Ordinance or any covenants, condition or stipulation thereof; and all the covenants, stipulations, promises and agreements in the General Ordinance contained by and on behalf of the City shall be for the sole and exclusive benefit of the City, the Fiscal Agent, the Owners of the Bonds, each provider of a Credit Facility, Qualified Swap, Standby Agreement and Remarketing Agreement.

Ordinances are Contracts With Bondholders

The General Ordinance and Supplemental Ordinances adopted pursuant to the General Ordinance are contracts with the Holders of all Bonds from time to time Outstanding thereunder and are enforceable in accordance with the provisions of the General Ordinance and the laws of Pennsylvania.

Effectiveness

The General Ordinance provides that it is to become effective as to the holders of Bonds only upon consent in writing of the owners of not less than 67% in principal amount of all Bonds outstanding at the time of such consent.

THE SIXTEENTH SUPPLEMENTAL ORDINANCE

A portion of the Series 2017B Bonds will be issued under and are subject to the Sixteenth Supplemental Ordinance, which supplements the provisions of the General Ordinance. Reference is made below to the Sixteenth Supplemental Ordinance and the General Ordinance, which provide more complete details of the terms of the Series 2017B Bonds. All capitalized and defined terms used in the following summary of the Sixteenth Supplemental Ordinance which are not otherwise defined in this Official Statement are defined as in the General Ordinance.

The Sixteenth Supplemental Ordinance was enacted pursuant to the Act and constitutes a Supplemental Ordinance enacted for the purpose of authorizing one or more Series of Bonds within the meaning of the General Ordinance.

The Sixteenth Supplemental Ordinance authorizes the Bond Committee, or a majority of them, on behalf of the City, to borrow, by the issuance and sale of one or more series or subseries of Bonds, a sum or sums which in aggregate principal amount shall not exceed $375,000,000, exclusive of original issue discount, and in the event such Bonds are issued with original issue discount, the Bond Committee is authorized to increase the aggregate principal amount of the Bonds so issued, by the amount of such original issue discount. In accordance with the General Ordinance, the Bond Committee, shall approve final terms of the Series 2017B Bonds in the Determination prior to, and as a condition of issuance of the Series 2017B Bonds. Such Determination shall be deemed a supplement to the Sixteenth Supplemental Ordinance.

The Bond Committee is authorized on behalf of the City to enter into agreements specified in the Determination (the "Enhancement Agreements") with any bank, insurance company or other appropriate entity providing credit enhancement or payment or liquidity sources (collectively a "Provider") for the account of the City for the Series 2017B Bonds, including, without limitation, letters of credit and bond insurance. Such Enhancement Agreements may provide for payment of the principal or purchase price of, or interest on, the Series 2017B Bonds if the City does not pay the Bonds when due and may provide for repayment with interest to the Provider from the date of such payment.

The Sixteenth Supplemental Ordinance authorizes the Bond Committee or the Director of Finance, as appropriate, to make all such covenants and to take any and all such other actions on behalf of the City as may be necessary or appropriate in connection with the consummation of the transactions contemplated in the Sixteenth Supplemental Ordinance.

The Sixteenth Supplemental Ordinance provides that the Series 2017B Bonds shall be sold either at public competitive sale to the highest bidder or bidders or at a private negotiated sale, as the Bond Committee shall determine to be in the best interest of the City. The Bonds may be sold in one or more Series or, as authorized by the General Ordinance and as specified by the Determination, in one or more subseries, each of which shall be deemed a Series for purposes of the General Ordinance and shall be designated by letter as a Series of Bonds of the year in which such Series is issued, and may include serial bonds, terms bonds, Capital Appreciation Bonds or derivative financial instruments as specified in the Determination.

The Sixteenth Supplemental Ordinance provides that the Series 2017B Bonds shall not pledge the credit or taxing power of the City, or create any debt, charge or lien against the tax, general revenues or property of the City other than the revenues pledged by the General Ordinance.

The Sixteenth Supplemental Ordinance provides that proceeds of the Series 2017B Bonds shall be used to: (a) refund and redeem all or any portion of the outstanding City of Philadelphia, Pennsylvania, Water and Wastewater Revenue Bonds (the "Refunded Bonds"); (b) if applicable, pay the costs of Enhancement Agreements and/or costs related to any Qualified Swap, including payments required in connection with the termination of all or a portion of a Qualified Swap relating to the Refunded Bonds; (c) pay any other Project Costs as such term is defined in the Act; and (d) pay the issuance costs of the Series 2017B Bonds.

Series 2017B Bond proceeds shall be deposited first in the Debt Reserve Account in an amount equal to the Debt Reserve Requirement to the extent that such requirement is not satisfied in whole or in part by available funds of the City or by a surety bond, insurance policy or letter of credit in accordance with the General Ordinance; all other Series 2017B Bond proceeds and other moneys currently on deposit under the General Ordinance, including current reserves and construction funds, shall be deposited or transferred as provided in a certificate of the Director of Finance.

The City covenants in the Sixteenth Supplemental Ordinance that, so long as any Series 2017B Bonds shall remain outstanding, it will make payments or cause payments to be made out of the Sinking Fund established pursuant to the General Ordinance or any of the other Water and Wastewater funds available therefor, at such times and in such amounts as shall be sufficient for the payment of the interest (including the Qualified Swap payments), if any on the Series 2017B Bonds and the principal thereof when due.

Prior to enactment of the Sixteenth Supplemental Ordinance by City Council, an opinion of the City Solicitor was filed with the City Council pursuant to the Act.

The Sixteenth Supplemental Ordinance authorizes the Director of Finance and any other applicable City officer to make such additional covenants and to take such other action with respect to the use and investment of the proceeds of the Series 2017B Bonds as may be necessary or advisable in order that the Series 2017B Bonds shall not be “arbitrage bonds” as defined in Section 148 of the Internal Revenue Code of 1986, as amended (the “Code”), that the City will comply with the requirements of Section 148 throughout the term of the Series 2017B Bonds as described in the Determination and in order to otherwise effect or maintain the exclusion of interest on the Series 2017B Bonds from gross income of the holders thereof for federal income tax purposes, and further to establish such sub-accounts within the Sinking Fund and terms or restrictions to permit issuance of the Series 2017B Bonds.

The Sixteenth Supplemental Ordinance authorizes the Director of Finance to execute and deliver a Continuing Disclosure Agreement (the “Continuing Disclosure Agreement”) meeting the requirements of Rule 15c2-12 promulgated under Securities Exchange Act of 1934. The City covenants and agrees that it will comply with and carry out all of the provisions of the Continuing Disclosure Agreement.

THE NINETEENTH SUPPLEMENTAL ORDINANCE

A portion of the Series 2017B Bonds will be issued under and are subject to the Nineteenth Supplemental Ordinance, which supplements the provisions of the General Ordinance. Reference is made below to the Nineteenth Supplemental Ordinance and the General Ordinance, which provide more complete details of the terms of the Series 2017B Bonds. All capitalized and defined terms used in the following summary of the Nineteenth Supplemental Ordinance which are not otherwise defined in this Official Statement are defined as in the General Ordinance.

The Nineteenth Supplemental Ordinance was enacted pursuant to the Act and constitutes a Supplemental Ordinance enacted for the purpose of authorizing one or more Series of Bonds within the meaning of the General Ordinance.

The Nineteenth Supplemental Ordinance authorizes the Bond Committee on behalf of the City, to borrow, by the issuance and sale of one or more series or subseries of Bonds, a sum or sums which in aggregate principal amount shall not exceed $300,000,000, exclusive of original issue discount, and in the event such Bonds are issued with original issue discount, the Bond Committee is authorized to increase the aggregate principal amount of the Bonds so issued, by the amount of such original issue discount. In accordance with the General Ordinance, the Bond Committee shall approve final terms of the Series 2017B Bonds in the Determination prior to, and as a condition of issuance of the Series 2017B Bonds. Such Determination shall be deemed a supplement to the Nineteenth Supplemental Ordinance.

The Bond Committee is authorized on behalf of the City to enter into agreements specified in the Determination (the “Enhancement Agreements”) with any bank, insurance company or other appropriate entity providing credit enhancement or payment or liquidity sources (collectively a “Provider”) for the account of the City for the Series 2017B Bonds, including, without limitation, letters of credit and bond insurance. Such Enhancement Agreements may provide for payment of the principal or purchase price of, or interest on, the Series 2017B Bonds if the City does not pay the Series 2017B Bonds when due and may provide for repayment with interest to the Provider from the date of such payment.

The Nineteenth Supplemental Ordinance authorizes the Bond Committee or the Director of Finance, as appropriate, to make all such covenants and to take any and all such other actions on behalf of the City as may be necessary or appropriate in connection with the consummation of the transactions contemplated in the Nineteenth Supplemental Ordinance.

The Nineteenth Supplemental Ordinance provides that the Series 2017B Bonds shall be sold either at public competitive sale to the highest bidder or bidders or at a private negotiated sale, as the Bond Committee shall determine to be in the best interest of the City. The Bonds may be sold in one or more Series or, as authorized by the General Ordinance and as specified by the Determination, in one or more subseries, each of which shall be deemed a Series for purposes of the General Ordinance and shall be designated by letter as a Series of Bonds of the year in which such Series is issued, and may include serial bonds, terms bonds, Capital Appreciation Bonds or derivative financial instruments as specified in the Determination.

The Nineteenth Supplemental Ordinance provides that the Series 2017B Bonds shall not pledge the credit or taxing power of the City, or create any debt, charge or lien against the tax, general revenues or property of the City other than the revenues pledged by the General Ordinance.

The Nineteenth Supplemental Ordinance provides that proceeds of the Series 2017B Bonds shall be used to: (a) refund and redeem all or any portion of the outstanding City of Philadelphia, Pennsylvania, Water and Wastewater Revenue Bonds (the "Refunded Bonds"); (b) if applicable, pay the costs of Enhancement Agreements and/or costs related to any Qualified Swap, including payments required in connection with the termination of all or a portion of a Qualified Swap relating to the Refunded Bonds; (c) pay any other Project Costs as such term is defined in the Act; and (d) pay the issuance costs of the Series 2017B Bonds.

Series 2017B Bond proceeds shall be deposited first in the Debt Reserve Account in an amount equal to the Debt Reserve Requirement to the extent that such requirement is not satisfied in whole or in part by available funds of the City or by a surety bond, insurance policy or letter of credit in accordance with the General Ordinance; all other Series 2017B Bond proceeds and other moneys currently on deposit under the General Ordinance, including current reserves and construction funds, shall be deposited or transferred as provided in a certificate of the Director of Finance.

The City covenants in the Nineteenth Supplemental Ordinance that, so long as any Series 2017B Bonds shall remain outstanding, it will make payments or cause payments to be made out of the Sinking Fund established pursuant to the General Ordinance or any of the other Water and Wastewater funds available therefor, at such times and in such amounts as shall be sufficient for the payment of the interest (including the Qualified Swap payments if any) on the Series 2017B Bonds and the principal thereof when due.

Prior to enactment of the Nineteenth Supplemental Ordinance by City Council, an opinion of the City Solicitor was filed with the City Council pursuant to the Act.

The Nineteenth Supplemental Ordinance authorizes the Director of Finance and any other applicable City officer to make such additional covenants and to take such other action with respect to the use and investment of the proceeds of the Series 2017B Bonds as may be necessary or advisable in order that the Series 2017B Bonds shall not be "arbitrage bonds" as defined in Section 148 of the Internal Revenue Code of 1986, as amended (the "Code"), that the City will comply with the requirements of Section 148 throughout the term of the Series 2017B Bonds as described in the Determination and in order to otherwise effect or maintain the exclusion of interest on the Series 2017B Bonds from gross income of the holders thereof for federal income tax purposes, and further to establish such sub-accounts within the Sinking Fund and terms or restrictions to permit issuance of the Series 2017B Bonds.

The Nineteenth Supplemental Ordinance authorizes the Director of Finance to execute and deliver a Continuing Disclosure Agreement (the "Continuing Disclosure Agreement") meeting the requirements of Rule 15c2-12 promulgated under Securities Exchange Act of 1934. The City covenants and agrees that it will comply with and carry out all of the provisions of the Continuing Disclosure Agreement.

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APPENDIX IV

GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA

The Bonds are payable solely from Project Revenues and monies deposited in the water and wastewater funds. The Bonds are special obligations of the City and do not pledge the full faith, credit or taxing power of the City, or create any debt or charge against the tax or general revenues of the City, or create any lien or charge against any property of the City other than against the Project Revenues and amounts, if any, at any time on deposit in the water and wastewater funds. This APPENDIX IV is included for purposes of providing general financial information regarding the City.

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THE GOVERNMENT OF THE CITY OF PHILADELPHIA

Introduction

The City of Philadelphia (the "City" or "Philadelphia") is located along the southeastern border of the Commonwealth of Pennsylvania (the "Commonwealth" or "Pennsylvania"). The City is the largest city in the Commonwealth and the sixth largest city in the United States with approximately 1.57 million residents (based on 2016 estimates). The City is also the center of the United States' seventh largest metropolitan statistical area, which is an 11-county area encompassing the City, Camden, NJ, and Wilmington, DE and represents approximately 6.07 million residents (based on 2016 estimates).

The City benefits from its strategic geographical location, relative affordability, cultural and recreational amenities, and its growing strength in key industries. The City is a business and personal services center with strengths in professional services, such as insurance, law, finance, healthcare and higher education, and leisure and hospitality. The cost of living in the City is relatively moderate compared to other major metropolitan areas in the northeast United States. In addition, the City, as one of the country's education centers, offers the business community a large and diverse labor pool.

The University of Pennsylvania, Temple University, Drexel University, St. Joseph's University, and La Salle University are certain of the well-known institutions of higher education located in the City. There are also a number of other well-known colleges and universities located near the City, notably including Villanova University, Bryn Mawr College, Haverford College, Swarthmore College, Lincoln University, and the Camden Campus of Rutgers University, among others.

The City is a center for health, education, research and science facilities. In the City, there are more than 30 hospitals, including the Children's Hospital of Philadelphia, Hospital of the University of Pennsylvania, Hahnemann University Hospital, Einstein Medical Center-Philadelphia, and Temple University Hospital, among others, and schools of medicine, dentistry, pharmacy, optometry, podiatry, and veterinary medicine.

Tourism is important to the City and is driven by the City's extraordinary historic and cultural assets. The City's Historic District includes Independence Hall, the Liberty Bell, Carpenters' Hall, the Betsy Ross House, and Elfreth's Alley, the nation's oldest residential street. The Parkway District includes the Philadelphia Museum of Art, the Barnes Foundation, and the Rodin Museum. The Avenue of the Arts, located along a mile-long section of South Broad Street between City Hall and Washington Avenue, includes the Kimmel Center, the Academy of Music, and other performing arts venues. All of the foregoing are key tourist attractions in the City.

For more information on the City's demographic and economic resources and economic development initiatives, see APPENDIX V hereto.

History and Organization

The City was incorporated in 1789 by an Act of the General Assembly of the Commonwealth (the "General Assembly") (predecessors of the City under charters granted by William Penn in his capacity as proprietor of the colony of Pennsylvania may date to as early as 1682). In 1854, the General Assembly, by an act commonly referred to as the Consolidation Act: (i) made the City's boundaries coterminous with the boundaries of Philadelphia County (the same boundaries that exist today) (the "County"); (ii) abolished all governments within these boundaries other than the City and the County; and (iii) consolidated the legislative functions of the City and the County. Article 9, Section 13 of the

Pennsylvania Constitution abolished all county offices in the City, provides that the City performs all functions of county government, and states that laws applicable to counties apply to the City.

Since 1952, the City has been governed under a Home Rule Charter authorized by the General Assembly (First Class City Home Rule Act, Act of April 21, 1949, P.L. 665, Section 17) and adopted by the voters of the City (as amended and supplemented, the "City Charter"). The City Charter provides, among other things, for the election, organization, powers and duties of the legislative branch (the "City Council") and the executive and administrative branch, as well as the basic rules governing the City's fiscal and budgetary matters, contracts, procurement, property, and records. Under Article XII of the City Charter, the School District of Philadelphia (the "School District") operates as a separate and independent home rule school district. Certain other constitutional provisions and Commonwealth statutes continue to govern various aspects of the City's affairs, notwithstanding the broad grant of powers of local self-government in relation to municipal functions set forth in the First Class City Home Rule Act.

Under the City Charter, there are two principal governmental entities in the City: (i) the City, which performs municipal and county functions; and (ii) the School District, which has boundaries coterminous with the City and responsibility for all public primary and secondary education.

The court system in the City, consisting of Common Pleas and Municipal Courts, is part of the Commonwealth judicial system. Although judges are paid by the Commonwealth, most other court costs are paid by the City, with partial reimbursement from the Commonwealth.

Elected and Appointed Officials

The Mayor is elected for a term of four years and is eligible to be elected for no more than two successive terms. Each of the seventeen members of City Council is also elected for a four-year term, which runs concurrently with that of the Mayor. There is no limitation on the number of terms that may be served by members of City Council. Of the members of City Council, ten are elected from districts and seven are elected at-large. No more than five of the seven at-large candidates for City Council may be nominated by any one party or political body. The District Attorney and the City Controller are elected at the mid-point of the terms of the Mayor and City Council.

The City Controller's responsibilities derive from the City Charter, various City ordinances and state and federal statutes, and contractual arrangements with auditees. The City Controller must follow Generally Accepted Government Auditing Standards, established by the federal Government Accountability Office (formerly known as the General Accounting Office), and Generally Accepted Auditing Standards, promulgated by the American Institute of Certified Public Accountants.

The City Controller post-audits and reports on the City's and the School District's Comprehensive Annual Financial Reports ("CAFRs"), federal assistance received by the City, and the performance of City departments. The City Controller also conducts a pre-audit program of City expenditure documents required to be submitted for approval, such as invoices, payment vouchers, purchase orders and contracts. Documents are selected for audit by category and statistical basis. The Pre-Audit Division verifies that expenditures are authorized and accurate in accordance with the City Charter and other pertinent legal and contractual requirements before any moneys are paid by the City Treasurer. The Pre-Audit Technical Unit, consisting of auditing and engineering staff, inspects and audits capital project design, construction and related expenditures. Other responsibilities of the City Controller include investigation of allegations of fraud, preparation of economic reports, certification of the City's debt capacity and the capital nature and useful life of the capital projects, and opining to the Pennsylvania Intergovernmental Cooperation Authority ("PICA") on the reasonableness of the assumptions and estimates in the City's five-year financial plans.

Under the City Charter, the principal officers of the City's government are the Managing Director of the City (the "Managing Director"), the Director of Finance of the City (the "Director of Finance"), the City Solicitor (the "City Solicitor"), the Director of Commerce (the "Director of Commerce"), the City Representative (the "City Representative"), and the Director of Planning and Development (the "Director of Planning and Development"). Under the City Charter, the Mayor appoints the Managing Director, the Director of Finance, the Director of Commerce, the City Representative, and the Director of Planning and Development. The Mayor, with the advice and consent of a majority of City Council, also appoints the City Solicitor.

The Managing Director, in coordination with the senior officials of City departments and agencies, is responsible for supervising the operating departments and agencies of the City that render the City's various municipal services. The Director of Commerce is charged with the responsibility of promoting and developing commerce and industry. The City Representative is the Ceremonial Representative of the City and especially of the Mayor. The City Representative is charged with the responsibility of giving wide publicity to any items of interest reflecting the activities of the City and its inhabitants, and for the marketing and promotion of the image of the City. The Director of Planning and Development oversees the Department of Planning and Development, which includes three divisions: (i) the Division of Development Services; (ii) the Division of Planning and Zoning; and (iii) the Division of Housing and Community Development.

The City Solicitor is head of the Law Department and acts as legal advisor to the Mayor, City Council, and all of the agencies of the City government. The City Solicitor is also responsible for: (i) advising on legal matters pertaining to all of the City's contracts and bonds; (ii) assisting City Council, the Mayor, and City agencies in the preparation of ordinances for introduction in City Council; and (iii) conducting litigation involving the City.

The Director of Finance is the chief financial and budget officer of the City and is selected from three names submitted to the Mayor by a Finance Panel, which is established pursuant to the City Charter and is comprised of the President of the Philadelphia Clearing House Association, the Chairman of the Philadelphia Chapter of the Pennsylvania Institute of Certified Public Accountants, and the Dean of the Wharton School of Finance and Commerce of the University of Pennsylvania. Under Mayor Kenney's administration, the Director of Finance is responsible for the financial functions of the City, including: (i) development of the annual operating budget, the capital budget, and capital program; (ii) the City's program for temporary and long-term borrowing; (iii) supervision of the operating budget's execution; (iv) the collection of revenues through the Department of Revenue; (v) the oversight of pension administration as Chairperson of the Board of Pensions and Retirement; and (vi) the supervision of the Office of Property Assessment. The Director of Finance is also responsible for the appointment and supervision of the City Treasurer, whose office manages the City's debt program and serves as the disbursing agent for the distribution of checks and electronic payments from the City Treasury and the management of cash resources.

The following are brief biographies of Mayor Kenney, his Chief of Staff, the Director of Finance, and the City Treasurer.

James F. Kenney, Mayor. On November 3, 2015, James F. Kenney was elected as the City's 99th Mayor and was sworn into office on January 4, 2016. Mayor Kenney is a lifelong resident of the City and a graduate of La Salle University. In 1991, Mayor Kenney was elected to serve as a Democratic City Councilman At-Large and was a member of City Council for 23 years.

Jane Slusser, Chief of Staff. Ms. Slusser was the campaign manager for Mayor Kenney's mayoral campaign. Previously, Ms. Slusser was Organizing Director at Equality Pennsylvania and led

Human Rights Campaign's Americans for Workplace Opportunity statewide campaign in Pennsylvania. In 2008 and 2012, Ms. Slusser worked on President Obama's campaigns in South Philadelphia and Northeastern Pennsylvania. Ms. Slusser is a graduate of Barnard College.

Rob Dubow, Director of Finance. Mr. Dubow has served as Director of Finance since being appointed on January 7, 2008. Prior to that appointment, Mr. Dubow was the Executive Director of PICA. He has also served as Executive Deputy Budget Secretary of the Commonwealth, from 2004 to 2005, and as Budget Director for the City, from 2000 to 2004.

Rasheia Johnson, City Treasurer. Ms. Johnson was appointed as City Treasurer on January 19, 2016. Ms. Johnson has over 15 years of experience in government and public finance. In public finance, she has worked in the capacities of investment banker, financial advisor, and issuer officer, including positions at Siebert Brandford Shank, Loop Capital Markets, and Public Financial Management, and as Assistant to the Director of Finance for Debt Management for the City.

Government Services

Municipal services provided by the City include: (i) police and fire protection; (ii) health care; (iii) certain welfare programs; (iv) construction and maintenance of local streets, highways, and bridges; (v) trash collection, disposal and recycling; (vi) provision for recreational programs and facilities; (vii) maintenance and operation of the water and wastewater systems (the "Water and Wastewater Systems"); (viii) acquisition and maintenance of City real and personal property, including vehicles; (ix) maintenance of building codes and regulation of licenses and permits; (x) maintenance of records; (xi) collection of taxes and revenues; (xii) purchase of supplies and equipment; (xiii) construction and maintenance of airport facilities (the "Airport System"); and (xiv) maintenance of a prison system. The City maintains enterprise funds – the Water Fund and the Aviation Fund – for each of the Water and Wastewater Systems and the Airport System. For information on the Water and Wastewater Systems, see APPENDIX V – "KEY CITY-RELATED SERVICES AND BUSINESSES – Water and Wastewater." For information on the Airport System, see APPENDIX V – "TRANSPORTATION – Airport System."

The City owns the assets that comprise the Philadelphia Gas Works ("PGW" or the "Gas Works"). PGW serves residential, commercial, and industrial customers in the City. PGW is operated by Philadelphia Facilities Management Corporation ("PFMC"), a non-profit corporation specifically organized to manage and operate PGW for the benefit of the City. For more information on PGW, see "PGW PENSION PLAN," "PGW OTHER POST-EMPLOYMENT BENEFITS," "EXPENDITURES OF THE CITY – PGW Annual Payments," and "LITIGATION – PGW," among others.

Local Government Agencies

There are a number of governmental authorities and quasi-governmental non-profit corporations that also provide services within the City. Certain of these entities are comprised of governing boards, the members of which are either appointed or nominated, in whole or part, by the Mayor, while others are independent of the Mayor's appointment or recommendation.

Mayoral-Appointed or Nominated Agencies

Philadelphia Industrial Development Corporation and Philadelphia Authority for Industrial Development. The Philadelphia Industrial Development Corporation ("PIDC") and the Philadelphia Authority for Industrial Development ("PAID"), along with the City's Commerce Department, coordinate the City's efforts to maintain an attractive business environment, attract new businesses to the City, and retain existing businesses. PIDC manages PAID's activities through a management agreement. Of the 30 members of the board of PIDC, eight are City officers or officials (the Mayor, the Managing Director, the Finance Director, the Commerce Director, the Director of Planning and Development, the City Solicitor, and two members of City Council), nine members are designated by the President of the Chamber of Commerce of Greater Philadelphia (the "Chamber of Commerce"), and the remaining 13 members are jointly designated by the Chamber of Commerce and the Commerce Director. The five-member board of PAID is appointed by the Mayor.

Philadelphia Municipal Authority. The Philadelphia Municipal Authority (formerly the Equipment Leasing Authority of Philadelphia) ("PMA") was originally established for the purpose of buying equipment and vehicles to be leased to the City. PMA's powers have been expanded to include any project authorized under applicable law that is specifically authorized by ordinance of City Council. PMA is governed by a five-member board appointed by City Council from nominations made by the Mayor.

Philadelphia Energy Authority. The Philadelphia Energy Authority ("PEA") was established by the City and incorporated in 2011 for the purpose of facilitating and developing energy generation projects, facilitating and developing energy efficiency projects, the purchase or facilitation of energy supply and consumer energy education. PEA is authorized to participate in projects on behalf of the City, other government agencies, institutions and businesses. PEA is governed by a five-member board appointed by City Council from four nominations made by the Mayor and one nomination from City Council.

Philadelphia Redevelopment Authority. The Philadelphia Redevelopment Authority (formerly known as the Redevelopment Authority of the City of Philadelphia) (the "PRA"), supported by federal funds through the City's Community Development Block Grant Fund and by Commonwealth and local funds, is responsible for the redevelopment of the City's blighted areas. PRA is governed by a five-member board appointed by the Mayor.

Philadelphia Land Bank. The Philadelphia Land Bank (the "PLB") was created in December 2013 with a mission to return vacant and tax delinquent property to productive reuse. The PLB is an independent agency formed under the authority of City ordinance and Pennsylvania law. The PLB has an 11-member board of directors, of which five are appointed by the Mayor and five are appointed by City Council. The final board member is appointed by a majority vote of the other board members. The City provides funds for its operations. For more information on the PLB, see APPENDIX V – "ECONOMIC DEVELOPMENT STRATEGIES AND IMPLEMENTATION – City and Quasi-City Economic Development Agencies – Philadelphia Land Bank."

Philadelphia Housing Authority. The Philadelphia Housing Authority (the "PHA") is a public body organized pursuant to the Housing Authorities Law of the Commonwealth and is neither a department nor an agency of the City. PHA is the fourth largest public housing authority in the United States and is responsible for developing and managing low and moderate income rental units and limited amounts of for-sale housing in the City. PHA is also responsible for administering rental subsidies to landlords who rent their units to housing tenants qualified by PHA for such housing assistance payments. PHA is governed by a nine-member Board of Commissioners, all of whom are appointed by the Mayor with the approval of a majority of the members of City Council. The terms of the Commissioners are concurrent with the term of the appointing Mayor. Two of the members of the Board are required to be PHA residents. For more information on PHA, see APPENDIX V – "ECONOMIC DEVELOPMENT STRATEGIES AND IMPLEMENTATION – City and Quasi-City Economic Development Agencies – The Philadelphia Housing Authority."

Hospitals and Higher Education Facilities Authority of Philadelphia. The Hospitals and Higher Education Facilities Authority of Philadelphia (the "Hospitals Authority") assists non-profit hospitals by financing hospital construction projects. The City does not own or operate any hospitals. The powers of the Hospitals Authority also permit the financing of construction of buildings and facilities for certain colleges and universities and other health care facilities and nursing homes. The Hospitals Authority is governed by a five-member board appointed by City Council from nominations made by the Mayor.

Southeastern Pennsylvania Transportation Authority. The Southeastern Pennsylvania Transportation Authority ("SEPTA"), which is supported by transit revenues and federal, Commonwealth, and local funds, is responsible for developing and operating a comprehensive and coordinated public transportation system in the southeastern Pennsylvania region. Two of the 15 members of SEPTA's board are appointed by the Mayor and confirmed by City Council. For more information on SEPTA, see "EXPENDITURES OF THE CITY – City Payments to SEPTA" and APPENDIX V – "TRANSPORTATION – Southeastern Pennsylvania Transportation Authority (SEPTA)."

Pennsylvania Convention Center Authority. The Pennsylvania Convention Center Authority (the "Convention Center Authority") constructed and maintains, manages, and operates the Pennsylvania Convention Center, which opened on June 25, 1993. The Pennsylvania Convention Center is owned by the Commonwealth and leased to the Convention Center Authority. An expansion of the Pennsylvania Convention Center was completed in March 2011. This expansion enlarged the Pennsylvania Convention Center to approximately 2,300,000 square feet with the largest contiguous exhibit space in the Northeast, the largest convention center ballroom in the East and the ability to host large tradeshows or two major conventions simultaneously.

Of the 15 members of the board of the Convention Center Authority, two are appointed by the Mayor and one by each of the President and Minority Leader of City Council. The Director of Finance is an ex-officio member of the Board with no voting rights. The Commonwealth, the City and the Convention Center Authority have entered into an operating agreement with respect to the operation and financing of the Pennsylvania Convention Center. In January 2014, SMG began managing and operating the Pennsylvania Convention Center, instituting a number of measures intended to reduce and control show costs and improve customer service. For more information on the Convention Center Authority, see "EXPENDITURES OF THE CITY – City Payments to Convention Center Authority."

The School District. The School District was established, pursuant to the First Class City Home Rule Education Act, by the Educational Supplement to the City Charter as a separate and independent home rule school district to provide free public education to the City's residents. Under the City Charter, the School District is governed by the Board of Education of the School District of Philadelphia (the "Board of Education"). During a period of distress following a declaration of financial distress by the Secretary of Education of the Commonwealth, all of the powers and duties of the Board of Education granted under the Public School Code of 1949, as amended (the "School Code"), or any other law are suspended and all of such powers and duties are vested in the School Reform Commission (the "School Reform Commission") created pursuant to the School Code. The School Reform Commission is granted all of the powers and duties of the Board of Education by the School Code, as well as all the powers and duties of a board of control under the School Code. The School Reform Commission is responsible for the operation, management, and educational program of the School District during such period. It is also responsible for financial matters related to the School District. The School District was declared distressed by the Secretary of Education of the Commonwealth pursuant to the School Code, effective December 22, 2001, and such declaration continues to be in effect.

The School Code provides that the members of the Board of Education continue to serve during the time the School District is governed by the School Reform Commission, and that the establishment of the School Reform Commission may not interfere with the regular selection of the members of the Board of Education. The School Code authorizes the School Reform Commission to delegate duties to the Board of Education if it so chooses. There has been no sitting Board of Education for many years. Two of the five members of the School Reform Commission are appointed by the Mayor and three by the Governor of the Commonwealth (the "Governor"), subject to confirmation by the Pennsylvania Senate.

Under the City Charter, the School District's governing body is required to levy taxes annually, within the limits and upon the subjects authorized by the General Assembly or City Council, in amounts sufficient to provide for operating expenses, debt service charges, and for the costs of any other services incidental to the operation of public schools. The School District has no independent power to authorize school taxes. Certain financial information regarding the School District is included in the City's CAFR.

Except during a period of distress following a declaration of financial distress by the Secretary of Education of the Commonwealth, as described above, the Board of Education consists of nine members appointed by the Mayor from a list supplied by an Educational Nominating Panel established in accordance with provisions set forth in the City Charter.

The School District is part of the Commonwealth system of public education. In a number of matters, including the incurrence of short-term and long-term debt, the School District is governed by the laws of the Commonwealth. The School District is a separate political subdivision of the Commonwealth, and the City has no property interest in or claim on any revenues or property of the School District. For more information on the School District, see "EXPENDITURES OF THE CITY – City Payments to School District."

Non-Mayoral-Appointed or Nominated Agencies

PICA. PICA was created by the Pennsylvania Intergovernmental Cooperation Authority Act for Cities of the First Class (the "PICA Act") in 1991 to provide financial assistance to cities of the first class, and it continues in existence for a period not exceeding one year after all of its liabilities, including the PICA Bonds (as defined herein), have been fully paid and discharged. The City is the only city of the first class in the Commonwealth. The Governor, the President pro tempore of the Pennsylvania Senate, the Minority Leader of the Pennsylvania Senate, the Speaker of the Pennsylvania House of Representatives, and the Minority Leader of the Pennsylvania House of Representatives each appoints one voting member of PICA's board. The Secretary of the Budget of the Commonwealth and the Director of Finance of the City serve as ex officio members of PICA's board with no voting rights.

In January 1992, the City and PICA entered into an Intergovernmental Cooperation Agreement (the "PICA Agreement"), pursuant to which PICA agreed to issue bonds from time to time, at the request of the City, for the purpose of funding, among other things, deficits in the General Fund and a debt service reserve. See "DEBT OF THE CITY – PICA Bonds."

Under the PICA Act and for so long as any PICA Bonds are outstanding, the City is required to submit to PICA: (i) a five-year financial plan on an annual basis; and (ii) quarterly financial reports, each as further described below under "DISCUSSION OF FINANCIAL OPERATIONS – Five-Year Plans of the City" and "– Quarterly Reporting to PICA." Under the PICA Act, at such time when no PICA Bonds are outstanding, the City will no longer be required to prepare such annual financial plans or quarterly reports. See "DEBT OF THE CITY – PICA Bonds" for the current final stated maturities of outstanding PICA Bonds.

The PICA Act and the PICA Agreement provide PICA with certain financial and oversight functions. PICA has the power to exercise certain advisory and review procedures with respect to the City's financial affairs, including the power to review and approve the five-year financial plans prepared by the City, and to certify non-compliance by the City with the then-existing five-year plan. PICA is also required to certify non-compliance if, among other things, no approved five-year plan is in place or if the City has failed to file mandatory revisions to an approved five-year plan. Under the PICA Act, any such certification of non-compliance would, upon certification by PICA, require the Secretary of the Budget of the Commonwealth to withhold funds due to the City from the Commonwealth or any of its agencies (including, with certain exceptions, all grants, loans, entitlements, and payments payable to the City by the Commonwealth, including payment of the portion of the PICA Tax, as further described under "DEBT OF THE CITY – PICA Bonds" below, otherwise payable to the City).

Philadelphia Parking Authority. The Philadelphia Parking Authority (the "PPA") is responsible for: (i) the construction and operation of parking facilities in the City and at Philadelphia International Airport ("PHL"); and (ii) enforcement of on-street parking regulations. The members of the PPA's board are appointed by the Governor, with certain nominations from the General Assembly. For more information on the PPA, see "REVENUES OF THE CITY – Philadelphia Parking Authority Revenues."

DISCUSSION OF FINANCIAL OPERATIONS

Principal Operations

The major financial operations of the City are conducted through the General Fund. In addition to the General Fund, operations of the City are conducted through two other major governmental funds and 19 non-major governmental funds. The City operates on a July 1 to June 30 fiscal year ("Fiscal Year") and reports on all the funds of the City, as well as its component units, in the City's CAFR. PMA's and PICA's financial statements are blended with the City's statements. The financial statements for PGW, PRA, the PPA, the School District, the Community College of Philadelphia, the Community Behavioral Health, Inc., the Delaware River Waterfront Corporation, and PAID are presented discretely.

Fund Accounting

Funds are groupings of activities that enable the City to maintain control over resources that have been segregated for particular purposes or objectives. All of the funds of the City can be divided into three categories: governmental funds, proprietary funds and fiduciary funds.

Governmental Funds. The governmental funds are used to account for the financial activity of the City's basic services, such as: general government; economic and neighborhood development; public health, welfare and safety; cultural and recreational; and streets, highways and sanitation. The funds' financial activities focus on a short-term view of the inflows and outflows of spendable resources, as well as on the balances of spendable resources available at the end of the Fiscal Year. The financial information presented for the governmental funds is useful in evaluating the City's short-term financing requirements.

The City maintains 22 individual governmental funds. The City's CAFRs, including the City's CAFR for Fiscal Year 2016 (the "Fiscal Year 2016 CAFR"), present data separately for the General Fund, Grants Revenue Fund, and Health Choices Behavioral Health Fund, which are considered to be major funds. Data for the remaining 19 funds are combined into a single aggregated presentation.

Proprietary Funds. The proprietary funds are used to account for the financial activity of the City's operations for which customers are charged a user fee; they provide both a long- and short-term view of financial information. The City maintains three enterprise funds that are a type of proprietary fund – airport, water and wastewater operations, and industrial land bank.

Fiduciary Funds. The City is the trustee, or fiduciary, for its employees' pension plans. It is also responsible for PGW's employees' retirement reserve assets. Both of these fiduciary activities are reported in the City's CAFRs, including the Fiscal Year 2016 CAFR, as separate financial statements of fiduciary net assets and changes in fiduciary net assets.

See "CITY FINANCES AND FINANCIAL PROCEDURES" for a further description of these governmental, proprietary, and fiduciary funds.

Budget Procedure

At least 90 days before the end of the Fiscal Year, the operating budget for the next Fiscal Year is prepared by the Mayor and submitted to City Council for adoption. The budget, as adopted, must be balanced and provide for discharging any estimated deficit from the current Fiscal Year and make appropriations for all items to be funded with City revenues. The Mayor's budgetary estimates of revenues for the ensuing Fiscal Year and projection of surplus or deficit for the current Fiscal Year may not be altered by City Council. Not later than the passage of the operating budget ordinance, City Council must enact such revenue measures as will, in the opinion of the Mayor, yield sufficient revenues to balance the budget.

At least 30 days before the end of the Fiscal Year, City Council must adopt by ordinance an operating budget and a capital budget for the ensuing Fiscal Year and a capital program for the six ensuing Fiscal Years. If the Mayor disapproves the bills, he must return them to City Council with the reasons for his disapproval at the first meeting thereof held not less than ten days after he receives such bills. If the Mayor does not return the bills within the time required, they become law without his approval. If City Council passes the bills by a vote of two-thirds of all of its members within seven days after the bills have been returned with the Mayor's disapproval, they become law without his approval. While the City Charter requires that City Council adopt the ordinances for the operating and capital budgets at least 30 days before the end of the Fiscal Year, in practice, such ordinances are often adopted after such deadline, but before the end of such Fiscal Year. For example, the City's Fiscal Year 2018 operating budget ordinance was presented to City Council on March 2, 2017, approved by City Council on June 15, 2017, and signed by the Mayor on June 21, 2017. There is no practical consequence to adopting the budget ordinances after the deadline in the City Charter, but before the end of the Fiscal Year.

The capital program is prepared annually by the City Planning Commission to present the capital expenditures planned for each of the six ensuing Fiscal Years, including the estimated total cost of each project and the sources of funding (local, state, federal, and private) estimated to be required to finance each project. The capital program is reviewed by the Mayor and transmitted to City Council for adoption with his recommendation thereon. The Capital Program ordinance for Fiscal Years 2018-2023 (the "Adopted Capital Program") was approved by City Council on June 15, 2017, and signed by the Mayor on June 21, 2017.

The capital budget ordinance, authorizing in detail the capital expenditures to be made or incurred in the ensuing Fiscal Year from City Council appropriated funds, is adopted by City Council concurrently with the capital program. The capital budget must be in full conformity with that part of the capital program applicable to the Fiscal Year that it covers.

For information on the City's Fiscal Year 2017 Adopted Budget (as defined below), see "– Summary of Operations" and "– Current Financial Information" herein. For information on the City's Fiscal Year 2018 Adopted Budget (as defined below), see "– Current Financial Information – Fiscal Year 2018 Adopted Budget and Twenty-Sixth Five-Year Plan" herein. For information on the City's capital program, see "CITY CAPITAL PROGRAM" herein.

Budget Stabilization Reserve

In April 2011, the City adopted an amendment to the City Charter that established the "Budget Stabilization Reserve." The City Charter provides that the annual operating budget ordinance is required to provide for appropriations to a Budget Stabilization Reserve, to be created and maintained by the Director of Finance as a separate fund, which may not be commingled with any other funds of the City. Appropriations to the Budget Stabilization Reserve are required to be made each Fiscal Year if the projected General Fund balance for the upcoming Fiscal Year equals or exceeds three percent of General Fund appropriations for such Fiscal Year. City Council can appropriate additional amounts to the Budget Stabilization Reserve by ordinance, no later than at the time of passage of the annual operating budget ordinance and only upon recommendation of the Mayor. Total appropriations to the Budget Stabilization Reserve are subject to a limit of five percent of General Fund appropriations. Amounts in the Budget Stabilization Reserve from the prior Fiscal Years, including any investment earnings certified by the Director of Finance, are to remain on deposit therein.

Since the establishment of the Budget Stabilization Reserve, no annual operating budget ordinance has included a provision to fund the Budget Stabilization Reserve because the conditions that would require the funding of such reserve have not been met.

Annual Financial Reports

The City is required by the City Charter to issue, within 120 days after the close of each Fiscal Year, a statement as of the end of the Fiscal Year showing the balances in all funds of the City, the amounts of the City's known liabilities, and such other information as is necessary to furnish a true picture of the City's financial condition (the "Annual Financial Reports"). The Annual Financial Reports, which are released on or about October 28 of each year, are intended to meet these requirements and are unaudited. As described above, the audited financial statements of the City are contained in its CAFR, which is published at a later date. The Annual Financial Reports contain financial statements for all City governmental funds and blended component units presented on the modified accrual basis. The proprietary and fiduciary funds are presented on the full accrual basis. They also contain budgetary comparison schedules for those funds that are subject to an annual budget. The financial statements of the City's discretely presented component units that are available as of the date of the Annual Financial Reports are also presented. Historically, the results for General Fund fund balance have not materially changed between the Annual Financial Reports and the CAFRs.

The Annual Financial Report for Fiscal Year 2016 was released on October 26, 2016. The Fiscal Year 2016 CAFR was filed with the Municipal Securities Rulemaking Board ("MSRB") on February 24, 2017. See "CITY FINANCES AND FINANCIAL PROCEDURES – Current City Disclosure Practices."

Five-Year Plans of the City

The PICA Act requires the City to annually prepare a financial plan that includes projected revenues and expenditures of the principal operating funds of the City for five Fiscal Years consisting of the current Fiscal Year and the subsequent four Fiscal Years. Each five-year plan, which must be approved by PICA, is required to, among other things, eliminate any projected deficits, balance the Fiscal

Year budgets and provide procedures to avoid fiscal emergencies. For information on the Modified Twenty-Fifth Five-Year Plan (as defined below), see "– Current Financial Information – Fiscal Year 2017 Adopted Budget and Modified Twenty-Fifth Five-Year Plan." For information on the Twenty-Sixth Five-Year Plan (as defined below), see "– Current Financial Information – Fiscal Year 2018 Adopted Budget and Twenty-Sixth Five-Year Plan."

Quarterly Reporting to PICA

The PICA Act requires the City to prepare and submit quarterly reports to PICA so that PICA may determine whether the City is in compliance with the then-current five-year plan. Each quarterly report is required to describe actual or current estimates of revenues, expenditures, and cash flows compared to budgeted revenues, expenditures, and cash flows by covered funds for each month in the previous quarter and for the year-to-date period from the beginning of the then-current Fiscal Year of the City to the last day of the fiscal quarter or month, as the case may be, just ended. Each such report is required to explain any variance existing as of such last day.

Under the PICA Agreement, a "variance" is deemed to have occurred as of the end of a reporting period if (i) a net adverse change in the fund balance of a covered fund (i.e., a principal operating fund) of more than 1% of the revenues budgeted for such fund for that Fiscal Year is reasonably projected to occur, such projection to be calculated from the beginning of the Fiscal Year for the entire Fiscal Year, or (ii) the actual net cash flows of the City for a covered fund are reasonably projected to be less than 95% of the net cash flows of the City for such covered fund for that Fiscal Year originally forecast at the time of adoption of the budget, such projection to be calculated from the beginning of the Fiscal Year for the entire Fiscal Year.

PICA may not take any action with respect to the City for variances if the City: (i) provides a written explanation of the variance that PICA deems reasonable; (ii) proposes remedial action that PICA believes will restore overall compliance with the then-current five-year plan; (iii) provides information in the immediately succeeding quarterly financial report demonstrating to the reasonable satisfaction of PICA that the City is taking remedial action and otherwise complying with the then-current five-year plan; and (iv) submits monthly supplemental reports until it regains compliance with the then-current five-year plan.

PICA last declared a variance in February 2009 and that variance was cured. A failure by the City to explain or remedy a variance would, upon certification by PICA, require the Secretary of the Budget of the Commonwealth to withhold funds due to the City from the Commonwealth or any of its agencies (including, with certain exceptions, all grants, loans, entitlements and payments payable to the City by the Commonwealth, including payment of the portion of the PICA Tax, as further described under "DEBT OF THE CITY – PICA Bonds" below, otherwise payable to the City). The City uses its Quarterly City Manager's Reports to satisfy the quarterly reporting requirement to PICA. Such reports are released within 45 days following the end of the applicable quarter and the most recent versions of such reports are available on the City's Investor Website (as defined herein). The most recent Quarterly City Manager's Report is the report for the period ending March 31, 2017, which was released on May 15, 2017 (the "Third Quarter QCMR"). The next Quarterly City Manager's Report will be the report for the period ending June 30, 2017, and is expected to be released on or about August 15, 2017.

Summary of Operations

The following table presents the summary of operations for the General Fund for Fiscal Years 2013-2016, budgeted amounts and current estimates for Fiscal Year 2017, and budgeted amounts for Fiscal Year 2018. For a description of the legally enacted basis on which the City's budgetary process accounts for certain transactions, see "CITY FINANCES AND FINANCIAL PROCEDURES – Budgetary Accounting Practices." "Current Estimate," as used in the tables and text below, refers (except as otherwise indicated) to the most recently revised Fiscal Year 2017 estimate, which was published by the City on June 21, 2017, as part of the Twenty-Sixth Five-Year Plan.

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Table 1
General Fund
Summary of Operations (Legal Basis)
Fiscal Years 2013-2016 (Actual), 2017 (Adopted Budget and Current Estimate), and 2018 (Adopted Budget)
(Amounts in Millions of USD)[(1), (2)]

	Actual 2013	Actual 2014	Actual 2015	Actual 2016	Adopted Budget 2017	Current Estimate 2017	Adopted Budget 2018
Revenues							
Real Property Taxes[(3)]	540.5	526.4	536.4	571.6	594.9	583.1	651.5
Wage and Earnings Tax	1,221.5	1,261.6	1,325.8	1,373.0	1,418.1	1,421.0	1,464.6
Net Profits Tax	19.2	16.3	21.2	25.4	24.5	29.1	29.7
Business Income and Receipts Tax	450.9	461.7	438.2	474.2	441.6	435.1	489.9
Sales Tax[(4)]	257.6	263.1	149.5	169.4	177.5	186.6	198.1
Other Taxes[(5)]	243.7	266.9	305.9	353.0	369.1	354.1	372.2
Philadelphia Beverage Tax[(6)]	0.0	0.0	0.0	0.0	46.2	39.7	92.4
Total Taxes	2,733.5	2,795.9	2,777.0	2,966.6	3,071.9	3,048.7	3,298.3
Locally Generated Non-Tax Revenue	266.2	301.8	294.4	291.0	287.3	305.1	307.1
Revenue from Other Governments							
Net PICA Taxes Remitted to the City[(7)]	314.0	318.7	346.5	383.4	384.7	394.7	419.2
Other Revenue from Other Governments[(8)]	337.5	347.3	302.8	305.6	312.3	314.2	316.3
Total Revenue from Other Governments	651.5	666.0	649.3	689.1	697.0	709.0	735.5
Receipts from Other City Funds	46.8	42.0	39.0	42.3	75.6	75.4	64.2
Total Revenue	3,698.0	3,805.6	3,759.8	3,989.0	4,131.8	4,138.2	4,405.1
Obligations/Appropriations							
Personal Services	1,362.4	1,450.6	1,508.7	1,562.6	1,565.8	1,590.8	1,628.9
Purchase of Services[(9)]	757.8	787.6	810.6	822.2	896.9	887.5	935.1
Materials, Supplies and Equipment	85.4	88.8	90.6	92.1	109.1	109.1	105.7
Employee Benefits	1,119.1	1,194.1	1,099.5	1,181.3[(12)]	1,229.8[(13)]	1,258.6[(14)]	1,307.8[(15)]
Indemnities, Contributions, and Refunds[(10)]	138.3	208.6	150.7	192.7	189.4	189.4	196.0
City Debt Service[(11)]	118.9	122.5	132.0	132.1	154.0	154.0	157.3
Payments to Other City Funds	31.5	34.4	39.4	32.8	32.1	32.3	36.0
Advances & Miscellaneous Payments / Labor Reserve	0.0	0.0	0.0	0.0	10.0	0.0	20.0[(16)]
Advances & Miscellaneous Payments / Federal Funding Reserve	0.0	0.0	0.0	0.0	0.0	0.0	50.9[(16)]
Total Obligations/Appropriations	3,613.3	3,886.6	3,831.5	4,015.8	4,187.1	4,221.7	4,437.7
Operating Surplus (Deficit) for the Year	84.7	(80.9)	(71.7)	(26.8)	(55.3)	(83.5)	(32.6)
Net Adjustments – Prior Year	25.4	26.1	21.1	23.6	19.5	23.7	19.5
Cumulative Fund Balance Prior Year	146.8	256.9	202.1	151.5	76.1[(17)]	148.3[(17)]	88.6
Cumulative Adjusted Year End Fund Balance (Deficit)	256.9	202.1	151.5	148.3	40.3	88.6	75.5

(1) Sources: For Fiscal Years 2013-2016, the City's CAFRs for such Fiscal Years. For Fiscal Year 2017, the Fiscal Year 2017 Adopted Budget and the Twenty-Sixth Five-Year Plan. For Fiscal Year 2018, the Fiscal Year 2018 Adopted Budget and the Twenty-Sixth Five-Year Plan.
(2) Figures may not sum due to rounding.
(3) The amount for Fiscal Year 2013 reflects a 3.6% increase in the Real Estate Tax rate. The amounts for Fiscal Year 2014 and thereafter reflect a reduction in the Real Estate Tax rate, but also an increase in the assessed value of all taxable real property resulting from a citywide property reassessment. See "REVENUES OF THE CITY – Real Property Taxes Assessment and Collection."
(4) The amounts for Fiscal Years 2013-2014 reflect a 1% increase in the City Sales Tax effective October 8, 2009, which expired June 30, 2014. Fiscal Year 2015 figures include remaining 1% City Sales Tax, an additional $15,000,000 for debt service, plus any amounts designated for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(5) Includes Amusement Tax, Real Property Transfer Tax, Parking Lot Tax, Smokeless Tobacco Tax and miscellaneous taxes.
(6) The Philadelphia Beverage Tax (as defined herein) taxes the distribution of certain beverages at 1.5 cents per ounce and became effective January 1, 2017. See "REVENUES OF THE CITY – Other Taxes" for a discussion of litigation relating to the Philadelphia Beverage Tax.
(7) For a detailed breakdown of "Net PICA Taxes Remitted to the City," see Table 43. Such figures reflect revenues received by the City from the PICA Tax of 1.50%, the proceeds of which are remitted to PICA for payment of debt service on PICA bonds and PICA expenses. After paying debt service and expenses, net proceeds from the tax are remitted to the City as Revenue from Other Governments. See "DEBT OF THE CITY – PICA Bonds."
(8) For a detailed breakdown of "Other Revenue from Other Governments," see Table 12. "Other Revenue from Other Governments" includes state gaming revenues.
(9) Includes debt service on lease and service agreement financings.
(10) Includes contributions to the School District. See also Table 21 and the accompanying text herein.
(11) Includes debt service on General Obligation Debt (as defined herein) and tax and revenue anticipation notes; excludes debt service on PICA bonds and lease and service agreement financings.
(12) Includes $9.7 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(13) Assumes $13.7 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(14) Assumes $18.3 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(15) Assumes $24.0 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(16) The Labor Reserve is set aside for the potential costs of anticipated new labor agreements with certain of the City's municipal unions. See "EXPENDITURES OF THE CITY – Overview of City Employees." The Federal Funding Reserve is set aside to address certain federal funding that may become unavailable as a result of cuts in the federal budget or the implementation of other federal policies that may affect federal funding for the City.
(17) In the Fiscal Year 2017 Adopted Budget, the City estimated that Fiscal Year 2016 would end with a General Fund balance of $76.1 million. In the Fiscal Year 2016 CAFR, the City reported that Fiscal Year 2016 ended with a General Fund balance of $148.3 million and such number has been included in the current estimate for Fiscal Year 2017.

Current Financial Information

Table 2 below shows General Fund balances for Fiscal Year 2016, budgeted amounts and current estimates for Fiscal Year 2017, and budgeted amounts for Fiscal Year 2018.

Table 2
General Fund – Fund Balance Summary
(Amounts in Thousands of USD)[(1)]

	Fiscal Year 2016 Actual[(2)] (June 30, 2016)	Fiscal Year 2017 Adopted Budget[(3)] (June 20, 2016)	Fiscal Year 2017 Current Estimate[(4)] (June 21, 2017)	Fiscal Year 2018 Adopted Budget[(5)] (June 21, 2017)
REVENUES				
Taxes	$2,966,648	$3,071,895[(6)]	$3,048,694[(6)]	$3,298,332[(6)]
Locally Generated Non – Tax Revenues	290,990	287,291	305,120	307,058
Revenue from Other Governments	689,076	697,010	708,950	735,524
Revenues from Other Funds of City	42,253	75,571	75,426	64,191
Total Revenue	**$3,988,967**	**$4,131,767**	**$4,138,190**	**$4,405,105**
OBLIGATIONS / APPROPRIATIONS				
Personal Services	1,562,628	1,565,831	1,590,847	1,628,903
Personal Services – Employee Benefits	1,181,265[(7)]	1,229,794[(7)]	1,258,611[(7)]	1,307,799[(7)]
Purchase of Services[(8)]	822,159	896,926	887,459	935,078
Materials, Supplies, and Equipment	92,086	109,128	109,060	105,678
Contributions, Indemnities, and Taxes	192,729	189,395	189,445	196,010
Debt Service[(9)]	132,089	153,950	153,950	157,322
Payments to Other Funds	32,839	32,064	32,278	36,026
Advances & Miscellaneous Payments	0	10,000	0	70,893[(10)]
Total Obligations / Appropriations	**$4,015,795**	**$4,187,088**	**$4,221,650**	**$4,437,709**
Operating Surplus (Deficit)	**(26,828)**	**(55,321)**	**(83,460)**	**(32,604)**
OPERATIONS IN RESPECT TO PRIOR FISCAL YEARS				
Net Adjustments – Prior Years	23,612	19,500	23,741	19,500
Operating Surplus/(Deficit) & Prior Year Adj.	(3,216)	(35,821)	(59,719)	(13,104)
Prior Year Fund Balance	151,531	76,103[(11)]	148,315[(11)]	88,596
Year End Fund Balance	**$148,315**	**$40,282**	**$88,596**	**$75,492**

(1) Figures may not sum due to rounding.
(2) From the Fiscal Year 2016 CAFR.
(3) From the Fiscal Year 2017 Adopted Budget.
(4) From the Twenty-Sixth Five-Year Plan.
(5) From the Fiscal Year 2018 Adopted Budget.
(6) For Fiscal Year 2017 Adopted Budget, assumes $46.2 million in revenue from the Philadelphia Beverage Tax. For Fiscal Year 2017 Current Estimate, assumes $39.7 million in revenue from such tax. For Fiscal Year 2018 Adopted Budget, assumes $92.4 million in revenue from such tax. The Philadelphia Beverage Tax taxes the distribution of certain beverages at 1.5 cents per ounce and became effective January 1, 2017. See "REVENUES OF THE CITY – Other Taxes" for a discussion of litigation relating to the Philadelphia Beverage Tax.
(7) For Fiscal Year 2016 Actual, includes $9.7 million from City Sales Tax revenues for the Municipal Pension Fund. For Fiscal Year 2017 Adopted Budget, assumes $13.7 million from such tax revenues for the Municipal Pension Fund. For Fiscal Year 2017 Current Estimate, assumes $18.3 million from such tax revenues for the Municipal Pension Fund. For Fiscal Year 2018 Adopted Budget, assumes $24.0 million from such tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(8) Includes debt service on lease and service agreement financings.
(9) Includes debt service on General Obligation Debt (as defined herein) and tax and revenue anticipation notes; excludes debt service on PICA bonds and lease and service agreement financings.
(10) Includes (i) $20.0 million for the Labor Reserve, which is set aside for the potential costs of anticipated new labor agreements with certain of the City's municipal unions (see "EXPENDITURES OF THE CITY – Overview of City Employees"), and (ii) $50.9 million for the Federal Funding Reserve, which is set aside to address certain federal funding that may become unavailable as a result of cuts in the federal budget or the implementation of other federal policies that may affect federal funding for the City.
(11) In the Fiscal Year 2017 Adopted Budget, the City estimated that Fiscal Year 2016 would end with a General Fund balance of $76.103 million. In the Fiscal Year 2016 CAFR, the City reported that Fiscal Year 2016 ended with a General Fund balance of $148.315 million and such number has been included in the current estimate for Fiscal Year 2017.

The following discussion of the Fiscal Year 2017 Adopted Budget, the Modified Twenty-Fifth Five-Year Plan, the current estimate for Fiscal Year 2017, the Fiscal Year 2018 Adopted Budget, and the Twenty-Sixth Five-Year Plan, as applicable, is based, in part, on projections and forward-looking statements related to Fiscal Years 2017 and 2018. No assurance can be given that the applicable budget estimates and forward-looking statements will be realized. The accuracy of such budget estimates and forward-looking statements cannot be verified until after the close of the applicable Fiscal Year and the completion of the related audit.

Fiscal Year 2017 Adopted Budget and Modified Twenty-Fifth Five-Year Plan. On March 3, 2016, Mayor Kenney submitted his proposed Fiscal Year 2017 budget to City Council, along with the proposed five-year plan for Fiscal Years 2017-2021. On June 16, 2016, City Council approved the Fiscal Year 2017 operating budget ordinance, which was signed by the Mayor on June 20, 2016 (the "Fiscal Year 2017 Adopted Budget").

On August 8, 2016, the City submitted to PICA its modified FY 2017-2021 Five Year Financial Plan Per Council Approved Budget (the "Modified Twenty-Fifth Five-Year Plan"). PICA approved the Modified Twenty-Fifth Five-Year Plan on August 31, 2016.

In the Modified Twenty-Fifth Five-Year Plan, the City set forth certain priorities, including: (i) finding efficiencies to stretch taxpayer funds; (ii) increasing collection and revenue efforts; (iii) making investments in children and families; (iv) making investments in the City's workforce; (v) improving public safety; (vi) improving economic opportunities; and (vii) improving the City's neighborhoods.

Labor Agreements. The Modified Twenty-Fifth Five-Year Plan provides $30 million for increased labor obligations in Fiscal Year 2017 and $328.4 million through Fiscal Year 2021. In July 2016, a collective bargaining agreement was reached with American Federation of State, County and Municipal Employees District Council 33 ("AFSCME DC 33"), which provides for pension reforms coupled with salary increases, lump sum payments for health care, and a one-time bonus. This collective bargaining agreement was ratified on August 19, 2016. The costs of such agreement, along with the cost of the wage reopener with International Association of Fire Fighters ("IAFF") Local 22, the City's firefighter union, which resulted in a 3.25% wage increase in Fiscal Year 2017, are included within the $328.4 million set-aside. The $328.4 million included in the Modified Twenty-Fifth Five-Year Plan also provides additional resources for compensation changes for other unionized and non-unionized employees.

Fiscal Year 2017 Current Estimate. The current estimate for Fiscal Year 2017 is derived from information included in the Twenty-Sixth Five-Year Plan. In the Twenty-Sixth Five-Year Plan, the City estimates that it will end Fiscal Year 2017 with a General Fund balance (on the legally enacted basis) of approximately $88.6 million. Although such estimated General Fund balance is higher than projected in the Fiscal Year 2017 Adopted Budget, it is still far below levels recommended by government finance experts.

Fiscal Year 2018 Adopted Budget and Twenty-Sixth Five-Year Plan. On March 2, 2017, Mayor Kenney submitted his proposed Fiscal Year 2018 budget to City Council, along with the proposed five-year plan for Fiscal Years 2018-2022. On June 15, 2017, City Council approved the Fiscal Year 2018 operating budget ordinance, which was signed by the Mayor on June 21, 2017 (the "Fiscal Year 2018 Adopted Budget").

On June 19, 2017, the City submitted to PICA its FY 2018-2022 Five Year Financial Plan Per Council Approved Budget (the "Twenty-Sixth Five-Year Plan"). PICA approved the Twenty-Sixth Five-Year Plan on July 18, 2017. PICA staff, in recommending that PICA approve the Twenty-Sixth Five-Year Plan, noted that the revenue and expenditure projections presented in the Twenty-Sixth Five-Year Plan were [quoting from the PICA Act] "based on reasonable and appropriate assumptions and methods of estimation . . . consistently applied." The PICA staff report concluded that "PICA is confident that the [Twenty-Sixth Five-Year Plan] is based on reasonable assumptions, which will ultimately result in positive fund balances over each of the five years presented" in the Twenty-Sixth Five-Year Plan. The PICA report did, however, note that there are certain risk factors present, which include: (i) that the labor reserve of $200 million may not be sufficient if future labor contracts are on parity with the new AFSCME DC 33 contract; (ii) that the Twenty-Sixth Five-Year Plan's projections do not take into account the impact of a recession or the possibility of an economic downturn; (iii) the sensitivity of the projected investment return assumption on pension fund performance; and (iv) the School Reform Commission approval on June 20, 2017 of a three-year contract for the Philadelphia Federation of Teachers, which will cost approximately $395 million through Fiscal Year 2022, the funding for which is not in the City's nor the School District's current budget projections.

In the Twenty-Sixth Five-Year Plan, the City set forth certain priorities, including: (i) protecting the City's most vulnerable populations; (ii) increasing public safety in all neighborhoods; (iii) ensuring City government runs efficiently and effectively; (iv) improving economic opportunities for City residents; (v) making progress on initiatives funded by the Philadelphia Beverage Tax; and (vi) improving the fiscal health of the City with a focus on program-based budgeting and General Fund balance.

For Fiscal Years 2018-2022, the Twenty-Sixth Five-Year Plan projects that the City will end such Fiscal Years with General Fund balances (on the legally enacted basis) of $75.5 million (Fiscal Year 2018), $85.0 million (Fiscal Year 2019), $60.5 million (Fiscal Year 2020), $75.2 million (Fiscal Year 2021), and $123.1 million (Fiscal Year 2022). The City continues to face uncertainty regarding the pace of economic growth. The estimated General Fund balances in Fiscal Years 2018-2022, which are low, could lead to financial risk.

The Twenty-Sixth Five-Year Plan includes (i) a $200.0 million Labor Reserve for potential costs of anticipated new labor agreements with certain of the City's municipal unions (see "EXPENDITURES OF THE CITY – Overview of City Employees"), and (ii) a $274.6 million Federal Funding Reserve to address certain federal funding that may become unavailable as a result of cuts in the federal budget or the implementation of other federal policies that may affect federal funding for the City.

For more information on the City's annual budget process under the City Charter and the five-year financial plans and quarterly reporting required under the PICA Act, see "– Budget Procedure," "– Five-Year Plans of the City," and "– Quarterly Reporting to PICA."

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CITY FINANCES AND FINANCIAL PROCEDURES

Except as otherwise noted, the financial statements, tables, statistics, and other information shown below have been prepared by the Office of the Director of Finance and can be reconciled to the financial statements in the Fiscal Year 2016 CAFR and notes therein. The Fiscal Year 2016 CAFR was prepared by the Office of the Director of Finance in conformance with guidelines adopted by the Governmental Accounting Standards Board and the American Institute of Certified Public Accountants' audit guide, Audits of State and Local Government Units.

General

Governmental funds account for their activities using the current financial resources measurement focus and the modified accrual basis of accounting. Revenues are recognized as soon as they are both measurable and available. Revenues are considered to be available when they are collectible within the current period or soon enough thereafter to pay liabilities of the current period. For this purpose, the City considers revenues to be available if they are collected within 60 days of the end of the current fiscal period. Expenditures are generally recorded when a liability is incurred, as in the case of full accrual accounting. Debt service expenditures, as well as expenditures related to compensated absences and claims and judgments, are recorded only when payment is due; however, those expenditures may be accrued if they are to be liquidated with available resources.

Imposed non-exchange revenues, such as real estate taxes, are recognized when the enforceable legal claim arises and the resources are available. Derived tax revenues, such as wage, Business Income and Receipts Tax ("BIRT"), net profits and earnings taxes, are recognized when the underlying exchange transaction has occurred and the resources are available. Grant revenues are recognized when all the applicable eligibility requirements have been met and the resources are available. All other revenue items are considered to be measurable and available only when cash is received by the City.

Revenue that is considered to be program revenue includes: (i) charges to customers or applicants for goods received, services rendered or privileges provided; (ii) operating grants and contributions; and (iii) capital grants and contributions. Internally dedicated resources are reported as general revenues rather than as program specific revenues; therefore, all taxes are considered general revenues.

The City's financial statements reflect the following three funds as major Governmental Funds:

- The General Fund is the City's primary operating fund. It accounts for all financial resources of the general government, except those required to be accounted for in other funds.

- The Health Choices Behavioral Health Fund accounts for resources received from the Commonwealth. These resources are restricted to providing managed behavioral health care to residents of the City.

- The Grants Revenue Fund accounts for the resources received from various federal, Commonwealth, and private grantor agencies. The resources are restricted to accomplishing the various objectives of the grantor agencies.

In Fiscal Year 2012, the City transferred the majority of the Department of Human Services ("DHS") revenues and obligations to the Grants Revenue Fund.

The City also reports on permanent funds, which are used to account for resources legally held in trust for use by the park and library systems of the City. There are legal restrictions on the resources of the permanent funds that require the principal to remain intact, while only the earnings may be used for the programs.

The City reports on the following fiduciary funds:

- The Municipal Pension Fund accumulates resources to provide pension benefit payments to qualified employees of the City and certain other quasi-governmental organizations.

- The Philadelphia Gas Works Retirement Reserve Fund accounts for contributions made by PGW to provide pension benefit payments to its qualified employees under its pension plan. For more information on the PGW Pension Plan (as defined herein), see "PGW PENSION PLAN."

- The Escrow Fund accounts for funds held in escrow for various purposes.

- The Employees Health & Welfare Fund accounts for funds deducted from employees' salaries for payment to various organizations.

- The Departmental Custodial Accounts account for funds held in custody by various departments of the City.

The City reports on the following major proprietary funds:

- The Water Fund accounts for the activities related to the operation of the Water and Wastewater Systems.

- The Aviation Fund accounts for the activities of the Airport System.

Proprietary funds distinguish operating revenues and expenses from non-operating items. Operating revenues and expenses generally result from providing services and producing and delivering goods in connection with a proprietary fund's ongoing operations. The principal operating revenues of the Water Fund are charges for water and sewer service. The principal operating revenues of the Aviation Fund are charges for the use of the City's airports. Operating expenses for enterprise funds include the cost of sales and services, administrative expenses, and depreciation on capital assets. All revenues and expenses not meeting this definition are reported as non-operating revenues and expenses.

Current City Disclosure Practices

It is the City's practice to file its CAFR, which contains the audited combined financial statements of the City, in addition to certain other information, such as the City's bond ratings and information about upcoming debt issuances, with the MSRB as soon as practicable after delivery of such report. For bonds issued in calendar year 2015 and after, the annual filing deadline is February 28; for bonds issued prior to calendar year 2015, the annual filing deadline is 240 days after the end of the respective Fiscal Year, being February 25. The Fiscal Year 2016 CAFR was filed with the MSRB on February 24, 2017, through the MSRB's Electronic Municipal Market Access ("EMMA") system.

A wide variety of information concerning the City is available from publications and websites of the City and others, including the City's investor information website at http://www.phila.gov/investor (the "City's Investor Website"). Any such information that is inconsistent with the information set forth in this Official Statement should be disregarded. No such information is a part of or incorporated into this Official Statement.

Independent Audit and Opinion of the City Controller

The City Controller has examined and expressed opinions on the basic financial statements of the City contained in the Fiscal Year 2016 CAFR. The City Controller has not participated in the preparation of this Official Statement nor in the preparation of the budget estimates and projections and cash flow statements and forecasts set forth in various tables contained in this Official Statement. Consequently, the City Controller expresses no opinion with respect to any of the data contained in this Official Statement other than what is contained in the basic financial statements of the City in the Fiscal Year 2016 CAFR.

Budgetary Accounting Practices

The City's budgetary process accounts for certain transactions on a basis other than generally accepted accounting principles ("GAAP"). In accordance with the City Charter, the City has formally established budgetary accounting control for its operating and capital improvement funds.

The operating funds of the City, consisting of the General Fund, nine Special Revenue Funds (County Liquid Fuels Tax, Special Gasoline Tax, Health Choices Behavioral Health, Hotel Room Rental Tax, Grants Revenue, Community Development, Car Rental Tax, Acute Care Hospital Assessment and Housing Trust Funds) and two Enterprise Funds (Water and Aviation Funds), are subject to annual operating budgets adopted by City Council. These budgets appropriate funds for all City departments, boards and commissions by major class of expenditure within each department. Major classes are defined as: (i) personal services; (ii) purchase of services; (iii) materials and supplies; (iv) equipment; (v) contributions, indemnities, and taxes; (vi) debt service; (vii) payments to other funds; and (viii) advances and other miscellaneous payments. The appropriation amounts for each fund are supported by revenue estimates and take into account the elimination of accumulated deficits and the re-appropriation of accumulated surpluses to the extent necessary. All transfers between major classes (except for materials and supplies and equipment, which are appropriated together) must have City Council approval. Appropriations that are not expended or encumbered at year-end are lapsed.

The City's capital budget is adopted annually by City Council. The capital budget is appropriated by project for each department. Requests to transfer appropriations between projects must be approved by City Council. Any appropriations that are not obligated at year-end are either lapsed or carried forward to the next Fiscal Year.

Schedules prepared on the legally enacted basis differ from the GAAP basis in that both expenditures and encumbrances are applied against the current budget, adjustments affecting activity budgeted in prior years are accounted for through fund balance or as reduction of expenditures and certain interfund transfers and reimbursements are budgeted as revenues and expenditures. The primary difference between the GAAP and legal (budgetary) fund balance is due to the timing of recognizing the BIRT. The legal basis recognizes BIRT revenues in the Fiscal Year they are collected. The GAAP basis requires the City to recognize the BIRT revenues (which are primarily paid in April) for the calendar year in which the BIRT taxes are due, requiring the City to defer a portion of the April payment into the next Fiscal Year. For more information on BIRT, see "REVENUES OF THE CITY – Business Income and Receipts Tax."

REVENUES OF THE CITY

General

Prior to 1939, the City relied heavily on the real estate tax as the mainstay of its revenue system. In 1932, the General Assembly adopted an act (commonly referred to as the Sterling Act) under which the City is permitted to levy any tax that was not specifically pre-empted by the Commonwealth. Acting under the Sterling Act and other Pennsylvania legislation, the City has taken various steps over the years to reduce its reliance on real property taxes as a source of income, including: (i) enacting the wage, earnings, and net profits tax in 1939; (ii) introducing a sewer service charge to make the sewage treatment system self-sustaining after 1945; (iii) requiring under the City Charter that the water, sewer, and other utility systems be fully self-sustaining; (iv) enacting the Mercantile License Tax (a gross receipts tax on business done within the City) in 1952, which was replaced as of the commencement of Fiscal Year 1985 by the Business Privilege Tax (renamed the Business Income and Receipts Tax in May 2012), and (v) enacting the City Sales Tax (as defined herein) for City general revenue purposes effective beginning in Fiscal Year 1992.

Major Revenue Sources

The City derives its revenues primarily from various taxes, non-tax revenues, and receipts from other governments. See Table 3 for General Fund tax revenues for Fiscal Years 2013-2016, as well as the budgeted amounts and current estimates for Fiscal Year 2017 and the budgeted amounts for Fiscal Year 2018. The following discussion of the City's revenues does not take into account revenues in the non-debt related funds. The tax rates for Fiscal Years 2013 through 2016 are contained in the Fiscal Year 2016 CAFR.

Table 3 provides a detailed breakdown of the "Total Taxes" line from Table 1 above. Table 3 does not include "Revenues from Other Governments," which consists of "Net PICA Taxes Remitted to the City" and "Other Revenue from Other Governments." "Net PICA Taxes Remitted to the City" is set forth in Table 1 and a detailed breakdown of such revenues is shown in Table 43. "Other Revenue from Other Governments" is set forth in Table 1 and a detailed breakdown of such revenues is shown in Table 12.

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Table 3
General Fund Tax Revenues
Fiscal Years 2013-2016 (Actual), 2017 (Adopted Budget and Current Estimate), and 2018 (Adopted Budget)
(Amounts in Millions of USD) [(1), (2), (3)]

	Actual 2013	Actual 2014	Actual 2015	Actual 2016	Adopted Budget 2017	Current Estimate 2017	Adopted Budget 2018
Real Property Taxes[(4)]							
Current	$504.2	$483.9	$493.1	$521.2	$537.9	$533.5	$602.1
Prior	36.3	42.5	43.4	50.4	57.0	49.6	49.3
Total	$540.5[(4)]	$526.4	$536.4	$571.6	$594.9	$583.1	$651.5
Wage and Earnings Tax[(5)]							
Current	$1,219.5	$1,255.9	$1,318.8	$1,364.6	$1,411.1	$1,413.9	$1,457.4
Prior	2.0	5.7	7.1	8.4	7.0	7.0	7.2
Total	$1,221.5	$1,261.6	$1,325.8	$1,373.0	$1,418.1	$1,421.0	$1,464.6
Business Taxes							
Business Income and Receipts Tax							
Current & Prior	$450.9	$461.7	$438.2	$474.2	$441.6	$435.1	$489.9
Net Profits Tax							
Current	$17.2	$13.2	$14.7	$23.3	$21.4	$26.0	$26.6
Prior	1.9	3.1	6.5	2.1	3.1	3.1	3.1
Subtotal Net Profits Tax	$19.2	$16.3	$21.2	$25.4	$24.5	$29.1	$29.7
Total Business and Net Profits Taxes	$470.1	$478.0	$459.4	$499.6	$466.1	$464.2	$519.6
Other Taxes							
Sales and Use Tax[(6)]	$257.6	$263.1	$149.5	$169.4	$177.5	$186.6	$198.1
Amusement Tax	19.1	20.0	19.0	19.4	20.5	21.2	22.1
Real Property Transfer Tax	148.0	168.1	203.4	237.3	249.6	232.9	242.9
Parking Taxes	73.3	75.1	79.7	92.7	95.1	96.7	103.7
Other Taxes	3.4	3.7	3.8	3.6	3.9	3.4	3.4
Subtotal Other Taxes	$501.3	$530.0	$455.4	$522.4	$546.6	$540.7	$570.3
Philadelphia Beverage Tax[(7)]	0.0	0.0	0.0	0.0	46.2	39.7	92.4
TOTAL TAXES	$2,733.5	$2,795.9	$2,777.0	$2,966.6	$3,071.9	$3,048.7	$3,298.3

(1) Sources: For Fiscal Years 2013-2016, the City's CAFRs for such Fiscal Years. For Fiscal Year 2017, the Fiscal Year 2017 Adopted Budget and the Twenty-Sixth Five-Year Plan. For Fiscal Year 2018, the Fiscal Year 2018 Adopted Budget.

(2) See Table 7 in the Fiscal Year 2016 CAFR for tax rates.

(3) Figures may not sum due to rounding.

(4) The amount for Fiscal Year 2013 reflects a 3.6% increase in the Real Estate Tax rate. The amounts for Fiscal Year 2014 and thereafter reflect a reduction in the Real Estate Tax rate, but also an increase in the assessed value of all taxable real property resulting from a citywide property reassessment. See "– Real Property Taxes Assessment and Collection."

(5) Does not include the PICA Tax of 1.50%, the proceeds of which are remitted to PICA for payment of debt service on PICA Bonds and PICA expenses. After paying debt service and expenses, net proceeds from the tax are remitted to the City as Revenue from Other Governments. See "DEBT OF THE CITY – PICA Bonds" for a description of the PICA Tax.

(6) The amounts for Fiscal Years 2013-2014 reflect a 1% increase in the City Sales Tax effective October 8, 2009, which expired June 30, 2014. For Fiscal Years 2015-2018, figures include the remaining 1% City Sales Tax, an additional $15,000,000 for debt service, plus any amounts designated for the Municipal Pension Fund. See "– Sales and Use Tax."

(7) The Philadelphia Beverage Tax taxes the distribution of certain beverages at 1.5 cents per ounce and became effective January 1, 2017. See "– Other Taxes" for a discussion of litigation relating to the Philadelphia Beverage Tax.

Wage, Earnings, and Net Profits Taxes

The largest tax revenue source (comprising more than 45% of all tax revenues in Fiscal Year 2016) is the wage, earnings and net profits tax. The wage and earnings tax is collected from all employees working within City limits, and all City residents regardless of work location. The net profits tax is collected on the net profits from the operation of a trade, business, profession, enterprise or other activity conducted by individuals, partnerships, associations or estates and trusts within the City limits. The following table sets forth the resident and non-resident wage, earnings and net profits tax rates for Fiscal Years 2013-2018, the annual wage, earnings and net profits tax receipts in Fiscal Years 2013-2016, the budgeted amount and current estimate of such receipts for Fiscal Year 2017, and the budgeted amount of such receipts for Fiscal Year 2018.

Table 4
Summary of Wage, Earnings and Net Profits Tax Rates and Receipts
Fiscal Years 2013-2016 (Actual), 2017 (Adopted Budget and Current Estimate), and 2018 (Adopted Budget)[1]

Fiscal Year	Resident Wage, Earnings and Net Profits Tax Rates[2]	Non-Resident Wage, Earnings and Net Profits Tax Rates	Annual Wage, Earnings and Net Profits Tax Receipts (including PICA Tax) (Amounts in Millions of USD)[3]
2013	3.9280%	3.4985%	$1,617.2 (Actual)
2014	3.9240%	3.4950%	$1,662.3 (Actual)
2015	3.9200%	3.4915%	$1,755.5 (Actual)
2016	3.9102%	3.4828%	$1,842.9 (Actual)
2017	3.9004%	3.4741%	$1,892.6 (Adopted Budget) $1,910.1 (Current Estimate)
2018	3.8907%	3.4654%	$1,969.5 (Adopted Budget)

(1) See Table 7 in the Fiscal Year 2016 CAFR for tax rates.
(2) Includes PICA Tax. See "DEBT OF THE CITY – PICA Bonds" for a description of the PICA Tax.
(3) Sources: For Fiscal Years 2013-2016, the City's CAFRs for such Fiscal Years. For Fiscal Year 2017, the Fiscal Year 2017 Adopted Budget and the Twenty-Sixth Five-Year Plan. For Fiscal Year 2018, the Fiscal Year 2018 Adopted Budget.

Commonwealth funding from gaming revenues is mandated by statute to be used to reduce the resident and nonresident wage tax rate. Gaming revenues have averaged approximately $86.3 million in Fiscal Years 2013-2016. For Fiscal Year 2017, the budgeted amount and current estimate of gaming revenues is $86.3 million. For Fiscal Year 2018, the budgeted amount of gaming revenues is $86.3 million. The wage tax rates in such Fiscal Years reflect a rate reduction due to these revenues.

See "– Proposed Tax Rate Changes" for information regarding proposed wage and earnings tax rate reductions commencing in Fiscal Year 2018 under the Twenty-Sixth Five-Year Plan.

In a 2015 decision by the Supreme Court of the United States (*Comptroller of the Treasury of Maryland v. Wynne*, 135 S. Ct. 1787 (2015)), a state's failure to provide certain credits against its personal income tax was held to have violated the dormant Commerce Clause of the United States Constitution. Such personal income tax was applied to income earned outside of the state of residency, and residents were not given a credit for income taxes paid to the state where such income was earned, resulting, in the circumstances presented, in taxing income earned interstate at a rate higher than income earned intrastate. The City does not provide a credit to resident taxpayers against their respective wage, earnings, and net profits tax liabilities for similar taxes paid to another jurisdiction. Over the last two years, the City has paid approximately $350,000 in the aggregate to resident taxpayers in connection with this matter.

Business Income and Receipts Tax

In 1984, the Commonwealth passed legislation known as The First Class City Business Tax Reform Act of 1984, authorizing City Council to impose a business tax measured by gross receipts, net income or the combination of the two. The same year, City Council by ordinance repealed the Mercantile License Tax and the General Business Tax and imposed the Business Privilege Tax. As of May 1, 2012, the Business Privilege Tax was renamed the Business Income and Receipts Tax (the "BIRT"). Rental activities are usually considered to be business activities. Every estate or trust (whether the fiduciary is an individual or a corporation) must file a BIRT return if the estate or trust is engaged in any business or activity for profit within the City.

The BIRT allows for particular allocations and tax computations for regulated industries, public utilities, manufacturers, wholesalers and retailers. There are also credit programs where meeting the requirement of the program allows for a credit against the BIRT. All persons subject to both the BIRT and the net profits tax are entitled to apply a credit of 60% of the net income portion of their BIRT liability against what is due on the net profits tax to the maximum of the net profits tax liability for that tax year.

In November 2011, legislation was enacted to halt a previously enacted program of reducing the gross receipts portion of the BIRT and to commence reductions in the net income portion of the BIRT to take effect in tax year 2014 with changes phasing in through tax year 2023. The following table reflects such changes and provides a summary of BIRT rates for tax years 2012-2023. Future scheduled reductions in the net income portion of the BIRT remain subject to amendment by action of City Council and the Mayor.

Table 5
Summary of Business Income and Receipts Tax Rates

Tax Year	Gross Receipts	Net Income
2012	1.415 mills	6.45%
2013	1.415 mills	6.45%
2014	1.415 mills	6.43%
2015	1.415 mills	6.41%
2016	1.415 mills	6.39%
2017	1.415 mills	6.35%
2018	1.415 mills	6.30%
2019	1.415 mills	6.25%
2020	1.415 mills	6.20%
2021	1.415 mills	6.15%
2022	1.415 mills	6.10%
2023	1.415 mills	6.00%

In addition, the 2011 legislation incorporated several changes intended to help small and medium sized businesses and lower costs associated with starting a new business in order to stimulate new business formation and increase employment in the City, including the following: (i) the Commercial Activity License fee for all businesses was eliminated in 2014; (ii) business taxes for the first two years of operations for all new businesses with at least three employees in their first year and six employees in their second year were eliminated beginning in 2012; and (iii) across the board exclusions on the gross receipts portion of the BIRT were provided for all businesses phased in over a three-year period beginning in 2014 and eventually excluding the first $100,000 of gross receipts, along with proportional reductions in the net income portion of the BIRT. The legislation also provides for implementation of single sales factor apportionment in 2015, which enables businesses to pay BIRT based solely on sales in the City, rather than on property or payroll.

Real Property Taxes Assessment and Collection

A tax is levied on the assessed value of all taxable residential and commercial real property located within the City's boundaries (the "Real Estate Tax") as assessed by the Office of Property Assessment ("OPA") and collected by the Department of Revenue. Real Estate Taxes are allocated to the City and the School District with the millage split between the two taxes changing over the years.

Beginning in 2010, the City significantly changed the system used for assessing Real Estate Tax in Philadelphia. On May 18, 2010, Philadelphia voters approved an amendment to the City Charter that split the assessment and appeals functions, moving assessment functions into City government into a new agency, OPA, and creating an independent board of appeals, replacing the Board of Revision of Taxes ("BRT"), which previously combined both functions. OPA formally took over responsibility for assessments in October 2010. However, the Pennsylvania Supreme Court ruled on September 20, 2010, that without an amendment to state law, the City did not have the authority to replace the BRT in its capacity as an existing appeals board. Therefore, the BRT remains in place as the property assessment appeals board; but the separation of the appeals function from the assessment function, which removed an inherent conflict and was a key goal of the legislation, remains in place. The BRT is an independent, seven-member board appointed by the Board of Judges of the Philadelphia Common Pleas Court.

For tax year 2014, under the Actual Value Initiative ("AVI"), all 579,000 properties in Philadelphia were reassessed at their actual market value by OPA, replacing outdated values and inequities within the system. As the new total assessed value of all properties more accurately reflected the market in Philadelphia, the total assessment grew substantially. As a result, the Mayor and City Council significantly reduced the tax rate to ensure that the reassessment resulted in the collection of approximately the same amount of current year revenue as the prior year (the rates are shown in Table 6 below). Moreover, in order to make the tax bills more understandable, AVI removed the complicated fractional system. Prior to AVI, tax bills were calculated by multiplying the certified market value by an established predetermined ratio ("EPR") multiplied by the tax rate. The last applicable EPR was 32%.

The changes in the system had implications for most property owners in the City. Under the old assessment system, some properties were valued closer to their actual value than other properties. Properties that had been valued closer to their actual value saw relatively smaller increases in assessments and when those assessment changes were coupled with the much lower Real Estate Tax rate, they produced tax decreases. On the other hand, properties that were relatively undervalued saw tax increases, a small number of which were substantial.

In order to mitigate the hardship that could be created by those large increases, the ordinance imposing the new Real Estate Tax rates included a homestead exemption of $30,000 for all primary residential owner-occupants. Alternative programs are also available to reduce Real Estate Tax bills for homeowners, including the Longtime Owner-Occupant Program (LOOP) to provide relief to longtime owners with large increases and the ten-year tax abatement. In addition to the homestead exemption, the City has also instituted several other property tax relief programs for taxpayers.

The Real Estate Tax rates for tax years 2012-2018 are set forth in Table 6 below:

Table 6
Real Estate Tax Rates and Allocations

Tax Year	City	School District	Total
2012	4.1230%	5.3090%	9.4320%
2013	4.4620%	5.3090%	9.7710%
2014[1]	0.6018%	0.7382%	1.3400%
2015[1]	0.6018%	0.7382%	1.3400%
2016[1]	0.6317%	0.7681%	1.3998%
2017[1]	0.6317%	0.7681%	1.3998%
2018[1]	0.6317%	0.7681%	1.3998%

(1) The reduction of the Real Estate Tax rates from tax year 2013 to tax year 2014 and succeeding tax years reflects the City's Actual Value Initiative.

For Fiscal Year 2015, the actual amount of Real Estate Tax revenue for the City was $493.1 million (excluding delinquent collections). For Fiscal Year 2016, the actual amount of Real Estate Tax revenue for the City was $521.2 million (excluding delinquent collections). For Fiscal Year 2017, the current estimate of Real Estate Tax revenue for the City is $533.5 million (excluding delinquent collections). For Fiscal Year 2018, the budgeted amount of Real Estate Tax revenue for the City is $602.1 million (excluding delinquent collections). See Table 3 above. Real Estate Tax bills are sent in December for the following year and payments are due March 31. A discount of 1% is available for taxpayers who pay their Real Estate Taxes on or before the last day of February.

Table 7 shows the assessed values of properties used for tax year 2016 and 2017 Real Estate Taxes (both of which reflect the effect of AVI). Under AVI, the OPA certifies the market values by March 31 of the prior year (that is, for tax year 2016, the OPA certified the market values on March 31, 2015). Taxpayers base their appeals on the certified market values, and therefore, the assessed values are adjusted as the appeals are finalized. For budgetary purposes, the OPA provides an updated table to the Office of the Director of Finance in December, from which tax rates are proposed.

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Table 7
Certified Property Values for Tax Years 2016 and 2017

Tax Year 2016*

Category	Tax Status	Assessed Value	Taxable Assessed Value	Exempt Assessed Value	Number of Parcels
Residential	Fully Taxable	$26,264,061,193	$26,264,061,193	$0	227,060
Residential	Abatement	8,297,419,600	2,773,190,544	5,524,229,056	31,295
Residential	Exemption	32,665,233,808	25,863,433,627	6,801,800,181	214,564
Total		**$67,226,714,601**	**$54,900,685,364**	**$12,326,029,237**	**472,919**
Hotels and Apartments	Fully Taxable	$11,097,523,000	$11,097,523,000	$0	21,864
Hotels and Apartments	Abatement	2,519,189,900	803,639,111	1,715,550,789	1,326
Hotels and Apartments	Exemption	3,118,605,200	913,756,282	2,204,848,918	4,017
Total		**$16,735,318,100**	**$12,814,918,393**	**$3,920,399,707**	**27,207**
Store with Dwelling	Fully Taxable	$2,710,425,800	$2,710,425,800	$0	12,722
Store with Dwelling	Abatement	248,270,600	135,312,637	112,957,963	760
Store with Dwelling	Exemption	273,755,100	215,685,182	58,069,918	1,281
Total		**$3,232,451,500**	**$3,061,423,619**	**$171,027,881**	**14,763**
Commercial	Fully Taxable	$15,061,397,900	$15,061,397,900	$0	10,020
Commercial	Abatement	1,710,678,900	841,467,004	869,211,896	400
Commercial	Exemption	25,401,030,100	529,930,868	24,871,099,232	4,394
Total		**$42,173,106,900**	**$16,432,795,772**	**$25,740,311,128**	**14,814**
Industrial	Fully Taxable	$2,781,476,200	$2,781,476,200	$0	4,129
Industrial	Abatement	127,442,100	50,481,990	76,960,110	60
Industrial	Exemption	553,087,800	27,130,885	525,956,915	238
Total		**$3,462,006,100**	**$2,859,089,075**	**$602,917,025**	**4,427**
Vacant Land	Fully Taxable	$1,447,838,635	$1,447,838,635	$0	33,302
Vacant Land	Abatement	32,505,900	2,054,545	30,451,355	47
Vacant Land	Exemption	1,985,521,500	17,718,350	1,967,803,150	12,057
Total		**$3,465,866,035**	**$1,467,611,530**	**$1,998,254,505**	**45,406**
Grand Total		**$136,295,463,236**	**$91,536,523,753**	**$44,758,939,483**	**579,536**

* Certified Market Value as of 3/31/2015.

Tax Year 2017*

Category	Tax Status	Assessed Value	Taxable Assessed Value	Exempt Assessed Value	Number of Parcels
Residential	Fully Taxable	$27,239,032,724	$27,239,032,724	$0	227,596
Residential	Abatement	5,656,888,300	1,584,639,283	4,072,249,017	13,906
Residential	Exemption	35,439,456,377	27,462,644,199	7,976,812,178	231,790
Total		**$68,335,377,401**	**$56,286,316,206**	**$12,049,061,195**	**473,292**
Hotels and Apartments	Fully Taxable	$11,309,938,300	$11,309,938,300	$0	21,819
Hotels and Apartments	Abatement	2,732,361,800	781,802,004	1,950,559,796	768
Hotels and Apartments	Exemption	3,144,407,300	1,009,817,435	2,134,589,865	4,629
Total		**$17,186,707,400**	**$13,101,557,739**	**$4,085,149,661**	**27,216**
Store with Dwelling	Fully Taxable	$2,654,179,000	$2,654,179,000	$0	12,611
Store with Dwelling	Abatement	113,049,600	49,070,436	63,979,164	211
Store with Dwelling	Exemption	410,214,200	295,454,160	114,760,040	1,830
Total		**$3,177,442,800**	**$2,998,703,596**	**$178,739,204**	**14,652**
Commercial	Fully Taxable	$13,987,005,400	$13,987,005,400	$0	9,873
Commercial	Abatement	2,474,106,400	787,638,368	1,686,468,032	426
Commercial	Exemption	24,712,736,300	430,585,920	24,282,150,380	4,358
Total		**$41,173,848,100**	**$15,205,229,688**	**$25,968,618,412**	**14,657**
Industrial	Fully Taxable	$2,654,419,300	$2,654,419,300	$0	3,960
Industrial	Abatement	292,220,700	49,509,849	242,710,851	107
Industrial	Exemption	499,667,800	28,545,270	471,122,530	291
Total		**$3,446,307,800**	**$2,732,474,419**	**$713,833,381**	**4,358**
Vacant Land	Fully Taxable	$1,397,808,735	$1,397,808,735	$0	33,804
Vacant Land	Abatement	42,839,500	117,908	42,721,592	35
Vacant Land	Exemption	1,921,166,000	18,996,099	1,902,169,901	11,898
Total		**$3,361,814,235**	**$1,416,922,742**	**$1,944,891,493**	**45,737**
Grand Total		**$136,681,497,736****[**]	**$91,741,204,390**	**$44,940,293,346**	**579,912**

* Certified Market Value as of 3/31/2016
** Based on revised market values for tax year 2017, as of 4/11/2017, the revised assessed value is $138,276,358,121 (based on 581,919 parcels).

As part of the transition to the new assessment system, OPA set up a new process called a first level review, where a taxpayer could request an administrative review of its assessment notice prior to launching a formal appeal with the BRT. The BRT has the authority, following a formal appeal, to either increase or decrease the property valuations contained in the return of the assessors in order that such valuations conform with law. After all changes in property assessments, and after all assessment appeals, assessments are certified and the results provided to the Department of Revenue.

On October 24, 2012, the Governor approved Act 160 ("Act 160"), which permits downward adjustments to School District property tax and use and occupancy tax rates, solely to offset the higher assessed values anticipated under AVI, and only to the extent the yield from such lower rates is no lower than the highest tax yield in the previous three years. Act 160 permits such adjustment for the reassessment year and the two years thereafter. Act 160 also precludes the School District from using its direct authority to levy real estate taxes, separately granted by the General Assembly of the Commonwealth, but only to the extent the City authorizes School District real estate taxes yielding an amount not lower than total real estate taxes yielded in the year prior to the year of the revision of assessments, adjusted to account for increases in assessed value since the first year of revision.

In 2014, City Council passed legislation intended to ease the transition to AVI, which provided, for tax year 2014 only, that residential and commercial property owners who appeal their new property assessments need only pay the prior year's amount of Real Estate Tax and (if applicable) use and occupancy tax, pending the assessment appeal. Interest and penalties would not accrue on the additional 2014 tax liability during the appeal, whether or not the appeal is ultimately successful.

For tax year 2017, OPA conducted reassessments on certain residential properties and on vacant land parcels not currently being used for commercial purposes. For tax year 2018, OPA conducted reassessments on commercial, industrial, and institutionally-owned parcels. OPA plans to conduct a comprehensive reassessment of all properties in the City for tax year 2019 and each year thereafter.

Since 2010, the City has pursued a number of initiatives to improve the collection of Real Estate Taxes, including (i) prompt correspondence with taxpayers with overdue Real Estate Taxes, (ii) using outside collection firms to collect overdue Real Estate Taxes, (iii) sequestration of delinquent properties occupied by commercial tenants, and (iv) tax lien sales. The City's current estimated Real Estate Tax collection rate for tax year 2017 is 93.9%.

See Table 8 below for data with respect to Real Estate Taxes levied from 2012 to 2016 and collected by the City from January 1, 2012 to June 30, 2016. See Table 9 for the assessed property values of the City's principal taxable assessed parcels in 2016. See Table 10 for the 2016 market and assessed values of the ten highest valued taxable real properties in the City, as well as the amounts and duration of Real Estate Tax abatements with respect to such properties.

Table 8
City of Philadelphia
Real Property Taxes Levied and Collected
For the Calendar Years 2012-2016
(Amounts in Millions of USD)[1], [2]

Calendar Year	Taxes Levied Based on Original Assessment[3]	Taxes Levied Based on Adjusted Assessment[4]	Collections in the Calendar Year of Levy[6]	Percentage Collected in the Calendar Year of Levy	Collections in Subsequent Years[5], [6]	Total Collections to Date: All Years[6]	Percentage Collected to Date: All Years[6]
2012	$508.6	$491.1	$459.2	93.5%	$22.7	$481.9	98.1%
2013	$554.0	$537.7	$505.6	94.0%	$22.8	$528.4	98.3%
2014	$553.2	$515.4	$482.1	93.5%	$21.2	$503.3	97.7%
2015	$547.4	$519.1	$489.1	94.2%	$10.9	$500.0	96.3%
2016	$569.9	$552.7	$502.6	90.9%	N/A	$502.6	90.9%

(1) Source: Fiscal Year 2016 CAFR.
(2) Real Estate Taxes are levied by the City and the School District. While this table reflects City General Fund Real Estate Tax revenues exclusively, the School District Real Estate Tax collection rates are the same.
(3) Taxes are levied on a calendar year basis. They are due on March 31.
(4) Adjustments include assessment appeals, a 1% discount for payment in full by February 28, the senior citizen tax discount, and the tax increment financing return of tax paid.
(5) Includes payments from capitalization charges. This capitalization occurs one time, after the end of the first year of the levy, on any unpaid balances.
(6) For calendar year 2016, the data shown reflects collections through June 30, 2016. For earlier calendar years, the data shown reflects collections through December 31 of the respective year.

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Table 9
Principal Taxable Assessed Parcels – 2016
(Amounts in Millions of USD) [(1)]

Taxpayer	2016 Assessment[(2)]	2016 Percentage of Total Assessments
HUB Properties Trust	$265.7	0.29%
Nine Penn Center Associates	232.6	0.25
Phila Liberty Place ELP	207.7	0.23
Philadelphia Market Street	203.7	0.22
Tenet Health Systems Hahnemann	192.1	0.21
Commerce Square Partners	178.2	0.19
Maguire / Thomas	170.1	0.19
NNN 1818 Market Street 37	170.0	0.19
Franklin Mills Associates	163.2	0.18
Brandywine Cira	160.7[(3)]	0.18
Total	$1,944.0	2.12%
Total Taxable Assessments[(4)]	$91,536.5	

Source: City of Philadelphia, Office of Property Assessment.

(1) Figures may not sum due to rounding.
(2) Assessment Values rounded to the nearest $100,000 and only include the largest assessed property for each taxpayer, additional properties owned by the same taxpayer are not included.
(3) Brandywine Cira was made fully taxable in error for tax year 2016, which was corrected after March 31, 2015. Following such correction, Brandywine Cira was assessed at $159.4 million.
(4) Total 2016 Taxable Assessment as of March 31, 2015.

Table 10
Ten Largest Certified Market and Assessment Values of Tax-Abated Properties
Certified Values for 2016
(Amounts in Millions of USD)

Location	2016 Certified Market Value	Total Assessment	Total Taxable Assessment	Total Exempt Assessment	Exempt Through Tax Year
1701 John F Kennedy Blvd.	$212.5	$212.5	$9.1	$203.4	2017
1001 N Delaware Ave.	$150.9	$150.9	$39.3	$111.6	2020
1500-30 Spring Garden St.	$138.7	$138.7	$78.4	$60.3	2020
2116 Chestnut St.	$72.5	$72.5	$1.4	$71.1	2023
2323 Race St.	$72.4	$72.4	$2.8	$69.5	2016
2026-58 Market St.	$65.0	$65.0	$8.4	$56.6	2023
1601 N 15th St.	$64.2	$64.2	$0.5	$63.7	2017
233-43 S Broad St.	$62.4	$62.4	$56.1	$6.3	2023
3401 Chestnut St.	$61.2	$64.6	$0.0	$61.2	2017
907-37 Market St.	$61.0	$61.0	$41.4	$19.6	2016

Source: City of Philadelphia, Office of Property Assessment.

Sales and Use Tax

Pursuant to the authorization granted by the Commonwealth under the PICA Act, the City adopted a 1% sales and use tax (the "City Sales Tax") for City general revenue purposes effective beginning in Fiscal Year 1992. It is imposed in addition to, and on the same basis as, the Commonwealth's sales and use tax. Vendors are required to pay City Sales Taxes to the Commonwealth Department of Revenue together with the Commonwealth sales and use tax. The State Treasurer deposits the collections of City Sales Taxes in a special fund and disburses the collections, including any investment income earned thereon, less administrative fees of the Commonwealth Department of Revenue, to the City on a monthly basis.

The City's budgets for Fiscal Years 2010-2014 provided for an increase in the City Sales Tax rate to 2%, as authorized by the Commonwealth effective October 8, 2009, through June 30, 2014. In July 2013, the Commonwealth authorized the implementation of a new, permanent 1% increase in the City Sales Tax rate effective July 1, 2014, which was adopted by the City on June 12, 2014 and became effective on July 1, 2014. Under the reauthorized City Sales Tax, the first $120 million collected from such additional 1% is distributed to the School District. For Fiscal Years 2015-2018, the General Assembly has also authorized the City to use the next $15 million of City Sales Tax revenues from such additional 1% collected in such Fiscal Years for the payment of debt service on obligations issued by the City for the benefit of the School District. Following any such debt service payments, that remaining portion of the City Sales Tax revenues from such additional 1% distributed to the City is required to be used exclusively in accordance with Act 205 (as defined herein) and deposited to the Municipal Pension Fund.

In October 2014, the City, through PAID, issued $57.5 million in bonds to fund a portion of the School District's operating deficit for Fiscal Year 2015 and refund certain outstanding bonds that funded a portion of the Fiscal Year 2014 operating deficit. The debt service on such bonds is approximately $15 million annually through Fiscal Year 2018 and the City expects to continue paying its obligations with respect to such bonds with a combination of proceeds from the City Sales Tax revenues and other General Fund revenues. Such City Sales Tax revenues are not pledged to the holders of such bonds. Such funding by the City of a portion of the School District's operating deficits for Fiscal Years 2014-2015, and the related payment of debt service, does not require a comparable increase in grants by the City to the School District in subsequent Fiscal Years. See "EXPENDITURES OF THE CITY – City Payments to School District" and the paragraphs that follow Table 21.

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The following table sets forth the City Sales Taxes collected in Fiscal Years 2013-2016, the budgeted amount and current estimate for Fiscal Year 2017, and the budgeted amount for Fiscal Year 2018.

Table 11
Summary of City Sales Tax Collections
Fiscal Years 2013-2016 (Actual), 2017 (Adopted Budget and Current Estimate), and 2018 (Adopted Budget)
(Amounts in Millions of USD)[1]

Fiscal Year	City Sales Tax Collections
2013 (Actual)	$257.6
2014 (Actual)	$263.1
2015 (Actual)	$149.5[2]
2016 (Actual)	$169.4[2]
2017 (Adopted Budget)	$177.5[2]
2017 (Current Estimate)	$186.6[2]
2018 (Adopted Budget)	$198.1[2]

(1) Sources: For Fiscal Years 2013-2016, the City's CAFRs for such Fiscal Years. For Fiscal Year 2017, the Fiscal Year 2017 Adopted Budget and the Twenty-Sixth Five-Year Plan. For Fiscal Year 2018, the Fiscal Year 2018 Adopted Budget.

(2) Net collections estimated to be distributed to the City from the first 1% City Sales Tax and following the distribution of $120 million of revenues from the second 1% City Sales Tax to the School District, as described above.

Other Taxes

The City also collects real property transfer taxes, parking taxes, an amusement tax, a valet parking tax, an outdoor advertising tax, a smokeless tobacco tax, the Philadelphia Beverage Tax (see below), and other miscellaneous taxes.

In June 2016, City Council passed the Philadelphia Beverage Tax (Chapter 19-4100 of the Philadelphia Code) (the "Philadelphia Beverage Tax"). On October 31, 2016, the Department of Revenue adopted regulations for the Philadelphia Beverage Tax. The Philadelphia Beverage Tax taxes the distribution of certain beverages at 1.5 cents per ounce and became effective January 1, 2017.

The Philadelphia Beverage Tax is providing funding for pre-kindergarten, community schools, and improvements to parks, recreational centers, and libraries. For Fiscal Years 2017-2022, the City projects it will collect approximately (i) $39.7 million (Fiscal Year 2017), (ii) $92.4 million (Fiscal Year 2018), (iii) $92.5 million (Fiscal Year 2019), (iv) $92.6 million (Fiscal Year 2020), (v) $92.1 million (Fiscal Year 2021), and (vi) $91.7 million (Fiscal Year 2022) in revenues from the Philadelphia Beverage Tax in such Fiscal Years.

On September 14, 2016, a lawsuit challenging the Philadelphia Beverage Tax was filed by the American Beverage Association and other co-plaintiffs in the Philadelphia Court of Common Pleas – Trial Division – Civil. On December 19, 2016, the Court of Common Pleas dismissed the complaint in its entirety. The plaintiffs appealed this ruling. On June 14, 2017, the Commonwealth Court of Pennsylvania, which is one of the Commonwealth's intermediate appellate courts, upheld the decision of the Court of Common Pleas. The plaintiffs have petitioned the Pennsylvania Supreme Court to review this decision. The decision to grant or deny any such petition is at the discretion of the Pennsylvania Supreme Court. Such petition is pending. For more general information on judgments and settlements on claims against the City, see "LITIGATION."

Improved Collection Initiative

The City is pursuing a multifaceted strategy designed to improve collections of various taxes while decreasing delinquencies. Key compliance strategies continue to include revocation of commercial licenses and sequestration and tax lien sales, among others.

In addition to compliance efforts, the City is engaged in two active projects to implement technology solutions for its cashiering and payments processing systems and to develop an integrated data warehouse and case management system. These initiatives are designed to improve operational efficiencies and drive compliance efforts by providing tools currently unavailable to the City.

Other Locally Generated Non-Tax Revenues

These revenues include license fees and permit sales, traffic fines and parking meter receipts, court related fees, stadium revenues, interest earnings and other miscellaneous charges and revenues of the City.

Revenue from Other Governments

The following table presents revenues received from other governmental jurisdictions for Fiscal Years 2013-2016, the budgeted amounts and current estimate for Fiscal Year 2017, the budgeted amounts for Fiscal Year 2018, and the percentage such revenues represent in the General Fund. The table does not reflect substantial amounts of revenues from other governments received by the Grants Revenue Fund, Community Development Fund, and other operating and capital funds of the City.

Table 12
Revenue from Other Governmental Jurisdictions
Fiscal Years 2013-2016 (Actual), 2017 (Adopted Budget and Current Estimate), and 2018 (Adopted Budget)
(Dollar Amounts in Millions of USD)[(1), (2), (3)]

Fiscal Year	Commonwealth[(4)]	Federal Government	Other Governments[(5)]	Total	Percentage of General Fund Revenues
2013 (Actual)	$233.6	$39.7	$64.2	$337.5	9.1%
2014 (Actual)	$255.3	$31.0	$61.0	$347.3	9.1%
2015 (Actual)	$212.7	$30.1	$60.0	$302.8	8.1%
2016 (Actual)	$223.7	$29.7	$52.3	$305.6	7.7%
2017 (Adopted Budget)	$220.8	$31.4	$60.1	$312.3	7.6%
2017 (Current Estimate)	$219.4	$38.1	$56.7	$314.2	7.6%
2018 (Adopted Budget)	$221.4	$35.6	$59.3	$316.3	7.2%

(1) Sources: For Fiscal Years 2013-2016, the City's CAFRs for such Fiscal Years. For Fiscal Year 2017, the Fiscal Year 2017 Adopted Budget and the Twenty-Sixth Five-Year Plan. For Fiscal Year 2018, the Twenty-Sixth Five-Year Plan.
(2) Figures may not sum due to rounding.
(3) Does not include the PICA Tax.
(4) Such revenues are for health, welfare, court, and various other specified purposes.
(5) Such revenues primarily consist of payments from PGW, parking fines and fees from PPA, and other authorized adjustments.

Revenues from City-Owned Systems

In addition to taxes, the City realizes revenues through the operation of various City-owned systems such as the Water and Wastewater Systems and PGW. The City has issued revenue bonds with respect to the Water and Wastewater Systems and PGW to be paid solely from and secured by a pledge of the respective revenues of these systems. The revenues of the Water and Wastewater Systems and PGW are not legally available for payment of other obligations of the City until, on an annual basis, all revenue bond debt service requirements and covenants relating to those bonds have been satisfied, and then only in a limited amount and upon satisfaction of certain other conditions.

Water Fund. The revenues of the Philadelphia Water Department (the "Water Department") are required to be segregated from other funds of the City. Under the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989 (the "Water Ordinance"), an annual transfer may be made from the Water Fund to the City's General Fund in an amount not to exceed the lesser of (i) all Net Reserve Earnings and (ii) $4,994,000. "Net Reserve Earnings" means the amount of interest earnings during the Fiscal Year on amounts in the Debt Reserve Account and Subordinated Bond Fund, each as defined in the Water Ordinance. The following table shows the amounts transferred from the Water Fund to the General Fund for Fiscal Years 2013-2016, the budgeted amount and current estimate for Fiscal Year 2017, and the budgeted amounts for Fiscal Year 2018.

Table 13
Transfers from Water Fund to General Fund (Excess Interest on Sinking Fund Reserve)
Fiscal Years 2013-2016 (Actual), 2017 (Adopted Budget and Current Estimate), and 2018 (Adopted Budget)[(1)]

Fiscal Year	Amount Transferred
2013 (Actual)	$560,156
2014 (Actual)	$400,364
2015 (Actual)	$745,585
2016 (Actual)	$1,555,702
2017 (Adopted Budget and Current Estimate)	$900,000[(2)]
2018 (Adopted Budget)	$1,000,000[(2)]

(1) Sources: For Fiscal Years 2013-2016, the City's Supplemental Report of Revenues & Obligations for such Fiscal Years. For Fiscal Year 2017, the Fiscal Year 2017 Adopted Budget and the Twenty-Sixth Five-Year Plan. For Fiscal Year 2018, the Fiscal Year 2018 Adopted Budget.

(2) For Fiscal Years 2017 and 2018, the Water Department has budgeted $1,200,000 and $1,500,000, respectively, as its transfer from the Water Fund to the General Fund. Historically, the Water Department's budgeted amount is greater than the figure included in the City's operating budget.

PGW. The revenues of PGW are required to be segregated from other funds of the City. Payments for debt service on PGW bonds are made directly by PGW. PGW is required to make an annual payment of $18 million to the General Fund. Both the Fiscal Year 2017 Adopted Budget and the Fiscal Year 2018 Adopted Budget include such $18 million annual payment to the General Fund from PGW for such Fiscal Years. In certain past Fiscal Years, the City granted back to PGW such annual payments. For more information on PGW, see "THE GOVERNMENT OF THE CITY OF PHILADELPHIA – Government Services."

Philadelphia Parking Authority Revenues

The PPA was established by City ordinance pursuant to the Pennsylvania Parking Authority Law (P.L. 458, No. 208 (June 5, 1947)). Various statutes, ordinances, and contracts authorize PPA to plan, design, acquire, hold, construct, improve, maintain and operate, own or lease land and facilities for parking in the City, including such facilities at PHL, and to administer the City's on-street parking program.

PPA owns and operates five parking garages and a number of surface parking lots at PHL. The land on which these garages and surface lots are located is leased from the City, acting through the Division of Aviation, pursuant to a lease expiring in 2030 (the "Lease Agreement"). The Lease Agreement provides for payment of rent to the City, which is equal to gross receipts less operating expense, debt service on PPA's bonds issued to finance improvements at PHL and reimbursement to PPA for capital expenditures and prior year operating deficits relating to its operations at PHL, if any.

One component of the operating expenses is PPA's administrative costs. In 1999, at the request of the FAA, PPA and the City entered into a letter agreement (the "FAA Letter Agreement"), which contained a formula for calculating PPA's administrative costs and capped such administrative costs at 28% of PPA's total administrative costs for all of its cost centers. PPA owns and/or operates parking facilities at a number of locations in the City in addition to those at PHL. These parking facilities are revenue centers for purposes of the FAA Letter Agreement. According to PPA's audited financial statements, as filed with the City, PPA has been in compliance with the FAA Letter Agreement since its execution.

On-street parking revenues are administered and collected on behalf of the City by the PPA. Pursuant to Pennsylvania law, PPA is to transmit these revenues to the City, net of any actual expenses incurred in the administration of the on-street parking system in accordance with the PPA's approved budget, provided that, should such net revenues exceed a designated threshold, any excess above that threshold is to be transmitted to the School District. Pursuant to Act 84 of 2012, the effect of which commenced in Fiscal Year 2015, the threshold, which was previously set at $25 million, was set at $35 million, including a mandatory escalator to take into account increases in revenues. The following table presents payments received by the City from PPA for on-street parking for Fiscal Years 2013-2016, the budgeted amount and current estimate for Fiscal Year 2017, and the budgeted amount for Fiscal Year 2018.

Table 14
PPA On-Street Parking Payments to the City
Fiscal Years 2013-2016 (Actual), 2017 (Adopted Budget and Current Estimate), and 2018 (Adopted Budget)[1]

Fiscal Year	Payments to the City
2013 (Actual)	$36.5
2014 (Actual)	$37.7
2015 (Actual)	$38.1
2016 (Actual)	$33.7
2017 (Adopted Budget)	$39.6
2017 (Current Estimate)	$38.1
2018 (Adopted Budget)	$38.8

(1) Sources: For Fiscal Years 2013-2016, the City's Supplemental Report of Revenues & Obligations for such Fiscal Years. For Fiscal Years 2017-2018, the Twenty-Sixth Five-Year Plan and the Fiscal Year 2018 Adopted Budget.

Proposed Tax Rate Changes

The Twenty-Sixth Five-Year Plan includes reductions in both the resident and non-resident wage and earnings tax, which resumed in Fiscal Year 2014 after being suspended during the national economic downturn. The following table details rates under the Twenty-Sixth Five-Year Plan.

Table 15
Changes in Wage and Earnings Tax Rates[1]

	Twenty-Sixth Five-Year Plan	
Fiscal Year	Resident Wage and Earnings Tax Rates[2]	Non-Resident Wage and Earnings Tax Rates
2017	3.9004%	3.4741%
2018	3.8907%	3.4654%
2019	3.8420%	3.4221%
2020	3.7844%	3.3707%
2021	3.7276%	3.3202%
2022	3.6997%	3.2953%

(1) Source: The Twenty-Sixth Five-Year Plan.
(2) Includes PICA Tax. See "DEBT OF THE CITY – PICA Bonds" for a description of the PICA Tax.

Under the Twenty-Sixth Five-Year Plan, receipts from the Wage and Earnings Tax are estimated to grow at a rate of 3.68% in Fiscal Year 2017, 3.41% in Fiscal Year 2018, 3.78% in Fiscal Year 2019, 3.62% in Fiscal Year 2020, 3.56% in Fiscal Year 2021, and 3.59% in Fiscal Year 2022.

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EXPENDITURES OF THE CITY

Three of the principal City expenditures are for personal services (including pensions and other employee benefits), purchase of services (including payments to SEPTA), and debt service. The expenditures for personal services and purchase of services are addressed below under this caption; debt service is addressed below under "DEBT OF THE CITY."

Personal Services (Personnel)

As of June 30, 2016, the City employed 27,042 full-time employees, representing approximately 3.89% of non-farm public and private employment in the City (approximately 694,900 employees, according to non-seasonally adjusted data from the Bureau of Labor Statistics). Of these full-time public employees, the salaries of 21,427 were paid from the General Fund. Additional sources of funding for full-time public employees include the Grants Revenue Fund, the Water Fund, and the Aviation Fund, as well as grants and contributions from other governments. Activities funded through such grants and contributions are not undertaken if funding is not received. The following table sets forth the number of filled, full-time positions of the City as of the dates indicated.

Table 16
Filled, Full-Time Positions(1), (2)

	June 30, 2012	June 30, 2013	June 30, 2014	June 30, 2015	June 30, 2016
General Fund					
Police	7,225	7,193	7,095	7,061	6,942
Fire	2,072	2,125	2,053	2,150	2,316
Courts	1,957	1,909	1,866	1,842	1,839
Prisons	2,144	2,248	2,268	2,286	2,289
Streets	1,682	1,690	1,684	1,664	1,676
Public Health	669	673	659	653	653
Human Services(3)	804	377	382	395	449
All Other	4,622	4,710	4,984	5,115	5,263
Total – General Fund	21,175	20,925	20,991	21,166	21,427
Other Funds	4,540	5,547	5,657	5,626	5,615
Total – All Funds	25,715	26,472	26,648	26,792	27,042

(1) Source: Table P-1 in the City's Quarterly City Manager's Reports.
(2) Table 16 does not include seasonal or temporary employees.
(3) Fiscal Year 2011 was the last year that the full amount of revenue for DHS was deposited into the General Fund. The decrease in filled, full-time positions Fiscal Year 2012 to Fiscal Year 2013 is largely due to the transfer of the majority of DHS revenue and obligations to the Grants Revenue Fund.

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Overview of City Employees

The wages and benefits of City employees vary not only by position, but also by whether the employees are represented by a union and, if so, which union. Employee wages and benefits may also be impacted by whether the employee is subject to the civil service system or exempt from those rules. Thus, City employees may be broken down into three major categories for purposes of understanding how their wages and benefits are determined: (i) employees who are not subject to the civil service system ("exempt employees"); (ii) employees who fall under the civil service system but are not represented by a union ("non-represented employees"); and (iii) employees who are subject to the civil service system and are represented by a union ("union employees").

As of June 30, 2016, the City's 22,789 unionized employees, representing approximately 84.3% of the City's employees, were represented by the City's four municipal unions: (i) Fraternal Order of Police ("FOP") Lodge No. 5; (ii) IAFF Local 22; (iii) AFSCME DC 33; and (iv) American Federation of State, County and Municipal Employees District Council 47 ("AFSCME DC 47").

In July 2016, a collective bargaining agreement was reached with AFSCME DC 33, which provides for pension reforms coupled with salary increases, lump sum payments for health care, and a one-time bonus. This collective bargaining agreement was ratified on August 19, 2016. The costs of such agreement, along with the cost of the wage reopener with IAFF Local 22, are included in the Modified Twenty-Fifth Five-Year Plan. Such plan also provides additional resources for compensation changes for other unionized and non-unionized employees.

On June 30, 2017, the labor agreements for FOP Lodge No. 5, IAFF Local 22, and AFSCME DC 47 are set to expire. The Twenty-Sixth Five-Year Plan includes a $200 million reserve for the potential costs of anticipated new labor agreements for such unions.

Collective bargaining with respect to the wages, hours and other terms and conditions of employment of union employees, other than uniformed employees of the Police Department and the Fire Department, is governed by the Public Employee Relations Act (Pa. P.L. 563, No. 195 (1970)) ("PERA"). PERA requires the City and the unions to negotiate in good faith to attempt to reach agreement on new contract terms and, if an impasse exists after such negotiations, to mediate through the Commonwealth Bureau of Mediation. Once the mediation procedures have been satisfied, and if no collective bargaining agreement has been reached, most employees covered by PERA are permitted to strike. Certain employees, however, including employees of the Sheriff's Office and the Register of Wills represented by the FOP, corrections officers represented by AFSCME DC 33, and employees of the First Judicial District represented by AFSCME DC 47, are not permitted to strike under PERA. These employees must submit any impasse to binding interest arbitration once the mediation procedures have been satisfied. PERA permits parties at an impasse, which are not required to submit to binding interest arbitration, to do so voluntarily. Provisions of an interest arbitration award issued under PERA that require legislative action are considered advisory only and the legislative body is permitted to meet, consider, and reject those provisions.

Uniformed employees of the Police Department and the Fire Department bargain under the Policemen and Firemen Collective Bargaining Act (Pa. P.L. 237, No. 111 (1968)) ("Act 111"), which provides for final and binding interest arbitration to resolve collective bargaining impasses and prohibits these employees from striking. Interest arbitration under Act 111 operates similarly to interest arbitration under PERA, but City Council is not permitted to reject the portions of an interest arbitration award that require legislative action. To the contrary, City Council is required to pass any legislation necessary to implement the award unless doing so would violate state or federal law. Thus, the arbitration panel has significant, although not limitless, power to issue an award on mandatory subjects of bargaining. As with interest arbitration under PERA, the arbitration panel cannot issue an award on a matter that is one of inherent managerial policy. In addition to the grounds available to challenge a PERA interest arbitration award on appeal, the PICA Act requires an Act 111 interest arbitration panel to, among other things, give substantial weight to the City's five-year plan and ability to pay for the cost of the award without negatively impacting services, and gives the City the right to appeal the award to the Court of Common Pleas if it believes the panel has failed to meet these responsibilities. If the arbitration panel fails to do so or, among other things, if it awards wages or benefits that exceed what is assumed in the most-recent five-year plan without substantial evidence in the record demonstrating that the City can afford these increases without adversely impacting service levels, the Court of Common Pleas is required to vacate the arbitration award and remand it to the arbitration panel.

Overview of Employee Benefits

The City provides various pension, life insurance, and health benefits for its employees. The benefits offered depend on the employee's union status and bargaining unit, if applicable. General Fund employee benefit expenditures for Fiscal Years 2013 through 2018 are shown in the following table.

Table 17
General Fund Employee Benefit Expenditures
Fiscal Years 2013-2016 (Actual) and 2017-2018 (Projected)
(Amounts in Millions of USD)[(1)]

	2013	2014	2015	2016	2017	2018
Pension Contribution[(2)]	$618.9[(4)]	$646.4[(4)]	$558.3	$622.1[(8)]	$651.0[(9)]	$680.2[(10)]
Health[(3)]						
Payments under City-administered plan	76.4	75.6	75.5	72.5	81.9	96.3
Payments under union-administered plans[(5)]	286.8	333.8	319.1	339.0	366.2	370.1
Total Health	363.2	409.4	394.6	411.5	448.1	466.4
Federal Insurance Contributions Act (FICA) Taxes[(6)]	64.7	67.5	71.2	71.7	75.4	76.1
Other[(7)]	72.3	70.8	75.6	76.0	84.1	85.1
Total	$1,119.1	$1,194.1	$1,099.5	$1,181.3	$1,258.6	$1,307.8

(1) Source: From the City's five-year financial plans, except for "Payments under City-administered plan," which was provided by the City, Department of Human Resources.
(2) Includes debt service on Pension Bonds (as defined herein) and the Commonwealth contributions to the Municipal Pension Fund. See Tables 29 and 30.
(3) This breakdown of "Health" between "Payments under City-administered plan" and "Payments under union-administered plans" is an estimate of actual expenses. The City records the actual health expenses in one line item, which corresponds to the figures in "Total Health."
(4) Includes repayment of deferred contributions. See Table 29.
(5) AFSCME DC 33 receives a per member per month amount of $1,194 from the City.
(6) Includes payments of social security and Medicare taxes.
(7) Includes payments for unemployment compensation, employee disability, group life, group legal, tool allowance, and flex cash payments.
(8) Includes $9.7 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(9) Assumes $18.3 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(10) Assumes $24.0 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."

Figures may not sum due to rounding.

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Each of the City's four municipal unions sponsors its own health plan that provides medical, prescription, dental and optical benefits to participating employees and eligible retirees through trusts on which the City has varying degrees of minority representation. Exempt and non-represented employees, along with represented employees of the Register of Wills and employees represented by AFSCME DC 33 who have chosen not to become members of the union's healthcare plan, receive health benefits through a plan sponsored and administered by the City. Each of the plans provides different benefits determined by the plan sponsor or through collective bargaining. To provide health care coverage, the City pays a negotiated monthly premium for employees covered by the union contract for AFSCME DC 33 and is self-insured for all other eligible employees. Aside from AFSCME DC 33, the City is responsible for the actual health care cost that is invoiced to the City's unions by their respective vendors. The actual cost can be a combination of self-insured claim expenses, premiums, ancillary services and administrative expenses. In addition, employees who satisfy the eligibility criteria receive five years of health benefits after their retirement. See "OTHER POST-EMPLOYMENT BENEFITS" below. These benefits are determined and administered by the plan in which the employee participated at the time of his or her retirement. As reflected in Table 17, the health payments under the City-administered plan have been relatively constant; the health payments for the union-sponsored plans have increased substantially since Fiscal Year 2013. Other employee benefits, including life insurance and paid leave, are similarly determined by the respective collective bargaining agreements and City policies and Civil Service Regulations. Employees also participate in the Municipal Pension Plan. See "PENSION SYSTEM" below.

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Overview of Current Labor Situation

Table 18 summarizes the current status of the interest arbitration awards that have been issued for, and contract settlements reached with, the City's major labor organizations, as well as changes that have been made for exempt and non-represented employees. It also provides a brief summary of pension reforms that have occurred since 2009.

Table 18
Status of Arbitration Awards and Labor Contract Settlements

Organization	Authorized Number of Full-Time Citywide Employees Represented[1]	Status of Arbitration Award or Contract Settlement	Wage Increases	Pension Reforms[2]
FOP Lodge No. 5 (Police Department)	6,375	Three-year contract effective July 1, 2014 through June 30, 2017 awarded by arbitration panel on July 30, 2014	• 3% pay increase for Fiscal Year 2015. • 3.25% pay increase for Fiscal Years 2016 and 2017.	• Employees in Plan 87 hired before 1/1/10 pay 5% of salary • Employees hired on or after 1/1/10 elect to either enter Plan 87 and pay 6% of salary or enter Plan 10

FOP Lodge No. 5 (Sheriff's Office and Register of Wills)	372	Three-year contract effective July 1, 2014 through June 30, 2017 awarded by arbitration panel on April 16, 2015	• 2.5% increase for Fiscal Year 2015.
			• 3.0% increase for Fiscal Year 2016.
			• 3.25% increase for Fiscal Year 2017.
			• Register of Wills employees receive same wage package as AFSCME DC 33.
				• Sheriff's Office:
				  ◦ Employees in Plan 87 hired before 1/1/12 pay 30% of normal cost
				  ◦ Employees hired on or after 1/1/12 elect to enter Plan 87 and pay 50% of normal cost or enter Plan 10
				• Register of Wills:
				  ◦ Employees in Plan 87 hired before 1/1/12 pay 30% of normal cost
				  ◦ Employees hired on or after 1/1/12 participate in Plan 10

IAFF Local 22	2,407	Four-year contract effective July 1, 2013 through June 30, 2017 awarded by arbitration panel on January 9, 2015	• 3% pay increase for Fiscal Year 2014 and 2015. • 3.25% pay increase for Fiscal Year 2016. • 3.25 % pay increase for Fiscal Year 2017.	• Employees in Plan 87 hired before 7/2/12 pay 5% of salary • Employees hired on or after 7/2/12 elect to enter Plan 87 and pay 6% of salary or enter Plan 10
AFSCME DC 33	7,372	Four-year contract term effective July 1, 2016 through June 30, 2020 (ratified on August 19, 2016)	• 3.0% pay increase effective July 1, 2016. • 3.0% pay increase for Fiscal Year 2018 • 2.5% pay increase for Fiscal Year 2019. • 3.0% pay increase for Fiscal Year 2020.	• Tiered contribution system for current employees under which employees who have higher salaries pay a higher percent of their salaries as contributions to the pension fund • Mandatory stacked hybrid plan for new hires under which employees receive a defined benefit pension for their first $50,000 of earnings and a defined contribution pension for earnings above $50,000 • Plan 10 closed to new enrollment for members of DC33 but remains unchanged for other employee groups • Once fully implemented, such employees in Plan 10 are expected to receive a letter indicating that they have 90 days to make an irrevocable election to opt into the stacked-hybrid • DROP (as defined below) interest rate decreases from 4.5% to the rate on the one year treasury effective January 1 of each year (currently 0.65%) for participants not currently enrolled or eligible to enroll

(1) From data provided by the Mayor's Office of Labor Relations as of June 30, 2016.
(2) "Plan 87" and "Plan 10" referenced in this column are described in Table 19. Plan 10 is mandatory for newly-hired employees of the Register of Wills and was mandatory for employees covered by the Correctional Officers arbitration award who are now covered by the same pension provisions as other employees of AFSCME DC 33.

Organization	Authorized Number of Full-Time Citywide Employees Represented[1]	Status of Arbitration Award or Contract Settlement	Wage Increases	Pension Reforms[2]
AFSCME DC 33, Local 159 Correctional Officers	2,220	Three-year contract effective July 1, 2014 through June 30, 2017 awarded by arbitration panel on March 23, 2015	• 3% pay increase for Fiscal Year 2015. • 3.25% pay increase for Fiscal Years 2016 and 2017. • $600 equity adjustment to base wages on January 1, 2016.	• Tiered contribution system for current employees under which employees who have higher salaries pay a higher percent of their salaries as contributions to the pension fund • Mandatory stacked hybrid plan for new hires under which employees receive a defined benefit pension for their first $50,000 of earnings and a defined contribution pension for earnings above $50,000 • Plan 10 closed to new enrollment for members of DC33 but remains unchanged for other employee groups • Once fully implemented, such employees in Plan 10 are expected to receive a letter indicating that they have 90 days to make an irrevocable election to opt into the stacked-hybrid • DROP interest rate decreases from 4.5% to the rate on the one year treasury effective January 1 of each year (currently 0.65%) for participants not currently enrolled or eligible to enroll
AFSCME DC 47	3,566	Contract term from July 1, 2009 through June 30, 2017 ratified on March 5, 2014	• 3.5% pay increase effective April 4, 2014. • 2.5% pay increase for Fiscal Year 2016. • 3% pay increase for Fiscal Year 2017.	• Employees in Plan 87 hired before 3/5/14 pay 30% of normal cost plus an additional 0.5% of pay in 2015 and an additional 0.5% of pay in 2016 (for a total of an additional 1% of pay by 1/1/16) • Employees hired on or after 3/5/14 may elect to enter Plan 87 and pay an additional 1% of pay over what others in Plan 87 pay or enter Plan 10 • DROP interest rate decreases from 4.5% to the rate on the one year treasury effective January 1 of each year (currently 0.65%) for participants not currently enrolled or eligible to enroll
AFSCME DC 47 Local 810 Court Employees	477	Agreement ratified August 13, 2014 on economic terms for July 1, 2014 through June 30, 2016; a one-year agreement for July 1, 2016-June 30, 2017 was also ratified in Fiscal Year 2017	• 2.5% pay increase for Fiscal Year 2015. • 2.5% pay increase for Fiscal Year 2016. • 3% pay increase for Fiscal Year 2017.	• Employees in Plan 87 hired before 3/5/14 pay 30% of normal cost plus an additional 0.5% of pay in 2015 and an additional 0.5% of pay in 2016 (for a total of an additional 1% of pay by 1/1/16) • Employees hired on or after 11/14/14 may elect to enter Plan 87 and pay an additional 1% of pay over what others in Plan 87 pay or enter Plan 10 • DROP interest rate decreases from 4.5% to the rate on the one year treasury effective January 1 of each year (currently 0.65%) for participants not currently enrolled or eligible to enroll
Exempt and Non-Represented Employees	3,752	Changes for exempt and non-represented employees	• 2.5% pay increase effective October 1, 2012. • 3.5% exempt pay increase effective September 1, 2014. • 3.5% non-represented pay increase effective April 1, 2014. • 2.5% non-represented pay increase for Fiscal Year 2016.	• Employees in Plan 87 hired before 5/14/14 for non-represented civil service and before 11/14/14 for non-represented non-civil service pay 30% of normal cost plus an additional 0.5% of pay in 2015 and an additional 0.5% of pay in 2016 (for a total of an additional 1% of pay by 1/1/16) • Employees hired on or after dates above may elect to enter Plan 87 and pay an additional 1% of pay over what others in Plan 87 pay or enter Plan 10 • DROP interest rate decreases from 4.5% to the rate on the one year treasury effective January 1 of each year (currently 0.65%) for participants not currently enrolled or eligible to enroll

(1) From data provided by the Mayor's Office of Labor Relations as of June 30, 2016.
(2) "Plan 87" and "Plan 10" referenced in this column are described in Table 19. Plan 10 is mandatory for newly-hired employees of the Register of Wills and was mandatory for employees covered by the Correctional Officers arbitration award who are now covered by the same pension provisions as other employees of AFSCME DC 33.

Certain features of the 1987 Plan ("Plan 87") and the 2010 Plan ("Plan 10") are summarized below. Plan 87 is solely a defined benefit plan. Plan 10 is a "hybrid" plan that includes both a defined benefit and a defined contribution component. A more comprehensive summary of each plan is included as Appendix D of the July 1, 2016 Valuation (as defined herein). See "PENSION SYSTEM" below.

Table 19
Summary of Key Aspects of Plan 87 and Plan 10

Plan 87	Normal Retirement Eligibility	Average Final Compensation ("AFC")	Defined Benefit – Retirement Benefits Multiplier
Municipal (Plan Y)	Age 60 and 10 years of credited service(1)	Average of three highest calendar or anniversary years	• (2.2% x AFC x years of service up to 10 years) plus (2.0% x AFC x numbers of years in excess of 10 years), subject to a maximum of 100% of AFC
Police and Fire	Age 50 and 10 years of credited service(1)	Average of two highest calendar or anniversary years	• (2.2% x AFC x years of service up to 20 years) plus (2.0% x AFC x numbers of years in excess of 20 years), subject to a maximum of 100% of AFC
Elected Official (Plan L)	Age 55 and 10 years of credited service(2)	Average of three highest calendar or anniversary years	• 3.5% x AFC x years of service, subject to a maximum of 100% of AFC

Plan 10	Normal Retirement Eligibility	Average Final Compensation ("AFC")	Defined Benefit – Retirement Benefits Multiplier
Municipal(3)	Age 60 and 10 years of credited service	Average of five highest calendar or anniversary years	• 1.25% x AFC x years of service up to 20 years
Police and Fire	Age 50 and 10 years of credited service	Average of five highest calendar or anniversary years	• 1.75% x AFC x years of service up to 20 years - **Defined Contribution** • The City matches employee contributions at a 50% rate, with the total City match not to exceed 1.5% of compensation for each year. • After five years of credited service, the full amount in the account is distributed to the employee when he or she separates from City service. • The right to the portion of the account attributable to City contributions does not vest until the completion of five years of credited service.

(1) Five years of credited service for those who make additional contributions. See "PENSION SYSTEM – Pension System; Pension Board – Membership."
(2) The lesser of two full terms or eight years of credited service for those elected officials who make additional contributions. See "PENSION SYSTEM – Pension System; Pension Board – Membership."
(3) Under Plan 10 (Municipal), pension contributions freeze after 20 years. At such time and for each subsequent year, the employee's pension payments remain fixed and the employee may no longer make pension contributions.

As part of the new collective bargaining agreement for AFSCME DC 33, the City and AFSCME DC 33 have agreed on a new, stacked hybrid pension plan for new municipal employees represented by AFSCME DC 33 ("Plan 16"). Plan 16 includes a defined benefit and defined contribution component. The defined benefit is applied to annual earnings up to $50,000. Employees with annual salaries over $50,000 may voluntarily participate in the defined contribution portion. The City will match a portion of an eligible employee's voluntary contributions up to a cap of 1.5% of annual compensation. Current municipal employees represented by AFSCME DC 33 will pay a tiered employee pension contribution rate based on their pay range. Starting at an annual salary of $45,000, the tiered structure is progressive so that higher earning employees will contribute at a higher rate.

Purchase of Services

The following table shows the City's major purchase of services, which represents one of the major classes of expenditures from the General Fund. Table 20 shows contracted costs of the City for Fiscal Years 2013-2016, the budgeted amounts and current estimates for Fiscal Year 2017, and the budgeted amounts for Fiscal Year 2018.

Table 20
Purchase of Services in the General Fund
Fiscal Years 2013-2016 (Actual), 2017 (Budget and Current Estimate), and 2018 (Budget)
(Amounts in Millions of USD)[(1), (7)]

	Actual 2013	Actual 2014	Actual 2015	Actual 2016	Adopted Budget 2017	Current Estimate 2017	Adopted Budget 2018
Human Services[(2)]	$67.5	$76.3	$77.3	$75.3	$78.9	$79.2	$77.4
Public Health	63.0	60.5	59.4	64.9	66.9	70.6	73.9
Public Property[(3)]	139.5	140.7	148.8	155.0	159.4	159.7	156.4
Streets[(4)]	40.5	48.3	47.6	51.9	49.0	48.9	49.7
First Judicial District	16.5	15.8	17.1	17.7	10.7	10.2	9.5
Licenses & Inspections	7.1	10.1	10.0	10.4	11.1	12.0	11.8
Homeless Services[(5)]	34.2	36.9	36.6	37.1	37.6	37.8	39.1
Prisons	105.4	105.8	101.6	104.9	105.5	108.1	105.5
All Other[(6)]	284.1	293.2	312.2	305.0	377.5	361.0	411.8
Total	**$757.8**	**$787.6**	**$810.6**	**$822.2**	**$896.9**	**$887.5**	**$935.1**

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(1) Sources: For Fiscal Years 2013-2016, the City's Supplemental Report of Revenues & Obligations for such Fiscal Years. For Fiscal Year 2017 (Adopted Budget), the Third Quarter QCMR. For Fiscal Years 2017 (Current Estimate) and 2018, the Fiscal Year 2018 Adopted Budget.

(2) Includes payments for care of dependent and delinquent children.

(3) Includes payments for SEPTA, space rentals, and utilities.

(4) Includes solid waste disposal costs.

(5) Includes homeless shelter and boarding home payments.

(6) Includes the Convention Center subsidy, payments for vehicle leasing, and debt service on lease and service agreement financings, among other things.

(7) Figures may not sum due to rounding.

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City Payments to School District

In each Fiscal Year since Fiscal Year 1996, the City has made an annual grant of at least $15 million to the School District. Pursuant to negotiations with the Commonwealth to address the School District's then current and future educational and fiscal situation, the Mayor and City Council agreed to provide the School District with an additional $20 million annual grant beginning in Fiscal Year 2002. The following table presents the City's payments to the School District from the General Fund for Fiscal Years 2013-2016, the budgeted amount and current estimate for Fiscal Year 2017, and the budgeted amount for Fiscal Year 2018.

Table 21
City Payments to School District
Fiscal Years 2013-2016 (Actual), 2017 (Budget and Current Estimate), and 2018 (Budget)
(Amounts in Millions of USD)[(1)]

	Actual 2013[(2)]	Actual 2014[(3)]	Actual 2015	Actual 2016	Budget and Current Estimate 2017	Budget 2018
City Payments to School District	$68.9	$114.1	$69.1	$104.2	$104.3	$104.3

(1) Sources: For Fiscal Years 2013-2016, the City's CAFRs for such Fiscal Years. For Fiscal Year 2017, the Fiscal Year 2017 Adopted Budget and the Twenty-Sixth Five-Year Plan. For Fiscal Year 2018, the Fiscal Year 2018 Adopted Budget.
(2) The City's contribution included a budgeted contribution of $48.9 million and an additional contribution of $20 million, which was derived from an increase in the Real Estate Tax rate.
(3) In Fiscal Year 2014, the City's contribution included a budgeted contribution of $69.1 million and an additional $45.1 million one-time contribution that was passed through from the Commonwealth.

In Fiscal Year 2014, the City also issued, through PAID, $27.3 million of bonds for the benefit of the School District. In Fiscal Year 2015, the City issued, through PAID, $57.5 million of bonds for the benefit of the School District and to refund the bonds issued in Fiscal Year 2014. The bond proceeds paid to the School District are not subject to the maintenance of effort described below.

The City's adopted Fiscal Year 2016 budget included a property tax increase and parking tax increase to benefit the School District in amounts of $25 million and $10 million, respectively, which are included in the $104.2 million for Fiscal Year 2016 and the $104.3 million for Fiscal Year 2017 reflected in Table 21 above. Both the $25 million and the $10 million are City revenues collected by the City and then granted to the School District. Each year in the Twenty-Sixth Five-Year Plan reflects these increases in tax revenues, as well as the related expense of the grant to the School District; therefore, these amounts are already part of the City's General Fund balance calculation.

Section 696 of the School Code imposes on the City a maintenance of effort obligation with respect to the School District. For so long as the School District remains subject to a declaration of "distress" by the Secretary of Education, the City is obligated to continue (i) paying over to the School District each year an amount at least equal to the amount paid over to the School District in the previous year and (ii) authorizing for the School District tax rates at least equal to the rates of taxation authorized by the City for the School District in the previous year. The School District was declared distressed effective December 22, 2001, and such declaration continues to be in effect. See "THE GOVERNMENT OF THE CITY OF PHILADELPHIA – Local Government Agencies – *Mayoral-Appointed or Nominated Agencies* – The School District."

For a discussion of changes and proposed changes in the funding provided by the City to the School District, see "REVENUES OF THE CITY – Sales and Use Tax." For a discussion of the transition to AVI, see "REVENUES OF THE CITY – Real Property Taxes Assessment and Collection."

City Payments to SEPTA

SEPTA operates a public transportation system within the City and Bucks, Chester, Delaware, and Montgomery counties. SEPTA's operating budget is supported by federal, Commonwealth, and local subsidies, including payments from the City. The following table presents the City's payments to SEPTA from the General Fund for Fiscal Years 2013-2016, the budgeted amount and current estimate for Fiscal Year 2017, and the budgeted amount for Fiscal Year 2018.

Table 22
City Payments to SEPTA
Fiscal Years 2013-2016 (Actual), 2017 (Budget and Current Estimate), and 2018 (Budget)
(Amounts in Millions of USD)[(1)]

	Actual 2013	Actual 2014	Actual 2015	Actual 2016	Budget and Current Estimate 2017	Budget 2018
City Payment to SEPTA	$65.2	$66.0	$70.4	$74.2	$79.7	$82.7

(1) Sources: For Fiscal Years 2013-2016, the City's CAFRs for such Fiscal Years. For Fiscal Year 2017, the Fiscal Year 2017 Adopted Budget and the Twenty-Sixth Five-Year Plan. For Fiscal Year 2018, the Fiscal Year 2018 Adopted Budget.

The City budgets operating subsidies each Fiscal Year to match the estimated operating subsidies of the Commonwealth under Act 89. The state operating subsidy is funded through the Pennsylvania Public Transportation Trust Fund as created by Act 44 of 2007, amended by Act 89 of 2013. The local match requirement for Fiscal Years 2017-2022 has been calculated to match state operating subsidies. In addition, local matching funds must be appropriated each Fiscal Year in which state funds are received in order for SEPTA to receive the full allocation of state funds. The Twenty-Sixth Five-Year Plan projects annual operating subsidy payments to SEPTA from the City will increase to $99.7 million by Fiscal Year 2022. For more information on SEPTA, see APPENDIX V – "TRANSPORTATION – Southeastern Pennsylvania Transportation Authority (SEPTA)."

City Payments to Convention Center Authority

In connection with the financing of the expansion to the Pennsylvania Convention Center and the refinancing of debt for the original Pennsylvania Convention Center construction, the Commonwealth, the City, and the Convention Center Authority entered into an operating agreement in 2010 (the "Convention Center Operating Agreement"). The Convention Center Operating Agreement provides for the operation of the Convention Center by the Convention Center Authority and includes an annual service fee of $15,000,000 from the City to the Convention Center Authority in each Fiscal Year through Fiscal Year 2040.

As authorized by ordinance, the City has agreed to pay to the Convention Center Authority on a monthly basis a certain percentage of hotel room taxes and hospitality promotion taxes collected during the term of the Convention Center Operating Agreement. The remaining percentages of such taxes are paid to the City's tourism and marketing agencies. The General Fund does not retain any portion of the proceeds of the hotel room rental tax or the hospitality promotion tax.

PENSION SYSTEM

The amounts and percentages set forth under this heading relating to the City's pension system, including, for example, actuarial liabilities and funded ratios, are based upon numerous demographic and economic assumptions, including the investment return rates, inflation rates, salary increase rates, post-retirement mortality, active member mortality, rates of retirement, etc. The reader is cautioned to review and carefully consider the assumptions set forth in the documents that are cited as the sources for the information in this section. In addition, the reader is cautioned that such sources and the underlying assumptions speak as of their respective dates, and are subject to changes, any of which could cause a significant change in the unfunded actuarial liability.

Overview

The City faces significant ongoing financial challenges in meeting its pension obligations, including an unfunded actuarial liability ("UAL") of approximately $6.1 billion as of July 1, 2016. In Fiscal Year 2016, the City's contribution to the Municipal Pension Fund was approximately $660.2 million, of which the General Fund's share (including the Commonwealth contribution) was $512.2 million. See Table 29. The City's aggregate pension costs (consisting of payments to the Municipal Pension Fund and debt service on the Pension Bonds (as defined herein)) have increased from approximately 10.15% of the City's General Fund budget to approximately 13.93% of the General Fund budget from Fiscal Years 2007 to 2016. See Table 31. As reflected in the Funded Ratio chart following Table 28, the funded ratio of the Municipal Pension Plan was 50.0% on July 1, 1997 (at which time the UAL was approximately $2.7 billion), and was 44.8% on July 1, 2016.

The decline in the Municipal Pension System's funded status and the net growth of the unfunded liability is the product of a number of factors, including the following:

- The declines in the equity markets in 2000-2001 and in 2008-2009. See Table 24 and the Funded Ratio chart below Table 28.

- A reduction in the assumed rate of return, from 9.00% in 2004 to 7.70% effective July 1, 2016. Although the gradual reductions in the assumed rates of return reflected in Table 24 are considered a prudent response to experience studies, by reducing the assumed return in the measurement of the actuarial liabilities, it serves to increase the UAL from what it otherwise would have been.

- Adopting more conservative mortality rates in response to experience studies performed by the Municipal Pension Plan actuary.

- The Municipal Pension Plan is a mature system, which means the number of members making contributions to the Municipal Pension Plan is less than the number of retirees and other beneficiaries receiving payments from the Municipal Pension Plan, by approximately 9,500. As a result, the aggregate of member contributions and the City's contributions are less than the amount of benefits and refunds payable in any particular year, with the result that investment income must be relied upon to meet such difference before such income can contribute to an increase in the Municipal Pension System's assets growth. See Table 26.

- The determination by the City, commencing in Fiscal Year 2005, to fund in accordance with the "minimum municipal obligation" ("MMO"), as permitted and as defined by Pennsylvania law, in lieu of the City Funding Policy (as defined herein), resulted in the City contributing less than otherwise would have been contributed. See below, "– Funding Requirements; Funding Standards."

- Revising, in Fiscal Year 2009, in accordance with Pennsylvania law, the period over which the UAL was being amortized, such that the UAL as of July 1, 2009 was "fresh started" to be amortized over a 30 year period ending June 30, 2039. In addition, changes were made to the periods over which actuarial gains and losses and assumption changes were amortized under Pennsylvania law. See "UAL and its Calculation – Actuarial Valuations."

The City has taken a number of steps to address the funding of the Municipal Pension Plan, including the following:

- Reducing the assumed rate of return on a gradual and consistent basis, which results in the City making larger annual contributions. See Table 24 below.

- Adopting more conservative mortality rates in response to experience studies performed by the Municipal Pension Plan actuary.

- In conjunction with the revisions to the amortization periods that occurred in Fiscal Year 2009, changing from a level percent of pay amortization schedule to a level dollar amount schedule. This results in producing payments that ensure that a portion of principal on the UAL is paid each year.

- Funding consistently an amount greater than the MMO (subject to the authorized deferrals for Fiscal Years 2010 and 2011 described below).

- Negotiating collective bargaining agreements by which additional contributions are being made (and will be made) by certain current (and future) members and by which benefits will be capped for certain future members of the Municipal Pension Plan. See Table 18.

- Securing additional funding, including funds required to be deposited by the City to the Municipal Pension Fund from its share of future sales tax revenue.

This "Overview" is intended to highlight certain of the principal factors that led to the pension system's current funded status, and significant steps the City and the Pension Board have taken to address the underfunding. The reader is cautioned to review with care the more detailed information presented below under this caption, "PENSION SYSTEM."

Pension System; Pension Board

The City maintains two defined-benefit pension programs: (i) the Municipal Pension Plan, a multi-employer plan, which provides benefits to police officers, firefighters, non-uniformed employees, and non-represented appointed and elected officials, and (ii) the PGW Pension Plan, a single employer plan, which provides benefits to PGW employees. The Municipal Pension Plan is administered through 18 separate benefit structures, the funding for which is accounted for on a consolidated basis by the Municipal Pension Fund. The 18 benefit structures establish for their respective members different contribution levels, retirement ages, etc., but all assets are available to pay benefits to all members of the Municipal Pension Plan. The Municipal Pension Plan is a mature plan, initially established in 1915, with investment assets that totaled approximately $4.4 billion as of June 30, 2016. The Municipal Pension Plan has approximately 28,300 members who make contributions to the plan, and provides benefits to approximately 37,800 retirees and other beneficiaries.

PGW is principally a gas distribution facility owned by the City. For accounting presentation purposes, PGW is a component unit of the City and follows accounting rules as they apply to proprietary fund-type activities. The PGW Pension Plan is funded with contributions by PGW to such plan, which are treated as an operating expense of PGW, and such plan is not otherwise addressed under the caption "PENSION SYSTEM." See "PGW PENSION PLAN" below.

Contributions are made by the City to the Municipal Pension Fund from: (i) the City's General Fund; (ii) funds that are received by the City from the Commonwealth for deposit into the Municipal Pension Fund; and (iii) various City inter-fund transfers, representing amounts contributed, or reimbursed, to the City's General Fund for pensions from the City's Water Fund, Aviation Fund, and certain other City funds or agencies. See Table 29. In addition to such City (employer) contribution, the other principal additions to the Municipal Pension Fund are: (i) member (employee) contributions; (ii) interest and dividend income; (iii) net appreciation in asset values; and (iv) net realized gains on the sale of investments. See Table 26 below. An additional source of funding is that portion of the 1% Sales Tax rate increase that is required under Pennsylvania law to be deposited to the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."

The City of Philadelphia Board of Pensions and Retirement (the "Pension Board") was established by the City Charter to administer "a comprehensive, fair and actuarially sound pension and retirement system covering all officers and employees of the City." The City Charter provides that the Pension Board "shall consist of the Director of Finance, who shall be its chairman, the Managing Director, the City Controller, the City Solicitor, the Personnel Director and four other persons who shall be elected to serve on the Board by the employees in the civil service in such manner as shall be determined by the Board." In addition, there is one non-voting member on the Pension Board, who is appointed by the President of City Council. An Executive Director, together with a staff of 73 personnel, administers the day-to-day activities of the retirement system, providing services to approximately 66,200 members.

The Municipal Pension Plan, the Municipal Pension Fund, and the Pension Board are for convenience sometimes collectively referred to under this caption as the "Municipal Retirement System."

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Membership. The following table shows the membership totals for the Municipal Pension Plan, as of July 1, 2016 and as compared to July 1, 2015.

Table 23
Municipal Pension Plan – Membership Totals

	July 1, 2016	July 1, 2015	% Change
Actives	28,308	27,951	1.3%
Terminated Vesteds	1,248	1,334	-6.4%
Disabled	4,005	4,016	-0.3%
Retirees	22,412	22,245	0.8%
Beneficiaries	8,567	8,566	0.0%
Deferred Retirement Option Plan ("DROP")	1,614	1,784	-9.5%
Total City Members	66,154	65,896	0.4%
Annual Salaries	$1,676,548,962	$1,597,848,869	4.9%
Average Salary per Active Member	$59,225	$57,166	3.6%
Annual Retirement Allowances	$741,828,339	$719,580,951	3.1%
Average Retirement Allowances	$21,205	$20,662	2.6%

Source: July 1, 2016 Valuation.

As shown in Table 23, total membership in the Municipal Pension Plan increased by 0.4%, or from 65,896 to 66,154 members, from July 1, 2015 to July 1, 2016, including an increase of 1.3% in active members from 27,951 to 28,308 (who were contributing to the Municipal Pension Fund). Of the 66,154 members, 37,846 were retirees, beneficiaries, disabled, and other members (who were withdrawing from, or not contributing to, the Municipal Pension Fund).

Subject to the exceptions otherwise described in this paragraph, employees and officials become vested in the Municipal Pension Plan upon the completion of ten years of service. Employees and appointed officials who hold positions that are exempt from civil service and who are not entitled to be represented by a union, and who were hired before January 13, 1999, may elect accelerated vesting after five years of service in return for payment of a higher employee contribution than if the vesting period were ten years. Such employees and officials hired after January 13, 1999, become vested after five years of service and pay a higher employee contribution than if the vesting period were ten years. Elected officials become vested in the Municipal Pension Plan once they complete service equal to the lesser of two full terms in their elected office or eight years and pay a higher contribution than if the vesting period were ten years. Elected officials pay an additional employee contribution for the full cost of the additional benefits they may receive over those of general municipal employees. Upon retirement, employees and officials may receive up to 100% of their average final compensation depending upon their years of credited service and the plan in which they participate.

All City employees participate in the U.S. Social Security retirement system except for uniformed Police and uniformed Fire employees.

Certain membership information relating to the City's municipal retirement system provided by the Pension Board is set forth in Appendix A to the July 1, 2016 Actuarial Valuation Report (the "July 1, 2016 Valuation") and includes as of July 1, 2016, among other information, active and non-active member data by plan, age/service distribution for active participants and average salary for all plans, and age and benefit distributions for non-active member data.

Funding Requirements; Funding Standards

City Charter. The City Charter establishes the "actuarially sound" standard quoted above. Case law has interpreted "actuarially sound" as used in the City Charter to require the funding of two components: (i) "normal cost" (as defined below) and (ii) interest on the UAL. (*Dombrowski v. City of Philadelphia*, 431 Pa. 199, 245 A.2d 238 (1968)).

Pennsylvania Law. The Municipal Pension Plan Funding Standard and Recovery Act (Pa. P.L. 1005, No. 205 (1984)) ("Act 205"), applies to all municipal pension plans in Pennsylvania, "[n]otwithstanding any provision of law, municipal ordinance, municipal resolution, municipal charter, pension plan agreement or pension plan contract to the contrary . . . ." Act 205 provides that the annual financial requirements of the Municipal Pension Plan are: (i) the normal cost; (ii) administrative expense requirements; and (iii) an amortization contribution requirement. In addition, Act 205 requires that the MMO be payable to the Municipal Pension Fund from City revenues, and that the City shall provide for the full amount of the MMO in its annual budget. The MMO is defined as "the financial requirements of the pension plan reduced by . . . the amount of any member contributions anticipated as receivable for the following year." Act 205 further provides that the City has a "duty to fund its municipal pension plan," and the failure to provide for the MMO in its budget, or to pay the full amount of the MMO, may be remedied by the institution of legal proceedings for mandamus.

In accordance with Pennsylvania law and Act 205, the City uses the entry age normal actuarial funding method, whereby "normal cost" (associated with active employees only) is the present value of the benefits that the City expects to become payable in the future distributed evenly as a percent of expected payroll from the age of first entry into the plan to the expected age at retirement. The City's share of such normal cost (to which the City adds the Plan's administrative expenses) is reduced by member contributions. The term "level" means that the contribution rate for the normal cost, expressed as a percentage of active member payroll, is expected to remain relatively level over time.

The City has budgeted and paid at least the full MMO amount since such requirement was established, and more specifically, prior to Fiscal Year 2005 the City had been contributing to the Municipal Pension Plan the greater amount as calculated pursuant to the City Funding Policy which was implemented before Act 205 was effective, as described below. Payment of the MMO is a condition for receipt of the Commonwealth contribution to the Municipal Pension Fund. See Table 29.

Act 205 was amended in 2009 by Pa. P.L. 396, No. 44 ("Act 44") to authorize the City to: (i) "fresh start" the amortization of the UAL as of July 1, 2009 by a level annual dollar amount over 30 years ending June 30, 2039; and (ii) revise the amortization periods for actuarial gains and losses and assumption changes in accordance with Act 44, as described below under "UAL and its Calculation – Actuarial Valuations." In addition, Act 44 authorized the City to defer, and the City did defer, $150 million of the MMO otherwise payable in Fiscal Year 2010, and $80 million of the MMO otherwise payable in Fiscal Year 2011, subject to repayment of the deferred amounts by June 30, 2014. The City repaid the aggregate deferred amount of $230 million, together with interest at the then-assumed interest rate of 8.25%, in Fiscal Year 2013. See Table 29. Because the final amortization date is fixed, if all actuarial assumptions are achieved, the unfunded liability would decline to zero as of the final amortization date. To the extent future experience differs from the assumptions used to establish the 30-year fixed amortization payment schedule, new amortization bases attributable to a particular year's difference would be established and amortized over their own 20-year schedule.

GASB; City Funding Policy. Governmental Accounting Standards Board ("GASB") Statement No. 27, "Accounting for Pensions by State and Local Governmental Employers" ("GASB 27"), applied to the City for Fiscal Years beginning prior to July 1, 2014. For the Fiscal Year beginning July 1, 2014, GASB Statement No. 68 ("GASB 68"), which amends GASB 27 in several significant respects, applies. GASB 27 defined an "annual required contribution" ("ARC") as that amount sufficient to pay (i) the normal cost and (ii) the amortization of UAL, and provides that the maximum acceptable amortization period is 30 years (for the initial 10 years of implementation, 1996-2006, a 40-year amortization period was permitted). GASB 27 did not establish funding requirements for the City but rather was an accounting and financial reporting standard. GASB 68 does not require the calculation of an ARC but does require the City to include as a liability on its balance sheet the City's "net pension liability," as defined by GASB 68. The City has been funding the Municipal Pension Fund since Fiscal Year 2003 based on the MMO, including the deferral permitted by Act 44. See Table 29 below.

The City, prior to Fiscal Year 2005, had been funding the Municipal Pension Fund in accordance with what the City referred to as the "City Funding Policy." That reference was used and continues to be used in the Actuarial Reports. Under the City Funding Policy, the UAL as of July 1, 1985 was to be amortized over 34 years ending June 30, 2019, with payments increasing at 3.3% per year, the assumed payroll growth. Other changes in the actuarial liability were amortized in level-dollar payments over various periods as prescribed in Act 205. In 1999, the City issued pension funding bonds, the proceeds of which were deposited directly into the Municipal Pension Fund to pay down its UAL. See "– Annual Contributions – Pension Bonds" below.

Revenue Recognition Policy. The City follows a policy (the "Revenue Recognition Policy") to contribute each year to the Municipal Pension Fund an amount in excess of the MMO. The determination for such additional funding is based on not including (i) the portion of the amounts generated by the increase in the Sales Tax rate that became effective on July 1, 2014 and are required by Act 205 to be deposited to the Municipal Pension Fund (see "Revenues of the City – Sales and Use Tax"), and (ii) contributions to be made by City employees that are under Plan 16 (described above in the text that immediately follows Table 19) in the actuarial asset value when determining the annual contribution obligation.

The amounts projected by the City in the Twenty-Sixth Five Year Plan to be deposited from Sales Tax revenue into the Municipal Pension Fund, for the six Fiscal Years 2017-2022, respectively, are as follows: $18.3 million; $24.0 million; $44.6 million; $49.9 million; $54.9 million; and $59.8 million. (These revenue estimates reflect updates made since the data cutoff for performing the July 1, 2016 Valuation. Compare to the amounts under "Sales Tax Contribution" in the first table under the subsection "Actuarial Projections of Funded Status.")

UAL and its Calculation

According to the July 1, 2016 Valuation, the funded ratio (the valuation of assets available for benefits to total actuarial liability) of the Municipal Pension Fund as of July 1, 2016 was 44.8% and the Municipal Pension Fund had an unfunded actuarial liability ("UAL") of $6.089 billion. The UAL is the difference between total actuarial liability ($11.025 billion as of July 1, 2016) and the actuarial value of assets ($4.936 billion as of July 1, 2016).

Key Actuarial Assumptions. In accordance with Act 205, the actuarial assumptions must be, in the judgment of both Cheiron (the independent consulting actuary for the Municipal Pension Fund) and the City, "the best available estimate of future occurrences in the case of each assumption." The assumed investment return rate used in the July 1, 2016 Valuation was 7.70% a year (which includes an inflation assumption of 2.75%), net of administrative expenses, compounded annually. For the prior actuarial valuation, the assumed investment return rate was 7.75%. See Table 24 for the assumed rates of return for Fiscal Years 2007 to 2016. The 7.75% was used to establish the MMO payment for Fiscal Year 2017; 7.70% will be used to establish the MMO payment for Fiscal Year 2018.

Other key actuarial assumptions in the July 1, 2016 Valuation include the following: (i) total annual payroll growth of 3.30%, (ii) annual administrative expenses assumed to increase 3.30% per year, (iii) to recognize the expense of the benefits payable under the Pension Adjustment Fund, actuarial liabilities were increased by 0.54%, based on the statistical average expected value of the benefits, (iv) a vested employee who terminates will elect a pension deferred to service retirement age so long as their age plus years of service at termination are greater than or equal to 55 (45 for police and fire employees), (v) for municipal and elected members, 70% of all disabilities are ordinary and 30% are service-connected, and (vi) for police and fire members, 50% of all disabilities are ordinary and 50% are service-connected.

“Smoothing Methodology”. The Municipal Retirement System uses an actuarial value of assets to calculate its annual pension contribution, using an asset smoothing method to dampen the volatility in asset values that could occur because of fluctuations in market conditions. The Municipal Retirement System used a five-year smoothing prior to Fiscal Year 2009, and beginning with Fiscal Year 2009 began employing a ten-year smoothing. Using the ten-year smoothing methodology, investment returns in excess or below the assumed rate are prospectively distributed in equal amounts over a ten-year period, subject to the requirement that the actuarial value of assets will be adjusted, if necessary, to ensure that the actuarial value of assets will never be less than 80% of the market value of the assets, nor greater than 120% of the market value of the assets. The actuarial value of assets as of July 1, 2016, was approximately 113.5% of the market value of the assets.

Actuarial Valuations. The Pension Board engages an independent consulting actuary (currently Cheiron) to prepare annually an actuarial valuation report. Act 205, as amended by Act 44, establishes certain parameters for the actuarial valuation report, including: (i) use of the entry age normal actuarial cost method; (ii) that the report shall contain: (a) actuarial exhibits, financial exhibits, and demographic exhibits; (b) an exhibit of normal costs expressed as a percentage of the future covered payroll of the active membership in the Municipal Pension Plan; and (c) an exhibit of the actuarial liability of the Municipal Pension Plan; and (iii) that changes in the actuarial liability be amortized in level-dollar payments as follows: (a) actuarial gains and losses be amortized over 20 years beginning July 1, 2009 (prior to July 1, 2009, gains and losses were amortized over 15 years); (b) assumption changes be amortized over 15 years beginning July 1, 2010 (prior to July 1, 2010, assumption changes were amortized over 20 years); (c) plan changes for active members be amortized over 10 years; (d) plan changes for inactive members be amortized over one year; and (e) plan changes mandated by the Commonwealth be amortized over 20 years.

Act 205 further requires that an experience study be conducted at least every four years, and cover the five-year period ending as of the end of the plan year preceding the plan year for which the actuarial valuation report is filed. The most recent Experience Study was prepared by Cheiron in March 2014 for the period July 1, 2008 – June 30, 2013. The changes to the actuarial and demographic assumptions that were adopted by the Pension Board in response to such Experience Study have been employed since the July 1, 2014 Valuation. The principal revisions included marginal changes in salary growth rates; changes in retirement assumptions (increase for those under the pension plan the City established in 1967; decrease for those under the pension plan the City established in 1987); increase in the expected disability rates for police and fire employees; and changes in mortality assumptions to fully reflect the most recent experience. Details of these assumption changes and the experience of the Municipal Pension Plan can be found in the *City of Philadelphia Municipal Retirement System Experience Study Results and Recommendations For the period covering July 1, 2008 – June 30, 2013,* available at the Investor Information section of the City’s Investor Website.

Pension Adjustment Fund

Pursuant to § 22-311 of the Philadelphia Code, the City directed the Pension Board to establish a Pension Adjustment Fund ("PAF") on July 1, 1999, and further directed the Pension Board to determine, effective June 30, 2000 and each Fiscal Year thereafter, whether there are "excess earnings" as defined available to be credited to the PAF. The Pension Board's determination is to be based upon the actuary's certification using the "adjusted market value of assets valuation method" as defined in § 22-311. Although the portion of the assets attributed to the PAF is not segregated from the assets of the Municipal Pension Fund, the Philadelphia Code provides that the "purpose of the Pension Adjustment Fund is for the distribution of benefits as determined by the Board for retirees, beneficiaries or survivors [and] [t]he Board shall make timely, regular and sufficient distributions from the Pension Adjustment Fund in order to maximize the benefits of retirees, beneficiaries or survivors." Distributions are to be made "without delay" no later than six months after the end of each Fiscal Year. The PAF was established, in part, because the Municipal Retirement System does not provide annual cost-of-living increases to retirees or beneficiaries. At the time the PAF was established, distributions from the PAF were subject to the restriction that the actuarial funded ratio using the "adjusted market value of assets" be not less than such ratio as of July 1, 1999 (76.7%). That restriction was deleted in 2007 by an ordinance adopted by City Council; the Mayor vetoed such ordinance, and City Council overrode such veto.

The amount to be credited to the PAF is 50% of the "excess earnings" that are between one percent (1%) and six percent (6%) above the actuarial assumed investment rate. Earnings in excess of six percent (6%) of the actuarial assumed investment rate remain in the Municipal Pension Fund. Although the Pension Board utilizes a ten-year smoothing methodology, as explained above, for the actuarial valuation of assets for funding and determination of the MMO, § 22-311 provides for a five-year smoothing to determine the amount to be credited to the PAF. The actuary determined that for the Fiscal Year ended June 30, 2016, there were no "excess earnings" as defined to be credited to the PAF. The Pension Board transfers to the PAF the full amount calculated by the actuary as being available in any year for transfer within six months of the Pension Board designating the amount to be transferred.

Transfers to the PAF and the resultant additional distributions to retirees result in removing assets from the Municipal Pension Plan. To account for the possibility of such transfers, and as an alternative to adjusting the assumed investment return rate to reflect such possibility, the actuary applies a load of 0.54% to the calculated actuarial liability as part of the funding requirement and MMO. Such calculation was utilized for the first time in the July 1, 2013 actuarial valuation.

The market value of assets as used under this caption, "PENSION SYSTEM," represents the value of the assets if they were liquidated on the valuation date and this value includes the PAF (except as otherwise indicated in certain tables), although the PAF is not available for funding purposes. The actuarial value of assets does not include the PAF.

Rates of Return; Asset Values; Changes in Plan Net Position

Rates of Return. The following table sets forth for the Fiscal Years 2007-2016 the market value of assets internal rate of return and actuarial value of assets internal rate of return experienced by the Municipal Pension Fund, and the assumed rate of return. The 5-year and 10-year annual average returns as of June 30, 2016, were 4.54% and 4.27%, respectively, on a market value basis.

Table 24
Municipal Pension Fund
Annual Rates of Return

Year Ending June 30,	Market Value	Actuarial Value[1]	Assumed Rate of Return
2007	17.0%	10.7%	8.75%
2008	-4.5%	10.1%	8.75%
2009	-19.9%	-9.3%	8.75%
2010	13.8%	12.9%	8.25%
2011	19.4%	9.9%	8.15%
2012	0.2%	2.4%	8.10%
2013	10.9%	5.1%	7.95%
2014	15.7%	4.8%	7.85%
2015	0.3%	5.8%	7.80%
2016	-3.2%	4.5%	7.75%

Source: July 1, 2016 Valuation.

(1) Net of PAF. See "Pension Adjustment Fund" above. The actuarial values for 2007-2008 reflect a five-year smoothing; for 2009-2016, a ten-year smoothing.

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Asset Values. The following table sets forth as of the July 1 actuarial valuation date for the years 2007-2016 the actuarial and market values of assets in the Municipal Pension Fund and the actuarial value as a percentage of market value.

Table 25
Actuarial Value of Assets vs. Market Value of Net Assets
(Dollar Amounts in Millions of USD)

Actuarial Valuation Date (July 1)	Actuarial Value of Assets(1)	Market Value of Net Assets(1)	Actuarial Value as a Percentage of Market Value
2007	$4,421.7	$4,850.9	91.2%
2008	$4,623.6	$4,383.5	105.5%
2009	$4,042.1	$3,368.4	120.0%
2010(2)	$4,380.9	$3,650.7	120.0%
2011(2)	$4,719.1	$4,259.2	110.8%
2012(2)	$4,716.8	$4,151.8	113.6%
2013	$4,799.3	$4,444.1	108.0%
2014	$4,814.9	$4,854.3	99.2%
2015	$4,863.4	$4,636.1	104.9%
2016	$4,936.0	$4,350.8	113.5%

Source: July 1, 2016 Valuation for Actuarial Value of Assets; 2007-2016 Actuarial Reports for Market Value of Net Assets.

(1) For purposes of this table, the Market Value of Net Assets excludes the PAF, which as of June 30, 2016 equaled $7.223 million. The Actuarial Value of Assets excludes that portion of the Municipal Pension Fund that is allocated to the PAF. The actuarial values for 2007-2008 reflect a five-year smoothing; for 2009-2016, a ten-year smoothing.

(2) The July 1, 2010 actuarial and market values of assets include the $150 million deferred contribution from Fiscal Year 2010, and the July 1, 2011 and July 1, 2012 actuarial and market values of assets include the total deferred contribution of $230 million. See Table 29 below.

Changes in Plan Net Position. The following table sets forth for the Fiscal Years 2012-2016, the additions, including employee (member) contributions, City contributions (including contributions from the Commonwealth), investment income and miscellaneous income, and deductions, including benefit payments and administration expenses, for the Municipal Pension Fund. Debt service payments on pension funding bonds (as described below at "Annual Contributions – Pension Bonds") are made from the City's General Fund, Water Operating Fund, and Aviation Operating Fund, but are not made from the Municipal Pension Fund, and therefore are not included in Table 26. In those years in which the investment income is less than anticipated, the Municipal Pension Fund may experience negative changes (total deductions greater than total additions), which, as the table reflects, did occur in Fiscal Year 2012. Furthermore, if unrealized gains are excluded from Table 26, resulting in a comparison of cash actually received against actual cash outlays, it results in a negative cash flow in each year, which is typical of a mature retirement system.

Contributions from the Commonwealth are provided pursuant to the provisions of Act 205. Any such contributions are required to be used to defray the cost of the City's pension system. The amounts contributed by the Commonwealth for each of the last ten Fiscal Years are set forth in Table 29 below. The contributions from the Commonwealth are capped pursuant to Act 205, which provides that "[n]o municipality shall be entitled to receive an allocation of general municipal pension system State aid in an amount greater that 25% of the total amount of the general municipal pension system State aid available."

Employee (member) contribution amounts reflect contribution rates as a percent of pay, which for the plan year beginning July 1, 2017, vary from 5.00% to 6.00% for police and fire employees, and from 3.10% to 7.00% for municipal employees excluding elected officials. These rates include the increases in contributions for certain municipal employees and elected officials currently in Plans 67, 87 and 87 Prime and elected officials as required by legislation. This legislation called for employees in these groups to pay an additional 0.5% of compensation from January 1, 2015 to December 31, 2015 and an additional 1.0% from January 1, 2016 onwards. New employees in these groups entering Plan 87 Municipal prime will pay an additional 1.0% of compensation which is included in the table below.

Table 26
Changes in Net Position of the Municipal Pension Fund
Fiscal Years 2012-2016
(Amounts in Thousands of USD)

	2012	**2013**	**2014**	**2015**	**2016**
Beginning Net Assets (Market Value)[1]	$4,030,216	$3,922,817	$4,445,224	$4,916,705	$4,674,252
Additions					
- Member Contributions	49,979	49,614	53,722	58,658	67,055
- City Contributions[2]	556,031	781,823	553,179	577,195	660,247
- Investment Income[3]	13,297	442,667	677,380	11,790	(147,424)
- Miscellaneous Income[4]	1,224	3,134	4,089	2,049	1,742
Total	$620,531	$1,277,238	$1,288,370	$649,692	$581,620
Deductions					
- Benefits and Refunds	(712,684)	(746,490)	(808,597)	(881,666)	(889,343)
- Administration	(15,246)[5]	(8,341)	(8,292)	(10,479)	(8,554)
Total	$(727,930)	$(754,831)	$(816,889)	$(892,145)	$(897,897)
Ending Net Assets (Market Value)[6]	$3,922,817	$4,445,224	$4,916,705	$4,674,252	$4,357,975

Source: Municipal Pension Fund's audited financial statements.

(1) Includes the PAF, which is not available for funding purposes.

(2) City Contributions include pension contributions from the Commonwealth. See Table 29.

(3) Investment income is shown net of fees and expenses, and includes interest and dividend income, net appreciation (depreciation) in fair value of investments, and net gains realized upon the sale of investments.

(4) Miscellaneous income includes securities lending and other miscellaneous revenues.

(5) The $15.2 million is the number in the Fund's 2012 audited financial statements. However, it was subsequently determined that certain investment expenses had been misclassified as administration expenses. If those investment expenses were not included, the administration deduction for Fiscal Year 2012 would have been $8.5 million.

(6) For Fiscal Year 2012, does not include the $230 million total contribution receivable, which was paid back and is included in Fiscal Year 2013 in the "City Contributions" amount. See Table 29.

Funded Status of the Municipal Pension Fund

The following two tables set forth as of the July 1 actuarial valuation date for the years 2007-2016, the asset value, the actuarial liability, the UAL, the funded ratio, covered payroll and UAL, as a percentage of covered payroll for the Municipal Pension Fund on actuarial and market value bases, respectively.

Table 27
Schedule of Funding Progress (Actuarial Value)
(Dollar Amounts in Millions of USD)

Actuarial Valuation Date (July 1)	Actuarial Value of Assets[1] (a)	Actuarial Liability (b)	UAL (Actuarial Value) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAL as a % of Covered Payroll [(b-a)/c]
2007	$4,421.7	$8,197.2	$3,775.5	53.9%	$1,351.8	279.3%
2008	$4,623.6	$8,402.2	$3,778.7	55.0%	$1,456.5	259.4%
2009	$4,042.1	$8,975.0	$4,932.9	45.0%	$1,463.3	337.1%
2010	$4,380.9	$9,317.0	$4,936.1	47.0%	$1,421.2	347.3%
2011	$4,719.1[2]	$9,487.5	$4,768.4	49.7%	$1,371.3	347.7%
2012	$4,716.8[2]	$9,799.9	$5,083.1	48.1%	$1,372.2	370.4%
2013	$4,799.3	$10,126.2	$5,326.9	47.4%	$1,429.7	372.6%
2014	$4,814.9	$10,521.8	$5,706.9	45.8%	$1,495.4	381.6%
2015	$4,863.4	$10,800.4	$5,937.0	45.0%	$1,597.8	371.6%
2016	$4,936.0	$11,024.8	$6,088.8	44.8%	$1,676.5	363.2%

Source: July 1, 2016 Valuation.

(1) The July 1, 2010 Actuarial Value of Assets includes the $150 million deferred contribution from Fiscal Year 2010 and each of the July 1, 2011 and July 1, 2012 Actuarial Value of Assets includes the total deferred contribution of $230 million.

(2) Reflects the assumed rate of return on deferred contributions at the time of the deferral.

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Table 28
Schedule of Funding Progress (Market Value)
(Dollar Amounts in Millions of USD)

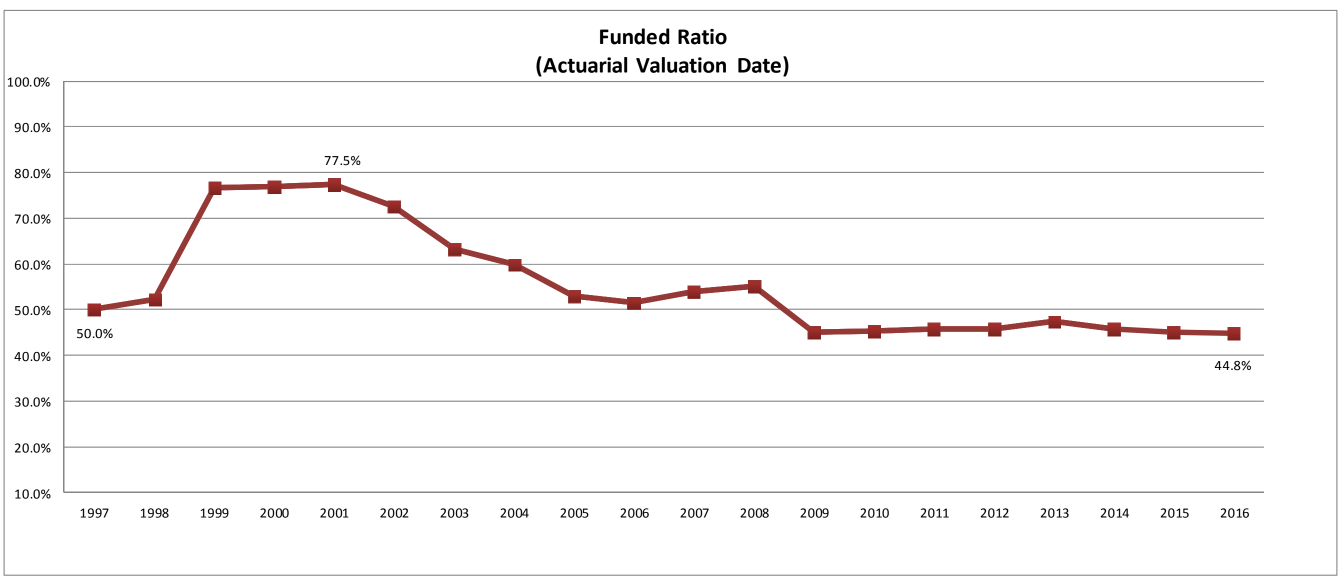
Actuarial Valuation Date (July 1)	Market Value of Net Assets[1] (a)	Actuarial Liability (b)	UAL (Market Value) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAL as a % of Covered Payroll [(b-a)/c]
2007	$4,850.9	$8,197.2	$3,346.3	59.2%	$1,351.8	247.5%
2008	$4,383.5	$8,402.2	$4,018.7	52.2%	$1,456.5	275.9%
2009	$3,368.4	$8,975.0	$5,606.6	37.5%	$1,463.3	383.2%
2010	$3,650.7	$9,317.0	$5,666.3	39.2%	$1,421.2	398.7%
2011	$4,259.2	$9,487.5	$5,228.3	44.9%	$1,371.3	381.3%
2012	$4,151.8	$9,799.9	$5,648.1	42.4%	$1,372.2	411.6%
2013	$4,444.1	$10,126.2	$5,682.1	43.9%	$1,429.7	397.4%
2014	$4,854.3	$10,521.8	$5,667.6	46.1%	$1,495.4	379.0%
2015	$4,636.1[2]	$10,800.4	$6,164.3	42.9%	$1,597.8	385.8%
2016	$4,350.8[2]	$11,024.8	$6,674.0	39.5%	$1,676.5	398.1%

Source: 2007-2016 Actuarial Valuation Reports.

(1) The July 1, 2010 Market Value of Net Assets includes the $150 million deferred contribution from Fiscal Year 2010 and each of the July 1, 2011 and July 1, 2012 Market Value of Net Assets includes the total deferred contribution of $230 million.

(2) For purposes of this table, the Market Value of Net Assets excludes the PAF, which as of June 30, 2015 equaled $38,198,762, and as of June 30, 2016 equaled $7,223,000.

The following chart reflects the funded ratios, using the actuarial value of assets, for the 20-year period 1997 – 2016.



Annual Contributions

Annual Municipal Pension Contributions

Table 29 shows the components of the City's annual pension contributions to the Municipal Pension Fund for the Fiscal Years 2007-2016.

Table 29
Total Contribution to Municipal Pension Fund
(Dollar Amounts in Millions of USD)

Fiscal Year	General Fund Contribution (A)	Commonwealth Contribution (B)	Aggregate General Fund Contribution (A+B)	Water Fund Contribution	Aviation Fund Contribution	Grants Funding and Other Funds Contribution[1]	Contributions from Quasi-governmental Agencies	Pension Bond Proceeds	Total Contribution (C)	MMO (D)	MMO (Deferred) Makeup Payments	% of MMO Contributed (C/D)
2007	$304.6	$57.7	$362.3	$31.5	$14.3	$11.2	$13.0	$0.0	$432.3	$400.3		108.0%
2008	$292.7	$59.6	$352.3	$32.4	$15.5	$12.2	$14.5	$0.0	$426.9	$412.4		103.5%
2009	$315.0	$59.6	$374.6	$36.4	$17.5	$11.5	$15.4	$0.0	$455.4	$438.5		103.9%
2010	$190.8[2]	$59.2	$250.0	$25.1	$11.6	$10.8	$15.1	$0.0	$312.6[2]	$447.4	$(150.0)[3]	100.0%[4]
2011	$325.8[2]	$61.8	$387.6	$37.7	$17.1	$13.6	$14.2	$0.0	$470.2[2]	$511.0	$(80.0)[3]	100.0%[4]
2012	$352.7	$95.0	$447.7	$43.8	$20.6	$27.4	$16.2	$0.0	$555.7	$507.0		109.7%
2013	$356.5	$65.7	$422.2	$41.4	$20.3	$27.2	$18.1	$252.6[3]	$781.8	$492.0	$230.0[3]	100.0%[4]
2014	$365.8	$69.6	$435.4	$45.5	$22.5	$30.0	$19.8	$0.0	$553.2	$523.4		105.7%
2015	$388.5	$62.0	$450.5	$48.3	$23.9	$33.4	$21.1	$0.0	$577.2	$556.0		103.8%
2016	$449.6	$62.6	$512.2	$55.1	$27.1	$34.8	$31.0	$0.0	$660.2	$595.0		110.0%

(1) Other Funds Contributions represents contributions to the Municipal Pension Fund from the City's Special Gasoline Tax Fund, Community Development Block Grant Fund, Municipal Pension Fund, Acute Care Hospital Assessment Fund, and General Capital Improvement Fund.

(2) Reflects the actual cash outlays for Fiscal Year 2010 and Fiscal Year 2011, which do not include the deferred contributions authorized pursuant to Act 44. See "– Funding Requirements; Funding Standards – Pennsylvania Law" above for a discussion of pension contribution deferrals authorized pursuant to Act 44.

(3) As authorized pursuant to Act 44, the City deferred payments to the Municipal Pension Fund of $150 million in fiscal year 2010 and $80 million in fiscal year 2011. Those amounts were repaid in fiscal year 2013, in which year the City made a contribution of $252.6 million to the Municipal Pension Fund, consisting of $230 million of proceeds of Pension Bonds that were issued in October 2012 and $22.6 million in refunding savings from a refunding Pension Bond financing in December 2012. See " – Pension Bonds" below.

(4) Act 205 directs the Actuary, in performing the actuarial valuations, to disregard deferrals, and therefore for ease of presentation 100.0% is reflected in this column for both the years in which the deferrals occurred and the year in which the makeup payment was made.

Annual Debt Service Payments on the Pension Bonds

Pension funding bonds ("Pension Bonds") were issued in Fiscal Year 1999, at the request of the City, by PAID. Debt service on the Pension Bonds is payable pursuant to a Service Agreement between the City and PAID. The Service Agreement provides that the City is obligated to pay a service fee from its current revenues and the City covenanted in the agreement to include the annual amount in its operating budget and to make appropriations in such amounts as are required. If the City's revenues are insufficient to pay the full service fee in any Fiscal Year as the same becomes due and payable, the City has covenanted to include amounts not so paid in its operating budget for the ensuing Fiscal Year.

The 1999 Pension Bonds were issued in the principal amount of $1.3 billion, and the net proceeds were used, together with other funds of the City, to make a contribution in Fiscal Year 1999 to the Municipal Pension Fund in the amount of approximately $1.5 billion.

In October 2012, PAID, at the request of the City, issued Pension Bonds in the principal amount of $231.2 million, the proceeds of which were used principally to make the $230 million repayment of deferred contributions to the Municipal Pension Fund reflected in Table 29 above. These bonds had maturities of April 1, 2013 and 2014, and have been repaid.

In December 2012, PAID, at the request of the City, issued Pension Bonds in the approximate principal amount of $300 million, the proceeds of which were used to current refund a portion of the 1999 Pension Bonds. The refunding generated savings of approximately $22.6 million, which the City deposited into the Municipal Pension Fund.

Table 30 shows the components of the City's annual debt service payments on the Pension Bonds for the Fiscal Years 2007-2016.

Table 30
Total Debt Service Payments on Pension Bonds
(Amounts in Millions of USD)

Fiscal Year	General Fund Payment	Water Fund Payment	Aviation Fund Payment	Other Funds Payment[1]	Grants Funding	Total Payment
2007	$74.6	$7.2	$3.2	$0.5	$1.3	$86.8
2008	$78.4	$7.8	$3.5	$0.6	$1.3	$91.6
2009	$84.4	$7.2	$3.3	$0.6	$1.3	$96.8
2010	$96.7	$7.6	$3.4	$0.6	$1.5	$109.8
2011	$97.7	$10.3	$4.6	$0.8	$1.5	$114.9
2012	$100.1	$10.7	$4.8	$0.7	$3.4	$119.7
2013[2]	$196.6	$21.5	$10.1	$1.3	$3.8	$233.3
2014[2]	$211.0	$23.6	$11.2	$1.4	$3.7	$250.9
2015	$107.7	$12.6	$5.9	$0.8	$4.0	$131.0
2016	$109.9	$13.7	$6.4	$0.9	$3.8	$134.7

(1) Other Funds Payments represents the allocable portion of debt service payments on the City's Pension Bonds from the City's Special Gasoline Tax Fund, Community Development Block Grant Fund, Municipal Pension Fund, Acute Care Hospital Assessment Fund, and General Capital Improvement Fund.

(2) The increase in debt service payments in fiscal years 2013 and 2014 over the fiscal year 2012 amounts reflect the debt service payments on the Pension Bonds that were issued in October 2012. See " – Pension Bonds" below.

Annual Pension Costs of the General Fund

Table 31 shows the annual pension costs of the General Fund for the Fiscal Years 2007-2016, being the sum of the General Fund Contribution to the Municipal Pension Fund (column (A) in Table 29 above) and the General Fund debt service payments on Pension Bonds (Table 30 above).

Table 31
Annual Pension Costs of the General Fund
(Amounts in Millions of USD)

Fiscal Year	General Fund Pension Fund Contribution (A)[1]	General Fund Pension Bond Debt Service Payment (B)	Annual Pension Costs (A+B)	Total General Fund Expenditures (C)	General Fund portion of Annual Pension Costs as % of Total General Fund Expenditures (A+B) / C
2007	$304.6	$74.6	$379.2	$3,736.66	10.15%
2008	$292.7	$78.4	$371.1	$3,919.84	9.47%
2009	$315.0	$84.4	$399.4	$3,915.29	10.20%
2010	$190.8	$96.7	$287.5	$3,653.73	7.87%
2011	$325.8	$97.7	$423.5	$3,785.29	11.19%
2012	$352.7	$100.1	$452.8	$3,484.88	12.99%
2013	$356.5	$196.6	$553.1	$3,613.27	15.31%
2014	$365.8	$211.0	$576.8	$3,886.56	14.84%
2015	$388.5	$107.7	$496.2	$3,831.51	12.95%
2016	$449.6	$109.9	$559.5	$4,015.80	13.93%

(1) Does not include Commonwealth contribution. See Table 29.

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The following table shows the annual City contribution to the Municipal Pension Fund as a percentage of the covered employee payroll.

Table 32
Annual City Contribution as % of Covered Employee Payroll
(Dollar Amounts in Thousands of USD)

Fiscal Year	Annual City Contribution	Fiscal Year Covered Employee Payroll(1)	ACC as % of Payroll
2007	$432,267	$1,351,826	31.98%
2008	$426,934	$1,456,520	29.31%
2009	$455,389	$1,463,260	31.12%
2010	$312,556	$1,421,151	21.99%
2011	$470,155	$1,371,274	34.29%
2012	$555,690	$1,372,174	40.50%
2013	$781,823	$1,429,723	54.68%
2014	$553,179	$1,495,421	36.99%
2015	$577,195	$1,597,849	36.12%
2016	$660,247	$1,676,412	39.38%

Source: Municipal Pension Fund Financial Statements, June 30, 2016.

(1) The definition of "covered-employee payroll" in GASB 68 differs slightly from the "covered payroll" definition in GASB 27. See "PENSION SYSTEM – Funding Requirements; Funding Standards – *GASB; City Funding Policy*."

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Actuarial Projections of Funded Status

Cautionary Note. The information under this subheading, "Actuarial Projections of Funded Status," was prepared by Cheiron. The table below shows a five-year projection of MMO payments, Actuarial Value of Assets, Actuarial Liability, UAL, and Funded Ratio. The charts below show projections through 2036 of funded ratios and MMO contributions. All projections, whether for five years or for twenty years, are subject to actual experience deviating from the underlying assumptions and methods, and that is particularly the case for the charts below for the periods beyond the projections in the five-year table. **Projections and actuarial assessments are "forward looking" statements and are based upon assumptions which may not be fully realized in the future and are subject to change, including changes based upon the future experience of the City's Municipal Pension Fund and Municipal Pension Plan.**

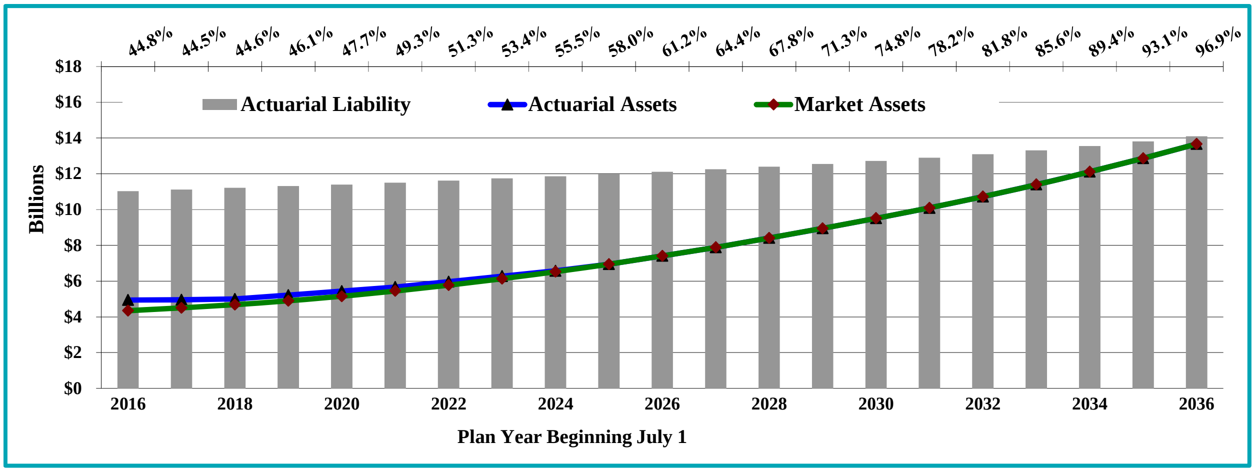
The projections are on the basis that all assumptions in the July 1, 2016 Valuation are exactly realized and the City makes all future MMO payments on schedule as required by Pennsylvania law, and must be understood in the context of the assumptions, methods and benefits in effect as described in the July 1, 2016 Valuation. Included among such assumptions are: (i) the rates of return for the Municipal Pension Fund over the projection period will equal 7.70% annually, (ii) MMO contributions will be made each year, and (iii) the provisions of Act 205 as amended by Act 44 will remain in force during the projection period. The July 1, 2016 Valuation includes charts reflecting the contributions based on MMO (charts 1A and 2A), and charts reflecting the additional contributions in accordance with the Revenue Recognition Policy (chart 3A). The charts below reflect the MMO contributions without taking into account any additional contributions in accordance with the Revenue Recognition Policy. See the July 1, 2016 Valuation for a further discussion of the assumptions and methodologies used by the Actuary in preparing the July 1, 2016 Valuation and the following projections, all of which should be carefully considered in reviewing the projections. The July 1, 2016 Valuation is available for review on the Municipal Retirement System website. The table and charts below separately set forth estimates of sales tax revenues that will be deposited by the City into the Municipal Pension Fund, which were provided by the City to Cheiron at the time of the valuation. Please note that the sales tax contribution figures below do not reflect the updated sales tax contribution figures included in the Twenty-Sixth Five-Year Plan (see line 11 of the "Revenues and Expenditures – Summary of Operations Fiscal Years 2016 to 2022" on page 333 of the Twenty-Sixth Five-Year Plan). Cheiron has not analyzed and makes no representation regarding the validity of the sales tax revenue assumptions and estimates provided by the City. See "REVENUES OF THE CITY – Sales and Use Tax." Each of the tables and graphs that follow are part of the July 1, 2016 Valuation and such Valuation report should be referenced regarding the underlying benefits, methods, and assumptions utilized in the production of these values.

Five-Year Projection. For the following chart, dollar amounts are in millions of USD.

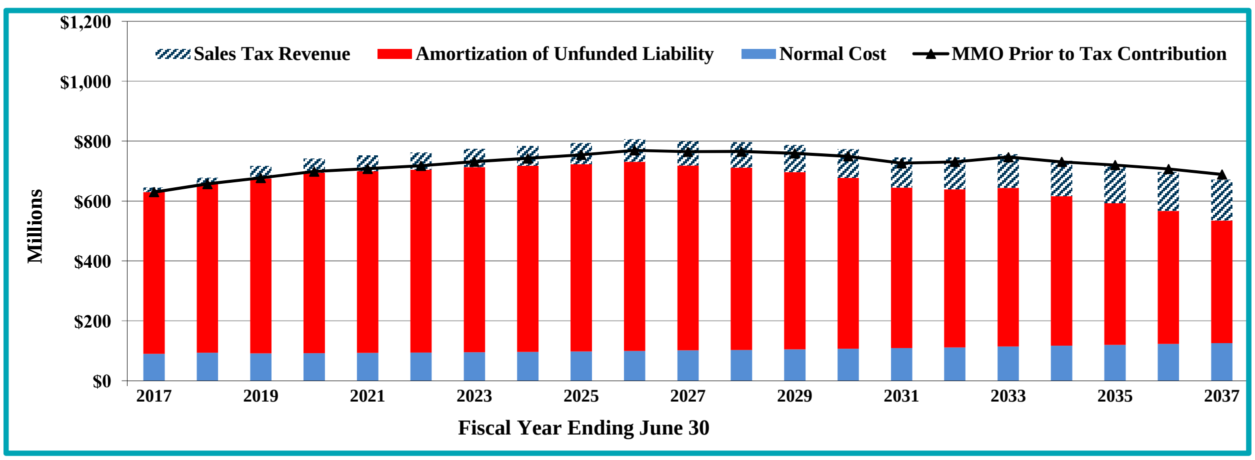
Fiscal Year End	MMO	Sales Tax Contribution	Actuarial Value of Assets	Actuarial Liability	UAL	Funded Ratio
2017	$ 629.6	$ 16.1	$ 4,936.0	$ 11,024.7	$ 6,088.7	44.8%
2018	657.0	21.1	4,955.1	11,126.1	6,171.0	44.5%
2019	675.4	41.7	5,002.4	11,221.0	6,218.5	44.6%
2020	694.7	47.3	5,214.9	11,309.2	6,094.2	46.1%
2021	699.7	52.9	5,437.5	11,392.6	5,955.1	47.7%
2022	704.7	57.2	5,672.3	11,506.9	5,834.6	49.3%

<u>Twenty-Year Projections</u>.

Funded Ratio Chart:



MMO Contribution Chart:



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OTHER POST-EMPLOYMENT BENEFITS

The City self-administers a single employer, defined benefit plan for post-employment benefits other than pension benefits ("OPEB"), and funds such plan on a pay-as-you-go basis. The City's OPEB plan provides for those persons who retire from the City and are participants in the Municipal Pension Plan: (i) post-employment healthcare benefits for a period of five years following the date of retirement and (ii) lifetime life insurance coverage ($7,500 for firefighters who retired before July 1, 1990; $6,000 for all other retirees). In general, retirees eligible for OPEB are those who terminate their employment after ten years of continuous service to immediately become pensioned under the Municipal Pension Plan.

To provide health care coverage, the City pays a negotiated monthly premium for retirees covered by the union contract for AFSCME DC 33 and is self-insured for all other eligible pre-Medicare retirees. Aside from AFSCME DC 33, the City is responsible for the actual health care cost that is invoiced to the City's unions by their respective vendors. The actual cost can be a combination of self-insured claim expenses, premiums, ancillary services, and administrative expenses. Eligible union represented employees receive five years of coverage through their union's health fund. The City's funding obligation for pre-Medicare retiree benefits is the same as for active employees. Union represented and non-union employees may defer their retiree health coverage until a later date. For some groups, the amount that the City pays for their deferred health care is based on the value of the health benefits at the time the retiree claims the benefits, but for police and fire retirees who retired after an established date, the City pays the cost of five years of coverage when the retiree claims the benefits.

The annual payments made by the City for OPEB for the last five Fiscal Years are shown in Table 33 below.

Table 33
Annual OPEB Payment
(Amounts in Thousands of USD)

Fiscal Year ended June 30,	Annual OPEB Payment
2012	$76,344
2013	$57,096
2014	$67,100
2015	$95,300
2016	$107,200

Source: See Note IV.3 to the City's audited Financial Statements for such Fiscal Years (as included in the City's CAFRs).

For financial reporting purposes, although the City funds OPEB on a pay-as-you-go basis, it is required to include in its financial statements (in accordance with GASB Statement No. 45) a calculation similar to that performed to calculate its pension liability. Pursuant to GASB 45, an annual required contribution is calculated which, if paid on an ongoing basis, is projected to cover normal costs each year and to amortize any unfunded actuarial liability over a period not to exceed 30 years. As of July 1, 2015, the date of the most recent actuarial valuation, the UAL for the City's OPEB was $1.77 billion, the covered annual payroll was $1.54 billion, and the ratio of UAL to the covered payroll was 114.8%. See Note IV.3 to the City's audited Financial Statements for the Fiscal Year ended June 30, 2016.

PGW PENSION PLAN

General

PGW consists of all the real and personal property owned by the City and used for the acquisition, manufacture, storage, processing, and distribution of gas within the City, and all property, books, and records employed and maintained in connection with the operation, maintenance, and administration of PGW. The City Charter provides for a Gas Commission (the "Gas Commission") to be constituted and appointed in accordance with the provisions of contracts between the City and the operator of PGW as may from time to time be in effect, or, in the absence of a contract, as may be provided by ordinance. The Gas Commission consists of the City Controller, two members appointed by City Council and two members appointed by the Mayor.

PGW is operated by PFMC, pursuant to an agreement between the City and PFMC dated December 29, 1972, as amended, authorized by ordinances of City Council (the "Management Agreement"). Under the Management Agreement, various aspects of PFMC's management of PGW are subject to review and approval by the Gas Commission. The PUC has the regulatory responsibility for PGW with regard to rates, safety, and customer service.

The City sponsors the Philadelphia Gas Works Pension Plan (the "PGW Pension Plan"), a single employer defined benefit plan, to provide pension benefits for all of PGW's employees and other eligible class employees of PFMC and the Gas Commission. As plan sponsor, the City, through its General Fund, could be responsible for plan liabilities if the PGW Pension Plan does not satisfy its payment obligations to PGW retirees. At July 1, 2016, the PGW Pension Plan membership total was 3,772, comprised of: (i) 2,521 retirees and beneficiaries currently receiving benefits and terminated employees entitled to benefits but not yet receiving them; and (ii) 1,251 participants, of which 1,036 were vested and 215 were nonvested.

PGW Pension Plan

The PGW Pension Plan provides retirement benefits as well as death and disability benefits. Retirement benefits vest after five years of credited service. Retirement payments for vested employees commence: (i) at age 65 and five years of credited service; (ii) age 55 and 15 years of credited service; or (iii) without regard to age, after 30 years of credited service. For covered employees hired prior to May 21, 2011 (union employees) or prior to December 21, 2011 (non-union employees), PGW pays the entire cost of the PGW Pension Plan. Union employees hired on or after May 21, 2011 and non-union employees hired on or after December 21, 2011 have the option to participate in the PGW Pension Plan and contribute 6% of applicable wages, or participate in a plan established in compliance with Section 401(a) of the Internal Revenue Code (deferred compensation plan) and have PGW contribute 5.5% of applicable wages.

PGW is required by statute to contribute the amounts necessary to fund the PGW Pension Plan. The PGW Pension Plan is being funded with contributions by PGW to the Sinking Fund Commission of the City, together with investment earnings and employee contributions required for new hires after December 2011 who elect to participate in the PGW Pension Plan. Benefit and contribution provisions are established by City ordinance and may be amended only as allowed by City ordinance. The pension payments are treated as an operating expense of PGW and are included as a component of PGW's base rate. The PUC approves all items that are to be included in PGW's base rates. PGW filed its current rate case with the PUC on February 27, 2017.

Effective October 2015, payments to beneficiaries of the PGW Pension Plan are made by the PGW Retirement Reserve Fund. Prior to October 2015, payments to beneficiaries of the PGW Pension Plan were made by PGW through its payroll system. The financial statements for the PGW Pension Plan for the fiscal year ended June 30, 2016, show an amount due to PGW of approximately $6.0 million, which represents the cumulative excess of payments made to the retirees and administrative expenses incurred by PGW, over the sum of PGW's required annual contribution and reimbursements received from the PGW Pension Plan.

Pension Costs and Funding

PGW pays an annual amount that is projected to be sufficient to cover its normal cost and an amortization of the PGW Pension Plan's UAL. The following table shows the normal cost, the amortization payment, and the resulting annual required contribution as of the last five actuarial valuation dates for the PGW Pension Plan. PGW has been using a 20-year open amortization period (and the payments in Table 34 are on the basis of a 20-year open amortization). Commencing in PGW's fiscal year 2016, PGW will calculate an annual required contribution on the basis of both a 20-year open amortization period and a 30-year closed amortization period, and will contribute the higher of the two amounts. See "– Projections of Funded Status" below. An open amortization period is one that begins again or is recalculated at each actuarial valuation date. With a closed amortization period, the unfunded liability is amortized over a specific number of years to produce a level annual payment. Because the final amortization date is fixed, if all actuarial assumptions are achieved, the unfunded liability would decline to zero as of the final amortization date. To the extent future experience differs from the assumptions used to establish the 30-year fixed amortization payment schedule, new amortization bases attributable to a particular year's difference would be established and amortized over their own 30-year schedule.

Table 34
PGW Pension – Annual Required Contributions
(Dollar Amounts in Thousands of USD)

Calculation of ARC for the 12-month period ended:	**Normal Cost**(1) (A)	**Amortization Payment**(1) (B)	**ARC**(1), (2) (A + B)	**Payments to Beneficiaries**(3)
9/1/2012	$8,782	$14,357	$23,139	$40,122
9/1/2013	$8,533	$15,127	$23,660	$41,614
9/1/2014	$8,852	$12,130	$20,982	$42,913
7/1/2015	$7,859	$18,063	$25,922	$46,917
7/1/2016	$7,992	$20,238	$28,230	$50,447

(1) Source: The Actuarial Valuation Report for the Plan Year July 1, 2016 – June 30, 2017 for the PGW Pension Plan.

(2) As described above, until October 2015, PGW did not make a net cash contribution to the PGW Pension Plan, but rather paid beneficiaries through its payroll system, and then was reimbursed by the Plan. Effective October 2015, payments to beneficiaries of the PGW Pension Plan are made by the PGW Retirement Reserve Fund. Each ARC is the sum reflected in this table, but the "Calculated Mid-Year Contribution" in Tables 36 and 37 more closely approximates the actual pension contributions made by PGW.

(3) Source: For 2012 and 2013, PGW's CAFR for the fiscal years ended August 31, 2012 and 2013, respectively. For 2014-2015, PGW's CAFR for the fiscal year ended August 31, 2015. For 2016, the audited financial statements for PGW for the fiscal years ended August 31, 2016 and 2015.

Although PGW has paid its annual required contribution each year, the market value of assets for the PGW Pension Plan is less than the actuarial accrued liability, as shown in the next table.

Table 35
Schedule of Pension Funding Progress
(Dollar Amounts in Thousands of USD)[(1)]

Actuarial Valuation Date	Market Value of Assets	Actuarial Liability	UAL (Market Value)	Funded Ratio
9/1/2012	$437,780	$585,632	$147,852	74.75%
9/1/2013	$462,691	$623,612	$160,921	74.20%
9/1/2014	$514,944	$643,988	$129,044	79.96%
7/1/2015	$510,719	$706,704	$195,985	72.27%
7/1/2016[(2)]	$483,259	$736,078	$252,819	65.65%

(1) Source: The Actuarial Valuation Report for the Plan Year July 1, 2016 – June 30, 2017 for the PGW Pension Plan.

(2) On July 1, 2016, the actuarial value of assets was $511.3 million, resulting in a UAL of $224.8 million, and a funded ratio of 69.46%. See Tables 36 and 37.

The current significant actuarial assumptions for the PGW Pension Plan are: (i) investment return rate of 7.30% compounded annually; (ii) salary increases assumed to reach 4.5% per year; and (iii) retirements that are assumed to occur, for those with 30 or more years of service, at a rate of 15% at ages 55 to 60, 30% at age 61, 50% at ages 62-69, and 100% at age 70 and older.

Since the last actuarial valuation performed as of July 1, 2015, the demographics of the plan participants have changed as follows: (i) the number of plan participants has decreased 0.7%, (ii) the total number of actives in the plan decreased 1.8%, (iii) total payroll has decreased 4.5%, (iv) average pay has decreased 2.8%, and (v) average age of active plan participants increased 1.2%. Effective September 1, 2016, PGW began utilizing an investment rate of return of 7.30% for the PGW Pension Plan. The assumed investment rate return for the period July 1, 2015 – August 31, 2016 was 7.65%. Such reduction in the assumed investment rate of return increased the measurement of plan liabilities by approximately 3.6% and increased the annual contribution by $2,407,000 (2.6% of pay). The foregoing, among other factors, have resulted in an increase in the UAL from approximately $196.0 million at July 1, 2015 to approximately $252.8 million at July 1, 2016.

PGW uses a September 1 – August 31 fiscal year, while the PGW Pension Plan uses a July 1 – June 30 fiscal year (the same as the City's fiscal year). The last two actuarial valuation reports for the PGW Pension Plan utilized a plan year of July 1 to June 30. This is reflected in Table 35 above.

The PGW Pension Plan actuary prepared a separate actuarial valuation report ("GASB 67 Report") for the fiscal year ending June 30, 2016, for purposes of plan reporting information under Governmental Accounting Standards Board Statement No. 67, "Financial Reporting for Pension Plans." The GASB 67 Report shows for the fiscal year ending June 30, 2016, an unfunded liability of approximately $296.1 million (rather than the approximately $252.8 million reflected in Table 35), which results in a funded ratio of 62.00%. In addition, that report provides an interest rate sensitivity, which shows that were the investment rate to be 6.30% (1% lower than the assumed investment rate of 7.30%), the unfunded liability would be approximately $387.1 million.

Projections of Funded Status

The information under this subheading, "Projections of Funded Status," is extracted from tables prepared by Aon Hewitt, as actuary to the PGW Pension Plan, which were included in their "Actuarial Valuation Report for the Plan Year July 1, 2016 – June 30, 2017," dated October 28, 2016. The charts show 10-year projections, using both the current amortization method (20-year, open) and the alternative amortization method (30-year, fixed). See "– Pension Costs and Funding" above. Projections are subject to actual experience deviating from the underlying assumptions and methods. **Projections and actuarial assessments are "forward looking" statements and are based upon assumptions that may not be fully realized in the future and are subject to change, including changes based upon the future experience of the PGW Pension Plan.**

Table 36
Schedule of Prospective Funded Status (20-Year Open Amortization)
(Dollar Amounts in Thousands of USD)

Actuarial Valuation Date (July 1)	Actuarial Value of Assets	Actuarial Accrued Liability	UAL (Actuarial Value)	Calculated Mid-Year Contribution[(1), (2)]	Funded Ratio
2016	$511,289	$736,078	$224,789	$29,260	69.46%
2017	$516,312	$743,161	$226,849	$29,201	69.48%
2018	$520,981	$749,322	$228,341	$29,227	69.53%
2019	$525,256	$754,759	$229,502	$29,361	69.59%
2020	$529,287	$760,354	$231,067	$29,267	69.61%
2021	$539,874	$764,209	$224,335	$28,403	70.64%
2022	$549,285	$766,619	$217,334	$27,526	71.65%
2023	$557,447	$767,850	$210,403	$26,709	72.60%
2024	$564,315	$768,739	$204,424	$25,598	73.41%
2025	$569,580	$769,172	$199,591	$25,018	74.05%

(1) Source: The Actuarial Valuation Report for the Plan Year July 1, 2016 – June 30, 2017 for the PGW Pension Plan.

(2) PGW makes monthly contributions to the PGW Retirement Reserve Fund. The actuary's report assumes contributions at the beginning, middle, and end of the plan year. PGW utilizes the mid-year contribution level to approximate the actual funding methodology.

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Table 37
Schedule of Prospective Funded Status (30-Year Closed Amortization)
(Dollar Amounts in Thousands of USD)

Actuarial Valuation Date (July 1)	Actuarial Value of Assets	Actuarial Accrued Liability	UAL (Actuarial Value)	Calculated Mid-Year Contribution[(1), (2)]	Funded Ratio
2016	$511,289	$736,078	$224,789	$26,470	69.46%
2017	$516,312	$743,161	$226,849	$26,587	69.48%
2018	$520,981	$749,322	$228,341	$26,806	69.53%
2019	$525,256	$754,759	$229,502	$27,157	69.59%
2020	$529,287	$760,354	$231,067	$27,293	69.61%
2021	$539,874	$764,209	$224,335	$26,792	70.64%
2022	$549,285	$766,619	$217,334	$26,298	71.65%
2023	$557,447	$767,850	$210,403	$25,880	72.60%
2024	$564,315	$768,739	$204,424	$25,178	73.41%
2025	$569,580	$769,172	$199,591	$25,013	74.05%

(1) Source: The Actuarial Valuation Report for the Plan Year July 1, 2016 – June 30, 2017 for the PGW Pension Plan.

(2) PGW makes monthly contributions to the PGW Retirement Reserve Fund. The actuary's report assumes contributions at the beginning, middle, and end of the plan year. PGW utilizes the mid-year contribution level to approximate the actual funding methodology.

Additional Information

The City issues a publicly available financial report that includes financial statements and required supplementary information for the PGW Pension Plan. The report is not incorporated into this Official Statement by reference. The report may be obtained by writing to the Office of the Director of Finance of the City.

Further information on the PGW Pension Plan, including with respect to its membership, plan description, funding policy, actuarial assumptions and funded status is contained in the Fiscal Year 2016 CAFR.

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PGW OTHER POST-EMPLOYMENT BENEFITS

PGW provides post-employment healthcare and life insurance benefits to its participating retirees and their beneficiaries and dependents. The City, through its General Fund, could be responsible for costs associated with post-employment healthcare and life insurance benefits if PGW fails to satisfy its post-employment benefit obligations.

PGW pays the full cost of medical, basic dental, and prescription coverage for employees who retired prior to December 1, 2001. Employees who retire after December 1, 2001 are provided a choice of three plans at PGW's expense and can elect to pay toward a more expensive plan. Union employees hired prior to May 21, 2011 and non-union employees hired prior to December 21, 2011 who retire from active service to immediately begin receiving pension benefits are entitled to receive lifetime post-retirement medical, prescription, and dental benefits for themselves and, depending on their retirement plan elections, their dependents. Employees hired on or after those dates are entitled to receive only five years of post-retirement benefits. Currently, PGW provides for the cost of healthcare and life insurance benefits for retirees and their beneficiaries on a pay-as-you-go-basis.

As part of a July 29, 2010 rate case settlement (the "Rate Settlement"), which provided for the establishment of an irrevocable trust for the deposit of funds derived through a rider from all customer classes to fund OPEB liabilities (the "OPEB Surcharge"), PGW established the trust in July 2010, and began funding the trust in accordance with the Rate Settlement in September 2010. The Rate Settlement provides that PGW shall deposit $15.0 million annually for an initial five-year period towards the ARC, and an additional $3.5 million annually, which represents a 30-year amortization of the OPEB liability at August 31, 2010. These deposits will be funded primarily through increased rates of $16.0 million granted in the Rate Settlement. The ARC represents a level of funding that, if paid on an ongoing basis, is projected to cover normal costs each year and amortize any unfunded actuarial liabilities (or funding excesses) over a period of 30 years. In PGW's 2015-2016 Gas Cost Rate ("GCR") proceeding, PGW proposed to continue its OPEB Surcharge. The parties to the GCR proceeding submitted a settlement agreement continuing the OPEB Surcharge at the same level of revenue ($16 million annually) and funding ($18.5 million annually). Such settlement agreement was approved by the PUC.

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Table 38 provides detail of actual PGW OPEB payments for the last five PGW Fiscal Years and projected PGW OPEB payments for PGW Fiscal Years 2017-2021.

Table 38
PGW OPEB Payments
(Amounts in Thousands of USD)

	Fiscal Year ended August 31,	Healthcare	Life Insurance	OPEB Trust	Total
Actual					
	2012	$24,503	$1,483	$18,500	$44,486
	2013	$22,180	$1,562	$18,500	$42,242
	2014	$24,247	$1,615	$18,500	$44,362
	2015	$28,598	$1,749	$18,500	$48,847
	2016(1)	$29,300	$1,800	$18,500	$49,551
Projections					
	2017	$30,971	$1,700	$18,500	$51,171
	2018	$34,449	$1,700	$18,500	$54,649
	2019	$37,659	$1,700	$18,500	$57,859
	2020	$41,010	$1,700	$18,500	$61,210
	2021	$44,661	$1,700	$18,500	$64,861

(1) For PGW Fiscal Year 2016, "Healthcare" and "Life Insurance" are rounded figures and, as such, will not sum. "Total" is an actual figure.

Table 39 is the schedule of PGW OPEB funding progress, as of the actuarial valuation date of August 31 for 2012-2016.

Table 39
Schedule of OPEB Funding Progress
(Dollar Amounts in Thousands of USD)

Actuarial valuation date (August 31)	Actuarial value of assets	Actuarial liability	Unfunded actuarial liability	Funded ratio
2012	$38,860	$443,982	$405,122	8.8%
2013	$61,796	$436,527	$374,731	14.2%
2014	$90,838	$450,289	$359,451	20.2%
2015	$104,318	$505,434	$401,116	20.6%
2016	$131,868	$489,725	$357,857	26.9%

Further information on PGW's annual OPEB expense, net OPEB obligation and the funded status of the OPEB benefits related to PGW is contained in the Fiscal Year 2016 CAFR.

CITY CASH MANAGEMENT AND INVESTMENT POLICIES

General Fund Cash Flow

Because the receipt of revenues into the General Fund generally lags behind expenditures from the General Fund during each Fiscal Year, the City issues notes in anticipation of General Fund revenues and makes payments from the Consolidated Cash Account (described below) to finance its on-going operations.

The timing imbalance referred to above results from a number of factors, principally the following: (i) Real Estate Taxes, BIRT, and certain other taxes are not due until the latter part of the Fiscal Year; and (ii) the City experiences lags in reimbursement from other governmental entities for expenditures initially made by the City in connection with programs funded by other governments.

The City has issued, or PICA has issued on behalf of the City, tax and revenue anticipation notes in each Fiscal Year since Fiscal Year 1972. Each issue was repaid when due, prior to the end of the Fiscal Year. The City issued $175 million of tax and revenue anticipation notes on October 19, 2016, which mature on June 30, 2017, and the funds for payment of the notes are on deposit with the paying agent.

The repayment of the tax and revenue anticipation notes is funded through cash available in the General Fund.

Consolidated Cash

The Act of the General Assembly of June 25, 1919 (Pa. P.L. 581, No. 274, Art. XVII, § 6) authorizes the City to make temporary inter-fund loans between certain operating and capital funds. The City maintains a Consolidated Cash Account for the purpose of pooling the cash and investments of all City funds, except those which, for legal or contractual reasons, cannot be commingled (e.g., the Municipal Pension Fund, sinking funds, sinking fund reserves, funds of PGW, the Aviation Fund, the Water Fund, and certain other restricted purpose funds). A separate accounting is maintained to record the equity of each member fund that participates in the Consolidated Cash Account. The City manages the Consolidated Cash Account pursuant to the procedures described below.

To the extent that any member fund temporarily experiences the equivalent of a cash deficiency, an advance is made from the Consolidated Cash Account, in an amount necessary to result in a zero balance in the cash equivalent account of the borrowing fund. All subsequent net receipts of a member fund that has negative equity are applied in repayment of the advance.

All advances are made within the budgetary constraints of the borrowing funds. Within the General Fund, this system of inter-fund advances has historically resulted in the temporary use of tax revenues or other operating revenues for capital purposes and the temporary use of capital funds for operating purposes. With the movement of the reimbursable component of DHS activities from the General Fund to the Grants Revenue Fund, a similar system of advances has resulted in the use of tax revenues or other operating revenues in the General Fund to make expenditures from the Grants Revenue Fund, which advances may be outstanding for multiple Fiscal Years, but which are expected to be reimbursed by the Commonwealth.

Procedures governing the City's cash management operations require the General Fund-related operating fund to borrow initially from the General Fund-related capital fund, and only to the extent there is a deficiency in such fund may the General Fund-related operating fund borrow money from any other funds in the Consolidated Cash Account.

Investment Practices

Cash balances in each of the City's funds are managed to maintain daily liquidity to pay expenses, and to make investments that preserve principal while striving to obtain the maximum rate of return. Pursuant to the City Charter, the City Treasurer is the City official responsible for managing cash collected into the City Treasury. The available cash balances in excess of daily expenses are placed in demand accounts, swept into money market mutual funds, or used to make investments directed by professional investment managers. These investments are held in segregated trust accounts at a separate financial institution. Cash balances related to revenue bonds for water and sewer and the airport are directly deposited and held separately in trust. A fiscal agent manages these cash balances in accordance with the applicable bond documents and the investment practice is guided by administrative direction of the City Treasurer per the Investment Committee and the Investment Policy (as described below). In addition, certain operating cash deposits (such as Community Behavioral Health, Special Gas/County Liquid and "911" surcharge) of the City are restricted by purpose and required to be segregated into accounts in compliance with federal or Commonwealth reporting.

Investment guidelines for the City are embodied in section 19-202 of the Philadelphia Code. In furtherance of these guidelines, as well as Commonwealth and federal legislative guidelines, the Director of Finance adopted a written Investment Policy (the "Policy") that went into effect in August 1994 and was most recently revised in September 2014. The Policy supplements other legal requirements and establishes guiding principles for the overall administration and effective management of all of the City's monetary funds (except the Municipal Pension Fund, the PGW Retirement Reserve Fund, the PGW OPEB Trust and the PGW Workers' Compensation Reserve Fund).

The Policy delineates the authorized investments as authorized by the Philadelphia Code and the funds to which the Policy applies. The authorized investments include U.S. government securities, U.S. treasuries, U.S. agencies, repurchase agreements, commercial paper, corporate bonds, money market mutual funds, obligations of the Commonwealth, collateralized banker's acceptances and certificates of deposit, and collateralized mortgage obligations and pass-through securities directly issued by a U.S. agency or instrumentality, all of investment grade rating or better and with maturity limitations.

U.S. government treasury and agency securities carry no limitation as to the percent of the total portfolio. Repurchase agreements, money market mutual funds, commercial paper, and corporate bonds are limited to investment of no more than 25% of the total portfolio. Obligations of the Commonwealth and collateralized banker's acceptances and certificates of deposit are limited to no more than 15% of the total portfolio. Collateralized mortgage obligations and pass-through securities directly issued by a U.S. agency or instrumentality are limited to no more than 5% of the total portfolio.

U.S. government securities carry no limitation as to the percent of the total portfolio per issuer. U.S. agency securities are limited to no more than 33% of the total portfolio per issuer. Repurchase agreements and money market mutual funds are limited to no more than 10% of the total portfolio per issuer. Commercial paper, corporate bonds, obligations of the Commonwealth, collateralized banker's acceptances and certificates of deposit, and collateralized mortgage obligations and pass-through securities directly issued by a U.S. agency or instrumentality are limited to no more than 3% of the total portfolio per issuer.

The Policy provides for an ad hoc Investment Committee consisting of the Director of Finance, the City Treasurer and one representative each from the Water Department, the Division of Aviation, and PGW. The Investment Committee meets quarterly with each of the investment managers to review each manager's performance to date and to plan for the next quarter. Investment managers are given any changes in investment instructions at these meetings. The Investment Committee approves all modifications to the Policy. The Investment Committee may from time to time review and revise the Policy and does from time to time approve temporary waivers of the restrictions on assets based on cash management needs and recommendations of investment managers.

The Policy expressly forbids the use of any derivative investment product as well as investments in any security whose yield or market value does not follow the normal swings in interest rates. Examples of these types of securities include, but are not limited to: structured notes, floating rate (excluding U.S. Treasury and U.S. agency floating rate securities) or inverse floating rate instruments, securities that could result in zero interest accrual if held to maturity, and mortgage derived interest and principal only strips. The City currently makes no investments in derivatives.

DEBT OF THE CITY

General

Section 12 of Article IX of the Constitution of the Commonwealth provides that the authorized debt of the City "may be increased in such amount that the total debt of [the] City shall not exceed 13.5% of the average of the annual assessed valuations of the taxable realty therein, during the ten years immediately preceding the year in which such increase is made, but [the] City shall not increase its indebtedness to an amount exceeding 3.0% upon such average assessed valuation of realty, without the consent of the electors thereof at a public election held in such manner as shall be provided by law." The Supreme Court of Pennsylvania has held that bond authorizations once approved by the voters need not be reduced as a result of a subsequent decline in the average assessed value of City property. The general obligation debt subject to the limitation described in this paragraph is referred to herein as "Tax-Supported Debt."

The Constitution of the Commonwealth further provides that there shall be excluded from the computation of debt for purposes of the Constitutional debt limit, debt (herein called "Self-Supporting Debt") incurred for revenue-producing capital improvements that may reasonably be expected to yield revenue in excess of operating expenses sufficient to pay interest and sinking fund charges thereon. In the case of general obligation debt, the amount of such Self-Supporting Debt to be so excluded must be determined by the Court of Common Pleas of Philadelphia County upon petition by the City. Self-Supporting Debt is general obligation debt of the City, with the only distinction from Tax-Supported Debt being that it is not used in the calculation of the Constitutional debt limit. Self-Supporting Debt has no lien on any particular revenues.

For purposes of this Official Statement, Tax-Supported Debt and Self-Supporting Debt are referred to collectively as "General Obligation Debt." The term "General Fund-Supported Debt" is comprised of: (i) General Obligation Debt; and (ii) PAID, PMA, PPA, and PRA bonds.

Using the methodology described above, as of June 30, 2017, the Constitutional debt limitation for Tax-Supported Debt was approximately $6,629,516,000. The total amount of authorized debt applicable to the debt limit was $1,952,005,000, including $873,632,000 of authorized but unissued debt, leaving a legal debt margin of $4,677,511,000. Based on the foregoing figures, the calculation of the legal debt margin is as follows:

Table 40
General Obligation Debt
June 30, 2017(Amounts in Thousands of USD)

Authorized, issued and outstanding	$1,431,705
Authorized and unissued	873,632
Total	$2,305,337
Less: Self-Supporting Debt	($353,332)
Less: Serial bonds maturing within a year	0
Total amount of authorized debt applicable to debt limit	1,952,005
Legal debt limit	6,629,516
Legal debt margin	$4,677,511

As a result of the implementation of the City's AVI, the assessed value of taxable real estate within the City has increased substantially. See "REVENUES OF THE CITY – Real Property Taxes Assessment and Collection." The $6.630 billion Constitutional debt limit calculation includes four years of property values certified under the City's AVI program, and six years of property values under the City's former property valuation process. Assuming no increase or decrease in property values used to calculate the Constitutional debt limit in Table 40, the Constitutional debt limit is estimated to be $13.411 billion by 2027.

The City is also empowered by statute to issue revenue bonds and, as of June 30, 2017, had outstanding $1,996,916,000 aggregate principal amount of Water and Wastewater Revenue Bonds ("Water and Wastewater Bonds"), $834,850,000, aggregate principal amount of Gas Works Revenue Bonds, and $1,186,465,000 aggregate principal amount of Airport Revenue Bonds. As of June 30, 2017, the principal amount of PICA bonds outstanding was $213,945,000. The City has also enacted an ordinance authorizing the issuance of approximately $350 million aggregate principal amount in commercial paper for the Division of Aviation, and ordinances authorizing the issuance of up to $270 million of Gas Works Revenue Notes to finance working capital and capital projects for PGW and the issuance of up to $300 million of Gas Works Revenue Bonds to finance capital projects for PGW.

Short-Term Debt

The City issued $175 million of tax and revenue anticipation notes on October 19, 2016, which matured on June 30, 2017 and were paid in full. As provided in the PICA Act, the City's tax and revenue anticipation notes are general obligations of the City, but do not constitute debt of the City subject to the limitations of the Constitutional debt limit. See "CITY CASH MANAGEMENT AND INVESTMENT POLICIES – General Fund Cash Flow."

Long-Term Debt

The following table presents a synopsis of the bonded debt of the City and its component units as of the date indicated. Of the total balance of the City's general obligation bonds issued and outstanding as of June 30, 2017, approximately 26% is scheduled to mature within five Fiscal Years and approximately 54% is scheduled to mature within ten Fiscal Years. When PICA's outstanding bonds are included with the City's general obligation bonds, approximately 60% is scheduled to mature within ten Fiscal Years.

Table 41
Bonded Debt – City of Philadelphia and Component Units
(as of June 30, 2017)
(Amounts in Thousands of USD)[(1), (2)]

General Obligation Debt and PICA Bonds				
General Obligation Bonds		$1,431,705		
PICA Bonds		213,945		
Subtotal: General Obligation Debt and PICA Bonds			**$1,645,650**	
Other General Fund-Supported Debt[(3)]				
Philadelphia Municipal Authority				
Criminal Justice Center	$33,100			
Juvenile Justice Center	87,325			
Public Safety Campus	65,155			
Fleet Management Equipment Lease	4,429			
Energy Conservation	9,915			
		$199,924		
Philadelphia Authority for Industrial Development				
Pension capital appreciation bonds	$465,351			
Pension fixed rate bonds	761,655			
Stadiums	262,830			
Library	5,570			
Cultural and Commercial Corridor	89,205			
One Parkway	32,165			
Philadelphia School District[(4)]	14,680			
		$1,631,456		
Parking Authority		11,660		
Redevelopment Authority		174,670		
Subtotal: Other General Fund-Supported Debt			**$2,017,710**	
Revenue Bonds				
Water Fund		$1,996,916		
Aviation Fund		1,186,465		
Gas Works		834,850		
Subtotal: Revenue Bonds			**$4,018,231**	
Grand Total				**$7,681,591**

(1) Unaudited; figures may not sum due to rounding.
(2) For tables setting forth a ten-year historical summary of Tax-Supported Debt of the City and the School District and the debt service requirements to maturity of the City's outstanding bonded indebtedness as of June 30, 2016, see the Fiscal Year 2016 CAFR.
(3) The principal amount outstanding relating to the PAID 1999 Pension Obligation Bonds, Series B (capital appreciation bonds) is reflected as the accreted value thereon as of June 30, 2017.
(4) This financing was undertaken by the City through PAID for the benefit of the School District and does not represent debt of the School District. For more information on this financing, see "REVENUES OF THE CITY – Sales and Use Tax" and "EXPENDITURES OF THE CITY – City Payments to School District."

Table 42
City of Philadelphia
Annual Debt Service on General Fund-Supported Debt
(as of June 30, 2017)
(Amounts in Millions of USD)[1]

	General Obligation Debt[2]			Other General Fund-Supported Debt[4]			Aggregate General Fund-Supported Debt		
Fiscal Year	Principal	Interest[3]	Total	Principal	Interest[5]	Total	Principal	Interest	Total
2018	70.82	68.73	139.55	108.14	139.22	247.36	178.96	207.95	386.91
2019	74.45	65.18	139.63	74.65	138.74	213.39	149.10	203.92	353.02
2020	76.65	61.51	138.15	65.56	138.61	204.17	142.21	200.12	342.32
2021	69.97	57.94	127.91	80.75	123.50	204.25	150.72	181.44	332.16
2022	73.12	54.45	127.57	78.56	125.71	204.27	151.68	180.16	331.84
2023	77.80	50.65	128.45	115.98	88.28	204.26	193.78	138.93	332.71
2024	81.68	46.59	128.27	114.74	88.28	203.02	196.42	134.87	331.29
2025	85.67	42.36	128.03	119.20	83.84	203.05	204.87	126.20	331.08
2026	82.42	38.14	120.55	134.81	67.43	202.24	217.23	105.57	322.79
2027	86.38	33.88	120.26	159.97	44.41	204.38	246.35	78.29	324.64
2028	91.08	29.57	120.65	165.11	35.16	200.27	256.19	64.73	320.92
2029	65.73	25.87	91.60	273.16	18.18	291.34	338.89	44.05	382.94
2030	81.49	22.33	103.81	53.30	8.60	61.90	134.79	30.93	165.71
2031	86.30	18.27	104.57	55.77	6.14	61.91	142.07	24.41	166.48
2032	90.66	13.99	104.65	15.23	4.08	19.30	105.89	18.07	123.95
2033	55.58	10.40	65.98	7.33	3.55	10.87	62.91	13.95	76.85
2034	43.80	7.85	51.65	7.66	3.20	10.86	51.46	11.05	62.51
2035	29.55	5.98	35.53	8.02	2.85	10.87	37.57	8.83	46.40
2036	31.00	4.54	35.53	8.40	2.47	10.87	39.40	7.01	46.40
2037	17.33	3.33	20.66	8.79	2.08	10.87	26.12	5.41	31.53
2038	17.79	2.42	20.21	9.21	1.66	10.87	27.00	4.08	31.08
2039	18.67	1.55	20.21	9.65	1.22	10.87	28.32	2.77	31.08
2040	7.58	0.96	8.54	3.31	0.77	4.08	10.89	1.73	12.62
2041	7.93	0.61	8.54	3.45	0.62	4.07	11.38	1.23	12.61
2042	8.34	0.21	8.54	3.60	0.48	4.07	11.94	0.69	12.61
2043	0	0	0	3.75	0.33	4.08	3.75	0.33	4.08
2044	0	0	0	3.91	0.17	4.08	3.91	0.17	4.08
Total	**$1,431.79**	**$667.31**	**$2,099.04**	**$1,691.98**	**$1,129.57**	**$2,821.54**	**$3,123.77**	**$1,796.88**	**$4,920.58**

(1) Does not include letter of credit fees. Figures may not sum due to rounding.
(2) Includes both Tax-Supported Debt and Self-Supporting Debt. See "– General." Does not include PICA Bonds.
(3) Assumes interest rate on hedged variable rate bonds to be the associated fixed swap rate.
(4) Includes PAID, PMA, PPA, and PRA bonds, with capital appreciation bonds including only actual amounts payable. The original issuance amount of such capital appreciation bonds is included under the "Principal" column in the Fiscal Year such bonds mature and the full accretion amount at maturity less the original issuance amount is included in the "Interest" column in the Fiscal Year such bonds mature.
(5) Assumes interest rate on hedged variable rate bonds to be the associated fixed swap rate, plus any fixed spread. Net of capitalized interest on PAID 2012 Service Agreement Revenue Refunding Bonds.

Other Long-Term Debt Related Obligations

The City has entered into other contracts and leases to support the issuance of debt by public authorities related to the City pursuant to which the City is required to budget and appropriate tax or other general revenues to satisfy such obligations, as shown in Table 41. The City budgets all other long-term debt-related obligations as a single budget item with the exception of PPA, which has a budget of $1,335,293 for Fiscal Year 2017.

The Hospitals Authority and the State Public School Building Authority have issued bonds on behalf of the Community College of Philadelphia ("CCP"). Under the Community College Act (Pa. P.L. 103, No. 31 (1985)), each community college must have a local sponsor, which for CCP is the City. As the local sponsor, the City is obligated to pay up to 50% of the annual capital expenses of CCP, which includes debt service. The remaining 50% is paid by the Commonwealth. Additionally, the City annually appropriates funds for a portion of CCP's operating costs (less tuition and less the Commonwealth's payment). The amount paid by the City in Fiscal Year 2016 was $30.3 million. The budgeted amount and current estimate for Fiscal Year 2017 is $29.9 million.

In the first quarter of Fiscal Year 2016, the City entered into a service agreement supporting PAID's guaranty of a $15 million letter of credit securing the funding of certain costs related to the 2016 Democratic National Convention.

PICA Bonds

PICA has issued 11 series of bonds at the request of the City (the "PICA Bonds"). PICA no longer has authority under the PICA Act to issue bonds for new money purposes, but may refund bonds previously issued. As of June 30, 2017, the principal amount of PICA Bonds outstanding was $213,945,000. The final maturity date for such PICA Bonds is June 15, 2023. The proceeds of the PICA Bonds were used to: (i) make grants to the City to fund its General Fund deficits, to fund the costs of certain City capital projects, to provide other financial assistance to the City to enhance operational productivity, and to defease certain of the City's general obligation bonds; (ii) refund other PICA Bonds; and (iii) pay costs of issuance.

The PICA Act authorizes the City to impose a tax for the sole and exclusive purposes of PICA. In connection with the adoption of the Fiscal Year 1992 budget and the execution of the PICA Agreement, as so authorized by the PICA Act, the City reduced the wage, earnings, and net profits taxes on City residents by 1.5% and enacted a new tax of 1.5% on wages, earnings, and net profits of City residents (the "PICA Tax"), which continues in effect. The PICA Tax secures the PICA Bonds. Pursuant to the PICA Act, at such time when no PICA Bonds are outstanding, the PICA Tax will expire. At any time, the City is authorized to increase for its own use its various taxes, including its wage, earnings, and net profits taxes on City residents and could do so upon the expiration of the PICA Tax. Certain taxes, such as sales, liquor, and hotel taxes, among others, cannot be increased by the City without Commonwealth approval.

The PICA Tax is collected by the City's Department of Revenue, as agent of the State Treasurer, and deposited in the Pennsylvania Intergovernmental Cooperation Authority Tax Fund (the "PICA Tax Fund") of which the State Treasurer is custodian. The PICA Tax Fund is not subject to appropriation by City Council or the General Assembly. See "THE GOVERNMENT OF THE CITY OF PHILADELPHIA – Local Government Agencies – *Non-Mayoral-Appointed or Nominated Agencies* – PICA."

The PICA Act authorizes PICA to pledge the PICA Tax to secure its bonds and prohibits the Commonwealth and the City from repealing the PICA Tax or reducing its rate while any PICA Bonds are outstanding. PICA Bonds are payable from PICA revenues, including the PICA Tax, pledged to secure PICA's bonds, the Bond Payment Account (as described below) and any debt service reserve fund established for such bonds and have no claim on any revenues of the Commonwealth or the City.

The PICA Act establishes a "Bond Payment Account" for PICA as a trust fund for the benefit of PICA bondholders and authorizes the creation of a debt service reserve fund for bonds issued by PICA. The State Treasurer is required to pay the proceeds of the PICA Tax held in the PICA Tax Fund directly to the Bond Payment Account. The proceeds of the PICA Tax in excess of amounts required for: (i) debt service; (ii) replenishment of any debt service reserve fund for bonds issued by PICA; and (iii) certain PICA operating expenses, are required to be deposited in a trust fund established exclusively to benefit the City and designated the "City Account." Amounts in the City Account are required to be remitted to the City not less often than monthly, unless PICA certifies the City's non-compliance with the then-current five-year financial plan.

The total amount of PICA Tax remitted by the State Treasurer to PICA (which is net of the costs of the State Treasurer in collecting the PICA Tax), PICA annual debt service and investment expenses, and net PICA tax revenue remitted to the City for Fiscal Years 2013-2016, the budgeted amounts and the current estimates for Fiscal Year 2017, and the budgeted amounts for Fiscal Year 2018 are set forth below.

Table 43
Summary of PICA Tax Remitted by the State Treasurer to PICA
and Net Taxes Remitted by PICA to the City
(Amounts in Millions of USD)[(1)]

Fiscal Year	PICA Tax	PICA Annual Debt Service and Investment Expenses	Net taxes remitted to the City
2013 (Actual)	\$376.5[(2)]	\$62.5[(2)]	\$314.0[(4)]
2014 (Actual)	\$384.5[(2)]	\$65.8[(2)]	\$318.7[(4)]
2015 (Actual)	\$408.5[(2)]	\$62.0[(2)]	\$346.5[(4)]
2016 (Actual)	\$444.5[(2)]	\$61.1[(2)]	\$383.4[(4)]
2017 (Adopted Budget)	\$450.0[(2)]	\$65.3[(2)]	\$384.7[(4)]
2017 (Current Estimate)	\$460.0[(3)]	\$65.3[(3)]	\$394.7[(4)]
2018 (Adopted Budget)	\$475.2[(3)]	\$56.0[(3)]	\$419.2[(4)]

(1) Figures may not sum due to rounding.
(2) Source: The City's Quarterly City Manager's Reports.
(3) Source: The City's Office of Budget and Program Evaluation.
(4) Source: For Fiscal Years 2013-2016, the City's CAFRs for such Fiscal Years. For Fiscal Year 2017, the Fiscal Year 2017 Adopted Budget and the Twenty-Sixth Five-Year Plan. For Fiscal Year 2018, the Fiscal Year 2018 Adopted Budget.

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OTHER FINANCING RELATED MATTERS

Swap Information

The City has entered into various swaps related to its outstanding General Fund-Supported Debt as detailed in the following table:

Table 44
Summary of Swap Information
for General Fund-Supported Debt
as of June 30, 2017

City Entity	City GO	City Lease PAID	City Lease PAID	City Lease PAID	City Lease PAID	City Lease PAID
Related Bond Series	2009B[(1)]	2007A (Stadium)[(2)]	2007B-2,3 (Stadium)[(3),(5)]	2014A (Stadium)[(3)]	2007B-2,3 (Stadium)[(3),(6)]	2014A (Stadium)[(3)]
Initial Notional Amount	$313,505,000	$298,485,000	$217,275,000	$87,961,255	$72,400,000	$29,313,745
Current Notional Amount	$100,000,000	$193,520,000	$87,758,745	$87,961,255	$29,246,255	$29,313,745
Termination Date	8/1/2031	10/1/2030	10/1/2030	10/1/2030	10/1/2030	10/1/2030
Product	Fixed Payer Swap	Basis Swap	Fixed Payer Swap	Fixed Payer Swap	Fixed Payer Swap	Fixed Payer Swap
Rate Paid by Dealer	SIFMA	67% 1-month LIBOR + 0.20% plus fixed annuity	SIFMA	70% 1-month LIBOR	SIFMA	70% 1- month LIBOR
Rate Paid by City Entity	3.829%	SIFMA	3.9713%	3.62%	3.9713%	3.632%
Dealer	Royal Bank of Canada	Merrill Lynch Capital Services, Inc.	JPMorgan Chase Bank, N.A.	JPMorgan Chase Bank, N.A.	Merrill Lynch Capital Services, Inc.	Merrill Lynch Capital Services, Inc.
Fair Value[(4)]	($21,708,517)	($1,859,739)	($15,296,505)	($14,571,079)	($5,097,981)	($4,882,679)
Additional Termination Events	For Dealer: Rating change below BBB- or Baa3 For City: Rating change below BBB- or Baa3 upon insurer event (includes insurer being rated below A- or A3)	For Dealer: Rating change below BBB- or Baa3 For PAID: Rating change below BBB- or Baa3	For Dealer: Rating change below BBB- or Baa3 For PAID: Rating change below BBB- or Baa3 upon insurer event (includes insurer being rated below A- or A3)	For Dealer: Rating change below BBB- or Baa3 For PAID: Rating change below BBB- or Baa3 upon insurer event (includes insurer being rated below A- or A3)	For Dealer: Rating change below BBB- or Baa3 For PAID: Rating change below BBB- or Baa3 upon insurer event (includes insurer being rated below A- or A3)	For Dealer: Rating change below BBB- or Baa3 For PAID: Rating change below BBB- or Baa3 upon insurer event (includes insurer being rated below A- or A3)

(1) On July 28, 2009, the City terminated a portion of the swap in the amount of $213,505,000 in conjunction with the refunding of its Series 2007B bonds with the Series 2009A fixed rate bonds and the Series 2009B variable rate bonds. The City made a termination payment of $15,450,000.

(2) PAID received annual fixed payments of $1,216,500 from July 1, 2004 through July 1, 2013. As the result of an amendment on July 14, 2006, $104,965,000 of the total notional amount was restructured as a constant maturity swap (the rate received by PAID on that portion was converted from a percentage of 1-month LIBOR to a percentage of the 5-year LIBOR swap rate from October 1, 2006 to October 1, 2020). The constant maturity swap was terminated in December 2009. The City received a termination payment of $3,049,000.

(3) On May 13, 2014, PAID converted a portion of the 2007B SIFMA Swap to a LIBOR-based swap in conjunction with the refunding of its Series 2007B bonds with the Series 2014A bonds. Under the conversion, PAID pays a fixed rate of 3.62% and 3.632% to JPMorgan and Merrill Lynch, respectively, and receives a floating rate of 70% of 1-month LIBOR.

(4) Fair values are as of June 30, 2017, and are shown from the City's perspective and include accrued interest.

(5) On July 15, 2014, PAID terminated a portion of the swap in the amount of $41,555,000 in conjunction with the refunding of its Series 2007B bonds with the Series 2014B fixed rate bonds. PAID made a termination payment of $4,171,000 to JPMorgan.

(6) On July 15, 2014, PAID terminated a portion of the swap in the amount of $13,840,000 in conjunction with the refunding of its Series 2007B bonds with the Series 2014B fixed rate bonds. PAID made a termination payment of $1,391,800 to Merrill Lynch.

While the City is party to several interest rate swap agreements, for which there is General Fund exposure and on which the swaps currently have a negative mark against the City, the City has no obligation to post collateral on these swaps while the City's underlying ratings are investment grade.

For more information related to certain swaps entered into in connection with revenue bonds issued for PGW, the Water Department, and the Division of Aviation, see the Fiscal Year 2016 CAFR. In addition, PICA has entered into swaps, which are detailed in the Fiscal Year 2016 CAFR.

Swap Policy

The City has adopted a swap policy for the use of swaps, caps, floors, collars and other derivative financial products (collectively, "swaps") in conjunction with the City's debt management. The swap program managed by the City includes swaps related to the City's general obligation bonds, tax-supported service contract debt issued by related authorities, debt of the Water Department, Division of Aviation, and debt of PGW. Swaps related to debt of the PICA, the School District, and the PPA are managed by those governmental entities, respectively.

The Director of Finance has overall responsibility for entering into swaps. Day-to-day management of swaps is the responsibility of the City Treasurer, and the Executive Director of the Sinking Fund Commission is responsible for making swap payments. The Office of the City Treasurer and the City Solicitor's Office coordinate their activities to ensure that all swaps that are entered into are in compliance with applicable federal, state, and local laws.

The swap policy addresses the circumstances when swaps can be used, the risks that need to be evaluated prior to entering into swaps and on an ongoing basis after swaps have been executed, the guidelines to be employed when swaps are used, and how swap counterparties will be chosen. The swap policy is used in conjunction with the City's Debt Management Policy, reviewed annually, and updated as needed.

Under the swap policy, permitted uses of swaps include: (i) managing the City's exposure to floating interest rates through interest rate swaps, caps, floors and collars; (ii) locking in fixed rates in current markets for use at a later date through the use of forward starting swaps and rate locks; (iii) reducing the cost of fixed or floating rate debt through swaps and related products to create "synthetic" fixed or floating rate debt; and (iv) managing the City's credit exposure to financial institutions and other entities through the use of offsetting swaps.

Since swaps can create exposure to the creditworthiness of financial institutions that serve as the City's counterparties on swap transactions, the City has established standards for swap counterparties. As a general rule, the City enters into transactions with counterparties whose obligations are rated in the double-A rated category or better from two nationally recognized rating agencies. If counterparty's credit rating is downgraded below the double-A rating category, the swap policy requires that the City's exposure be collateralized. If a counterparty's credit is downgraded below the A category, even with collateralization, the swap policy requires a provision in the swap permitting the City to exercise a right to terminate the transaction prior to its scheduled termination date.

Letter of Credit Agreements

The City has entered into various letter of credit agreements related to its General Fund-Supported Debt as detailed in the table below. Under the terms of such letter of credit agreements, following a purchase of the applicable bonds, the City may be required to amortize such bonds more quickly than as originally scheduled at issuance.

Table 45
Summary of Letter of Credit Agreements
for General Fund-Supported Debt
as of June 30, 2017

Variable Rate Bond Series	Amount Outstanding	Bond Maturity Date	Provider	Expiration Date	Rating Thresholds [1]
General Obligation Multi-Modal Refunding Bonds, Series 2009B	$100,000,000	August 1, 2031	Barclays Bank PLC	May 24, 2019	The long-term rating assigned by any one of the rating agencies to any unenhanced long-term parity debt of the City is (i) withdrawn or suspended for credit-related reasons or (ii) reduced below investment grade.
PAID Multi-Modal Lease Revenue Refunding Bonds, Series 2007B-2	$72,400,000	October 1, 2030	TD Bank	May 29, 2019	The long-term ratings assigned by at least two of the rating agencies to any unenhanced general obligation bonds of the City is (i) withdrawn or suspended for credit-related reasons, or (ii) reduced below investment grade.
PAID Multi-Modal Lease Revenue Refunding Bonds, Series 2007B-3	$44,605,000	October 1, 2030	PNC Bank	May 22, 2020	The long-term ratings assigned by at least two of the rating agencies to any unenhanced general obligation bonds of the City is (i) withdrawn or suspended for credit-related reasons, or (ii) reduced below investment grade.

[1] The occurrence of a Rating Threshold event would result in an event of default under the reimbursement agreement with the related bank.

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Recent and Upcoming Financings

Recent Financings. The following is a list of financings that the City has entered into since June 30, 2016:

- In April 2017, PMA issued $83,220,000 in City Agreement Revenue Refunding Bonds for the benefit of the City.

- In April 2017, the City, together with the Water Department, issued $279,865,000 in Water and Wastewater Revenue Bonds.

- In February 2017, the City issued $262,865,000 in General Obligation Refunding Bonds.

- In November 2016, the City, together with the Water Department, issued $192,680,000 in Water and Wastewater Bonds to refund certain outstanding maturities.

- In October 2016, the City issued $175,000,000 of its tax and revenue anticipation notes to finance certain cash flow needs of the City.

- In August 2016, the City, together with PGW, issued $312,425,000 of its Gas Works Revenue Refunding Bonds to refund certain outstanding series of such bonds.

Upcoming Financings. The City currently expects to enter into the following financings within the next six months:

- In August 2017, the City expects to issue $331,615,000 in General Obligation Bonds.

- In August 2017, PAID expects to issue approximately $60 million in City Service Agreement Revenue Bonds for the benefit of the City.

- In August 2017, the City, together with PGW, expects to issue approximately $280 million in Gas Works Revenue Bonds.

- In the fall of 2017, the City, together with the Division of Aviation, expects to issue approximately $690 million in Airport Revenue and Refunding Bonds.

Other Upcoming Transactions

City Council has enacted an ordinance authorizing the City to enter into a sublease not to exceed nineteen years for property located at 400 N. Broad Street and 1501 Callowhill Street to be renovated and used as the City's police headquarters and related facilities. The City's sublease payments will be based on a market interest rate and the repayment of the master landlord's total project cost (currently estimated at $260 million) over the term of the sublease; however, the final structure of the sublease payments has not yet been determined. The City has a purchase option for the property in the ninth year of the sublease. The sublease is anticipated to be executed and effective in the first quarter of Fiscal Year 2018.

CITY CAPITAL PROGRAM

As part of the annual budget process, the Mayor submits for approval a six-year capital program to City Council, together with the proposed operating budget. For more information on the City's budget process, see "DISCUSSION OF FINANCIAL OPERATIONS – Budget Procedure."

Certain Historical Capital Expenditures

Table 46 shows the City's historical expenditures for Fiscal Years 2012-2016 for certain capital purposes, including expenditures for projects related to transit, streets and sanitation, municipal buildings, recreation, parks, museums, and stadia, and economic and community development. The source of funds used for such expenditures are primarily general obligation bond proceeds, but also include federal, state, private, and other government funds and operating revenue. Figures in the table below may not sum due to rounding.

Table 46
Historical Expenditures for Certain Capital Purposes
Fiscal Years 2012-2016

Purpose Category	2012	2013	2014	2015	2016
Transit	$ 1,224,771	$ 3,895,208	$ 2,168,224	$ 1,283,307	$ 3,157,479
Streets & Sanitation	61,753,417	63,925,744	46,806,225	63,612,248	18,004,055
Municipal Buildings	41,583,740	37,979,932	35,579,152	53,419,449	126,772,899
Recreation, Parks, Museums & Stadia	27,002,563	26,609,320	17,787,234	29,875,633	24,737,224
Economic & Community Development	4,654,093	4,654,403	11,839,066	12,714,468	9,695,604
TOTAL	**$136,218,584**	**$137,064,607**	**$114,179,901**	**$160,905,105**	**$182,367,262**

Table 47 shows the City's historical expenditures for Fiscal Years 2012-2016 for certain capital purposes from general obligation bond proceeds only and the percentage of the total costs covered by such proceeds in such Fiscal Years. Figures in the table below may not sum due to rounding.

Table 47
Historical Expenditures for Certain Capital Purposes
(General Obligation Bond Proceeds Only)
Fiscal Years 2012-2016

Purpose Category	2012	2013	2014	2015	2016
Transit	$ 1,224,771	$ 3,895,208	$ 2,168,224	$ 1,274,467	$ 3,157,479
Streets & Sanitation	27,421,106	20,921,343	18,642,621	24,887,488	5,676,057
Municipal Buildings	18,611,628	19,108,015	27,936,597	47,163,418	69,192,711
Recreation, Parks, Museums & Stadia	20,992,545	23,403,765	15,838,047	25,494,778	17,524,673
Economic & Community Development	3,739,978	4,459,786	11,816,222	12,714,468	9,511,479
TOTAL	**$71,990,028**	**$71,788,117**	**$76,401,711**	**$111,534,619**	**$105,062,399**
Percentage of Total Costs	**53%**	**52%**	**67%**	**69%**	**58%**

Adopted Capital Program

The Adopted Capital Program is included as part of the Twenty-Sixth Five-Year Plan and contemplates a total budget of $9.57 billion. In the Adopted Capital Program, $3.33 billion is expected to be provided from federal, Commonwealth, and other sources and the remainder through City funding. The following table shows the amounts budgeted each year from various sources of funds for capital projects in the Adopted Capital Program.

Table 48
Adopted Capital Program (Fiscal Years 2018-2023)
(Amounts in Thousands of USD)

Funding Source	2018	2019	2020	2021	2022	2023	2018-2023
City Funds--Tax Supported							
Carried-Forward Loans	$426,560	-	-	-	-	-	$426,560
Operating Revenue	22,216	$2,250	$2,250	$2,250	$2,000	$2,000	32,966
New Loans	165,206	181,942	160,450	156,978	159,945	157,035	981,556
Prefinanced Loans	4,653	-	-	-	-	-	4,653
PICA Prefinanced Loans	4,947	-	-	-	-	-	4,947
Tax Supported Subtotal	$623,582	$184,192	$162,700	$159,228	$161,945	$159,035	$1,450,682
City Funds--Self Sustaining							
Self-Sustaining Carried Forward Loans	$419,075	-	-	-	-	-	$419,075
Self-Sustaining Operating Revenue	139,345	$59,522	$56,045	$75,048	$82,091	$82,162	494,213
Self-Sustaining New Loans	638,804	636,897	645,134	629,803	643,934	650,701	3,845,273
Self-Sustaining Subtotal	$1,197,224	$696,419	$701,179	$704,851	$726,025	$732,863	$4,758,561
Other City Funds							
Revolving Funds	$9,000	$3,000	$3,000	$3,000	$3,000	$3,000	$24,000
Other Than City Funds							
Carried-Forward Other Government	$4,884	-	-	-	-	-	$4,884
Other Government Off Budget	1,338	$1,639	$1,435	$1,744	$1,717	$1,580	9,453
Other Governments/Agencies	2,300	-	-	-	-	-	2,300
Carried-Forward State	165,951	-	-	-	-	-	165,951
State Off Budget	209,147	200,791	195,945	205,504	204,846	202,860	1,219,093
State	34,350	30,259	30,266	29,763	29,787	22,849	177,274
Carried-Forward Private	115,108	-	-	-	-	-	115,108
Private	87,270	77,351	73,140	73,678	78,591	71,358	461,388
Carried-Forward Federal	262,013	-	-	-	-	-	262,013
Federal Off-Budget	26,819	39,636	69,612	9,324	3,497	-	148,888
Federal	139,934	123,324	141,938	121,961	122,460	116,336	765,953
Other Than City Funds Subtotal	$1,049,114	$473,000	$512,336	$441,974	$440,898	$414,983	$3,332,305
TOTAL	**$2,878,920**	**$1,356,611**	**$1,379,215**	**$1,309,053**	**$1,331,868**	**$1,309,881**	**$9,565,548**

LITIGATION

Generally, judgments and settlements on claims against the City are payable from the General Fund, except for claims against the Water Department, the Division of Aviation, and PGW, which are paid out of their respective funds or revenues and only secondarily out of the General Fund.

The Act of October 5, 1980, P.L. 693, No. 142, known as the "Political Subdivision Tort Claims Act," (the "Tort Claims Act") establishes a $500,000 aggregate limitation on damages for injury to a person or property arising from the same cause of action or transaction or occurrence or series of causes of action, transactions or occurrences with respect to governmental units in the Commonwealth such as the City. The constitutionality of that aggregate limitation on damages has been previously upheld by the Pennsylvania appellate courts, including in the recent decision of the Supreme Court of Pennsylvania in *Zauflik v. Pennsbury School District*, 104 A.3d 1096 (2014). Under Pennsylvania Rule of Civil Procedure 238, delay damages are not subject to the $500,000 limitation. The limit on damages is inapplicable to any suit against the City that does not arise under state tort law, such as claims made against the City under federal civil rights laws. In two instances over the last several years, legislation has been introduced in the General Assembly that would have increased such $500,000 limitation. In both such instances, the legislation was not reported out of committee or scheduled for a vote.

General Fund

The following table presents the City's aggregate losses from settlements and judgments paid out of the General Fund for Fiscal Years 2013-2017 and the budgeted amount for Fiscal Year 2018.

Table 49
Aggregate Losses – General and Special Litigation Claims (General Fund)
Fiscal Years 2013-2017 (Actual) and 2018 (Budget)
(Amounts in Millions of USD)

	Actual 2013	Actual 2014	Actual 2015	Actual 2016	Actual 2017	Budget 2018
Aggregate Losses	$30.3	$41.0	$37.3	$41.2	$38.3	$44.9

Sources: The City, Office of Budget and Program Evaluation – Budget Bureau, Indemnity Account, Status Reports.

The current estimate of settlements and judgments from the General Fund for Fiscal Year 2018 is $44.9 million. Such estimate is based on the Law Department's internal calculations using (i) the "Possible Costs" listed in its Quarterly Litigation Reports, (ii) the 3-year average cost for closed cases, and (iii) current year to date spending reports. Based on the Twenty-Sixth Five-Year Plan, the current estimate of settlements and judgments from the General Fund for Fiscal Years 2019-2022 is $44.9 million for each such Fiscal Year.

In budgeting for settlements and judgments in the annual operating budget and projecting settlements and judgments for each five-year plan, the City bases its estimates on past experience and on an analysis of estimated potential liabilities and the timing of outcomes, to the extent a proceeding is sufficiently advanced to permit a projection of the timing of a result. General and special litigation claims are budgeted separately from back-pay awards and similar settlements relating to labor disputes. Usually, some of the costs arising from labor litigation are reported as part of current payroll expenses.

In addition to routine litigation incidental to performance of the City's governmental functions and litigation arising in the ordinary course relating to contract and tort claims and alleged violations of law, certain special litigation matters are currently being litigated and/or appealed and adverse final outcomes of such litigation could have a substantial or long-term adverse effect on the General Fund. These proceedings involve: (i) environmental-related actions and proceedings in which it has been or may be alleged that the City is liable for damages, including but not limited to property damage and bodily injury, or that the City should pay fines or penalties or the costs of response or remediation, because of the alleged generation, transport, or disposal of toxic or otherwise hazardous substances by the City, or the alleged disposal of such substances on or to City-owned property; (ii) contract disputes and other commercial litigation; (iii) union arbitrations and other employment-related litigation; (iv) potential and certified class action suits; and (v) civil rights litigation. The ultimate outcome and fiscal impact, if any, on the General Fund of the claims and proceedings described in this paragraph are not currently predictable.

In addition, see "REVENUES OF THE CITY – Other Taxes," for a discussion of litigation relating to the Philadelphia Beverage Tax.

Water Fund

Various claims have been asserted against the Water Department and in some cases lawsuits have been instituted. Many of these Water Department claims have been reduced to judgment or otherwise settled in a manner requiring payment by the Water Department. The following table presents the Water Department's aggregate losses from settlements and judgments paid out of the Water Fund for Fiscal Years 2013-2017 and the budgeted amount for Fiscal Year 2018. The current estimate for Fiscal Year 2018 is $6.5 million. The Water Fund is the first source of payment for any of the claims against the Water Department.

Table 50
Aggregate Losses – General and Special Litigation Claims (Water Fund)
Fiscal Years 2013-2017 (Actual) and 2018 (Budget)
(Amounts in Millions of USD)

	Actual 2013	Actual 2014	Actual 2015	Actual 2016	Actual 2017	Budget 2018
Aggregate Losses	$5.1	$6.1	$3.8	$5.4	$7.0	$6.5

Sources: The City, Office of Budget and Program Evaluation – Budget Bureau, Indemnity Account, Status Reports.

Aviation Fund

Various claims have been asserted against the Division of Aviation and in some cases lawsuits have been instituted. Many of these Division of Aviation claims have been reduced to judgment or otherwise settled in a manner requiring payment by the Division of Aviation. The following table presents the Division of Aviation's aggregate losses from settlements and judgments paid out of the Aviation Fund for Fiscal Years 2013-2017 and the budgeted amount for Fiscal Year 2018. The current estimate for Fiscal Year 2018 is $2.5 million. The Aviation Fund is the first source of payment for any of the claims against the Division of Aviation.

Table 51
Aggregate Losses – General and Special Litigation Claims (Aviation Fund)
Fiscal Years 2013-2017 (Actual) and 2018 (Budget)

	Actual 2013	Actual 2014	Actual 2015	Actual 2016	Actual 2017	Budget 2018
Aggregate Losses	$1.4 million	$665,527	$750,793	$1.3 million	$1.6 million	$2.5 million

Sources: The City, Office of Budget and Program Evaluation – Budget Bureau, Indemnity Account, Status Reports.

PGW

Various claims have been asserted against PGW and in some cases lawsuits have been instituted. Many of these PGW claims have been reduced to judgment or otherwise settled in a manner requiring payment by PGW. The following table presents PGW's settlements and judgments paid out of PGW revenues, with accompanying reserve information, in PGW Fiscal Years 2012 through 2016. PGW revenues are the first source of payment for any of the claims against PGW. PGW currently estimates approximately $3.8 million and $5.4 million in settlements and judgments for PGW Fiscal Years 2017 and 2018, respectively.

Table 52
Claims and Settlement Activity (PGW)
PGW Fiscal Years 2012-2016
(Amounts in Thousands of USD)

Fiscal Year (ending August 31)	Beginning of Year Reserve	Current Year Claims and Adjustments	Claims Settled	End of Year Reserve	Current Liability Amount
2012	$10,697	$3,725	($3,320)	$11,102	$7,664
2013	$11,102	$2,616	($3,307)	$10,411	$4,925
2014	$10,411	$2,498	($2,965)	$9,944	$4,728
2015	$9,944	$3,610	($2,042)	$11,512	$5,011
2016	$11,512	$2,022	($3,041)	$10,493	$5,307

Source: PGW's audited financial statements.

APPENDIX V

CITY OF PHILADELPHIA SOCIOECONOMIC INFORMATION

The Bonds are payable solely from Project Revenues and monies deposited in the water and wastewater funds. The Bonds are special obligations of the City and do not pledge the full faith, credit or taxing power of the City, or create any debt or charge against the tax or general revenues of the City, or create any lien or charge against any property of the City other than against the Project Revenues and amounts, if any, at any time on deposit in the water and wastewater funds. This APPENDIX V is included for purposes of providing general socioeconomic information regarding the City.

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INTRODUCTION

The City of Philadelphia (the "City" or "Philadelphia") is the sixth largest city in the nation by population, and is at the center of the United States' seventh largest metropolitan statistical area, according to 2016 estimates. The Philadelphia MSA (further described below) includes a substantial retail sales market, as well as a diverse network of business suppliers and complementary industries. Some of the City's top priorities include attracting and retaining knowledge workers, increasing educational attainment and employment skills among Philadelphians, attracting real estate development, and promoting Philadelphia as a desirable location for business.

According to the 2010 U.S. Census, the City increased its population by 0.7% to 1.53 million residents in the ten years from 2000 to 2010, ending six decades of population decline. Although the increase was modest, it was an indicator of more recent growth and development in Philadelphia. From 2010 to 2016, the City increased its population by 2.6% to 1.57 million residents, which exceeded the rate of population growth projected by the Philadelphia City Planning Commission in its 2011 comprehensive plan.

Although facing challenges such as underfunded pension liabilities, low estimated General Fund balances in Fiscal Years 2017-2022, high rates of poverty, and the School District of Philadelphia's (the "School District") ongoing fiscal challenges, the City benefits from its strategic geographical location, relative affordability, cultural and recreational amenities, and its growing strength in key industries.

Geography

The City has an area of approximately 134 square miles, and is located along the southeastern border of the Commonwealth of Pennsylvania (the "Commonwealth"), at the confluence of the Delaware and Schuylkill Rivers. The City, highlighted in orange in Figure 1, lies at the geographical and economic center of the MSA and PMSA (described below). Philadelphia is both the largest city and the only city of the first class in the Commonwealth, and is coterminous with the County of Philadelphia.

Philadelphia Metropolitan Statistical Area (the "MSA"), highlighted in blue in Figure 1, is the eleven-county area named the Philadelphia-Camden-Wilmington metropolitan statistical area, representing an area of approximately 5,118 square miles with approximately 6,070,500 residents according to 2016 estimates by the U.S. Census Bureau.[1]

Philadelphia Primary Metropolitan Statistical Area (the "PMSA"), highlighted with bold black outlines, in Figure 1, is a five-county area within the MSA that lies in the Commonwealth and is sometimes called the Philadelphia Metropolitan Division. The counties of Bucks, Chester, Delaware, and Montgomery are referred to as the Suburban PMSA herein.

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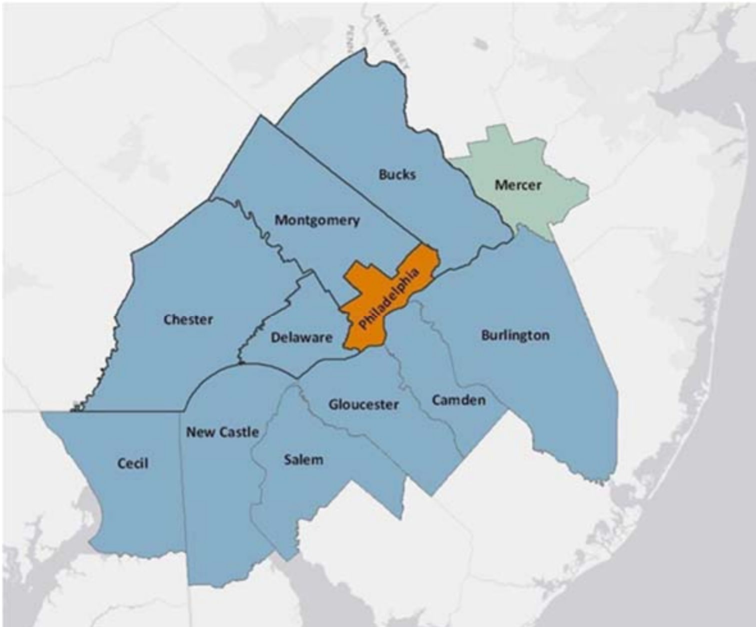
[1] Due to its close proximity and impact on the region's economy, Mercer County, New Jersey, highlighted in green in Figure 1, is included in the MSA by many regional agencies, although it is not included in the area defined by the U.S. Office of Management and Budget.

Figure 1
Map of Philadelphia Region including the MSA, PMSA, and Mercer County, NJ



Source: 2009 TIGER County Shapefiles

Strategic Location

Philadelphia is at the center of the second largest MSA on the East Coast, and is served by a robust transportation infrastructure, including: the Philadelphia International Airport, Amtrak's Northeast Corridor rail service, major interstate highway access, regional train service provided by Southeastern Pennsylvania Transportation Authority ("SEPTA") and New Jersey's PATCO (as defined herein), and the Port of Philadelphia. Due to the transportation infrastructure centered in the City, Philadelphia is accessible to regional and international markets, and is within a day's drive of 50% of the nation's population. Philadelphia's central location along the East Coast, an hour from New York City and less than two hours from Washington, D.C. by high-speed rail, also allows for convenient access to these significant economic centers.

Essential to Philadelphia's strategic location is the region's access to public transit. The U.S. Census reports that 26.5% of Philadelphians used public transit to commute to work in 2014. SEPTA regional rail service had record ridership in Fiscal Year 2015, and SEPTA public transit modes collectively had an average annual aggregate ridership increase of 1.2% from fiscal years 2006-2015.

Population and Demographics

Philadelphia is the nation's sixth most populous city, with 1.57 million residents, based on 2016 estimates. The 2000 and 2010 U.S. Census reflect the City's first population gain in 60 years. The City's population reached its nadir in 2006 with 1.45 million residents. Philadelphia's population has increased by nearly 119,428 residents from 2006 – 2016, or by 8.25%.

From 2006 to 2012, the share of the population represented by citizens age 20 to 34 grew from 20% to 26%, becoming the largest share of Philadelphia's population. Of the 30 largest cities in the country, Philadelphia had the largest percentage point increase of millennials as a share of overall population from 2006 to 2012. This demographic tends to be better educated than the City's and the nation's adult population as a whole. In 2015, 41.3% of 25- to 34-year-olds in Philadelphia held a bachelor's degree or higher, while only 34.1% of 25 to 34-year-olds in the United States were college graduates. The City's many universities and diverse employment opportunities are likely draws for residents in the 20 to 34 age group. In addition to an increase in the millennial population, the City's immigrant population also grew significantly, with the City's Asian population increasing 161.4% and the Hispanic or Latino population growing by 164.6% from 2000 to 2014, according to the US Census Bureau.

Table 1
Population: City, MSA, Pennsylvania & Nation

	1990	**2000**	**2010**	**2016**	**Percent Change 2000-2010**	**Percent Change 2010-2016**
Philadelphia	1,585,577	1,517,550	1,528,427	1,567,872	0.7%	2.6%
Philadelphia-Camden-Wilmington MSA	5,435,468	5,687,147	5,972,049	6,070,500	5.0%	1.6%
Pennsylvania	11,881,643	12,281,054	12,712,343	12,784,227	3.5%	0.6%
United States	248,709,873	281,421,906	309,348,193	321,127,513	9.9%	4.5%

Source: U.S. Census Bureau, Population Estimates 2016, Census 2010, Census 2000, Census 1990.

Nearly 27% of Philadelphia's population is school-aged (aged 5-17), and in 2015, Philadelphia exceeded many selected peer cities in its share of students who are enrolled in an undergraduate, graduate or professional education program. Selected peer cities (as shown in Table 2) reflect characteristics consistent with Philadelphia, such as geography, socio-economic statistics, industrial legacies, or port facilities. Among these cities, while Boston had the highest percentage of its population enrolled in higher education, Philadelphia had 37,315 more students enrolled in higher education than Boston. Philadelphia had the sixth highest percentage of its population enrolled in higher education and the fifth largest university student population.

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Table 2
2015 Total Number of Students, as a Percent of Total Population of Selected Cities, Ranked by Total Number of Students Enrolled in Higher Education

	Total Number of Students Enrolled in School (all years)	Total Number of Students Enrolled in Higher Education	Percent of All Students Enrolled in Higher Education	Percent of Total Population Enrolled in Higher Education
Los Angeles, CA	1,034,553	357,488	34.55%	9.04%
Chicago, IL	680,596	221,655	32.57%	8.67%
Houston, TX	609,644	159,906	26.23%	7.30%
San Diego	376,271	155,714	41.38%	11.27%
Philadelphia, PA	402,440	140,412	34.89%	9.65%
San Antonio, TX	403,558	110,739	27.44%	8.33%
Boston, MA	188,623	103,097	54.66%	17.09%
Phoenix, AZ	410,290	91,924	22.40%	6.72%
Washington, DC	166,940	76,339	45.73%	11.78%
Baltimore, MD	156,644	53,524	34.17%	9.89%
Milwaukee, WI	176,509	49,857	28.25%	10.03%
Detroit, MI	163,368	45,632	27.93%	7.95%
Memphis, TN	181,285	48,901	26.97%	7.56%
Cleveland, OH	99,028	28,664	28.95%	7.56%
United States	81,618,288	22,656,979	27.76%	7.52%

Source: 2015 American Community Survey, 1-Year Estimates.

ECONOMIC BASE AND EMPLOYMENT

The Philadelphia Economy

The City's economy is composed of diverse industries, with virtually all classes of industrial and commercial businesses represented. The City is a major regional business and personal services center with strengths in insurance, law, finance, health, education, utilities, and the arts. As of 2013, approximately 182,600 residents of the Philadelphia region's four suburban counties (Bucks, Chester, Delaware, and Montgomery), and an additional 129,000 residents of counties outside the five-county region, worked within the City. The City also provides a destination for entertainment, arts, dining and sports for residents of the suburban counties, as well as for those residents of the counties comprising the MSA plus Mercer County, New Jersey.

As shown in Table 11, the cost of living in the City is relatively moderate and affordable compared to other major metropolitan areas along the East Coast. Philadelphia's cost of living is 20% less than the Washington D.C. metropolitan area and 61% less than Manhattan. The City, as one of the country's education centers, offers the business community a large, diverse, and industrious labor pool.

Key Industries

Table 3 provides location quotients for Philadelphia's most concentrated industry sectors. Location quotients quantify how concentrated a particular industry is in a region as compared to a base reference area, usually the nation. A location quotient greater than 1.00 indicates an industry with a greater share of the local area employment than is the case in the reference area.

As shown in Table 3, compared to the nation, Philadelphia County has higher concentrations in eight sectors: 1. educational services; 2. health care and social assistance; 3. management of companies and enterprises; 4. arts, entertainment, and recreation; 5. finance and insurance; 6. professional and technical services; 7. other services, and 8. transportation and warehousing.[2] Of these eight sectors, the City has a higher concentration of employment than the Commonwealth in six sectors: educational services; health care and social assistance; arts, entertainment and recreation; finance and insurance; professional and technical services; and other services.

Table 3
Ratio of Philadelphia County and Pennsylvania Industry Concentrations Compared to the United States

Industry	Philadelphia County to the US	Pennsylvania to the US
Educational Services	4.32	1.51
Health Care and Social Assistance	1.73	1.22
Management of Companies and Enterprises	1.27	1.42
Arts, Entertainment, and Recreation	1.20	1.01
Finance and Insurance	1.16	1.05
Professional and Technical Services	1.13	0.92
Other Services	1.12	1.06
Transportation and Warehousing	1.10	1.18

Source: Bureau of Labor Statistics: 2015 Location Quotient, Quarterly Census of Employment and Wages Data.
Industry Location Quotients are calculated by comparing the industry's share of regional employment with its share of national employment.

The concentration of educational services not only provides stable support to the local economy, but also generates a steady and educated workforce, fueling the City's professional services and healthcare industries. In a 2014 Campus Philly report "Choosing Philadelphia," 51% of non-native students, and 76% of native graduates from the region, chose to live in Philadelphia directly after graduation.

The City is also capitalizing on the region's assets to become a leader in research generated by life sciences and educational institutions. Several sites now foster life science incubator facilities, including The Navy Yard, University City Science Center, University of Pennsylvania, Children's Hospital of Philadelphia, Jefferson Hospital, Drexel University, and The Wistar Institute. The University of Pennsylvania's Penn Center for Innovation and Temple University's Office of Technology Development and Commercialization are two of several organizations driving tech transfer and commercialization of innovations developed at Philadelphia's major research institutions. A new development, uCity Square, was announced in late 2016. When the project is complete, it will expand the one million square feet in facilities offered by the University City Science Center to 6 million square feet, with a projected investment of over $1 billion. Such project is expected to be completed in 2027.

[2] The Bureau of Labor Statistics ("BLS") defines the "Other Services" (except Public Administration) sector as establishments engaged in providing services not specifically provided for elsewhere in the BLS classification system, such as equipment and machinery repairing, promoting or administering religious activities, grantmaking, advocacy, providing dry cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services.

Employment

Table 4 shows non-farm payroll employment in the City over the last decade by industry sectors. In the past 10 years, growth has occurred in Mining, Logging, and Construction; Trade, Transportation, and Utilities; Professional and Business Services; Education and Health Services; and Leisure and Hospitality. These sectors provide stability to the City's overall economy.

Table 4
Philadelphia Non-Farm Payroll Employment[1] (Amounts in Thousands)

Sector	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	% Change 2007-16	Average Annual % Change
Leisure and Hospitality	58.0	57.9	56.9	58.4	60.6	63.2	64.8	66.9	68.5	70.8	22.1%	2.3%
Education and Health Services	192.4	196.7	199.5	202.3	206.4	208.1	209.3	212.7	216.6	223.9	16.4%	1.5%
Professional and Business Services	85.8	85.3	80.1	81.6	83.0	84.1	86.4	88.3	90.9	95.4	11.2%	0.8%
Trade, Transportation, and Utilities	87.8	87.6	85.9	86.6	87.4	88.9	89.5	90.9	92.2	93.0	5.9%	0.6%
Other Services	28.0	27.8	26.6	26.5	26.4	26.8	26.9	26.8	27.1	27.8	-0.7%	-0.4%
Mining, Logging, and Construction	11.9	12.1	10.1	10.0	10.0	10.2	10.4	11.0	11.5	12.0	0.8%	-0.2%
Information	12.6	12.5	12.6	12.2	12.0	12.0	11.5	11.5	11.8	11.7	-7.1%	-0.8%
Financial Activities	47.1	46.5	44.9	42.6	41.6	41.0	41.1	41.7	42.3	42.7	-9.3%	-1.3%
Manufacturing	28.5	27.8	25.7	24.7	23.7	22.9	21.8	21.5	21	20.4	-28.4%	-3.7%
Private Sector Total	552.1	554.2	542.3	544.9	551.1	557.2	561.7	571.3	581.9	597.7	8.3%	0.7%
Government	110.6	109.2	110.4	112.1	109.0	105.3	103.5	102.2	101.6	101.9	-7.9%	-1.0%
Total	662.7	663.4	652.7	657.0	660.1	662.5	665.2	673.5	683.5	699.6	5.6%	0.4%

Source: Bureau of Labor Statistics, 2016.
[1] Includes persons employed within the City, without regard to residency.

Table 5
Philadelphia Change in Share of Employment Sectors[1], Ranked by Percent Change of Share

Sector	Share of Total Employment 2007	Share of Total Employment 2016	Percent Change of Share 2007-2016
Leisure and Hospitality	8.8%	10.1%	15.6%
Education and Health Services	29.0%	32.0%	10.2%
Professional and Business Services	12.9%	13.6%	5.3%
Trade, Transportation, and Utilities	13.2%	13.3%	0.3%
Other Services	4.2%	4.0%	-6.0%
Mining, Logging, and Construction	1.8%	1.7%	-4.5%
Information	1.9%	1.7%	-12.0%
Financial Activities	7.1%	6.1%	-14.1%
Manufacturing	4.3%	2.9%	-32.2%
Private Sector Total	83.3%	85.4%	2.5%
Government	16.7%	14.6%	-12.7%

Source: Bureau of Labor Statistics, 2016.
[1] Includes persons employed within the City, without regard to residency.

Bureau of Labor Statistics data show that in 2016, the Education and Health Services, Professional and Business Services, Financial Activities, and Leisure and Hospitality sectors collectively represented 61.9% of total employment in the City for the year. From 2010 to 2016, Philadelphia has created 52,800 private sector jobs since losing nearly 12,000 private jobs at the peak of the recession in 2009.

Unemployment

Although Philadelphia has recently narrowed the gap between its unemployment levels and the national unemployment levels, the effects of the recession on unemployment endured longer in Philadelphia than in many other parts of the country.

As shown in Table 6, employment gains in the latter part of 2013 through 2015 have resulted in a decline in Philadelphia's unemployment rate from a high of 10.9% in 2012 to 6.8% in 2016.

Table 6 below shows unemployment information for Philadelphia, the MSA, the Commonwealth and the United States.

Table 6
Unemployment Rate in Selected Geographical Areas
(Annual Average 2007-2016)

Geographical Area	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Change in rate from 2007-2016
United States	4.6	5.8	9.3	9.6	8.9	8.1	7.4	6.2	5.3	4.9	0.3
Pennsylvania	4.3	5.3	7.9	8.5	7.9	7.9	7.4	5.9	5.1	5.4	1.1
Philadelphia-Camden-Wilmington MSA	4.3	5.3	8.3	8.8	8.5	8.4	7.7	6.2	5.3	5.1	0.8
Philadelphia	6.1	7.1	9.7	10.6	10.7	10.9	10.3	8.1	6.9	6.8	0.7

Source: Local Area Unemployment Statistics, Bureau of Labor Statistics

Principal Private Sector Employers in the City

Table 7 lists Philadelphia's 15 largest private sector employers by number of employees. Five are hospitals and providers of other medical services, four are renowned universities, and three are in the finance and insurance industry. Other sectors represented include food services, bio-tech, and broadcasting/cable.

Fortune 500 companies headquartered or maintaining a major presence in Philadelphia include: the Comcast Corporation, Cigna Corporation, Aramark Corporation, Crown Holdings Inc., and Lincoln National. As of 2015, four Fortune 1000 companies are also headquartered within the City: FMC Corporation, Urban Outfitters Inc., Chemtura and Pep Boys.

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Table 7
Principal Private Sector Employers
Ranked by Number of Employees in Philadelphia (as of October, 2016)

Employer	Sector	Employees within Philadelphia
University of Pennsylvania	Education	21,193
University of Pennsylvania Health System	Health	15,956
Children's Hospital of Philadelphia	Health	11,895
Temple University Hospital, Inc.	Health	9,030
Temple University	Education	8,674
Comcast Corporation[1]	Media/IT	8,000
Thomas Jefferson University Hospitals	Health	7,825
Drexel University	Education	6,291
Aramark Corporation	Food Service	6,207
Albert Einstein Medical	Health	5,323
American Airlines	Transportation	5,198
Thomas Jefferson University	Education	4,547
Independence Blue Cross	Insurance	3,554
PNC Bank N.A.	Finance	1,883
Ace Insurance Company	Insurance	1,512
GlaxoSmithKline LLC	Bio-tech	1,376
	Total	**118,464**

Source: City of Philadelphia Department of Commerce
[1] Employment data for Comcast Corporation are an estimate provided by Comcast Corporation, May 2015. This estimate includes approximately 2,000 contract workers.

Hospitals and Medical Centers

The City is a center for health, education, research and science facilities with the nation's largest concentration of healthcare resources within a 100-mile radius. There are presently more than 30 hospitals, five medical schools, two dental schools, two pharmacy schools, as well as schools of optometry, podiatry and veterinary medicine located in the City. The City is one of the largest health care and health care education centers in the world, and a number of the nation's largest pharmaceutical companies are located in the Philadelphia area.

Major research facilities are also located in the City, including those located at its universities and medical schools: Children's Hospital of Philadelphia, the Hospital of the University of Pennsylvania, The Wistar Institute, the Fox Chase Cancer Center, and the University City Science Center. Philadelphia is home to two of the nation's 41 National Cancer Institute ("NCI")-designated Comprehensive Cancer Centers (the Abramson Cancer Center at the University of Pennsylvania and Fox Chase Cancer Center, which is part of the Temple University Health System). Additionally, Philadelphia is also home to two NCI-designated Cancer Centers (Kimmel Cancer Center and The Wistar Institute Cancer Center).

Penn Medicine University of Pennsylvania Health System

Penn Medicine includes Pennsylvania Hospital, the nation's first hospital, founded in 1751 and the nation's first medical school, the University of Pennsylvania School of Medicine, opened in 1765. In addition, the Hospital of the University of Pennsylvania was established in 1874 as the nation's first teaching hospital. Penn Medicine's hospitals have been named among the top ten hospitals in the country with the combined University of Pennsylvania and Penn Presbyterian Medical Center ranked #1 in the region by *U.S. News and World Report*. Penn Medicine, which has invested more than $200 million in major capital investments between 2014 and 2015, began construction in 2016 on a new 1.5 million square foot Patient Pavilion, a new clinical facility that is projected to be occupied by spring of 2021.

Children's Hospital of Philadelphia Expansion

Top-ranked Children's Hospital of Philadelphia ("CHOP") is the oldest children's hospital in the nation and one of the largest in the world. Since 2002, CHOP has invested over $2.6 billion in its expansion in Philadelphia. CHOP recently approved an additional $2.7 billion expansion in Philadelphia through 2017. In fall of 2015, phase one of the $500 million, 700,000 square foot Buerger Center for Advanced Pediatric Care was completed; the last few levels within phase two will open in 2017.

Temple University Hospital, Inc.

Temple University Hospital (TUH) is one of the region's most respected academic medical centers. The 722-bed Philadelphia hospital is also the chief clinical training site for the Lewis Katz School of Medicine at Temple University. TUH was ranked among the "Best Regional Hospitals" in six different specialties in *U.S. News & World Report* 2014-2015 regional rankings.

Thomas Jefferson University and Jefferson Health

Thomas Jefferson University Hospital has been at the top of the list of hospitals in Pennsylvania (3rd) and the Philadelphia metro area (2nd) in *U.S. News & World Report*'s annual listing of the best hospitals and specialties. Jefferson Health has recently participated in two significant mergers, integrating the Aria Health system and Abington Hospital into its system. Thomas Jefferson University is currently in the process of acquiring Philadelphia University.

Einstein Healthcare Network

Einstein Healthcare Network is a private, not-for-profit organization with several major facilities and many outpatient centers that has been in existence for nearly 150 years. The Einstein Health and Medical Center in Philadelphia has been listed as a top hospital in *U.S. News & World Report*.

Table 8 lists the top ten recipients of funding from the National Institutes of Health ("NIH") in fiscal year 2016, in order of total funding received. The University of Pennsylvania ("Penn") was the fourth largest recipient of NIH funding in 2016 and consistently places near the top of this list.

Table 8
Largest Recipients of National Institutes of Health Funding, Fiscal Year 2016

	Organization	City	State	Awards	Funding
1	Johns Hopkins University	Baltimore	MD	1297	$650,878,713
2	University of California, San Francisco	San Francisco	CA	1208	$577,576,919
3	University of Michigan	Ann Arbor	MI	1106	$486,690,808
4	University of Pennsylvania	Philadelphia	PA	1107	$478,866,008
5	University of Pittsburgh, Pittsburgh	Pittsburgh	PA	1053	$475,851,374
6	University of Washington	Seattle	WA	885	$458,217,212
7	Stanford University	Stanford	CA	944	$427,012,784
8	Duke University	Durham	NC	778	$416,881,431
9	Univ. of North Carolina Chapel Hill	Chapel Hill	NC	871	$412,385,487
10	Yale University	New Haven	CT	924	$407,245,439

Source: National Institutes of Health, 2016

Educational Institutions

The MSA plus Mercer County, New Jersey, has the second largest concentration of undergraduate and graduate students on the East Coast, with 101 degree granting institutions of higher education and a total enrollment of over 434,000 full and part-time students. Approximately 149,000 students lived within the geographic boundaries of the City in 2015. Included among these institutions are the University of Pennsylvania, Temple University, Drexel University, St. Joseph's University, and LaSalle University. Within a short drive from the City are such schools as Princeton University, Villanova University, Bryn Mawr College, Haverford College, Swarthmore College, Lincoln University, and the Camden Campus of Rutgers University.

University of Pennsylvania

Penn, the first university in the U.S., founded in 1740, and a prominent Ivy League institution, is located in West Philadelphia across the Schuylkill River from downtown Philadelphia. In Fall 2016, more than 21,000 full-time undergraduate, graduate and professional full-time students attended Penn, 5,000 of which are international students. Approximately 3,600 part-time students were enrolled. As of December 2016, Penn had a total workforce of over 17,500 faculty and staff, and the University of Pennsylvania Health System had a workforce of 21,626 employees. In September 2016, Penn opened Pennovation Works, a 55,000 square foot business incubator and laboratory that houses researchers, innovators, and entrepreneurs for the commercialization of research discoveries.

Penn has undergone significant expansion in the last decade and has a growing endowment currently valued at $10.7 billion. In 2015, Penn, and related third-party developers, spent $932 million dollars on new buildings and renovations. A recent independent report conducted by Econsult Solutions, Inc. found that Penn and Penn Medicine had a combined economic impact on the City and state of more than $14 billion in fiscal year 2015 including $10.8 billion to the City. According to the same study, Penn generates $1 out of every $20 of Philadelphia's general fund and one out of every nine jobs in the Philadelphia economy.

Drexel University

Founded in 1891 as the Drexel Institute of Science, Art and Industry, Drexel University ("Drexel") is one of Philadelphia's top 10 private employers, and a major engine for economic development in the region. Drexel is known for its innovation and civic engagement, ranked a "top 15 most innovative school" by *U.S. News and World Report*. Drexel's student body consists of approximately 26,000, making it one of the 15 largest private universities in the country. Drexel is unique in that it provides its students with a co-op work experience every six months throughout the four year college experience. Over the last decade, Drexel has undergone significant expansion and has major plans for future development. In 2011, Drexel opened the doors to the $69 million Constantine N. Papadakis Integrated Sciences Building, a $92 million facility for its LeBow School of Business, and a new mixed use residential and retail project, Chestnut Square.

Temple University

Temple University ("Temple"), founded in 1884, has undergone a significant transformation over the past three decades from a university with a mostly commuter-based enrollment to one in which on and near-campus housing is now in high demand. Temple features 17 schools and colleges, eight campuses, hundreds of degree programs and more than 38,000 students. Currently, an estimated 12,000 students live on or around the Temple campus. Temple's Board of Trustees approved a master plan, "Visualize Temple," in December 2014, and Temple has begun $1.2 billion of investment. Planned upgrades include improved green space, a student recreation facility, and academic buildings such as a library and a new science research lab.

Family and Household Income

Table 9 shows median family income, which includes related people living together, and Table 10 shows median household income, which includes unrelated individuals living together, for Philadelphia, the MSA, the Commonwealth and the United States. Over the period 2006-2015, median family income for Philadelphia increased by 14.7% (see Table 9), while median household income increased by 24.1% over the period 2006-2015 as a result of an influx of higher income households (see Table 10).

Table 9
Median Family Income* for Selected Geographical Areas, 2006-2015
(Dollar Amounts in Thousands)

Year	Philadelphia	Philadelphia-Camden-Wilmington MSA	Pennsylvania	United States	Philadelphia as a percentage of the US
2006	$43.0	$70.8	$58.1	$58.5	73.50%
2007	$44.9	$74.0	$60.8	$61.2	73.37%
2008	$46.4	$77.6	$63.3	$63.4	73.19%
2009	$45.7	$76.9	$62.2	$61.1	74.96%
2010	$43.1	$74.5	$61.9	$60.6	71.12%
2011	$42.7	$75.7	$63.3	$61.5	69.43%
2012	$44.3	$77.0	$65.1	$62.5	70.88%
2013	$44.6	$78.2	$66.5	$64.0	69.69%
2014	$47.0	$80.6	$67.9	$65.9	71.32%
2015	$49.3	$83.0	$70.2	$68.3	72.18%
Change 2006-2015	$6.3	$12.2	$12.1	$9.8	

* Includes related people living together.
Source: 2015 American Community Survey 1-Year Estimates

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Table 10
Median Household Income* for Selected Geographical Areas, 2006-2015
(Dollar Amounts in Thousands)

Year	Philadelphia	Philadelphia-Camden-Wilmington MSA	Pennsylvania	United States	Philadelphia as a percentage of the US
2006	$33.2	$55.6	$46.3	$48.5	68.45%
2007	$35.4	$58.3	$48.6	$50.7	69.82%
2008	$37.0	$60.9	$50.7	$52.0	71.15%
2009	$37.0	$60.1	$49.5	$50.2	73.71%
2010	$34.4	$58.1	$49.3	$50.0	68.80%
2011	$34.2	$58.3	$50.2	$50.5	67.72%
2012	$35.4	$60.1	$51.2	$51.4	68.87%
2013	$36.8	$60.5	$52.0	$52.3	70.36%
2014	$39.0	$62.2	$53.2	$53.7	72.63%
2015	$41.2	$65.1	$55.7	$55.8	73.84%
Change 2006-2015	$8.0	$9.5	$9.4	$7.3	2006-2015

* Includes unrelated people living together.
Source: 2015 American Community Survey 1-Year Estimates

One of the factors that contributes to a lower median household income is the fact that Philadelphia has the fifth largest undergraduate and graduate student population among major U.S. cities. These individuals, numbering approximately 140,412 according to the 2015 American Community Survey, or approximately 9.65% of the City's overall population, generally have very low or no income, as they are either unemployed or working only part-time while they complete their education. The City's large student population has historically led to an overstatement of the City's percentage of residents living at or below the poverty level.

Cost of Living Index

Philadelphia has the second lowest cost of living index among major cities in the Northeast, as shown in Table 11 below. Additionally, the City's Wage, Earnings, and Net Profits Tax Rates have decreased in Fiscal Years 2014, 2015, and 2016. See "REVENUES OF THE CITY – Wages, Earnings, and Net Profits Taxes" in APPENDIX IV for this Official Statement.

Table 11
2015-2016 Cost of Living Index* of Cities in the Northeastern U.S.

Metropolitan Area	Cost of Living Index
New York (Manhattan)	228.2
Washington-Arlington-Alexandria	149.2
Boston-Cambridge-Quincy	148.1
Philadelphia-Camden-Wilmington	118.6
Baltimore-Towson	115.6

* Data reflects Q3 2015 – Q3 2016
Source: 2016 ACCRA Cost of Living Index

Housing

For purposes of the information included under this "Housing" subheading, the City engaged an outside consultant, Kevin C. Gillen, Ph.D., who prepared the text and tables below and conducted the analysis related thereto. As a professional in the field of urban and real estate economics, the City has relied on the analysis Dr. Gillen has provided below, but makes no representations regarding the accuracy of the findings set forth herein.

Philadelphia is a post-industrial city located in the northeast corridor of the U.S. between New York and Baltimore. Its housing stock is among the oldest of any city in the country, and has suffered from decades of depopulation and abandonment during the postwar era. Like many U.S. cities, Philadelphia has also undergone a significant revitalization in the past 25+ years, particularly in and around its downtown core of Center City. Philadelphia experienced a net population increase in the most recent Census for the first time since 1950, which was overwhelmingly due to new household growth in these aforementioned neighborhoods.

As population has continued to increase, many neighborhoods have undergone significant new construction and investment, leading to increases in the value of the City's housing stock, while large parts of the rest of the City continue to face significant challenges caused by the persistent problems of poverty, crime, underperforming schools and lack of employment opportunities. Most housing indicators for Philadelphia indicate a positive outlook for the near future.

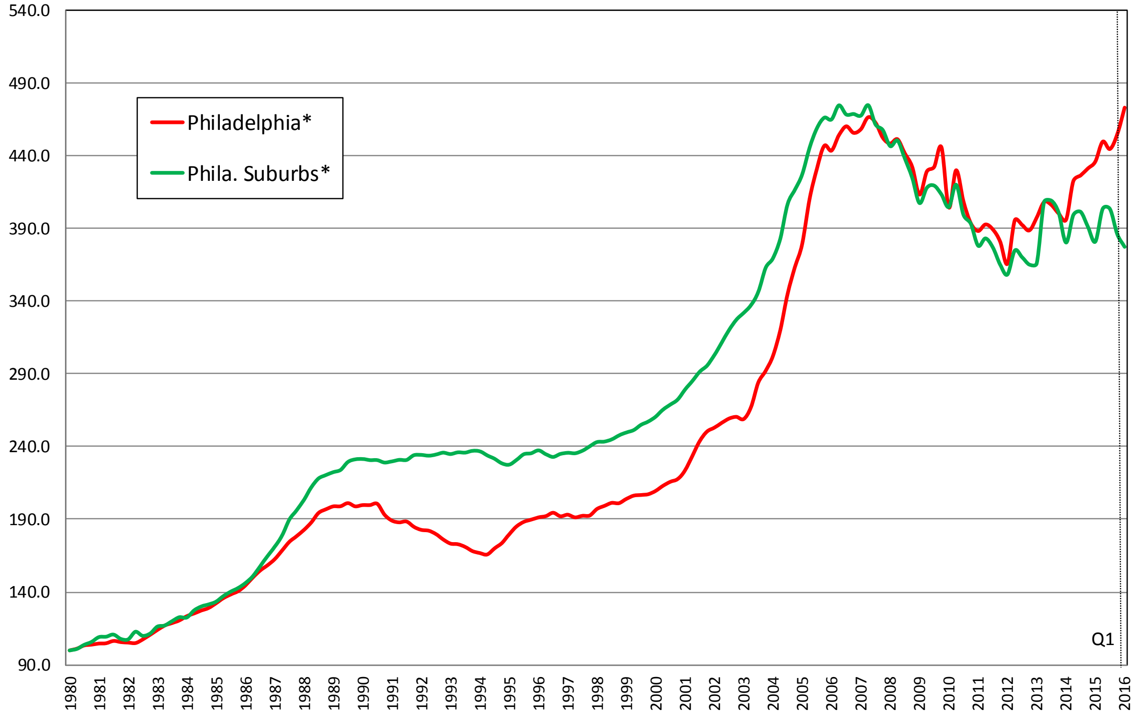
The total housing stock, measured by the number of properties, increased by 3.3% from 2010-2015, for a total of 500,374 in 2015. While both single-family and multi-family unit stock increased over this five year period, the number of multi-family (structures with five or more dwelling units) units decreased by approximately 56.3% from 2014 to 2015. The homeownership rate in the City in 2015 was 52.9%, which represents a 7.2% decline over the prior five-year period. Alternatively, the rental market in the City has continued to improve with average monthly housing rent in 2015 equal to $1,209, which represents a 10.7% increase over the prior five-year period.

The data points referenced in this paragraph were derived from the following source: Philadelphia Recorder of Deeds, Philadelphia Office of Property Assessment, U.S. Census, National Multifamily Housing Council, and Trend MLS.

Home Prices

After nearly ten years of house price deflation and sluggish recovery, 2015 proved to be the best year for Philadelphia housing since the recession. Both the median house price and the house price index for Philadelphia hit new all-time highs. The following chart shows an empirically estimated house price index that displays the trajectory and level of average house prices in Philadelphia on a quality- and seasonally-adjusted basis (the red line) and a similar house price index for Philadelphia's suburbs (the green line). The index is computed via regression, using a hybrid hedonic repeat-sales specification, which is very similar to the same methodology used in the computation of the Case-Shiller House Price Indices.

Philadelphia County v. Suburban House Price Indices 1980-2016



*Empirically estimated by Kevin C. Gillen, PhD

Note: The suburban index includes all counties in the regional index, except for Philadelphia county.

Source: Philadelphia Recorder of Deeds, Computed by Kevin C. Gillen, PH.D.

The index is normalized to a starting value of 100 in its first period of 1980 Q1, with its percent change over time reflecting the average price appreciation (or depreciation) rate of the average Philadelphia home. After hitting a peak in mid-2007, the index began a 5-year decline of 23% before hitting bottom in early 2012. Since then, Philadelphia has lagged both other cities and the nation as a whole in its house price recovery. But, after making significant gains in the latter half of 2015 and early 2016, the current index stands at a value that is slightly higher than its peak in 2007, thus indicating that the aggregate loss in the value of Philadelphia's housing stock from the Great Recession has been erased.

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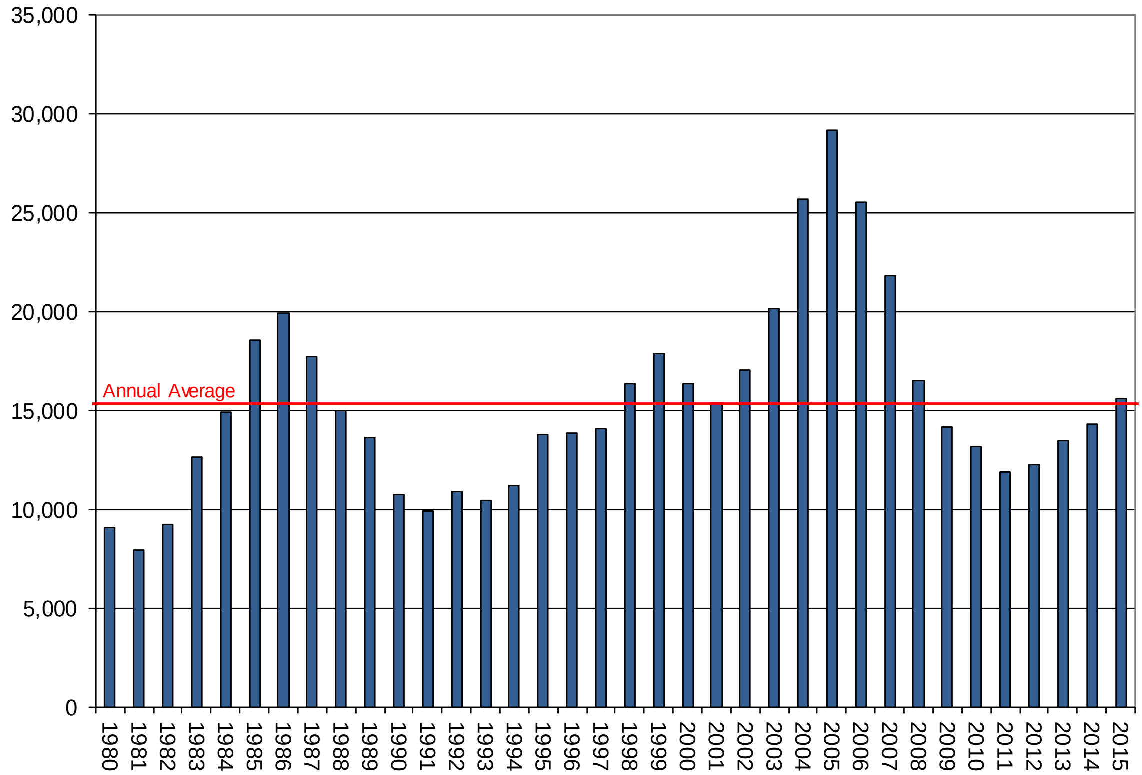
Home Sales

Another indicator of the housing market's recovery is the current level of home sales. The following chart shows the annual number of single-family house sales in Philadelphia since 1980. Only arms-length home sales at market-rate prices are counted in the following chart.

Number of Philadelphia House Sales Per Year: 1980-2015



Source: Philadelphia Recorder of Deeds

Like prices, home sales dropped significantly following the bursting of the housing bubble, and after hitting bottom in 2011 have only sluggishly recovered. However, in 2015, total home sales were just above 15,000 units in Philadelphia, which is back to its historic long-run annual average, and is at its highest level since 2008. As such, the 2015 level of home sales activity reflects the recovery of the City's housing market.

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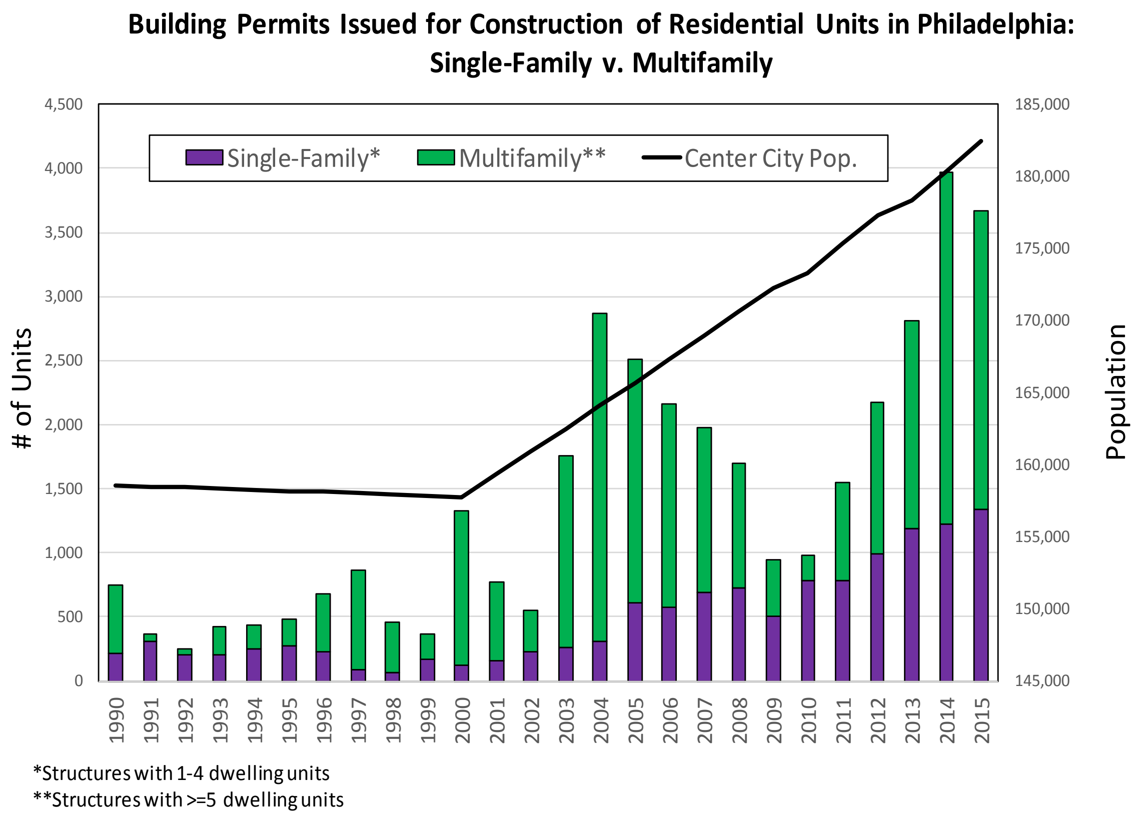
Home Construction

Homebuilding activity in Philadelphia has also made significant progress since hitting its recessionary low in 2009. The following chart shows the number of newly constructed units being added to Philadelphia's housing stock, as represented by the number of building permits issued for such units, from 1990 through 2015.



Source: U.S. Census

Because the overwhelming amount of current new construction is in and around the Center City (downtown) neighborhoods of Philadelphia, the above chart also shows total population growth in those same neighborhoods, as represented by the black line.

Prior to 2000, construction of new housing units in Philadelphia was low by both absolute and relative measures, averaging only 400 units per year, while population growth during this period was actually slightly negative. Following passage of a ten-year property tax abatement program[3] in 2000, construction began to grow steadily, hitting a peak of nearly 3,000 units in 2004. After declining to 947 units during the recession in 2009, construction activity has recovered steadily, and currently stands well above the boom years of the previous decade. In 2014, permits were issued to approve the construction of nearly 4,000 new housing units in Philadelphia—an all-time high. Although total permitting activity declined in 2015 from the previous year, total residential development activity still remains quite high,

[3] Under the tax abatement program, the value of any new improvements to real estate in Philadelphia is untaxed for the first ten years after the improvements are made. In the case of new construction, this is a substantial tax break to the owner because the entire structure represents an improvement. As such, the owner only pays real estate taxes on the value of the land for the first ten years after a new building is completed.

and appears justified by continued population growth. An easing in development activity could actually be taken as a positive sign, since it gives the market time to allow recently finished projects to be absorbed by the current population, rather than having the flow of supply (new units) exceed the flow in demand (new households).

Office Market and New Development

The City currently has approximately 44.7 million square feet of office space in the Central Business District ("CBD"), with an additional 2.4 million square feet under construction according to Jones Lang LaSalle's ("JLL") statistics for the fourth quarter of 2016. The CBD includes four submarkets: University City, the Navy Yard, Market Street East and Market Street West. Although total vacancy eased slightly in University City with the delivery of the new 49-story, 861,000 square foot FMC Tower at Cira South, JLL also reports that total vacancy in the City's other CBD submarkets remains tight at 10.2%. This low vacancy and the delay of delivery of other Class A office towers, have driven trophy rent in University City to surpass $50 per square foot (full service gross) and the conversion of Class B office space into Class A across the CBD. Properties undergoing redevelopment, especially those in the Market East submarket, are well positioned in current market conditions.

The average direct asking rental rates in the City's CBD rose to $30.24 per square foot in the fourth quarter of 2016. Markedly, the City's CBD enjoys rising rents with low overall total vacancy, the third lowest vacancy rate among peer CBDs across the nation, while its suburban counterparts have higher overall total vacancy and lower rents during the same period, at 14.1% and $25.87 per square foot.

Table 12 shows comparative overall fourth quarter 2016 office vacancy rates for selected office markets.

Table 12
Total Office Vacancy Rates of Selected Office Markets
Central Business Districts, Fourth Quarter 2016

Market	Vacancy Rate
New York-Midtown South	7.5%
Boston	9.4%
Philadelphia	10.2%
Chicago	10.3%
New York-Midtown	10.6%
New York-Downtown	11.6%
Washington, DC	12.0%
United States CBD, All Markets	12.1%
San Antonio	12.8%
Baltimore	14.0%
Detroit	14.1%
San Diego	14.6%
Houston	16.1%
Los Angeles	16.3%
Cleveland	20.5%
Phoenix	21.7%

Source: Jones Lang LaSalle, National CBD Data, Fourth Quarter 2016

Notable developments include the lease-up of FMC Tower to 95% committed within six months of its delivery. Tenants include Spark Therapeutics, Lutron, Penn, FreedomPay, and NASDAQ. Comcast's $1.2 billion Comcast Technology Center is on schedule to deliver in the first quarter of 2018. The new skyscraper will enable Comcast to consolidate employees currently scattered at several sites (in both Philadelphia and the surrounding suburbs) into a single location. The facility will also create a media center in the heart of the City by becoming home to the operations of local broadcast television stations NBC 10/WCAU and Telemundo 62/WWSI. Comcast also recently clarified plans for a startup accelerator within the building, to be branded as LIFT Labs for Entrepreneurs. The tower will also serve as the new home to the Four Seasons Hotel, which will occupy the tower's top floors with 222 rooms. The mixed-use tower is expected to be the tallest building in the United States outside of New York and Chicago and will be one of the largest private development projects in the history of Pennsylvania. Ultimately, the project is expected to create 1,500 permanent jobs in Philadelphia.

Retail Market, Food and Dining

According to a December 2016 Center City District report, Philadelphia's retail market has grown substantially and with nearly 185,000 residents, 300,000 workers, 3.1 million occupied hotel room nights and 117,000 college students in and around Center City, the market generates more than $1 billion in retail demand. The report also states that Center City's "affluent and highly educated residential demographic has attracted more than 45 national retailers since 2013. More than 2 million square feet of retail is under construction downtown, as older shopping streets are being redeveloped and Philadelphia's prime retail district continues to expand." According to Commercial Brokers Real Estate's Fall 2016 Report "Philadelphia Urban Retail," Center City's retail rental rates have risen faster than all North American cities other than Miami. The Center City District also reports that pedestrian volumes along West Chestnut now match and surpass pedestrian volumes along West Walnut, the City's traditional "high street." In January 2015, Philadelphia was named the second of 24 "Best Shopping Cities in the World," by Condé Nast Traveler Magazine, behind Barcelona.

Market East, an important commercial area nestled between City Hall and the City's historic district is experiencing a development boom. The revitalization of this section of the City, containing a major transport hub, is expected to be transformative. Most notably, the planned redevelopment of The Gallery at Market East into the Fashion Outlets of Philadelphia is one of the biggest developments in the area. This 430,000 square foot urban retail mall complex features 130 stores. In April 2013, Pennsylvania Real Estate Investment Trust ("PREIT") acquired single entity ownership of The Gallery at Market East. In July 2014, the Macerich Company, which owns 55 shopping centers across the nation, acquired a 50% interest in The Gallery. In December 2015, Macerich and PREIT closed on their agreement for the $325 million redevelopment of the shopping center. Interior demolition of The Gallery at Market East began in 2016 with an estimated completion date of Q4 2018.

Recent improvements along East Market Street also include the 2014 opening of New York-based department store Century 21, the chain's first store outside of New York City, in a 95,000 square foot space that was previously vacant. Also, in March 2014, NREA Development Services announced a mixed-use redevelopment project, called East Market, also located on Market Street between 11th and 12th Streets. Once completed in the late spring of 2017, the project will include 325 apartments, and up to 122,000 square feet of retail space. Just one block south of Market Street, as of July 2016, Brickstone Co. has completed construction of a mixed-use redevelopment project. The project is a mix of new construction and historic preservation and includes up to 115 apartments and 90,000 square feet of retail space. Tenants include Target Express, one of two Center City locations that opened in 2016.

Complementing the rise of retail in Philadelphia, the City has experienced a revival of restaurant establishments, especially in Center City and in the Greater Center City area, indicating an improved quality of life and vibrancy of those neighborhoods. The Center City District's investment in beautification of the area as well as the City's support in making the area more welcoming to visitors and diners sparked a significant increase in the number of indoor/outdoor dining establishments throughout Center City. From 1992 to 2010, the number of fine dining establishments within the Center City District increased 322%. Preliminary data reports that foodservice and drinking establishments employed about 48,800 people in 2015, representing an average annual growth of 2.4% since 2005.

ECONOMIC DEVELOPMENT STRATEGIES AND IMPLEMENTATION

City of Philadelphia Economic Development Mission and Goals

The City's economic development strategy is to (1) spur job-creation by fostering an improved business environment; (2) increase the City's population and visitation; and (3) enhance quality of life within the City – all in order to grow the City's tax base and market competitiveness. The City partners with numerous quasi-city and private agencies to accomplish these objectives.

The City utilizes several place-based economic development strategies to spur development in Philadelphia. These strategies include: (i) a 10-year real estate tax abatement on all construction, as well as on improvements to existing properties; (ii) Commonwealth-designated Keystone Opportunity Zones in which eligible businesses may be exempt from all Commonwealth and local business taxes until a specified date; (iii) Commonwealth-designated Keystone Innovation Zones in which energy, defense, technology, and life-sciences companies may be eligible for saleable tax credits worth $100,000 annually for the first eight years of operations; (iv) tax increment financing; and (v) commercial corridor revitalization through support of Business Improvement Districts and reimbursement for certain storefront and interior retail improvements.

The City has also actively worked to raise its profile in the international business community. In October 2015, Philadelphia received the designation of the first World Heritage City in the United States by the Organization of World Heritage Cities. In summer 2015, the City entered into a "sister city" agreement with Frankfurt, Germany, considered the largest financial center in continental Europe. This agreement is Philadelphia's first sister city since 1992. In September 2016, a delegation of City officials and business leaders participated in a trade mission to Germany, France and Portugal further enhancing Philadelphia's relationship with these three countries. In fall 2014 and 2015, Philadelphia hosted delegations of Israeli high-tech companies following a 2013 Israeli trade mission. Additionally, by participating in the Global Cities Initiative with multiple private stakeholders, the City of Philadelphia is supporting the development of a metro export growth plan, which launched in spring 2016.

City and Quasi-City Economic Development Agencies

City of Philadelphia Department of Commerce

The mission of the Department of Commerce, a 75-person City agency, is to ensure that Philadelphia is a globally-competitive city where employers hire, entrepreneurs thrive, and innovation abounds; to recruit and retain a diverse set of businesses; to foster economic opportunities for all Philadelphians in all neighborhoods; and to partner with workforce development programs and local businesses on talent development with the goal of ensuring that all Philadelphians can find and retain living-wage jobs. The Department of Commerce has three major divisions: Neighborhood & Business Services; Office of Business Development and Office of Economic Opportunity.

City of Philadelphia Department of Planning and Development

The Department of Planning and Development oversees all planning, real estate development support, and commissions such as Historical Commission, Planning Commission, Art Commission and Civic Design Review. Planning and Development also oversees all housing initiatives and plays a key role in community development.

Philadelphia Industrial Development Corporation (PIDC)

PIDC is a non-profit organization founded by the City of Philadelphia and the Greater Philadelphia Chamber of Commerce in 1958. PIDC offers flexible financing tools, a targeted portfolio of industrial and commercial real estate, and expertise to help clients invest, develop, and grow in Philadelphia. PIDC also structures and invests in public-private partnerships for key City policy areas and development priorities. Since its inception, PIDC and its affiliates have settled approximately 6,700 transactions, including $14 billion in financing that has leveraged over $25 billion in total investment and assisted in creating and retaining hundreds of thousands of jobs. Its direct loan and managed third-party portfolio at the start of 2016 exceeded $642 million, representing 520 loans.

Philadelphia Redevelopment Authority (PRA)

In 1945, the Commonwealth enacted the Urban Renewal Law and created the PRA as the City's urban renewal agency. Today, the PRA continues its role as a key financer, project manager, leader, and expert of developing and maintaining land in the City of Philadelphia. The PRA is one of five municipal land holding agencies. Its Real Estate Division facilitates the redevelopment of PRA assets and it provides project management and analysis for real estate sales, acquisitions, redeveloper agreements, developer submissions and required approvals. Its Housing Department leads the underwriting and loan closing process for all affordable housing projects within the City of Philadelphia and works primarily with non-profit and for-profit developers as a lender.

Philadelphia Land Bank (PLB)

A new institutional partner in land use is the recently established the PLB. The aim of the PLB is to consolidate many of the land acquisition and disposition processes of the City under one umbrella, making it easier for private individuals and organizations to acquire properties that otherwise contribute to neighborhood disinvestment and turn them into assets for the community in which they are located. The PLB can: (i) consolidate properties owned by multiple public agencies into single ownership to speed property transfers to new, private owners; (ii) acquire tax-delinquent properties through purchase or by bidding the City's lien interests at a tax foreclosure; (iii) with consent of the City, clear the title to those properties so new owners are not burdened by old liens; and (iv) assist in the assemblage and disposition of land for community, non-profit, and for-profit uses.

The Division of Housing and Community Development (DHCD)

DHCD, formerly known as the Office of Housing and Community Development (OHCD), and now part of the City's Department of Planning and Development, manages planning, policy and investment in low-income housing through several assistance programs. Most significantly, the DHCD creates and manages implementation of the Consolidated Plan, a federally-mandated plan and budget that must be updated yearly in order to receive federal Community Development Block Grant funding.

The Philadelphia Housing Authority (PHA)

PHA is funded primarily by the federal government and is the largest landlord in Pennsylvania. PHA develops, acquires, leases and operates affordable housing for City residents with limited incomes. PHA works in partnership with the City and state governments, as well as private investors. Over 93% of PHA's annual budget is funded directly or indirectly by the U.S. Department of Housing and Urban Development, and most of the balance of PHA's budget is derived from resident rent payments. Neither PHA's funds nor its assets are available to pay City expenses, debts or other obligations, and the City has no power to tax PHA or its property. Neither the City's funds nor its assets are subject to claims for the expenses, debts, or other obligations of PHA.

Rebuilding Community Infrastructure Program (REBUILD)

Rebuild is a new $500 million initiative to revitalize neighborhood parks, recreation centers, playgrounds, and libraries across the City over a seven-year period. This program is intended to catalyze economic development in some of Philadelphia's most impoverished communities and neighborhoods. Rebuild is not only committed to making transformative capital improvements in neighborhood public and shared spaces, but will also strive to build capacity and opportunities for minority and women-owned businesses and job opportunities for local residents.

Key Commercial Districts and Development

Over the last two decades the efforts of Philadelphia's economic development agencies and others have spurred significant economic revitalization throughout the City. In particular, a number of geographic areas have experienced concentrated developments: Philadelphia's Historic District, Avenue of the Arts, North Broad Street, and the Benjamin Franklin Parkway. Many of these developments, such as a significant increase to Philadelphia's hotel room inventory in Center City Philadelphia and expansion of the Pennsylvania Convention Center, are key to the growth of Philadelphia's leisure and hospitality sector. Several key areas within the City have been instrumental in the economic and commercial development of Philadelphia over the past twenty-five years and the population growth since 2000.

Center City

A district that has seen a resurgence over the last two and a half decades, Center City is Philadelphia's central business and office region within the City. Center City is the strongest employment center in the City. In addition, the area contains a sizeable residential population and provides ample access to retail, dining, arts and culture, entertainment, and mass transportation services, to both residents and daily commuters. According to the Center City District, one of the City's business improvement districts, 290,664 riders took public transportation into Center City on the average weekday in 2015. Center City is flanked by neighborhoods that are considered "Greater Center City." Over the last two decades, as there has been an influx of new businesses and residents in these neighborhoods, the boundaries of Greater Center City have moved significantly further North and South, with the Delaware and Schuylkill rivers remaining boundaries on the East and West. 2016 saw a record number of new residential units for a growing downtown population, with 2,506 new units in Greater Center City, a 15.5% increase over the previous high of 2,168. Of these, 73% are rental apartments and 27% were for-sale housing. Six large projects of 100 units or more account for 73% of all new apartments (1,331 units) completed in 2016. Recent and current key developments in Center City listed in Table 13 below total more than $4.1 billion.

Old City

Old City is home to some of the country's oldest historical assets and is considered America's "most historic square mile." Independence National Historical Park is an international destination, attracting 3.6 million visitors annually. Important culturally and economically, Old City is also home to world-class museums, theaters and art galleries. The neighborhood offers excellent hotels, a wide range of dining and nightlife establishments, independent retailers and a diverse mix of technology, media, professional and service organizations. Some 8,000 residents live in historic townhouses, industrial loft apartments and new condominium properties. Old City is located within a Keystone Innovation Zone, meaning that technology, energy and life sciences businesses may be eligible for up to $100,000 in tax credits. Old City District (OCD) is a business improvement district that promotes the area and fosters economic development locally. OCD helps companies find suitable real estate and actively promotes the sector to attract businesses. Over the last few years, technology and creative businesses have established an increasingly important presence in the area.

University City

Located west of Center City, University City is a hub for the health care, life sciences, and higher education sectors and accounted for approximately 11% of the City's employment in 2015. It includes the campuses of the University of Pennsylvania, Drexel University, University of the Sciences, the University of Pennsylvania Health System, the Children's Hospital of Philadelphia and The Wistar Institute, as well as the University City Science Center, a biomedical incubator. University City has experienced significant real estate development, driven mostly through the investment of its universities and research institutional anchors. The University of Pennsylvania built the $88 million Singh Center for Nanotechnology in 2013 and is investing $127 million in a new residence hall called New College House at Hill Field. Drexel University invested nearly $300 million into University City in 2013, and is planning for an additional $3.5 billion over 20 years in the development of Schuylkill Yards in partnership with Brandywine Realty Trust. This project will develop 14 acres of underutilized land near Philadelphia's 30th Street Station into an innovation neighborhood. It will feature a mix of entrepreneurial spaces, educational facilities and research laboratories, corporate offices, residential and retail spaces, hospitality and cultural venues and public open spaces.

The Navy Yard

The Navy Yard is a 1,200 acre mixed-use office, research and industrial park with over 13,000 people working on site across 150 companies. The Navy Yard has diverse tenants such as Philly Shipyard, one of the world's most advanced commercial shipbuilding facilities; the global headquarters for retailer Urban Outfitters, Inc.; a 208,000 square foot, double LEED Platinum corporate office for pharmaceutical company GlaxoSmithKline; and a LEED Silver bakery facility for the Tasty Baking Company. More than 7.5 million square feet of space is currently occupied or in development with significant additional capacity available for office, industrial, retail and residential development.

PIDC and its partners released an updated Navy Yard master plan in 2013, detailing a comprehensive vision for the Navy Yard. The plan calls for a total of over 13.5 million square feet of new construction and historic renovation supporting office, R&D, industrial and residential development, complemented with commercial retail amenities, open spaces and expanded mass transit. At full build, the Navy Yard will support more than 30,000 employees and over $3 billion in private investment. Currently, PIDC is negotiating changes to deed restrictions with the U.S. Navy to allow the construction of housing at Philadelphia's Navy Yard.

The Navy Yard continues to grow, adding over 500 employees and attracting four new companies in 2016, bringing the Navy Yard closer to its strategic targets. Recently completed construction projects include: 4701 League Island Blvd, the third facility on campus for WuXi AppTec, a leading pharmaceutical and biotechnology company; 1200 Intrepid Ave, the new LEED Gold office building designed by world-renowned architecture firm Bjarke Ingels Group; and most recently, in March 2017, UK-based life sciences company, Adaptimmune, opened its U.S. headquarters and Clinical and Manufacturing Operations at the Navy Yard. This was in addition to the City's announcement in September 2015 that Axalta Coating Systems, an advanced coatings manufacturer, is developing a 175,000 square foot Global Innovation Center at the Navy Yard, which is under construction and slated to open in 2018. Since 2000, the Navy Yard has leveraged more than $150 million in publicly funded infrastructure improvements to spur more than $750 million in new private investment.

Waterfront Developments

Taking advantage of the City's geographic assets, the Schuylkill River and the Delaware River, the City is redeveloping its waterfront to accommodate a variety of developments, including mixed-use projects and housing, parks and recreational trails, and hotels. These projects improve quality of life for residents and improve the visitor experience, but also are an impetus for environmental remediation and private development of former industrial property within the City.

Delaware River Waterfront Corporation

The Delaware River has historically been a center of activity, industry, and commerce, bounded at its north and south ends by active port facilities. The City adopted a Master Plan for the central Delaware River in 2011. The Delaware River Waterfront Corporation (the "DRWC"), in partnership with the City, is a nonprofit corporation that works to transform the central Delaware River waterfront into a vibrant destination for recreational, cultural, and commercial activities. Successful park projects include Race Street Pier in 2011, Washington Avenue Green in 2014, and Pier 68 in September 2015. All three parks are adaptive reuse projects built on former pier structures. In April 2014, the DRWC published a feasibility study for redevelopment of Penn's Landing, a major public space along the Delaware River waterfront. The Master Plan calls for a combination of public and private investment for the two million square foot development program. Recently the City announced a $90 million commitment to cap I-95 and build an 11-acre expanse of greenery between Walnut and Chestnut streets, as part of an estimated $225 million project to better connect Center City with the waterfront.

Schuylkill River Development Corporation

Redevelopment along the Schuylkill River is managed by a partnership among the Schuylkill River Development Corporation (the "SRDC"), the Department of Parks & Recreation, and the Department of Commerce. SRDC works with federal, Commonwealth, City and private agencies to coordinate, plan and implement economic, recreational, environmental and cultural improvements, and tourism initiatives on the Schuylkill River.

From 1992 to 2015, $60 million was invested by SRDC, the City, and their partners along the tidal Schuylkill to create 1.8 miles of riverfront trails within 17 acres of premiere park space in the heart of the City, and has added amenities to the Schuylkill River Park such as floating docks, fishing piers, composting toilets, and architectural bridge lighting. SRDC continues to work towards meeting its goal of creating and maintaining 10 miles of trail and 70 acres of green space along the tidal Schuylkill River in Philadelphia. The latest Schuylkill Trail extension running from Locust Street to South Street, called the Boardwalk, opened in October 2014 and plans to extend the trail farther south to Christian Street are in final design stages. In October 2015, Philadelphia was awarded $10.265 million in federal TIGER grants, split among three projects across the City. The City will use $3.265 million of the grant to convert an abandoned swing rail bridge over the Schuylkill River near Grays Ferry into a bridge trail.

Since 2005, Philadelphia has benefitted from more than $1 billion in development along the Schuylkill River, with more planned by private developers, universities, and healthcare institutions.

Penn Park

Although not publicly funded, the University of Pennsylvania's Penn Park is a significant piece of infrastructure that strengthens the connection between University City and Center City, improving the resident and visitor experience. It lies along the west bank of the Schuylkill River, and complements the work of the SRDC.

The University of Pennsylvania opened Penn Park in 2011, increasing the University's green space by 20%. The park includes 24 acres of playing fields, open recreational space and pedestrian walkways located between Walnut and South Streets. Formerly parking lots, the park embraces sustainable features, including underground basins that capture rainwater and mitigate storm water overflow into the Schuylkill River. Forty-five thousand cubic yards of soil, 2,200 pilings and more than 500 trees were installed to create canopied hills and picnic areas.

Sugarhouse Casino

Legislation enacted by the Pennsylvania General Assembly authorized two stand-alone casino licenses for the City. Philadelphia's first casino, SugarHouse, opened in September 2010. SugarHouse Casino sits on the Delaware River waterfront offering an array of slot machines, table games and dining options. In May 2013, SugarHouse received approval from the Pennsylvania Gaming Control Board to expand its operations, including additional parking and a larger gaming floor. The $155 million expansion, completed in 2015, added 500 additional employees to the casino. After a period of significant gains from 2010 through 2012, SugarHouse revenue has leveled off. In fiscal year 2015, the casino's total revenue was $271,201,316, an increase of 0.6% from 2013, and it employed 1,204 people in 2015, up from 1,128 in 2013.

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Table 13
Selected Major Development Investments Recently Completed or Under Construction
(as of March 2017)

Project Name, by Neighborhood	Project Type	Cost in Millions	Est. Completion Date
CENTER CITY		$4,000.00	
1919 Market Street	Mixed Use	148.0	Complete Q2 2016
1116-28 Chestnut	Mixed Use	75.0	Complete Q3 2016
Rodin Square, Whole Foods	Mixed Use	160.0	Complete Q3 2016
1601 Vine Street	Residential	120.0	Complete Q3 2016
Mormon Temple	Religious	70.0	Complete Q4 2016
The Sterling – Redevelopment	Residential	75.0	Complete Q1 2017
East Market (formerly Girard Square)	Mixed Use	250.0	Q2 2017
One Riverside	Residential	90.0	Q3 2017
View 32 - 3201 Race Street	Residential	55.0	Q3 2017
1213 Walnut	Residential	125.0	Q3 2017
Comcast Innovation and Technology Center	Commercial/Hotel	1,200.0	Q4 2017
Park Towne Place – Redevelopment	Residential	200.0	Q1 2018
2400 Market	Mixed Use	230.0	Q1 2018
National Building	Residential	23.0	Q2 2018
W Hotel/Element	Hotel	359.0	Q2 2018
The Hamilton	Residential	130.0	Q3 2018
The Gallery	Commercial	100.0	Q4 2018
1911 Walnut	Mixed Use	300.0	2018
Hanover North Broad	Mixed Use	50.0	2018
SLS Hotel and Residences	Residential and Hotel	240.0	Q1 2019
NAVY YARD		$184.2	
4701 League Island Blvd	Commercial	34.5	Complete Q3 2016
1200 Intrepid	Commercial	47.7	Complete Q3 2016
Adaptimmune	Commercial	23.5	Complete Q1 2017
Axalta R & D Facility	Commercial	67.5	Q4 2017
Pavilion	Commercial	11.0	Q4 2018
OLD CITY		$365.0	
American Revolution Center	Arts & Culture	101.0	Complete Q1 2017
205 Race Street	Residential	65.0	Q2 2017
500 Walnut	Residential	174.0	Q2 2017
218 Arch	Mixed Use	25.0	Q4 2017
OTHER NEIGHBORHOODS		$272.0	
One Water Street	Residential	65.0	Q3 2016
Philadelphia Mills	Commercial	34.0	Q4 2016
Divine Lorraine	Residential	43.0	Q2 2017
Lincoln Square	Mixed Use	130.0	Q1 2018
UNIVERSITY CITY		$2,588.0	
FMC Tower at Cira Centre South	Mixed Use	385.0	Complete Q1 2017
New College House at Hill Field	University Residential	127.0	Complete Q3 2016
The Study at University City	Hotel	50.0	Complete Q3 2016
University of Pennsylvania Pennovation Works	Commercial	26.0	Complete Q4 2016
CHOP Schuylkill Ave Expansion	Health Care	250.0	Q2 2017
4601 Market - Public Safety Services Campus	Public	250.0	Q2 2018
Penn Health Tower	Health Care	1,500.0	Q2 2021
TOTAL		$7,409.2	

Source: Philadelphia Department of Commerce

TOURISM AND HOSPITALITY

Philadelphia has experienced a significant increase in tourism over the last decade, fueled by several high profile, global events that the City hosted, notably the 2015 World Meeting of Families, culminating in a papal visit from Pope Francis, and the Democratic National Convention in 2016. In April 2017, Philadelphia hosted the NFL Draft, which is estimated to have brought approximately 250,000 people to Center City. Both business and convention tourism as well as leisure tourism were at a record high in 2016. In January 2015, the New York Times ranked Philadelphia third on its listing of "52 Best Places to Visit in 2015," the top listing for a location in the United States.

The Philadelphia Convention and Visitors Bureau (PHLCVB) books meetings, conventions and sporting events and supports international marketing of Philadelphia overseas. PHLCVB also books domestic group tours. Tourism Economics, an Oxford Economics Company, reported that international visitors from overseas to Philadelphia in 2015 numbered more than 638,000, spending $595 million generating $982 million in total economic impact to the Philadelphia region. According to the same source, Philadelphia ranks as the 15th most visited city in the U.S. by overseas travelers. Philadelphia's international visitation has seen significant growth over the past decade, a 27% growth in overseas travelers since 2006 (up from 501,000 in 2006).

The PHLCVB has booked 569 meetings, conventions and sporting events for future years. These groups will bring a total of 2.4 million attendees to Philadelphia consuming 3.5 million room nights and generating an estimated $4.8 billion in total economic impact.

Visit Philadelphia markets Philadelphia domestically, as well as in Canada and Mexico, to promote leisure travel. Philadelphia has attracted more overnight leisure travelers than ever before and Center City hotels reached a landmark 1 million leisure room nights in 2016. Further, several big and new-to-the-city brands are preparing to enter the market during the next two years, along with smaller boutique hotels. Leisure hotel room stays have increased 287% since 1997 and in 2016 the estimated economic impact of leisure travel was $107 billion according to the Visit Philly 2016 Annual Report.

Table 14
Greater Philadelphia† Visitation Growth, 1997-2015
(In Millions)

	1997	2015	Net Change	Percent Growth
Total Visitation	26.7	41.1	14.4	54%
Day - Leisure	15.5	21.9	6.4	41%
Overnight - Leisure	7.3	14.3	7.0	96%
Day - Business	2.5	2.7	0.2	8%
Overnight - Business	1.4	2.2	0.8	57%

†Bucks, Chester, Delaware, Montgomery and Philadelphia counties.
Source: Visit Philadelphia, Tourism Economics, Longwoods International.

Philadelphia has seen an influx in new hotel development, with numerous new developments underway or confirmed. Table 15 lists notable hotel developments since 2015, representing over $1 billion in investment. The number of hotel rooms available in the City in 1993 was 5,613, with annual demand of 1,331,684 hotel rooms, representing 65% occupancy. In 2016, the City's hotel room inventory was 16,115 rooms, with occupancy at 76.7%. Several hotel projects are currently under development, which will increase hotel room inventory by more than 1,300 rooms.

In October 2013, City Council approved a tax increment financing assistance package for the development of a 755-room hotel, home to both the W and Element brands, which will serve as an anchor to the Convention Center. Additionally, in February 2014, the City announced plans for the adaptive reuse of the City's former Family Division of the Court of Common Pleas building to become a 199-room luxury hotel, currently projected to be completed in 2019. The 222-room Four Seasons Hotel will reopen in 2017 on the top 12 floors of the Comcast Innovation and Technology Center.

Table 15
Notable Hotel Developments From 2015 And Projected Forward, In Millions
(As of March 2017)

Project Name	**Cost (millions)**
The Logan Hotel (2015)	$28
The Study at University City (2016)	$50
101 N. Broad Street Hotel (expected opening in 2017)	-
Four Seasons Hotel in Comcast Tower (expected opening in 2017)	-
SLS Hotel and Residences	$240
Aloft by Starwood (expected opening in 2017)	
W Hotel/Element Hotel (expected opening in 2018)	$359
Conversion of former Family Court Building (projected opening in 2019)	$85
Total	**$762**

Museum and Cultural Centers

Crucial to tourism is the City's robust arts and culture sector. The Center City District reports that one in three tourists who come to Center City Philadelphia cite museums and cultural events as the primary reason for their visit. In 2016, Lonely Planet named Philadelphia on its top-10 best list of "unexpectedly exciting places to see." In 2015, the top attractions in Philadelphia, including the Independence National Park, the Philadelphia Zoo, and the Philadelphia Museum of Art, had over 14.5 million visitors according to the Philadelphia Business Journal.

Organizations like the Philadelphia Museum of Art, the Kimmel Center, FringeArts, and the more than 400 smaller cultural organizations throughout the City help improve the quality of life for residents and visitors. The Greater Philadelphia Cultural Alliance reported in 2012 that cultural institutions in the PMSA contributed an estimated $1.4 billion in household income in 2011, with $490.3 million in Philadelphia County alone. Part of the wider economic impact generated by this revenue is demonstrated in the over 48,900 creative jobs that the sector supports within Philadelphia.

Avenue of the Arts (South Broad Street) Investments

The Avenue of the Arts is located along a mile-long section of South Broad Street between City Hall and Washington Avenue, in the heart of Philadelphia's Center City. Reinventing South Broad Street as the Avenue of the Arts, a world class cultural destination, has been a civic goal in Philadelphia for more than two decades. Cultural institutions, the William Penn Foundation, local property owners and civic leaders advanced the idea of a performing arts district on South Broad Street anchored by the Academy of Music and modeled after successful performing arts districts around the country. The Avenue of the Arts became a key element of the City's strategy to strengthen Center City as the region's premier cultural destination and an important element in the City's bid to expand its convention and tourism industries.

The Benjamin Franklin Parkway

Complementing the Avenue of the Arts theater district developments, the Benjamin Franklin Parkway is considered the spine of Philadelphia's museum district. Designed by French architect Jacques Gréber, to emulate the Champs Elysées of Paris, the Parkway opened in 1929. It runs from the area of City Hall to the Philadelphia Museum of Art and is a central public space and tourist attraction. Key Parkway features include Love Park – which is undergoing major renovations estimated to be completed in 2017, the Philadelphia Museum of Art, the Rodin Museum, the Franklin Institute, The Barnes Foundation, the Free Library of Philadelphia, the Academy of Natural Sciences, the Swann Memorial Fountain, Sister Cities Park, Cathedral Basilica of Saints Peter and Paul on Logan Square, and numerous pieces of public art.

Opened in May 2012, The Barnes Foundation is a welcome addition to the City's impressive roster of arts facilities, and has had a significant impact on the City's leisure and hospitality industry. In October 2015, the Barnes welcomed its one millionth visitor since opening on the Parkway. With membership over 85,000, it is ranked among the top institutions of its kind in the country.

Historic District

Key to the City's leisure and hospitality growth is the maintenance and investment in the City's extraordinary historic assets. As the birthplace of the country, Philadelphia remains a major tourist destination year-round, particularly the City's Historic District, which includes such national treasures as the Liberty Bell, Independence Hall, Carpenters' Hall, Betsy Ross' house and Elfreth's Alley, the nation's oldest residential street. The City continues to invest in the maintenance and expansion of the Historic District's tourist experience. Since 2001, $613 million of improvements have been made in Philadelphia's historic district, with an additional $120 million either under construction or planned over the next three years. Coupled with proposed developments, public and private, this district is expected to remain competitive in the national and international tourism markets for years to come.

North Broad Street and the Philadelphia Convention Center

In 1993, with support from the Commonwealth, the Pennsylvania Convention Center was completed, providing a total of 624,000 square feet of saleable space across its four exhibit halls, ballroom and banquet spaces. In 2011, a $786 million expansion, across 20 acres of central Philadelphia real estate, increased the facility to 2.3 million square feet. It is the largest single public works project in Pennsylvania history. In January 2014, SMG began managing and operating the Convention Center, instituting a number of measures intended to reduce and control show costs and improve customer service. In May 2014, SMG implemented new work rules through a customer service agreement signed by the Convention Center and four of six unions. The Convention Center continues to operate with no plans to replace the two unions that did not sign the agreement. In February 2016, the Convention Center announced that 2015 was its highest booking year ever with 856,663 bookings, a 1.2% increase from 2014, representing an estimated $1.1 billion in future economic impact. The 2011 expansion of the Pennsylvania Convention Center reignited development efforts along this key corridor of North Broad Street. Improvements include Lenfest Plaza, which is adjacent to the Pennsylvania Academy of Fine Arts and across from the Pennsylvania Convention Center expansion entrance. Adjacent to the Convention Center, a 178-room Aloft Hotel by Starwood is under construction and expected to open in 2017.

South Philadelphia Sports Complex

Another key element of Philadelphia's hospitality industry is professional sports. Philadelphia is the only city to have a professional hockey, basketball, baseball, and football team playing in a single district within the City, the Sports Complex Special Services District, created by the City in 2000.

The South Philadelphia Sports Complex houses three professional sports facilities: The Wells Fargo Center opened in 1996 and is home to the Philadelphia Flyers (National Hockey League) and Philadelphia 76ers (National Basketball Association); Lincoln Financial Field opened in 2003 and is home to the Philadelphia Eagles (National Football League); and Citizens Bank Park opened in 2004 and is home to the Philadelphia Phillies (Major League Baseball). The Phillies and the Eagles are contractually obligated to play in Philadelphia until 2033 and 2034, respectively.

Average paid home season attendance for the Eagles in Lincoln Financial Field has exceeded 100% of actual seating, since its opening in 2003. In the 2009 through 2012 seasons, the Phillies had a paid home season attendance in excess of 100% of actual seating at Citizen's Bank Park. In 2010, the Phillies had the second highest attendance of any team in Major League Baseball and in both 2011 and 2012 the Phillies registered the highest home attendance of any team in Major League Baseball. The Phillies attendance rate declined in 2013, but remained in the top ten of Major League Baseball teams. However, team performance has contributed to a significant decline in overall attendance, dropping the Phillies attendance ranking to 16 out of 30 teams in 2014, 25 out of 30 in 2015, and 24 out of 30 in 2016.

In 2012, Xfinity Live! Philadelphia, a 50,000 square foot sports entertainment and dining complex, opened within the sports complex. The privately funded, $60 million venue includes a miniature sports field hosting free concerts and other activities, an outdoor theater accommodating sports games and family films, and a dozen dining and bar establishments. The complex, a Comcast-Spectacor and Cordish-owned company, also hosts the first ever NBC Sports Arena, featuring a 32-foot LED HD television, displaying the NBC Sports Ticker and in-game promotions. Cordish is currently in early conceptual planning stages of a phased expansion of the complex that could include retail, hotel and theater space. The entire complex is open year-round and sustains 276 full-time equivalent jobs.

In November 2014, the Pennsylvania Gaming Control Board awarded the City's remaining casino license to Live! Hotel & Casino, a joint venture between Cordish Cos. and Greenwood Gaming and Entertainment Inc. The $425 million, 200,000-square-foot casino will include a 240-room hotel, 2,000 slots and 125 table games. It will also have a spa and conference center built in and around an existing Holiday Inn at the South Philadelphia Sports Complex. The license award has been challenged by several court appeals; in March 2016, the Pennsylvania Supreme Court ruled that the Pennsylvania Gaming Control Board must take a closer look at the company's ownership structure. Cordish was granted zoning approval in December 2015 and plans to complete the project in 2018, pending further approvals.

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TRANSPORTATION

The residents of the City and surrounding counties are served by a commuter transportation system operated by SEPTA. This system includes two subway lines, a network of buses and trolleys, and a commuter rail network joining Center City and other areas of the City to PHL and to the surrounding counties. For more information on SEPTA, see "ECONOMIC BASE AND EMPLOYMENT – Southeastern Pennsylvania Transportation Authority (SEPTA)" and APPENDIX IV – "EXPENDITURES OF THE CITY – City Payments to SEPTA."

A high-speed train line runs from southern New Jersey to Center City and is operated by the Port Authority Transit Corporation ("PATCO"), a subsidiary of the Delaware River Port Authority. On the average weekday, PATCO brings approximately 15,000 individuals to Philadelphia.

New Jersey Transit operates 19 different bus routes and the Atlantic City Train Line, all of which serve to connect Philadelphia and New Jersey. On the average weekday, the New Jersey Transit bus routes bring approximately 2,000 individuals to Philadelphia and the Atlantic City Line brings approximately 700 individuals to Philadelphia.

Amtrak, SEPTA, Norfolk Southern, CSX Transportation, Conrail and the Canadian Pacific provide inter-city commuter and freight rail services connecting the City to other major cities and markets in the United States. According to Amtrak, Philadelphia's 30th Street Station is the third busiest station in the United States. Structural improvements of $30 million were recently completed to the station, and an additional $60 million restoration project is awaiting federal approval.

The City now has one of the most accessible downtown areas in the nation with respect to highway transportation by virtue of Interstate 95 ("I-95"); Interstate 676 (the "Vine Street Expressway"), running east-to-west through the Central Business District between Interstate 76 (the "Schuylkill Expressway") and I-95; and Interstate 476 (the "Blue Route") in suburban Delaware and Montgomery Counties, which connects the Pennsylvania Turnpike and I-95 and connects to the Schuylkill Expressway, which runs to Center City Philadelphia. In addition, more than 100 truck lines serve the Philadelphia area.

The City is served within city limits by numerous private buses and shuttles. These buses and shuttles are operated by apartment complexes, universities, and private companies. These buses and shuttles connect Philadelphians to transit hubs, employment, and residences. A rail line reaches PHL in less than 20 minutes from the City's central business district and connects directly with the commuter rail network and the Pennsylvania Convention Center.

Philadelphia launched the Indego bike share program, sponsored by Independence Blue Cross, in April 2015. The system launched with 600 bicycles and 70 stations throughout the City from Temple University in North Philadelphia to Tasker Street in South Philadelphia and from the Delaware River to 44th Street in west Philadelphia. Indego is the first bike share system in the United States to launch with a cash payment option for members. In 2016, the City expanded Indego to 1,000 bicycles and 103 bike share stations.

Southeastern Pennsylvania Transportation Authority (SEPTA)

SEPTA operates facilities across the five-county Greater Philadelphia area encompassing approximately 2,200 square miles and serving approximately 4.0 million inhabitants. SEPTA operates service 24 hours a day, seven days a week, 365 days a year. SEPTA's Fiscal Year 2016 operating budget totals $1.365 billion. This is supported by $829 million in federal, state, and local subsidies, as well as

$535 million of operating revenue. A significant segment of the region relies on SEPTA for public transportation and annual SEPTA ridership totaled more than 326.1 million in Fiscal year 2016.

SEPTA's operations are accounted for in three separate divisions, the percentages following each division representing its approximate share of SEPTA's expense budget: City Transit (67%); Regional Rail Division (23%); and Suburban (10%). The City Transit Division serves the City with a network of 84 subway-elevated, light rail, trackless trolley and bus routes, providing approximately 902,000 unlinked passengers trips per weekday. The Regional Rail Division serves the City and the local counties with a network of 13 commuter rail lines providing approximately 123,000 passenger trips per weekday.

Beginning in Fiscal Year 2015, SEPTA's annual capital budget and 12-year capital program have increased significantly. The Fiscal Year 2016 capital budget is $534.5 million, representing a 74% increase over the Fiscal Year 2014 budget of $308 million. The Fiscal Year 2016-2027 capital program also increased significantly to $6.8 billion from $3.7 billion in the Fiscal Year 2014-2025 capital program. These increases are largely the result of the passage of Pennsylvania Act 89 in 2013 ("Act 89"), a state transportation funding bill.

SEPTA's increased capital budget will enable it to address a variety of needs. First, SEPTA will address its State of Good Repair ("SGR") backlog, which has grown as a result of funding shortfalls in previous years. In addition to renovating and upgrading substations, bridges, stations, and aging rail vehicles, SEPTA will also focus on expanding its capacity to serve a growing ridership and enhance accessibility to public transportation. Other projects and expenses supported by the capital program include the New Payment Technology project, expansion of the fleet of hybrid busses, installation of federally-mandated Positive Train Control signal technology, vehicle overhauls, capital leases, and debt service.

Recent Ridership Trends

Demand for public transportation has steadily increased over the past decade in the City, and in Fiscal Year 2012, SEPTA experienced its highest ridership in 25 years and in Fiscal Year 2015, SEPTA experienced its highest ridership ever for regional rail. For the first quarter of Fiscal Year 2017, SEPTA has reported an overall ridership increase of 4.5%, when compared to the same period for Fiscal Year 2016. However, SEPTA Regional Rail has been impacted by a rail car shortage, resulting from a defect discovered on new rail cars causing 120 cars to be pulled from service. Such shortage has resulted in an approximately 9.1% decline in Regional Rail trips and an overall passenger revenue decrease of 2.3% when compared to the same period for Fiscal Year 2016.

Airport System

The Airport System serves residents and visitors from a broad geographic area that includes eleven counties within four states: Pennsylvania, New Jersey, Delaware and Maryland. The Airport System consists of the following:

Philadelphia International Airport (PHL)

PHL is classified by the Federal Aviation Administration as a large air traffic hub (enplaning 1.0% or more of the total passengers enplaned in the U.S.). According to data reported by Airports Council International – North America, PHL was ranked the nineteenth busiest airport in the United States, serving 30.7 million passengers in calendar year 2014 (i.e. total passengers enplaned and deplaned), and was ranked the twelfth busiest in the nation based on aircraft operations. PHL consists of approximately 2,426 acres located partly in the southwestern section of the City and partly in the northeastern section of Delaware County, about 7.2 miles from Center City Philadelphia. PHL's runway system consists of parallel Runways 9L-27R and 9R-27L, crosswind Runway 17-35, commuter Runway 8-26, and interconnecting taxiways.

PHL terminal facilities include approximately 3.3 million square feet, consisting of seven terminal units (A-West, A-East, B, C, D, E and F). The terminal facilities principally include ticketing areas, passenger hold rooms, baggage claim areas and approximately 180 food, retail and service establishments. There are certain other buildings and areas located at PHL, consisting of six active cargo facilities, two American Airlines aircraft maintenance hangars, and a former United States Postal Service building located at the western end of PHL. On July 2, 2015, PHL purchased an adjacent property to PHL known as International Plaza, which has two fully leased buildings with approximately 500,000 square feet of rentable space on a 27-acre tract of land. More recently PHL acquired four additional parcels for future PHL expansion. These include A: 2-acre parcel (8436 Enterprise Ave.), which consists of a one story office and warehouse building, totaling 30,078 square feet, as well as an exterior yard and surface parking lots; B: two segments of a public roadway adjacent to the Airport (Hog Island Road) totaling approximately 8.5 acres and a leasing of three segments totaling approximately 21 acres for 50 years, with an option to purchase after 20 years; C: a 3.4-acre parcel (4848 Island Avenue) adjacent to the Airport consisting of a one story office and warehouse building, totaling nearly 40,750 square feet, as well as a surface parking lot; and D: a vacant lot of 1.1 acres in Tinicum Township (Parcel 8A) at Tinicum Island Road (rear) and bounded by Philadelphia International Airport to the south, east and west sides. These properties were acquired for future PHL expansion.

The outside terminal area consists of a 15-story, 419-room hotel (414 rooms and 5 suites), seven rental car facilities, a 150-vehicle cell-phone lot and two employee parking lots with a total of 4,200 spaces. This area also includes five parking garages and surface lots consisting of a total of 18,940 vehicle spaces, operated by the Philadelphia Parking Authority.

Northeast Philadelphia Airport (PNE)

PNE is located on approximately 1,126 acres situated within the City limits, ten miles northeast of Center City Philadelphia. PNE serves as a reliever airport for PHL and provides for general aviation, air taxi, corporate, and occasional military use. PNE currently has no scheduled commercial service. There are presently 85 T-hangars, nine corporate hangars, and six open hangars for general aviation activities. There are approximately 175 general aviation aircraft based at PNE.

Capital Development

In the last ten years, the Airport has constructed more than $1.3 billion of capital improvements, including expansion and renovation of existing terminals, and airfield improvement projects, including a runway extension. The Airport's capital projects are included in the long-range Capacity Enhancement Program (CEP) and a near-term, on-going Capital Improvement Program (CIP). The CEP is a set of projects being pursued to improve efficiency, modernize airport facilities and provide additional capacity for future growth. It is a multi-year endeavor with multiple phases, and the timing for each development will be closely coordinated with the airlines and other stakeholders in order to maintain operational efficiency during construction. Approved CEP projects include a runway extension, taxiway improvements and the consolidated rental car facility. The Airport is working with its airline partners to review the sequencing and prioritization of the remaining elements within the CEP, which include expanding and reconfiguring the existing terminal complex; a new runway; an additional runway extension; further taxiway improvements; relocating several on and off-airport facilities to facilitate airfield improvements; cargo facility development; and parking and roadway improvements.

The CIP focuses on the near-term capital facility needs. CIP projects are developed to complement the framework of the CEP and the Airport's ultimate development. Major CIP projects include completion of Terminals D/E checked baggage inspection system; a new deicing facility; and on-going rehabilitation and replacement projects.

Use and Lease Agreement

In June 2015, the City Council of Philadelphia approved a five-year Airport-Airline Use and Lease Agreement (Airline Agreement) between PHL and the airlines. The Airline Agreement began July 1, 2015, and includes options for two one-year extensions.

PHL will continue to study, plan, and modularly execute the mission to ensure its full potential benefit to PHL and its stakeholders. Table 16 provides the total project amounts approved since 2007.

Table 16
Ongoing Capital Projects Approved Since 2007

Capital Projects	**Current Project Amount (millions $)**
Capacity Enhancement Program (CEP)(1)	$1,125.90
2007-2015 Capital Improvement Program (CIP)(2)	$309.92
2016 Capital Improvement Program (CIP)(3)	$173.25
2016 Majority in Interest (MII) approved Projects(4)	$289.24

Source: City of Philadelphia, Division of Aviation

(1) Includes redevelopment of existing terminals; relocations of on-airport and off-airport facilities; environmental commitment start-up; Runway 9R-27L (future 9C-27C) extension and associated eastside taxiway work; stage 1 airfield site work and fuel line work; automated people mover (design); and ground transportation center.

(2) Includes repair, rehabilitation and upgrade programs for roofs, restrooms, windows, passenger loading bridges, mechanical and electrical systems, and security and access control systems; airfield civil improvements; and landside infrastructure improvements.

(3) Includes airfield re-pavement, emergency operations center, repair & rehabilitation and upgrade programs for curb doors, roofs, loading bridges, air handling units, HVAC and fire protection systems; emergency operations center; and LED conversion program.

(4) Includes land acquisitions, airfield taxiway reconstruction, purchases of Aircraft Rescue and Fire Fighting (ARFF) Vehicle and central deicing facility reconstruction, Arrivals road security bollards, Air Traffic Control Tower.

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PHL Passenger and Other Traffic Activity

In FY 2016, domestic enplaned passenger traffic grew as PHL's low-cost carriers, specifically Frontier Airlines and Spirit Airlines, began serving several new destination cities. JetBlue Airways also added twice daily service to Fort Lauderdale, FL during the course of FY 2016. This growth was offset by slight reductions in outbound international traffic, which was mainly attributable to American Airlines discontinuing year-round service to Tel Aviv, Israel in early January 2016 and seasonal service to Edinburgh, Scotland, which did not return in May 2015. Additionally, American temporarily suspended service to Brussels, Belgium in March 2016 after a series of coordinated bombings in that city, two of which occurred at Brussels Airport. American later discontinued the Brussels service across their entire network.

PHL experienced a decline in aircraft operations while also experiencing a slight increase in landed weight in FY 2016 due mainly to changes in aircraft fleet mix instituted by PHL's mainline carriers as they move to eliminate many of the regional aircraft from their respective route networks.

Enplanements and Operations Activity at PHL

	Fiscal Year 2016	Fiscal Year 2015	Percentage Increase (Decrease)
Domestic Enplanements (Outbound passengers):	13,484,253	13,072,574	3.1%
International Enplanements (Outbound passengers):	2,199,305	2,240,164	(1.8)%
Total Enplanements (Outbound passengers):	15,683,558	15,312,738	2.4%
Operations (Takeoffs & landings):	407,968	414,121	(1.5)%
Landed Weight (1,000-pound units):	20,821,203	20,772,632	0.2%

Port of Philadelphia

The Port of Philadelphia (the "Port") is located on the Delaware River within the City limits. Philadelphia's Port facilities are serviced by two Class I railroads (CSX and Norfolk Southern) and provide service to major eastern Canadian points, as well as Midwestern, southern and southeastern U.S. destinations. Terminal facilities, encompassing four million square feet of warehousing, are located in close proximity to Interstate 95 and Interstate 76. Over 1,600 local general freight trucking companies operate in the MSA, according to Hoover's Inc.

The Philadelphia Regional Port Authority (the "PRPA") reported approximately 6,262,648 metric tons of cargo moved through the Port in 2016, the second year of more than 6 million tons of cargo in a single calendar year, representing a 2.7% increase over 2015. The Port is the top-ranked port for meat importing in the United States, and is among the nation's leaders for fruit, cocoa, forest products and steel imports. In December 2015, the PRPA secured a new shipping service that will link directly with burgeoning port operations on the Gulf of Mexico at Veracruz and Altamira. This service will target commodities including goods such as avocados, lemons, tomatoes and commercial cargo.

The PRPA is working to increase the Port's competitiveness by increasing capacity by deepening the main channel of the Delaware River from 40 to 45 feet which scheduled to be completed in late 2017/early 2018. Most recently in November, the Governor announced $300 million in Commonwealth funding to significantly expand the Port's facilities and double its capacity by 2020. Improvements will double container and auto capacity at the Port and increase the Port's ability to handle wood pulp, a food grade commodity.

KEY CITY-RELATED SERVICES AND BUSINESSES

Water and Wastewater

The water and wastewater systems of the City are owned by the City and operated by the City's Water Department (the "Water Department"). The water and wastewater systems are referred to herein individually as the "Water System" and "Wastewater System," respectively.

The Water System's service area includes the City of Philadelphia and has one wholesale water contract. Based on the 2015 U.S. Census Bureau estimate, the Water System served approximately 1,567,442 individuals.

As of June 30, 2016, the Water System served approximately 480,000 active retail customer accounts using approximately 3,100 miles of mains and approximately 25,000 fire hydrants. The City obtains approximately 59% of its water from the Delaware River and the balance from the Schuylkill River. The City is authorized by the Pennsylvania Department of Environmental Protection (the "PaDEP") to withdraw up to 423 million gallons per day ("MGD") from the Delaware River and up to 258 MGD from the Schuylkill River. On September 27, 2016, the PaDEP issued the Water Department a new water allocation permit, which expires on September 27, 2041. Under the new permit, the amount the City is authorized to withdraw from each river has not changed. The Water Department will begin discussions with the Delaware River Basin Commission to ratify the new permit.

Water treatment is provided by the Samuel S. Baxter Water Treatment Plant on the Delaware River and by the Belmont and Queen Lane Water Treatment Plants on the Schuylkill River. The combined rated treatment capacity of these plants is 546 MGD. The combined maximum source water withdraw capacity from the two rivers that supply these plants is 680 MGD. The excess source water capacity enables higher than normal withdrawal on either river should conditions limit the withdrawal from one river. The storage capacity for treated and untreated water in the combined plant and distribution system totals 1,065.5 million gallons ("MG"). In Fiscal Year 2016, the Water System distributed 81,687 MG of water at an average daily rate of 223.8 MGD. In Fiscal Year 2016, the maximum water production experienced by the Water System in one day was 258.2 MG.

The Wastewater System's service area is the City of Philadelphia and ten wholesale contracts with municipalities in the Philadelphia metropolitan area. Based on the 2015 U.S. Census Bureau estimate, the Wastewater System serves approximately 1,567,442 individuals that live in the City, in addition to those living in areas served by the wholesale contracts.

As of June 30, 2016, the Wastewater System served approximately 545,000 accounts, including approximately 50,000 stormwater-only accounts, and ten wholesale contracts with neighboring municipalities and authorities.

The Wastewater System consists of three water pollution control plants ("WPCPs"), 19 pumping stations, approximately 3,700 miles of sewers, and a privately managed centralized biosolids handling facility. It includes 1,850 miles of combined sewers, 760 miles of sanitary sewers, 740 miles of stormwater sewers, 13 miles of force mains (sanitary and storm) and 349 miles of appurtenant piping. The three WPCPs processed a combined average of 379 MGD of wastewater in Fiscal Year 2016, have a 522 MGD combined average daily design capacity and a peak capacity of 1,059 MGD.

Solid Waste Disposal

The City is responsible for collecting solid waste, including recycling, from residential households and some commercial establishments. On average, approximately 2,300 tons of solid waste per day are collected by the City. Municipal solid waste is disposed of through a combination of recycling processing facilities, private and City transfer stations within the City limits, and at various landfills operated outside the City limits.

Parks

The City was originally designed by William Penn and Thomas Holme around five urban parks, each of which remains in Center City to this day. The City's parklands total over 10,300 acres, and include Fairmount Park, the world's largest landscaped urban park at 9,200 acres, Pennypack Park, and the Philadelphia Zoo, the country's first zoo. The City also offers its residents and visitors America's most historic square mile, which includes Independence Hall and the Liberty Bell.

Libraries

The Free Library of Philadelphia, the City's public library system, comprises 54 branches and an extensive online resource system.

Streets and Sanitation

The Philadelphia Streets Department (the "Streets Department") and the divisions within it are responsible for the City's large network of streets and roadways. The City's pavement condition is considered to be a "Fair" pavement condition. In order for the City to maintain its pavement in a state of good repair, local streets should be repaved once every 20 years and arterials should be repaved once every 10 years. This requires approximately 131 miles of paving every year. The pavement program has accumulated a backlog of approximately 1,100 miles since 1996. As a result of the new funding under Act 89, the Streets Department has funds to address long standing state of good repair needs without an additional allocation from the General Fund. During Fiscal Years 2014-2017, the Streets Department will invest in critical equipment replacements and begin to implement a strategy to address recurring state of good repair needs. This includes critical equipment replacement, street paving and pothole repair, and replacement of traffic control equipment.

The Streets Department is also responsible for the ongoing collection and disposal of residential trash and recyclables, as well as the construction, cleanliness and maintenance of the street system. The streets system in Philadelphia totals 2,575 miles - 2,180 miles of City streets, 35 miles of Fairmount Park roads and 360 miles of state highways. The Highway Unit and Sanitation Division annually collects and disposes of approximately 600,000 tons of rubbish and 125,000 tons of recycling, completes over 48,000 miles of mechanical street cleaning, clears 1,800 major illegal dump sites, and removes over 155,000 abandoned tires.

Sustainability and Green Initiatives

Mayor Kenney continues the City's commitment to make Philadelphia the greenest and most sustainable city in America. To aid in achieving this goal, the Philadelphia Energy Authority has been tasked with improving energy sustainability and affordability in the City and with educating consumers on their energy choices. The City is investing in and evaluating additional options and investing in green infrastructure to better manage storm water reclamation and reduce pollution of the City's public waters. There has been extensive investment in creating more and better public green spaces, such as Love Park in Center City, as well as green spaces along both the Delaware and Schuylkill Rivers. Finally, the City has been taking steps to further reduce automobile traffic, congestion and pollution by making Philadelphia's streets increasingly friendly to bicyclists. The City introduced its new bicycle sharing system, Indego, in 2015, as further described in "TRANSPORTATION." Bicycle share programs have been successfully implemented in other cities worldwide.

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APPENDIX VI

FORM OF APPROVING OPINION OF CO-BOND COUNSEL

FORM OF OPINION OF CO-BOND COUNSEL

Re: $174,110,000 City of Philadelphia, Pennsylvania
Water and Wastewater Revenue Refunding Bonds, Series 2017B

Ladies and Gentlemen:

We have acted as Co-Bond Counsel to the City of Philadelphia (the "City") in connection with the issuance by the City of $174,110,000 aggregate principal amount of its Water and Wastewater Revenue Refunding Bonds, Series 2017B (the "Bonds"). The Bonds are issued under and pursuant to (a) The First Class City Revenue Bond Act, P.L. 955, Act No. 234 of the General Assembly of the Commonwealth of Pennsylvania, approved October 18, 1972 (the "Act"); (b) the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989 approved June 24, 1993, as amended by an Ordinance approved on January 23, 2007 (as so amended, the "General Ordinance"), and as supplemented, including by the Sixteenth Supplemental Ordinance approved by the Mayor on April 24, 2013 (the "Sixteenth Supplemental Ordinance") and the Nineteenth Supplemental Ordinance approved by the Mayor on December 8, 2015 (the "Nineteenth Supplemental Ordinance") authorizing the issuance of the Bonds; and (c) the Bond Committee Determination dated July 26, 2017 (the "Bond Committee Determination"). Capitalized terms used but not defined herein have the meanings assigned to such terms in the General Ordinance.

The Bonds are being issued for the purpose of providing funds which, together with other available funds of the Water Department, will be used to finance (i) the current refunding of all or a portion of the City's outstanding Water and Wastewater Revenue Refunding Bonds, Series 2007B, (ii) the advance refunding of a portion of the City's outstanding Water and Wastewater Revenue Bonds, Series 2010C, and a portion of its Water and Wastewater Revenue Refunding Bonds, Series 2012, and (iii) the costs of issuance relating to the Bonds.

The City previously has issued, pursuant to the General Ordinance, and there are outstanding Water and Wastewater Revenue Bonds, consisting of the Variable Rate Series 1997B, the Series 1999 (Pennvest), the Variable Rate Series 2005B, the Series 2007A, the Series 2007B, the Series 2009A, the Series 2009B (Pennvest), the Series 2009C (Pennvest), the Series 2009D (Pennvest), the Series 2010A, the Series 2010B (Pennvest), the Series 2010C, the Series 2011A, the Series 2011B, the Series 2012, the Series 2013A, the Series 2014A, the Series 2015A, the Series 2015B, the Series 2016, and the Series 2017A (collectively, the "Outstanding Bonds"). The Outstanding Bonds, the Bonds and all other Water and Wastewater Revenue Bonds hereafter issued by the City under the General Ordinance are and will be equally and ratably secured to the extent provided in the General Ordinance and the Act by the pledge of, and the security interest created in, all Project Revenues derived from the System and all amounts on deposit in or standing to the credit of the funds and accounts (other than the Rebate Fund) established pursuant to the General Ordinance.

The City has covenanted in the Sixteenth Supplemental Ordinance, the Nineteenth Supplemental Ordinance and the Bond Committee Determination that it will make or permit no investment or other use of the proceeds of the Bonds that would cause the Bonds to be "arbitrage bonds" under Section 148 of the Internal Revenue Code of 1986, as amended (the "Code"), and the rules promulgated thereunder, and that it will comply with the requirements of said Section throughout the term of the Bonds. The City has further covenanted that it will comply with the requirements of the Code that must be met after the issuance of the Bonds in order that interest on the Bonds will be excluded from gross income for federal income tax purposes. An officer of the City has executed a certificate stating the reasonable expectations of the City on the date of issue of the Bonds as to future events that are material for purposes of Section 148 of the Code pertaining to arbitrage bonds. We have reviewed this certificate, and in our opinion the Bonds are not arbitrage bonds. The City is filing with the Internal Revenue Service a report of the issuance of the Bonds as required by Section 149(e) of the Code as a condition of the exclusion from gross income of the interest on the Bonds for federal income tax purposes. We have not undertaken to monitor compliance with respect to the aforesaid covenants or to advise any party as to changes in the law that may affect the exclusion of interest on the Bonds from gross income for federal income tax purposes.

We have examined such proceedings, documents, statutes and decisions, as we consider necessary as the basis for this opinion, including, *inter alia*, the Act, the General Ordinance, the Sixteenth Supplemental Ordinance, the Nineteenth Supplemental Ordinance, the Bond Committee Determination, and the executed and authenticated Bonds. We assume that all other Bonds have been similarly executed and authenticated. We also assume that all documents, records, certifications and other instruments examined by us are genuine (including the signatures thereon), accurate and complete and we have not undertaken, by independent investigation, to verify the factual matters set forth in any such documents, records, certifications or other instruments.

Based on the foregoing, it is our opinion that:

1. The City has the power under the Constitution and the laws of the Commonwealth of Pennsylvania (the “Commonwealth”) to perform its obligations under the General Ordinance, the Sixteenth Supplemental Ordinance, the Nineteenth Supplemental Ordinance, the Bond Committee Determination and the Bonds.

2. Under the Constitution and the laws of the Commonwealth, including the Act, the City is authorized to issue the Bonds, and the terms of the Bonds comply with the requirements of the Act, the General Ordinance, the Sixteenth Supplemental Ordinance, the Nineteenth Supplemental Ordinance and the Bond Committee Determination.

3. The purposes for which the Bonds have been issued are lawful purposes under the Act and the General Ordinance.

4. The General Ordinance, the Sixteenth Supplemental Ordinance, and the Nineteenth Supplemental Ordinance have been duly enacted, and the Bond Committee Determination has been duly authorized, executed and delivered by the City; and each is a legal, valid and binding obligation of the City enforceable in accordance with its terms, except as the rights created thereunder and the enforcement thereof may be limited by bankruptcy, insolvency, moratorium or other laws or legal or equitable principles affecting the enforcement of creditors’ rights.

5. The Bonds have been duly authorized, executed, authenticated, issued and delivered and are legal, valid and binding obligations of the City, enforceable in accordance with their terms, except as enforcement may be limited as described in paragraph 4 above.

6. Under the Act and the General Ordinance, the Bonds constitute special obligations of the City payable solely from Project Revenues and all amounts on deposit in or standing to the credit of the funds and accounts (other than the Rebate Fund) established pursuant to the General Ordinance, together with interest earnings, if any, on amounts in such funds and accounts (other than the Rebate Fund). The Bonds do not pledge the credit or taxing power or create any debt or charge against the tax or general revenues of the City or create any lien against property of the City other than all amounts on deposit in or standing to the credit of the funds and accounts (other than the Rebate Fund)

established pursuant to the General Ordinance, together with interest earnings on amounts in such funds and accounts (other than the Rebate Fund).

7. Interest on the Bonds is excludable from gross income for purposes of federal income tax under existing laws as enacted and construed on the date of the initial delivery of the Bonds, assuming the accuracy of the certifications of the City and continuing compliance by the City with the requirements of the Code. Interest on the Bonds is not an item of tax preference for purposes of either individual or corporate federal alternative minimum tax; however, interest on Bonds held by a corporation (other than an S corporation, regulated investment company, or real estate investment trust) may be indirectly subject to federal alternative minimum tax because of its inclusion in the adjusted current earnings of a corporate holder. We express no opinion regarding other federal tax consequences relating to ownership or disposition of, or the accrual or receipt of interest on, the Bonds.

Original issue premium on a Bond issued at an issue price that exceeds its principal amount is amortizable periodically over the term of a Bond through reductions in the holder's tax basis for the Bond for determining taxable gain or loss from sale or from redemption prior to maturity. Amortization of premium does not create a deductible expense or loss.

In rendering this opinion, we have assumed compliance by the City with the covenants contained in the General Ordinance, the Sixteenth Supplemental Ordinance, the Nineteenth Supplemental Ordinance, and the Bond Committee Determination that are intended to comply with the requirements in the Code relating to actions to be taken by the City in respect of the Bonds after the issuance thereof to the extent necessary to effect or maintain the federal exclusion from gross income of the interest on the Bonds. Failure to comply with such covenants could cause the interest on the Bonds to be includable in gross income retroactively to the date of issuance of the Bonds.

8. Under the laws of the Commonwealth, as enacted and construed on the date of the issuance of the Bonds, the Bonds are exempt from personal property taxes in Pennsylvania and interest on the Bonds is exempt from Pennsylvania personal income tax and Pennsylvania corporate net income tax.

We render this opinion as of the date hereof on the basis of federal law and the laws of the Commonwealth as enacted and construed on the date hereof. We express no opinion as to any matter not set forth in the numbered paragraphs herein, including, without limitation, the accuracy or completeness of the preliminary or final official statement or other documents prepared or statements made in connection with the offering and sale of the Bonds, and make no representation that we have independently verified the contents thereof.

Very truly yours,

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APPENDIX VII

FORM OF CONTINUING DISCLOSURE AGREEMENT

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CONTINUING DISCLOSURE AGREEMENT

This Continuing Disclosure Agreement (the "Agreement") dated August 10, 2017, by and between The City of Philadelphia, Pennsylvania ("City") and Digital Assurance Certification, L.L.C., as dissemination agent ("Dissemination Agent") in connection with the issuance and sale by the City of Philadelphia, Pennsylvania (the "City") of $174,110,000 aggregate principal amount of its Water and Wastewater Revenue Refunding Bonds, Series 2017B (the "Bonds"). The Bonds are being issued pursuant to the Act and the General Ordinance. Capitalized terms used in this Agreement but not defined herein shall have the meanings ascribed to such terms in the Official Statement, including Appendix III thereto.

In consideration of the mutual covenants, promises and agreements contained herein and intending to be legally bound hereby, the parties hereto agree as follows:

ARTICLE I

The Undertaking

Section 1.1. Purpose. This Agreement is authorized to be executed and delivered by the City pursuant to the General Ordinance and Section 7 of the Bond Committee Determination in order to assist the Underwriters in complying with subsection (b)(5) of the Rule.

Section 1.2. Annual Financial Information. (a) Commencing with the fiscal year ending June 30, 2017, the Disclosure Representative shall deliver to the Dissemination Agent no later than February 28, 2018, and no later than each succeeding February 28 thereafter, Annual Financial Information with respect to each fiscal year of the City. The Dissemination Agent shall promptly upon receipt thereof file the Annual Financial Information with EMMA (as defined herein).

(b) The Dissemination Agent shall provide, in a timely manner, notice of any failure of the City to provide the Annual Financial Information by the date specified in subsection (a) hereof.

Section 1.3. Audited Financial Statements. If not provided as part of Annual Financial Information by the date required by Section 1.2(a) hereof, the Disclosure Representative shall provide Audited Financial Statements, when and if available, to the Dissemination Agent. The Dissemination Agent shall promptly upon receipt thereof file such Audited Financial Statements with EMMA.

Section 1.4. Notice Events. (a) If a Notice Event occurs, the Disclosure Representative shall provide through the Dissemination Agent, in a timely manner not in excess of ten (10) business days after the occurrence of such Notice Event, notice of such Notice Event to EMMA.

(b) Any notice of a defeasance of the Bonds shall state whether the Bonds have been escrowed to maturity or to an earlier redemption date and the timing of such maturity or redemption.

(c) Each Notice Event notice relating to the Bonds shall include the CUSIP numbers of the Bonds to which such Notice Event notice relates or, if the Notice Event notice relates to all bond issues of the City including the Bonds, such Notice Event notice need only include the CUSIP number of the City.

(d) The Dissemination Agent shall promptly advise the City whenever, in the course of performing its duties as Dissemination Agent under this Agreement, the Dissemination Agent has actual notice of an occurrence which, if material, would require the City to provide notice of a Notice Event hereunder; provided, however, that the failure of the Dissemination Agent so to advise the City shall not constitute a breach by the Dissemination Agent of any of its duties and responsibilities under this Agreement.

Section 1.5. Additional Information. Nothing in this Agreement shall be deemed to prevent the City from disseminating any other information, using the means of dissemination set forth in this Agreement or any other means of communication, or including any other information in any Annual Financial Information or notice of Notice Event hereunder, in addition to that which is required by this Agreement. If the City chooses to do so, the City shall have no obligation under this Agreement to update such additional information or include it in any future Annual Financial Information or notice of a Notice Event hereunder.

Section 1.6. Additional Disclosure Obligations. The City acknowledges and understands that other state and federal laws, including but not limited to the Securities Act of 1933 and Rule 10b-5 promulgated under the Securities Exchange Act of 1934, may apply to the City and that, under some circumstances, compliance with this Agreement without additional disclosures or other action may not fully discharge all duties and obligations of the City under such laws.

ARTICLE II

Operating Rules

Section 2.1. Reference to Other Filed Documents. It shall be sufficient for purposes of Section 1.2 hereof if the City provides Annual Financial Information by specific reference to documents (i) available to the public on the MSRB Internet Web site (currently, www.emma.msrb.org) or (ii) filed with the SEC. The provisions of this Section shall not apply to notices of Notice Events pursuant to Section 1.4 hereof.

Section 2.2. Submission of Information. Annual Financial Information may be set forth or provided in one document or a set of documents, and at one time or in part from time to time.

Section 2.3. Dissemination Agent. The City has designated the Dissemination Agent as its agent to act on its behalf in providing or filing notices, documents and information as required of the City under this Agreement. The City may revoke or modify such designation. Upon any revocation of such designation, the City shall comply with its obligation to provide or file notices, documents and information as required under this Agreement or may designate another agent to act on its behalf.

Section 2.4. Transmission of Notices, Documents and Information. (a) Unless otherwise required by the MSRB, all notices, documents and information provided to the MSRB shall be provided to the MSRB's Electronic Municipal Markets Access ("EMMA") system, the current Internet Web address of which is www.emma.msrb.org.

(b) All notices, documents and information provided on EMMA shall be provided in an electronic format as prescribed by the MSRB and shall be accompanied by identifying information as prescribed by the MSRB.

Section 2.5. Fiscal Year. (a) The City's current fiscal year begins July 1, and the City shall promptly file a notification on EMMA, through the Dissemination Agent, of any change in its fiscal year.

(b) Annual Financial Information shall be provided at least annually notwithstanding any fiscal year longer than 12 calendar months.

ARTICLE III

Effective Date, Termination, Amendment and Enforcement

Section 3.1. Effective Date; Termination. (a) This Agreement shall be effective upon the issuance of the Bonds.

(b) The City's and the Dissemination Agent's obligations under this Agreement shall terminate upon a legal defeasance, prior redemption or payment in full of all of the Bonds.

Section 3.2. Amendment. (a) This Agreement may be amended, by written agreement of the parties, without the consent of the holders of the Bonds (except to the extent required under clause (4)(ii) below), if all of the following conditions are satisfied: (1) such amendment is made in connection with a change in circumstances that arises from a change in legal (including regulatory) requirements, a change in law (including rules or regulations) or in interpretations thereof, or a change in the identity, nature or status of the City or the type of business conducted thereby, (2) this Agreement as so amended would have complied with the requirements of the Rule as of the date of this Agreement, after taking into account any amendments or interpretations of the Rule, as well as any change in circumstances, (3) the City shall have delivered to the Dissemination Agent an opinion of Counsel, addressed to the City and the Dissemination Agent, to the same effect as set forth in clause (2) above, (4) either (i) the City shall have delivered to the Dissemination Agent an opinion of Counsel or a determination by an entity, in each case unaffiliated with the City (such as bond counsel or the Dissemination Agent), addressed to the City and the Dissemination Agent, to the effect that the amendment does not materially impair the interests of the holders of the Bonds or (ii) the holders of the Bonds consent to the amendment to this Agreement pursuant to the same procedures as are required for amendments to the General Ordinance with consent of holders of Bonds pursuant to the General Ordinance as in effect at the time of the amendment, and (5) the Disclosure Representative shall have delivered copies of such opinion(s) and amendment to the Dissemination Agent. The items provided in clause (5) shall be promptly filed by the Dissemination Agent on EMMA and sent to each Registered Owner.

(b) This Agreement may be amended, by written agreement of the parties, without the consent of the holders of the Bonds, if all of the following conditions are satisfied: (1) an amendment to the Rule is adopted, or a new or modified official interpretation of the Rule is issued, after the effective date of this Agreement which is applicable to this Agreement, (2) the City shall have delivered to the Dissemination Agent an opinion of Counsel, addressed to the City and the Dissemination Agent, to the effect that performance by the City and the Dissemination Agent under this Agreement as so amended will not result in a violation of the Rule and (3) the Disclosure Representative shall have delivered copies of such opinion and amendment to the Dissemination Agent. The items provided in clause (3) shall be promptly filed by the Dissemination Agent on EMMA and sent to each Registered Owner.

(c) This Agreement may be amended by written agreement of the parties, without the consent of the holders of the Bonds, if all of the following conditions are satisfied: (1) the City shall have delivered to the Dissemination Agent an opinion of Counsel, addressed to the City and the Dissemination Agent, to the effect that the amendment is permitted by rule, order or other official pronouncement, or is consistent with any interpretive advice or no-action positions of Staff, of the SEC, and (2) the Disclosure Representative shall have delivered copies of such opinion and amendment to the Dissemination Agent. The items provided in clause (2) shall be promptly filed by the Dissemination Agent on EMMA and sent to each Registered Owner.

(d) To the extent any amendment to this Agreement results in a change in the type of financial information or operating data provided pursuant to this Agreement, the first Annual Financial

Information provided thereafter shall include a narrative explanation of the reasons for the amendment and its effect on the type of operating data or financial information being provided.

(e) If an amendment is made pursuant to Section 3.2(a) hereof to the accounting principles to be followed by the City in preparing its financial statements, the Annual Financial Information for the fiscal 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. Such comparison shall include a qualitative and, to the extent reasonably feasible, quantitative 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.

Section 3.3. Benefit; Third-Party Beneficiaries; Enforcement. (a) The provisions of this Agreement shall constitute a contract with and inure solely to the benefit of the holders from time to time of the Bonds, except that beneficial owners of Bonds shall be third-party beneficiaries of this Agreement. The provisions of this Agreement shall create no rights in any person or entity except as provided in this subsection (a) and in subsection (b) of this Section.

(b) The obligations of the City to comply with the provisions of this Agreement shall be enforceable by any holder of Outstanding Bonds. The holders' rights to enforce the provisions of this Agreement shall be limited solely to a right, by action in mandamus or for specific performance, to compel performance of the City's obligations under this Agreement. In consideration of the third-party beneficiary status of beneficial owners of Bonds pursuant to subsection (a) of this Section, beneficial owners shall be deemed to be holders of Bonds for purposes of this subsection (b).

(c) Any failure by the City or the Dissemination Agent to perform in accordance with this Agreement shall not constitute a default or an Event of Default under the General Ordinance, and the rights and remedies provided by the General Ordinance upon the occurrence of a default or an Event of Default shall not apply to any such failure.

(d) This Agreement shall be construed and interpreted in accordance with the laws of the Commonwealth, and any suits and actions arising out of this Agreement shall be instituted in a court of competent jurisdiction in the Commonwealth; provided, however, that to the extent this Agreement addresses matters of federal securities laws, including the Rule, this Agreement shall be construed in accordance with such federal securities laws and official interpretations thereof.

ARTICLE IV

Definitions

Section 4.1. Definitions. The following terms used in this Agreement shall have the following respective meanings:

(1) "Act" means The First Class City Revenue Bond Act, P.L. 955, Act No. 234 of the General Assembly of the Commonwealth of Pennsylvania, approved October 18, 1972.

(2) "Annual Financial Information" means, collectively, (i) the Philadelphia Water Department Financial Statements for the most recently ended fiscal year and, if not included or able to be derived from information presented therein, updates to the information presented in the Official Statement under the headings and in the Tables enumerated in the schedule annexed hereto as Exhibit A and made a part hereof, (ii) financial information or operating data with respect to the City, substantially similar to the type set forth in Appendices IV and V of the Official Statement, delivered at least annually pursuant to

Section 1.2(a) hereof and in accordance with the Rule and (iii) the information regarding amendments to this Agreement required pursuant to Sections 3.2(d) and (e) of this Agreement. Annual Financial Information shall include Audited Financial Statements, if available, or Unaudited Financial Statements.

In connection with Section 4.1.(2)(ii), it is the City's intention to satisfy all or a portion of the obligations set forth therein by submitting to EMMA (A) its "Annual Report of Bonded Indebtedness and Other Long Term Obligations" in substantially the same format as such report for the fiscal year ended June 30, 2016, and (B) with respect to financial information or operating data regarding the Pension System, either (i) the annual audited financial statements of the Municipal Pension Fund, (ii) an Official Statement of the City, including the Appendices thereto, that updates the financial information and operating data under the heading "Pension System", as included in the Official Statement, or (iii) updated financial information and operating data under the heading "Pension System," as included in the Official Statement.

The descriptions contained in Section 4.1(2)(i) hereof of financial information and operating data constituting Annual Financial Information are of general categories of financial information and operating data. When such descriptions include information that no longer can be generated because the operations to which it related have been materially changed or discontinued, a statement to that effect shall be provided in lieu of such information. Any Annual Financial Information containing modified financial information or operating data shall explain, in narrative form, the reasons for the modification and the impact of the modification on the type of financial information or operating data being provided.

(3) "Audited Financial Statements" means the annual financial statements, if any, of the City, which includes the financial statements of the Water Fund, audited by such auditor as shall then be required or permitted by Commonwealth law. Audited Financial Statements shall be prepared in accordance with GAAP; provided, however, that pursuant to Sections 3.2(a) and (e) hereof, the City may from time to time, if required by federal or Commonwealth legal requirements, modify the accounting principles to be followed in preparing its financial statements. The notice of any such modification required by Section 3.2(a) hereof shall include a reference to the specific federal or Commonwealth law a regulation describing such accounting principles, or other description thereof.

(4) "Bond Committee Determination means the Bond Committee Determination for the Bonds adopted by the Bond Committee (consisting of the Mayor, the City Solicitor and the City Controller and acting by a majority thereof) on July 26, 2017.

(5) "Commonwealth" means the Commonwealth of Pennsylvania.

(6) "Counsel" means any nationally recognized bond counsel or counsel expert in federal securities laws.

(7) "Disclosure Representative" means the Director of Finance of the City, the City Treasurer or such other official or employee of the City as the Director of Finance or the City Treasurer shall designate in writing to the Dissemination Agent.

(8) "Fiscal Agent" means U.S. Bank National Association, as fiscal agent and registrar for the Bonds.

(9) "GAAP" means generally accepted accounting principles as prescribed from time to time for governmental units by the Governmental Accounting Standards Board, the Financial Accounting Standards Board, or any successor to the duties and responsibilities of either of them.

(10) "General Ordinance" means the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989, approved June 24, 1993, as supplemented and amended by nineteen (19) supplemental ordinances, as further supplemented or amended from time to time.

(11) "MSRB" means the Municipal Securities Rulemaking Board established pursuant to Section 15B(b)(1) of the Securities Exchange Act of 1934, or any successor thereto or to the functions of the MSRB contemplated by this Agreement.

(12) "Notice Event" means any of the following events with respect to the Bonds, whether relating to the City or otherwise:

(i) principal and interest payment delinquencies;

(ii) non-payment related defaults, if material;

(iii) unscheduled draws on debt service reserves reflecting financial difficulties;

(iv) unscheduled draws on credit enhancements reflecting financial difficulties;

(v) substitution of credit or liquidity providers, or their failure to perform;

(vi) adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices of determinations with respect to the tax status of the Bonds, or other material events affecting the tax status of the Bonds;

(vii) modifications to rights of Bondholders, if material;

(viii) Bond calls, if material, and tender offers;

(ix) defeasances;

(x) release, substitution, or sale of property securing repayment of the Bonds, if material;

(xi) rating changes;

(xii) bankruptcy, insolvency, receivership or similar event of the City;

(xiii) the consummation of a merger, consolidation, or acquisition involving the City or the sale of all or substantially all of the assets of the City, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material; and

(xiv) appointment of a successor or additional paying agent, or the change of name of a paying agent, if material.

(13) "Official Statement" means the Official Statement dated July 26, 2017 of the City relating to the Bonds.

(14) "Registered Owner" or "Registered Owners" means the person or persons in whose name a Bond is registered on the books of the City maintained by the Fiscal Agent in accordance with the

General Ordinance. For so long as the Bonds shall be registered in the name of the Securities Depository or its nominee, the term "Registered Owner" or "Registered Owners" also means and includes, for the purposes of this Agreement, the owners of book-entry credits in the Bonds evidencing an interest in the Bonds; provided, however, that the Dissemination Agent shall have no obligation to provide notice hereunder to owners of book-entry credits in the Bonds except those who have filed their names and addresses with the Dissemination Agent for the purposes of receiving notices or giving direction under this Agreement.

(15) "Rule" means Rule 15c2-12 promulgated by the SEC under the Securities Exchange Act of 1934 (17 CFR Part 240, §240.15c2-12), as amended, as in effect on the date of this Agreement, including any official interpretations thereof issued either before or after the effective date of this Agreement which are applicable to this Agreement.

(16) "SEC" means the United States Securities and Exchange Commission.

(17) "Securities Depository" shall mean The Depository Trust Company, New York, New York, or its nominee, Cede & Co., or successor thereto appointed pursuant to the General Ordinance.

(18) "Unaudited Financial Statements" means the same as Audited Financial Statements, except that they shall not have been audited.

(19) "Underwriters" means the financial institutions named on the cover of the Official Statement.

ARTICLE V

Miscellaneous

Section 5.1. Duties, Immunities and Liabilities of the Dissemination Agent. The Dissemination Agent shall have only such duties under the Agreement as are specifically set forth in this Agreement, and the City agrees to indemnify and save the Dissemination Agent, its officers, directors, employees and agents, harmless against any loss, expense and liabilities which it may incur arising out of or in the exercise or performance of its powers and duties hereunder, including the costs and expenses (including attorneys' fees) of defending against any claim of liability, but excluding liabilities due to the Dissemination Agent's negligence or willful misconduct in the performance of its duties hereunder. The obligations of the City under this Section shall survive resignation or removal of the Dissemination Agent and payment of the Bonds.

Section 5.2. Counterparts. This Agreement may be executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same instrument.

IN WITNESS WHEREOF, THE CITY OF PHILADELPHIA, PENNSYLVANIA, has caused this Disclosure Agreement to be executed by the Director of Finance and DIGITAL ASSURANCE CERTIFICATION, L.L.C., as Dissemination Agent, has caused this Disclosure Agreement to be executed by one of its authorized officers, all as of the day and year first above written.

CITY OF PHILADELPHIA, PENNSYLVANIA

By:______________________________
Name: Rob Dubow
Title: Director of Finance

DIGITAL ASSURANCE CERTIFICATION, L.L.C.,
as Dissemination Agent

By:______________________________
Name:
Title:

EXHIBIT A

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APPENDIX VIII

BOOK-ENTRY ONLY SYSTEM

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BOOK-ENTRY ONLY SYSTEM

DTC will act as securities depository for the Bonds. The Bonds will be initially 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 Bond certificate will be issued for each maturity of the Bonds, each in the aggregate principal amount thereof, 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 3.6 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 an S&P 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 and www.dtc.org.

Purchases of the Bonds under the DTC system must be made by or through Direct Participants, which will receive a credit for the Bonds on DTC's records. The ownership interest of each actual purchaser of each Bond ("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 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 the Bonds, except in the event that use of the book-entry system for the Bonds is discontinued.

To facilitate subsequent transfers, all 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 Bonds with DTC and their registration in the name of Cede & Co. or such other DTC nominee do not effect any change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the Bonds; DTC's records reflect only the identity of the Direct Participants to whose accounts such 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 the Bonds of a series 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 the 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 issuer 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 the Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Principal and interest payments on the 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 City or the Fiscal Agent, on payable dates 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, the Fiscal Agent, or the City, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of principal and interest to Cede & Co. (or such other nominee as may be requested by an authorized representative of DTC) is the responsibility of the City or the Fiscal Agent, 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 Bonds at any time by giving reasonable notice to the City or the Fiscal Agent. Under such circumstances, in the event that a successor depository is not obtained, bond certificates are required to be printed and delivered.

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

THE CITY AND THE FISCAL AGENT WILL NOT HAVE ANY RESPONSIBILITY OR OBLIGATION TO DTC PARTICIPANTS OR THE PERSONS FOR WHOM THEY ACT AS NOMINEES WITH RESPECT TO THE ACCURACY OF THE RECORDS OF DTC, ITS NOMINEE OR ANY DTC PARTICIPANT WITH RESPECT TO ANY OWNERSHIP INTEREST IN THE BONDS, OR PAYMENTS TO, OR THE PROVIDING OF NOTICE FOR, DTC PARTICIPANTS OR THE INDIRECT PARTICIPANTS OR BENEFICIAL OWNERS.

The information in this section concerning DTC and DTC's book-entry system has been obtained from sources that the City believes to be reliable, but the City takes no responsibility for the completeness or accuracy thereof, or the absence of materially adverse changes in such information subsequent to the date hereof. For further information, Beneficial Owners should contact DTC in New York, New York.

SEAL OF THE CITY OF PHILADELPHIA

PHILADELPHIA MANETO