Tsodilo Resources starts LDD programme at BK16

Tsodilo Resources, listed on the TSX-V, has started the Large Diameter Drill (LDD) programme on its wholly owned BK16 kimberlite project located in the Orapa Kimberlite Field (OKF) in Botswana. In 2016, the OKF area produced 8,85 million carats.

The diamondiferous BK16 kimberlite pipe – located 37 km east-southeast of the Orapa mine and 25 km north-northeast of the Karowe mine – is approximately 6 hectares in size at surface and is known to contain rare and valuable Type IIa diamonds. The following phases of kimberlite were identified during the 2015 drilling programme: Red volcaniclastic kimberlite VK1, Black VK2, Grey VK3 and VKxxx also referred to as the basalt breccia, country rock breccia (CB) and coherent kimberlite (CK1).

A total of 14 holes will be drilled to a cumulative depth of just over 3 000 m and approximately 2 000 tonnes will be recovered by this process.

This bulk sampling programme will be achieved by drilling 24-inch diameter holes that vary in depth from 96 to 366 m depending on the kimberlite intersections. The holes are spread across the pipe in order to achieve a first pass grade distribution across the kimberlite as outlined by Z Star Mineral Resource Consultants (Cape Town, South Africa).

Pilot NQ size core holes have been drilled adjacent to each proposed LDD hole to ensure that the hole intersections with these large diameter holes and the kimberlite are maximised. This approach will also allow the diamond recoveries to be directly correlated with the geological model once the results are available.

De Wet Drilling's Elephant drill rig on site at BK16.

The LDD programme has been contracted to De Wet Drilling (DWD), which is using its Elephant drill rig. This rig has a direct hydraulic pullback of 120 tonnes and a rotational torque of 100 000 Nm. The slow rpm through its large torque on the rotary action, combined with the weight of the bit and collars, ensures optimum sample recovery with large kimberlite chips. The drill pipe within the drill rods has an internal diameter of 8 inches which results in an efficient fluid reverse circulation flow to minimise diamonds breakage during the drilling process.

The LDD programme will sample the various kimberlite phases every 12 m resulting in 237 samples. The samples will be treated through the company's 10 t/h DMS plant which is positioned just outside Letlhakane. The plant has just been refurbished and upgraded under the direction of independent contractor Phillip Mills, a diamond metallurgist with over 20 years' experience in diamond mining production.

The mobile DMS treatment plant was purchased in March 2015 by Tsodilo's subsidiary, Newdico, from the original owner, De Beers Botswana Prospecting Ltd. The plant was built for De Beers in Kimberley, South Africa and later transported and installed just outside Letlhakane to evaluate the AK6 kimberlite (now the Karowe mine). It was used over several years for the feasibility study of AK6.

The plant is set on a concrete foundation and has been in place at the De Beers Letlhakane Exploration Camp since it arrived from South Africa in 2005. It is connected to the power grid and has access to water through the Debswana pipeline and two local boreholes. A settling dam and a connected overflow dam have been build next to the plant to receive and recycle the water used by the plant into the treatment system.

The plant, which is enclosed by its own security fence, consists of a scrubbing unit, jaw and cone crushers, screening units, a DMS cyclone, a DMS concentrate cage to collect and secure the DMS concentrate, and several conveyor belts that are used to direct the materials to the various sections of the plant.

Office facilities, laboratory and storage containers are adjacent to the plant and within the plant security fencing. The containers are secured and locked and contain all the spares for the plant, additional screens, and miscellaneous equipment. The secure containers will also house the drums that will contain the DMS concentrate from the various samples.

The facility has a capacity to treat some 10 tons per hour (tph) but due to treatment of individual samples with blank samples in between, and with purging and cleaning the circuit between different sample consignments, this is rarely achieved and a production of 5 tph is more realistic for drill samples.

Tsodilo has held the exploration licence over the BK16 kimberlite since 2014. The pipe was discovered by De Beers in the 1970s using soil sampling techniques, airborne magnetics, and ground magnetic surveys. This work was followed up by some drilling and the sinking of a shallow shaft to 36 m in the central part of the pipe. Initial indications were that the kimberlite was diamondiferous but of low grade and no further work was done by De Beers.

The rig has a direct hydraulic pullback of 120 tonnes and a rotational torque of 100 000 Nm.

Over the period 1994 to 2010, several companies held the prospecting rights over the area containing the BK16 kimberlite and various forms of surveying and sampling were employed in an attempt to ascertain whether BK16 was economically viable. However, none of those efforts systematically evaluated the kimberlite to answer the question as to BK16's merits.

Tsodilo believes that much of the above described sampling was done in the upper part of the kimberlite which is characterised by a basalt breccia. Like several of the other Orapa kimberlites, this upper zone of basalt diluted kimberlite is of low grade but the underlying 'cleaner' kimberlite is known to be of higher grade.

Photos courtesy of Tsodilo Resources

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