



# Abilene “Phocus’s” on their Non-Revenue Water Program



## The Situation.

The State of Texas, and the region around Abilene in particular has been experiencing an ongoing drought of historic proportion. Not since the 1950s have they experienced conditions this severe. Abilene takes the region’s need for adequate water supplies seriously, and has been analyzing the short-term water needs (5-10 years) as well as the long-term water needs (+50 years) for its service area. The ongoing drought had pulled the three primary water supply reservoirs for the region down to extremely low levels. In the fall of 2014: Lake OH Ivie was at 15% capacity; Hubbard Creek Reservoir was at 16% capacity; Lake Fort Phantom Hill was at 32% capacity.



## The Action.

In response to the drought, Abilene undertook a series of projects, valued in excess of \$200 million, with the objective of ensuring an adequate water supply to meet the current and future demand. One of Abilene’s projects was bringing additional water supplies online to secure the short-term water needs of the region in the event the drought was not broken.

In addition to these large water supply projects, Abilene began a project centered on minimizing overall water loss through detecting leakage areas throughout the distribution system. Abilene began actively searching for solutions that would help ensure the integrity of their water system for their customers. Abilene’s goal was to find the appropriate technology to implement an in-house Non-Revenue Water reduction program, or to outsource the program to a qualified firm.

In 2014 Abilene initially hired a company to conduct a trial leak detection system, using fixed-based, non-intrusive technology. This particular program did not identify any water leaks, but it did identify significant challenges to a

## The Technology.

**Phocus3** is an acoustic logger that automatically detects and localizes leaks on any water distribution network. The Phocus3 loggers are deployed underground on existing assets and utilize low power radio and/or infrared communications, without the need for costly above ground technology. The logger listens for any potential leakage and confirms if there is or is not a leak nearby. The data is retrieved, and viewed, easily and quickly by a communication module, which can be easily downloaded to any PC for further analysis if required.



**Eureka3** is a real time correlator that combines all the latest technology innovations to provide a high performance leak location correlator. It is intuitive and easy to use, but also has many advanced features to enable operators to obtain optimum leak location results.



**Mikron3** is designed for optimum leak pinpointing and confirmation. The combination of advanced, *wireless*, sensors with low-noise processing electronics gives excellent acoustic performance. With its choice of sensors and processors, Mikron3 is a flexible operational tool.



fixed-base technology system that relied on above ground assets, such as repeaters, to send data. Still eager to begin a Non-Revenue Water reduction program, Abilene reached out to Matchpoint Water Asset Management's (MWAM) Texas distributor, WL Prospecting (WLP), to perform a similar service. MWAM was brought in for consultation and all three parties worked together to commit to a 60-day trial leak detection survey.

MWAM assessed the success and failures of Abilene's initial leak detection trial, and due to its lack of above ground infrastructure and interference, chose to deploy its Phocus3 underground loggers for the trial.

On November 11, 2015 Abilene, with assistance from MWAM and WLP, deployed 30 Phocus3 loggers, 25 of which were in the drive-by mode and 5 were left to use as Lift N Shift loggers in other areas as needed. The drive-by loggers were deployed within a five-block radius in the downtown area on 6" cast iron pipe on some of the oldest parts of their system.

Abilene's intent was to understand the new technology, see it function effectively, determine the path forward – and if possible, find leaks.

### The Results.

Two leaks were detected within the 60-day trial – a leak within a fire hydrant and another very significant leak on a 6" cast iron water main. The combined technology was successful in not only highlighting the leaks, but also pinpointing their exact location.

The fire hydrant leak was detected by Abilene utilizing, the "live" listening function of the Phocus3 loggers. This feature allows the utility to use headphones and a communication device to listen "live" to all loggers in leak mode, without removing the loggers or even remove the chamber lid. The 6" leak was a break that went all the way around the circumference of the pipe. Even though the leak on the 6" main break was very significant there was no sign of it on the surface. This is very often the case, as approximately 50% of any underground leaks never surface.

In this case, there was a broken sewer line so the leak was traveling out of the water main and into the sewer service line. Abilene could not determine exactly how long the leak had been going, but estimates that it was ongoing for about one year, in a fully pressurized 6" main where their system pressure is a steady 45-psi. Abilene lost a substantial amount of water – approximately 925 GPM or 40,000,000 gallons per month during the time it was leaking.

When the Phocus3 loggers highlighted this significant leak, WLP revisited Abilene and performed a correlation using the Eureka3 real time correlator. The Eureka3 was able to easily pinpoint the leak within 1 foot. The technology was able to perfectly execute its purpose. Even with the great success of the loggers and the correlator, WLP still deployed the Mikron3 electronic ground microphone system to ensure that the exact location for the excavation was confirmed.

### **The Conclusion.**

The City of Abilene was able to fix both the minor and significant leak, thus reducing Abilene's Non-Revenue Water. Moreover, the 60-day trial gave Abilene extensive insight into the process of leak detection as well as the technology behind it. Abilene is now confident that a leak detection program is critical, and the Primayer technology is a viable solution for achieving their water usage reduction goals. Abilene's pilot project with WLP/MWAM was a success, and helped them move closer to the initiation of their in-house leak detection program, and the start of proactively minimizing water usage on an on-going, long-term basis.

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