

Some Experiences

in Leak Detection



in Towns and RWDs in Kansas

Detecting leaks can be very difficult for anyone. The most experienced operator can have difficulty in locating leaks. Some people think that it is easy and that all you have to do is go look for water exiting the ground. Unfortunately, it is not that simple.

Water can follow rock ledges for hundreds of feet before surfacing. If the leak is in a creek crossing, it will never show itself unless in a drought. In cities, the water can easily enter the sanitary or storm sewer system and never surface directly over the waterline.

I thought some readers might be interested in experiences that I've had in conducting water loss surveys and leak detection.

The first example is from several years ago in a small town in northeast Kansas. The unaccounted for water loss had continued to increase month by month.

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I was called to conduct a water loss survey in the town to attempt to identify any possible leaks. We first tested the master meter to ensure accuracy and eliminate any issues that the meter could be creating and resulting in a water loss. The master meter tested accurate. Using sonic leak detection equipment, the operator and I began listening to the residential meters for any sounds that would indicate a water line leak. It wasn't too far into the survey that the meters on a 2-inch cast line indicated a leak. Before using the ground mic, we opened sewer manholes to see if there was a large amount of flow. Sure enough, the customers on that particular water line showed a sizable amount of flow in the sewer line. I then ground microphoned the area of the 2-inch line, I was able to narrow down the area of the leak to within 20 feet. The line was exposed and the repair was made. The water loss was reduced. This leak was approximately 20 gpm. That may not seem very significant to many systems, however when the supply is only 60 gpm, it is critical.

Another experience was in southeast Kansas. A rural water district had been losing approximately 50 percent of the water for several months. I was called to assist in finding the possible large leak. KRWA Tech Lonnie Boller also

assisted with this particular leak. When we arrived we learned that the system was split into several areas and each area had a submeter to help monitor water loss. After inspecting the changes in the water usage in each area, we narrowed it down to one that had the particularly high usage. After that Lonnie watched the master meter as the operator and I closed valves down the line until the meter kept spinning. We knew then it was between the last two valves that were closed. Lonnie started at one valve and I started at the other, walking towards each other. It wasn't long when Lonnie had found the leak. The leak was on a 6-inch PVC line, out in the pasture, then entering a creek. The leak was approximately 30 gpm. The sound of 30 gpm is obvious when going through a partially closed mainline valve.

Just a short note regarding customers that have leaks on their side of the meter. In my experience, a low or intermittent flow is often due to a toilet that is continuously running because of a failed flapper valve. It's not uncommon for a failed toilet tank valve to allow 5,000 to 6,000 gallons per month. A test on toilet tank valves is to add a few drops of food color in the tank. That will help determine if the flapper is leaking. Another possible place to look on the customer side of



KRWA Tech Tony Kimmi uses sonic leak detection equipment to try to further isolate possible leak on service line to this customer.

the system is at outside “Horsehead” hydrants. Sometimes if they are not fully closed, they will lose water through the weep hole at the base of the hydrant.

The most memorable leak

The “most memorable leak” and one that will always stick in my mind was very unique. Lonnie and I were called to assist on a large leak in a water district that was operating all its wells to maintain a supply. That was 335 gpm but the district continued to see a reduction in the water level in their elevated storage tank. Upon arrival, we discussed which direction everyone would go to inspect the lines. We drove all the lines down to the 2-inch, knowing it was next to impossible for a 2-inch line to be leaking 335 gpm. We then regrouped and quizzed the new operator as what the district had

done recently with any waterlines that might be contributing to a water loss problem. The operator stated a new bore was recently done in a creek crossing. We then went and inspected that situation; there was no problem there. At about dark, I asked again what was recently done in the system. The operator stated that the south standpipe had just been sandblasted and painted. So we proceeded to the standpipe. Upon arrival it was apparent where the leak was. The operator opened the valve to fill the standpipe but forgot to shut the drain valve. It was an honest mistake, but one of the easiest leaks to fix that I have ever been involved with.

The Kansas Rural Water Association provides a great deal of assistance concerning water loss reduction from testing master meters to searching for leaks. We have crawled on hands and knees through underbrush and worked in almost every imagineable situation. The assistance comes largely as a benefit of the Clean Drinking Water

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Fee and a contract administered through the Kansas Water Office. Give KRWA a call if anyone can be of help on water loss reduction or any other operation or management issue concerning a water or wastewater system.

Tony Kimmi has worked as a Tech Assistant for KRWA since October 2009. He has extensive experience in the operation of construction equipment. He has assisted in the construction of several rechlorination stations and ongoing monitoring of water quality issues. Tony enjoys providing assistance to public water systems.



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