

## **Energy Management with Water Loss Control – Leak Detection City of Thunder Bay, Ontario**

### Description

Leak Detection is a proactive component of the Thunder Bay's water distribution operation and maintenance activities. The City of Thunder Bay has been conducting leak detection throughout the distribution system since 1986 through the use of electronic locating equipment. Through this program, the city has been able to reduce water loss through proactive leak repairs which in turn can result in increased overall customer satisfaction, reduced energy consumption through reduced pumping requirements and treatment processes.

The cost of the program to the City of Thunder Bay is around \$80,000 per year.

The leak detection program was relatively quick to implement. Once the equipment was purchased, city personnel were trained on the device then sent out in the field to start detecting.

### Background

Leak detection is a day-to-day operation conducted by a leak technician and an assistant. Specific training was required and like anything else, the ability to operate equipment and detect leaks has increased with experience.

A dedicated vehicle is used to house electronic locating equipment – a computer, two correlating units, and two sounding devices. The entire distribution system is covered each year. Leak detection is conducted more frequently in older areas, and suspect areas such as those with ductile iron pipe.

Sounding equipment is connected to available contact points on the distribution system, such as curb stops or fire hydrants. After a leak has been detected a supervisor is notified and the leak is pin-pointed. Leaks can be pin-pointed in less than one hour. Plans are then made to excavate and repair the leak almost immediately. If the leak is not causing a significant impact, it will be repaired the next day.

### Results

The City of Thunder Bay finds this method of leak detection very beneficial, especially during winter months where the alternative method for leak detection involves labor intensive and costly excavation into frozen ground. Over the several years of the program's operation, significant leaks have been detected. Savings in terms of water loss have not been quantified to date.

Although Thunder Bay has not metered water loss and is unable to estimate the savings their water loss strategy has achieved over the last ten years, the City is confident that their approach is effective and has achieved savings in terms of water loss and associated consumption and costs for electricity.

In addition, Thunder Bay has eliminated costly Workplace Safety and Insurance Board (WSIB) claims that were associated with back injuries from the old method of leak detection which required drilling holes. The amount of time and manpower to detect leaks has decreased significantly with electronic leak detection as well, and the need for a drilling crew and equipment has been eliminated. Thunder Bay's previous method of drilling holes to listen and test for leaks would take a four man crew 4-8 hours at each location, where as with the current method a two man crew can pinpoint leaks with electronic leak detection in 15 – 30 minutes. To detect a single leak, this translates into approximately \$465/location in wages alone.

By implementing these practices for leak detection, Thunder Bay has reduced water loss in its distribution system. By identifying and repairing leaks it has improved the condition of the distribution system resulting in savings for water treatment and pumping requirements.

## Contacts

Kerri Marshall, P. Eng  
Manager, Environment Division  
City of Thunder Bay  
(807) 625-2836  
[kmarshall@thunderbay.ca](mailto:kmarshall@thunderbay.ca)