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Issue 5 | 2021

MINING REVIEW AFRICA

UMS GROUP
UNITED MINING SERVICES

STEEPED IN HISTORY, GEARED FOR FUTURE SUCCESS

P4

MINING IN SOUTHERN AFRICA

BIG INVESTMENTS, BIG CHANGES

P18

COMMODITY FOCUS

DIAMONDS

P40

IN THE SPOTLIGHT P8

"The Minerals Council is a strong believer that businesses must positively impact its stakeholders and society at large."

Tebello Chabana, Minerals Council South Africa senior executive: public affairs and transformation

SPECIAL REPORT P55

ESG

More than just compliance

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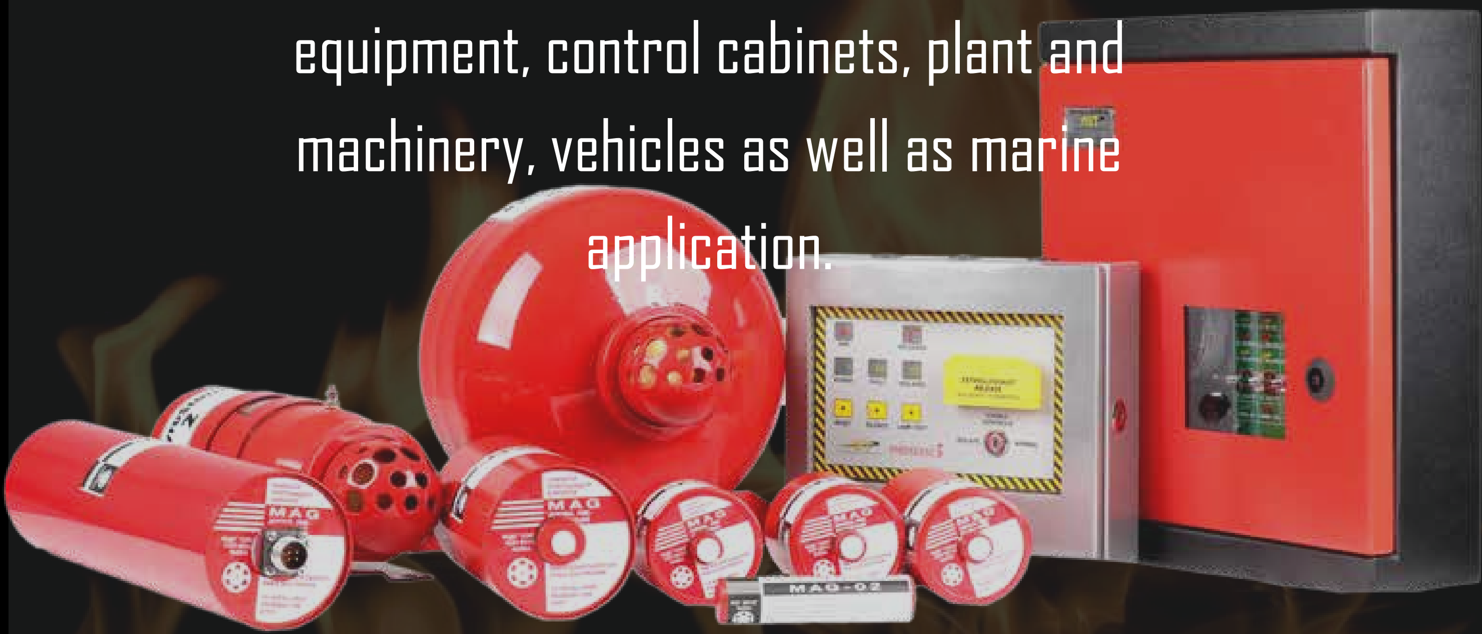

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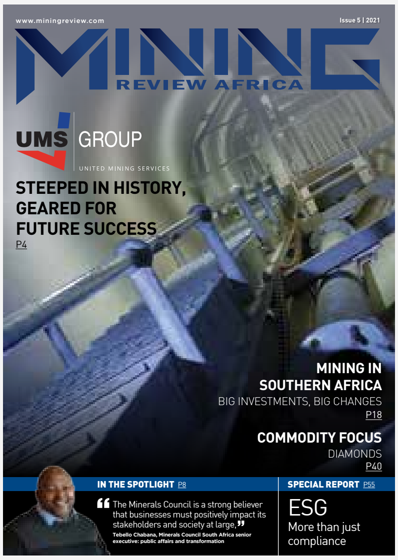
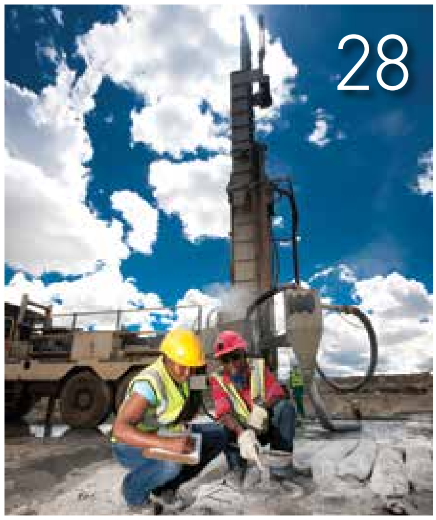


FRONT COVER

United Mining Services is embarking on a new era in its history – that of a unified brand across all its operations.

P4



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ESG

What does it mean to you?

ESG (environmental, social and governance) compliance – a term I heard for the first time about three years ago – has quickly escalated to become one of the mining sector's biggest priorities.

But the essence of what it means is by no means new. It has overridden the phrases 'social license to operate' and perhaps 'corporate social responsibility' which have all had their spotlight moments. Are they the same thing? In part yes, but each has built on the concept before to incorporate greater responsibility into more areas.

Let me stop here before this starts sounding like a textbook extract. The point I'm making is that the mining industry's contribution towards sustainability within and around the areas in which it operates has always been a requirement – only now it's a non-negotiable requirement if you want investment and funding support. And this brings me back to the word I used at the start: compliance.

From my perspective, the simple definition of ESG is 'giving back'. Giving back to the environment, the communities you may have affected and the country you've chosen to settle in. And giving back should be a willing act of desire, not an obligation.


On site at Otjikoto

Let's hope, for the most part, the true motivation for doing what's right is just that – doing what's right. The reward is, and can undoubtedly be, so much greater.

> Let's hope, for the most part, the true motivation for doing what's right is just that – doing what's right,

One company living the ESG philosophy in its truest form is B2Gold Namibia. Having had the privilege of spending three days with the company on site, I got to see and experience it for myself. This company is an example of what one mine can do to make a significant difference.

I don't want to go into specifics here (you can read about it for yourself on page 62) but I do want to salute B2Gold Namibia's MD and country manager Mark Dawe for all the wonderful work he is doing in conjunction with an equally passionate and committed team supporting him.

Because *Mining Review Africa* as a whole is an ESG ambassador, you can join our team for the *Africa Mining Forum* digital event on 2 – 4 November. This year it has chosen to look at ESG, not collectively but as individual components. Over the three days we'll delve into each field of ESG and unpack some of the latest trends and changes in this regard.

We are excited to see you there. Join us in being part of the real ESG evolution. **MRA**

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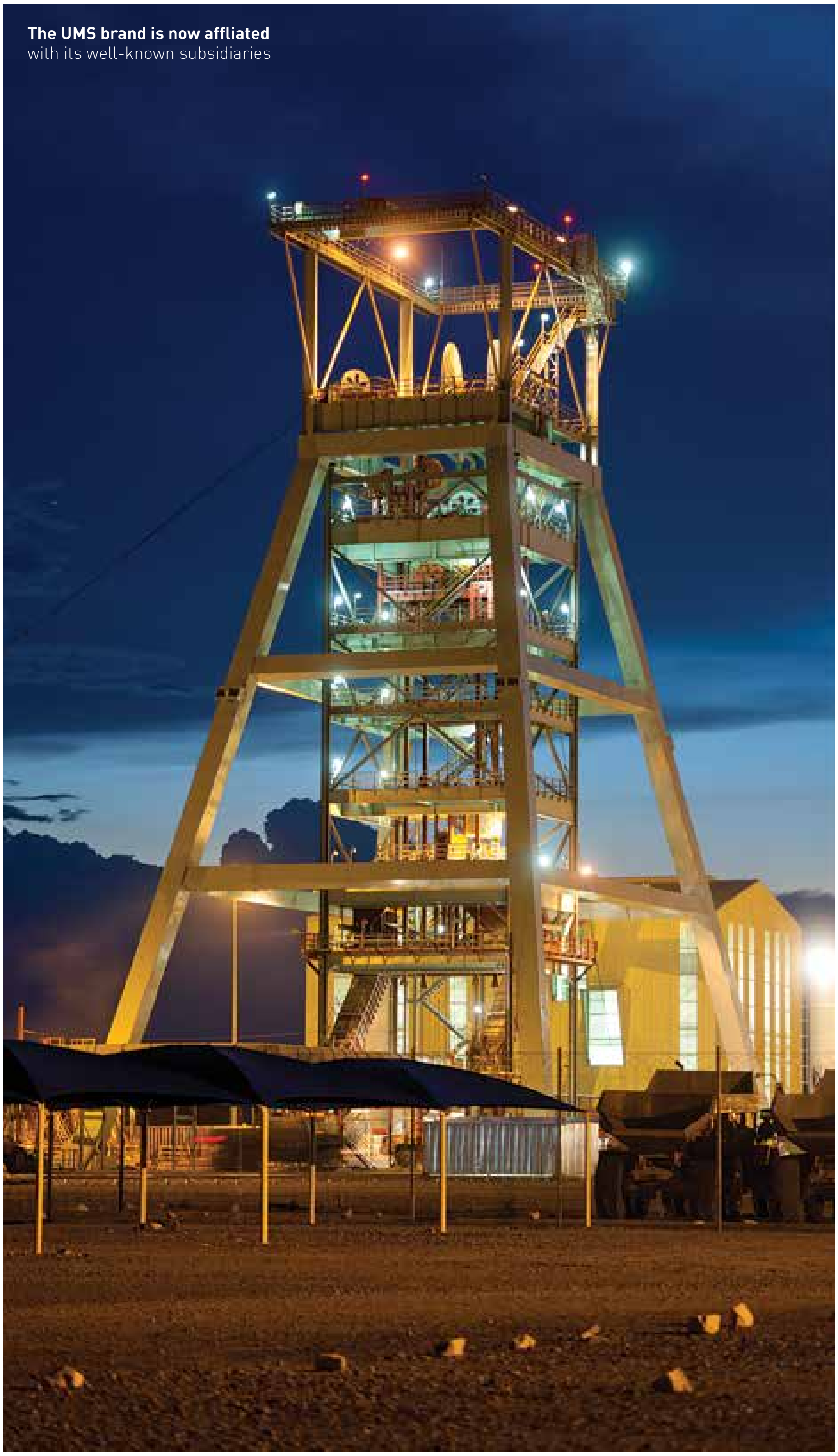
UMS Group

Unified brand heralds the dawn of a new era



The UMS brand is now affliated with its well-known subsidiaries

Since its establishment in 2015, **United Mining Services (UMS) Group** along with its subsidiaries UMS Shaft Sinkers and its engineering and design counterpart UMS METS (Mining Engineering Technical Services) has established a reputation for providing comprehensive turnkey mining solutions. Fast track six years and the company is embarking on a new era in its history – that of a unified brand across all its operations. **GERARD PETER** finds out more.

The driving force behind the company's success is the amalgamation of innovation and a wealth of industry experience that spans six decades along with a visionary management team that is keen to continue to grow the company's global footprint. Already, UMS has been involved in projects in southern Africa as well as Brazil, the UK and the USA.

UMS's core technical capabilities reside in its UMS METS and UMS Shaft Sinkers divisions which were both acquired by UMS six years ago. UMS Shaft Sinkers is the contracting/construction division specialising in shaft sinking, all mine underground and surface construction and specialist services of shaft optimisation. UMS METS is the EPCM arm of the business and has two divisions: UMS METS Mining and UMS METS Process. UMS METS Mining undertakes the engineering and design of underground mining structures including shafts, headgear and declines. UMS METS

Process serves the process and metallurgical industry, focusing on the crushing and screening, material handling, beneficiation projects and tailings reclamation process on all commodities, applying a 'fit for purpose' process solution using a modular approach where applicable.

UMS Shaft Sinkers celebrates 60 years in business this year, while UMS METS will reach the same milestone in 2024. And while both divisions have established their own identity in the industry, this year the company made the decision to bring the various divisions under the UMS Group umbrella. Subsequently, the company's divisions are now operating as UMS Shaft Sinkers, UMS METS, UMS Construction, UMS Botswana and UMS Nevada, UMS METS International in the UK, with UMS Brazil set to be launched in the near future.

According to Group CEO Digby Glover, UMS has been moving towards unifying the divisions for quite some time and in some ways, the decision has given METS and Shaft Sinkers a new lease of life. "It's really been a balance between trying to retain the proud history that the companies have and also trying to move away from some of the negative perceptions that the industry has about these businesses, particularly Shaft Sinkers that went through a bad patch between 2012 and 2015," he explains.

Glover adds that when he joined the company in 2018, he realised that it was important for the industry to have renewed faith in Shaft Sinkers following the investment by new shareholders and the appointment of a new, carefully selected top level management team. "We have realised through this journey that rather than dropping the old company names completely, we needed to unify and expand on the brands under the United Mining Services brand. We needed to retain the long solid track record of Shaft Sinkers and METS whilst enhancing value by adding new skills and services. We have gone about this by bringing in top flight skills from across the industry and by maximising synergies between UMS METS and UMS Shaft Sinkers to provide full turnkey solutions. This symbolises our true competitive advantage. In

> "Our clients are recognising the value of having UMS involved right from the get-go,"
>
> **DIGBY GLOVER**

doing so, we are gearing up to ensure that the new companies can offer more value to the industry than ever before."

A full suite of turnkey solutions on offer

By uniting the various brands under one roof, UMS is now able to offer high-level design, contracting and construction management skills for the full lifecycle of mining and metallurgical processing projects. Thus far, the new-look company has been greatly received by the mining and processing sector. "Our clients are recognising the value of having UMS involved right from the get-go. We can grow a project from concept study phase to execution, so that the project is set up to perform, the contract is set up correctly and all long lead time equipment specified and procured.

"This way we get far better results than following a traditional process where a contractor gets one or two months to estimate a tender with no real in-depth understanding of what has been done during the feasibility and detailed design phases," states Glover.

Alongside a diverse geographical footprint, UMS provides diversity in its offerings and has successfully completed a number of projects in the gold, chrome and general processing applications. The organisation's combined experience and expertise incorporates over 170 000 metres of vertical shafts sunk across the globe, including shaft rehabilitation, shaft towers and mining and tunnelling design.

As part of its ongoing evolution, the company has embraced new technology to provide both improved and safer mining solutions. According to Murray Macnab, Group Technical Director, safety improvement is UMS's number one focus combined with sustainable production improvements. These both require ongoing technology advancements to ensure that the company remains competitive and relevant.

Macnab states that UMS is proud of its safety record and the calibre of people it has attracted and retained over the years, and who embrace continuous improvement. "We collaborate with our suppliers to implement any lessons learnt and improvements or innovations that can only come with contracting and utilising the equipment. Our design engineering teams also develop innovative methodologies to improve safety performance and productivity. The selection and adaption of equipment will have an impact on the performance of our contracts and the sustainability of our business in the future. Innovation and continuous improvement is a culture that is supported throughout the business," he adds.

One such innovation, Macnab explains, is a two-boom shaft jumbo that was recently designed and built for a shaft sinking project in North America. It utilises an electro-hydraulically driven twin drill to improve drilling advance rates and noise reduction. "Furthermore, the drill is remote controlled and is also adapted to drill sidewall support and reduce the need for handheld jackhammer drilling, thereby drastically reducing the number of people required on shaft bottom."

Meanwhile, newly appointed UMS COO Rob Hull points out that while there is a plethora of new technologies on the market, any technology is only beneficial if implemented correctly in a project. "There are many technology buzzwords such as Artificial Intelligence, Virtual Reality and Realtime Analytics doing the rounds; however, the key is to implement any technology in the right way. As such, we first look at what technology is available and whether it is fit for purpose for a project. Also, we've got exceptional people who can ensure that the right technology is implemented in the correct manner for it to add value," Hull adds.

The company has a significant footprint in Africa as well as Brazil, the UK and the USA

Attracting and retaining the right workforce

The UMS Group prides itself on attracting the right human capital in all its operations. With a highly experienced management team in place, the company has set about securing those skills that will help it continue on its growth trajectory. According to Glover, while it is important to have traditional civil / structural design skills or contract management skills, UMS has aggressively expanded in the skills and experience it has brought into the organisation. "Instead of just being a contracting company with some in-house design skill, we have brought in people with various and diverse high-level engineering design skills, project management skills, company management skills and financial skills," he explains.

Another key area of focus for UMS is ensuring diversity and inclusion in its workforce. To that end, the company has made significant strides, particularly when it comes to empowering women in the workplace. Already, a number of key positions in the company are held by females such as Takalani Randima who is currently the MD of UMS Shaft Sinkers.

While diversity and inclusivity is a long-standing value of UMS, Guenther Hellhoff, Group Executive: Business Services points out that any appointment is primarily focused on the skills and attributes that an individual brings to the company. "Fortunately, there are an increasing number of highly talented women and people of colour entering the industry than previously was the case. And, it is encouraging to see that these are highly talented individuals who prefer to be appointed on merit and will not tolerate tokenism. Through our recruitment processes, we have managed to create a well-balanced workforce that is talented and representative of the demographics of the country," he states.

Finally, Glover points out that UMS will continue to build on its solid reputation and is keenly focused on expanding its service offering. "We have a number of process plant projects that we are currently working on and have successfully completed, as well as general mining projects, underground construction projects, and infrastructure projects in the mining industry that don't have shafts. We are well positioned to effectively deliver safe mines and related infrastructure from concept to construction," he concludes. MRA

↑ **Front left to right: Dr Pieter Louw, Group Executive Project Services; Takalani Randima, MD UMS Shaft** Sinkers; Pieter de Frey, CFO; Cherine Hoffman, Group Legal Counsel;James Keir, Group Executive Project Technical Services; Digby Glover, CEO; Chris du Toit, Group Risk Manager; Murray Macnab, Group Technical Director; Guenther Hellhoff, Group Executive Business Services; Robert Hull, COO

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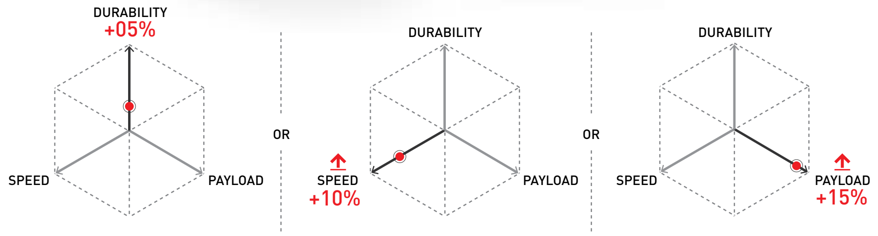

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Human rights protection

A mining industry responsibility

In South Africa's mining sector, the **Minerals Council South Africa** believes that companies have an important role to play in protecting the human rights of all industry stakeholders and has therefore taken a leading role in advocating for this among its member companies. **CHANTELLE KOTZE** spoke to senior executive for public affairs and transformation **TEBELLO CHABANA** about how the Council is driving the protection of human rights in the workplace through its Human Rights Framework.

While it is a widely accepted norm that businesses should respect fundamental human rights, it is an important starting point for businesses to first understand what human rights are and how their operations could potentially have an impact on them in and out of the workplace, Chabana explains.

The Minerals Council's Human Rights Framework, adopted in 2018, is a living document that outlines a set of management practices the industry aspires to implement to demonstrate a responsible approach to respecting human rights.

The framework has largely been based on the United Nations Guiding Principles on Business and Human Rights (UNGP) as well as the International Finance Corporation's (IFC) Performance Standards on Environmental and Social Sustainability and the International Council on Mining and Metals (ICMM) Standards.

"Although the framework is a voluntary instrument in nature, it provides guidance on the notion of business respect for human rights and is aimed at encouraging compliance with existing laws and taking adequate measures to prevent, mitigate against and provide for mediation where impacts on human rights are not avoidable," says Chabana.

He explains that the respect of human rights is upheld by Minerals Council members as the fourth principle of the Council's 10 Guiding Principles within the Minerals Council's Membership Compact – a mandatory code of good business practice to which members of the Minerals Council subscribe as a condition of membership.

Should any member breach the Membership Compact and fail to take active steps to comply with the Compact within a reasonable time, Chabana says the Council will cancel the membership of such member – as has been the case with a member in the past. Membership of the Minerals Council has also been denied on the basis of not meeting the Council's values or standards of good business conduct, he further notes.

Driving value through improved, implementable standards and guidelines

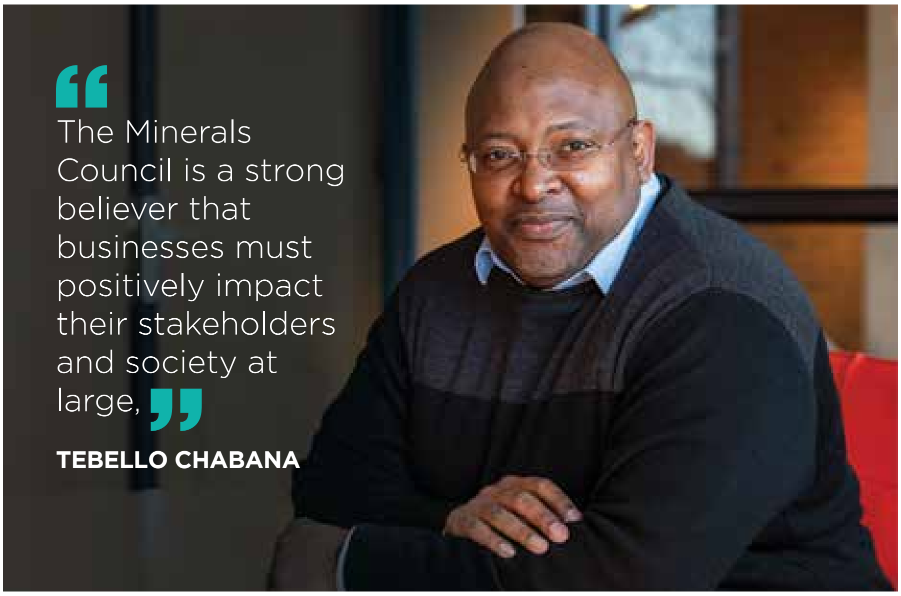
"The Minerals Council is a strong believer that businesses must positively impact their stakeholders and society

To entrench the protection of human rights in South Africa's mining industry, the Minerals Council South Africa adopted its Human Rights Framework in 2018

Image: 123rf.com

GUIDING HUMAN RIGHTS PROTECTION IN SOUTH AFRICA'S MINING SECTOR

The fourth principle in the Minerals Council South Africa's Membership Compact is to respect fundamental human rights and respect cultures, customs and values in dealing with employees and others who are affected by the members' activities. To further entrench the protection of human rights in South Africa's mining industry, the Council's Human Rights Framework was born.



at large," says Chabana, noting that the adoption of this framework is a step forward for companies to become better corporate citizens.

Although recognising that all rights need to be respected, the Minerals Council has identified a number of priority areas specific to the South African mining context where mining operations may potentially impact on human rights. These include:

- Environmental management and conservation;
- Health and safety;
- Governance and ethics;
- Security and human rights;
- Transformation;
- Human rights at the workplace;
- Land-use and resettlements; and
- Development of grievance mechanisms.

In assessing whether mining operations may potentially be impacting on any of these priority areas, Chabana says the framework clearly outlines the responsibility that needs to be taken by mining companies to ensure that human rights are being respected within the mining sector.

Chabana explains that mining companies must start by developing a policy statement with public affirmation to stakeholders of the company's human rights commitments – followed by a due diligence to assess how its operations may impact on human rights and engagement with affected stakeholders on how an operation may potentially be impacting on the respective stakeholders.

Implementing grievance mechanisms as a way for impacted stakeholders to raise concerns is an important reporting mechanism in the process, says Chabana, and it must be followed by the implementation of remediation measures. The progress of this must be monitored and the way in which the impacts are being addressed and resolved must be communicated to the affected stakeholders, he notes.

"Despite the varied nature of member companies, some of which are large multi-national corporations who are global good governance trailblazers compared with small to mid-sized entities, it is important for member companies to understand what protecting human rights entails and make an effort to adhere to some of the basics relating to the Council's Human Rights Framework," Chabana says.

Going forward, the Council's aim is to provide training in various elements and components of the framework so that its members understand what the local and global norms and standards are, with the aim of going beyond compliance among our member companies, he adds. **MRA**

PROTECTING THE MOST BASIC HUMAN RIGHTS

When it comes to advancing critical human rights, the mining industry is one of very few sectors that act as strong developmental partners in supporting the government at a local and provincial level in terms of service delivery capacity. Through its social and labour plans, mining companies outline and then action the establishment of infrastructure such as roads, schools, healthcare facilities and provision of water and sanitation services, to name a few, in local communities and labour sending areas.

In addition to supporting municipal service delivery, the mining industry also plays a critical role in holding municipalities to account in delivering services to communities where this is not being done.

Image: Minerals Council South Africa

↑ **The Royal Bafokeng Platinum housing project**

South Africa is in a favourable position to capitalise on the opportunities presented by the nascent green hydrogen sector

Image: 123rf.com

South Africa

Is the country at the core of our sustainable energy future?

As part of the global drive towards creating a net-zero carbon economy, South Africa may hold the key raw materials and renewable energy generation potential to produce green hydrogen. But this will require significant investment into cost-effective renewable energy, the infrastructure needed to produce green hydrogen and the logistics needed to store, transport, and export the green hydrogen to the world's largest predicted consumer regions of Europe, Asia and North America, writes **CHANTELLE KOTZE**.

Green hydrogen is a clean source of energy that is produced by splitting water into hydrogen and oxygen through a process of electrolysis using renewable sources of energy which are consumed in fuel cells to generate power using a chemical reaction rather than combustion, producing only water and heat as by-products.

South Africa has an abundance of renewable energy sources such as wind and solar, and a rich endowment of the platinum group metals used in the electrolysers needed to produce green hydrogen, which positions South Africa at the forefront in building a global, green hydrogen economy. This unique opportunity can be leveraged to boost the southern African country's economy.

The country's ability to capitalise on this could not be better following South African President Cyril Ramaphosa's June decision to increase the licensing threshold for embedded generation projects from 1 MW to 100 MW without the need for a licence. While this will not only assist in achieving national energy security and reduce the impact of loadshedding, it is expected to unlock significant investment in new energy generation capacity in the short to medium term.

During a virtually-held fuel cell and hydrogen conference, hosted by Nedbank CIB and moderated by Nedbank CIB analyst Arnold Van Graan, Switzerland-based energy transition consultancy E4tech director Professor David Hart said that despite the difficulties in 2020 as a result of COVID-19, there was still an increase in fuel cell shipments that took place, dominated by fuel cell shipments for the transport sector.

While fuel cells have been predominantly used in light duty applications, we are seeing an increase in the use of fuel cells in heavy-duty applications such as heavy-duty vehicles, including busses and trucks, driven by air-quality regulations and reductions in costs, says Hart, noting that heavy-duty trucks and buses have few other options to hit emissions targets.

Even heavier duty applications, in mining, rail transport and shipping, which have previously been dismissed as too difficult or too long-term to execute, are under development, says Hart.

The South African opportunity

Also speaking during the conference was metals service provider Isondo Precious Metals CEO and founder Vinay Somera, who has 30 years of experience within the PGMs industry, having also helped create and build platinum refiner Impala Refining Services (IRS), a subsidiary of PGM miner Impala Platinum.

Somera said South Africa has all the tools to become a leader in the green hydrogen sector, as a strategic pathway to drive economic growth and job creation and is strategically positioned to leverage two opportunities: Firstly, by becoming a green hydrogen supplier and secondly, industrialisation across the PGM component value chain as required by the hydrogen sector.

Further unpacking the first opportunity, UK Hydrogen Hub chairperson and EnAcumen CEO Kevin Fothergill, who serves as technical consultant to Isondo Precious Metals, said South Africa has some of the best renewable energy potential in the world for solar and wind energy.

"The total area of high solar irradiation in South Africa is approximately 194 000 km^2, including

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> It remains to be seen what role South Africa will play in the commercialisation of the green hydrogen economy,
>
> **ARNOLD VAN GRAAN**

the Northern Cape Province – one of the best solar resources in the world," said Fothergill.

However, many of the centres of energy demand are some distance from the best generation locations and would require significant investment in the transmission and distribution of hydrogen to where it is needed – investments which Fothergill believes should be made.

The energy storage capability of hydrogen can be used to bridge the gap between low demand and high renewables and low renewables and high demand, he says.

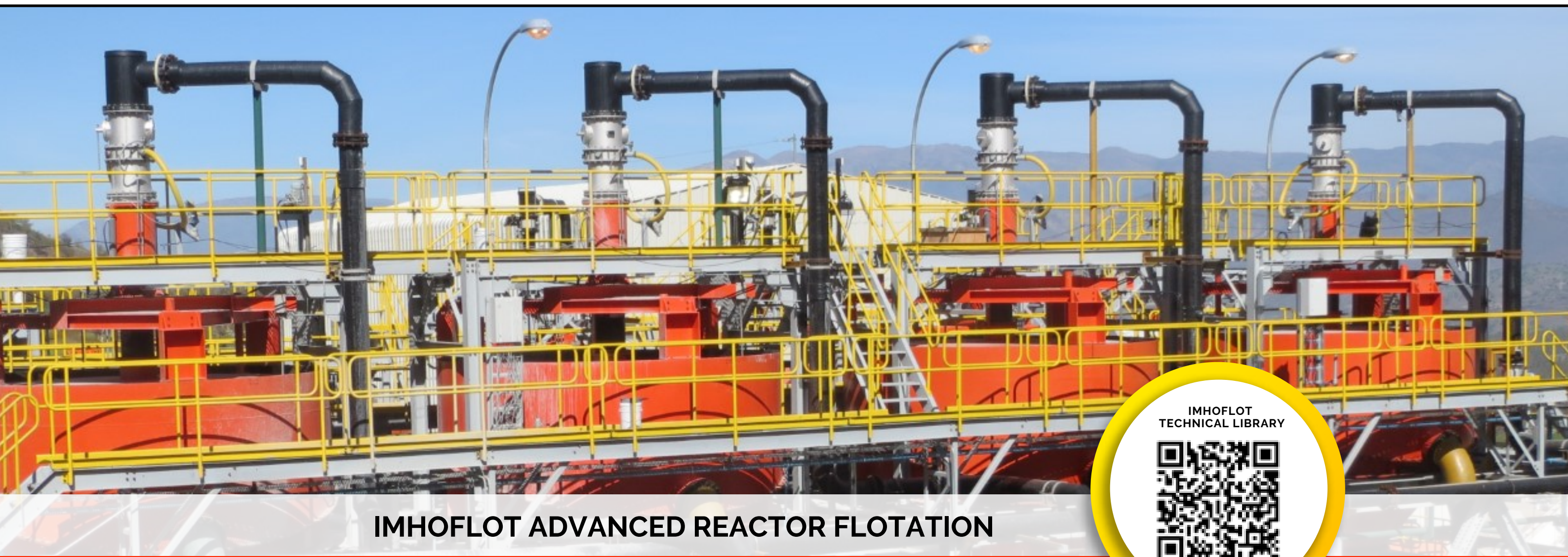
The second opportunity, which is the industrialisation opportunity that lies within using South African-mined PGMs in the green energy revolution, is the localisation of the entire green hydrogen supply chain, Somera says. This entails the localisation of renewable energy production, green hydrogen production, energy storage deployment, electricity generation and PGM recycling, which could greatly assist with the reindustrialisation of South Africa.

Somera outlined Isondo's plan to establish membrane electrode assembly (MEA) manufacturing capability in South Africa at the OR Tambo special economic zone.

The MEA is at the heart of the fuel cell or electrolyser stack, and includes the membrane, the catalyst layers, and gas diffusion layers.

Isondo has already broken ground at its manufacturing facility where it plans to produce 3, 5 or 7-layer MEAs for fuel cell and electrolyser applications.

While Van Graan said that it remains to be seen what role South Africa will play in the commercialisation of the green hydrogen economy, the country remains in a favourable position to capitalise on the opportunities presented by the nascent green hydrogen sector. MRA



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Petroleum and mining sectors

Call for innovation

In a paper developed by the IBM's Institute for Business Value on 'Essential tactics to foster innovation in oil and gas', industry leaders emphasised the importance of innovation within the sector. It is a space that's facing numerous challenges around infrastructure, revenue, operations, budgets, regulations and shifting market dynamics. The same challenge lies within the mining industry.

Dr Nkosi Kumalo, managing executive of sales at BCX Exa

Both sectors are facing incredibly complex market demands, difficulties around infrastructure and access to raw materials, and new dynamics around power generation solutions. These industries are expected to juggle everything from compliance to environment to skills to disruption within tight constraints and with increasingly limited budgets.

There are questions that both sectors must however answer. Do they need to innovate around power? Do they need to invest into different types of gas, biofuels or hydrogen? How can they manage the disruption that's taking place around traditional solutions within the sector? The answer to all these questions lies in innovation.

Innovation is more than just investigating new technologies, fuels and alternatives to existing solutions. It's also investment into skills that allow for industries to reshape their approaches to resources and infrastructure. The sectors must find ways of invigorating themselves and building a strong skills pipeline that will enable longevity around production. Within this lies the need to build the skills required to leverage technology so that it can change how companies within this industry manage systems and processes.

Organisations can't afford to ignore the impact that technology can make on key areas such as operations, cost efficiencies and revenue. Technology can use data and analytics to gain insights into consumption patterns and to provide forecasting that can transform investment and strategy. This is critical to any business, but particularly those in the petroleum and mining sectors.

If a company can gain granular insight into user patterns it can potentially visualise how these will play out over the next six months and then it can use this data to change the way processes are optimised. It can align systems and spend with analytics to refine how it approaches different markets and how it manages cost efficiencies. And, perhaps even more importantly, it can help the legacy business become more agile and adaptable in the face of disruption.

There are a number of diverse start-ups entering this space, start-ups that are digitally native and capable of digging into customer needs and delivering very targeted results. This is a difficult hurdle for many stalwarts in the industry to deal with. They're dug in, their processes are rigid, and they struggle to embed the culture and agility required to pivot and innovate.

On top of this, the industry is grappling with finding space for innovation. The IBM paper points out that there are four types

Image: 123rf.com

of innovation that can fundamentally shift the balance within the petroleum (and mining) sectors: product innovation, service innovation, process innovation, and revenue innovation.

These areas are key to the long-term, sustainable growth of the industry. Companies must look to the future to shape their product offerings, their service delivery, and how their strategies are aligned with visionaries like Elon Musk – leaders who are changing the shape of the industry as a whole.

While this may seem a daunting list of challenges and hurdles that have to be vaulted, the truth is that there is immense potential for both industries. It is one that sits on the cusp of change that can allow for innovative shifts in focus and solution and that can potentially change the dialogue around the future. What are needed, to fully support the sector as it embraces technology and innovation, are partnerships that understand the landscape and the unique needs within it.

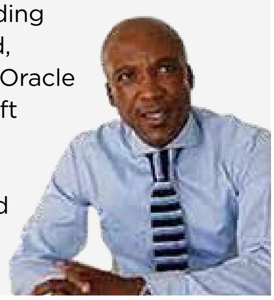
Partnerships are key to the future. They can help organisations determine what type of innovation is relevant to them, what areas require investment, and how to leverage technology to create holistic ecosystems for sustainable results. Now is the time to collaborate and create solutions that will redefine the industry alongside the right partners. This is how the sector can innovate and recreate the narrative that currently limits its potential. MRA

Image: 123rf.com

ABOUT THE AUTHOR

Dr Nkosi Kumalo is the managing executive of BCX Exa. In this role, he is tasked with building capability in advisory and consulting, digital software development, digital integration, data science and insights, robotic process automation and cloud migration services for BCX.

Prior to joining BCX, he worked in strategic business development and marketing roles for leading multinational brands within the FMCG and ICT industries. Kumalo is a well-rounded senior IT professional with strong experience across all technology stacks including Public Cloud, Datacentre, Oracle and Microsoft Licensing, Printing and Imaging, and Endpoint Devices.



New electrical shutdown system

Saves millions, and millions

The potential fire hazards associated with electrical equipment pose a significant threat to any mining operation, but thanks to a new electrical shutdown system, this is one hazard threat that can effectively be eliminated.

The Safety Solutions MicroFire Protection System, distributed by auto-electrical components and services specialist Trysome Auto Electrical Engineering, is a personnel and asset safety-driven initiative which protects key assets from electrical fires and assists any fire-suppression system in minimising the damage caused by a mechanical fire by shutting down the machine completely.

The system acts as an early-warning alert for operators and mine managers of a pending fire due to an electrical short.

How it works

The MicroFire Protection System is triggered either by the fire-suppression system or an electrical short. Each system is set up against customised, pre-set parameters defined by the customer.

MicroFire Protection will monitor the current being drawn from the machine and if the system current is higher than the parameter settings the system will send out a visual and audible alert. The operator is warned, via the in-cab display, and any number of pre-defined individuals will receive an alert via the Telegram communication portal.

These alerts will identify the error type i.e., over-current or mechanical. A pre-set timer will begin the countdown to a complete, fail-to-safe vehicle shutdown, giving the operator enough time to pull the vehicle over and evacuate safely and without recurrent incident.

The MicroFire Protection System will switch off all current supplied from the battery, minimising equipment damage, and stay locked-out until an investigation has been done and any threat has been neutralised.

The system intelligently logs a history of all DC parameters for further analysis.

Case study in sub-Saharan Africa

In light of ongoing fire hazards with its fleet, largely because conventional fire-suppression systems cannot control electrical fires due to the massive currents from the batteries the machines are operating on, a coal mine approached Trysome for a solution to its fire-hazard problems.

Trysome conducted extensive research and physical inspections on the machine fleet to establish the correct values to be used to furnish the ultimate product – a solution that works as a dual vehicle fire prevention system, that needs no human intervention, and that meets all safety requirements.

As there was no pre-existing product to deal with this type of hazard, Trysome developed and patented the Safety Solutions MicroFire Protection Electrical Shutdown System.

MicroFire utilises a pressure switch on the existing fire-suppression system and a master control unit with a display that analyses the pressure on the fire-suppression system, as well as the voltage and current on the machine to ensure a delayed shutoff of the machine for the operator to exit safely and to minimise asset damage without any human intervention (system is fully automated).

A prototype system was designed, manufactured, and installed on a 60-ton excavator in August 2019. Within a matter of weeks, the system triggered and saved the machine from an electrical burn. Upon thorough investigation, it was found that the starters on the machine had been the main cause of activating the system as it had a short-circuit due to over-cranking, which, in turn, caused the positive lead on the solenoid to melt and arcweld to the engine chassis.

Without the MicroFire Protection System, the mine would have lost its asset and it was so impressed with the outcome that it immediately ordered a batch of units to be installed on its fleet. MRA

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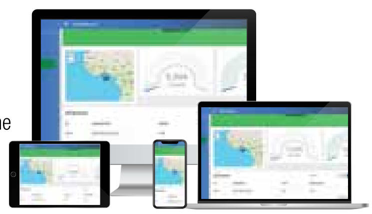

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Otjikoto

An over-achiever

Dual-listed gold major **B2Gold's Otjikoto** mine in Namibia may not be the largest producer in the company's three operating mines portfolio, but nonetheless it is a star performer. Having nearly completed seven years of fruitful open pit production and operating performance, Otjikoto has embarked on a new journey – establishing an underground mine which will support its annual production targets as the mine matures and potentially enable a significantly longer lifespan. **LAURA CORNISH** was hosted on-site by B2Gold's MD and country manager **MARK DAWE** to learn more.

IN SHORT
The future of Otjikoto is bright – as the mine begins to tap into an underground ore body that could have significant years of mining potential.

Since producing first gold in December 2014, Otjikoto's star has always shone brightly – and having visited the mine, it's not hard to see why. Yes, it comprises a good, economically sound ore body and a well-constructed and operated process plant – but there is a lot more to this story.

It is run by a team (not only management) who are undoubtedly true experts in their fields. Coupled with passion, commitment, and devotion to the mine's daily needs, it has become almost impossible to fail in any task, big or small, undertaken.

I was fortunate to have spent time with the various heads of department on site (in addition to Dawe, this included the general manager, underground project manager, dispatch manager, power plant manager, spares storage facility manager and heavy mobile equipment manager), each fulfilling their roles and responsibilities with unwavering dedication and drive.

For those who don't know the mine, it is situated in north-central Namibia, about an hour's flight from Windhoek.

Decline to access the Otjikoto underground ore body is well underway

It comprises two adjacent open pits – the original Otjikoto pit and the newer Wolfshag pit.

Together, these two pits have consistently delivered solid production years which in 2020 totalled 168 041 oz of gold, near the midpoint of its guidance range. While this was slightly lower than normal, it was expected due to lower grade mined areas. This scenario was short-lived and the mine is on track to produce between 180 000 and 200 000 oz of gold in 2021, within the range of Otjikoto's annual production record (of 191 534 oz achieved in 2017). This can be attributed to high-grade ore which will be mined from Phase 3 of the Wolfshag pit in the second half of 2021. Important to note, Dawe shares, is the plant's +98.6% recovery rate: "an exceptional achievement."

Tapping into the greater ore body

In December 2019, the B2Gold board approved the development of the Wolfshag underground mine, a down-plunge extension of the narrow, high-grade Wolfshag ore body calculated at this stage to contain 210 000 oz of gold in 1.2 Moz of ore at 5.57 g/t gold.

During the first half of 2020, engineering of the underground mine commenced. Development mining contractor Murray & Roberts Cementation was appointed (in joint venture with local Namibian partner, Lewcor). The latter half of the year saw them mobilise on site and immediately thereafter commence with the development of the portal (situated within the Phase 2 portion of the Otjikoto open pit). The primary underground ramp subsequently followed.

"In the fourth quarter of 2020, development of the portal was completed while the decline itself continued into the start of 2021 – which in August had achieved around 670 m in length and a 70 m vertical depth at a dipping angle of 14°. It is due to reach its final length (950 m) before year end. A ventilation raisebore shaft, 220 m in length in the primary phase and then another 70 m to service the ore body, is also included in the underground mine's infrastructure," explains Eric Mouton, underground project manager.

Otjikoto process plant

"This project is progressing comfortably and we remain on track to commence with stope production work in the first months of 2022," Dawe confirms.

With underground development well underway, Otjikoto's higher 2021 gold production level (of between 180 000 and 200 000 oz) is expected to continue through to 2024, as production from the Wolfshag open pit ramps down towards closure and the full production output becomes supplemented from the Otjikoto pit, together with existing medium and low-grade stockpiles.

180 000 – 200 000 ozpa
Otjikoto's gold production target for 2021

"The Otjikoto pit still has significant gold tonnages to contribute and so we are simultaneously developing the decline while opening up a combined Phase 3 and 4 (pitwall/pushback expansions)," Mouton adds. To ensure the mine's excellent safety record is not compromised in this regard, the entire portal entrance has been shotcreted and a corrugated arch established to protect men working within pit.

While the combination of the underground mine and Otjikoto pits' known and mineable resources equates to a five-year lifespan, Dawe reveals that the ore body at depth has only been partly defined. "Our mine model only incorporates a small fraction of our underground resource which we've just started to uncover through surface drilling." The potential to expand the Otjikoto pit with a Phase 5 pushback is also on the cards – "so this mine's future is far from over."

For now, the 3.5 Mtpa (ROM) process plant continues as is – designed to handle ore grade of no higher than 2.8 g/t. While the underground mine varies in grade between 3 and 6 g/t, when combined with surface material, the plant will continue to process as per the original grading specifications. "As Mark mentioned, our plant delivers an exceptional performance with over 98% recoveries, an achievement we are particularly proud of," says general manager Eric Barnard.

Wolfshag pit, adjacent to the Otjikoto pit


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What's missing?

In today's new age technology-driven era, could this be a missing piece in completing the Otjikoto puzzle? No, it is not. Over and above a sound operation and a dependable team, this mine also benefits from technology – which can be seen throughout all aspects of the operation, says Steve Robinson, mining technical services manager.

The dispatch control room is good evidence of this. The mine deploys a system developed by Wenco, which specialises in digital technologies for mining. This system gives both a broad and in-depth view of the mine and can track every machine and its performance; and even has the capability to debottleneck truck queues at the loader when they arise through automated algorithms. The downstream benefits this has, thanks to streamlined/optimised productivity, are substantial. Incorporated into this system is a fatigue monitoring system which, as I have seen firsthand, undeniably works. The system overrides the truck and stops it – this applies to any driver who is not fully cognisant behind the wheel.

To best control potential pit wall failures, the mine makes use of a robotic pit stability monitoring system. While the system is not designed to prevent pit wall failures, it does monitor seismic activity and can predict wall failures, enabling the mine to be prepared for them – which obviously has the benefit of protecting both man and machine from danger or injury or even worse, fatalities.

Spare parts as well as PPE are also monitored using smart technology systems, and this includes fuel monitoring which I found particularly impressive.

"Naturally the underground mine will follow our technology focused approach," Dawe points out. "The mine will have an entirely wireless communication system, automated drill rigs, a semi-autonomous space station fleet system as well as the same fatigue monitoring system we have on surface.

"Naturally, our employees underground will require the best training available, which we will provide, and we will further ensure the contractors we work with do as well. Our intention is not to dilute our Namibian workforce with international expatriates," Dawe affirms.

Otjikoto's technology also extends beyond the mine – it operates a 30 MW

A GENIUS MOVE – LITERALLY

While walking through the HME workshop, hosted at this stage by Wynand van Wyk, engineering manager, I was truly enlightened. First, by the initiative to cover the mine's three loader tyres with chains (something you wouldn't expect to see in Africa). "This concept is extending the lifespan of our tyres by three times longer, delivering another area of massive saving for the mine," he says.

The HME workshop also has full rebuild capabilities – performed by the mine's own staff who are all, impressively, self-taught. This includes trucks, loaders, excavators and even drills (which is a technically complex machine to build). This in-house team is supported by on-site Caterpillar staff who certify the rebuilds, as do Kanu Equipment representatives, on behalf of the Liebherr excavators.

hybrid microgrid, which was the first within the Namibian mining sector to add synchronicity to the plant – meaning it can autonomously stop and start as required. In fact, the autonomous integration of the PV plant with the HFO plant through a specialised algorithm, was a world first. The HFO plant offers a 24 MW capacity and is supplemented by a 7 MW photovoltaic plant as well. In its first year the power plant saved 2.3 million litres in HFO fuel and reduced associated power generation fuel costs by approximately 10%. It has been delivering similar significant savings ever since, including the elimination of over 17 000 t of CO_2 equivalent emissions in 2020.

"We are nonetheless looking at ways to reduce our power costs further and are undertaking a project to link the mine to the national power grid. At a cost of $13 million, the mine will oversee and fund the construction of a 21 km overhead power line. Not only will this reduce our costs, but it will also significantly reduce our carbon emissions as well," says Sydney Kavehaha, electrical O&M superintendent.

Truly one can never understand the full breadth of a mining operation without visiting it and I was afforded that opportunity. And it was well worth my while. Meeting the team, understanding their work ethic and seeing it happen is testament to Otjikoto's great success – long may it continue. MRA

Botswana's Khoemacau

A mining 'hall of fame' contender

Botswana made the headlines in June as it celebrated the official production start-up from the world-class **Khoemacau** copper/silver project. And while the delivery of first concentrate from any new Greenfields project is a milestone achievement in itself, there are many more reasons why this new mine should make it into the 'African mining hall of fame', writes **LAURA CORNISH**.

IN SHORT

Not many companies can say they successfully delivered a Greenfields large-scale, underground fully mechanised mine on time and within budget during the peak of COVID-19, but Khoemacau Copper Mining, proudly, has done just that.

What makes Khoemacau so special?

Situated about 70 km south-west of Maun in the northern region of Botswana, the 100% privately owned Khoemacau copper project is situated on the Kalahari Copperbelt and forms part of a 4 040 km² land package that Khoemacau Copper Mining owns. (The company is wholly owned by private company Cuprous Capital, which in turn is owned 87.9% by Cupric Canyon Capital LP, a company majority owned by funds advised by Global Natural Resources Investments and 11.9% by Resource Capital Fund VII LP.)

Delivering as mentioned, a US$410 million world-class, significantly sized underground mining operation during the height of COVID-19 is no easy feat, but Khoemacau is proof that it can be done.

A lack of underground mechanised mining skills in the area, no decent access road for the first nine months of project development and equipment supply challenges associated with the pandemic posed no challenge too big for this project.

Not only did the project achieve first production as per its original timeframe (established before the pandemic) in June 2021, it also kept to its original budget and closed out the project within 2% of its original financial model. "To safely execute the project, construct and bring into production a world-class mine, in two and a half years since we started construction, considering the impact and typical delays caused by COVID-19, is an achievement we are particularly proud of," states Johan Ferreira, CEO of Khoemacau Copper Mining.

Khoemacau represents the first fully mechanised underground copper (and silver) mine in Botswana. It is also one of the few mining projects to be

Overview of the Boseto process plant

delivered, relatively unaffected, during a global pandemic which has, generally speaking, caused scheduling delays across the mining development board.

Having developed a relationship with Khoemacau in early 2017, Fluor was officially awarded the full EPCM contract for the project in 2018. This incorporated detailed design of the surface infrastructure and upgrading of the processing facility, procurement of fixed surface equipment (including the long lead equipment items) and construction management of the surface infrastructure and the process facility upgrading. "This undoubtedly can be attributed to the full integration and unwavering commitment of both the mine and EPCM teams," points out Russell Ayres, Fluor's Mining & Metals vice-president and general manager for Asia Pacific, Europe and Africa.

Ayres believes in an integrated project management model, noting that – together – challenges are quickly resolved, and delivery targets are well aligned. "For the large part, Khoemacau and Fluor key personnel required to deliver the surface infrastructure and process facility part of the project on site stayed resident on the mine, for months at a time, to ensure we maintained the original schedule we had committed to – something we pride ourselves on achieving as the commitment made to the project's funders needed to be met. This was a commitment Fluor undertook on behalf of Khoemacau," he continues.

"This project represents diversity for Botswana's mining sector and a significant new GDP revenue generator outside of diamonds,"

JOHAN FERREIRA

As if the above achievements are not enough, the entire project recently surpassed the 7 million LTI-free hour mark – an incredible feat for any mine project development, "and something Khoemacau believes is a rare achievement", Ferreira notes.

This was achieved through dedicated focus and interventions from the integrated project management team; and commitment from contractors, despite the lean staffing approach of a combined construction management team, which has covered a widespread site that extends over 90 km.

"And while the mine itself is substantial in size, it represents only the start of what is intended to be a much larger project in the medium-term. A strategic priority is the expansion study that is already well underway," Ferreira highlights.

↑ **Boseto plant**

↑ **Khoemacau is an undergound, full mechanised operation**

Operation outline

"At present, the Khoemacau mine comprises the high grade Zone 5 underground mine and associated surface infrastructure, as well as the metallurgically and volumetrically upgraded Boseto processing facility – referred to as the 'Starter Project'. This is now in the process of ramping up to its nameplate throughput of 3.65 Mtpa – to produce +60 000 tpa copper and +2 Mozpa silver, with both payable metals in concentrate at a cash cost of

about US$1.30/lb and an AISC of about $1.75/lb (net of silver credits at consensus pricing). Based on a resource of 92 Mt, delivering these volumes equates to a long operating lifespan in excess of 20 years," Ferreira outlines.

Zone 5 comprises a measured, indicated and inferred resource of 92 Mt containing high grade +2% copper and +21 g/t of silver.

The mine itself comprises three boxcuts with twin declines, each servicing three standalone long-hole open stoping mines. The ore is processed at the nearby Boseto process plant – which was acquired out of provisional liquidation back in 2015 and which Khoemacau Copper Mining refurbished and metallurgically and volumetrically upgraded from 3 Mtpa to 3.6 Mtpa, and now includes an improved flotation circuit.

"The infrastructure required to deliver the project is another proud achievement," says Chrisjan van Wyk, project director for Khoemacau Copper Mining. This included the establishment of a 35 km haulage road from Zone 5 to the Boseto processing facility, 32 km of access road from the Boseto processing facility to Zone 5, a 50 km 132 kV transmission line and two 2x25 MVA sub-stations, an extension of the Haka Wellfield, water reservoirs and a 40 km water pipeline that supplies borehole water to Zone 5 – plus the Zone 5 mining surface infrastructure (including administration offices, changehouse, medical and security facilities, workshops and stores and an on-site 560 person accommodation camp).

With nameplate capacity in sight, what's next?

"We are already tracking well towards achieving steady-state production in Q1, 2022. However, getting this project to full performance, to leverage these remarkable copper and silver prices, and continuing to prove up our significant expansion opportunities remain top of the company's priorities," Ferreira notes.

Considering the Khoemacau land package is substantial and known exploration work has revealed additional copper and silver resources , the mid-term plan aims to expand production to over 130 000 tpa of copper and 5 Mozpa of silver metal in concentrate and in the longer term to +150 000 tpa

PROUDLY UPSKILLING BOTSWANA

Ensuring its contribution to longer-term sustainability within and around the area in which Khoemacau exists, Fluor has excelled on this front, from CSI initiatives such as the delivery of new ablution facilities for a nearby school to training and education in construction skills.

"Having acquired skills in these areas, Botswana has benefited enormously from Khoemacau, Fluor and all their business partners' efforts in this regard. Not only does Botswana but also other mining projects now have access to an upskilled workforce," Ayres proudly shares.

1 760	The peak number of construction workers on site
+90%	Local employment rate

↑ The team celebrating first production

of copper and +6 Mozpa of silver metal by developing further resources, with grades in excess of 2% copper, in the area including Zeta North East, Zone 5 North and Mango. "There is also potential to expand mining at Zone 5 to 4.5 Mtpa ROM – which we are already confident can be achieved considering the resource continues at depth below 1 200m," Ferreira confirms.

This would be achieved through the construction of a new 4.5 Mtpa process plant at Zone 5, thereby freeing up the Boseto plant to treat new ore originating from the above-mentioned deposits.

At present, a pre-feasibility study is underway, targeted for completion towards the end of the year, with a full feasibility study expected by the middle of 2023.

"Having met all of our original commitments, we have undoubtedly delivered a great project for Botswana, notwithstanding the challenges we encountered. This project represents diversity for Botswana's mining sector and a significant new GDP revenue generator outside of diamonds. What we have delivered to date is just the beginning of a much bigger story for Khoemacau and Botswana," Ferreira concludes. MRA

↑ First concentrate ready for shipment

BEYOND ZONE 5

Outside of Zone 5, there is 76 Mt of near mine measured, indicated and inferred resource at +2% copper and +34 g/t silver drilled out to date from surrounding high grade deposits.

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Pilanesberg Platinum Mine

A great future, unfolding

The road ahead is paved with green lower carbon PGMS for the **Pilanesberg Platinum Mine** (PPM). Now in its 12th year of operation as a financially profitable open pit mine, it is evolving with the exciting Triple Crown expansion into contiguous deposits of Sedibelo Central, Magazynskraal and Kruidfontein with an estimated resource base in excess of 60 million 4PGE ounces. The predominantly shallow deposits will enable safe and sustainable mining activities for potentially more than 50 years, as COO **CASPER BADENHORST** tells **LAURA CORNISH**.

IN SHORT

The PPM journey to sustainable cost-efficient, lower carbon production is well underway – as a well-established open pit mine becomes multifaceted.

Comfortably situated on the Western Limb of the Bushveld Complex, PPM has produced some 1.5m 4PGE (Platinum Group Elements) ounces since March 2009 – having successfully weathered the storm of depressed metals prices and emerged cash positive, ready to grow responsibly and take advantage of improved market conditions.

First ore was delivered to the process plant in Q2, 2009 – averaging between 140 000 and 150 000 ozpa of PGM concentrate. Production of around +/- 325 000 tpm of ROM material is generated from the West/ Tuschenkomst pit which is focused primarily on the silicates (upper and lower pseudo reef package) and the UG2 reef.

"We are excited about this significant evolution of our operation. The next phase is the establishment of our second open pit (the East Pit) on the adjacent farm Wilgespruit and simultaneously to that, the first decline for PPM's underground operations will start," Badenhorst explains.

Making COVID-19 count: Starting on surface

The COVID-19 initial lockdown period allowed the mine to review mining plans and in doing so, to materialise objectives into realistic growth strategies given the current circumstances.

"The full exploitation of our resource has eventually become a reality," Badenhorst enthuses. "Our vision is becoming our reality as we start to implement various projects that will cement PPM's position as a thriving cost-efficient, low carbon PGM producer within the region for many, many years to come."

> "Our vision is becoming our reality as we start to implement various projects that will reposition PPM as a green, cost-efficient low carbon PGM producer within the region for many, many years to come."
>
> **CASPER BADENHORST**

The much-improved PGM basket price and tight cost control provide a solid growth platform and has given PPM the flexibility to extend the operating lifespan of the West Pit. PPM is currently busy with an optimisation study to determine the extent of the opportunity.

"As mentioned, this is just the beginning. The mine will now introduce a second, entirely new East pit to its production profile. Situated directly adjacent to the West pit, it is separated only by a fault line. This new pit has been a long time coming and required the preparation of Wilgespruit for mining, which involved the successful negotiation and resettlement of families living across the area. We are now in a position to execute our first blast and develop this new pit with alacrity," Badenhorst outlines.

As with mining in general, the social environment within which PPM

Aerial view of the PPM operation

operates is an important feature of its sustainability and provides optimum employment opportunity for local communities. Perhaps it is also the expanded opportunities for new work that has ultimately seen such a smooth transition for the mine to enter a new mining zone.

There is also no forgetting the Triple Crown expansion, which will be mined simultaneously with ore from the existing open pit.

While the fruits of its labour to deliver a longer-life and potentially larger open pit mine is materialising, it is the underground potential that represents a truly long-life (+50 year) operation.

Outlining the underground mine

Developing an underground mine has also required long-term planning. "It was essential to get the timing on this just right," Badenhorst states.

DID YOU KNOW?
Besides its PGM operations, PPM is also equipped with a standalone chromite recovery plant, which for the past two years has contributed to profitability, producing about 6 000 tpm of chrome.

"We understand our geology, which is challenging, and want to ensure our commitments and intentions are within reach. And with added flexibility around the lifespans of both of our pits, the board approved our underground mine development plan in December 2020."

At present, the plan determined to be the most optimal is to construct two declines in two phases. This will be

↑ **The open pit potential at the existing West pit has a flexibility upside**

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↑ **Basic plan for underground**

overseen by an underground general manager who has already been appointed.

The first decline will be on the farm Wilgespruit and the current planning is to start with development in Q1, 2022 and the first reef coming out in 2026, reaching steady-state in 2030. A second decline is planned to start with development in 2024. Both these declines will deliver a high grade UG2 ore that will be treated in the existing concentrator. Each decline will have a 80 000t/m capacity and will reach steady state by 2030.

With a major drive to provide local employment to neighbouring and nearby communities, the underground mine offers an opportunity to increase on-site numbers. "We will of course provide progressive training to operate comfortably in an underground environment," Badenhorst notes.

Going green

Another exciting addition to the PPM portfolio is the 110 000 tpa Kell plant with alternative technology to conventional smelting and refining. Kell promises to reduce energy consumption by 60% and have a much smaller carbon footprint than the conventional smelters. Kell will give the PPM concentrator the opportunity to improve recoveries, and there is limited

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PPM process plant

constraint on the chrome content produced from the concentrator.

Well known in the industry, Keith Liddell is the inventor of the Kell Process, having conceived the concept initially as a treatment route for PGM concentrate from the UG2 reef. Chromite contained in UG2 concentrates presents challenges in smelting, with constraints being placed on the amount of chromite that flotation concentrates can contain reducing flotation recovery. Kell was designed to remove this chromite constraint and it is insensitive to chromite.

Over the years of development, the Kell Process has been fine-tuned through testing and engineering studies to be robust and flexible so that its operating conditions can be integrated with the needs of each concentrate processed.

"We are proud to be associated with this initiative and to be the first in Africa to adopt the technology – taking us on a green hydrometallurgical journey that again offers additional employment opportunities. With its success, our ultimate goal is to use the smelter for toll treating neighbouring companies' ores," Badenhorst concludes.

Besides its PGM operations, PPM is also equipped with a standalone chromite recovery plant, which for the past two years has contributed to profitability. MRA

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Prospect Resources

Demonstrating its near-term, dual-commodity lithium opportunity in Zimbabwe

ASX-listed African lithium developer **Prospect Resources** has been resolute in its goal of defining a clear pathway to becoming a near-term, high-purity lithium producer. What sets the company's 87%-owned **Arcadia lithium project** apart from its peers is the dual commodity opportunity that exists, which could see the company's high-purity petalite and spodumene concentrates enjoy premium market pricing, over and above recent price increases on the back of widening long-term lithium deficits, MD **SAM HOSACK** tells **CHANTELLE KOTZE**.

IN SHORT
Prospect Resources is currently working towards finalising both a two-stage and single-stage optimised feasibility study for the development of Arcadia, which is progressing well and is on track for completion in the third quarter and fourth quarter of 2021, respectively.

Lithium, which has the highest electrochemical potential of all metals, has become highly favoured as a key raw material in the manufacture of lithium-ion batteries for use in the burgeoning electric vehicle and energy storage market. However, of equal importance is the wide range of uses that lithium and its chemical compounds have in industrial applications, resulting in numerous chemical and technical uses including glass, ceramics and industrial alloys manufacture.

Having acquired the Arcadia project in 2016, Prospect Resources has undertaken extensive metallurgical test work programmes on Arcadia's ore body, given that it contains petalite (containing 4% lithium oxide) in addition to the more commonly produced spodumene

Commissioning and the commencement of production at the Arcadia pilot plant was achieved on schedule and within budget on 25 June 2021

(containing 6% lithium oxide), to ensure that it is able to deliver the highest product quality with the most optimised, efficient and de-risked recovery pathway.

"The co-mineralisation of petalite in the ore body is of adequate concentration and sufficient quantity to be extremely beneficial and economically viable to recover," explains Hosack. While the petalite is used in the European and Asian technical market, a niche and stable market for glass and ceramics manufacture, the lithium oxide can also be extracted for use in battery manufacture, he says.

Important to note is that although the petalite contains a lower lithium oxide concentration than spodumene, technical-grade petalite sells at a premium to chemical-grade spodumene in today's market, owing to its niche yet very material market, providing Prospect Resources with two extremely valuable lithium products, Hosack highlights.

Low-risk execution imperative

Prospect Resources' focus throughout 2021 was on the successful construction, commissioning and commencement of production at the Arcadia pilot plant, a major milestone toward near-term lithium production, which it achieved on schedule and within budget on 25 June 2021.

According to Hosack, the aim of the pilot plant allowed the company to substantially reduce the metallurgical risk at Arcadia, while also demonstrating the company's ability to successfully operate in Zimbabwe, providing the market with increased confidence in the technical and economic study work outcomes.

Having produced high purity technical grade petalite concentrate samples from the pilot plant, Prospect Resources has shipped the petalite concentrate to both of its offtake partners, global industrial minerals company Sibelco and Chinese mining investor Sinomine Resource Group, for on-delivery to customers across Europe and Asia. These parties are planning to use the samples in their respective production runs to undertake product qualification processes through the second half of 2021.

Meanwhile, spodumene concentrate samples have also been produced (with a partner laboratory in South Africa) for supply to, and potential qualification with, strategic groups across China, Japan and Europe, with whom Prospect Resources has been engaged and who have an interest in spodumene concentrate offtake and assisting with the development of Arcadia.

↑ **The Arcadia pilot plant was officially opened on 1 July 2021**

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> The co-mineralisation of petalite in the ore body is of adequate concentration and sufficient quantity to be extremely beneficial and economic to recover.
>
> **SAM HOSACK**

Securing a pathway to developing Arcadia

Prospect Resources is now focused on demonstrating its high purity products by passing product qualification processes with customers, demonstrating Arcadia's economics through the completion of an optimised feasibility study, and lastly, by securing a clear, low-risk pathway to develop Arcadia.

"The optimised feasibility study is being advanced on a dual-track basis to asses both a single-stage and two-stage development pathway for Arcadia," Hosack explains, noting that it aims to optimise the flowsheet and design of the process plant and associated infrastructure for greater accuracy in both development cases, building on the technical assessments undertaken in the 2019 definitive feasibility study (DFS).

The two development pathways under evaluation through the optimised feasibility study process are a two-stage development to 2.4 Mtpa throughput, via progressive construction of two 1.2 Mtpa modules, which provides a lower upfront capital pathway to production and allows project and market risks to be managed progressively; and a single-stage development to a 2.4 Mtpa throughput operation, which provides greater development efficiencies and higher economic returns, but with higher upfront capital requirements.

"Although the 2.4 Mtpa pathway is preferred should favourable market conditions and accessible funding allow, retaining optionality on both development pathways will enable Prospect Resources to execute the pathway that generates the best outcome for the company on a fully-funded basis," says Hosack.

Completion of the optimised feasibility study on the two-stage development remains on track for the third quarter this year, while the single-stage optimised feasibility study is expected to be completed during the fourth quarter.

According to the company's 2019 DFS results, on a 2.4 Mtpa base case development, Prospect Resources' average spodumene concentrate production is expected to be approximately 173 000 tpa while its average petalite production is estimated at 122 000 tpa over a 15.5 year life of mine at an estimated cost of US$162 million.

This makes Prospect Resources the largest global petalite producer, a significant spodumene producer and places Arcadia in the top 10 global hard rock lithium projects in the world, in terms of size and grade, with a large scale JORC-compliant mineral resource of 72.7 Mt grading at 1.11% lithium oxide (LiO_2) and 119 ppm tantalum pentoxide (Ta_2O_5).

According to Hosack, based on insights from industry analysts, the lithium supply base will need to double between now and 2025, and double again between 2025 and 2029, in order to meet growing lithium demand and fill the growing supply gap.

On the back of a tightening lithium market, which is creating increased urgency for customers to secure lithium raw material, Prospect Resources is in a strong position as one of only a few shovel-ready projects globally.

Funding via a partnership process

In parallel to completion of the optimised feasibility study for Arcadia, the company has been in discussions with its existing offtake partners and institutional financiers with respect to financing the development of Arcadia. Hosack says Prospect Resources is also in early-stage discussions with multiple strategic partners regarding joint development or partnership structures.

Having received multiple enquiries from a range of international parties in relation to funding and development of Arcadia and following the review of various funding options for the development of Arcadia, Prospect Resources, in August, opted to fund the project through a partnership process as it provides more flexibility and the ability to accelerate project execution and bring Arcadia into production as early as possible.

"This will provide us with a structured process whereby interested parties could put forward partnership proposals in a competitive environment to fully fund the Arcadia project and will enable us to find the right long-term partner for the funding and development of Arcadia," Hosack concludes. MRA

THE PETALITE OPPORTUNITY

Existing petalite production sources have declined over recent years, with Zimbabwe-based petalite producer Bikita Minerals having reached the end of life at its petalite resource and no longer in operation. This means that Arcadia is the only known petalite deposit of scale, globally.


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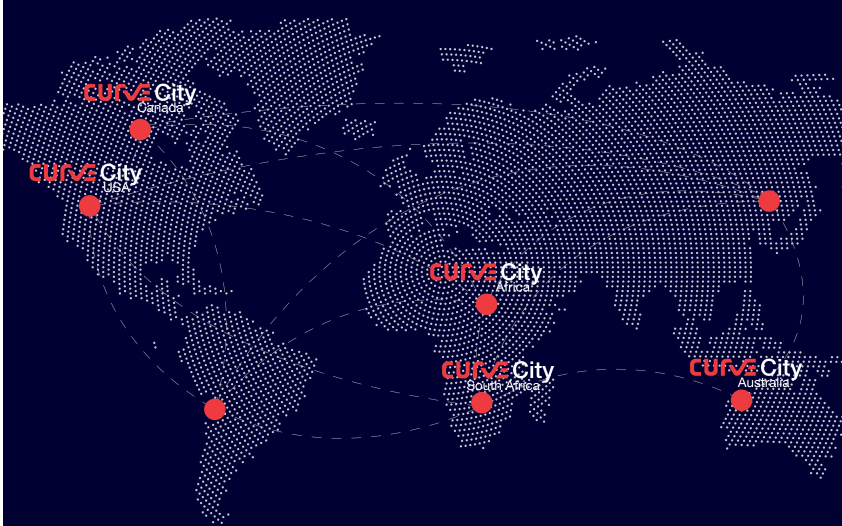

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Botswana Diamonds' Thorny River

A high-quality, high-volume diamond asset emerging

AIM and BSE-listed diamond explorer **Botswana Diamonds** is making steady progress with exploration on its Thorny River diamond project in South Africa's Limpopo province as it progresses towards the potential discovery of a commercial diamond ore body, MD **JAMES CAMPBELL** tells **CHANTELLE KOTZE**.

IN SHORT
Botswana Diamonds is in the final stages of exploration work targeted at understanding the scale and economic potential of its Thorny River project in South Africa – the company's most advanced diamond exploration asset in its southern Africa focused portfolio.

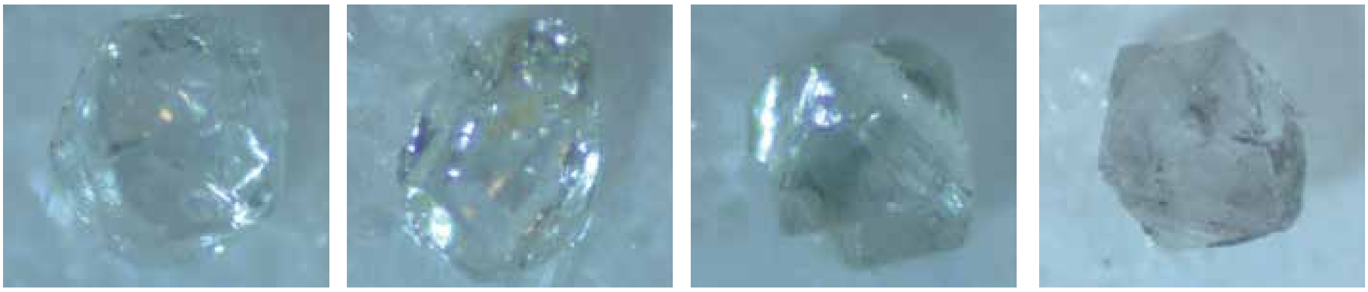
Having diligently undertaken exploration on Thorny River over the past four years, Botswana Diamonds has managed to narrow down its exploration focus from an area spanning about 10 km of kimberlite dyke strike on portions of the Frischgewaagt, Hartbeesfontein and Doornrivier properties, to two target areas of no more than 200 m of strike, each on the Frischgewaagt property.

It is on these two target areas at Thorny River that the company has been pleasantly rewarded with the discovery of two small kimberlite pipes, known as kimberlite blows, on which detailed ground geophysics and drilling has subsequently taken place.

The first blow – River Blow – was discovered in November 2020, while the second blow – River Extension Blow – was discovered in May 2021. Both blows are similar in size at between 10 and 20 m wide and lie contiguous to one another, says Campbell, noting that independent specialists have modelled the two blows as containing between 300 000 and 600 000 t of kimberlite.

Drill samples from the recently discovered River Extension Blow, which were sent to an independent processing facility for assessment earlier this year, were found to contain four diamonds of good colour, clarity

Exploration drilling at Thorny River in South Africa's Limpopo province



↑ **The four diamonds recovered from the River Extension Blow**

and of commercial quality – along with extensive diamond indicator minerals including G10 and G9 pyrope garnets (which are common in diamond-bearing kimberlite pipes), eclogitic garnets, chromites, ilmenites and chromium diopsides which are common in diamond-bearing kimberlite pipes, Campbell notes.

"The encouraging diamond indicators from our drill results and drill samples now point towards Thorny River being a high-quality prospect," says Campbell.

The company is now underway with the crucial next step in its exploration work at Thorny River, which started in early September. This entails a percussion drilling programme to assess the mineralisation between the two adjacent blows, which are located less than 100 m apart from one another.

"This is expected to test the company's belief that the two blows potentially join to form one continuous ore body," says Campbell, noting that this would be a significant step towards defining a commercial diamond ore body at Thorny River.

The company is currently undertaking further resource definition work by refining its estimate of the geological continuity, grade continuity and volume at Thorny River, which could culminate in the release of a maiden diamond resource assessment for the project, which Campbell estimates will take place in the not too distant future.

He explains that the next step to be embarked on by the company would be to undertake a detailed core drilling programme, currently planned for the 2022 dry season, to further define the geological model at Thorny River, which may comprise a larger economic kimberlite zone than was previously thought to exist.

This is a necessary next step, says Campbell, noting that the geology of the kimberlite fissure system was found to comprise both kimberlite and a weathered transition zone of kimberlite and granite, or kimberlite breccia. "By re-evaluating our previous core samples and performing additional core drilling, we will be able to map a clearer picture of the potential economic zone at Thorny River, taking into account both the kimberlite and kimberlite breccia zones," he says.

The company also plans to undertake a bulk sampling programme at the project (for which it has Section 20 authorisation) to better understand the diamond value of the Thorny River ore body. By selling the diamonds that it recovers from the bulk sample, the company will be able to arrive at a definitive Dollar-per-carat diamond price, giving it a better idea of how best to commercialise the asset, says Campbell.

Could history repeat itself in delivering another diamond mine?

According to Campbell, all signs currently point to the fact that history may repeat itself within the Zebediela kimberlite field in Limpopo, which hosts the Thorny River project.

The kimberlite field consists of a series of consistent diamondiferous kimberlite dykes along a 20 km strike length, with several blows discovered along the east to west trending kimberlite dyke system to date.

Besides the recently discovered blows at Thorny River, Campbell says there have been several historic blows discovered within the kimberlite dykes: namely Kudu, Sugarbird, Sugarbird Pass (which together formed the Klipspringer mine) and the Marsfontein blow, all of which have since been mined out.

The relatively small 0.4 ha Marsfontein blow was developed into the extremely profitable Marsfontein diamond mine by its then shareholders De Beers and SouthernEra Diamonds – which was etched into history as the mine with the

"The encouraging diamond indicators from our drill results and drill samples now point towards Thorny River being a high-quality prospect,"

JAMES CAMPBELL

GHAGHOO ACQUISITION

AIM-listed companies Botswana Diamonds and Vast Resources announced in August that their joint venture, Okwa Diamonds, would acquire the Ghaghoo diamond mine in central Botswana, which is currently under care and maintenance.

Botswana Diamonds has an initial 10% free-carried interest in Okwa Diamonds, for the first $15 million of expenditure by Okwa, which is being funded by Vast Resources, including the acquisition cash consideration of US$4 million.

Thereafter, Botswana Diamonds will not be diluted below 2.5% of Okwa and can also earn up to a further 20% interest in Okwa through funding 20% of expenditure.

Under the terms of the joint venture with Vast Resources, Botswana Diamonds will be the operator of the Ghaghoo mine until such time as an agreed management team is in place.

James Campbell and drilling geologist Trevor Mashiolane undertaking chip logging at the River Blow at Thorny River

fastest payback period at just three-and-a-half days.

Campbell believes finding another 'Marsfontein' is likely at Thorny River, as the historic Marsfontein mine is a mere 3.5 km west and on strike from the company's discoveries.

The kimberlite at Thorny River has also been found to be consistent in terms of geology, grade and diamond value with that found at the Klipspringer mine in the west and the Frischgewaagt property to the east. Botswana Diamonds therefore expects the Thorny River kimberlite to contain an average in situ grade of 60 cpht, based on the historical data from the surrounding areas and assets, which is

Drilling at the River Blow at Thorny River

high grade for a kimberlite, according to Campbell.

Fast-tracking exploration in Botswana

Across the border in Botswana, the world's largest diamond producer by value and the second largest by volume, Botswana Diamonds has grown its asset base even further.

Having undertaken exploration in the Kalahari region of Botswana, both under its own wholly-owned subsidiary Sunland Minerals and in joint venture with BCL in Maibwe Diamonds, the company acquired the full interest in Sekaka Diamonds, Petra Diamonds' exploration vehicle in Botswana in 2020.

The deal saw Botswana Diamonds acquire three prospecting licences which include the high grade KX36 kimberlite pipe; a recently constructed, fit-for-purpose bulk sampling plant; and an extensive database built up over 15 years of exploration – all of which are also located in the country's Kalahari region.

Later that year, in November, Botswana Diamonds also entered into an earn-in agreement to fund exploration of its prospecting licence assets in Botswana with private Botswana company Diamexstrat, which in turn has an alliance agreement with ASX-listed Burgundy Diamond Mines.

As part of the agreement, Diamexstrat and Burgundy can earn up to a 70% interest in Botswana Diamonds' Sunland Minerals and Sekaka prospecting licences, while Botswana Diamonds can earn a 15% interest in prospecting licences held by Diamexstrat and its partners.

Under the agreement, the parties have also agreed to use Botswana Diamonds' extensive diamond exploration database (acquired as part of the Sekaka transaction), which contains the results of work undertaken in country since 2005, and could provide all parties with substantial support for all future kimberlite exploration activities in Botswana.

According to Campbell, through its partnerships Botswana Diamonds is now one of the most active explorers in Botswana.

On the back of a recovering diamond market which was impacted by the COVID-19 pandemic, Botswana Diamonds is evaluating the potential of its current exploration assets and continues to remain on the lookout for new opportunities, Campbell concludes. MRA

DID YOU KNOW?

In addition to its diamond assets in South Africa and Botswana, Botswana Diamonds is also present in Zimbabwe, where it plans to jointly develop the diamond potential of Zimbabwe together with AIM-listed explorer Vast Resources, both of whom have past experience and information on the Marange Diamond Fields of eastern Zimbabwe.

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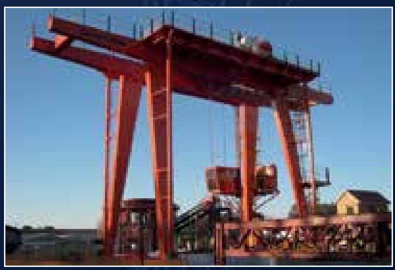

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Lucara Diamond Corp.'s Karowe mine

Diamond darling keeps delivering

Triple-listed diamond miner **Lucara Diamond Corp.** is embarking on a new and exciting journey that will see it continue to recover (in possibly higher quantities) high quality, Type IIA diamonds in excess of 10.8 carats from its 100% owned Karowe mine in Botswana. How? By transitioning from an open pit operation to an underground mine, thereby gaining access to deeper resources within the kimberlite ore body that hosts the true 'gems' of this operation, CEO **EIRA THOMAS** tells **LAURA CORNISH**.

IN SHORT

One of Botswana's most lucrative diamond projects – Karowe – has added significantly to the country's long-term value as the mine extends its lifespan to at least 2040, as an underground operation.

Karowe mine is well-recognised within the diamond fraternity – it has recovered a variety of spectacular large diamonds larger than 300, 500 and even 1 000 carats. This is over and above its consistent delivery of +10.8 carat diamonds, making it a true performer within this market sector.

And now this performance is set to continue – to at least 2040 – as the mine transitions into an underground mine that will override the production drop off from open pit resources around 2026.

"This is an exciting time for us as we are finally in a position to move forward with underground expansion at Karowe,

a plan which has been in the works for a while but was largely interrupted by the COVID-19 pandemic," Thomas notes. She is referring in particular to the cash raising portion of the project, no easy feat considering investors have remained largely 'in hiding' during this pandemic uncertainty.

But the economics of the underground project, forecast to contribute approximately US$4 billion (based on conservative diamond prices) in additional revenues using conservative diamond prices, made it hard to ignore, enabling Thomas and her team to secure the necessary cash. It includes two financing pieces, a $220 million senior secured debt facility package, supplemented with an additional C$41 million in equity. "This puts us in a strong position in terms of available liquidity to get this project fully built."

Coupled with this is the overall cost of the project – US$534 million – only up a minor 4% from the feasibility study, an impressive feat considering some engineering adjustments as well as a year lost to COVID-19. "A year lost perhaps but not wasted,"

Karowe process plant

Images: UMS Group

↑ **Sinking activities underway**

Thomas highlights. "We have already spent $51.4 million of our budget which, as mentioned, included detailed engineering work and equipment procurement."

And now, with cash in hand and the necessary contractors appointed, the development of a new Karowe is officially in progress.

What's important to understand about the project is the ore body – as an open pit operation, mining was undertaken across the north, central and south lobes. The underground mine, however, will focus on the high value south lobe – the highest-grade area of the resource, attributable to all the ultra-large diamonds recovered. "Within the south lobe, we will also have greater access to the EM/PK(S) portion of the ore body, which has delivered some of our largest, exceptional diamonds including the 1 758 carat Sewelo, the largest diamond ever recovered from Botswana," Thomas confirms.

With a tight schedule, the transition will commence in 2026 with first ore generated from underground. To ensure steady production – 2.5–2.8 Mtpa ROM material to the plant – Karowe is preparing surface stockpiles to supplement the total feed if required. Upon reaching nameplate capacity, Karowe will continue operating comfortably for another 14 years beyond its original open pit lifespan.

"The underground project also comes at a time when the outlook for the diamond market is stronger than it has been for many years, representing an exciting growth opportunity for our shareholders and stakeholders in Botswana," Thomas adds.

Karowe underground development outlined

Shaft pre-sink start-up is scheduled for Q3, 2021, which will be followed by the completion of early civil works in Q4, 2021. The continuation of detailed design and engineering of the underground mine infrastructure and layout, commencement of bulk power supply infrastructure with substation construction is also scheduled to start in Q3, 2021. The start of engineering on the tailings dam expansion and completion of other site related infrastructure will also take place in 2021.

Canada-based JDS Energy & Mining Inc. is the appointed EPCM contractor for the execution of the Karowe underground project. The company is currently building up the onsite project team in conjunction with Lucara's owner's team and is working in close cooperation with the Karowe diamond mine operations team.

Access to the underground mine will be via two vertical shafts, the production and ventilation shafts. The shafts will be concrete lined with the production shaft acting as the main air intake and the ventilation shaft as the exhaust.

Detailed design and engineering work on the production and ventilation shafts is now 90% complete, and has resulted in the following changes to the 2019

> "The underground project also comes at a time when the outlook for the diamond market is stronger than it has been for many years,"
>
> **EIRA THOMAS**

feasibility study:

i) production shaft diameter has increased from 8 m to 8.5 m;
ii) ventilation shaft permanent headframe, hoists and internal conveyances have been removed;
iii) parallel pre-sinking of both shafts;
iv) ventilation fans and coolers to be located on surface;
v) in shaft grouting of water strikes changed from grout curtain installation from surface;
vi) planned development of an additional sublevel to assist in drilling of drawbells; and
vii) removal of 670L de-watering galleries.

The planned depth of the production shaft remains at approximately 767 m, but final planned depth of the ventilation shaft has increased marginally to 733 m from 716 m.

Increased schedule time related to shaft sinking has been a result of the following design changes: i) increased production shaft diameter, ii) time allowances for in shaft grouting during sinking operations planned at known water strike horizons, iii) holing through all shaft stations between shafts, iv) additional ground support for underground stations/level breakouts.

Pre-sink construction contract and shaft sinking equipment procurement were awarded to UMS Botswana and UMS South Africa respectively (UMS). METS International, a subsidiary of UMS, was awarded the shaft engineering contract. UMS is in the process of mobilising crews to Karowe to initiate pre-sink works.

With the exception of an additional sublevel (340L) to assist with drill and

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MINING LICENCE

Karowe's mining licence has been approved by the Botswana government to 2046

Karowe's 2021 big diamond recoveries

July	393 carats 62 carat fancy pink
June	1 174 carats 470 carats
January	378 carats 341 carats

blast of drawbells, the design, layout and infrastructure of the underground mine remain unchanged from the feasibility study. Detailed engineering and design of the underground infrastructure and layouts will commence in Q3, 2021 and are expected to be competed in Q3, 2022. Underground mine development is scheduled to commence in H2, 2024 with underground production ramp-up starting in 2026. Full production is scheduled for the end of 2026.

Civil works for the underground expansion progressed through detailed design, and construction activities ramped up through Q1, 2021 with completion of the construction area terraces, laydown areas, shaft pad preparations, along with commencement of shaft collar box cut construction and blasting within the shaft columns in preparation of civil works.

Hoist houses, hoist foundations and shaft collars are now well advanced and on time for commencement of pre-sinking which is planned during Q3, 2021. As construction and mining activities ramp up, attention will continue to be focused on maintaining safe operations.

Temporary power for shaft sinking is required until such time as the upgrade bulk power supply infrastructure is commissioned in Q4, 2022. A three-phased ramp-up of the generator capacity is planned to support the increasing power requirements related to the shaft sinking activities. A power supply and services contract for the temporary generators has been signed with Aggreko International Projects.

Mobilisation has been initiated with the generator pad established. Commissioning of Phase 1 is

The Karowe open pit.
The headgear (not shown in this image) is located directly adjacent to the south lobe of the ore body

scheduled during Q3 2021 to support the start of pre-sink activities.

During 2020, Lucara negotiated and signed a self-build agreement with the Botswana Power Corporation (BPC) for the construction of two substations and a 29 km-long, 132 kV transmission line from BPC's newly established Letlhakane substation to the Karowe mine.

The planned route follows an existing regional 400 kV line and then runs parallel to the existing 11 kV transmission line currently supplying bulk power to the Karowe mine. The new power infrastructure will provide the required power for the current open pit, processing plant and the underground mine expansion.

Commissioning of and handover to BPC is scheduled for Q4, 2022. Construction of substations is scheduled to commence in Q3, 2021 and power line construction in Q1, 2022.

As with any major mining project, there are a lot of moving parts, and a lot of smaller timeframe scheduling commitments that need to be delivered but it's all systems go for Lucara and its appointed contractors. This operation has, for the large part always, run like a well-oiled machine and confidence levels that this new project will flow smoothly is high.

"The last element of this project is training – which has already been initiated, to help develop the skills locally that will be required for underground mining in approximately five years' time. With the start-up of the underground Khoemacau operation in country, Botswana has already started to establish the necessary skills. Lundin Gold, also a member of the Lundin Group of Companies, has recently completed the construction and commissioning of a new underground mine in Ecuador, and was largely required to develop those skills in country themselves. We will benefit from that experience and will also be in a position to apply lessons learned," Thomas concludes. MRA

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Natural vs lab-grown diamonds

Where does the true value lie?

While there are several arguments that can be made in the natural versus lab-grown diamond debate, finding out where the true value lies is an important starting point. While the choice may simply be based on the personal preference of the buyer, a critical factor in the decision-making process is increasingly being made on the grounds of whether the diamond has been produced sustainability, ethically and in an environment-friendly manner, writes **CHANTELLE KOTZE**.

As with most mined commodities, and even some consumer goods, environment, social and governance (ESG) compliance is a must, not only as a requirement by investors, but increasingly by the consumers of the final products, who demand sustainability, transparency and ethical sourcing throughout the value chain.

The Africa Mining Forum and *Mining Review Africa*-hosted Webinar, titled *Lab-grown vs natural diamonds – what's your preference?* looked at whether natural diamond producers would be able to sustain their operations or uncover new kimberlite resources and effectively compete with the growing lab-grown diamond market.

The panel comprised diamond industry stalwart James Campbell, who is also the MD of AIM and BSE-listed diamond explorer Botswana Diamonds and independent diamond industry analyst and consultant Paul Zimnisky. David Kellie, CEO of the Natural Diamond Council, also shared his insights on the topic in a pre-recorded video interview, which was played during the Webinar.

Providing context on the global natural diamond market and his outlook for the sector, Zimnisky noted that natural diamond prices are the strongest they have been since 2011 when the diamond price was at an all-time high, recovering from the relatively week diamond pricing environment experienced over most of the past decade. Major diamond miners have seen their excess inventory levels fall and are at historical lows on the back of increased consumer demand. Retailers are aggressively placing orders while jewellery manufacturers and cutters and polishers are unable to secure rough diamonds to meet retailers' demands.

In general, diamond jewellery demand is strong, with the US and China driving current demand, says Zimnisky, who expects this to continue for the remainder of the year, driven by pent-up demand.

According to Campbell, even though natural diamond prices fell by between 20% and 30% during the COVID-19 pandemic in 2020, his almost four decades in the diamond industry and avid interest in the history of the diamond sector have taught him that although diamond prices always fall hard and fast amid a global catastrophe, they also always rebound thereafter.

"The diamond business goes up and down," Campbell reiterated, noting that Botswana Diamonds – which has exploration assets in South Africa, Botswana and Zimbabwe – used the

> "Most corporate diamond mining companies are taking various initiatives to minimise their environmental impact while maximising the social benefit within the communities in which they operate."
>
> **PAUL ZIMNISKY**

downturn caused by the COVID-19 pandemic as a time of opportunity and has undertaken three deals in Botswana since the beginning of the pandemic.

While the lab-grown diamond industry has been steadily growing over the past decade as the technology improves and more companies have become involved in their manufacture, David Kellie, CEO of the Natural Diamond Council says lab-grown diamonds occupy a space in the diamond market that natural diamonds do not – and that is price point.

According to Kellie, as lab-grown diamond production continues to accelerate, the price spread between lab-grown and natural diamonds across all sizes and qualities will continue to widen. "As this takes place, consumers will increasingly understand the difference between the two products from an emotional and sentimental point of view," he says.

Does a diamond's value lie in its sustainability?

Kellie believes that the topic of sustainability accelerated during the pandemic as people became more connected with the impact that they have on the planet. This led consumers to make decisions based on sustainable value rather than on prices of goods. This is great, not only for the diamond industry, but every industry that values sustainability, he says.

"Within the natural diamond industry, from mine to market, each value chain participant plays a role in ensuring that the entire diamond value chain is upholding the highest standards, from the people whose lives we touch to the environment in which we operate," says Kellie.

He admits that the natural diamond industry suffers from a legacy narrative that dates back over a decade but points out that ethical natural diamond companies operate with a high level of transparency, have good business practices, and take responsibility for their societal and environmental impact.

Campbell, who prefers to refer to the topic of ESG or sustainability as the social licence to operate, points out that having a social licence to operate means that miners must conduct themselves correctly and undertake work in a specific manner. "It is not just a tick box exercise," he points out.

Importantly, Campbell also notes that the strong focus on ESG is not only the right thing to do from a moral and ethical point of view, but is also a business imperative, as many funders want proof of one's ESG credentials before investing.

Campbell says that diamond mining has the potential to have a negative carbon footprint. "By using new technologies, combined with the use of renewable energy and the efficient use of water, you can end up with a negative carbon footprint mine," he says.

In playing close attention to the diamond industry, Zimnisky says that most corporate diamond mining companies are taking various initiatives to minimise their environmental impact while maximising the social benefit within the communities in which they operate – something that is accelerating quite rapidly now.

This is also taking place across the value chain, he says. MRA

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Strength in global diamond demand, which started as a rebound of sorts in the second half of 2020, has continued and even accelerated into mid-2021

Image: 123rf.com

Diamond prices

Charging towards an all-time high

By Paul Zimnisky, independent diamond industry analyst and consultant

The commencement of production of three new large-scale diamond mines pushed global diamond output to a multi-year high of almost 152 million carats in 2017. However, due to a lack of new projects in the pipeline and a continued depletion of legacy mines – compounded by the impact of the COVID-19 pandemic – diamond production dropped to a multi-decade low of under 120 million carats in 2020. A similar level of output forecasted for the foreseeable future.

While an oversupplied diamond market was arguably the biggest culprit for apathetic diamond prices most of last decade, relatively weak prices have also limited appetite for diamond exploration and new mine development in recent years. Given the traditionally long-lead-time to bring new diamond mines online (it can take decades), supply lost from the closure of world-class mines, like the Argyle mine in Australia which closed in late-2020, is not being replaced.

Strength in global diamond demand, which started as a rebound of sorts in the second half of 2020, has continued and even accelerated into mid-2021. Pandemic-related global economic stimulus, especially in the US (the diamond industry's largest consumer market), plus a halt in experiential luxury, like travel and dining out, bodes extremely well for diamond sales in recent quarters.

For context, Signet Jewelers, the largest jeweller in North America, has raised sales guidance twice for the fiscal year ending January 2022, due in part to "tailwinds from (US government) stimulus and a slower than anticipated return to travel and experience spending." The company is currently forecasting a 7% sales gain over the fiscal year ended January 2020, the pre-pandemic proxy.

The recent uptick in diamond demand combined with a multi-year trend of declining supply has weighed on diamond miner inventory levels, which have historically provided a supply cushion to the industry. Major miners De Beers and ALROSA, which account for around two-thirds of global diamond supply, have seen their excess inventory levels fall to an estimated 3 million carats and nil, respectively, as of end-Q2 2021 according to Paul Zimnisky data. For comparison, De Beers held an estimated 11 million carats a year ago and ALROSA held an estimated 16 million.

In a press release in July, ALROSA management said "the [diamond] market has been plagued by acute shortages of rough diamonds needed by cutters to complete their current polished diamonds orders", further commenting that the "rough market [is entering] a long period of supply deficit".

According to the Zimnisky Global Rough Diamond Price Index, consolidated rough diamond prices are up 18% year to date 2021

The above favourable supply/demand dynamic for diamonds has led to upward price pressure for rough (and polished diamonds) in recent months. According to the Zimnisky Global Rough Diamond Price Index, consolidated rough diamond prices are up 18% year to date 2021, which puts prices above the pre-pandemic level and about 10% off the all-time high reached in H1 2011. MRA

ABOUT THE AUTHOR

Paul Zimnisky is an independent diamond industry analyst and consultant based in the New York metro area. He is a graduate of the University of Maryland's Robert H. Smith School of Business with a B.S. in finance, and he is a CFA charterholder.

For regular in-depth analysis of the diamond industry please consider subscribing to his monthly State of the Diamond Market industry report. Also, listen to the Paul Zimnisky Diamond Analytics Podcast on iTunes or Spotify for wide-ranging and interesting discussions with prominent guests from around the industry.

"By 2030, we aim for every one of our diamonds to be a catalyst for thriving, resilient communities and to support more diverse voices to shape the future of our industry."

Katie Fergusson,
Senior Vice-President of Sustainable Impact for De Beers.

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Vibramech

A leading force in the diamond industry

Vibrating screen specialist **Vibramech** dominates the supply of vibrating equipment to southern Africa's diamond industry.

Vibramech equipment at a diamond recovery plant

In affirmation of the above, the company consistently supplies the lion's share of screens to diamond plants in Botswana, Lesotho, Namibia and South Africa. Furthermore, it is the majority supplier to all of the top mining companies in South Africa, having equipment on almost every diamond mine in the country.

The company has been supplying vibrating equipment to the diamond processing industry for almost 35 years. "This lengthy association has enabled us to generate an unparalleled database of successful applications distinctive to the circumstances that prevail in the diamond mining industry, not only in Africa, but worldwide," says Vibramech MD David Massey.

Vibramech also continues to regularly supply into countries such as Zimbabwe, Sierre Leone, the Democratic Republic of Congo and Angola; and also has majority supply share in Canada's diamond industry.

The range of vibrating equipment especially suited to the diamond industry comprises, amongst others: Plant grizzly feeders, plant screens and feeders, scrubber and crusher screens, coarse and fine dense media separation (DMS) screens, recrush DMS, recovery plant feeders and screens, tube feeders and grease tables.

"We firmly believe that the process and engineering knowledge gained over three decades enables Vibramech's engineers to accurately predict the optimal equipment solution required to accomplish the duties specified by any of our diamond mining clients," adds Massey.

No compromise on product quality

Vibramech understands the harsh operating conditions which vibrating screens, grizzlies and feeders are subjected to in the mining industry. As such, the company is cognisant that its designs need to cater for both abrasive and corrosive environments.

"Our equipment needs to withstand the high wear associated with the screening of abrasive ores such as chrome, platinum and iron ore. We also have a range of speciality liner materials, paint specifications and wear prevention compounds which are used to combat the effects of corrosion in the marine and refinery applications. Vibramech even offers the option to install a screen in stainless steel," explains Massey.

The Vibramech design makes extensive use of rubber lining to reduce the effect of wear and impact on screen components. A range of steel, ceramic and polyurethane liners are available to protect screen and grizzly side plates, as well as feeder pans. An abrasion resistant/anti-corrosion Epoxy resin system is used to minimise wear associated with fines in wet applications.

"It is imperative that stresses induced by welding are minimised to prevent crack formation in vibrating equipment," says Massey. Vibramech therefore makes use of heat treatment to stress relieve all welded screen components. The overall design philosophy is to minimise welding and maximise the use of swaged fasteners.

As sound dynamic behaviour is essential to ensure vibrating equipment reliability, all equipment is built to perform within strict dynamic parameters. All internal mating surfaces are machined in order to maintain stringent dimensional tolerances.

In addition, the company's quality assurance programme makes provision for a full 3D vibration analysis to be conducted on all equipment prior to release. This is used as a benchmark for the life of the equipment. MRA

Please visit Vibramech's website at www.vibramechglobal.com for an overview on how Vibramech could assist with your current and future mineral processing requirements.

SPECIAL REPORT

ESG

Mining's commitment to our people, our planet, our future

Image: 123rf.com

Take ESG back to its roots

Real sustainability requires a strong commitment

Rather than ticking boxes and aligning definitions, industry needs to strive for 'impactful ESG' and contributing towards the UN's Sustainable Development Goals.

By Paula-Ann Novotny and Garyn Rapson, Weber Wentzel

The mining industry is no stranger to the depths and parameters of ESG, and has long been at the forefront of championing sustainable development. At Mining Indaba 2020, the mining industry identified the need for companies to move away from seeing ESG as a reporting and data-gathering exercise and towards extracting value from it. The industry very much understands the drive to incorporate ESG awareness and implementation into corporate strategy, organisational culture, risk management, stakeholder engagement and portfolio planning.

At Mining Indaba Virtual 2021, these concepts were taken forward, while also taking a step back. It was emphasised that ESG is no longer a nice-to-have or merely a value-driver or investment metric; but rather a prerequisite to alleviating South Africa's (and Africa's) environmental and socio-economic ills. Sustainable Development and ESG performance needs to improve the social trust deficit; ensure that metals and minerals are responsibly sourced; drive policy reform; and, ultimately, assist in decarbonising the economy.

These drivers point to a key element of ESG which must inform nuanced approaches to compliance, sustainable investment, and sustainable development: A recognition that ESG may and does have a jurisdiction-specific, nuanced meaning. We must consider the socio-economic and geophysical contexts which are unique to South Africa to create meaningful positive impacts and long-term, shared value. In Africa, we are faced with different tensions and a multiplicity of stresses.

South Africa has a distinct ESG thread: On paper, we've made great strides on ESG and sustainability, but there is little, if any, enforcement of its foundational elements and the reality of poverty and non-existent basic services means that the ability to focus on ESG daily has too many pulling demands – the reality of our socio-economic context makes it difficult. To make ESG attractive and implementable, we must balance institutional, environmental, social, and economic needs. What are some of the industry pillars achieving this balance?

Directors' duties

Directors, in discharging their duty of care to the company, its people, its host communities and the environment, must be taking account of relevant ESG factors, and including ESG issues as board agenda items.

Litigation will increase enormously, as directors will be sued for failures to discharge their duties of care. By way of example, director duties relating to climate change have become prolific in international jurisdictions and international litigation. Making business judgment calls are protected under the business judgment rule, but a golden thread needs to run through directors' minds (individual and board) relating to ESG issues. Shareholders (more commonly becoming known in the climate justice space as shareholder activists) have now demonstrated that they are willing to act and expect executives to take ESG and climate change seriously.

There is still too much focus at board level on the risks and costs of ESG. But have companies calculated how much climate change has cost them this year? How much money have organisations lost through force majeure, delays in supply

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↑ Set up in 2015, the SDGs are a blueprint to achieve a better and more sustainable future for all

chain due to drought, COVID-19 and increased likelihood of pandemics? Reconciling ESG considerations at the board level with the SDGs will allow directors to consider various of the SDGs holistically, as opposed to in silos; such as SDG 8 (Decent Work and Economic Growth) and SDG 13 (Climate Action) and how efforts can contribute towards both goals and their targets.

Policy advocacy

Historically known as the backbone of our economy, South Africa's mining industry may well return to its throne in the near future, with policy advocacy supporting developments such as the backing of rare earth metals mining as a key input to the renewables industry; the governmental recognition of the interconnected and regional clustering of mines and how post-mining land use ought to benefit from collaborative closure strategies; and the relaxation of regulatory hurdles to self-generation and co-location of power generation/transmission projects. SDG 16, for example, promotes the rule of law at the national and international levels, while other SDGs such as SDG 11 (Sustainable Cities and Communities) provide the groundwork to further develop policies and laws.

Legislative development and reform

The accelerating ESG needs of the international investment and finance community, and the evolving ESG requirements of regulatory and reporting agencies, is seeing an increasing rate of regulatory development from a disclosure perspective. Yet, the global drive for a uniform ESG disclosure standard is proving difficult and currently unattainable, leaving industry players to traverse a minefield of disclosure standards and frameworks. Nevertheless, adequate reporting and disclosure remains crucial despite these challenges, as shareholders and stakeholders demand and place intense scrutiny on transparency and accountability.

At the same time, existing legal frameworks which traverse the 'E', 'S' and 'G' imperatives continue to become stricter and more pronounced as governments take steps to enforce ESG considerations through new laws.

While often seen as a barrier to mine project development and commencement, legislative compliance in the key ESG spheres should be viewed as an opportunity to leverage opportunities, integrate solutions, access or craft sustainable financing instruments and co-ordinate efforts to achieve true and meaningful impact and shared value.

Collaboration and partnerships

Arguably the most important SDG – SDG 17 – seeks to strengthen the means of implementation and revitalising the global partnership for sustainable development. The mining industry is phenomenally placed to establish partnerships and lean on sector collaboration to move this agenda forward and strengthen (or create new avenues of) domestic resource mobilisation.

The UN's overview of progress towards SDG 17 in 2021 indicates that with multilateral and global partnerships already challenged by scarce financial resources, trade tensions, technological obstacles and a lack of data, the COVID-19 pandemic has administered an unprecedented shock to the global system. As such, the interconnected global economy requires a global response to ensure that all countries and territories, in particular developing countries, can address the compounding and parallel health, economic and environmental crises to recover better.

We are now in the Decade of Action, with nine years left to deliver on the UN's 2030 Agenda for Sustainable Development, underpinned by the SDGs. ESG performance must strive to achieve these goals through the lens of shared value creation and our common future. MRA

ABOUT THE AUTHORS

Paula-Ann Novotny is a senior associate and Garyn Rapson is a partner at Weber Wentzel

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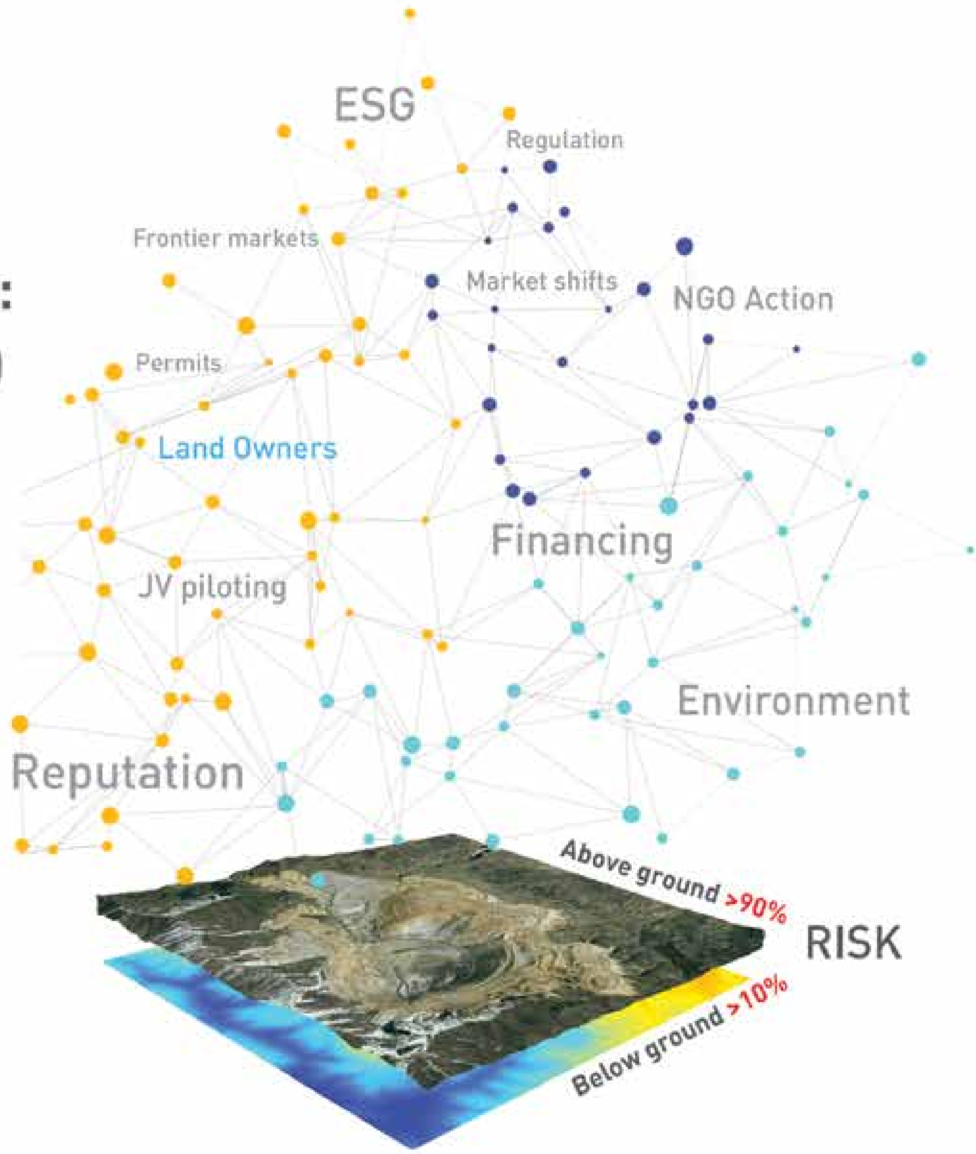

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Good governance

The key to social progress in mining-dependent countries

With the increased demand for new-technology minerals and metals driven by the global transition towards a low-carbon economy, the mining sector must not lose sight of the environmental, social and governance responsibilities in the host countries in which it operates. An opportunity to accelerate socio-economic progress has emerged in the mining-dependent countries where these minerals will be mined, but this hinges on good natural resource governance to ensure that the natural resource wealth is used to improve the lives of the people in these countries, **International Council on Mining and Metals** (ICMM) CEO **ROHITESH DHAWAN** tells **CHANTELLE KOTZE**.

Image: Anglo American

The creation of an enabling environment for resource governance is critical for good socio-economic outcomes

The ICMM initially undertook extensive research on the topic of social progress in mining-dependent countries in a 2018 study which challenged the notion of the 'resource curse' – a widely held perception that an abundance of natural resources in host countries damages economic and social progress. The ICMM's most recent study on the topic builds on this research and was aimed at better understanding the linkage between effective resource governance and social progress.

The ICMM launched a report on its findings in July titled: "Social Progress in Mining-Dependent Countries: Analysing the role of resource governance in delivering the UN Sustainable Development Goals (SDGs)". In it, the research strongly suggested that the higher the quality of governance, the stronger the socio-economic progress observed in these countries.

The report analysed 41 social metrics grouped under 12 relevant United Nations Sustainable Development Goals (SDGs) and found that life in mining-dependent countries had improved significantly in the last 23 years.

It was found that across three quarters of these metrics, there has been significant progress made on socio-economic development, with the most progress realised in the areas of health and wellbeing (SDG 3), quality education (SDG 4), clean water and sanitation (SDG 6), energy (SDG 7) and infrastructure (SDG 9).

Proper implementation of mining regulations and frameworks is critical

Dhawan says that in determining whether mining-dependent countries effectively govern, or manage their natural resources there are two points to consider: Whether the country has mining and mineral laws in place; and whether the country

DID YOU KNOW?
Over the past 25 years, the number of mining-dependent countries has increased to 34, half of which are in Africa.

implements and executes these laws consistently and effectively over time.

While the research found that a stable and enabling governance environment has the strongest positive relationship with good socio-economic outcomes, it importantly highlighted that having mining regulations and frameworks was an insufficient condition for good socio-economic outcomes.

"The findings indicated that effective implementation of mining regulations and frameworks was critical, without which the developmental benefits of mining may not be realised for mining-dependent countries, Dhawan says.

According to the CEO, the West African country of Guinea is a good example of how structural mining sector reforms have improved socio-economic outcomes over time, evidenced by increased investments, job creation and funding for development programmes. Although Guinea started its journey of improvement many years ago, the results were not at first easily observable, and it took the country about a decade to transform and generate positive social outcomes.

Liberia on the other hand, despite having developed a relatively strong framework for mineral resource governance following the decades-long civil wars that had devastated its once strong mining sector, has been ineffective in properly monitoring and enforcing its mining regulations over time. As a result of poor implementation of its mining policy, gains have translated to suboptimal social progress in Liberia.

What this shows is that having a good framework in place is not enough, and that effective implementation remains critical, says Dhawan.

"The mining industry also has a central role to play in this by supporting effective implementation of the frameworks needed to help drive social progress," says Dhawan. In doing so, mining companies themselves should be exemplars of good corporate governance, says Dhawan, noting that this will have a knock-on effect of good governance in the host countries.

Moreover, mining companies often spearhead good governance practices in host countries, so when mining

> "The mining industry has a central role to play by supporting effective implementation of the frameworks needed to help drive social progress."
>
> **ROHITESH DHAWAN**

companies take these voluntary leadership positions on governance issues in the countries in which they operate, and are joined or supported by other mining companies, it is quite likely that governments will acknowledge this and turn these standards into law, improving governance practices in-country.

In assisting countries achieve better governance, mining companies can also establish corporate social responsibility initiatives towards improving governance and capacity building in the communities in which they operate. In South Africa, for example, mining companies have channelled investment and human capital into assisting municipalities develop better operating practices and better governance. This has enabled improved service delivery at municipalities and has in turn reduced the pressure on mining companies to deliver basic public services such as water, dentation, health care and infrastructure.

Positive socio-economic outcomes rely on the existence of an enabling environment

According to Dhawan, the analysis indicated that the creation of an enabling environment for resource governance is critical for good socio-economic outcomes.

Countries that are more peaceful because of politically stability and the absence of violence, with lower levels of corruption, and rule of law, are better able to translate natural resources into positive social outcomes.

The creation of an enabling environment goes beyond mining policies. For example, the improvement of regulatory effectiveness and control of corruption are not only critical to mining sector development, but the development of most other economic sectors.

The report found that out of the countries that were studied, those that are mining dependent had outperformed countries that are non-mining dependent in terms of development over the past 25 years at both a national and regional level, refuting the notion of the 'resource curse', says Dhawan.

Moreover, studies indicated that at a regional level in mining-dependent countries, the areas in which mining takes place tend to develop more quickly than the parts of the country where mining does not take place, which indicates that when you properly govern natural resources you can generate better social outcomes than in the absence of natural resources.

Dhawan says the mining industry and government ought to act now to create an environment of effective natural resource governance, transparency and accountability if it intends to reap the socio-economic growth and development outcomes of the predicted low-carbon economy resource boom.

"This is even more important in the post-COVID-19 environment that we currently find ourselves in," Dhawan concludes. MRA

B2Gold's Otjikoto gold mine

For the love of Namibia

If you've been paging through this edition, you've no doubt read about the great work that B2Gold's Otjikoto is doing to ensure a longer-life operation at what is already a very sustainable mine. But this is only one part of its story. Driven by passion, devotion and sheer love for Namibia (and Africa), B2Gold Namibia MD and country manager **MARK DAWE** has committed himself, with the support of his team, to implementing sustainable initiatives across Namibia that pay homage to the country's beautiful people and environment. Having spent a few days on site, I got to see some of the great work that is being done in this regard.

Written by Laura Cornish, Editor-in-Chief, Mining Review Africa

Any initiatives that a mine undertakes in support of the communities and/or environment in which it operates today falls under the accepted terminology – ESG. From an investor perspective, to be ESG-compliant is non-negotiable, but in my experience, very clinically defined.

The theory of applying ESG principles on paper is one thing in my opinion, however, putting them into practice, with care and a true desire to make a difference, is what really counts, and this is where Dawe, his team and Otjikoto (supported by B2Gold) excel.

And now I have the opportunity to share my experience with you. But where do I begin? I can shower you with facts about the money Otjikoto spends annually on its sustainability programmes, and I can formally showcase the work that has been done, but my intention here is to transfer the enthusiasm I saw and experienced on site to each of you, and hopefully inspire you to follow in the footsteps of a company that has moved far beyond the realms of box-ticking compliancy.

But where do I begin? There are so many initiatives to talk about that I don't have the space. If this is of particular interest to you, you can access B2Gold's full responsibility report online. It covers every aspect of its sustainability drive.

So, I'll use this time and space to highlight those efforts that truly resonated with me while I was on site. And let me start with the one initiative most of you are probably aware of – the rhino gold bars.

The Rhino Gold Bar initiative

The Rhino Gold Bar initiative began in early 2020 when B2Gold announced the ground-breaking donation of 1 000 oz of gold produced from its Otjikoto mine in Namibia to support the preservation of the endangered black rhino population in the country and the communities that protect them.

With this donation, B2Gold produced a series of limited edition Rhino Gold Bars that were available for sale to investors. On one side of the bar a black rhino mother and calf are represented – symbols of hope for the future of the species. The other side shows the Namib Desert – an evocative and recognisable image strongly associated with Namibia. Bars were sold at the spot price of gold on the date of sale plus a 15% conservation premium and were available in 500 g, one ounce and half ounce denominations.

In the space of roughly one year, the entire inventory of limited-edition bars were sold, generating approximately US$1.7 million to support community-backed black rhino conservation efforts in north-west Namibia.

Proceeds from the sale of the bars are managed by the Rhino Gold Bar Advisory Committee (RGBAC), which includes representatives from B2Gold, Save the Rhino Trust Namibia (SRT), Integrated Rural Development and Nature Conservation (IRDNC), the Namibian Chamber of Environment, and the Namibian Ministry of Environment, Forestry and Tourism.

A portion of the proceeds is being used to assist conservation actions in the field, including support for patrols, intelligence activities, and rural communities for whom the protection of rhinos is their birthright.

To date, the project has already disbursed significant funding to community-backed rhino conservation efforts due to the unexpected and dire impacts of COVID-19 on the Kunene Region in Namibia (where SRT operations are located). The effects of the pandemic in terms of job security, provisions for families and the protection of Namibia's black rhinos is potentially devastating for communities in the region that have worked hard to develop a rhino-based economy. Several areas within the rhino range have been left exposed by the lack of tourists and require extra patrolling efforts by SRT, IRDNC and Conservancy Rhino Rangers. Filling

The Little Shop of Physics has become a powerful teaching mechanism in Namibia

this gap requires increased resources at a time when conservation funding has been slashed.

B2Gold, in conjunction with RGBAC, also plans to use a portion of the proceeds from the sale of the bars to mint a new series of limited rhino bars and medallions, helping the Rhino Bar initiative to become self-sufficient and sustainable.

The Little Shop of Physics (LSOP)

LSOP is just one of the many examples that demonstrate B2Gold Namibia's commitment to 'giving back''. And this instance, it's about education – the cornerstone upon which any country's economic wealth and growth is built.

LSOP is a project – first created by some passionate people at Colorado University – designed to help students and teachers overcome the challenges of a) teaching maths and physics and b) learning maths and physics in a fun environment by using practical experiments and demonstrations to make concepts easy to understand. I love the model of teaching teachers. This is one of the many definitions of sustainability and is aimed at helping teachers take the practical information they have and learn how best to apply it in the classroom.

"Practical teaching, in a fun environment, using the simple tools and examples at our disposal is an incredibly effective tool. It is also

↑ **The Wilderness camp where children stay while learning at the LSOP**

rewarding to watch children enjoy learning and grasping concepts that are difficult to understand in theory," says Paulo Samuel, B2Gold's CSI education specialist.

In essence, LSOP is a big classroom and is situated within B2Gold's Otjikoto Education Centre (housed on the Otjikoto nature reserve). Because the programme is designed over a two or three day period, teachers and children stay on the property and also get to experience the joy of wilderness living in fully equipped tented camps. Having stayed there myself, it's not difficult to see why Namibian schools, far and wide, come to the Centre. I understand it has been so successful that it is now central to the current revision of the national curriculum.

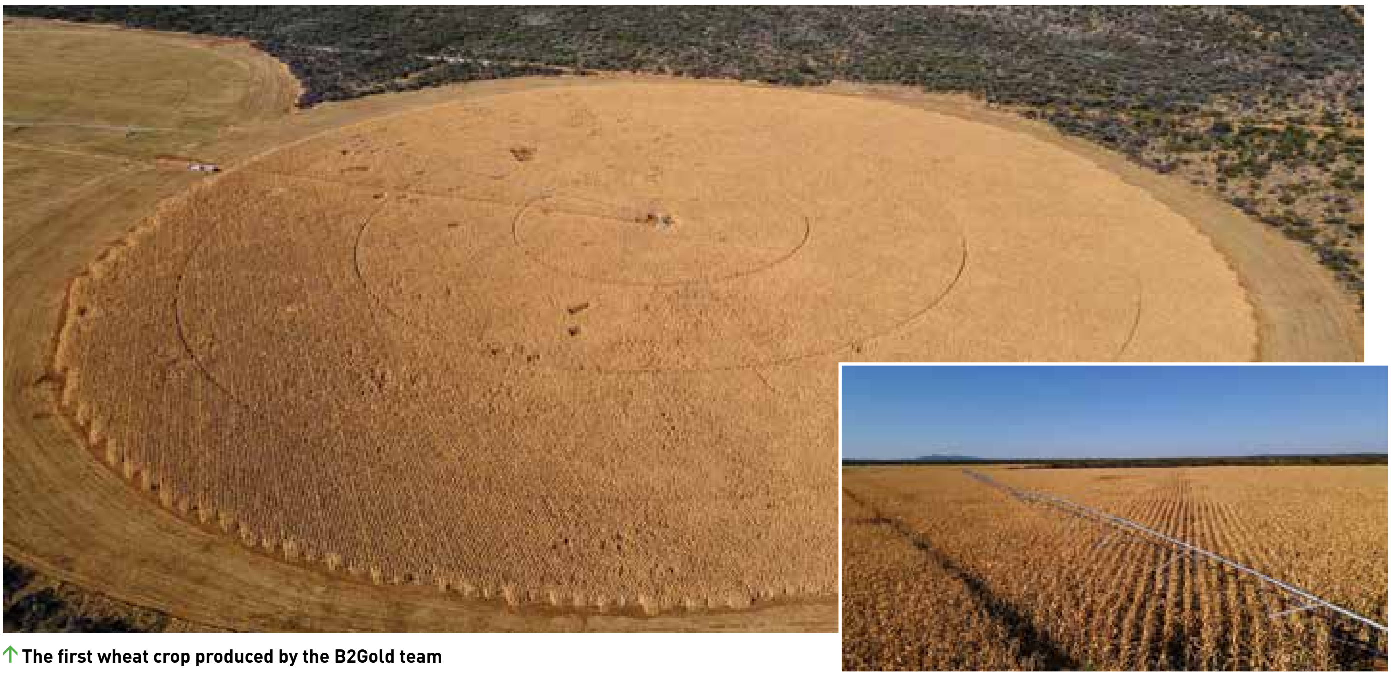
Agriculture initiatives – for mine and country

The second day of my visit to Otjikoto saw me spending some time with consultant Jeremy Ford, an experienced farmer by profession and now employed to use his expertise for B2Gold. Situated about 3 km from the mine itself, I got to see the work that Ford, and his right-hand woman Miya Kabajani, environmental research coordinator, are doing. Their work is multifaceted and forms a part of B2Gold Namibia's ESG commitments.

Kabajani spends her time focused on growing populations of trees and shrubs that are indigenous to the area upon which the mine is built. Naturally, the intention is to rehabilitate the land as thoroughly as possible. "This is an ongoing programme that is already underway. Replanting in areas that are no longer impacted by mining is a constant focus and will continue through the mine's lifespan and well thereafter," she says. Through various trials, the nursery team has managed to grow over 5 000 seedlings that represent 17 indigenous species.

Ford and Kabajani have also started a horticultural (vegetable) nursery which provides for the nature reserve, including the Education Centre, contractor's camp and the mine's canteen. The nursery currently cultivates 2 000 plants of five vegetable varieties. Added on to this is another recent project: the establishment of a fruit orchard which is aimed at marketing to local stakeholders. Again, this is sustainability by its very definition.

What left the biggest impression on me in this regard is Ford's creation of the mine's first wheat crop – substantial in size and on the back of its success is the first of many maize (in summer) and wheat (in winter) crop fields to come.



↑ **The first wheat crop produced by the B2Gold team**

Produce grown by B2Gold Namibia

Considering Namibia's dry and arid land conditions, Ford has truly applied himself to overcoming the challenges of nutrient-deficient soil and hot weather conditions and has made this conceptual project a complete success. "Namibia is an importer of maize and through Otjikoto's funding and support, this project is aimed at seeing the country become self-sufficient in maize production," he reveals.

The bigger vision for B2Gold Namibia's integrated mine closure solution is a project known as the Greater Waterberg Partnership Park (GWPP). This project's concept hinges on joining land owned by various entities (including the Otjikoto nature reserve), private farmers, NGOs, communal farmland, communal conservancies and the existing Waterberg Plateau Park under a joint ownership scheme.

Aggregating and protecting land under this public-private partnership would create a variety of employment opportunities and also provide alternative revenue options for current land owners, attracting several economic activities linked to nature-based tourism.

This concept is currently undergoing a feasibility study and is one that B2Gold believes can play a role in post-mining opportunities for Namibia.

Nakayale Academy and agricultural project

Dawe certainly ended my visit to Otjikoto on a high note. Day three of my visit took me further up north in Namibia to Etunda in the western Omusati Region of Namibia, which is located quite literally next door to the Angola border.

Here you will find, in an area quite remote, the five-year-old Nakayale Academy for Orphans and Marginalised Children – a school and orphanage for neglected, homeless children who have now been given the chance to obtain an education and become contributing adults within Namibian society. The school and farm were set up by the Dirk Mudge Trust, which was unable to continue supporting it unless it was able to secure a stable source of income. Enter B2Gold Namibia.

Enrolment is 100% free of charge and learners are exposed to the highest standard of education through a partnership with St Paul's College. Currently, there are just over 100 students and 10 teachers, a principal, hostel manager, 11 kitchen and cleaning staff members, one gardener, three maintenance and four security personnel. The school boasts eight classrooms, girls' and boys' dormitories, a school hall that is the centre of activity and a kitchen area that serves balanced and nutritious food to the staff and students.

"Running a school and orphanage of this size is no easy feat and its running costs are substantial, so B2Gold has stepped in to help," says Dawe.

In this particular instance, help was needed to build capacity on the school's

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The Nakayale agricultural project spans many hectares

Mark Dawe connects with the Nakayale farm workers

35 hectares of nearby farmland with the aim of utilizing the profits from the horticultural farm to fully fund the school for orphans and vulnerable children. Under the guidance and operation of recently employed Albertus Viljoen, farm manager, abundant crops of sweet potato, pumpkin, onion, gem squash, watermelon, cabbage and more are not only feeding the orphanage but almost all production is being purchased by a large fresh produce chain in Windhoek – generating income for Nakayale while employing about 100 local residents.

"Through our involvement we want to see this agricultural project become sustainable and self-supporting from donor funding and we are already reaching this point," says B2Gold Namibia's reporting and projects manager John Roos. "This is a significant project for the business and one we are truly passionate about. It requires constant attention and input and hours offered in this regard fall outside of Otjikoto time," Dawe continues.

A visit to the school was tear-jerking for me. I had the honour of meeting the principal, teachers and children who were grateful for visitors and to see one of their benefactors. The classrooms were immaculate and the children well-mannered and eager to sing for me. It has been a long time since I saw such pride in a schooling system and it was a true joy to experience it. Clearly, no region is too remote to form an establishment of this excellence and it left me amazed.

And here I saw what a mine can truly do for a country and its citizens, and it has warmed my heart. This is an experience I will never forget.

This trip marked the end of my visit to Otjikoto and in my mind was a true demonstration of what ESG really is. These initiatives are all driven by Dawe whose passion for Namibia extends well beyond the mine but is in essence supported by the mine. This is harmony in its truest form. I have yet to mention that throughout my trip, Dawe spent time working on another initiative that I admired – securing oxygen for remote hospitals in Namibia to help COVID-19 patients who are left dying without it. In collaboration with government and key stakeholders, Dawe has volunteered his hand to help in this regard. I don't know when he finds the time to sleep.

And there you have it – I don't have any more page space to continue although there are many more initiatives I could write about. A massive congratulations to Dawe, his team and B2Gold Namibia who are proving just how far a mine can go to give back. I salute you! MRA

Children at the Nakayale Academy

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Ivanhoe's Minichess intiative is not only fun but it has also resulted in better Maths and English marks at the Motshitshi Primary School

Ivanhoe Mines

Mining with a conscience

When **Ivanhoe Mines** started copper concentrate production at its Kamoa-Kakula mine in the Democratic Republic of Congo (DRC) in May this year, it was not only an economic boost for the country but it was also the company's first step towards producing the world's 'greenest' copper. Group sustainability manager **JASMINE ABRAHAMS** tells **GERARD PETER** that this is part of the company's ongoing initiatives to become a global ESG leader in mining.

In addition to Kamoa-Kakula, Ivanhoe Mines is also developing the Platreef project in South Africa and the Kipushi project in the DRC, as well as exploring for new copper discoveries on its Western Foreland exploration licences, in close proximity to the Kamoa-Kakula mining licence. While ESG compliance is now fast gaining momentum in the mining sector, for Ivanhoe mining in an ethical and sustainable way has always been top of mind. It is for this reason, Abrahams explains, that the company has appointed a Sustainability Committee that deals with matters related to sustainability and ESG. "The focus starts at board level and then filters all the way down to each one of our projects that have dedicated sustainability teams working on them. However, even though we have standalone functions, we regard sustainability as a multidisciplinary responsibility for all employees," she states.

It is with this in mind that the company has implemented sustainability KPIs for employees. For example, KPIs for the Kamoa-Kakula engineering department include conducting repairs to water wells in villages and fixing the roads in nearby communities. Abrahams states that while it is important to have a policy in place, it is equally important to have employees buy into the company's ESG vision. "One of the ways we are achieving this is through launching an employee portal that deals with various components of ESG every month such as human rights and climate change," she adds.

Furthermore, Ivanhoe Mines' ESG policy and actions are aligned to six key United Nations Sustainable Development Goals (SDGs) that are viewed as the blueprint for a sustainable future for all. These six SDGs are eradicating poverty; ensuring quality education; providing clean water and sanitation; aiding responsible consumption and production; taking action to combat climate change; and promoting sustainable use of terrestrial ecosystems.

Meanwhile, the company has made good inroads into ensuring that it reduces its carbon footprint at Kamoa-

Kakula. "We are currently utilising hydropower at the mine, which is sufficient for the first phase of mine production," explains Abrahams. "We've signed an MOU to refurbish Turbine Five of the Inga 2 hydropower plant and this will then power our subsequent phases of development at Kamoa-Kakula. In addition, we have started discussions with manufacturers to supply an electric fleet which will reduce emissions at the mine."

A long-term approach to socio-economic development

No doubt, the development and operation of Ivanhoe Mine's projects will lead to much-needed socio-economic development in the countries in which it operates. In addition to job creation, communities also stand to benefit from improved infrastructure, water supply, educational programmes and local business opportunities.

Abrahams points out that the company is keenly focused on local procurement and the development of local enterprises. "Our model for enterprises provides assistance both financially and from a development and business support perspective. However, the loans afforded to these enterprises are repayable to ensure that these business owners adopt the correct business approach and philosophy, as well as to enable these funds to be utilised again to help incubate/support other enterprises. One of the programmes that was affected by COVID-19 was the training

> "The focus starts at board level and then filters all the way down to each one of our projects that have dedicated sustainability teams working on them."
>
> **JASMINE ABRAHAMS**

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Sustainability KPIs include ensuring that communities have access to water

of local enterprises and suppliers, mainly due to challenges around engagement, however the support to local businesses did continue despite the pandemic."

When it comes to community upliftment projects, Abrahams states that Ivanhoe Mines takes a long-term approach to any initiative. Before embarking on any such project, it carries out a sustainability assessment to identify community needs and to ensure that a project can be self-sustainable in the future.

One initiative that has seen tremendous success is a MiniChess tournament that the company sponsored at the Motshitshi Primary School in Mokopane, South Africa. The initiative was rolled out at the beginning of 2017 with the aim of improving the learners' cognitive skills in mathematics and other learning disciplines. The programme has been making a significant difference to the learners' educational experience as they are more enthusiastic about their lessons. "We have also noticed zero absenteeism on days when chess games are played and learners' maths and English marks have also improved because of this initiative," adds Abrahams.

While the COVID-19 pandemic has caused a delay in implementing some initiatives, Abrahams states that the company has no intention of scaling back on any of its ESG programmes. "For example, we have allocated US$8 million to ESG at Kamoa-Kakula over the next five years. Furthermore, it is very important to ensure that we have a social licence to operate. Our aim is to leave a legacy. That is to change the negative perception that people have of mining and to be viewed as good corporate citizens," she concludes. MRA

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Purpose before profit

Canyon Coal committed to responsible mining

Good corporate governance is one of the tenets that **Menar** subsidiary **Canyon Coal** is built on. By ensuring compliance to mining legislation and its associate licences, the company is ensuring that it carries out its operations in a sustainable and ethical manner. **GERARD PETER** reports.

According to Melissa Pillay, Menar Head of Environmental Compliance, the company primarily aligns its policies with the Constitution of the Republic of South Africa, the overarching legal framework of South Africa. Furthermore, Canyon Coal aims to abide by all relevant provisions of the Mineral and Petroleum Resources Development Act (MPRDA), which is the predominant piece of legislation governing rights to conduct reconnaissance, prospecting and mining in South Africa.

"We also abide by all other pieces of legislation that specifically govern mining such as the Mining Titles Registration Act, Mineral and Petroleum Resources Royalty Act, National Water Act, National Environmental Management Act, and the National Environmental Management Waste Act; as well as the Mine Health and Safety Act which specifically focuses on the health and safety of the employees on mines," adds Pillay.

Compliance is managed by the Projects, Environmental and Legal Departments that ensure that the company is compliant with all relevant mining laws and regulations. In addition, audits are conducted externally on an annual basis to ensure compliance with relevant mining legislation and associated licences.

As a South African company, Canyon Coal implements the principles and recommendations of good corporate governance contained in the King Code of Governance Principles for South Africa, known as the King III Report.

Pillay adds that the company conducts business with its employees on the basis of the Labour Relations Act as well as Employment Equity Act and also has a particular focus on B-BBEE in terms of how it sources its employees and contractors.

Having a social licence to operate is highly important to Canyon Coal. As such, the company takes its corporate social responsibility seriously and addresses it in terms of its social and labour plans (SLPs), which are also regulated by the MPRDA. "In addition, we always try and adopt a compassionate practice while focusing on the promotion of sustainable development in the communities in which we operate," Pillay states.

The end goal of the Singani rehabilitation project is to ensure that the site can be used for agricultural purposes

Turning back the clock on a mine site

Canyon Coal's commitment to good mining practices goes beyond just the operational phase. The company also places a strong emphasis on mine rehabilitation. One such example is the rehabilitation of the former opencast Singani Colliery in Middelburg.

Singani is Canyon Coal's first mine to reach the rehabilitation stage with the ultimate goal of receiving a mine closure certificate from the Department of Mineral Resources and Energy (DMRE). The project reached an important stage with the completion of earthworks in June this year. This included the moving of a large quantum of hard soil, subsoil and topsoil materials as part of the remediation process.

Mining commenced at Singani in September 2014 and its resource was depleted in February 2019. At peak production, the mine produced 130 000 tpm of run of mine (RoM) coal. However, throughout the life of mine concurrent rehabilitation of the mining areas was undertaken, which has aided in the speed of the rehabilitation of the site.

Canyon Coal implemented a risk-based approach to ensure concurrently implemented rehabilitation actions would achieve the desired post-mining landscape and land capability aligned with end land use goals of restoring the site to agricultural land.

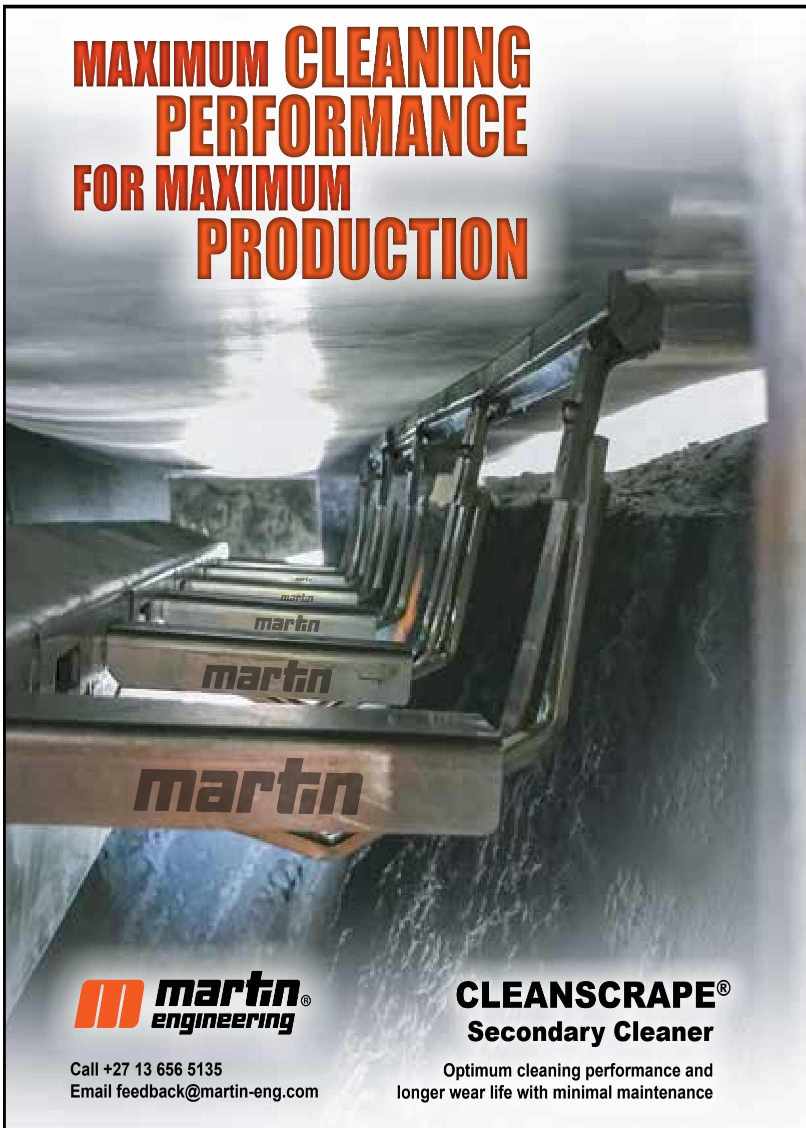
Singani mine manager Mike Seme says that being part of the rehabilitation team has meant a great deal to him. "I was at Singani when it was an active mine; now it is good to see it gradually returning to its original state before mining was undertaken here." He notes that the earthworks rehabilitation included backfilling of pit areas and voids; the removal of the RoM pad, roads, workshops, offices and all infrastructure and levelling the ground; along with the eradication of invasive plants. All the pit areas have been carefully backfilled with the overburden that was removed to access the coal, and have been covered with topsoil.

Meanwhile, Canyon Coal compliance officer Arjen Nell points out that Singani Colliery has followed the prescribed, environmentally sound way of mining and rehabilitating the site. The team has stockpiled the overburden material in the sequence it was removed, preparing to backfill these mining areas again with the hard soil, soft soil and topsoil after taking out all the coal in the pit. He explains that a free draining topography was encouraged in order for the rehabilitated area to blend in with the surrounding landscape and the direction of water flow on-site.

"I believe this will set a benchmark for future projects in terms of achieving a fully rehabilitated mine, to get as close as possible to what the environment was initially, to return it to agriculturally productive land. This means that our end goal is to restore the land to arable land and ensure that the whole area is functioning ecologically as it was before mining commenced. Achieving this would be a major milestone for the company," states Arjen.

Pillay adds that Canyon Coal has carried out regular environmental audits at Singani to examine the stability of the site. Rehabilitated areas are examined for surface cracks and to ensure all areas are free draining.

"Canyon Coal and Menar are deeply committed to ensuring the full restoration of agricultural land usage at site. The completion of the earthworks will allow for seeding to take place, which will commence in due course. This is in line with the Menar Group's goal to attain a mine closure certificate for Singani," concludes Pillay. MRA



Harmony has identified greenhouse gas emissions as a contributing factor to climate change as one of the areas of greatest environmental risk exposure to the company from a financial and environmental perspective

Image: 123rf.com

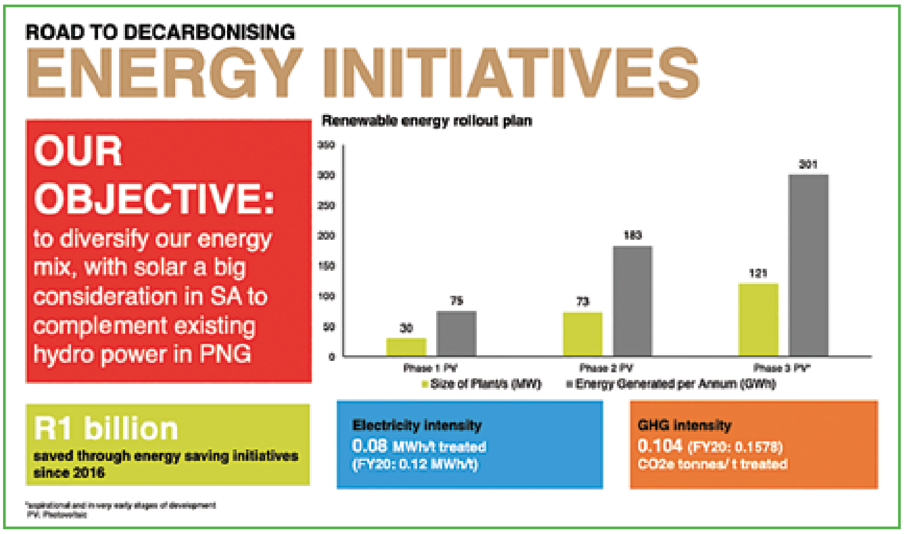
Harmony Gold Mining Company

On the road towards decarbonisation

South Africa's largest gold producer, **Harmony Gold Mining Company** (Harmony), is committed to creating a greener and more equitable future for its stakeholders and has set a number of sustainability targets and ambitions to do so. One of its target areas hinges on decarbonisation, through which the company aims to diversify its energy mix away from fossil fuel-generated energy, reduce its carbon footprint and greenhouse gas emissions and improve its energy efficiency. Compiled by **CHANTELLE KOTZE**.

With hydroelectric power already in place in Papua New Guinea, Harmony is also embarking on the rollout of a comprehensive, phased renewable energy plan in South Africa, consisting mainly of solar photovoltaic (PV) energy.

Speaking during Harmony's full year results webcast for the period ended 30 June 2021, CEO Peter Steenkamp said that the company's initial phase entails the construction of three 10 MW solar PV plants to generate a total of 30 MW in the Free State province.



Harmony is embarking on the rollout of a comprehensive, phased renewable energy plan in South Africa

For the next phase, the company plans to add a further 73 MW of renewable energy generation capacity to its plan.

In addition to these two phases, Harmony also has a pipeline of renewable and alternative energy projects in various stages of development, and these are being supplemented by a pipeline of energy efficiency projects.

Harmony also has an aspirational third phase in this plan, which is still in the very early stages of development, which could increase the company's renewable energy generation capacity to 121 MW.

During its 2021 financial year, the company managed to reduce its electricity intensity per ton of ore treated from 0.12 MWh/t in the prior period, to 0.08 MWh/t. Its greenhouse gas intensity in the period was 0.104 of CO_2 equivalent tons per ton of ore treated, down on the 0.1578 of CO_2 equivalent tons per ton treated in the 2020 financial year.

Over the past five years, Harmony has implemented more than 200 energy savings initiatives which have reduced the company's electricity consumption by 33% while realising cumulative saving of R1 billion on the back of these energy saving initiatives. This translates into an energy reduction of approximately 1.3 TWh or 1.2 Mt of CO_2 equivalent reduction.

"This is a testimony to the fact that Harmony turns risk into opportunity," said Steenkamp.

Mitigating climate change risks

Speaking at the company's inaugural investor ESG day, held in June, Melanie Naidoo-Vermaak, Harmony executive: sustainable development, highlighted greenhouse gas emissions as a contributing factor to climate change as one of the areas of greatest environmental risk exposure to the company from a financial and environmental perspective.

"Apart from the direct impact of rising electricity costs, as well as carbon pricing impacting our margins, our climate change risks extend to future operating costs and infrastructure requirements, operating conditions, and indeed may impact the health and well-being of employees and host communities," she said.

"It is imperative for us to understand the sources, scope and extent of greenhouse gas emissions associated with our operations, to better evaluate our risks and exposures over the short, medium, and long term," she added.

The company therefore published its first Task Force for Climate-related Financial Disclosure, or TCFD, report in 2020, which is a more profound reflection of the interface between climate change impacts and the financial well-being of the company. In October 2021, the company will publish its second TCFD report alongside its ESG report. MRA

RECOGNITION OF ESG PERFORMANCE

As a result of the continued improvement in its ESG efforts, Harmony was included in the FTSE4Good, the Bloomberg Gender-Equality and FTSE/JSE Africa Top 40 indices in recognition of its performance in 2020. In addition, the company maintained a CDP A- rating for water management.

In 2021, the company was again included in the FTSE4Good Index and the Bloomberg Gender-Equality Index for a third consecutive year and was certified by Standard Bank as a Top gender empowerment company.

Furthermore, in the 2021 financial year, MSCI upgraded Harmony's score from 'CCC' to a 'B' rating on the back of its strong governance framework.

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Forewarned is forearmed

Averting future tailings facilities disasters

Without proper management, tailings facilities can pose a significant risk to the natural and social environment. It is for this reason that **Sibanye-Stillwater** is committed to the safe and environmentally responsible stewardship of its tailings storage facilities in accordance with the Global Industry Standard on Tailings Management (GISTM). Compiled by **GERARD PETER**.

According to Grant Stuart, senior vice-president of environmental, the group is on a journey of continual improvement and embedding ESG as the way it does business.

Currently, the company has 38 tailings storage facilities under management, both in South Africa and the United States, most of which were acquired through its transformational journey. As a result of having been designed, built and managed by various companies, according to different standards and specifications over varying decades, there was limited uniformity in Sibanye-Stillwater's fleet of tailings storage facilities, particularly in their historic management and governance. Nor was there any consistency or alignment in the regulations that govern the two jurisdictions in which the tailings storage facilities are situated.

Sibanye-Stillwater has embarked on a wide-ranging programme to align its management of tailings storage facilities with the Global Industry Standard on Tailings Management (GISTM) which was launched in August last year.

Adopting the GISTM is a required commitment of all member companies of the International Council of Mining and Metals (ICMM). This standard is the first of its kind and was developed through collaboration between the United Nations Environment Programme (UNEP), Principles for Responsible Investment (PRI) and ICMM.

It covers the entire tailings storage facility lifecycle – from site selection, design and construction, management and monitoring, to closure and post-closure – and seeks to strengthen current practices in the mining industry by integrating social, environmental, local economic and technical considerations. "The standard significantly raises the bar for the industry to achieve strong social, environmental and technical outcomes. It also establishes clear expectations

Proper management of its tailings facilities is part of Sibanye-Stillwater's commitment to Zero Harm around global transparency and disclosure requirements, helping to improve understanding by interested stakeholders," Stuart adds.

Journey to compliance

Given the extensive requirements contained in the GISTM, all participating mining companies have been given a grace period of three years from 2020 (for high and extreme facilities) or five years (for all other facilities) to make adjustments to their tailings storage facility policies and procedures and to improve or upgrade existing high-risk facilities.

Subsequently, Sibanye-Stillwater began implementing a range of initiatives to improve and align its management of tailings storage facilities, a process which is expected to take between two and three years. Stuart explains that the first priority measure undertaken in 2020 was the creation of a new position – vice-president of tailings engineering – to oversee all aspects relating to tailings management. Linked to this appointment was a shift in reporting procedure so that all matters relating to tailings management are reported directly to the executive committee with the chief technical officer appointed as the accountable executive, responsible for the safety of tailings facilities and for minimising the social and environmental consequences of a potential tailings facility failure. This is a specific requirement of the GISTM. In addition to its focus on executive accountability, the group is also focused on the governance aspect of tailings management.

All of the company's tailings facilities in South Africa are built in an upstream direction. While building in the upstream direction has not been abandoned, specific countries have banned upstream construction; such as Chile due to earthquakes and Brazil due to high rainfall. In addition, upstream facilities pose a higher risk and hence require an increased and robust level of management which has been practised for decades in South Africa.

The tailings storage facilities of the company's South African and US PGM operations, which were designed and built more recently according to more stringent parameters, are aligned with international best practice on tailings management. However, much work needs to be done, particularly integrating operational management with environmental and social requirements, in order for all of the company's tailings storage facilities to be fully compliant with the GISTM.

"The standard significantly raises the bar for the industry to achieve strong social, environmental and technical outcomes."

GRANT STUART

Putting the markers in place

According to Stuart, there are several changes that are being made to align with the strict governance requirements contained in the GISTM. "This includes, but is not limited to, the development of a new tailings storage facility-focused governance framework, the overhaul of tailings storage facility-related systems into a single board-approved group tailings management system and the improvement of operational documentation to assist in site-level validation and third-party assessments."

At the same time, Sibanye-Stillwater has embarked on a programme to evaluate the geotechnical status of all its South African tailings storage facilities. Of particular focus in these investigations will be detailed assessments of each tailings storage facility. Furthermore, a comprehensive gap analysis is underway to determine the shortfalls against the GISTM and group tailings management system. The new system is aligned to the GISTM and includes measures to identify, report and mitigate risks.

Catastrophic tailings facility failures devastate the environment and destroy lives and livelihoods. "Such catastrophic failures are unacceptable, and Sibanye-Stillwater is dedicated to ensuring that systems, standards and resources are in place to prevent failures," concludes Stuart. MRA

DRDGOLD ACQUISITION A BOOST FOR TAILINGS FACILITIES MANAGEMENT

In recent years, Sibanye-Stillwater has undertaken various initiatives to improve its rehabilitation capabilities, particularly as they relate to tailings storage facilities. The flagship initiative was the purchase of a 50.1% shareholding in DRDGold, a leader in the retreatment of surface gold tailings, in January 2020. This partnership allows Sibanye-Stillwater to leverage off DRDGold's proven capabilities, particularly in terms of reversing the environmental legacy of mining through the retreatment of tailings storage facilities.

Stuart adds that, ultimately, the acquisition of DRDGold will help the company to remove and rehabilitate vast tracts of land historically inundated by tailings facilities and thereby limit their environmental and social impacts.

AMF 2021

Responsible mining takes centre stage

ESG is the overarching theme at this year's **Africa Mining Forum** (AMF) digital event, taking place from 2 to 4 November.

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The focus on ESG follows touch points that were explored at the first AMF digital event in November last year. This year, each day will be dedicated to exploring the three ESG requirements and pillars through a diverse format and activities across the three-day event.

There can be no doubt that ESG has become the centrepiece of future investment decision making, with mining companies' policies and operations coming under increasing scrutiny. Elodie Delagneau, project director: Mining at Clarion Events Africa, adds, "The COVID-19 pandemic has accelerated some of the ESG processes and the race towards greener mining and environmental sustainability has also presented strong opportunities for transformational change in the industry. Mining companies that haven't embraced ESG need to face the reality of the future investment trends; investors will increasingly look into companies that have adopted and implemented ESG policies through their operations and business plan."

With so much content in the market, Delagneau explains the organisers have created touch points and content pieces that will fit the audience's needs and time. We understand that not everything online has to be a 60-minute long webinar. As such, attendees can expect 15 minutes live commodity outlooks from our experts from CRU diving into pricing and trends; a focus on key mining destinations such as the DRC, Tanzania, Burkina Faso and Botswana; and live debates and keynotes gravitating around the ESG theme. We have chosen an engaging format with our audience through roundtables that allow any participants to take part and engage directly with some of our experts. We believe that such tools will support some of the challenges that our technical and operational audience is facing on the ground."

Recognising those making a difference

In addition, AMF 2021 will also home in on how technology is changing the mining landscape and also helping to ensure ESG compliance. Topics include how technology is benefitting managing waste products, supporting mining's energy transition with hybrid solutions and improving health and safety.

Another highlight of this year's event is a digital awards ceremony for the winners of the *Mining Elites in Africa* 2022. Published by *Mining Review Africa, Mining Elites in Africa* celebrates the leaders, companies and projects that are making a difference in the sector: from breakthroughs in environmental challenges, to finance, health and safety, to engineering and technology.

Mining Review Africa Editor-in-Chief Laura Cornish states, "Until now, this has been a print-focused brand, but our move towards digital is further demonstration of this product's ability to adapt to market demand. What better way to showcase our *Elites* leaders than through digital acknowledgement and a strong digital brand like AMF that is set to grow rapidly in years to come." Delagneau adds that given the prestige of *Mining Elites in Africa*, it made complete sense for both projects to work together and merge to deliver the first *Mining Elites* Awards Ceremony.

"You can already meet some of our speakers on the Mine.it Africa platform and start engaging with them on niche topics. We are looking forward to our live edition next year but for now, we invite the global mining community to join us online and attend this exciting edition," Delagneau concludes. MRA

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ESG is more than a box-ticking exercise

For specialist mining solutions provider **Fraser Alexander**, ESG compliance is a lot more than adhering to industry standards and company policy. Rather, it is embedded in the company's culture. COO **BONGANI BUTHELEZI** explains to **GERARD PETER** how this approach is ensuring that all employees play a role in promoting responsible and sustainable mining operations.

Buthelezi starts by explaining that for Fraser Alexander ESG compliance starts at a boardroom level and filters down to the rest of the company. "ESG forms part of the performance scorecard of the executive and this is then cascaded down to the various levels of management to ensure that compliance is measured at all levels of operations," he states.

While scorecards provide a good indication of how each of the company's divisions are faring when it comes to ESG compliance, Buthelezi points out that putting such markers in place goes far beyond measuring performance. Instead, it is part of the company's narrative in every activity that it is involved in. For example, ESG is a key fundamental at the roadshows that Fraser Alexander organises on a regular basis.

Furthermore, Buthelezi states that its commitment to sustainable mining that benefits all is a key factor when it comes to deciding which mining projects to be involved in. "A project could be profitable but if it is against the values we believe in when it comes to the environment or social issues, then we opt not to be a part of that project despite its profitability. Fortunately, the majority of the clients we work with are firm believers in ESG compliance," adds Buthelezi.

When it comes to the environment, Buthelezi points out that technology is playing a huge role in ensuring that operations are carried out in a more sustainable manner. A case in point is the machinery that Fraser Alexander's Mining Division uses for mining tailings dams. "Currently, the hydraulic guns that are used in the processing of tailings uses diesel. However, we are currently in discussions with OEMS to transition from diesel to battery electric. Not only will this be more economical but it will also be less harmful on the environment.

Uplifting its own workforce

Without doubt, the onset of the COVID-19 pandemic had a considerable impact on mining operations and Fraser Alexander was not spared. Buthelezi explains that this had an impact on employees as well as communities. Subsequently, the board of directors, executive team and employees at all levels contributed towards a fund set up by the company to help those who were impacted financially by the pandemic. The campaign raised close to R400 000 and the money was donated to affected stakeholders. In addition, Fraser Alexander donated food parcels to the various communities where it operates.

Furthermore, the company remains committed to good corporate governance. "Fraser Alexander is run like a listed company. In this way, we ensure that we always operate in a transparent and ethical manner," Buthelezi adds.

Finally, Buthelezi emphasises that the company's ESG policy is not just to ensure compliance to government and industry regulations but rather to ensure that mining can make a meaningful impact on the socio-economic well-being of all citizens. "For example, South Africa has a high unemployment rate and the earlier companies get involved in addressing this issue, the greater the impact will be. And it is not just about compliance; it is also the right thing to do," he concludes. MRA

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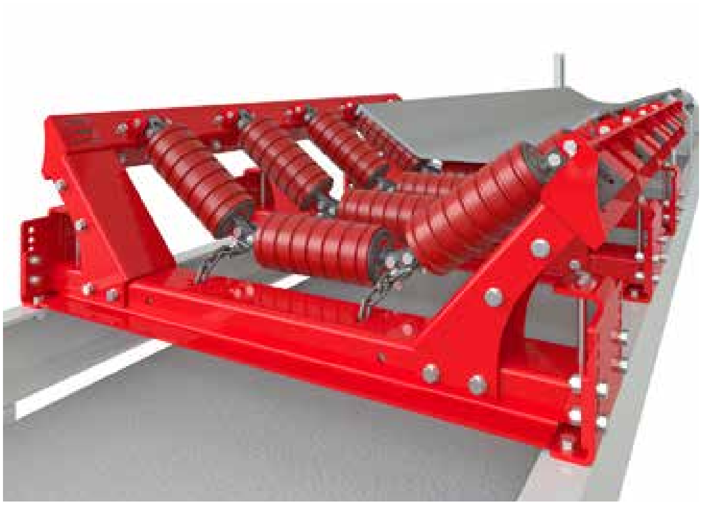

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