

VALIDATED WATER AUDIT DATA FOR RELIABLE UTILITY BENCHMARKING

THE AWWA WATER LOSS CONTROL COMMITTEE'S WATER AUDIT DATA COLLECTION INITIATIVE - 2011

The Water Loss Control Committee created its first dataset of validated water audit data which is posted for review by water utility stakeholders.

Twenty one utilities provided their water audit data for review and careful validation of the data by members of the Committee's Water Audit Software Subcommittee in conference calls with utility personnel. Data from the entire group of utilities was assembled with results shown in the online, read-only Compiler of water audit data. Data was collected via the industry standard AWWA Free Water Audit Software© and the data gradings and data validity scores used in the software were the key parameters employed in the data validation work. Outputs include the first North American benchmark performance indicators using the IWA/AWWA water audit methodology. This is a significant step toward improving the level of accountability and the robustness of water audit data within North America.

The subcommittee conducted extensive analysis of the water audit data and presented these findings in papers delivered at the 2011 AWWA Annual Conference & Exposition (ACE) in Washington, DC, and at the 2011 AWWA Distribution System Symposium (DSS) in Nashville, TN. The paper presented at the 2011 DSS reports the most extensive analysis of water audit data undertaken. This paper "Assembling Validated Water Audit Data for Reliable Utility Benchmarking" is available as part of the 2011 DSS conference proceedings, available at:

<http://apps.awwa.org/ebusmain/OnlineStore/ProductListing.aspx?Category=PROC>

The tables included below are samples of the analysis included in the above paper and show the overall performance indicators in Table 1. Table 2 outlines the differences between large and small utilities, and the graphic (Figure 1) outlines the range of overall validation scores from each of the participating utilities.

The AWWA Water Loss Control Committee welcomes input and discussion of these datasets. Please forward your questions or comments to: wlc@awwa.org

Key Performance Indicator	#	Average	Range		
NRW as a % by Volume	21	22.6%	6.8%	-	45.5%
NRW as a % by Cost	21	10.0%	1.7%	-	23.0%
NRW - Total Annual Cost (Million \$)	21	5.81	0.04	-	42.97
Apparent Losses (gals/conn/day)	21	14.95	2.36	-	65.89
Real Losses (gals/conn/day)	18	63.32	17.07	-	149.71
Real Losses (gals/mile of main/day)	3	1,821.15	645.42	-	3,496.21
Infrastructure Leakage Index (ILI)	21	3.57	1.15	-	12.68
Water Audit Data Validity Score	21	74.97	52.28	-	89.72
Cost Data	#	Average	Range		
Annual operating cost (Million \$)	21	51.22	1.36	-	224.43
Annual operating cost (\$/1,000 gal of Water Supplied)	21	\$ 3.32	\$ 1.15	-	\$ 8.14
Customer retail unit cost (\$/1,000 gal)	21	\$ 4.57	\$ 1.10	-	\$ 8.38
Variable production (or import) cost (\$/1,000 gal)	21	\$ 0.73	\$ 0.18	-	\$ 2.16

Table 1. Calculated Key Performance Indicators - Overall.

Key Performance Indicator	# connections <50,000					# connections >50,000				
	#	Avg	Range			#	Avg	Range		
NRW as a % by Volume	1 0	24.1%	12.2 %	-	45.5%	1 1	21.4%	6.8%	-	39.6%
NRW as a % by Cost	1 0	9.3%	3.1%	-	17.5%	1 1	10.6%	1.7%	-	23.0%
Apparent Losses (gals/conn/day)	1 0	10.38	2.36	-	20.64	1 1	19.11	6.45	-	65.89
Real Losses (gals/conn/day)	7	58.71	26.08	-	149.71	1 1	66.24	17.07	-	124.36
Real Losses (gals/mile of main/day)	3	1,821	645	-	3,496	0			-	
Infrastructure Leakage Index (ILI)	1 0	3.51	1.24	-	12.68	1 1	3.62	1.15	-	9.89
Water Audit Data Validity Score	1 0	70.44	52.28	-	84.79	1 1	79.08	61.92	-	89.72
Cost Data	#	Avg	Range			#	Avg	Range		
Annual operating cost (Million \$)	1 0	9.16	1.36	-	29.08	1 1	89.45	24.77	-	224.43
Annual operating cost (\$/1,000 gal Water Supplied)	1 0	4.25	1.87	-	8.14	1 1	2.47	1.15	-	4.34
Customer retail unit cost (\$/1,000 gal)	1 0	5.09	3.19	-	8.38	1 1	4.09	1.10	-	7.89
Variable production (or import) cost (\$/1,000 gal)	1 0	0.98	0.33	-	2.16	1 1	0.49	0.18	-	1.80

Table 2. Comparison of Key Performance Indicators among systems with < and > 50,000 connections.

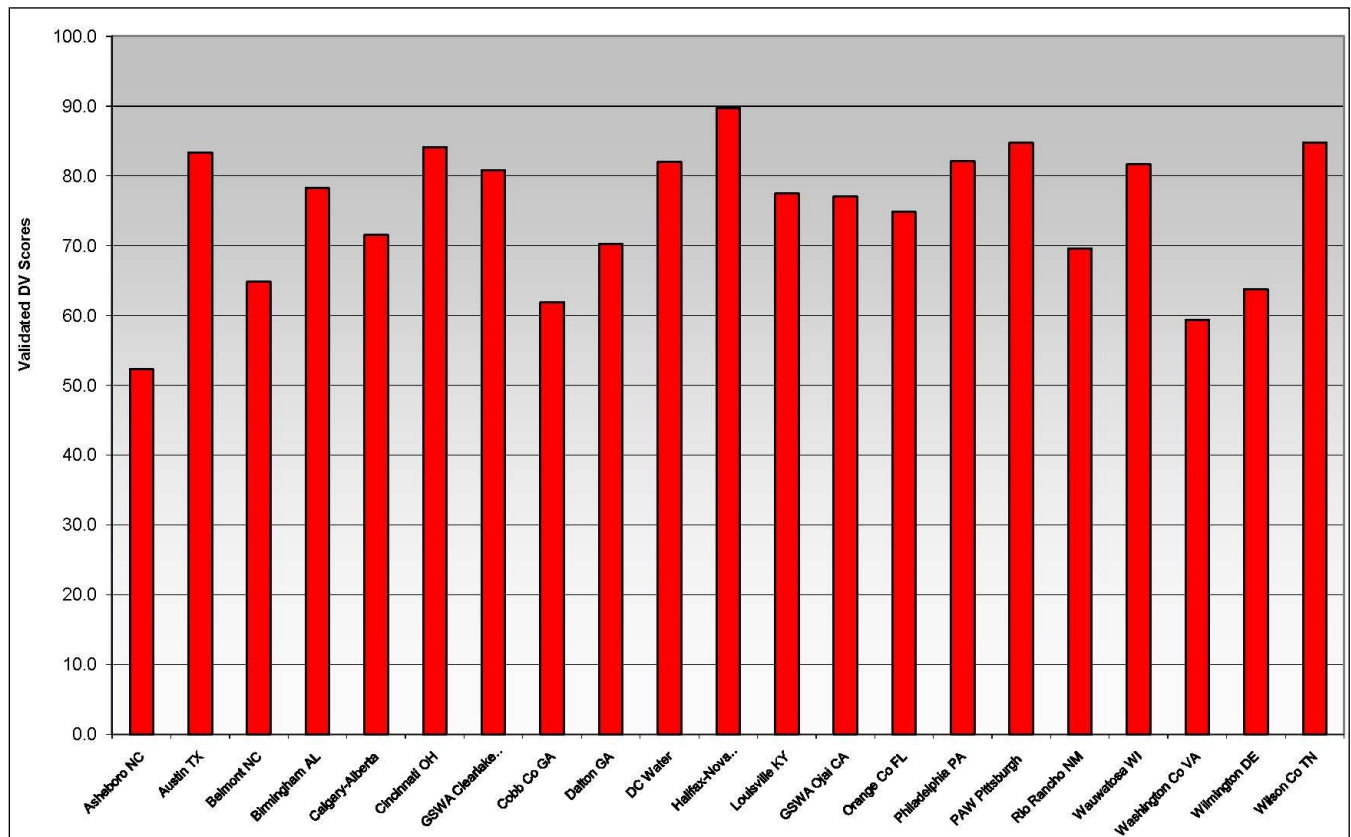


Figure 1. Utility Data Validation Scores.

AWWA recognizes and thanks the water utility participants in this ground breaking water audit data collection initiative.

- City of Asheboro, NC; Michael Rhoney
- Austin Water Utility, TX; Dan Strub
- City of Belmont, NC; Chuck Flowers
- Birmingham Water Works Board, AL; Ray Sloan
- City of Calgary, Alberta, Canada; Chris Huston
- Greater Cincinnati Water Works, OH; Mark Ginty
- Cobb County Water System, GA; Kathy Nguyen
- Dalton Utilities, GA; David Oxford
- DC Water & Sewer Authority; Syad Khalil
- Golden State Water Company – Clearlake, CA; John Turner
- Golden State Water Company – Ojai, CA; John Turner
- Halifax Regional Water Commission, Nova Scotia, Canada; Graham McDonald
- Louisville Water Company, KY; Tonya Taylor
- Orange County Utilities Department, FL; Bob Dudas
- Philadelphia Water Department, PA; George Kunkel
- Pennsylvania American Water - Pittsburgh, Pittsburgh, PA; Anthony Emanuelle
- City of Rio Rancho, NM; Marian Wrage
- Washington County Service Authority, VA; Robbie Cornett
- City of Wauwatosa Water Utility, WI; James Wojcehowicz
- City of Wilmington, DE; Colleen Arnold
- Water & Wastewater Authority of Wilson County, TN; Chris Leauber