

STOPPING THE BLEED

City Decides to Renew Instead of Loop a Dead End Main

By Mike Kezdi

AFTER THREE YEARS

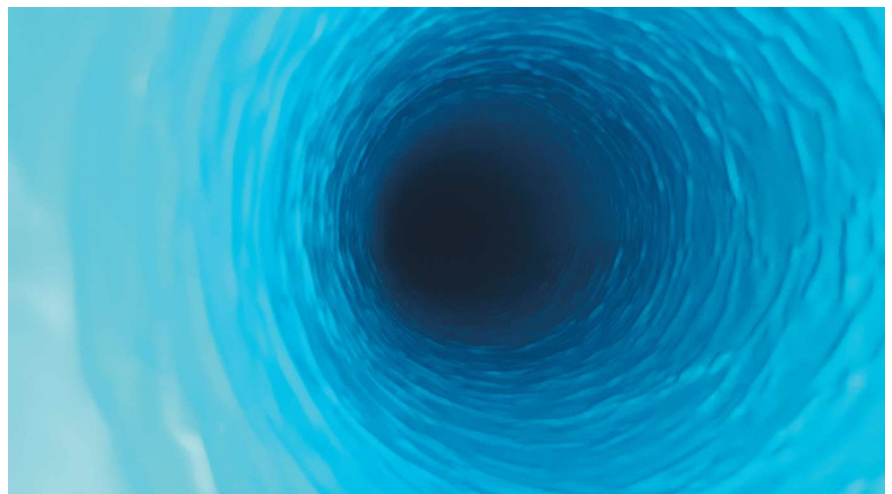
of development and testing, the first five installations using the Tomahawk BluKote Airborne Lining System are in the ground in Ontario and Quebec. The projects were completed from June to October by Logistique Saint-Laurent, an Enterprise of the Gilbert Group.

The first project, completed in June, involved the relining of 460 m of 150 mm cast and ductile iron watermain, with some PVC repair sleeves, in North Bay, Ontario. The line in question was a dead-end line servicing a small residential area and three large commercial properties along Graham Drive.

Developed by Envirologics Engineering Inc., in Bracebridge, Ontario, the Tomahawk System initially hit the market as a cleaning system that uses rocks as the abrasive and air flow to pull the rocks and debris through the line cleaning and drying it with little to no water. Envirologics added a disinfection system and now the airborne lining. Logistique Saint-Laurent is the first licensee of the Tomahawk BluKote Airborne Lining System.

To help facilitate bringing the product from the lab to the general public — in real-life scenarios — Logistique Saint-Laurent received assistance through the Federal Government's Build in Canada Innovation Program (BCIP). According to Stephane Joseph, project lead with Logistique Saint-Laurent, the company received approximately \$500,000 to spread across the five projects.

These images — from top to bottom — show the deplorable condition of the Graham Drive watermain before the project, the main after Tomahawk cleaning and again following the application of the Tomahawk BluKote.



“BCIP allows us to show the technology and results in live situations, so future clients can see actual results,” Joseph says. “Customers want to see these innovations in real-life situations outside of the lab.”

Bleeding the Line

Like many of the other watermains in the North Bay system, the Graham Drive line was heavily tuberculated leading to capacity and water quality issues, as well as leaks and breaks due to corrosion and aging. Because the line is a dead-end it suffered from sub-par chlorine concentrations making water quality a major issue for the users.

To help combat this the City installed a bleeder line at the end of the pipe, which on its initial installation was only meant to run on a timer. In reality, because the water quality was so poor, the bleeder ran approximately 23 hours a day, seven days a week. Not only is this a waste of clean water at a considerable cost, it was also running into a sanitary line, where the city incurred additional retreatment costs.

In North Bay’s scenario the use of the Tomahawk System provided a cost savings from its original plans for the watermain on Graham Drive. Before Joseph approached the City about using the system, its original plan was to add a loop to the end of the line connecting it to an adjacent neighbourhood.

“We were in the process of trying to work out an easement with one of the companies at the end of the line and we were going to loop through to an adjoining system in a residential area. Then we were presented with this option from Logistique Saint-Laurent,” says Domenic Schiavone, director of Public Works for North Bay. “When we looked at the cost of the loop, it involved a lot of rock removal. We opted to try the trenchless technology.”

Schiavone estimates that the loop line would have cost the city \$500,000 at the least. With this trenchless option and its BCIP fund-

ing, North Bay handled the bypass and excavation of the lining pits, providing a considerable savings. At this time the bleeder is still on the line, but it only runs for 20 minutes about every two hours and Schiavone is optimistic that it will be removed from the line all together.

Tomahawk in Action

The Tomahawk System requires two vehicles — an abrasive and coating delivery trailer and a positive displacement vacuum truck to provide the airstream — and a four-person crew to handle the work. Following the Tomahawk Cleaning and inspection with the Tomahawk Scout CCTV camera, the same trailer and vacuum truck rigging is used to move the BluKote through the line. Any residual BluKote is collected in a material outlet and does not make its way into the vacuum truck.

BluKote is an AWWA Class 1 non-structural liner that meets NSF/ANSI 61 certification for drinking water. The two-part resin is poured into the line at the trailer end and the vacuum truck sucks the resin, along with the Distributive Body (DB), through the pipe. The DB is tethered to a winch in the trailer and helps distribute the BluKote evenly throughout the line. Because the system uses the airstream, BluKote also fills pits and joints and evenly wraps around service connections.

“We can line 100 mm, 150 mm and 200 mm lines, which make up about 75 per cent of the distribution pipes in North America,” says Brian Thorogood, general manager, Envirolitics. “The North Bay project also allowed us to test lining a longer stretch and lining in both directions.”

Because the pilot projects and lab tests were completed on shorter section of lines, Thorogood says that the North Bay project offered Envirolitics and Logistique Saint-Laurent the opportunity to test the length that can be lined. Preliminary tests indicate that 107 m of 150 mm diameter watermain can be lined without interruption. The team was able to line

up to a 115 m stretch of a 135 m section. To cover the entire length the equipment was turned around and lined in the opposite direction.

“We also lined it from both directions because we know there is a limit to the length that can be lined, because we have to mix the material onsite and pour it in and begin fighting a cure time,” Thorogood says. “We wanted to try lining from both ends because if we have a longer pipe that we knew we couldn’t apply in one shot, we wanted to make sure we could line it from both ends.”

When looking at the video, Joseph says that you cannot see where the sections meet indicating an even coating. To line more than 115 m the crew will adjust the DB and modify the airflow and that was tested on the other BCIP projects.

The team also lined through some abandoned valves with no problem and through PVC transitions where the watermain was repaired over time. They also found that all leaky services to the watermain must be repaired prior to application as any moisture in the watermain inhibits proper bonding.

According to Joseph, the crew took all of this information learned and has used it on the subsequent BCIP lining projects in Huntsville, Ontario; and Sherbrooke, Saguenay and Alma, Quebec.

At the end of the project the watermain was disinfected and the team is confident that it has inhibited further corrosion of this watermain, as well as restored the water quality and hydraulic capacity of this line for years to come.

Mike Kezdi is associate editor of *Trenchless Technology Canada*.