

WHEN WILL IT END?

A Manitoba contractor tackles a huge jetting and vacuum cleaning job on a trunk sewer line buried 130 feet down

By **Scottie Dayton**

A crew from the City of Edmonton, Alberta, was tunneling under the North Saskatchewan River to connect a sewer line on the east side with an 8-foot combined sewer trunk line on the west side.

Installed in 1993, the trunk line had never entered service, but did function as an overflow during heavy rains. A downstream baffle plate restricted the flow to 36 inches, backing up the water and giving the treatment plant time to handle the additional flow.

Thirteen years of debris had dammed the head of the two-mile trunk line. Before tying into it, the city wanted to send down two men to investigate its condition. The 130-foot deep line has a bend, manholes are 4,000 feet apart, and the men feared that if the upstream blockage let go, they could be seriously injured.

City engineer Ray Davies turned to Insituform Technologies Inc. for advice and was referred to Morris Baziuk, owner of Uni-Jet Industrial Pipe Services Ltd. in Winnipeg, Manitoba, a specialist in cleaning large pipes. When Baziuk and general manager Murray Rach evaluated the situation, fall temperatures and time restraints kept them from cleaning the entire line.

“We were operating the vacuum hose attached to the boom truck with the remote control in the camera van, and using the camera to see what we were doing with the hose. It was quite a learning experience.”

Murray Rach

“Based on the remaining time we had, we agreed to clean the 12-foot manhole chamber and 500 feet downstream,” says Rach. “We had never worked this deep before either.” Initial attacks on the debris failed, launching Uni-Jet into battle with long, heavy, compacted accumulations of fibrous decomposed material. Using proprietary equipment and vehicles, the company emerged victorious.

Into the dark

Baziuk and seven others drove a camera van, two jet trucks, a vacuum tanker, two vacuum trucks, a boom truck, and a service vehicle 16 hours to Edmonton. All work was done through the line’s topmost 36-inch manhole. No flow came in from behind it.

From its 1.5-foot high riser, the manhole opened to 8 feet for 30 feet down before widening to a 12-foot shaft. The crew built a special platform with a safety railing over the manhole. Two sleeves in the floor enabled them to insert the hoist arms.

“We hung our equipment off these arms,” says Rach. “One held the cable winch on which we suspended a Pearpoint P494 40:1 zoom pan-and-tilt color camera with light head. At 130 feet down, it’s a black hole, and we couldn’t see anything without that camera.” The whole job was completed without a confined space entry.

The first challenge was to find the trunk line. At 108 feet, the camera encountered water, sludge, and debris. Subtracting that number from 130 feet meant removing 14 feet of material to reach the top of the 8-foot pipe.

The fenced-in job site shows all equipment needed for the cleaning and repair job.



A Uni-Jet crew begins to pull out the record-setting 28-foot long section of fibrous material.

Lowering a 6-inch submersible pump with its hydraulic hoses to that depth was not easy. “You don’t know how far 130 feet is until you start dropping stuff down the hole,” says Rach. The pump ran five minutes before debris clogged it. Plan B was to pump and vacuum simultaneously. The boom truck lowered the pump, hoses, and 6-inch discharge pipe coupled together in 25-foot sections. When the pump was activated, the score was Debris 2, Uni-Jet 0. “We tried three different pumps and the fibrous material clogged every one,” says Rach. The team then spent three days developing a new strategy.

Frustration times two

The plan was to lower two flushers fitted with Uni-Jet’s proprietary nozzles into the chamber, then blast the fiber and debris with 330 gpm at 2,000 psi to break them up. The two vacuum trucks, each with Roots blowers rated at 5,200 cfm/27 inches Hg, were hooked to the 10,000-gallon vacuum tanker with boom.

“We started with an 8-inch vacuum pipe, then switched to 10-inch,” Rach says. “We spent two days vacuuming and sucking, as more water and debris kept replacing the volume just removed.”

TOUGH JOB

PROJECT:

Clean a manhole and 500 feet of 8-foot combined sewer packed with fibrous material at a depth of 130 feet

CONTRACTOR:

**Uni-Jet Industrial Pipe Services Ltd.,
Winnipeg, Manitoba**

CUSTOMER:

City of Edmonton, Alberta

EQUIPMENT:

P494 40:1 zoom pan-and-tilt color camera with light head from Pearpoint; proprietary equipment and vehicles from Uni-Jet

RESULT:

Blockage removed and sewer cleaned

When they found the top of the pipe, they discovered that it was full of sludge. Vacuuming the sludge soon plugged the 8-inch hose with a tangle of fibers that was difficult to remove. They switched to the 10-inch hose and went back to jetting and vacuuming.

The two vacuum trucks produced 10,000 cfm pulled through the 10-inch hose hooked to the vacuum tanker. To help force the goo up from the depths, they added a 350-hp air compressor to blow





Darrin Walker, Chris Hunter, Kurt Gretsinger, and Larry Burbella lower a camera into the manhole to watch the vacuuming process 130 feet below.



The 28-foot length of fibrous debris completely free of the manhole.

120 psi at 350 cfm through two venturis into the bottom of the vacuum hose.

“We were down 122 feet and didn’t have a lot of control over the vacuum hose or where we could put it in the 12-foot chamber,” says Rach. “We were operating the vacuum hose attached to the boom truck with the remote control in the camera van, and using the camera to see what we were doing with the hose. It was quite a learning experience.”

The hardest part was agitating and liquefying the combined sewage, tar, and decomposing material so that it would flow. “This stuff wasn’t sand and gravel,” says Rach. “Some fibrous material was too large for the vacuum pipes, so we

used the boom truck. When we started pulling it out, we wondered where it ended. The record-setting piece was 28 feet long, 16 inches in diameter, and full of everything you’d find in a combined sewer.”

With the fibrous material extracted, the team resumed jetting and vacuuming. The jet trucks held 700 feet of hose, of which 125 feet dangled down the manhole. The rest was shot into the pipe, and cleaning proceeded backward. As the level of material dropped, the sewer’s slope allowed liquids to flow back to the manhole.

Liquids were discharged into a combined sewer line 150 feet away, and 300 cubic yards of solid debris was transported to a landfill. The routine of jet and vacuum continued until the pipe was clean and video inspected. The entire project took 14 days.

In summer 2007, Uni-Jet’s team will return to clean the remaining two miles of line. The longest run is 4,000 feet between manholes. Uni-Jet has built a special hose reel to handle enough dual 1.25-inch sewer hose to clean 2,200 feet upstream and 2,200 feet downstream. ■

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