

Photos courtesy of Stellar Diamonds



Stellar win-win deal

Stellar Diamonds' recent agreement with Octea Mining in Sierra Leone is set to hold tremendous value for shareholders, writes Leon Louw.



Waste stripping in progress at Kundu Central Dyke.



The kimberlite pipes in Sierra Leone have historically produced good and high quality diamonds.

Karl Smithson is no stranger to West Africa: the CEO of exploration company Stellar Diamonds (Stellar) has been doing exploration work in the region for many years. He has been responsible for building Stellar's portfolio of assets within Mano River Resources since 2000. In addition, Smithson led the listing of Stellar on the Alternative Investment Market (AIM) in London through a reverse takeover of West African Diamonds and has over the years successfully raised more than GBP15-million in equity funding for Stellar.

The synergies created because of Smithson's latest deal with Israeli-based Octea Mining (Octea) in Sierra Leone are bound to generate substantial value for Stellar's stock. The company announced earlier this year that it has signed a conditional Tribute Mining Agreement and Revenue Share Agreement with Octea in respect of the Tongo-Tonguma kimberlite diamond project in eastern Sierra Leone.

"The deal will allow Stellar to build a single mine for the simultaneous commercial production from the contiguous Tongo (owned by Stellar) and Tonguma (owned by Octea) kimberlite deposits," says Smithson.



Work on the Kpanebu Dyke in Sierra Leone.

Before the official deal was signed, Canadian company MPH Consulting completed an independent Competent Person's Report, which confirmed the project's initial inferred recoverable resource, and MPH subsequently endorsed the mine plan for the project in October 2016.

The combined Tongo/Tonguma project has an initial 4.5 million carat resource. Due to the high grade of 100 carats per hundred tonnes (cpht) to 260cpht at a size of +1.18mm and high quality diamonds (USD209 per carat (ct) to USD310/ct), the project is considered to be one of the highest value kimberlite ore bodies in Africa on a dollar per tonne basis.

According to Smithson, the 21-year mine plan, with a consistent output of over 200 000 carats per annum and with estimated gross revenues of USD45-million per year at full production, would quantify this development as the second-largest kimberlite diamond mine in West Africa. The Tongo/Tonguma has a modest two-year capital requirement of less than USD32-million to get into full-scale commercial production.

Shareholder benefits

"The benefits for shareholders are quite significant," says Smithson. It will be a much bigger operation with the associated economies of scale, as compared to two separate small mining operations, which

would be effectively in direct competition with each other. "We approached Octea more than a year ago. For Stellar, it really made strategic sense to combine these resources. One big mine offers operational synergies and substantial cost-savings," says Smithson.

The agreement is in fact an asset consolidation with no acquisition cost to Stellar. The two companies will continue to hold their mining licences, but Stellar will invest the capital and operate the enlarged project. Once it has recouped its development capital investment, a 10% revenue share on diamonds sold (after the government royalty has been paid) is paid to Octea. Octea is happy, as the company is taking no financial risk while assured of future revenue. "It's one of those rare win-win situations and it makes perfect strategic and financial sense," says Smithson.

Octea is a private company with an office in the UK. The major shareholder is well-known Israeli diamond mogul Beny Steinmetz. Steinmetz owns BSG Resources, which, through its wholly owned subsidiary BSG Diamonds, operates Sierra Leone's oldest and largest diamond mine, Koidu. Smithson realised that an opportunity existed to combine the two Tongo-Tonguma licenses a year ago when Octea was investing heavily in its Koidu operation through developing it into an underground mining operation, and so, Tonguma was potentially up for grabs.



Measuring the Kundu West Dyke on Stellar Diamonds' mining area during exploration work.



A 709ct diamond discovered in Sierra Leone.

Contractors appointed

Stellar recently appointed Paradigm Project Management (PPM) to prepare the front-end engineering and design (FEED) study for underground development at Tongo–Tonguma. PPM and SRK Consulting completed the preliminary economic assessment (PEA) and mine plan that has justified Stellar's continued investment in the Tongo–Tonguma development.

“PPM is highly experienced in the delivery of diamond mine projects and, together with SRK Consulting, they will refine all elements of the mine plan as determined in the PEA to higher levels of confidence to reduce the project delivery risk. With

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Stellar Diamonds, headed by CEO Karl Smithson, has done extensive exploration work in Sierra Leone.

over 66km of drilling completed at the project to date, we will undertake mine plan related drilling to a depth of 75m concurrent with the FEED study,” says Smithson.

Once work commences on the FEED, it is expected to take about four months to deliver (including drilling), and will mark the onset of the mine development programme. There are eight different kimberlites throughout the license areas, only three of which have been drilled into resource by Stellar and Octea. These three kimberlites are spaced out a couple of kilometers apart, and the ore bodies will be accessed by three separate underground declines. The processing will be done at a single, central dense media separation (DMS) processing facility. According to Smithson, there is a 50 tonnes per hour (tph) processing plant at Koidu, which will be relocated to Tonguma and upgraded to provide the necessary processing capacity for a 200 000 carats per annum operation.

Better defining the resource

Stellar and Octea have jointly spent more than USD45-million on the two licences. “This includes 66km of drilling, so there is a high degree of confidence in the geology,” says Smithson. In addition to the current resource, other kimberlites on the properties have been drilled and bulk sampled, and a further eight million carats is independently defined as exploration target. These can be

converted to resource through further geological testing and can provide significant upside to the current mine plan, which is based on the existing 4.5 million carat resource.

Stellar intends to drill a further 5km of infill drilling along the strike length of the three kimberlites in resource, to better define the geology of the first two levels of mining, down to a depth of around 80m below surface. “Once the FEED is done, the declines, mining levels, and stopes can begin,” says Smithson.

The three kimberlites in resource (4.5 million carats to 200–300m depth) are elongated dykes that have significant strike length and have been drilled in some cases down to 300–400m below surface. They are typical kimberlite dykes that will be mined from underground by shrinkage stoping mining methods. Although common in South Africa, this will be the first such mine in Sierra Leone.

The host rock is competent granite, which will enable clean mining to minimise dilution that can be experienced where the country rock is more friable, for example the Karoo Shales in South Africa. Therefore, Stellar believes that dilution can be well controlled, which will result in a good run of mine (ROM) grade. The in situ grades range from 100cpht to 260cpht at a +1.18mm cut-off, with diamond values ranging from USD209/ct to USD310/ct. Stellar is



Kundu Central Dyke exposed after waste stripping.

using a ROM average diamond value of USD230/ct. The starting operating cost (all in) is estimated at USD74 per tonne, with an operating cost of USD115 per carat. This offers an operating margin of approximately 50%.

Stellar will mine the three kimberlites from three separate declines. At every 35m of vertical depth, there will be a development drive along the kimberlite dyke, with cross-cuts every 10m along strike to intersect the kimberlite and create the stopes to be drilled and mined,” explains Smithson. ROM ore will be transported on an underground rail and dumped into collection bins, from where it will be loaded into articulated dump trucks (ADTs) and transported to the surface for processing.

Underground development

The current mine plan has three declines, each at a depth of about 200m below surface. It will not have vertical shafts. The declines can go deeper as the resource is extended to depth. Standard underground infrastructure will be deployed, with ore transported and loaded onto ADTs and hauled to surface. “Stellar will use an existing 50tph DMS plant that is already in the country and that will upgrade and rehabilitate. This will save us a lot of time and money to get into production,” says Smithson. This plant has enough capacity to process the expected ~300 000t per annum



An aerial view of the Kundu West Dyke, one of Stellar Diamonds’ licensed areas in Sierra Leone.

of ROM production from underground, equating to 200 000 carats per annum on a ROM diluted basis. The processing will be traditional DMS and X-ray recovery.

Existing infrastructure

The site is located about 350km from the capital Freetown. According to Smithson, the first 300km is on good tar roads, with the last 50m a dirt road that the company will maintain. A good camp with workshops and a fuel dump are in place. The camp can house 35 senior staff members. Some mine buildings, like change houses and canteens, for example, will have to be constructed. However, all underground infrastructure development will be new.

According to Smithson, PPM and SRK will run the FEED, after which Stellar will start looking for an engineering, procurement, and construction management (EPCM) contractor. “We will be the owner/operator of the mine. Local contracts like catering, provision of materials, and timber will be given to Sierra Leonean small and medium-sized enterprises (SMEs).”

Once underway, the FEED will take about four to five months to complete. Thereafter, the mine construction will start and the first declines will be constructed, with first ore expected to be produced six months after work on the declines gets underway. At the same time, the 50tph plant will be relocated to site, upgraded, and commissioned.

Despite the fast progress, Smithson says that logistics remain a challenge in Sierra Leone. “There is no mains power or water on site and local road infrastructure needs to be enhanced and maintained,” says Smithson. In addition, managing the expectations of local communities will be necessary.

Sierra Leone has settled down after the devastating Ebola virus crisis in 2014. Stellar’s project will be the first large-scale mining license that has been issued since then. Nevertheless, according to Smithson, the mining sector in the country is still struggling, although there is a lot of new business development and activity. The Stellar Tongo–Tonguma mine development will be a big boost for the Sierra Leonean economy. The mine will employ as many as 1 000 local national staff during the construction phase and the impact on the regional economy will be massive. This is good news for a country where unemployment is estimated at about 70–80%. 🌱