

Country updates

Botswana

Kimberlite A15 is located about 25 km east of the Namibia/Botswana border in **Tsodilo Resources'** Newdico license block. The kimberlite lies within the **Nxau Nxau kimberlite field** where 23 kimberlites have been identified to date. The kimberlite is also close (about 15 km) from a diamondiferous kimberlite body anomaly 40/97/07 (drill hole THC 16) discovered in February 1998.

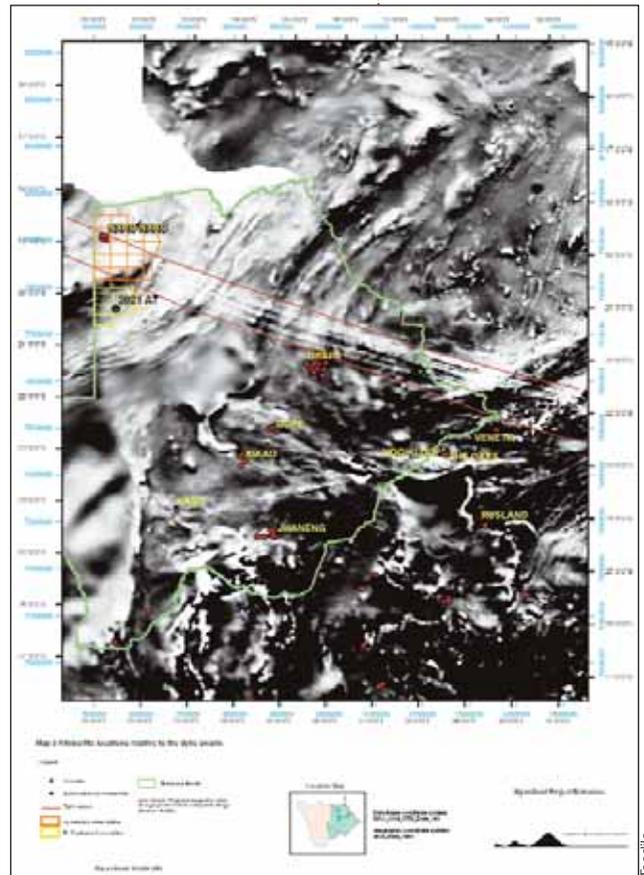
Previous geochemical loam sampling work over A15 resulted in the collection of abundant numerous micro-ilmenite and a lesser amount of kimberlitic garnet grains. Kimberlite A15 has a coincident magnetic and gravity anomaly with a diameter of about 800 m to 1 000 m. The magnetic anomaly is dipolar and roughly circular, indicative of a pipe-like intrusive. The target was initially sampled with a vertical reverse circulation drill hole in October 2004. After drilling through a 34 m-thick section of loose sand and a Kalahari-Formation silcrete, abundant coarse grains of kimberlitic ilmenite, diopside and pyrope up to 5 mm in size were visually identified in altered kimberlite from 34 m depth.

Due to technical problems of drilling with a high groundwater inflow, the drill-hole (A15/1) was stopped at a depth of 116 m still in primary kimberlite. The primary kimberlite appears to be a tuffisitic kimberlite breccia that is altered throughout the section. The tuffisitic kimberlite breccia contains xenoliths of regional shale, quartzite, granite and basalt throughout the section. Due to the favourable mineral chemistry of the A15/1 garnet, ilmenite and chrome diopside, a decision was made to submit a sample of A15 for micro-diamond analysis. In July and August 2005, three additional 200 m holes were drilled in A15 to collect a composite sample for micro-

diamond analysis. Grains of pyrope and diopside from drill-hole A15/4 were also collected for analysis.

A 500 kg sample was collected and sent to the Geoanalytical Laboratories of the Saskatchewan Research Council (SRC) in Saskatchewan, Canada, for processing and micro-diamond analysis. On November 9, 2005, the company was informed by the SRC that due to the carbonate-rich makeup of the samples, reaction with the caustic sodium hydroxide was causing boil-overs and clogging of the 75 micron bottom screen. The SRC recommended switching to a 106 micron screen to process the sample. At the time of going to press, the sample was still being processed.

While collecting grains of pyrope, it was noticed that the abundance of grains with the visual characteristics of megacrystic garnet differed from A15/1 to A15/4. To investigate this, probe mounts containing 307 garnet grains and 25 chrome diopside grains were dispatched to the Euclid Geometrics Laboratory in Kitchener, Ontario, for microprobe analysis.



Kimberlite location relative to the dyke swarm.

Summary of the A15/4 mineral analysis

- The mineral chemistry is characteristic of diamond-rich eclogite-dominant kimberlite
- The Na-rich composition of A15/4 diopside is essentially identical to that of economic kimberlite pipes in Canada (Jericho, NWT) and Russia (Grib, Arkhangelsk), and eclogitic kimberlites in western Africa (Koidu, Sierra Leone) and southern Africa (Koffiefontein, Letseng, Kao, Thaba Putsoa, Matsuko and Orapa)
- Thermometry of the A15/4 diopside using the enstatite solvus indicates at least 42% of grains in the diamond zone. These A15/4 grains were altered, however, and the unaltered diopside of A15/1 indicates at least 58% of grains in the diamond zone
- Both diopside and pyrope have a distinctly reduced crystal chemistry, with low values of

Fe³⁺ indicating a favourable environment for the preservation of diamond, an important factor for grade

- Relative to A15/1, the A15/4 pyrope has far fewer megacrystic grains and far more lherzolitic grains, indicating surges of magma from lower depths in a stratified magma chamber
- The A15 mineral compositions are comparable to those of the diamond-rich Jericho kimberlite, a (Na, Ca)-rich rock in which the diopside is jadeite-rich and the G10/G9 line separating peridotitic pyrope and diamond from pyrope and graphite is shifted towards Ca-rich compositions. This modified plot places 69% of the A15/4 peridotitic garnet and a similar percentage of the eclogitic garnet in the diamond stability field.