

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

**PA-EXE-201. Please identify the annual quantities of lost and unaccounted-for water (LUFW) for the most recent five-year period available. Also identify annual water production for the same five annual periods.**

**Response:**

The American Water Works Associated (AWWA) recognizes that accounting for Non-Revenue Water (NRW) is an industry best practice. The Department no longer utilizes the matrix of Unaccounted-for water for tracking water losses. The major difference between LUFW and NRW is that NRW includes authorized unbilled consumption, such as the water used for firefighting. Attachment response PA-EXE-201 is the standard IWA/AWWA water balance for the Department for the last five years with key definitions. A detailed description of the water balance can be found in the AWWA M36 Manual.

**Response Provided By:** Gary Gehringer, Philadelphia Water Department

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**PA-EXE-202. Please identify the causes of LUFW on the PWD system. Provide copies of any studies or analyses conducted in the last three years that evaluate the causes of LUFW on the PWD system.**

**Response:**

The causes of Non-revenue water include the following. See also attachment response PA-EXE-201.

**Authorized Consumption**

Unbilled Unmetered

**Apparent Losses**

Customer Meter Inaccuracies  
Unauthorized Consumption  
Systematic Data Handling Error

**Real Losses**

Tank Overflows/Operator Error  
Reported & Unreported Leakage  
Transmission Main Breaks &  
Leaks  
Distribution Mains Leaks & Breaks  
Customer Service Lines  
Hydrant & Valve Leaks  
Measured Leakage (DMAs)  
Background Leakage  
Leakage Liability Costs

**Response Provided By:** Gary Gehringer, Philadelphia Water Department

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**PA-EXE-203. Please provide a detailed explanation of the PWD’s efforts and programs to reduce LUFW over the last three years. Identify the success of those efforts.**

**Response:**

The Philadelphia Water Department and the WRB have organized a group known as The Water Accountability Committee. The Water Accountability Committee’s goal is to promote a high level of efficiency in the water delivery and billing processes and perform the strategic planning necessary to implement lasting improvements in water and revenue loss reduction. This group has been meeting since 1994. Some efforts which committee members have lead include the Revenue Protection Program (PWD) and Reinspection Program. These groups work to reduce apparent water loss by investigating water-consuming accounts suspected to be unbilled, or under-billed; and have recovered over \$45 million since FY2000.

Efforts to reduce real water losses are performed using leak detection technology during routine leak detection surveys. PWD has continued its successful use of the Sahara® inline transmission main leak detection technology provided by the Pure Technologies in a program that was launched in FY2007. Large diameter transmission pipelines have historically been difficult to survey for leaks, however the PWD leak detection program has been successful using newer technology. Any observed leaks are scheduled for repairs to reduce non-revenue water. The PWD distribution system has 3,028 miles of pipeline, and as presented below in the table, PWD leak detection surveys a significant proportion of the total distribution system each year.

| <b>Fiscal Year</b> | <b>Miles of Pipe Surveyed for Leaks</b> |
|--------------------|---|
| 2014               | 775                                     |
| 2013               | 962                                     |
| 2012               | 1,137                                   |
| 2011               | 995                                     |
| 2010               | 1,133                                   |

**Response Provided By:** Debra McCarty and Gary Gehringer, Philadelphia Water Department

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**PA-EXE-204. Please identify the annual quantities of “Non-Revenue Water” for the most recent five year period available as that term is used in the response to PA-EXE-167. Include a detailed breakdown of Non-Revenue Water by component/type.**

**Response:**

Please see the below table that presents the volume of non-revenue water (NRW) and the number of main breaks. Many factors contribute to the presence of NRW. The winter of 2014 was a severe winter which led to an increase in main breaks and therefore an increase in NRW. PWD and WRB work to keep NRW at an economical level and are continually refining techniques to help reduce it.

| <b>Fiscal Year</b> | <b>Non-Revenue Water, MGD</b> | <b>Main Breaks</b> |
|--------------------|-------------------------------|--------------------|
| 2014               | 92.2                          | 919                |
| 2013               | 86.3                          | 823                |
| 2012               | 84.5                          | 563                |
| 2011               | 91.6                          | 954                |
| 2010               | 78.6                          | 646                |

*MGD is million gallons per day*

**Response Provided By:** Debra McCarty and Gary Gehringer, Philadelphia Water Department