Case Study:  
CITY OF MONTREAL  
CATCHING THE LEAKS: The City of Montreal and Pure Technologies locate known leaks on Pine Avenue

- Sahara® Leak Detection  
- March 2012

<table>
<thead>
<tr>
<th></th>
<th>PIPE MATERIAL</th>
<th>LENGTH</th>
<th>DIAMETER</th>
<th>TRANSMISSION TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cage and Cylinder Pipe (Type of RCCP)</td>
<td>1.3 kilometres</td>
<td>34-inch</td>
<td>Potable Water</td>
</tr>
</tbody>
</table>

Program Benefits

- 9 leaks located in 1.3 kilometres of large-diameter inspection
- Non-intrusive technologies were unable to locate the known leaks during previous inspections
Pure Technologies has been working with the City of Montreal’s potable water transmission division on a pipeline assessment program since 2007 that has included electromagnetic (EM) inspection, acoustic monitoring and a small leak detection program using the Sahara® platform. Recently, Pure was contracted to perform leak detection on an 80-year-old cage and cylinder Bonna-type water transmission main in downtown Montreal. The cage and cylinder pipe on Pine Avenue is 34-inches and is a variation of Reinforced Concrete Cylinder Pipe (RCCP). The inspection was performed in February 2012 and subsequent pipeline repairs were done in August 2012.

**CHALLENGE:**
The Pine Avenue pipeline had known leaks and is a critical supply of potable water to the western portion of a major sector in the city, making it important to locate and repair the suspected leaks. After unsuccessful attempts to locate the leaks using non-intrusive techniques, the City of Montreal decided to use Pure’s Sahara technology.

**SOLUTION:**
The City of Montreal had an existing relationship with Pure Technologies, which encouraged them to try the Sahara leak detection platform to locate the leaks. The Sahara platform is a non-destructive leak detection tool that is pulled by the water flow by a small drag chute. When the sensor is inserted into a tap, it remains tethered to the surface to allow for confirmation of suspected leaks. The sensor is also tracked along the surface, allowing for precise marking of leaks in real time.

**PROCEDURE:**
There was significant traffic control required during the inspections as the pipeline runs beneath a busy road in downtown Montreal. To avoid major commuter disruption, the City of Montreal rerouted traffic and thoroughly planned the inspection to avoid high traffic times - for example, starting the inspection in the mid-morning when traffic slows as opposed to during morning rush hour. The City of Montreal did an excellent job minimizing disruptions by completing inspections in a flexible manner, often working outside of typical business hours. During any tethered inspection, there are unavoidable environmental challenges that require adjustments. Water mains will sometimes run under a busy highway or an environmental obstacle like a river, making it unsafe for the staff member on the ground to track the Sahara and mark the exact leak location. In this case, the operator needs to review potential leaks more closely by winching the tool back and forth to determine the exact location using the inline video. Sahara also requires close control of the flow rate to ensure the tool reaches its full intended distance. To achieve this and maximize efficiency, Pure’s staff worked closely with the City throughout the inspections to control flow rates.

An added benefit of Sahara over non-intrusive leak detection platforms is that it allows for real time location of leaks, cracks and gas pockets. This eliminates the need for data analysis and allows problems to be mitigated quickly after the inspection. Also, because the tool can be winched back and forth when a leak is suspected, it is usually possible to find precise leak locations on even the most challenging areas on a pipeline.

**RESULTS:**
This Sahara inspection on the 34-inch Pine Avenue pipeline in Montreal was extremely successful, locating nine leaks in the 1.3 kilometres of inspection. The City of Montreal was expecting one major leak and possibly another minor one and was surprised at the number of leaks identified. The use of Sahara leak detection identified and located nine leaks, qualifying them as being from small to large. In August 2012, all nine leaks were excavated for repair. All of the located leaks also had a size that corresponded with the estimates made by Pure Technologies.