Hydro-Fracturing

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Plagued by a crummy well? Here's something to consider before shelling out for a new one.

Rural residents know first-hand how a low-producing well is more than just an inconvenience. "You wouldn't believe the number of people who can't do their laundry and have a shower on the same day," says Troy Hughson with Ontario Water Well Fracturing in Inverary, Ontario. "Or who take their laundry to the laundromat because there isn't enough water to do it at home."

Mike Welsby of Duncan, B.C., concurs. "At first, we didn't know how little the well was producing so we installed a 1,000-gallon storage tank. But we couldn't keep the tank filled with enough water for family use," he says. Eventually, a water meter revealed that his well yielded a mere 455 litres of water each day, or 1/8 of a gallon per minute (g/m). That was pretty paltry, considering that the average Canadian consumes 329 litres a day and 1 g/m produces 1,440 gallons in 24 hours. Mike needed to revive his well and fast. The solution? Hydro-fracturing.

Originally developed for the oil and gas industry, hydro-fracturing (also known as hydro fracking or well-water fracturing) works by using high-pressure water to flush the sediment and sand out of existing fissures (or open new ones) in the bedrock aquifer supplying water to a well. Once other causes of low water yields have been eliminated, such as partial plugging of the well bottom or mechanical pump failure, hydro-fracturing can be a cost-effective alternative to deepening an existing well or drilling a new one that may also be as dry as the first.

"I did one in North Bay [Ontario] years ago and the owner had five dry wells and the driller was coming to do the sixth," says Hughson. "The wells were all 450 feet to 500 feet deep. He had somewhere between $40,000 and $50,000 in wells. We fractured one well and got water in three."

Hydro-fracturing is less messy and disruptive than drilling anew. It's cheaper too, costing between $2,500 and $4,000, while drilling can run into the tens of thousands. The best candidates are drilled wells in bedrock formations of hard rocks like granite or sandstone, rather than sand and gravel aquifers.

Here's how it's done. One or two "packers"—like four-foot-long rubber and steel balloons—are set and inflated in the well below the casing. Chlorinated water is pumped through the packer at pressures between 1,000 and 4,000 psi (for comparison, a fire hose sprays at between 100 and 300 psi, a car wash around 1,000 psi) and at flow rates of between 65 and 200 g/m causing the pressure in the sealed well below the packer to rise.

When the high pressure suddenly drops, that's a sign the fissures have been opened. The packer is then moved down the well shaft and the process is repeated.

While there are a few contractors in Canada with sophisticated machinery that specialize in hydro-fracturing, most are drillers that have a smaller hydro-fracturing pump on their rig that's used once a well is deemed deep enough to intersect a water-bearing foundation. And when it comes to hydro-fracturing, size matters: the higher the pressure and greater the volume, the more likely you'll be successful.

Hydro-fracturing doesn't come without risks—nearby wells can be temporarily stirred up with muck or discoloured and there's a chance of introducing salt or sulphur to a once clean system. But when it works—and a typical improvement can be double or triple the original output—the difference is life altering. Just ask Mike Welsby, who's now averaging over 1,800 gallons per day or just over 1 g/m. "It certainly saved our well," he says.

"But those aren't the ones that we get really excited about," adds David Slade of Drillwell Enterprises Ltd. in Duncan, B.C. "It's the ones that go from nothing and then to 6 or 8 g/m. Then people are dancing in the street."

FIONA WAGNER

QUESTIONS TO ASK A CONTRACTOR...
...BEFORE HAVING YOUR WELL HYDRO-FRACTURED

- **What is your success rate?**
- **How do you define success? Any increase or a minimum increase, say 1 g/m?**
- **What do you charge? Does the client still pay if there's no increase in water yield?**