

BEFORE THE
PHILADELPHIA WATER, SEWER AND STORM WATER RATE BOARD

In the Matter of the Philadelphia Water Department's Proposed Change in Water, Wastewater and Stormwater Rates and Related Charges	Fiscal Years 2019-2021
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Direct Testimony

of

Donna Schwartz

on behalf of

The Philadelphia Water Department

Dated: February 12, 2018

1 **Q5. PLEASE IDENTIFY EXAMPLES OF THE DEPARTMENT'S USE OF**
2 **NEW AND INNOVATIVE TECHNOLOGIES IN WATER AND**
3 **WASTEWATER OPERATIONS.**

4 A5. Examples of the Department's investments in new and innovative technologies
5 include those undertaken to address (A) non-revenue water losses; (B) work
6 order management and customer service request tracking; (C) water treatment
7 operations; (D) wastewater collector system; and (E) advanced meter reading –
8 each of which is addressed below. The Department's use of innovative
9 technologies (the Early Warning System) is also described in the testimony of
10 Debra McCarty (PWD Statement No. 1).

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12 **A. Non-Revenue Water Losses**

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14 **Q6. HOW DOES THE DEPARTMENT'S USE OF TECHNOLOGIES**
15 **REDUCE NON-REVENUE WATER LOSSES?**

16 A6. The Department uses various approaches to proactively contain leakage and
17 reduce non-revenue water losses, including: (i) employing an advanced leak
18 detection program, (ii) using district metered areas as a leak detection tool and
19 (iii) applying the hydrant tracking program. The Department was one of the first
20 water utilities in the United States to employ the techniques in its leak detection
21 and district metered area programs to mitigate leakage and reduce the
22 occurrence of water main breaks. The Department's hydrant tracking program
23 has resulted in hydrant availability remaining significantly above 99% through
24 initiatives such as routine inspection, repair and painting.

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1 **Q7. PLEASE DESCRIBE THE DEPARTMENT'S LEAK DETECTION**
2 **PROGRAM.**

3 A7. The Department's distribution system has approximately 3,200 miles of water
4 mains, approximately 400 miles of which are large diameter transmission mains.
5 As presented below, the Department surveys a significant proportion of the total
6 distribution system (6-inches to 12-inches) for leaks each year.

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<u>Fiscal Year</u>	<u>Miles of Pipe Surveyed for Leaks</u>
8 2017	1,053
9 2016	799
10 2015	637

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13 Transmission mains are more difficult to survey for leaks through traditional
14 methods. As such, the Department uses in-line leak detection in active large-
15 diameter transmission water mains. The Department has continued its
16 successful use of the Sahara® inline transmission main leak detection
17 technology in a program that was launched in Fiscal Year 2007. The Sahara
18 system uses a sophisticated, highly accurate acoustic sensor attached to a tether
19 and inserted into an active water main. It travels through the pipeline with the
20 flow of water and can detect sounds created by water escaping from pipes to
21 locate leaks, including very small volume leaks, within a foot of accuracy. The
22 Department has used this advanced technology to locate and repair leaks on the
23 most critical supply mains in the City. This has resulted in reduced sources of
24 Non-Revenue Water and allowed the Department to plan targeted rehabilitation
25 programs to minimize the risk of future water main failures.

1 **Q8. PLEASE DESCRIBE THE DEPARTMENT’S USE OF DISTRICT**
2 **METERED AREAS AS A LEAK DETECTION TOOL.**

3 A8. A district metered area is a small, discrete area of the water distribution system
4 which is isolated from the larger distribution system by closing valves. Water
5 supply into the district metered area is regularly tracked and the flow profile is
6 analyzed for higher flows into the area that might indicate a newly emerging
7 leakage. This technology has resulted in up to 90% reduction of the leakage
8 rate. PWD was one of the first water utilities in the United States to employ this
9 technique to reduce leaks and reduce the occurrence of water main breaks.

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11 **Q9. WHAT OTHER STEPS HAS THE DEPARTMENT TAKEN IN RECENT**
12 **YEARS TO REDUCE NON-REVENUE WATER?**

13 A9. Over recent years the Department and the Water Revenue Bureau have
14 implemented a host of programs to reduce and control non-revenue water losses.
15 Specifically, the Department operates a Customer Meter Management Program
16 and a Revenue Protection Program, and the Water Revenue Bureau operates a
17 Reinspection Program. The Customer Meter Management Program features the
18 nation’s second largest water utility Automatic Meter Reading (“AMR”) system.
19 The Revenue Protection Program and the Reinspection Program investigate
20 water-using accounts suspected to be unbilled or under-billed. These programs
21 have increased billing by approximately \$5.0 million in Fiscal Year 2014, \$3.8
22 million in Fiscal Year 2015 and \$4.4 million in Fiscal Year
23 2016.

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25 **B. Work Order Management and Customer Service Tracking**

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Q10. HOW DOES THE DEPARTMENT UTILIZE NEW TECHNOLOGIES TO TRACK REPAIR WORK AND CUSTOMER SERVICE REQUESTS?

A10. Historically, PWD had separate databases to track underground asset management, pipeline and sewer repairs and work on other systems. In 2009, PWD began consolidating its multiple systems for maintenance and operations into one database through a computerized work order management system called Cityworks. Two of the primary drivers for selecting Cityworks were that it is GIS centric and has a robust customer service interface. The Department was thus able to further leverage its investment in GIS. In 2012, all of the Department’s primary groups that conduct maintenance and repair work on the water distribution and collection systems migrated to the Cityworks system to record and track work orders. In addition, the Department began using Cityworks to receive and store water quality complaint information, customer service requests and other data collected by Department staff involved in customer response at the Call Center, the Department’s laboratories and core field workgroups, including the Customer Field Services, Distribution and Sewer Maintenance groups. This improved efficiency and the turnaround time for responding to customer service requests and made it easier for multiple units in the Department to share and track information about such service requests and responses. For example, in Fiscal Year 2017 the Department used Cityworks to track 4,076 service requests for inlet cleaning and achieved an average requested response time of 1.3 days.

1 **Q11. HAS THE DEPARTMENT MADE ANY CHANGES IN CITYWORKS**
2 **SINCE THE LAST RATE PROCEEDING?**

3 A11. Yes. Since the last rate proceeding, the Department has expanded Cityworks to
4 incorporate ancillary groups such as Green Stormwater Infrastructure. Future
5 enhancements to Cityworks include the development of reporting and data
6 analysis capabilities that are expected to result in additional improvements to
7 operations and maintenance tracking.

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C. Water Treatment Operations

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11 **Q12. HOW HAS THE DEPARTMENT USED NEW TECHNOLOGIES TO**
12 **ADDRESS ISSUES THAT ARISE AT THE WATER TREATMENT**
13 **PLANTS?**

14 A12. The Department's water treatment plants are all over 50 years old and are
15 constantly being upgraded to address structural issues and incorporate
16 advancements in water treatment technologies. The Belmont Water Treatment
17 Plant faced some challenges in recent years when modifying the existing
18 disinfection scheme to reduce the production of disinfection by-products.
19 Innovative technologies and practices were tested and evaluated to address these
20 challenges. For example, to address operational challenges resulting from algae
21 growth that contributed to decreased filter performance, the Department
22 installed ultrasonic devices in the sedimentation basins and applied a different
23 algaecide to the raw water. This, along with a series of enhancements to the
24 backwash procedure, improved filter performance and finished water quality.
25 As part of the Department's ongoing initiatives to achieve optimal operation at

1 the Queen Lane Water Treatment Plant, the Department performed a
2 demonstration study to quantify the technical and economic benefits of using air
3 scour technology to reduce filter backwash discharges.

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5 **D. Wastewater Collector System**

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7 **Q13. HOW HAS THE DEPARTMENT IMPROVED ON ITS WASTEWATER**
8 **COLLECTOR SYSTEM OPERATIONAL EFFICIENCY?**

9 A13. The Department inspects sewers using closed circuit television (CCTV) cameras
10 to quickly identify problems, decrease response time and reduce the number of
11 disruptions impacting customers. The use of CCTV information has led the
12 Department to use sewer lining technology in some cases instead of sewer
13 replacement. Sewer rehabilitation by lining provides as much as 50% cost
14 reduction over sewer replacement. The Department also has streamlined its inlet
15 cleaning waste handling procedures, leading to increased operational efficiency
16 and resulting in over 13,000 more inlets being cleaned in the past year.

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18 **Q14. HOW HAS THE DEPARTMENT USED NEW TECHNOLOGIES TO**
19 **CONTROL COMBINED SEWER OVERFLOWS?**

20 A14. The Department's Flow Control Unit is responsible for operation and
21 maintenance of the Department's combined sewer overflow regulators. This
22 unit continues to utilize the latest technology-based controls such as remote
23 monitoring equipment to collect and transmit or poll real time data on flow
24 measurements and levels from over 320 electronic sensing devices.

1 **Q15. WHAT OPERATIONAL CHANGES HAS THE DEPARTMENT MADE**
2 **IN ITS GREEN STORMWATER INFRASTRUCTURE OPERATIONS**
3 **AND MAINTENANCE?**

4 A15. The Department recently started transitioning the Green Stormwater
5 Infrastructure (GSI) operation and maintenance work from service contracts to
6 City employees. The Department is also adopting more efficient ways to manage
7 the growing number of GSIs. With this recent transition in staffing and
8 improved practices, the Department is anticipating cost savings and increased
9 operational efficiency.

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11 **E. Advanced Meter Reading and Metering Infrastructure**

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13 **Q16. HOW HAS THE DEPARTMENT USED NEW METER READING**
14 **TECHNOLOGY?**

15 A16. The Water Department's Automatic Meter Reading System has produced many
16 positive results, including more accurate meter reading and billing, fewer billing
17 disputes, better customer service and increased revenue collection. In 2017, the
18 City, through the Procurement Department, Water Department and the Water
19 Revenue Bureau, solicited proposals from qualified vendors to provide an
20 advanced metering infrastructure system for water meters. The project, if
21 implemented, will provide customers with faster access to usage information
22 and early detection of leaks at service locations.

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24 **Q17. DOES THIS CONCLUDE YOUR PREPARED TESTIMONY?**

25 A17. Yes, it does.

Schedule DS-1

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Philadelphia, PA 19107

EDUCATION:

Drexel University
B.S. in Chemical Engineering, June 1982

The Pennsylvania State University
Pre-med major, September 1977 to June 1979

EXPERIENCE:

03/16 to present:

City of Philadelphia Water Department
Title: Deputy Commissioner/Director of Operations
Duties: Direct the activities of all operating units of the Philadelphia Water Department. Responsibilities include oversight of the operation and maintenance of the water and wastewater utilities including three water plants, three wastewater plants and a biosolids recycling facility. Responsibilities also include the operation and maintenance of 3,100 miles of water mains, 3,500 miles of sewers, 79,000 storm water inlets, 25,000 fire hydrants and water and wastewater pumping stations, throughout the City. Oversee the supply of water and wastewater services to suburban contract customers.
Liaison with other divisions within the Department to coordinate efforts and ensure effective operations.
Advance Philadelphia Water Department interests in activities involving other city departments, local, state and federal agencies as well as other outside entities.

01/09 to 03/16 :

City of Philadelphia Water Department – Belmont WTP
Title: Engineer IV – Plant Manager
Duties: Oversee the effective and efficient operation and maintenance of the plant and employees ensuring compliance with all standards
Develop staff by mentoring subordinate managers, supporting group leaders, coaching individuals and building a team
Direct capital and operational planning
Develop and adhere to the operational budget that is based on best management practices and cost effectiveness
Set goals and protocols for the facility and personnel, oversee their implementation and assess performance
Promote sustainability, energy management and green initiatives
Liaison with other units, departments, utilities and agencies
Provide off hours technical support as Incident Commander and Certified Operator in Charge

11/89 to 01/09: City of Philadelphia Water Department – Belmont WTP
Title: Engineer III – Assistant Plant Manager
Duties: Maintain water quality and plant operation
Ensure compliance with all local, state and federal regulations for water and wastewater including all reporting requirements and involvement in the PfSDW
Set process goals and performance criteria and assess performance of plant
Suggest, research, design and evaluate the effectiveness of plant upgrades and process enhancements
Provide off hours technical support and spill response

6/82 to 11/89: City of Philadelphia Water Department – Industrial Waste Unit
Title: Engineer
Duties: Manage the wastewater pretreatment program.
Interpret and enforce all discharge requirements
Assess compliance, suggest improvements, levy fines/charges
Develop/ manage the PCB transformer delisting program
Provide off hours spill response

**PROFESSIONAL
MEMBERSHIPS
AND LICENSES:**

Commonwealth of Pennsylvania Professional Engineer
Commonwealth of Pennsylvania Water System Operator Certification

References: Supplied on request