Savannah ups the pace at Mutamba

With its joint venture with Rio Tinto now finalised and in full operation and the ilmenite market emerging from a long slump, AIM-quoted Savannah Resources is moving at speed to develop the Mutamba mineral sands project in Mozambique. Recent drilling has boosted the project's resource base by 900 Mt, a scoping study is virtually complete, environmental studies are well advanced and bids have been invited for the erection and commissioning of a 20 t/h pilot plant on site. Says Savannah's CEO, David Archer: "Assuming all the studies are positive, our goal is to start construction of Mutamba in 2018 and have it in production by late 2019."

Above: A rig working on the Ravene deposit. Based on the recent 107-hole drill programme at Ravene (and earlier Rio Tinto work), the JV announced a maiden resource for the deposit of 900 Mt at 4,1 % THM in March this year.

***Centre:** A drill site at Mutamba. Well over 80 000 m of drilling has been undertaken on the project.*

Pictured on site are (from left): David Archer, CEO of Savannah; Dean Wadsworth, Exploration Manager (Mozambique); Aydin Sen, Project Geologist; Victor Jose, Ministry of Natural Resources, Inhambane; Teodato Cumaio, Geologist; Jose Bata, Geologist; and Paul O'Donoghue, Country Manager Mozambique for Savannah.

The project – which encompasses several separate deposits – is located in Mozambique's Gaza and Inhambane provinces roughly 450 km north-east of the capital of Maputo in an area of well-established infrastructure. The port of Inhambane lies 40 km to the north of the project while the Lindela substation is just 5 km away. Road access is excellent with Mozambique's main north-south (EN1) highway running right through the tenements. Air links are also good with direct flights into Inhambane Airport available from Johannesburg or Maputo.

The interesting point about Mutamba is that it represents an unusual alliance between a relatively small junior – Savannah has a market cap of about £25 million – and one of the world's biggest mining groups. The normal pattern in mining is for a junior to take a project up the value curve before either partnering with or selling off to a major. In the case of Mutamba, the roles have virtually been reversed. Rio Tinto, which carried out a huge amount of work on the project, has entrusted Savannah to develop Mutamba and has further agreed an offtake arrangement to take 100 % of the proposed mine's production.

Explaining the background to the joint venture with Rio, Archer says that Savannah – then known as African Mining & Exploration – acquired a controlling interest in the Jangamo minerals sands project from Matilda Minerals Limitada in 2013. "Jangamo, a 180 km² tenement, was well positioned being adjacent to Mutamba, where Rio had been working since 2002 and which it believed could host a truly world-class resource," he says. "Indeed its publically declared exploration target was 7 to 12 billion tonnes of total heavy minerals (THM) at a 3 to 4,5 % grade.

"We produced a maiden inferred resource at Jangamo of 65 Mt at 4,2 % at the end of 2014 based on a very modest drill programme. While there was no doubt that there was scope for this to be expanded and that Jangamo was probably viable as a standalone project, we were very aware by this stage that combining Jangamo with the Rio ground would make sense as the two projects were both part of the same continuous mineralisation trend. We initiated talks with Rio and in June 2015 we were able to announce a joint venture (JV) whereby the two projects would be combined with Savannah as the operator."

In practice, it took more than another year for the joint venture to become operational with Savannah announcing in October last year a new consortium arrangement allowing the immediate start of JV operations following consultation with the Ministry of Mineral Resources and Energy (MIREM) of Mozambique.

The commercial terms of this JV are substantially the same as those in the original agreement, with Savannah having an initial 10 % beneficial interest in the combined projects with the potential to raise this to 20 % on completion of the scoping study, 35 % on completion of a pre-feasibility study and 51 % on completion of a feasibility study. It also reaffirmed the offtake agreement whereby Rio or an affiliate will take 100 % of production on commercial terms.

As part of the agreement, Savannah – as project operator – has inherited Rio's existing camp, facilities and equipment and also, of course,

An early phase of drilling in late 2013 – prior to the formation of the JV – at the Jangamo deposit.

its vast geological database. As Archer points out, Rio carried out over 80 000 m of drilling at Mutamba producing over 35 000 samples from approximately 4 000 reverse circulation, sonic and auger drill holes. "This work, which represents a huge investment over a period of around 14 years, is a significant asset in itself," he says.

Although the combined project used to be known as Mutamba/Jangamo, it is now known simply as Mutamba, a less cumbersome name which also reflects the fact that what were the original Rio Tinto tenements host the bulk of the resource. At the heart of the project are the Jangamo, Dongane and Ravene deposits, which are contiguous to each other. A fourth deposit, Chilubane, is located 180 km to the south-west. The heavy minerals they host are thought to have been derived from the Limpopo River system over a long period of geological time and reworked along ancient and current coast lines. All the deposits are ilmenite dominant.

Outlining the JV's strategy for developing the deposits, Archer says it will adopt a staged approach with phase one being a low capex, long life, dry mining operation around a potential 200 Mt well graded resource. "The scoping study will give us clarity on the exact level of production but we envisage that phase one would probably produce around 500 000 tonnes per annum of heavy metals concentrate (HMC), containing mainly ilmenite," he says. "The processing would take place in a conventional wet concentrator – essentially a simple gravity plant based on cyclone technology."

Many mineral sands projects also take on-site processing to a second stage in which magnetic and electrostatic methods are used to separate out the individual minerals in the concentrate – ilmenite, zircon and rutile. "The construction of a minerals separation plant is being considered in the scoping study but it would, of course, push up capex considerably," Archer observes.

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On the subject of mining methods, Archer says that the dry mining to be deployed in phase one using standard earthmoving equipment not only reduces capex but also allows a high degree of mining flexibility. "Moreover, one can get into production very fast. Parts of our resource are suited to wet or dredge mining and we certainly don't rule out the method for later phases of the project but dry mining is definitely the preferred approach for phase one."

As an indication of the energy with which Savannah is now tackling Mutamba, it published a mineral resource for the enlarged project within less than a month of signing the JV agreement with Rio Tinto in October last year. This delineated a total resource of 3,5 billion tonnes at 3,8 % THM containing 81 Mt of ilmenite, 2,2 Mt of rutile and 3,8 Mt of zircon, with 52 % in the indicated category and 48 % in the inferred category.

This initial resource was based on the Jangamo and Dongane deposits. In March this year it was further enlarged when Savannah announced a maiden resource for the Ravene deposit of 900 Mt at 4,1 % THM. This represents a 26 % increase in the previously estimated resource and includes a high-grade portion of 92 Mt at 6,2 % THM. With Ravene in the mix, the total Mutamba resource is now 4,4 billion tonnes at 3,9 % THM.

Comments Archer: "There is no question that Mutamba now ranks as a globally significant mineral sands resource. In Africa, it compares favourably with other major east coast deposits such as Moma in northern Mozambique, which has a global resource of 6,5 billion tonnes at 2,9 % THM, and far exceeds others such as Kwale in Kenya, which has 143 Mt at 4,4 % THM. Our resource has considerable scope to grow although there is no urgency to do more drilling as what we have is sufficient to support many years of mining."

The scoping study is being undertaken by TZ Minerals International (TZMI) of Perth, Australia, which was established in 1994 and now ranks as one of the world's leading mineral sands consulting companies. On the environmental side, leading Mozambican environmental consultants ERM and IMPACTO have been appointed to conduct the requisite studies. "We are using two consultancies to speed up the work with ERM being responsible for the three northern deposits – Mutamba Project North – and IMPACTO for the Chilubane deposit," says Archer.

Regarding the 20 t/h pilot plant, Archer says this was inherited from Rio. "It was one of two that were ordered by Rio for the project but never used. One was re-allocated some time back to a mineral sands operation in Madagascar and is operational but the other has simply been sitting in containers near the project area and has now been moved to site. We expect that erection – which will include some earthworks and civils – and commissioning will take several months so it should be operational in the second half of this year. It will allow us to undertake a proof-of-concept bulk sampling programme with the results feeding into our pre-feasibility and feasibility studies."

Savannah's operations at Mutamba are supervised by Country Manager Paul O'Donoghue, who is a fluent speaker of Portuguese and is based in Maputo, while the technical aspects of the project are directed by Dale Ferguson, based in Perth, a geologist whose experience spans exploration, resource delineation, feasibility studies and mine development. The workforce on site at Mutamba currently numbers about 50 people, most of them Mozambican citizens. All the personnel who used to work for Rio directly have been integrated into the JV team.

The exploration camp, originally established by Rio Tinto and now the base for the JV. It suffered some damage when tropical cyclone Dineo made landfall near Inhambane in February this year but the impact on the work of the JV was minor.

Looking ahead, Archer says that the scoping study, if positive, will very likely be followed, without any delay, by the pre-feasibility. "We are very serious about getting this project into production and believe we are doing it at the right time, with ilmenite prices currently on a strong upward trend in response to a supply shortfall that has developed in the market," he says. He adds that the project has strong community support.

While Mutamba is Savannah's flagship, the company has copper/gold assets in Oman and it has also recently acquired two new lithium projects in Finland. From a production standpoint, the projects in Oman are likely to beat Mutamba into production, with mining targeted to start by the end of this year in order to produce first copper concentrate in 2018.

Report by Arthur Tassell, photos courtesy of Savannah Resources