



Locating and Correcting "Non-Revenue Water" Requires Persistence, Tools

Controlling unaccounted for water is an issue that is important to every public water system. The average “water loss” in public water systems in Kansas is approximately 18 percent. Any system with an unaccounted for water loss higher than 30 percent is identified by the Kansas Water office and will be put on a special focus list for assistance through a contract for assistance. That work is funded through the Clean Drinking Water Fee; the contract is administered by the Kansas Water Office and the contract is operated by the Kansas Rural Water Association.

Unaccounted for water loss is also referred to as "non-revenue water".

There are numerous possible contributors to unaccounted for water. Often, it is difficult to identify the cause. Kansas Rural Water has been assisting systems across the state for decades concerning leak detection and water loss surveys.

It's a challenge to locate and correct situations in some systems that have chronic losses.

Unaccounted for water loss is also referred to as “non-revenue water”. That title seems to get higher attention of the boards and councils of water systems. The truth is that unaccounted for water can have a huge impact on a system financially. If you are a board or council member, I suggest grab your calculator and work through the numbers on what it really costs to produce or purchase 1,000 gallons of water. Suppose there is a loss of 14 or 15 gallons per minute (gpm). Take 14 gpm multiplied by 1,440 minutes in a day. The loss is 20,160 gallon per day or 604,800 gallons per month and 7,257,600 gallons per year. Let's suppose that the water cost is \$2 per thousand. If that 14 gallon per minute loss can be corrected, the savings would be \$1,200 a month or \$15,000 dollars annually.



This photo shows a 14-gpm leak that was located in Jewel County RWD 1 with the use of KRWA's non-intrusive flow meter. This leak was not surfacing.

Hi-tech tools

Locating leaks in a water system can be a real challenge. One of the tools KRWA has that I've used successfully is an ultrasonic meter. This meter can be set on the pipe that is excavated; the meter will show if there is flow and it can also show you what direction the water is flowing.

Recently, I provided leak detection work for Jewell County RWD 1 in north-central Kansas. Operator Dan Cleveland requested help from KRWA. He was trying to locate a leak that he knew existed on a PVC pipeline of about 3.5 miles. There were valves at either end.

We first excavated one mile from the first valve on the upstream side of a creek crossing to expose the pipe and to place the meter on the pipe. The meter showed a flow of 14 gallons per minute. The leak was much more than anyone suspected. That answered the question of why the usage had been so high in that area of the system and that water loss had increased.

The non-intrusive meter provides an advantage compared to just using sonic leak detection equipment and listening to valves to determine flow. It's particularly difficult to determine flow on the on-quarter turn valves that some systems have.

We were fairly confident that the leak was in the creek crossing and that was why we had not been able to locate it or see it surface. We exposed the pipe about one-quarter mile past the creek. The meter still showed 14 gallon per minute flow. We ultimately excavated at eight locations to install the meter to determine flow, continuing to eliminate low areas and suspect creeks and ponds where a waterline crossing might not be apparent.

We finally worked to be close enough to the leak that I could hear it with KRWA's ultrasonic listening equipment. We began additional excavations over the pipeline. After partially exposing about 40 feet of the pipeline, we located the leak. Yes it was between 12 and 14 gallons per minute. That leak was not visible until we were within a foot or less of the actual leak. The pipeline had been installed in a very rocky

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limestone shale area. Rather than surfacing, the leaking water was following the rock layer down the hill to the creek across the road.

Kansas Rural Water has some great equipment and KRWA has experienced staff. Helping search for and locate water loss often requires a discipline. There's no magic wand method of doing it.

I also want to encourage readers to check out the KRWA training calendar. The calendar is posted online at www.krwa.net. There are many great sessions coming up and more are planned. And also, if anyone has any specific training needs or suggestions for topics, I encourage them to email me at gmetz@krwa.net or contact someone at the office at 785-336-3760.

Greg Metz joined KRWA as a Technical Assistant in July 2009. He previously worked at the city of Washington for 13 years where he was involved in city utilities including the power plant, streets, water and wastewater. He also served as purchasing agent for those utilities.



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