

Reducing Non-Revenue in Water Systems: The Standard Water Audit Approach to Identifying Water Conservation Opportunities

Bryan Odom

P.E. WK Dickson & Co., Inc. 720 Corporate Center Drive Raleigh, Nc 27067 919.782.0495
bodom@wkdickson.com

Water conservation responses that many municipalities utilize reduce water consumption that otherwise generates revenue for the system. Other strategies include leak detection surveys of the system, hoping to find and fix leaks to reduce losses. Reducing consumption has dramatic revenue effects, as demonstrated by the many North Carolina systems with significant water revenue shortfalls during the drought. As municipalities attempt to reduce their “unaccounted for water”, they struggle to effectively reduce real losses and maintain the revenues needed to economically operate their infrastructure. Several years ago, IWWA and AWWA established an improved process to conduct a Standard Water Audit and water balance that allows systems to more accurately understand the causes, volume and value of the real water losses in the system. This information allows the system to develop and implement strategies that can more effectively reduce real losses in the water system that have positive impacts on the system – revenue enhancement, cost reduction and water conservation. The AWWA water balance accounts for all of the water used in the system. Most systems in North Carolina do not use this standard balance, labeling most of the water that is not sold to customers as Unaccounted For Water (UFW). The water balance process requires that the system estimate certain portions of the water balance, however these detailed estimates are more accurate than determining UFW in a single large category as is the case now. By accounting for all of the water in the system, the owner can assess the volume and value of water that does not create any revenue once it has been generated for use. Every system produces or buys source water that does not generate any revenue - Non-Revenue Water (NRW). NRW is comprised of both Apparent Water Losses and Real Water Losses. The AWWA Standard Water Audit Process evaluates the value and volume of the Apparent and Real Losses in a water system. The process gives the system more information to determine the technical and economic feasibility of recovering Apparent and Real Losses. Recovery of Apparent Losses can enhance revenues. Recovery of Real losses can reduce expenses and conserve water without reducing customer revenues. The audit estimates the baseline unavoidable real loss volume (UARL) that’s specific to the system, and compares current volume of real loss to the baseline. This unitless performance metric is used to measure system efficiency, allows systems to compare themselves to one another and to track performance improvement over time. Additionally, the system can determine their economic level of leakage, and determine if strategies can be economically implemented to reduce real water losses. By better understanding the volume and sources of Non-Revenue Water, water systems can utilize proven strategies that are more effective in reducing real losses. The technical and economic implications of the strategies can be understood. Strategies that are not currently understood or utilized in North Carolina can be used, such as pressure management. These strategies provide cost-effective long-term reductions in real losses with defined pay-back periods.