

# Non-Revenue Water Audits Add Value for Water Utilities

By Joanna Schroeder

**W**ater utilities across the country are discovering the financial and resource benefits from conducting water audits for non-revenue water. According to Steve Cavanaugh, President and CEO of Cavanaugh and Associates, non-revenue water is composed of unbilled authorized consumption, apparent loss, and real loss.

Utilities need to realize that non-revenue water is a problem; however, it is also a potential for a new water source as well as revenue. Utilities can identify and take advantage of these challenges and opportunities with an American Water Works Association (AWWA) M36 Water Audit. This audit is the first step in understanding non-revenue water, Cavanaugh says.

Historically, a utility is motivated to conduct a water audit by one or more of four key drivers: drought, economics, politics, and regulatory requirements. “Drought, followed by economics are the top drivers for a utility to begin conducting water audits,” Cavanaugh notes. “Other drivers include politics, for example, when a utility proposes a rate increase, or their regulatory agency moves to the industry best practice for reporting water loss. California, Georgia, and Hawaii have non-revenue water laws that embrace industry best practices. Now many other states are looking to correct and update their reporting requirements.”

The AWWA, of which Cavanaugh serves as chairperson of the Water Loss committee’s Outreach Subcommittee, offers a free water audit tool based on the M36 methodology – a practice manual for water loss audits and water loss control. The detailed manual includes information on how utilities have developed their strategy for non-revenue water reduction, Cavanaugh says.

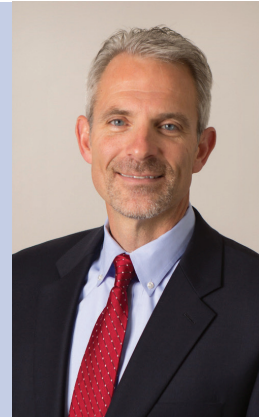
“Out of this, the committee saw the value of offering free water audit software to take the concepts that the utility learns from the M36 methodology and apply that to perform a water audit,” Cavanaugh explains. “This software is in its fifth version and has more than 8,000 downloads. This means utilities are taking the knowledge and practices they’ve learned through the M36 and applying it into the software.”

The easy part of the audit is to populate the software, Cavanaugh says. The hard parts are for the utility to determine what to actually put into the software and the reliability of the inputs. “During this process, the utility is really building the capacity to properly track its non-revenue water use,” Cavanaugh explains. “Once it’s tracked, the utility can understand its nature, for example, what’s the economic impact or the nature of the value, or how much the utility should spend. This assists the utility in improving its business practices and ensuring its rate payers are not paying for leaks or the utility’s inefficiencies.”

Small utilities often require a unique strategy to address their operational needs with hands-on teaching methods

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that help them evaluate and report water losses in their system. “This gives the utility a better understanding of its components of non-revenue water,” says Cavanaugh.

Gathering data is as important as the outcomes, Cavanaugh says, because the utility begins to see the inherent challenges in how it’s gathering the data and its usefulness. “The audit is really a reflective practices review and that takes struggling on purpose with your data and making improvements over time.”

A utility should get its hands around the nature of the loss using the M36 methodology. This is done through four key steps:

**Step 1:** Determine loss and volume through breaking down apparent and real-loss volumes.

**Step 2:** Distinguish loss by its components through breaking down the type of leakage and apparent loss. There is free software to assist in this step called Leakage Component Analysis.

**Step 3:** Evaluate the economics of recovery.

**Step 4:** Implement an intervention plan.

Several best practices have emerged from the utilities using the M36 methodology, Cavanaugh says, including:

- **Going beyond calibration of source meters.** A utility will actually do a comparative volumetric test to learn how to adjust what is actually being delivered to its distribution system.
- **Optimizing their large customer meter testing program.** A utility should economically look at test and repair costs, re-test, and then optimize based on the revenue that meter is generating.
- **Optimizing their leak detection program.** A utility either behaves reactively or overspends. Optimization enables the utility to better evaluate its technology for leakage discovery and leak detection program implementation.
- **Better defining observation areas through district metered areas.** A utility is actually able to shorten its awareness (discovery) time to shorten leakage run time.

- **Pressure management.** A utility can identify distribution areas with excess pressure, which has a direct one-to-one reduction of main breaks and sustained leakage.
- **Flow charting.** A utility can see potential value through flow-charting its billing system and practices. Once they are mapped out, potential errors can be discovered.

Cavanaugh recommends utilities publish and share results with customers. “This builds trust and momentum for a utility to show they are being efficient and proactive and that it’s a better steward of the water and its customers’ dollars.”

As more utilities adopt water audits for non-revenue, Cavanaugh hopes states continue to offer support with capacity planning, training, and technical assistance. Cavanaugh will conduct a water audit seminar during IAMU’s Water and Wastewater Workshop Nov. 14 - 16, 2017. ☑



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