



The Digital Difference

Leak Detection at Clayton County Water Authority

As part of a six-year long leak detection scan of its entire 1,456 miles of water main, Clayton County Water Authority (CCWA) was dismayed at the start of 2000 to find its non-revenue water losses nearing 20 percent. Recognizing that these losses were no longer a necessary part of doing business, and in response to an increasingly water constrained environment, the CCWA board of directors and management team began looking for ways to distance themselves from the alarming statistic. They took action in 2000 to implement a comprehensive leak detection initiative — the results of which are so successful that their non-revenue water losses plummeted to 12.5 percent last year. Here's how.

Setting out with a goal to develop and maintain an affordable, all-inclusive leak detection program that surveys its entire distribution system — as opposed to an average of 250 miles of leak scan annually — CCWA investigated and demonstrated several types of leak detection equipment. Diligent research led to its purchase of a suite of proven products that work in concert to pinpoint and curtail leaks. The first product in the suite is DigiCorr; the world's only true digital correlator from Itron. CCWA is able to use the technology's patented computerized acoustic technique to accurately localize its pipeline leaks. By analyzing the pressure waves caused by leak turbulence inside pressurized pipes, CCWA can exactly locate a leak source.

The second item, also from Itron, is ZCorr digital correlating loggers, which pinpoint the exact locations of CCWA's leaks in a single overnight surveillance. The utility strategically placed the loggers 400 to 4,000 feet apart to better plan spot investigations of several miles of water pipeline, guide field service personnel in the deployment and retrieval of the loggers, and then analyze and review the results of overnight recording the next day.

The permanent cornerstone of its leak detection program is Itron's MLOG technology, a network of intelligent, leak detecting sensors installed on every 10th water service. The MLOG sensor data is collected daily, gathered while collecting reads from meters. An Itron web interface, mlog online Network Leak Monitoring System, handles data interpretation and creates a leak index for each logger, generates a historical record to track leakage, directs investigation and identifies all leaks localized by MLOG. The patented acoustic sensor technology and sophisticated sound analysis software offers CCWA permanent, maintenance-free leak detection across the entire water distribution system 365 days a year.

To round out its program, CCWA selected employees for a newly incepted leak detection crew and added a repair crew dedicated to mending leaks found by the leak detection team.



CUSTOMER

» Clayton County, GA

SERVICE TERRITORY

» Clayton County Water Authority serves a quarter of a million people in and around Clayton County, GA, through approximately 76,000 customer accounts. The Authority has a combined water production capacity of 42 million gallons per day streaming through a system of distribution mains 1,456 miles long.

TECHNOLOGY

» Itron AMR with Leak Detection

Year	# Leaks Discovered	Gallons Recovered	Production Cost
2000	47	735,445,800	\$551,584.35
2001	48	506,941,200	\$380,205.90
2002	16	134,810,700	\$101,108.03
2003	48	462,468,000	\$346,851.00
2004	30	237,308,400	\$177,981.30
2005	54	805,219,200	\$603,914.40
2006	54	1,248,825,600	\$936,619.20
2007	74	987,076,800	\$740,307.60
2008	69	583,416,000	\$437,562.00

Figure 1 Shows the monumental impact of non-revenue water losses. In total, CCWA has discovered and repaired 440 leaks, accounting for 5,701,511,700 gallons of water recovered over 8.5 years, and \$4,276,133.78 in production cost saved (based on a \$.75 cost for producing the “next thousand gallons” of water).

THE DIGITAL DIFFERENCE

Itron technology creates digital images of both area maps and detailed street plans used by CCWA. With the digitized map information, the entire county's water system is visible in DigiCorr. Installation of the MLOG devices began in March 2008. After the initial 585 sensors were deployed, the system identified 11 leaks in the oldest part of CCWA's system (Jonesboro, Ga.), totaling 54,662,400 million gallons per year at a production cost of \$40,996.80 using the IWA/AWWA method of calculating the cost of producing the next thousand gallons of water.

So far in 2009, the Authority has found 40 leaks, saving over 78,051,600 gallons of water, and equaling \$226,349.64 in production cost and \$58,538.70, again using the IWA/AWWA method. CCWA conservatively estimates that for every dollar spent on its leak detection program, they have recovered \$4.28 in production savings.

ADVANTAGES OF PERMANENT LEAK DETECTION

Motivated by the program's success, the CCWA board of directors recently approved the purchase of an additional 950 MLOG units for deployment in Jonesboro and Forest Park, GA. Once the system is installed in the whole county, the Authority will be able to complete leak studies once a month — a process that used to take six years of surveying. Leaks will be detected as they start, stemming water loss sooner. CCWA looks forward to improved relationships with its customers as well, as leak detection begins to occur on the customer-side.

Prior to implementing its leak detection program, CCWA was producing/purchasing 9.67 billion gallons of potable water per year, or 26.5 millions of gallons per day (MGD). The success of CCWA's leak detection program has decreased its production requirement by 7 MGD for a real conservation win. The reduced production will delay plant expansions by several years.

Next up for CCWA, its management wants to lead its peers in supporting leak detection programs. With its proactive leak detection program, CCWA is able to demonstrate how to cost-effectively reduce leakage and minimize associated costs. Interested water providers should contact Jeff Jones, CCWA leak detection and repair foreman, at 770-960-3612, or email jjones@ccwa1.com.



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