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Uranerz, partners drill-test Saskatchewan kimberlite field

By Thomas Brockelbank

Diamond exploration is always a needle-in-a-haystack venture, but the four joint-venture partners looking for gems beneath the Saskatchewan prairies figure they have enough haystacks to make their odds tolerable.

The Fort a la Corne area, 80 km east of Prince Albert, Sask., contains at least 41 (and as many as 71) kimberlites, making it one of the world's greatest concentrations of diamond-bearing rock. The question that remains is: Are there enough gem-quality diamonds to make mining under 100 metres of overburden profitable?

The first accounts of diamonds found in Saskatchewan date back to 1948, when two prospectors claimed to have found five stones near Prince Albert. The diamonds were purportedly lost in a fire before any exploration work was started, and no diamond activity was reported again until 1961. At that time, Max Pellack, together with a partner who had attended a prospecting course while serving time at the Prince Albert Penitentiary, claimed to have discovered diamonds in gravels just north of Prince Albert. Again, these claims were never substantiated.

A DeBeers affiliate explored southern Saskatchewan for diamonds around 1963, but found only indicator minerals. Cameco (TSE) explored for diamonds in the La Ronge area during the mid-1980s, yet to no avail. But when DeBeers subsidiary Monopros began exploring the area in 1987, Uranerz Exploration & Mining finally took notice. The company acquired the 280-sq.-km Fort a la Corne property in 1988.

Uranerz was intrigued by the results of airborne surveys, flown between 1988 and 1992, that revealed 88 magnetic anomalies. Seventy-one of these are considered to be possible kimberlites.

"We thought they may be kimberlites because kimberlites were found on the other side of Prince Albert," Project Manager Rodney Orr of Uranerz told The Northern Miner on a recent tour of the property.

Uranerz formed a joint venture with Cameco and, later, with Monopros. And earlier this year, Vancouver-based junior Kensington Resources (VSE) bought a quarter-share of the joint venture for \$3.4 million. Orr said it was the arrival of Kensington, with its flair for promotion, that helped raise the profile of the project; hitherto, it had attracted far less fanfare than the recent spree of diamond exploration in the Northwest Territories.

"It's a very important project for us," says Kensington President Clive Newall, "perhaps more so than for our partners because we're a small company." Forty-one of the 71 targets drill-tested thus far have been found to be kimberlites. Of these, 22 contain macrodiamonds, which represents more than twice the worldwide ratio of barren to diamondiferous kimberlites.

A total of 540 macrodiamonds, with a combined weight of 28.3 carats, have been recovered at Fort la Corne; among them, a handful of small stones showing impressive color and clarity which were passed around during the site tour. More than 3,000 microdiamonds have also been recovered.

Until 1994, the best individual bulk-sample grade was 23 carats per 100 tonnes, while the best grade estimate for any one kimberlite was 7.7 carats per 100 tonnes. Orr described the grades as "clearly not economic," but added that "they are nonetheless encouraging in that we're getting large numbers of macrodiamonds from a number of different kimberlites."

He explained that grade estimates can be misleading when the amount of rock sampled on a given kimberlite is proportionately small -- an inevitability if exploration costs are to be kept down. Orr's goal is to collect samples that represent at least one-millionth of the mass of each

kimberlite. To illustrate the minuteness of such an amount, he said that if 4 million tonnes of ore-grade kimberlite (100 carats per 100 tonnes) were to occupy the entire mass of Toronto's Skydome, all the gems contained therein would amount to a small pile on the pitcher's mound.

Although none of the initial results is economic, the joint-venture partners believe the project is worth pursuing. Their optimism is based on the fact that a large number of kimberlites are diamondiferous. Moreover, many targets have yet to be tested, and even the drilled kimberlites require further sampling.

Uranerz spokesman Roland Loewer spoke of the great potential of Fort a la Corne that has yet to be tapped.

"We had, from the very beginning, a large number of targets, and even now 40% of our targets are totally untested. The odds are always in your favor when you've got a lot of targets. Statistically, worldwide, one in 300 kimberlites is economic, and we've got 71 to work with!"

The bulk of these are crater-facies Group 1 kimberlites, consisting of sub-aerial volcanoes formed 95 million years ago. Most of the bodies have shallow, saucer-shaped craters, usually fewer than 1,300 metres in diameter and up to 200 metres deep. Root zones have not yet been defined, making them similar to kimberlites found in Zaire.

While most kimberlites around the world consist of pyroclastic-filled pipes and fissures found in Archean-age cratons which outcrop at the surface, the Fort a la Corne pipes were later overlain by thick layers of sediment from an inland sea which once covered central and southern Saskatchewan. As a result, the glacial erosion that wiped away the top of the kimberlites in Russia, South Africa and to some extent in the Northwest Territories never occurred at Fort a la Corne, leading Orr and the project's other geologists to believe the potential size and grade of the kimberlites could be high indeed.

It is not surprising, given the large diameter of the craters, that feeders have yet to be found at Fort a la Corne. And while the absence of feeders would imply that the kimberlites could have been rafted from their original source area by glacial action, the lack of diatremes would be irrelevant as long as economic values of diamonds are found in the craters.

"We've got many, many more tonnes of ore in one of these bodies than you would find in a typical diatreme," Orr said. "The problem in the Territories is that they have the grades and the value of the stones, but they haven't got the tonnage.

"A lot of exploration is luck. Companies [working in the Territories] got lucky faster than we did; we just had too many targets to test. With 70 targets and only so much money per year, you go with the ones you think are the best."

The joint-venture partners got a lucky break themselves, however, in terms of infrastructure. Roads and rails serve the area well, and even cellular phone service is available.

Sample bags are being filled 24 hours a day at each reverse-circulation drill site. The goal this season was to hit eight or nine kimberlites with one hole per body, and at presstime, that program was completed. Holes were drilled both on untested and tested kimberlites, and samples will now be tested for macro- and microdiamond recoveries, and for indicator minerals as well. In addition, ground magnetometer surveys are being carried out.


At the drill site visited by The Northern Miner, drillers pulled up kimberlite in the form of a slurry. Two geologists then examined the material as it was being shot onto a screen through which was passed material less than 0.85 mm in size. All material left on top of the screen was collected in sample bags.

Orr quipped that if each bag contained just one diamond, the project would be a rousing success; such is the uniqueness of diamond exploration.

Ideally, the partners would send all material to the DeBeers lab. However, in order to cut costs, the smallest particles are being ignored.

Drilling costs at Fort a la Corne are high because a considerable amount of overburden overlies the kimberlite. Each hole is drilled down to about 350 metres (including roughly 100 metres of overburden), which can take up to five days. Twenty tonnes of kimberlite are sampled at each site before the drill moves on.

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