



**TOWN OF VULCAN**  
 CLIENT  
 ALBERTA, CANADA  
 LOCATION



**The Town of Vulcan – AMR Meter Replacement Project**



**To boldly go where no one has gone before...**

The Town of Vulcan sits in the heart of Vulcan County and at the western edge of the Canadian Badlands in southern Alberta, Canada. Vulcan is recognized around the world for its coincidental relationship to the science fiction television and feature film series *Star Trek* as the name of

Mr. Spock's home planet – Vulcan. Capitalizing on this coincidence, the town has built a *Star Trek*-themed tourist station (the Tourism and Trek Station) which provides tourist information, displays *Star Trek* memorabilia, and provides unique photo opportunities. Nearby, a replica of the starship *Enterprise* from *Star Trek V* has been mounted on a pedestal which includes writing from *Trek* alien languages. The town also hosts an annual community-wide *Star Trek* convention known as VulCON: Spock Days/Galaxyfest. This convention attracts hundreds of "Trekkers" from around the world.

In the summer of 2009 the Town of Vulcan issued a Request for Tender for the replacement of its aging meter population. The town understood the need to replace its aging meter population to regain the revenue it was losing due to the older meters' inaccuracies. As well, the town was struggling with the many challenges of having to manually read meters – whether reading the outdoor visual remote or walking up to houses to read the meter through the touchpad receptacle. Vulcan knew that significant meter reading efficiencies can be realized by upgrading to a radio frequency automatic meter reading (RF AMR) technology.

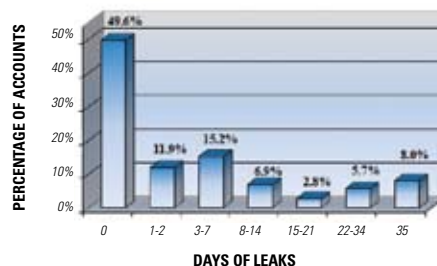
Approximately 700 meters were required to be replaced in addition to another approximately 200 existing newer meters the town wished to upgrade to AMR technology. Although the town had not previously dealt with Neptune, Vulcan selected Neptune Technology Group (Canada) Ltd. as the preferred vendor to supply and install all its meters and AMR system. This decision was based on Neptune's strong meter and AMR product portfolio as well as Neptune Canada's long history and experience in water meter service and installation. The town was looking for a one-stop shop for its project. It got that and more with Neptune's integrated turnkey supply-and-install solution. The project began in September 2009 and in six short weeks the project was successfully completed.

For its AMR technology the town had the choice to install basic wired RF meter reading transmitters; however, Vulcan elected to equip all its meters with Neptune's E-Coder)R900i™ integrated RF encoder. It saw the value in having the E-Coder® provide leak detection, tamper detection, and backflow detection flags as well as the convenience of not having to run wiring. Additionally, the town saw the that the E-Coder)R900i's hourly datalogging capabilities would make an excellent customer service enhancement tool – helping resolve customers' high bill complaints. As Vulcan saw the value in having E-Coder technology on its meters, it elected not to simply retrofit existing meters that were less than 10 years old with R900 Meter Interface Units (MIUs) but rather replace these relatively newer meters with Neptune meters equipped with E-Coder)R900i encoders. This afforded the town the ability to provide

the same level of customer service for all its customers by having E-Coder technology on every meter. A summary of the E-Coder flags can be seen in the following graphs from the town's most recent reading cycle:

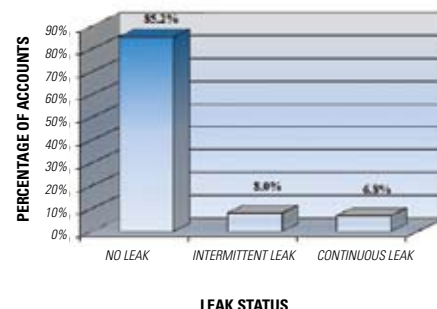
**Days of Leak**

Depicted in the Days of Leak graph is a breakdown of the leak status (based on a percentage) of 901 accounts. What is interesting is that 8.0 percent of the accounts are showing a continuous or intermittent leak for the last 35 days. This equates to 72 accounts with some form of leak that lasted a minimum of 35 days. Additionally, fewer than 50 percent of the accounts reported no form of a leak. This means that the remainder (over 454 accounts) developed a leak with varying degrees of severity.



**Leak Status in the Last 24-Hour Period**

The status of the current leak state is determined by the number of 15-minute intervals during a 24-hour period where the eighth digit of the E-Coder is incremented by one. No leak status flag is set for an installation if less than 50 15-minute intervals indicate a change in the eighth digit. An intermittent leak flag is set when 50 to 95 15-minute intervals indicate a change in the eighth digit. A continuous leak flag is set when all 96 15-minute intervals indicate a change in the eighth digit.

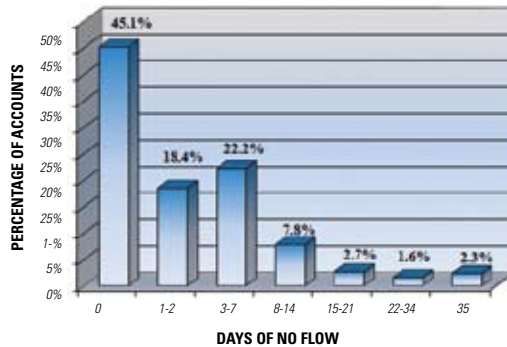


The “leak status in the last 24-hour period” for all 901 accounts is shown in the Leak Status graph. Of the 901 accounts read, 14.8 percent (or 133 accounts) developed either an intermittent leak or a continuous leak.

As an example, if a continuous leak of 1/16 gpm occurred (a small leak), this would equate to 90 gallons of water passing through a single meter in one (1) day. Extending this number to all 61 meters showing a continuous leak status would bring the total water leakage to 192,150 gallons in the last 35 days.

**Days of Zero Consumption**

Another very interesting statistic is found when analyzing the number of meters not showing any consumption during the past 35 days (see Days of No Flow graph). Of the 901 meters read, 55.0 percent (or 495 accounts) indicate a number of days (from 1 to 35 days) of no flow. Importantly, 2.3 percent (or 21 accounts) show a status of zero consumption over the last 35 days. Zero consumption can be attributed but is not limited to the following three things:

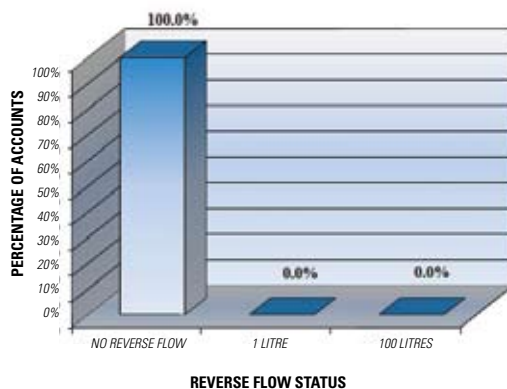


- The account is legitimately not using water because the building or house is temporarily vacant;
- The meter has stopped due to excess debris within its measuring chamber; or
- The meter has been bypassed or removed.

**Reverse Flow Events**

As part of a backflow prevention program or to determine if a reverse flow event has occurred, the reverse flow detection feature of the E-Coder will provide this valuable information in an efficient and effective manner.

As depicted in the Reverse Flow Status graph, there are no accounts where a reverse flow has occurred in the last 35 days. A reverse flow event for these meters would indicate one of two things:



- The meter has been oriented in the incorrect direction; or
- The meter is in the correct direction but a possible cross connection may exist allowing a backflow event to occur.

The latter of the two scenarios could indicate either a failure of an installed backflow device or, where no backflow device is installed, that a cross connection may exist for the account. The E-Coder’s detection of a true backflow occurrence is of significant value – without it, backflow occurrences may go undetected or the failure of a backflow device may go unnoticed until the point of testing.

Many utilities recognize the value of reading their meters more frequently but lack the resources to implement such practices. Today the solution is simple and the trend is clear – utilities are opting to use AMR technology to achieve these goals. The Town of Vulcan implemented radio frequency AMR technology as its answer but also implemented it using the value-added features of the E-Coder/R900i integrated RF encoder. The percentage of AMR utilized in water meter projects in Canada is on the rise and for many of Neptune Canada’s projects – like that at Vulcan – the E-Coder/R900i is the technology of choice.

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