MODERN MINING

May 2022 | Vol 18 No 5

CROWN PUBLICATIONS

For people who are serious about mining

PAN AFRICAN RESOURCES eyes the big league

- **RESOLUTE CONSOLIDATES** and targets future growth
- **LINDI JUMBO GRAPHITE** focused on production this year
- **GOLD REMAINS RESILIENT** amid heightened global uncertainty

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vodacom business

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Vodacom targets mining for integrated IoT, Edge, and analytics solutions as evidenced in its flagging of a 'next-generation' private network offering. See story on page 8.

COMMENT

The party's over

"The party's over for soaring commodity prices, and the descent of most commodities prices is imminent," says Peter Major, director at Mergence Corporate Solutions. This news comes just as we are beginning to get comfortable with surging commodity prices and, if his prediction proves to be correct, it is sad news for all of us, miners, suppliers to the industry, and government coffers.

The windfall from elevated commodity prices has allowed mining houses to pay off debt and return dividends to shareholders, and has done much to prop up the economy. So good has the commodities boon been that Sibanye-Stillwater's board awarded its CEO Neal Froneman an astounding R300 million in 2021.

But if prices are on a downward spiral, it certainly spells bad news for the sector, which has done little to improve its lot in terms of the stranglehold of red-tape.

It is widely believed that South Africa could unlock as much as R100Bn in investment if it cleared the red tape impeding new mining and renewable energy projects that remain in the pipeline. In fact, this red tape coupled with government's reticence to improve the sector, is a key contributor to South Africa being ranked in the world's ten least attractive mining destinations, according to the latest Fraser Institute's Annual Survey of Mining Companies 2021.

The ranking serves as a clear warning that we are headed in the wrong direction if hoping to attract investment in the country's resources sector, the Minerals Council South Africa said.

The Fraser Institute's annual survey ranks countries' attractiveness in terms of policy, mineral potential and other metrics based on the responses from companies operating and exploring in these mining jurisdictions to come up with a report card that governments can use to assess whether their policies are attracting or driving away investment.

According to the Minerals Council, South Africa's ranking in the 2021 Investment Attractiveness Index is the worst since 2009. And, while the country has consistently been in the bottom half of the rankings since 2009, this is the first time it has fallen into the ten least attractive mining destinations.

The backlog of more than 4 000 mining and prospecting rights and mineral right transfer applications within the department is of foremost concern, as is the slow progress to replace the failed SAMRAD cadastral system with a modern, transparent, corruption-free, online system. Both issues are curtailing the much-needed investment in exploration and the development of a junior mining sector, according to the Minerals Council.

Bulk mineral miners lost revenue of R35 billion in 2021 because Transnet did not meet targeted rail movements, and the opportunity cost of Transnet not matching the capacity on its rail network amounted to R50 billion, of which about a third would have flowed into the fiscus in taxes and royalties.

Mining Indaba

The Investing in Mining Indaba 2022 conference was certainly well-attended but there were not many new exploration or early-stage projects on show, nor as many investors as usual in sight.

Modern Mining caught up with Peter Major at the Investing in Mining Indaba and, according to him, the 1-2-1 junior mining investment meetings between investors and junior mining company management teams, were abuzz. However, compared to previous years, fewer projects were showcased and even those on show were definitely skewed towards early-stage gold assets.

On the topic of unlocking opportunity, the Presidents of Zambia and Botswana and the delegation from Saudi Arabia flagged initiatives related to geological mapping in their respective destinations; a sure indication that mining will continue to play a key role in their economies going forward.

One of the highlights of the Mining Indaba was the speech delivered by President Hakiainde Hichilema of Zambia, who made it clear that the time for talk by African leaders about the continent's potential was over, and that the time for delivery was now.

He highlighted his government's commitment to a transparent and predictable investment climate with absolutely no tolerance for corruption. Zambia is currently fixing its mineral licensing system, and has placed a temporary moratorium on the issuing of licences to expedite this process. Now, if the DMRE would take a leaf out of the Zambian president's book and invigorate our lacklustre mining sector, then perhaps we will not remain as laggards in the Fraser Institute's next annual survey. ■

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P O Box 140, Bedfordview, 2008
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Printed by: Tandym Print

Average circulation
January-March 2022: 12 150

African Governments maintain infrastructure spending despite rising debt

African Governments maintained spending on infrastructure, in spite of Covid and rising debt levels. At the same time, West Africa has, for the first time since 2016, led the continent in both the number and value of infrastructure projects.

These are some of the findings of the *Deloitte African Construction Trends 2021 Outlook report*, which tracked infrastructure and capital projects (I&CP) activity across Africa. The report analyses who owns, funds, and builds infrastructure projects.

The number of projects in 2021 increased by 20%, from 385 projects in 2020. The total value of projects under construction increased by 30.7%. Deloitte highlights Transport and Energy & Power projects as having consistently been key contributors to the sectoral mix of projects underway, with the Real Estate sector – most prominently Commercial Real Estate – emerging as a critical sector in recent years.

"African governments continue to play a critical role as owners of infrastructure projects and both public and private investors have managed to help increase spending even through the pandemic," said Alex Moir, industrial products and construction leader at Deloitte Africa. African governments own 73,8% of projects under review.

African Governments have also consistently been the top funders at 31,8%, with international development finance institutions (DFIs) and African DFIs as important financiers too. The share of projects funded by China stood at 10,6% in 2021, the single largest by country or region. China remained the largest builder on the continent with 21,4%.

In this edition, West Africa is, for the first time since 2016, leading by the number and value of projects, with 153 projects valued at $172,8 Bn. Southern Africa recorded the second largest project share by value at $147,7 Bn, followed by North Africa at $132,2 Bn.

East Africa's high growth and economic development saw the region lead by the number of projects annually over the three-year period from 2018. Last year the region recorded 102 projects at $60,6 billion, a decline from 118 projects at $77,7 Bn in 2021.

In the Southern African region, in value terms, the Real Estate sector recorded a share of 52% ($76.7 Bn). The high value of projects in the Real Estate sector was fuelled by investments in some mega projects in Mozambique and South Africa. Industrial Real Estate projects in recent years in Mozambique include the Rovuma LNG Project and the Coral South Floating LNG Projects.

Energy & Power accounted for 27.3% ($40.3 Bn) of the projects underway. Despite the Transport sector having recorded the most projects, the sector came third in value terms, contributing 8.6% ($12.6 Bn) in Southern Africa respectively. ▪

African governments continue to play a critical role as owners of infrastructure projects.

Exploration strategy and exploration implementation plan welcomed

The Minerals Council South Africa has welcomed the publication of the Exploration Strategy and the Exploration Implementation Plan documents by the Department of Mineral Resources and Energy (DMRE).

The Minerals Council will study both documents to analyse and understand what the DMRE has changed since the Minerals Council, the Council for Geoscience and the regulator started negotiating the Exploration Implementation Plan in 2020.

With South Africa ranked for the first time in the 10 least desirable of 84 global mining jurisdictions in the Fraser Institute's Mining Companies Survey 2021, as measured by the Investment Attractiveness Index, the mining industry needs investor-friendly regulations and policies to ensure sustainable, inclusive growth to benefit all stakeholders.

Exploration plan: Minerals Council has welcomed the publication of the Exploration strategy.

One of the most urgent matters for the DMRE to address is the rapid implementation of a transparent, functional, corruption-free, online cadastre system to replace the failed SAMRAD system that has stymied exploration, expansion of the junior mining sector, and growth of the South African mining industry. The Minerals Council and its members have offered financial and technical assistance to the DMRE to urgently implement a readily available, internationally proven, and off-the-shelf solution, the council said. ■

TotalEnergies looks to explore in South-Western coast

As part of its application for Environmental Authorisation (EA) to support exploration activities on the south-western coast of South Africa in Block 5/6/7, TotalEnergies Exploration & Production South Africa (TEEPSA) and its Joint Venture (JV) partners are inviting consultation with interested and affected parties.

Both parties are committed to ensuring all exploration or development activities are subject to the satisfactory completion of an Environmental and Social Impact Assessment (ESIA) and the granting of all required Environmental Authorisations (EAs), the company said.

The EAs will cover the drilling of exploration and development wells, installation of subsea infrastructure for production, as well as the acquisition of geophysical data.

In the long term, if the exploration activities result in the discovery of commercially viable hydrocarbon deposits, then these fields have the potential to make significant contributions to South Africa's energy security, help sustain and generate employment opportunities and support development by enabling participation by local businesses, the company said. ■

TotalEnergies invites consultation ahead of drilling.

Minerals Council CEO Roger Baxter.

SA among the least attractive mining jurisdictions

South Africa's ranking in the world's ten least attractive mining destinations, in the Fraser Institute's Annual Survey of Mining Companies 2021, is deeply disappointing and serves as a warning that we are headed in the wrong direction if aiming to attract investment to the country's resources sector.

The Fraser Institute's annual survey ranks countries' attractiveness in terms of policy, mineral potential and other metrics based on responses from companies operating and exploring in these mining jurisdictions. The survey 'report card' allows governments to assess whether their policies are attracting or driving away investment.

South Africa is slipping sharply down the ranks when measured in the Investment Attractiveness Index, falling to 75 out of the 84 jurisdictions surveyed. This compares to 60th out of 77 in 2020 and 40th out of 76 in the previous year. The Investment Attractiveness Index is weighted 40% by policy and 60% by mineral potential.

South Africa's ranking in the 2021 Investment Attractiveness Index, which is a policy and mineral potential metric, is the worst since 2009. South Africa has consistently been in the bottom half of the rankings since then, but this is the first time it has fallen into the ten least attractive mining destinations.

"We are working closely with Minister Gwede Mantashe, his officials in the Department of Mineral Resources and Energy, other ministers, and the Presidency to address the many challenges mining companies are facing, but we are not gaining the traction or the urgency we'd like to see in resolving these challenges," says Minerals Council CEO, Roger Baxter. ■

Kinross sells Chirano mine in Ghana

Canadian-based gold mining company, Kinross Gold has entered into a sale agreement with Asante Gold to sell its 90% interest in the Chirano mine in Ghana for a total consideration of $225-million in cash and shares. The Ghanaian government has a 10% carried interest in Chirano. Upon closing of the transaction, Kinross will receive $115-million in cash. The transaction is expected to be completed around May 31, 2022. Chirano represented around 3% of Kinross' total mineral reserve estimates as of year-end 2021. ■

Chirano mine in Ghana.

Resolute Mining COO Terry Holohan to be appointed CEO

ASX-listed Resolute Mining has advised that the CEO role will transition to current chief operating officer Terry Holohan following the resignation of Stuart Gale as CEO.

Holohan will formally take over as CEO after Gale leaves the company to pursue an opportunity in the Australia-focused resources sector. Holohan is an experienced mining sector executive with more than 40 years in the industry, including seven years' experience as CEO for two mining companies. Thirty of those years have been spent working in Africa on a range of precious and base metals mining projects. Holohan was appointed as COO in May 2021 and has been instrumental in resetting operations at the company's flagship Syama mine in Mali. ■

Record Q1 Production at Blanket Mine

Caledonia Mining has announced record gold production of 18,515 ounces from the Blanket Mine in Zimbabwe for the quarter ended 31 March 2022. The company expects gold production for 2022 to be between 73,000 and 80,000 ounces.

Commenting on the announcement, Steve Curtis, CEO, said:

"I am delighted that during this quarter we have set a new first quarter production record. 18,515 ounces is ahead of our expectations and reflects the increased capacity at Central Shaft. The ramp-up in production towards our quarterly target of 20,000 ounces means we are on track to meet our annual production target." ■

Blanket Mine.

Completion of sale of Arcadia project

Prospect's MD Sam Hosack.

Prospect Resources has advised that the sale of the Prospect group's 87% interest in the Arcadia Lithium Project to a subsidiary of new energy lithium-ion battery material producer, Zhejiang Huayou Cobalt (Huayou), was completed on 20 April 2022. The transaction was for a cash consideration of some $377.8-million.

Prospect's managing director, Sam Hosack commented: "We are extremely delighted to have successfully completed the transaction with Huayou. I would like to take this opportunity to express a sincere thanks to the Government of Zimbabwe. Without its strong support and vision, we simply would not have been able to complete this transaction, confirming indeed, that Zimbabwe is open for business and is a premier jurisdiction for the burgeoning lithium industry." ■

Building the future of mining through

In light of the current economic climate and recent events surrounding the global political landscape, the mining sector is emerging as an important point of focus. This is in relation to how it can be key to remedying the domestic production power of countries around the world.

Right: Our solutions are aimed at assisting mines to be more sustainable in their day-to-day activities.

Below: Vodacom has targeted mining for integrated IoT, Edge, and analytics solutions.

Never has it been more necessary for our country to have a competitive and sustainable mining industry. South Africa is ranked fifth in the world in terms of mining contribution to Gross Domestic Product (GDP) and it will only be possible to maintain, and improve, this output if technology plays a key role in shifting the cost and efficiency spheres of this sector.

Most, if not all, mines in South Africa presently connect through Wi-Fi and there is a pressing need to move them to Mobile Private Networks. Mobile Private Networks (MPNs) are the next generation of connectivity and yield better speeds and strength than Wi-Fi.

Wi-Fi cannot be scaled to run an operation, whereas an MPN is dedicated to each business through Service Level Agreements (SLAs), security, etc. Many businesses are changing the way they operate through automation of processes and the intelligent allocation of people, technology, and even workspaces.

Vodacom has targeted mining for integrated IoT, Edge, and analytics solutions evidenced in its flagging of a 'next-generation' private network

digitisation

offering. This will comprise converged Mobile Private Networks as well as Edge Computing systems, to name a few, for its key mining business segments in Africa.

More about Vodacom's Mobile Private Networks

Vodacom MPN is an integrated portable, private, and secure network that provides the same speed and strength of Wi-Fi at the business owner's fingertips. Alongside Edge Computing, it bears the potential to revolutionise how businesses are run by bringing the network and the Cloud closer to the devices that need it in a mining operation.

Mobile Private Networks (MPNs) support business-critical services, with a reliable industrial-grade network that is on-premises and can take businesses further in the following ways.

Security

- ❑ Keep your data safe, since it does not leave your site.
- ❑ Access control: Based on a mobile network, MPN provides all the end-user security of a mobile network.
- ❑ Private connectivity: Only your company devices can connect.

High Speed, Low Latency

- ❑ Enables low latency/ultra-reliable low latency (URLL) applications.
- ❑ Allows URLL Cloud-based applications to be located on customer premises.
- ❑ Cloud compute (distributed MEC) enables low latency applications.
- ❑ Connecting your Autonomous Guided Vehicles.

Reliability

- ❑ Assured SLAs with guaranteed QoS and high availability deliver the best performance and minimise downtime.
- ❑ Greater business responsiveness is possible as your data can be collected, analysed, and then acted upon locally without needing to cross the network with Edge Computing.

Scalability

- ❑ Tailored to your requirements – addressing your specific needs now and in the future.
- ❑ Bring compute power closer to application users through Edge Computing, experience the same agility and scalability offered by the public Cloud.

More choice

- ❑ With Edge Computing, you choose where to run your workloads, depending on their specific latency, bandwidth, and data sovereignty requirements.
- ❑ Guaranteed capacity that is dedicated and tailored to your needs.

Cost Saving Performance

- ❑ With local decision-making happening at the edge, non-time-critical data can be streamed to the Cloud when bandwidth needs are lower, leading to improved performance, and cost savings.

Our solutions are aimed at assisting mines to be more sustainable in their day-to-day activities. Let's partner with you to help create a high-performance environment that fits your business. ■

Mobile Private Networks (MPNs) are the next generation of connectivity and yield better speeds and strength than Wi-Fi.

Scan the QR code to learn more, search Vodacom Digital Mine or visit www.vodacombusiness.co.za

Louise Street, senior analyst EMEA at the World Gold Council.

Gold remains resilient amid heightened global uncertainty

The global gold market saw a solid start to 2022, with first quarter demand (excluding OTC) up 34% year-on-year, thanks to strong ETF flows and reflecting gold's status as a safe haven investment during times of geopolitical and economic uncertainty.

Geopolitical crises weighed heavily on the global economy and reinvigorated investor interest, pushing the gold price briefly, and just shy of its all-time high, to $2,070/oz in March. The World Gold Council's latest *Gold Demand Trends Report* reveals gold ETFs had their strongest quarterly inflows of 269t since Q3 2020, more than reversing the 173 t annual net outflow from 2021 and driven in part by the rising gold price. Meanwhile, gold bar and coin demand was 11% above its five-year average at 282 t.

However, renewed lockdowns in China and high prices in Turkey contributed to a 20% year-on-year decline, compared to the very strong Q1 2021.

Turning to the jewellery sector, global gold demand fell 7% year-on-year to 474 t, driven primarily by softer demand in China and India. Despite a strong performance in China over the lunar New Year period, this was later dampened by Covid outbreaks in February and March leading to strict lockdowns as China continues to follow its zero-covid policy.

In India, a fall in the number of weddings and a lack of auspicious days in the first quarter had a direct impact on gold purchasing in the country. This, coupled with rising gold prices globally, prompted many Indian consumers to hold back on their purchases.

The demand for gold in technology hit a four-year high of 82 t, up 1% on Q1 2021. While the sector saw modest growth, it was not free of challenges. Major financial and industrial hubs such as Shanghai were under renewed lockdowns, which impacted the electronics supply chain.

Net buying by central banks more than doubled from the previous quarter, adding over 84 t to official gold reserves during Q1 2022, with buying in the

There has been strong gold mine production in the first quarter of this year.

sector dominated by countries such as Egypt and Turkey. While 29% lower than Q1 2021, central banks continue to value gold's performance during times of uncertainty.

Total gold supply increased by 4% year-on-year. This was driven by strong mine production, which hit 856 t. In addition, recycling rose 15% on the previous year, reaching 310 t in response to higher gold prices.

Louise Street, senior analyst EMEA at the World Gold Council commented: "The first quarter of 2022 has been a turbulent one, marked by geopolitical crises, supply chain difficulties and surging inflation. These global events and market conditions have solidified gold's status as a safe haven holding, not just for investors but also for retail consumers thanks to its unique position as a dual-natured asset class.

"Given the current market dynamics, investment demand is expected to remain strong as the combination of high inflation and heightened geopolitical tensions will likely fuel demand for gold amongst investors. On the other hand, consumers are facing the global cost of living crisis, meaning many will reconsider how they spend their money. While consumer demand has been recovering from covid-inflicted weakness, continued growth in jewellery demand could be stifled by rising costs and a general economic slowdown." ■

Gold bar and coin demand was 11% above its five-year average.

World Gold Council

The World Gold Council is the market development organisation for the gold industry.

Its purpose is to stimulate and sustain demand for gold, provide industry leadership and be the global authority on the gold market.

Pan African Resources eyes the big league

Mid-tier miner Pan African Resources' growth strategy, underpinned by organic growth and advanced acquisition opportunities, will soon see the AIM and JSE-listed gold producer, which currently produces around 200 000 oz of gold per annum, move up the gold production ranks. The dual-listed entity is already busy with initiatives to ramp up production to 250 000 oz in the next three years and 300 000 oz in the next six years, investor relations head Hethen Hira tells *Modern Mining's* Nelendhre Moodley.

"We are currently mining just over 200 000 oz per annum – a recent record production for the Group – and are aiming to increase production to 250 000 oz, which will put us in a totally different mid-tier bracket," says Hira.

Like its peers benefitting from the favourable gold price, Pan African Resources reduced its debt significantly and is reinvesting in its existing operations, bedding down on its tailings acquisition opportunities – Mintails and Blyvoor – and making a play for new Greenfields projects, having recently entered the Sudanese gold sector.

"With the gold price sitting at close to $2000/oz, South African companies are also benefitting greatly from the weaker rand. A gold price of anything above R900 000 per kilogram is fantastic news for Pan African Resources, as our average all in sustaining production cost sits at around R600 000/kg," says Hira.

This bounty has helped the miner significantly lower its debt, reinvest to unlock more gold ounces at its existing operations and return cash to shareholders in the form of dividends.

"There are also sufficient funds in the kitty to buy back shares, as we believe Pan African Resources is

Barberton plant.

Image of 8 shaft at Evander Gold mine.

significantly undervalued, and available debt facilities for expansion and exploration undertakings."

Investing in organic growth

Pan African Resources assets include Barberton Mines, a high-grade operation comprising of Fairview, Consort and Sheba mines; the Barberton Tailings Retreatment Plant (BTRP); and Evander Gold Mining, made up of the Evander underground and surface assets (shaft headgears and metallurgical plants) as well as the Elikhulu Tailings Retreatment Plant.

"We are quite fortunate that we are not a one asset company but have a mix of assets, including tailings (surface remining) and underground operations and have the flexibility to unlock value from these assets to take advantage of the buoyant gold price."

Its near-term assets include the Evander 24, 25 and 26 Level projects, Egoli underground project and the Mintails and Blyvoor tailings opportunities that are currently undergoing feasibility studies.

"Our growth strategy is driven by prudent capital allocation and we are currently focused on organic growth as we have substantial mineral reserves of nearly 10 Moz and 30 Moz in resources. Although we are keeping a close eye on the international acquisition space, our portfolio provides us with sufficient organic growth prospects to keep the company meeting targeted production rates on home ground. The current focus is to upgrade the existing infrastructure at our operations, in particular the Barberton mine assets which have been in existence for more than 130 years. Plans are in place to upgrade and add refrigeration plants and ventilation systems where required at both operations to allow us to continue accessing precious ounces," notes Hira.

Barberton

Although the Barberton mines have an estimated 20 years life of mine within the currently identified mineral resource, the gold miner recently renewed Barberton Mines' mining rights for another 30 years – to 2051 – allowing Pan African Resources scope to implement long-term initiatives to unlock more gold reserves.

Barberton has one of the oldest mines still in operation today, having started mining over 130 years ago. The assets consist of the Fairview, Consort and Sheba underground operations and the BTRP surface operations and is the company's flagship asset consisting of long-life, high-grade operations and a tailings retreatment plant producing some 100 000 oz of gold per year.

"The Barberton orebodies are not a typical Wits orebody but consists of vein-type shear zones. As

10 MW solar plant at the Evander operation.

a result, the early miners followed the gold bearing reefs and mined without a systematic approach. As a result, they did not develop the necessary infrastructure from the outset to mine at depth," explains Hira.

Pan African Resources has since adopted a more systematic approach and is revamping the existing infrastructure to improve efficiencies, unlock ounces at depth and thereby expand the life of the operation.

"In this financial year, Pan African Resources has allocated R150-million to developing additional platforms at Barberton mines and another R300-million for sustaining capital, as well as R290-million allocated in the next year for the development of underground infrastructure which will go a long way to improving efficiencies, the underground working environment and ensure overall improved productivity," says Hira.

Elikhulu gold pour.

Among the initiatives put in place at Barberton mines are the two additional platforms at the Fairview mine, which now provides greater mining flexibility as a result of the increased number of available mining platforms.

"There has always been the concern that if one of the original two existing platforms was under development, this would place greater constraints on the second platform and limit the quantity of ore dispatched from the underground operation," he explains.

Following the completion of the two additional high-grade platforms, the miner is now mining along 358, 256, 257 and 258 platforms of the MRC orebody. Further to this, the company also established three mining platforms at the Rossiter ore-body to enhance output.

Another important initiative underway at Barberton mines is the design and development of a sub-vertical shaft at the Fairview mine which, when complete, will allow increased throughput of between 7 000 oz and 10 000 oz per annum.

"Our initiatives to optimise the existing infrastructure will enable Pan African Resources to improve efficiencies and productivity as we extract more gold ounces," says Hira

Meanwhile, following the news that Pan African Resources had identified a rich vein of gold at the Consort mine, with grades in excess of 300 g/t, the miner has since acquired new geological software to enhance data interpretation and unpack the historical data to identify and generate prospective targets underground. Pan African Resources is currently exploring the significant exploration upside at Consort and has since identified 36 potential targets.

The PC Shaft ore body at Consort contained a "proved mineral reserve of 5 000 tons at an average grade of 25 g/t with initial sampling revealing grades in certain areas in excess of 300 g/t". "The area where the vein has been found has been in operation since 1928 and although it's a small area, it highlights the potential that the orebody offers," notes Hira.

Moreover, the favourable gold price has enabled the miner to unlock opportunities from its lower grade projects, such as the Royal Sheba project, and sees Pan African Resources undertaking bulk sampling to unlock additional ounces.

According to Hira, while not massive, the 1 Moz resource will allow for the conversion to reserves and add some 17 years life to the tailings plant at the BTRP operation.

Barberton Tailings Retreatment Plant

The R325-million Barberton Tailings Retreatment Plant (BTRP), located within the Fairview Mine's footprint area, is designed to treat 100 000 tonnes of tailings per month and adds high margin and low risk ounces to Pan African Resources' production profile, with production capacity of up to 20 000 oz per year, at an AISC of $814/oz in the first half of the 2022 financial year.

BTRP contributes low-cost and low-risk ounces to the groups' production profile, says Hira, adding that the current life of the operation, which is estimated at three years, is set to increase following the incorporation of feed from the Royal Sheba project. "BTRP has the added benefit of turning our

Barberton environmental rehabilitation liabilities into profits."

The miner will invest R75-million to convert BTRP to a hard rock run-of-mine plant, which includes the crusher circuit and conversion of regrind mill to treat 35 000 tpm of Royal Sheba ore.

Barberton tailings re- treatment plant.

Evander Mines

The Evander Mines mining right is valid to 2038, where the African-focused gold producer is progressing developments at the 24, 25 and 26 levels.

"Mining at 8 Shaft pillar has been undertaken in such a way that it will allow us to access greater depths," explains Hira. "In fact, we have found that we can access resources at 24 level from 8 shaft, even going down to 25 and 26 level. This equates to adding another 10 years to the mining operation, producing a further 60 000 ozpa in about three years from now."

Further to this and in line with its focused initiatives to reduce costs and improve efficiencies, the miner achieved all-in-sustaining cost of $983/oz in H1 FY22 at 8 Shaft, making it the lowest cost underground gold mine in South Africa. Gold production from Evander underground in H1 FY22 increased by 116,6% to 27,312 oz (H1 FY21: 12 607oz).

According to Hira, despite the increased number of crews working at Evander targeting higher tonnages, the mine has recorded improved safety rates, and the Group has recorded industry leading safety rates over the past five years.

Elikhulu Tailings Retreatment Plant (Elikhulu)

Pan African Resources is also rolling out a number of initiatives at its Elikhulu Tailings Retreatment Plant (Elikhulu) surface operations located at Evander mines which is delivering at a steady state rate at an all-in-sustaining cost of sub $1000/oz.

The plant processes 1,2 Mt per month of historic tailings from the three existing slimes dams at Kinross, Leslie/Bracken and Winkelhaak, commencing with the Kinross facility. According to Hira, in a bid to lower the miner's ecological footprint, the tailings reprocessing residues will ultimately be redeposed into a single tailing's storage facility site.

"This operation consists of a technologically advanced, automated plant, which means that during the hard lockdowns resulting from the Covid-19 pandemic, our production rates remained relatively stable. Given this high level of automation, even with the reduced staff complement, we were able to continue mining by processing the surface stockpiles," Hira explains.

Pan African Resources' drive to stabilise its energy supply and reduce electricity costs has seen the miner invest in a 10 MW solar plant at its Evander operation, which will feed power to the Elikhulu tailings treatment plant and contribute to the reduction of carbon emissions.

"Following the successful installation of the 10 MW solar photovoltaic renewable energy plant, which has a five-year payback period – less if Eskom continues with above inflation price increases, we are looking at expanding the installed capacity to 22 MW and will use some of the additional energy in the development of the underground expansion projects at Evander 24, 25 and 26 levels," says Hira.

In addition, the miner recently completed the design of the Leslie Bracken pump station and is on the last leg of construction for an overland pipe, scheduled for completion this month. The pump station is earmarked for completion in July 2022.

Egoli – Pan Africa Resources' next big flagship project

With the development of Evander 24, 25 and 26 levels, Pan African Resources R2-billion Egoli project, has been deferred.

According to Hira, mining Evander 24,25 and 26 levels allows the miner to adopt a 'pay as you go' model for the Egoli project.

"In other words, as we mine the next levels of the Evander project, the money gained from the project will pay for some of the development costs of the Egoli project. The capex necessary for the refrigeration, ventilation and development for Evander 24, 25 and 26 level has already been accounted for," explains Hira.

Gold ore produced at Barberton smelter.

Inside Pan African Resources sample test laboratory which is ready to be exported to Sudan.

The Egoli project is a long life, high-margin brownfield project that will capitalise on the Evander mine's existing infrastructure during its development. This synergy has materially reduced Egoli's upfront capital investment, when benchmarked against other development projects of similar scale, and contributes to its compelling and robust economic returns, the company said.

The Egoli project has an initial life of mine of nine years, with annual gold production of around 72 000 oz at an average head grade of 6,61 g/t and a LOM gold production of 17,771 kg.

First gold is expected to be produced about 20 months after construction commences, with ramp up to steady state production over the following 16 months. The project offers an additional geological and operational upside with the firming up of the inferred resources, which could potentially increase the LOM to 14 years.

Bedding down on tailings acquisitions

Following the announcement of the Mintails SA Mogale Gold and Soweto Cluster (MSC) tailings storage facility (TSF) transaction in November 2020, the company has since completed a pre-feasibility study, which has outlined average production of between 50 and 60 000 oz/yr over an 11-year life of mine, and is busy finalising a Definitive Feasibility Study (DFS), led by DRA Global.

The Mintails project has a combined mineral resource of 243 Mt at a grade of 0,30 g/t gold.

"Pan African Resources will acquire the Mintails and Blyvoor assets relatively cheaply; however, much work needs to be done to get the projects ready, including the establishment of new processing plants, the installation of new surface infrastructure and investment in proper security systems. The Mintails areas were badly vandalised, leaving behind a scarred surface, which needs to be rehabilitated."

The company hopes to complete the DFS and subsequent construction of the Mintails asset by 2025, which will allow it to unlock between 50 000 oz and 60 000 oz of gold per annum.

Further to this, Pan African Resources hopes to achieve an additional 40 000 oz to 50 000 ozpa from 2028 onwards from the Blyvoor Gold Operations. The gold miner announced the transaction for the Blyvoor Gold Operations, which includes six historical TSFs with total Mineral Resources of more than 1,4-million ounces of contained gold, in 2021.

"With Mintails 50 000 oz – 60 000 ozpa and Blyvoor operations 40 000 oz – 50 000 ozpa, Pan African Resources can easily achieve its 250 000 – 300 000 ozpa target just from organic growth and local acquisitions," affirms Hira.

Pan African Resources expands its geographical footprint

In March, the local gold miner secured five exploration licences in north-eastern Sudan for a period of three years, with the option to renew for a further two years.

The concessions, covering almost 1 100 km^2 are located within close proximity to Port Sudan, a regional trading and shipping hub.

Ten initial target areas have already been identified for further exploration. From the second quarter of 2022, the company will undertake plans to verify the initial identified targets as well as identify additional targets.

To ensure a limited financial risk outlay, Pan African Resources has earmarked a $7-million for exploration in the first three years on the Sudanese licences.

According to Hira, Sudan is a highly prospective gold mining destination. It produced around 90 tonnes of gold in 2021, making it the third largest gold producer in Africa after Ghana and South Africa, and the tenth largest producer in the world with production in 2021 equivalent to Peru's gold output.

According to CEO Cobus Loots, recently announced investments in Sudan by other international mining companies, including Perseus Mining's $155-million acquisition of Orca Gold, validates the company's views on the region's prospectivity for gold exploration and mining.

There are numerous shallow gold projects in Sudan that are peppered by artisanal activity. "This initiative offers Pan African Resources the opportunity to expand our geographical footprint into a highly prospective gold producing region and will allow for a potentially quick turnaround time-frame for the development of a mining operation to deliver the required ounces," concludes Hira.

Resolute consolidates and targets future growth

Incoming CEO Terry Holohan.

Global market uncertainty continues to fuel demand for commodities, particularly gold, a safe haven commodity that is basking at an attractive price range – around the $2 000/oz mark – and keeping gold producers extremely satisfied. For miners looking to consolidate their portfolios and strengthen their balance sheets, there is no better time to be in the game, writes *Nelendhre Moodley*.

African-focused gold miner Resolute is progressing well on strengthening its balance sheet, increasing production to take advantage of the favourable gold price and unlocking opportunities from its exploration programme, CEO Stuart Gale tells *Modern Mining*, just before he steps down from the role of CEO. Gale is currently in a handover period ahead of company COO Terry Holohan taking over.

"Given that Resolute is highly geared, our main focus is to improve our cash flow, reduce debt and achieve our production targets," says Gale.

In line with consolidating its portfolio, the gold miner, which has over 30 years of gold mining experience, has been off-loading its non-core assets, including selling its shares in Orca Gold to Perseus Mining for $13,7-million and its interest in Bibiani Gold Mine to Asante Gold for $90-million.

Reducing costs and improving efficiencies

Resolute has multiple long-life, high-margin assets and attractive future growth prospects underpinned by a strong pipeline of exploration assets.

The miner's large-scale assets include the Syama Gold mine which comprises the Syama Underground Mine and the Tabakoroni complex and is located in southern Mali, and the Mako Gold Mine, located in eastern Senegal.

Staff at the Tabakoroni mine, Mali.

In line with improving efficiencies at its operations, Resolute recently undertook a massive upgrade on the Syama sulphide plant, which saw improvements made to crusher liners, transfer chutes, mill cyclone feed pumps, flotation tailings pumps and roaster feed systems, as well as the roaster primary cyclone.

The Syama operation consists of two separate processing plants: a 2,4 mtpa sulphide processing circuit and a 1,5 mtpa oxide processing circuit.

The sulphide circuit comprises three-stage crushing, milling, flotation, roasting, calcine leaching and elution with ore sourced from the Syama Underground Mine and stockpiles. The oxide circuit consists of conventional crushing, SAG milling and leaching, with ore sourced from the Tabakoroni open pit mine located 35 km south of the Syama processing plant, and the Beta pit immediately north of Syama.

Following the upgrade, the sulphide plant is expected to deliver improved production outcomes, including increased roaster capacity.

"The recent upgrade has effectively optimised the sulphide circuit and de-bottlenecked the roaster, making way for a more efficient process. The Syama plant will now enjoy improved utilisation and availability as well as increased roaster throughput and enhanced recoveries, which we expect to stabilise above 80%," explains Gale.

After completing a 35-day plant shutdown to upgrade the Syama plant earlier this year, Resolute's flagship asset is scheduled, in 2022, to produce 220 000 oz of gold from existing processing and mining infrastructure and, coupled with production from Mako, Resolute forecasts gold production for 2022 to be 345 000 oz at an all-in sustaining cost (AISC) of $1 425/oz.

The company aims to ramp up production over the next two years to deliver close to 400 000 oz of gold in 2024.

Unlocking future growth opportunities

With future growth in mind, Resolute is advancing drilling activities at its operations to extend and enhance the ore bodies at its Syama and Mako operations.

The Syama exploration programme is a key priority as Resolute targets oxide resource expansion for an extension of oxide processing beyond 2026.

According to Gale, given that Syama has not been fully explored, there is significant opportunity to unlock further ounces with recent exploration activities already extending the Oxide life of mine (LOM) by a further two years.

Last year the miner undertook a multi-rig accelerated exploration programme at Syama designed to outline mineable oxide resources and unlock high grade sulphide zones to complement the existing ore reserves.

“By now we should have run out of oxide material at the Syama mine, but through brownfields exploration we have capitalised on additional ounces from satellite oxide deposits,” explains Gale.

On the back of encouraging results from the Beta area north of Syama, Resolute commenced openpit mining at the Beta South pit in October last year, which resulted in a 15% increase in the gold poured in the December quarter.

Following its strategy of unlocking additional ounces, Resolute not only extended the life of the oxide operations by a further two years but subsequently deferred development of the Tabakoroni Underground Mine sulphide resources until completion of oxide operations in 2026.

The automation control room at Syama.

Resolute holds 80 km of contiguous tenements along the highly prospective Syama shear zone and continues to explore for new oxide positions along this zone. According to drilling results, mineralisation occurs within shear zones and around lithological contacts. Deeper sulphide mineralisation remains open at depth and is a target for future exploration.

In addition to the main Syama deposit, there are a number of satellite deposits within the Company’s tenements, including the Tabakoroni deposit, 32 km south of the Syama processing facilites. Resolute commenced mining at Tabakoroni in September 2018 with first oxide ore put through the mill in November 2018.

In parallel with undertaking open pit mining at Tabakoroni, a major exploration effort to delineate sulphide resources below the open pit has been under way since 2019. The culmination of exploration and the completion a pre-feasibility study at Tabakoroni led to the declaration of a maiden

The Mako plant site, Senegal.

Primary loader hauling ore at the mining operations.

Core sample from Syama.

underground ore reserve of 2,9-million tonnes at 4,6 grams per tonne gold for 430 000 oz – this has subsequently been developed to over 766 000 oz and showing open pit potential prior to going underground.

Moreover, studies conducted last year at Tabakoroni North supported expanded oxide open pit operations and subsequently led to Resolute recommencing with mining at Tabakoroni Porphyry Splay.

"Recent drilling results from Tabakoroni provide us with a better understanding of the ore-body and offer us the opportunity to extend the open-pit oxide operation and increase future production from the deeper sulphide resources," says Gale.

Mako

According to Gale, Mako is a high quality, open pit mine with attractive scale and strong growth potential through near-mine exploration opportunities. Resolute has owned and operated Mako since August 2019 and is looking to extend the remaining five-year mine life. It is rolling out an exploration programme on the Petowal Mine lease as well as at neighbouring exploration permits.

Following an extensive soil geochemistry programme at its Sangola permit which identified four large gold in soil anomalies, Resolute plans to undertake drill testing on the various potential targets this year.

Community development

According to Gale, Resolute has a strong community development focus, with a particular emphasis on improving the skills set of its workforce.

"Our training and skills development programme has led to a highly educated and skilled workforce at our mining operations. We are engaged with community upliftment programmes, which include investing in community agricultural programmes, amongst others."

The company also partnered with the governments of Mali and Senegal to double vaccinate more than 2 000 employees and contractors, thereby safeguarding their well-being and supporting the communities in which it operates.

Resolute's investments

- $630-million economic value distributed in Mali and Senegal
- $2,6-million spent in community investment
- $339-million procurement expenditure in Mali and Senegal
- $5-million local procurement expenditure in host communities and local regions
- Significant improvement in high-risk safety systems and associated training

Team inspecting the ventilation rise.

Syama Power Station

In line with optimising efficiencies and reducing costs, the London Stock Exchange-listed miner recently completed construction of the Syama Power Station, which comprises three modular 10 MW Marine Oil (HFO) generators together with a 10 MW battery storage system. It is expected to deliver long-term electricity cost savings while reducing carbon emissions by around 20%.

Apart from commissioning a battery storage system which replaces the need for conventional fossil fuel spinning reserves, the miner also completed construction on a bulk fuel storage facility with a capacity of 4-million litres (signifying more than 30 days of consumption).

"The Syama hybrid power plant represents an environmentally friendly long-term electricity cost saving of up to 40% and will reduce our carbon emissions by some 20%. Collectively, our activities demonstrate our continued commitment to delivering a consolidated, increasingly productive, operation focused on moving down the cost-curve," concludes Gale.

Lindi Jumbo graphite targets production

As the uptake for clean energy options intensifies, the demand for associated minerals to support these developments is also on the rise. In particular, battery storage and electric vehicle segments continue to gain traction with market research company, Fortune Business Insights, reporting that the electric vehicle market, which accounted for $163,01-billion in 2020, is set to reach a whopping $823,74-billion by 2030; growing at a compound annual growth rate of 18,2% from 2021 to 2030. By *Nelendhre Moodley*.

Right: Construction of the Lindi Jumbo graphite project is scheduled for completion before year-end.

Below: Construction of the Lindi Jumbo project underway.

Graphite is an essential raw material used in electric vehicle (EV) batteries and, on the back of a surge in growth of the EV market, the demand for and price of graphite has been rising. It is estimated that between 50 and 100 kg of graphite, whether synthetic or natural, is present within each electric vehicle.

For Australian-owned energy minerals developer Walkabout Resources, which is focused on the development of its flagship Lindi Jumbo graphite project in Tanzania, the robust demand for graphite is good news.

According to CEO Andrew Cunningham, there are massive investments being made in the development of EV battery mega-factories across the world, which is underpinning the substantial demand for minerals used in the production of EV.

before year-end

"Although industry pundits had forecast graphite growth of 6% per annum, the demand predicted in 2019 for the current year has soared significantly beyond the prediction made three years ago. In fact, graphite flake prices over the past six months alone have increased by up to 40%, with smaller graphite flakes selling at $500/t (containing 94% carbon) late last year now trading above $800/t."

While there are a variety of graphite flake sizes and purities in concentrate, only the finer flakes (<150 microns) are traditionally used in the manufacturing of the anode material in the lithium-ion battery supply chain.

Given the high demand for small to medium size flakes, what does this mean for the Walkabout Resources Lindi Jumbo graphite project in Tanzania, which predominantly produces jumbo graphite flakes?

"The larger the flake at a certain grade, the higher the sales price and we have noted a growing demand for larger flake sizes of 180 to 500 microns (large to Super Jumbo flake). The Lindi Jumbo project is highly skewed towards larger flake sizes in final concentrate, but a quarter of our proposed production is in the small size flake category and we will be producing between 10 000 t and 12 000 t of smaller flake per annum," says Cunningham.

Global production of graphite was estimated at one million tonnes last year and despite the massive investments being made in the development of mega factories for energy storage and EVs, there is currently limited investment outlay for development of new graphite mines and new projects.

"This is due largely to the uncertainty surrounding the graphite market as investors do not have a clear understanding of the commodity and its pricing, given the opaqueness of the market. Although to some extent a graphite spot price does exist, greater understanding of the market is needed by the investment community and will go a long way in unlocking investment in the development of new mines," he says.

According to Cunningham, as a result of continued supply chain challenges and shortage of

"Although industry pundits had forecast graphite growth of 6% per annum, the demand predicted in 2019 for the current year has soared significantly beyond the prediction made three years ago. In fact, graphite flake prices over the past six months alone have increased by up to 40%, with smaller graphite flakes selling at $500/t (containing 94% carbon) late last year now trading above $800/t."

Original founders of the Lindi Jumbo project – Andrew Cunningham, Allan Mulligan (middle) and Rikard Taljaard.

Mine pre-strip area in the foreground with plant and TSF area at the back.

graphite, European companies in need of graphite are paying a premium price for the commodity.

Meanwhile, owing to the limited number of new graphite projects under development, EV producers have been seeking opportunities to secure future graphite supply, with leading EV manufacturer Tesla already making a play to this effect.

Earlier this year Tesla inked a deal with Australian mining company Syrah Resources to secure Active Anode Material, which is used in lithium-ion batteries. Syrah Resources is a graphite miner and a future producer of Active Anode Material from its graphite mine in northern Mozambique.

Lindi Jumbo targets production before year-end

Situated in south-eastern Tanzania, some 200 km from the Port of Mtwara, the Lindi Jumbo project is set within the highly prospective Mozambique belt, renowned for its coarse flake graphite deposits.

However, it is also an area regarded as a predominantly lower-grade graphite district, with in-situ grades of between 4 and 10% percent Total Graphitic Carbon (TGC). The Lindi Jumbo project is the stand-out high-grade deposit amongst its peers in a region with a Reserve Grade of ~18% TGC for a life of mine (LOM) of around 24 years, scheduled to produce 40 000 tonnes of high-grade flake concentrate per annum with close to 75% of the flakes in final concentrate above 180 micron.

Super Jumbo Flake concentrate.

Walkabout's 100%-owned Lindi Jumbo Graphite Mine is currently at construction phase and aiming for construction completion and production before year-end.

"The high-grade nature of the asset and the unique geology lends itself to an easier graphite liberation process, which allows for large flake retention through to final concentrate and for us to develop a relatively small plant, requiring a small mining fleet and, above all, a smaller capital expenditure outlay. The 240 000 tpa processing plant will consist of a few stages of flotation to produce a 95% level carbon purity in final concentrate," says Cunningham. The 95% product purity level is the minimum grade Walkabout Resources is targeting.

The African-focused energy minerals developer allocated $32-million in capex, raised through a combination of debt ($20-million) and equity, to bring the Lindi Jumbo project into production.

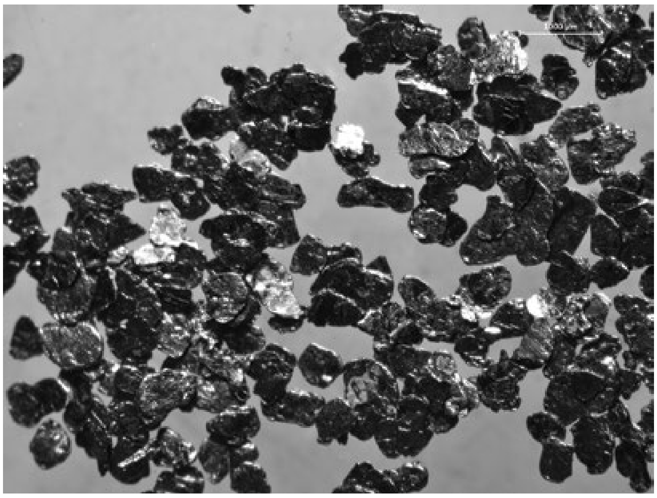
"From the outset, our focus has been to chase margins and we believe that a small-scale plant able to deliver 40 000 tpa is manageable especially as the Lindi Jumbo project is located in an isolated part of Africa. Developing a huge plant that produces large tonnages is a great risk in this remote part of the world and while the initial focus is to develop a small-scale plant, we will develop one that can be expanded as demand dictates," explains Cunningham.

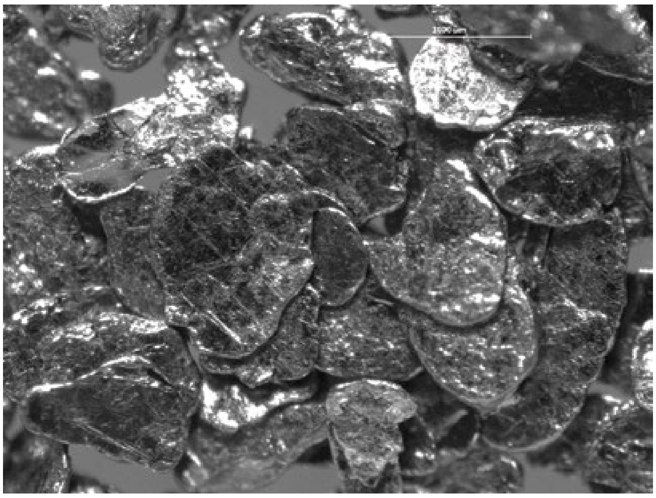
Walkabout Resources began construction on the Lindi Jumbo project in September last year, and continued with early earthworks in preparation for the civil engineering component of the project.

"The project has a short build time of between nine and 12 months and we are working hard to stick to the proposed time-frames and an extremely tight budget. However, supply chain challenges, resulting from the Covid-19 pandemic, continue to push the boundaries of both budget and time-schedules. Added to this, the war in Europe is having a detrimental impact on shipping, with shipping prices continuing to escalate. Aside from the fact that the price of containers has more than trebled in the past year, it is often a struggle to get access to even four shipping containers within China. Moreover, ships are cancelling on short notice and we are experiencing delays in getting our equipment out of China," explains Cunningham.

To mitigate these challenges, a Walkabout Resources EPC contractor in China has been working around the clock to find the quickest and most cost-effective routes out of China from the multiple ports.

In line with keeping its costs under control, the imminent miner has turned to a combination of the more cost-effective bulk vessels for larger equipment to complement the more costly and often slower container vessels to transport its equipment to Tanzania. The company has also appointed China-based Axis Group to act as project manager ensuring quality assurance and quality control of all procured and manufactured equipment – from the company's EPC partner (Yantai Jinpeng Engineering) – leaving the country.





Above: Image showing graphite flake sizes of +500.

Left: Image showing graphite flakes sizes of +300.

"We have various plans in action to dampen effects of soaring shipping costs, but the reality is that the supply chain challenges are impacting everyone and, while it is not ideal, we are actively seeking solutions to manage the situation. To date, seven shipments of containerised and bulk equipment have arrived in Dar es Salaam and have subsequently been delivered to site. Our EPC contractor has been onsite for many weeks and has already commenced with installation of the steelworks."

Although the ASX-listed entity is targeting graphite production of 40 000 tpa from its Lindi Jumbo project, it has a 23% additional plant capacity and can easily ramp up production to 52 000 tpa without increasing capital expenditure to meet increased demand.

"If there is demand for more product, we can easily increase capacity as we have more than enough product on our surrounding 200 km^2 tenement holdings and there is the option to further upgrade our Ore Reserve, which is currently based on only 37% of the Indicated and Measured resources. Further to this, we know of other graphite occurrences within our licence areas that fit our model of high-grade and large flakes which will make expanding the current Mineral Resource a relatively simple process," explains Cunningham.

Once in production, Walkabout Resources plans to follow in the footsteps of its peers and look to downstream opportunities, and has already undertaken a scoping study on a portion of its graphite for this purpose.

In 2019 Walkabout Resources signed offtake agreements with two Chinese companies for the sale of the majority of its graphite production. However, the project developer is yet to finalise a pricing mechanism suitable to both parties.

"We will consider negotiating a suitable price approximately six months before we begin production. If we are unable to reach an agreement, we have the option to withdraw from the offtake agreements," says Cunningham.

The imminent graphite producer has also partnered with Hong Kong-based global metal and mineral trading company Wogen Pacific, which has, for the past two years, been actively marketing the Lindi Jumbo project.

Diversified portfolio

"As with any exploration company we retain our interest in evaluating additional mineral projects at various stages of development and have a portfolio of early-stage base-metals and gold projects in Scotland and Northern Ireland and a gold project in Tanzania," says Cunningham.

The graphite project developer holds a 100% stake in the Amani Gold project, which consists of four prospecting licenses in the Ludewa district located in southern Tanzania. Following the completion of baseline soil sampling and stream sediment sampling, the company has followed this up with more focused stream sediment sampling and the re-interpretation of the open-file geophysical and remote sensing datasets as it refines the hard rock targets in the area.

The company has begun actively drilling at Blackcraig in Scotland, while projects Tyrone and Glenhead remain drill ready, pending final approvals.

Around the time when Tanzania was making changes to its mining laws in 2017, platinum producer Lonmin was looking to off-load its exploration assets in Northern Ireland and, according to Cunningham, made Walkabout Resources a "really good offer".

"We paid $100 000 for the base-metals asset in Northern Ireland which gave us access to $7-million worth of exploration datasets, equipment, and tenements," he says.

Following the acquisition in Northern Ireland, Walkabout Resources partnered with an exploration company in Scotland for a majority stake in a gold project and earlier this year acquired the remaining shares.

"It has always been our strategy to have a diversified portfolio of projects but at this point, the development of the Lindi Jumbo graphite project is taking centre stage," concludes Cunningham. ■

"If there is demand for more product, we can easily increase capacity as we have more than enough product on our surrounding 200 km^2 tenement holdings and there is the option to further upgrade our Ore Reserve, which is currently based on only 37% of the Indicated and Measured resources."

Investment in FLSmidth's Delmas facility underpins local success


GM for operations, manufacturing & warehousing, Warren Walker.

Almost a decade since its launch in June 2013, engineering company FLSmidth's centre of excellence in Delmas, Mpumalanga is helping its African customer base negate the logistical challenges associated with shipping to deliver vibrating equipment at speedy turnaround times. GM for operations, manufacturing & warehousing, Warren Walker, speaks to *Modern Mining's* Nelendhre Moodley.

FLSmidth's global centre of excellence, which stands at an impressive 120 000 m^2 and is equipped with state-of-the-art technology, manufactures, refurbishes and upgrades vibrating equipment, screens and associated wear parts and spares.

"Customers across the globe continue to benefit from the establishment and our continuous investment in the Delmas facility, which produces quality products efficiently. The Delmas Supercenter is a world class OEM centre that provides specialist expertise within the African market and beyond," explains Walker.

Over the years, the equipment manufacturer has made significant investments in the facility, expanding it from a centre with an under roof capacity of 5 000 m^2 in 2013 to 10 500 m^2 currently, to meet a growing interest from the international mining sector. In fact, the multinational engineering company is currently manufacturing eight large double-deck screens for a European customer.

According to Walker, despite the onset of the Covid-19 pandemic, 2020 has been one of the best years in terms of product sales and revenue – due largely to the buoyant commodities market which sees miners hastening to increase production as they take advantage of favourable commodities prices.

"2021 continued the trend of strong demand from local and global segments, and this year is also proving propitious, with FLSmidth fulfilling orders for the export market as well."

Vibrating equipment specialist

Positioned as the 'Rolls-Royce' of screens, the equipment manufacturer is set apart from its competitors

FLSmidth manufactures, refurbishes and upgrades vibrating equipment and screens.

feature

by being a producer of heavy-duty screens designed for a 10-year-plus life.

"From initially manufacturing, repairing and refurbishing screens, we have grown our capability to include screen media and panel manufacturing. As the sole screen and screen media manufacturer in the country we also produce all the structural elements associated with screen media and panels," Walker explains.

Following a revised execution model, which saw the company previously outsourcing the manufacture of its products, the Delmas centre of excellence enabled the company to begin manufacturing its entire product range in-house.

"In the past all the design, engineering, research and development was undertaken in-house while the manufacturing and assembly of our products was outsourced to original equipment manufacturers. Now that we produce all our equipment in-house, we have greater control in terms of product quality, and better protection of our intellectual property, including all new technology implemented, such as the latest technology on the spiral welder and specialised procedures implemented, together with those related to our welding equipment. In essence, we control product quality from the start of the design process, through assessment of customer needs, to the design of the screen, right up to the finished product. Being involved in the entire manufacturing value chain unlocks a number of advantages, such as increased cost effectiveness – by ensuring there is no double-handling of products – faster lead times and speedy turnaround times for the customer," explains Walker.

As such, the single source manufacturer of screens and screen media is ideally positioned to recommend the best screen media deck layout for any application. According to Walker, FLSmidth has close relationships with mining and project houses and as a result insight into the application, feed-rate and throughput capability that the screens and panels are required to deliver once operational.

"With screens and screen media required to perform across a range of commodities, all with varying levels of viscosity, each application requires specific panels and screen layouts, and material used to manufacture the product to ensure that it delivers the intended outcome. For instance, a dewatering function will require a different type and size of panel from that of a sizing application in order to meet optimal production rates," explains Walker.

FLSmidth's experience and deep understanding of the ideal screen deck layout helps customers to garner the most favourable layout and thereby the greatest longevity for its products.

"Over time, different ore types exhibit greater wear on different parts of the screen and we are able to advise customers on the most efficient panel layout for a plant. And, before we dispatch a product

The new polyethene machine delivers a step-change in pouring capacity.


Screens and screen media are required to perform across a range of commodities.

FLSmidth continues to make significant investments in its Delmas facility.

The company produces all the structural elements associated with screen media and panels.

FLSmidth's technology-driven investment delivers major benefits to the African and global mining sectors.

to a customer, we undertake a full final analysis of the screen, including simulating the intended weight on the screen to ensure that it operates optimally."

Investing in the latest technology

FLSmidth's technology-driven investment at its Delmas facility continues to deliver major benefits to the African and global mining sectors.

In order to deliver 'best in class' products, the equipment supplier has invested in expanding and equipping its facility and recently acquired a R5-million polyethene machine which delivers a significantly increased pouring rate.

"The new polyethene machine delivers a step-change in pouring capacity as it pours material at a rate of 42 kg per minute, compared to the existing two machines which have a 4 kg per minute and 5 kg per minute pouring capability respectively."

In 2019, the company upgraded its pre-heating and curing oven with the latest auto-calibrating self-driven rail mounted machine, which delivers significant value as it handles larger quantities of material and thereby higher levels of efficiency.

"FLSmidth recognises the importance of Africa and the mining sector, and continues to invest in the centre of excellence. As a result, we have been receiving an increasing number of orders from international customers, including an order for eight large double-deck screens for a European customer.

"FLSmidth was an early adopter of digitalisation and remote monitoring and its appetite for the latest technology targets aspects such as precision, efficiency and speed. In fact, the drive to adopt digitalisation is so important to FLSmidth that it has appointed an executive, Mikko Tepponen, as Chief Digital Officer to drive the agenda globally," explains Walker.

Mission zero

FLSmidth's MissionZero sustainability ambition underpins its strategy and drives its agenda towards zero emissions and zero water and energy waste in the mining and cement industries by 2030.

According to the company, "combined, cement and minerals production accounts for about 10% of all CO_2 emissions".

"With growing populations, a larger middle class and a transition to greener energy, the demand for cement and minerals – and thus the environmental impact – will increase in the next decade. With MissionZero, we take the lead in bringing these industries into a sustainable future," Walker says.

To meet this agenda, FLSmidth South Africa has embarked on efforts to reduce its energy and water consumption. At its Delmas facility, the company has installed LED lights to ensure low energy consumption and is in the process of accessing water from a borehole, which will see it reduce its reliance on the local municipality. The borehole water will be used for irrigating the gardens and for cleaning vehicles and equipment sent for refurbishment.

Further to this, FLSmidth has earmarked the roll-out of solar panels at its Delmas facility which will further lower its reliance on power producer, Eskom.

"We have already undertaken an assessment of the viability of solar panels at the facility and have proposed the required capex for this financial year. Expectations are that the solar panel installation will be rolled out in 2023," concludes Walker. ■

FLSmidth

- ❑ FLSmidth: Sustainable productivity through innovation
- ❑ FLSmidth is a leading provider of innovative engineering, equipment and service solutions to the mining and cement industries. We help customers to improve performance, lower costs and reduce environmental impact.
- ❑ Our sustainability ambition, MissionZero, is our commitment to enable customers to achieve zero emissions, zero water waste and zero energy waste by 2030. For instance, our dry stack/filtered tailings solution can recycle over 90% of process water, while we have several technologies that cut water requirements in other areas, such as flotation and comminution.

feature

Lowering TCO through correct screen media selection

Although screen media is only a fraction of the total consumable cost of any processing plant, it is a critical part of any mine's profit machine. Yet, many procurement decisions are still informed by price, at the expense of installing the appropriate screen panel or screen panel combinations to ensure maximum efficiency, throughput and lower total cost of ownership.

Gerrit van den Heever, sales director, Multotec.

Screen media is a critical part of the metallurgical process, and it is therefore essential that the appropriate screen panel or screen panel combinations are selected, not only to improve efficiencies, but also to lower the overall cost of operation.

According to Gerrit van den Heever, sales director at Multotec, total cost of ownership (TCO) should be a principle factor in choosing the right screen media for the application at hand. TCO, he says, considers not only the price of the consumable, but also its lifetime and impact on plant efficiencies.

Why TCO?

Although a screen panel is a relatively inexpensive component in a processing plant, its impact on the overall economics of running the plant can be substantial, warns Van den Heever.

"In a dense media separation (DMS) application, for example, the cost component of screen panels in the overall cost of operation of the plant is not even 0.01%. The cost of the ferro silicone or magnetite is significant. Effective screening can result in improved medium recoveries and huge savings. Yet, some of the customers we encounter make decisions based only on price," says Van den Heever. "Looking at the unit price of the component without considering the actual TCO is, in my view, a flawed procurement practice."

According to Van den Heever, there is often a complete disconnect between the key performance indicators (KPIs) of the procurement manager and those of the end user, i.e. the metallurgist or the site manager. The procurement manager is more concerned about the item cost and cost saving initiatives, while the site manager values the impact of a screen panel on the metallurgical process which can make a significant difference to the financial gains or losses of the process

Screen panels, adds Van den Heever, are applied to fulfil a certain function, and maximum value is only

Multotec offers over 70 different compounds and 1 000 aperture combinations to meet customers' application needs.

It is essential to select appropriate screen panel or screen panel combinations to avoid blinding, pegging and scaling.

Multotec can assess application requirements and recommend the most appropriate screen panels for any given application.

realised when they fulfil that specific duty. "Applying incorrectly selected screen panels will be detrimental to the desired efficiency and throughput – it is as simple as that. Consequently, the impact on the bottom line can be severe," he says.

Key factors

There are several factors that must be considered when choosing screen media for an operation. According to van den Heever, it is always important to look at the abrasion resistance function that the screen panel needs to fulfil, as well as the metallurgical performance and the life of the panel. All these factors, he says, must be in good balance to ensure that end users get the best value out of their investments.

Another principle factor to consider is whether the screening application is wet or dry. In a wet application, it is important to establish whether blinding, pegging and scaling are evident in the current process. In a dry application, the supplier should check whether impact and pegging are issues of concern. This will be key in selecting the right material with the relevant physical properties in which the screen panel should be manufactured

"It is therefore important to deal with a reputable screen media manufacturer that can assess these application requirements and recommend the most appropriate screen panels and screen deck configurations for the application at hand," says Van den Heever.

When dealing with a supplier of Multotec's stature, customers have a wide range of solutions to choose from. The company has invested in a substantial range of material compound manufacturing capabilities to meet different customer needs. These include 21 different types of injection moulded polyurethane compounds, 17 types of hand caste polyurethane compounds, 17 types of compression moulded rubber compounds and 18 types of injection moulded rubber compounds (e.g. fire-retardant)

"There are a variety of compounds available to the customer to ensure that they select the right fit for their application. In addition, we have over 1 000 apertures in different screen panel thicknesses. If we cannot assist a customer out of this range, we will tailor a solution to suit the application," he says.

Testing

Multotec has also developed a screening test rig to enhance its screen media development programme. "The idea is to put our products to the test and learn from that. The research and development (R&D) behind our screen media solutions ensures that we offer the industry products that optimise their efficiencies and recoveries," says Van den Heever.

More importantly, the screening test rig ensures that all Multotec screen media products are assessed to prove efficiency and capabilities before they are physically installed on customer plants. Van den Heever says changing anything on customer plants without proof of performance brings with it the risk of metallurgical inefficiencies or unexpected downtime if the product does not meet customer expectations or site requirements.

The research and development behind Multotec screen media solutions ensures that it offers the industry products that optimise efficiencies and recoveries.

Multotec can accurately simulate the plant operating conditions on its screening test rig to get an idea of what customers expect from its screen media product.

Multotec receives samples from customers, which come with certain process parameters and plant operating conditions. The company then accurately simulates the plant operating conditions on its screening test rig to get an idea of what the customer can expect from the selected screen panel and the solutions it offers.

"The screening test rig is about evaluating the capabilities of the product before it is installed on customer plants. The site installation will obviously be the final stage of the test work, but we are already assured of between 85% and 95% accuracy before site implementation," he says.

"We apply the panels to see how they perform, not only from a wear rate perspective, but also from a metallurgical point of view. Out of this process, we can advise the customer what is best for their application," concludes Van den Heever. ■

feature

Theo Hendricks, product manager comminution at Weir Minerals Africa.

Unleashing the power of Enduron HPGR

Having set the benchmark in energy efficiency, high throughput and lower total cost of ownership, Weir Minerals' Enduron® high pressure grinding roll (HPGR) technology has become the go-to solution for hard rock applications such as gold, copper, platinum and iron ore, amongst others.

As mining companies seek to improve and protect their margins in the face of declining ore grades and rising input costs, many greenfield and brownfield hard rock mining projects are turning to Enduron HPGR technology for greater total cost of ownership reductions and resource savings.

According to Nathi Mtsweni, senior process engineer for Trio®/Enduron comminution products at Weir Minerals Africa, there are three main drivers of the increased uptake, namely declining ore grades, increasing energy costs and water scarcity.

As declining ore grades become the order of the day, mines are using more energy per tonne of total ore mined, which in turn increases their carbon footprint. Yet, rising energy costs are a reality, and environmental stewardship has become an imperative to achieving sustainable mining.

Given that generally 36% of the overall energy use of an average mine site is attributable to comminution, mining companies are seeking energy efficient technologies to reduce their energy consumption drastically and simultaneously minimise their environmental impact, says Theo Hendricks, product manager – comminution at Weir Minerals Africa.

"Where our Enduron HPGR technology has replaced traditional methods of crushing and grinding such as SAG or ball mills, customers have seen energy savings of up to 40%," says Hendricks.

As water scarcity poses one of the greatest risks to mining activities, mines are on the lookout for solutions that enable them to achieve responsible and equitable water stewardship. "With its ability for micron-sized grinding without water whilst using dry air classification, Enduron HPGR technology represents a step change in sustainable mineral processing," says Mtsweni.

Key differentiators

Setting Enduron HPGR technology apart from the competition are four exclusive features. Firstly, the unique bearing arrangement that enables durable skew – designed to guard against premature failure and reduce the number of peak loads transferrable to the bearings – typically delivering bearing life greater than 10 years in these rogue applications.

"The bearing arrangement is one of the most critical aspects of an HPGR," stresses Mtsweni. "Where bearing failure occurs, or sub-optimal conditions are used to protect the bearings from failing, the plant is at risk of underperformance and prolonged downtime. Often, pre-mature failure comes unscheduled and both components and resources need to be urgently mobilised which comes at a cost – particularly given the current supply chain dynamics."

The Enduron HPGR bearing arrangement is designed to allow for durable dynamic skewing, allowing the roll to skew to a certain tolerance to maintain an even and effective pressure distribution

Centre: An Enduron HPGR during assembly at the Weir Minerals Venlo facility.

Below: Nathi Mtsweni inspects an Enduron HPGR installed at a customer site.

feature

in hard rock mining applications

across the rollers; maintaining optimal pressure and exceeding the ore's compressive strength across the entire feed. This is required for the rocks to break effectively, and to minimise power consumption and reduce recirculating load, even at segregated and changing feeding conditions common to real life ore processing.

"The overarching benefit of the unique bearing arrangement is the long bearing life, ensuring greater than 95% machine availability, which directly results in increased product yield. Enduron® HPGR customers can have peace of mind with bearing life guarantees greater than 10 years, combined with overall machine and process guarantees de-risking the heart of grinding circuit." says Mtsweni.

Another unique feature is the control philosophy. The efficiency of HPGR technology is largely dependent on how you feed it, explains Mtsweni. If not fed properly, it is unlikely to achieve the required grind and throughput.

"Our unique control philosophy comes with multiple start-up and shut-off kits. These eliminate an abrupt start-up process by enabling a smooth and steady ramp up of material onto the rolls," says Mtsweni. "Material first reports to the start-up gate, which allows for a shorter drop-off height from the feed bin and reduced peak torque loads, thus eliminating potential roller surface damage and avoiding motor trips."

HPGR reduces particles by compressing the feed material between two equally sized, parallel counter-rotating rolls, of which one is hydraulically pressurised. To compensate for the edge effect, a lateral wall or 'cheek plate' is deployed on either side of the Enduron HPGR to prevent material exiting the gap between the rollers sideways.

The self-adjusting cheek plates maintain the pressure in the operating gap and always ensure a tight seal. "Combined with our tailored edge studs, our self-aligning cheek plates provide an optimal seal, reducing accelerated wear in the roll edges and lowering energy consumption in the process," says Mtsweni.

"What makes our lateral wall system unique is that it is spring-loaded, which not only reduces the edge effect, but also facilitates roll skew. Having one roller skew facilitates larger material at one end while ensuring the smaller particles on the other side receive enough pressure to be ground down," adds Hendricks.

Long roll life is another attribute of the Enduron HPGR technology. The longevity of roll life, says Mtsweni, is essential to the overall performance of the processing plant – both in terms of availability and operating costs.

Stud selection is critical to the long life of the roll and to align roller life time with scheduled maintenance shutdowns of downstream equipment.

Weir Minerals' expertise and extensive portfolio of stud grades and designs caters for the needs of specific applications. "The Enduron HPGR technology has thus been proven to offer significantly higher roll life than the competition whilst minimising ineffective usage of tungsten carbide, which aligns with our ESG strategy. In addition, as a result of our compact bearing arrangement, we are able to deploy longer rolls combined with a compact diameter, which enhances grinding efficiency and reduces infrastructure costs, keeping structural height to a minimum," concludes Mtsweni. ■

Weir Minerals can optimise and tailor durable studs to suit the application.

Why transfer chutes shouldn't be an afterthought

Traditionally, new plant designs have always placed greater focus on crushers, screens, mills and conveyors, with transfer chutes often considered an afterthought. Given their pivotal role in the successful operation of a plant, chutes should be given the principal attention they deserve in plant designs, urges Mark Baller, managing director of Weba Chute Systems.

Based on decades of experience in the design, engineering and manufacture of chute systems, Baller says a significant portion of plant downtime across commodities is attributable to transfer chute issues, ranging from blockages to spillages and excessive wear, amongst others.

An average plant, he says, has a lot more transfer chutes than crushers, screens and even conveyors. Yet, often, insufficient attention is paid to the design of chutes which, in turn, results in excessive plant downtime, high maintenance costs and lost production during operation.

"Simply stated, a chute is a piece of equipment that ties everything together in a plant," says Baller. "A crusher is there for all the material size reduction needs, while a screen serves the sizing purpose and conveyors are the means of transporting material from one stage to the other. However, the equipment that joins all these pieces of a plant together is the transfer chute. It is instrumental in the successful operation of a plant," he says.

Given its significance to the overall economics of the circuit, Baller urges mining companies and design houses to engage a reputable chute manufacturer from the very start of their design processes.

General practice in the industry is for a chute manufacturer to be engaged at a late stage in the design process. Consequently, chute configurations are often wrong, which calls for changes to plant designs at a later stage, resulting in unnecessary delays and loss of man hours.

"For greenfield projects, we always ask our mining clients and their EPCM (Engineering, Procurement and Construction Management) contractors to involve us in their plant designs as early as possible," says Baller.

"Engaging us early in the design process means we can provide correct chute design parameters such as heights and pulley positions. This approach means that the EPCM contractor can carry on with structural and conveyor layout designs in confidence, knowing no alterations will be required at a later stage of the process," he adds.

In several of its brownfields or retrofit projects, Weba Chute Systems has found incorrect chute configurations to be a common challenge. While improving poor chute designs is often a feasible task, says Baller, it is always difficult when the transfer point configuration is wrong. This calls for complex modifications such as moving the head pulley or changing structures and flows to allow for a different flow path, which becomes costly for the client.

However, this is an area in which Weba has excelled over the years. For example, the company came to the rescue of an Australian iron ore mine which had to put up with plant shutdowns every six weeks due to transfer chutes. At some point, the six-week maintenance window was unachievable, as chutes started holing out after four weeks.

"The brief to us was to increase the maintenance window from six to eight

Right: A South African iron ore mine where more than 400 Weba chutes are installed and operating successfully.

Below: A Weba conveyor head chute catering for a sampler application.

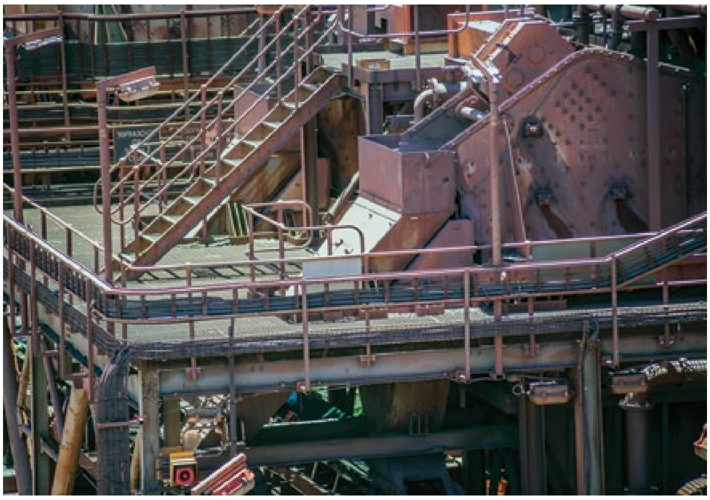
feature

in plant designs

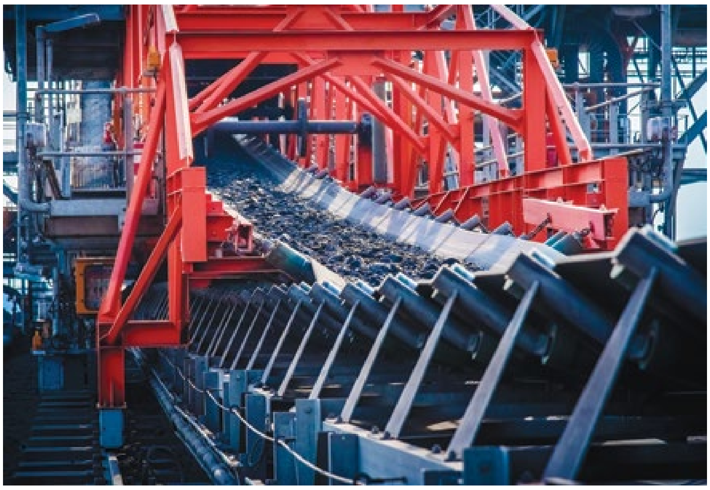
weeks. We engineered a fitting solution for their challenging ore, which was sticky when wet, and we were able to move their maintenance window from six to 12 weeks. The main driver of the 12 week maintenance window to date is no longer the transfer chutes, but other apparatus in the plant," says Baller.

In conclusion, Baller says the worst thing for any mine is to endure unplanned stoppages due to chute or any other component failures in a plant.

"Unplanned downtime represents direct production losses and ultimately loss of revenue for the mine. Depending on the size of the mine and the commodity, unplanned production losses can run from hundreds of thousands to millions of US dollars per hour," concludes Baller. ■



Weba screen oversize and screen undersize chutes installed at an iron ore mine in South Africa.



Material being conveyed between two custom engineered Weba transfer points.

Kwatani expertise delivers bespoke solutions

While vibrating screen specialist Kwatani is known for its heavy-duty 'engineered for tonnage' machines, its depth of expertise makes it capable of precision designs on the other end of the size spectrum.

Kim Schoepflin, CEO of Kwatani.

According to Kim Schoepflin, CEO of Kwatani, the company is a partner of choice to fellow original equipment manufacturers (OEMs) in minerals processing. These partners frequently have applications where their equipment must operate within tight specifications, and which may have other specific requirements that a standard range of screens would not accommodate.

"This is where Kwatani's engineers and metallurgists put their extensive on-site experience – supported by the company's in-house laboratory and testing facilities – to best advantage," she says. "They develop solutions using the full range of our technology and intellectual property, from structural dynamics to metallurgy."

Designing screens for minerals sorting equipment is a good example, she notes, where Kwatani has precision-engineered solutions to suit the exacting demands of these relatively sensitive applications. Screens serving this niche have to make sure that all the particles entering the minerals sorter have been specially treated by the screen.

"Our designs ensure that all the particles moving across our vibrating screen achieve the required velocity to achieve the precision movement and size fraction required by the analysers of the sorter," she says.

There are other restrictions that may apply in these applications, including the protection of vital electronic systems. This means that the screen design must carefully contain any water that accompanies the feed material, so it does not damage delicate electronics on equipment at the feed-end. At the same time, water must also be effectively removed from the material so the sorter can deal optimally with the final feed.

It is crucial that slimes are removed from the feed, as this fine material could interfere with the performance of downstream analysers. The Kwatani solution manages this range of detailed requirements while still minimising the structural dynamics.

"We recently designed a screen feeder with a dynamic underpan which integrated into the vibrating unit – so that it delivers a two-fold function," she says. "Firstly, it could contain and drain away the water from the feed material, but it also acted as a subframe to reduce the dynamic forces on the structure."

This is important because electronic analysers need to be protected not only from possible damage, but also from interference arising due to vibrations in the proximity. This requires controlling the dynamic loads of the screen – both when it is running and especially when it starts and stops.

Schoepflin says that Kwatani's depth of screen-related knowledge places the company in a good position to conduct these innovations. Delivering the basic duty – including throughput tonnages, particle sizes and output specifications – is just the beginning of the screen's performance journey. It then needs to achieve this optimally with minimal structural vibration.

Kwatani double deck vibrating screens nearing completion on the assembly shop floor.

feature

Kwatani's depth of screen-related knowledge as well as its resources place the company in a good position to conduct innovations.

"Screens vibrate more with starting and stopping, which can reduce the unit's longevity and even damage other structures or equipment nearby," she says. "We reduce the impact of vibrations with carefully selected combinations of isolators like torsional springs and coil springs between the screen and the plant floor."

With these bespoke designs, it is also important to collaborate closely with customers during the engineering and fabrication process, she says. To achieve this, customers visit the facilities regularly during development, and are integrally involved in the testing phases. ▪

Above: Kwatani screens, gearboxes and motors on the assembly shop floor.

Left: Testing on a single deck banana screen at Kwatani.

MEMSA hosts inaugural Innovation Awards

The inaugural Innovation Awards, hosted by Mining Equipment Manufacturers of South Africa (MEMSA) in April, was a celebration of local excellence in technological development and manufacturing capability, says CEO Lehlohonolo Molloyi.

"A lot of decision-makers in procurement tend to consider international mining equipment as being superior, when the reality is that our own local Original Equipment Manufacturers (OEMs) are on par with the major international players."

The Innovation Awards 2022 not only showcased members' innovative capabilities, but was also a platform to raise the profile of MEMSA itself. "Many of our members invest substantially in in-house R&D, but the long lead time to deliver a working prototype is often offset by international companies exploiting preferential interest rates and other benefits to import equipment at a substantially cheaper cost. These are some of the challenges that MEMSA has been addressing," says Molloyi.

Thus, the Innovation Awards initiative was developed to make the local mining industry aware of the high level of innovation in local manufacture. The category winners were as follows:

- **Hard Rock Mining Equipment (the Navin Singh Award):** Hydro Power Equipment (HPE) for the development of the Isidingo Drill and Drill Guide.
- **Soft Rock Mining Equipment:** Rham Equipment for the development of the Battery Electric driven LHD, Dump Truck and Land Cruiser.
- **Mining Infrastructure and Mineral Processing:** AZMET Technology & Projects for the AZMET Cyanide Removal Process (AZ-CRP).
- **Safer and Healthier Mining:** Mine Support Products for the Rocnet Modular Safety Net.
- **Improved Productivity:** Hydropower Systems for the HV212 EOD Hydrovessel.
- **Emerging or Small Enterprise:** Gravitas Minerals for the Optima Classifier.

Through the competition process and recent engagements with members around safety and energy projects, exciting innovations are happening across the cluster's membership. These include the development of battery electric mining vehicles by members, including Rham Equipment, Fermel (personnel carrier) and Battery Electric (diesel locomotive conversion); innovations in explosive casings (NXCO); the development of trackless mining machinery suitable for mechanised mining methods, with sophisticated safety mechanisms; innovative hydro powered equipment; and data sensing devices and systems for better safety and productivity. ■

MEMSA CEO Lehlohonolo Molloyi.

MEMSA celebrates local excellence in technological development.

Epiroc wins large order for battery-electric mining equipment

Epiroc, a manufacturer of mining and infrastructure equipment, has won a large order for battery-electric mining equipment to be used at a manganese ore mine in South Africa, from Assmang.

Assmang has ordered several of Epiroc's battery loaders and mine trucks – the Scooptram ST14 Battery and Minetruck MT42 Battery, respectively – that will be deployed at its Black Rock underground mine in the Northern Cape Province.

"Epiroc is proud to support Assmang on its journey toward lower emissions through the use of our cutting-edge battery-electric machines, while also prioritising productivity and safety," says Helena Hedblom, Epiroc's CEO.

Assmang has previously ordered the same type of battery-electric machines for this mine, and in 2019 Assmang selected Epiroc's Mobilaris Mining Intelligence digital solution, which provides superior situational awareness of the mining operation in real-time.

The Scooptram ST14 Battery and Minetruck MT42 Battery machines, manufactured in Örebro, Sweden, are built to face the toughest conditions and are packed with intelligent features. They will be equipped with a Collision Avoidance System and with the telematics system Certiq, which allows for automated monitoring of productivity and machine performance. ▪

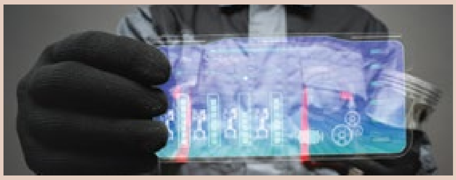
Epiroc wins order from Assmang for battery-electric mining equipment.

ELB adopts telematics across its range

In an era where machine uptime has a direct impact on an operations' bottom line, construction and mining equipment supplier ELB Equipment has launched its own custom-developed telematics system to radically enhance the effectiveness of its machines on sites.

The telematics solution comes standard with equipment across the entire medium and heavy range, providing a host of valuable information to the user via easy-to-use web-based reporting software. While the machinery supplied by the company is at the pinnacle of reliability, the telematics systems assist the fleet manager to locate and manage fleets from remote locations on any device in real-time.

According to Keon Kardolus, ELB Equipment earthmoving and construction sales manager, the addition of telematics as a standard feature on its equipment is the next logical evolution of fleet optimisation. Nowadays, Premium quality equipment is made to be productive, and is ultra-durable and reliable. The addition of a telematics management system further ensures operator conformance, assisted service and maintenance scheduling, alarm parameters, geolocation and a host of other parameters to ensure the equipment remains optimised. ▪



ELB adopts telematics across its product range.

Increased uptake of the Sandvik DD422i development drill in Africa

As mines in Africa are constantly turning to modern technologies to run more efficient operations and improve safety, Sandvik Mining and Rock Solutions has seen renewed interest in its DD422i, the next-generation mining jumbo with the widest range of automatic drilling functions.

Having sold the first DD422i development drill in Africa to Black Mountain Mine in 2018, Sandvik Mining and Rock Solutions has seen a ramp up in sales in the past three years, with nine more units making their way onto local mining sites, averaging at least three machines per year.

Saltiel Pule, business line manager for underground drilling in southern Africa at Sandvik Mining and Rock Solutions, says there will be more than 10 units operating in southern Africa by the end of 2022. The Sandvik DD422i has proven to be a machine of choice for tier one mining contractors operating at high-production mines in South Africa, Botswana and Namibia.

Increased uptake of Sandvik's DD422i development drill.

"Traditionally, mines in Africa have always lagged behind their global counterparts in adopting new technologies," says Saltiel. "However, the Covid-19 pandemic has accelerated the application of Fourth Industrial Revolution (4IR) technologies in the local mining industry, hence the ramp up in sales of the DD422i drill since 2020."

RopeCon Booysendal North enters into operation

A RopeCon system has been transporting platinum ore in Booysendal since the end of 2018. In December 2021, the second installation, Booysendal North, was handed over to the customer. For this extension project at its Booysendal site, the South African mining company Booysendal Platinum, a subsidiary of Northam Platinum, once again relied on technology from Doppelmayr, a pioneer in ropeway engineering. This second RopeCon serves another mining area situated in the northern part of the site. It transports around 400 t/h over a distance of 2.8 km and a difference in elevation of −160 m.

The Booysendal North RopeCon discharges the material into the same silo from which the material is loaded onto the Booysendal South system, which makes it a perfect link in a continuous conveying line. Since early 2022, the second loading point along the line has been in use, too. The option of an alternative loading point was provided at Tower 2. A conventional feeder conveyor transports the material to the RopeCon line where it is loaded directly onto the belt via a chute.

RopeCon is a technology developed by the ropeway manufacturer Doppelmayr. The system offers the advantages of a ropeway and combines them with the properties of a conventional belt conveyor. By using the RopeCon system, the customer did not have to rely on trucks to transport the material, a definite advantage in this topographically challenging terrain with its sometimes very steep roads.

Doppelmayr's RopeCon system is used at Booysendal North project.