

Digging a Better Ditch

Landowners angry about pipeline ditches being carved into their properties gave companies a choice: Do better or stay out. BY GEOFFREY MORGAN

Devon Canada had a massive problem in the spring of 2007. After years of drought, the Grande Prairie area had accumulated three metres of snow over the winter – about double the city’s average yearly snowfall. “Come spring breakup, that altered the water table significantly in the area,” says Marc LaBerge, Devon’s construction lead. Changes to the water table meant Devon’s trench lines sank, forming depressions along the company’s pipelines throughout north-west Alberta. “What happened is the soils overtop of the pipelines started sinking, and you could get corrections of anywhere from six inches to a foot-and-a-half deep,” LaBerge says. Farmers and ranchers were furious that ditches were hurting their crop yields, and an increasing number were refusing to allow pipeline construction on their land. The depressions were deep and long enough that the company had to fix entire quarter sections of land. The bills began to pile up.

Albertan companies like Devon operate more than 380,000 kilometres of pipeline carrying liquids and natural gas across the province. In 2009, the value of those assets was \$31.6 billion. The Canadian Energy Pipeline Association says \$1.6 billion is spent on pipeline maintenance and operation each year. For Devon, maintenance costs become even more frustrating when the same pipeline and the same ditches need to be repaired

multiple times. LaBerge says the problems his company faced in 2007 were a major irritant. “We started getting these complaints and we didn’t know what we were doing wrong.”

Devon wasn’t the only pipeline operator to have problems in 2007. That spring and summer, contractors all around Grande Prairie were busy repairing sunken ditch lines. The problem had become apparent a year earlier to Doug Kulba, a resource assurance specialist with Alberta Environment. “I would issue [a non-compliance directive] and then the following day the same contractor would go out and make the same mistake,” he says. But Kulba didn’t think contractors were working carelessly. “The industry was doing the best they could with

of things because any businessman feels he needs a competitive advantage.”

To improve his company’s construction technique, Galbreath started meeting with Kulba. They toured pipeline sites north of Grande Prairie in the forested Saddle Hills region where water erosion formed ditches. The first problem they identified was that companies were digging trenches a metre wide to install a pipe 30 centimetres or less in diameter. Companies were also cutting down 15-metre-wide swaths of trees and pulling the root structures out of the ground to smooth rights-of-way for construction equipment. In 2006, Galbreath and Kulba started to develop a new process, called Innovative Pipeline Strategies (IPS), and changed all that.

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the knowledge, tools and technology that they had available.” The problem, he says, is that companies were working towards the government’s minimum standards. “We needed to go beyond compliance.”

Randy Galbreath, president and CEO of Stratus Pipelines, also recognized the need for a change. Stratus is a pipeline contractor based in Grande Prairie. He decided to partner with Kulba and rethink his company’s construction technique. “It was a huge leap of faith,” he says, “[but] we do these sorts

Galbreath says he invested about \$1.5 million in developing the new process. “It was probably more money than I should have spent,” he says. Despite the cost, he is happy with the outcome. In forests, Stratus Pipelines now digs narrower trenches and so cuts fewer trees for narrower rights-of-way. The company also leaves tree roots in place, which means trees grow back in less time in the rights-of-way. The tree roots act as a barrier against water erosion, reducing the danger of sunken trench lines.

“There’s this whole system where everything is dependent on each other,” Kulba says. “So when we reduced the disturbance in one area, we saw efficiencies in others.” Devon Canada, which installs 150 to 200 kilometres of pipeline a year, joined Kulba and Galbreath in 2007. LaBerge says that by narrowing the company’s trenches, cutting fewer trees and saving existing root structures, “we’ve reduced our impact by about 80 per cent.” More importantly, Devon reports that the changes are saving money in long-term repair costs both in forested areas and on agricultural lands.

With farmers upset, improving pipeline construction techniques on farmlands was critical for Devon. To fix the problem, Kulba, Galbreath and LaBerge started by digging a narrower ditch and adding a new requirement: all the soil that came out of a ditch needed to go back in after the pipe was in. Industry practice had been (and still is, for most companies) to distribute excess soil around a trench rather than compact it to the point where everything fits in the hole along with the pipe. “If you don’t compact it, what you end up with is 30 to 40 per cent of the soil that you excavated not going back into the ditch line,” LaBerge says. Ensuring that the soils are compacted – and that the clay and

topsoil are replaced in the right order – has saved Devon millions of dollars on remediating sunken ditch lines, LaBerge says.

The spring of 2011 could have been another disaster for Devon Canada in Grande Prairie. “Last winter we did some significant pipelining in some very steep terrain, and in the spring, the area had a huge amount of rainfall,” LaBerge says. More than 15 centimetres of rain fell in two days. “They called it a local hurricane.”

The rainfall let Devon compare the effectiveness of the IPS with conventional methods. “On the stuff that we did out there, we should have – had we used conventional methods – had significant pipeline issues,”

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– Doug Kulba, resource assurance specialist, Alberta Environment

LaBerge says. Instead, both Devon and its contractor, Stratus, say the depressions in the ditch lines were negligible. “Unfortunately for our peers in the area, most of their pipelines had the soils above them completely eroded. Their pipelines were exposed and they had huge issues with soil in water crossings,” LaBerge says.

Galbreath says he went out to inspect the pipelines his company had built over the winter. “There was a competitor right beside us and he had places where the depression was four feet wide and two feet deep from the erosion,” he says. “Ours didn’t look perfect, but it wasn’t bad. There could have been some really serious issues.”

Devon has made the IPS system the company standard in Canada. It’s the only company to adopt the system at a national level, despite the significant cost savings. “The beauty of all this is that it’s not rocket science. It’s some basic principles that are put in place, planned around, executed on and then pay dividends immediately.” LaBerge says the cost of building a pipeline

using IPS is cheaper and more efficient, not just “greener,” and the savings compound every year. “From an economics standpoint, we’ve learned this pays dividends year after year after year,” LaBerge says. “You do it once, you do it right the first time, and then you don’t have these ongoing issues going forward.” **AV**

CROSSING GUARDS

Doug Kulba and Randy Galbreath aren’t the only people in the pipeline business who are developing innovative new strategies. Take BPC, a directional driller working on pipeline projects from Rocky Mountain House to southwest Manitoba. In the past, directional drilling was used as a construction method when pipeline routes crossed railways and highways. But Martin Campbell, BPC’s trenchless pipeline manager, says an increasing number of farmers and ranchers are asking

(or demanding) that companies use horizontal drilling to dig trenches on agricultural lands, as well. “Our biggest advantage is minimum disturbance,” Campbell says. “After this type of construction, there is no concern about lost topsoil or pipeline settlement – all of those issues that come with digging a hole.”

Then there’s Complete Crossings International (CCI) of Cochrane, which has lent its expertise in pipeline construction across rivers and streams.

Brent Goerz, a principal with the firm, says in days past, running a pipeline through a stream meant construction crews would work directly in the water. “They would ditch through the crossing, build a trench, put in a pipeline and then backfill,” he says. “There was a lot of in-stream activity and a lot of impact to the water quality.”

Today, pipelines that cross streams and rivers are generally installed by directional drilling contractors. CCI consults on

pipeline planning and construction projects and specializes in finding locations where pipelines can cross rivers with minimal environmental disturbance. “Major pipeline routes depend on how effectively they can cross a river,” Goerz says. “There are a number of rivers in northeastern B.C. where there’s one suitable location within 10 or 20 miles.” His company works with major pipeline operators like Enbridge and has consulted on river crossings as far away as Australia.