RESPONSE TO PUBLIC ADVOCATE'S INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS

PA-VIII-1. REFERENCE THE RESPONSE TO PA-ADV-43:

A. PLEASE IDENTIFY WHAT AWWA STANDARDS PWD BELIEVES ARE APPROPRIATE TO ASSESS WHETHER THE LEVEL OF NRW AND LEAKAGE (SEPARATELY) ON THE PWD SYSTEM ARE REASONABLE AND WITHIN AWWA INDUSTRY STANDARDS; AND

B. PROVIDE SUPPORTING CALCULATIONS TO EVALUATE HOW PWD'S NRW AND LEAKAGE COMPARE TO AWWA INDUSTRY STANDARDS.

RESPONSE:

A. Since a number of characteristics contribute to each distribution system's overall Non-Revenue Water (system age, size, etc.), AWWA doesn't have a definitive industry standard for NRW. AWWA recommends techniques and methodologies, such as completing water audits using their M36 methodology. In addition to performing a comprehensive water audit, PWD uses the results of the audit to target the most economical ways to reduce NRW.

B. Since each distribution system has unique variables that impact NRW, there is no AWWA industry standard for NRW, only recommended methodologies for calculating NRW. AWWA emphasizes the management and economic reduction of NRW.

RESPONSE PROVIDED BY: Donna Schwartz, Philadelphia Water Department

PA-VIII-2. REFERENCE THE RESPONSE TO PA-ADV-43. PLEASE IDENTIFY THE EXTENT TO WHICH MAINS OR SERVICE LINE LEAKAGE CONTRIBUTE TO WASTEWATER I/I.

RESPONSE:

The water cost analysis included in the annual water audit, assumes that 25% of service line losses enters the wastewater collection system and is treated at the wastewater treatment plants. Based on the response to PA-ADV-43 this would amount to 3,739 million gallons per year. Based on the annual I/I volume of 67,557 million gallons reflected in the FY 2019 cost of service study, the estimated service line leakages contributes about 5.5% of the wastewater I/I.

RESPONSE PROVIDED BY: Black & Veatch Management Consulting, LLC

PA-VIII-3. REFERENCE THE "STATEMENT OF CHANGES FROM THE ADVANCE NOTICE FILED WITH THE CITY COUNCIL AND THE WATER, SEWER, AND STORMWATER RATE BOARD ON FEBRUARY 12, 2018." PLEASE PROVIDE A DETAILED EXPLANATION AND ALL CALCULATIONS AND DOCUMENTATION SUPPORTING THE CHANGES TO IA AND GA SQUARE FOOTAGE.

RESPONSE:

The changes to the IA and GA square footage referenced in the "Statement of Changes from the Advance Notice Filed with The City Council and The Water, Sewer, and Stormwater Rate Board On February 12, 2018" were with respect to the non-residential IA and GA square footage referenced in the narrative portion of Exhibit 2.

The original text included with Exhibit 2 stated that sample bill was for a small commercial customer having a 2,110 square foot lot with 1,794 square feet of impervious area.; these square footage references were incorrect. The sample bill for a small commercial customer was calculated based on a customer having a 5,500 square foot lot with 4,000 square feet of impervious area. Therefore, the narrative in Exhibit 2 was correct as part of the official filing. The underlying calculations were correct. No changes have been made to the IA and GA square footage projections utilized in the cost of service study.

RESPONSE PROVIDED BY: Black & Veatch Management Consulting, LLC

PA-VIII-4. PLEASE PROVIDE ALL INFORMATION AVAILABLE OR TO WHICH PWD OR B&V IS AWARE THAT COMPARES THE NRW AND LEAKAGE EXPERIENCE OF PWD WITH THAT OF OTHER WATER UTILITIES.

RESPONSE:

In general, water audits are essentially water loss models. The Department was one of the first water utilities in the United States to employ the techniques in its leak detection and district metered area programs to mitigate leakage and reduce the occurrence of water main breaks.

The challenge with benchmarking against peer utilities is the limited amount of equivalent distribution system data. When comparing peer water utilities, it is important to consider distribution systems of similar age, density, and location. Newer systems of smaller size in temperate climates are not comparable to older systems in the northeast with several hundred thousand connections such as Philadelphia's. PWD strives for the economic reduction of water loss with initiatives that are tailored for PWD's distribution system. For those reasons, PWD focuses on management techniques and methodologies.

RESPONSE PROVIDED BY: Donna Schwartz, Philadelphia Water Department

PA-VIII-5. REFERENCE PWD EXHIBIT 6, TABLE W-11:

A. PAGE 724, LINE 3 ("PWD FACILITIES"). PLEASE DESCRIBE WHAT USAGE IS REFLECTED ON THIS LINE;

B. PAGE 724, LINE 5 ("ESTIMATED NON-REVENUE WATER BASED ON % OF SYSTEM METERED DEMAND"). PLEASE EXPLAIN THE BASIS FOR INCLUDING NRW IN THE DIVERSITY FACTOR CALCULATIONS; AND

C. PAGE 724, LINES 3 AND 5. PLEASE PROVIDE A REFERENCE TO THE AWWA M-1 MANUAL SUPPORTING THE INCLUSION OF ITEMS (A) AND (B) IN THE DIVERSITY FACTOR CALCULATION.

RESPONSE:

A. Line 3, PWD Facilities, reflects the metered water demands from PWD facilities. PWD does not bill itself for water service. The water demand provided to PWD facilities should be included in the determination of the system-wide non-coincidental demands.

B. Estimated annual volume associated with system-wide non-revenue water should be included in the determination of the system-wide noncoincidental demands to provide the complete system demand for relative comparison to the system-wide coincidental demand. The system-wide coincidental demand reflects the total output from the water treatment plants which includes system-wide non-revenue water.

C. AWWA's Manual of Water Supply Practices – M1, Seventh Edition, Principles of Water Rates, Fees, and Charges defines the measure of system diversity demand as "the relationship of the noncoincidental to coincidental demand" (page 377 of AWWA's Manual M1). The intent is to present the diversity of the customer demands. To present the diversity of the customer demands, the noncoincidential demand should be adjusted to reflect the non-revenue water demands reflected in the coincidental demand data. The coincidental demand data is based on the total system volume of water delivered which

includes non-revenue water such as water provided to PWD facilities and system water losses.

RESPONSE PROVIDED BY: Black & Veatch Management Consulting, LLC

PA-VIII-6. REFERENCE THE RESPONSE TO PA-ADV-37. PLEASE UPDATE THIS RESPONSE FOR FY 2017 AND FY 2018 TO DATE.

RESPONSE:

All figures presented below are in Millions of Gallons Per Day (MGD)

System average day production (in MGD);

FY 2014	FY 2015	FY 2016	FY 2017	**FY 2018***
239.5	230.8	223.8	223.0	225.5

System maximum day production (in MGD); and

FY 2014	FY 2015	FY 2016	FY 2017	FY 2018*
295.5	291.8	258.2	263.8	301.0

System maximum hour production (in MGD)

FY 2014	FY 2015	FY 2016	FY 2017	FY 2018*
428.4	365.5	430.8	402.5	346.0

*FY 2018 figures represent fiscal year to date data as of February 28, 2018.

RESPONSE PROVIDED BY: Black & Veatch Management Consulting, LLC

PA-VIII-7. REFERENCE THE RESPONSE TO PA-ADV-43. PLEASE UPDATE THIS RESPONSE FOR FY 2017.

RESPONSE:

Please see response attachment PA-VIII-7 for FY 2017 data.

RESPONSE PROVIDED BY: Donna Schwartz, Philadelphia Water Department