

OPERATIONAL PERFORMANCE REVIEW continued

# BARBERTON MINES



- Three underground gold mines: Fairview Mine, Sheba Mine and Consort Mine
- One tailings retreatment operation: BTRP

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## OVERVIEW OF OPERATIONS

The Fairview, Sheba and Consort underground mining operations constitute the Group's Barberton Mines complex, which has been operating for over 130 years. With a remaining life-of-mine estimated at 20 years, this asset is positioned as a long-life operation in Pan African's portfolio.

Sheba Mine is recognised as one of the oldest working gold mines in the world and commenced its operations in 1885. Fairview Mine is the birthplace of BIOX®, an environmentally friendly process of releasing gold associated with sulphide (refractory) minerals using micro-organisms that perform this process naturally and with excellent recoveries consistently in the region of 98.8%. The BIOX® plant was commissioned in 1988 and is still used as a training facility for BIOX® plants globally.

These flagship underground mines are high-grade operations that can produce approximately 80,000oz of gold per year, with an excellent long-term safety record.

Barberton Mines also includes the BTRP surface retreatment operation which is located within Fairview Mine's mining right footprint area. The BTRP was designed to treat 100,000t of tailings per month and adds low-cost and low-risk ounces to our production profile.

Barberton Mines has made significant progress in recent years to enhance mining flexibility through various key initiatives. These include achieving higher development rates at Fairview Mine, leading to the establishment of multiple high-grade mining platforms on the MRC and Rossiter orebodies. Ongoing exploration drilling is currently underway to extend its Mineral Reserves. Measures have also been implemented to alleviate congestion in

existing infrastructure, and plans are in place to optimise hoisting operations from a subvertical shaft in the future. Additionally, an up-dip mining method has been implemented at Sheba Mine to reduce dilution on the narrow orebodies previously mined using cut-and-fill methodology, and significant attention has been given to equipping the PC Shaft remnant blocks at Consort Mine, enabling the extraction of high-grade ore in the 41 to 45 Level range. These initiatives collectively demonstrate Barberton Mines' commitment to improving operational efficiency and maximising the value of its resources.

Fairview Mine is working to improve its production profile and enabling mining at deeper levels. As part of these efforts, it will be developing and equipping a chairlift decline adjacent to the 3 Decline between 42 and 64 Levels. This development aims to enhance hoisting times and address existing logistical constraints. Additionally, it is extending its refrigeration infrastructure and making investments in a grout backfill plant. These measures will contribute to optimised operations and improved mining capabilities.

Despite the aforementioned improvements, the underground operations faced several challenges in their efforts to maintain gold production. These challenges included labour, energy and processing cost increases that exceeded inflationary rates, as well as the escalating depth and resultant travel times at Fairview Mine, adversely impacting productivity. Additionally, the high-grade 42 Level

block at Consort Mine was depleted while geotechnical conditions hampered access to the 41 Level up-dip extensions. These operational headwinds required strategic solutions and mitigation measures to ensure optimal productivity and sustainable operations, which entailed a detailed review of Barberton Mines' operations. After engagement with stakeholders, an agreement was reached to restructure the underground operations. Consort Mine was converted to a contractor mining operation, and both Fairview and Sheba Mines implemented a continuous shift operating cycle, while still allowing for ongoing maintenance and other support activities. Negotiations with the unions to support the conversion to continuous shift operations were concluded in January 2023, and the transition to continuous shift operations was initiated in February 2023.

## FAIRVIEW AND SHEBA MINES

The Fairview and Sheba Mines experienced a slower-than-anticipated ramp-up during the transition to continuous operations. However, the Group is pleased to report that notable improvements in production were achieved during the last quarter of the financial year. Additionally, the optimisation of mining methods at Sheba Mine's MRC and ZK stopes, along with increased availability of trackless mining machinery, have contributed to enhanced underground production tonnes and mined grades. The implementation of the Consort Mine contractor model achieved full production in June 2023, and the operation is now positioned to return to profitability.

During the year, operational challenges led to a decline in the high-grade tonnes processed from the underground mining platforms, resulting in additional milling capacity becoming available. This additional milling capacity was optimised through increased tonnages being processed from our lower-grade surface stockpile, causing the processed tonnes from mining to increase year-on-year, while the recovered grade decreased.

## COST-SAVING AND PRODUCTION IMPROVEMENT INITIATIVES

- **Commissioning of an 8.75MW solar plant.** We have entered into an agreement with juwi, a leading developer of solar, wind and hybrid electricity projects, to construct an 8.75MW solar energy plant at Barberton Mines' Fairview operation. This plant will bring significant benefits, including annual cost savings. Moreover, the solar plant is expected to reduce carbon dioxide emissions by approximately 22,000t per year. With an economic life in excess of 25 years, the solar plant is expected to generate power beyond the mine's existing 20-year life-of-mine, based on the current Mineral Reserves estimates.

The plant has obtained all the necessary permits, including a water-use licence, environmental approvals and registration with the National Energy Regulator of South Africa. juwi has completed the early works phase, which involved tasks such as facility design and conducting specialist studies to finalise the detailed design and cost estimation for the subsequent engineering, procurement and construction work. Preparatory construction

activities began in May 2023. The first power generation is anticipated to take place in the hot commissioning phase during in the 2024 calendar year, assuming Eskom's cooperation and the absence of delays on the project.

It is foreseen that the solar plant's construction will be financed through a ring-fenced facility, similar to the financing of Evander Mines' solar plant, and negotiations are already well advanced with financiers in this regard.

- **Optimised infrastructure plans for an improved production profile.** The design of the proposed subvertical shaft project at Fairview Mine's 42 Level to 78 Level is progressing as planned and should be completed over the next two years. In addition deeper gold reserves are being bolstered to further enhance the business case for this development after which construction of the shaft can commence. It is expected that the subvertical shaft can contribute an additional 10,000oz of production per annum through an increase in the available hoisting capacity below 42 Level (3 Decline). Extension of the existing refrigeration infrastructure, to enable cooling as mining progresses at depth, is also planned through the development of a pipe-raise.

Additionally, the development and equipping of a chairlift decline adjacent to the 3 Decline will commence between 42 and 64 Levels to ensure improved hoisting times from the current logistically constrained 3 Decline. A grout backfill plant will also be installed at Fairview Mine, enabling the pumping of backfill from the surface down the decline system, rather than transporting bags of cement as is currently the practice. These projects will relieve logistical constraints on the 3 Decline and improve the available time for hoisting high-grade ore from the MRC and Rossiter orebodies.

Project Dibanisa has been completed by connecting 23 Level at Sheba Mine with 38 Level at Fairview Mine. This connection not only allows for the movement of mined ore from the Sheba Mine infrastructure to Fairview Mine, when required, but also allows for the movement of employees and consumables between the mines. The completion of this project adds flexibility in access and logistics between different sections of the underground, thereby improving operational efficiency.

An integrated drilling and production plan has been formulated to ensure that exploration and grade control drilling is done in accordance with the short-, medium- and long-term mine plans. This was done so as to de-risk the relevant mine plans and improve the Group's Mineral Resources to Mineral Reserves conversion. Additionally, the electronic radio frequency reef and waste tagging system has been fully commissioned at both Fairview and Sheba Mines, enabling the management team to actively track on a live system the movement of ore from underground to the plant.

The mine planning department has successfully implemented state-of-the-art planning and scheduling systems and enhanced its technical expertise, allowing them to schedule and plan all mining-related activities with specific measurable tasks and

## OPERATIONAL PERFORMANCE REVIEW continued

enhanced system has significantly improved the department's ability to achieve its planned goals. Furthermore, the survey and geology department has been equipped with computer-assisted drawing and 3D systems, further bolstering their capabilities.

During the current financial year, an operations control room was established, which is integrated with multiple supervisory control and data acquisition (SCADA) systems to monitor various mining services, including a comprehensive reporting protocol. The primary objective behind this initiative is to enhance response times to breakdowns and emergencies, ultimately leading to a reduction in production downtime.

Furthermore, we are currently in the process of installing the Mineware Syncromine reporting system. This system will provide valuable insights by reporting on production data in relation to planning statistics. Additionally, it will capture labour-related information, enabling detailed analysis and facilitating expeditious decision-making.

We are also implementing a safety application and upgrading the mine's fibre and radio communication infrastructure to empower employees to report safety incidents from any location within the mine. This upgrade is designed to enhance the flow of information and facilitate prompt responses, ultimately fostering an even safer working environment.

- **Exploration drilling for target identification.** Barberton Mines faces operational challenges due to the geological variability and the complexity of its greenstone orogenic orebodies. These orebodies, which are characterised by gold deposits hosted in shear zones within the greenstone belts, exhibit significant variations in metal content and mineralised extents along both strike and down-dip directions. To address these challenges, we have continued our rigorous exploration programmes throughout the financial year, focusing on identifying additional mining opportunities in the form of high-grade platforms within Fairview's MRC and Rossiter orebodies.

During the current financial year, up to five large high-grade platforms (256, 257, 258, 259 and 260 Platforms) were available for mining in the MRC orebody, along with two platforms within the Rossiter orebody. However, two of the five high-grade platforms (256 and 257) were depleted, leaving three platforms in the MRC orebody available for mining in the 2024 financial year. Notably, access to the lower high-grade platform (260) in Fairview Mine's MRC orebody was achieved in January 2023, and the development towards the down-dip 261 Platform is progressing as planned.

### BARBERTON TAILINGS RETREATMENT PLANT

The BTRP produced 19,875oz (2022: 19,560oz) for the 2023 financial year at an AISC<sup>®</sup> of US\$717/oz (2022: US\$891/oz). The remaining life-of-mine from current tailings sources is estimated at three years with production declining in the last two years. In the coming years, production at the BTRP is expected to be supplemented with ore from Barberton Mines' Western Cross and Royal Sheba orebodies, where the extraction of a 10,000t bulk sample was successfully conducted. Mining the Royal Sheba orebody has the potential to increase the BTRP's life by an estimated eight additional years.

### ROYAL SHEBA

The processing of the 10,000t bulk sample from the Royal Sheba project at the Sheba and Consort metallurgical plants has been completed. The achieved grade of the bulk sample was 1.22g/t, surpassing the planned grade of 0.5g/t, with recoveries of 84% relative to the planned recovery rate of 85%.

Finalisation of mine layout optimisation and scheduling has been achieved, and requests for quotations have been issued for the initial development and production activities. Preliminary optimisation work for life-of-mine planning has also been completed, utilising a cut-off grade of 1.7g/t, resulting in an estimated average mining grade of approximately 3.0g/t. Over the project's currently estimated eight-year lifespan, it is projected that approximately 235,000oz of gold can be recovered from the orebody, with the potential for further extensions at depth.

DRA Global has concluded the feasibility study for installing a crushing and milling circuit at the Royal Sheba project site, incorporating a design to enable slurry pumping from the milling plant to the BTRP. The processing plant's feasibility study and the project's financial model are currently undergoing updates and reviews. A phased capital spending approach, aligning with the availability of BTRP material feed, is being considered for the development of this project. This phased development includes the progression of the decline, production levels and the necessary ventilation infrastructure for initial stoping operations.

The planned timeline for the project envisions the mining of the first stoped ore in 2025 at a rate of 5,000t per month, gradually increasing to 10,000t, 30,000t and 45,000t per month thereafter, following a defined development and production schedule.

Through a trucking cost trade-off analysis, it has been determined that the on-site crushing and milling circuit, as well as the slurry pipeline, will only be feasible once a production rate of 45,000t per month has been attained. The internal feasibility study for the entire project is anticipated to be completed in the coming months, providing further insights into DRA Global's feasibility study.

The adverse impact of illegal mining on gold production remains a challenge, however, the implementation of a multi-faceted and integrated security strategy, along with improved collaboration with law enforcement, has significantly enhanced our ability to combat the effects of illegal mining. Measures have been taken to limit the unauthorised access of illegal miners to underground areas and prevent the theft of surface infrastructure.

Since May 2022, a national police intervention contingent has been deployed to Barberton Mines specifically targeting illegal mining and associated criminal activities. Specialised police units, including the National Intervention Unit, tactical response teams and public order police, have been engaged in this external operation.

The deployment of these dedicated external police resources has yielded substantial successes, targeting and neutralising almost 120 gold-bearing material processing plants and illicit smelting facilities.

The mine's security services continued to implement their integrated security model to address criminal activities. Utilising surveillance technology, more than 700 individuals were arrested at the mine for various offences during the current financial year. The expanded CCTV network, consisting of 744 cameras, of which 284 cameras were installed in the current financial year, facilitated these arrests. The integration of radar, seismic, long-range thermal cameras and X-ray technology is also underway to further enhance crime prevention measures.

The Group's risk and security executive, along with specialised security personnel, are dedicated to introducing new technologies, integrated security strategies and collaborative efforts with national law enforcement and prosecution agencies to mitigate the challenge of illegal mining in Barberton.



### FOCUS FOR 2024

Our objective is to continually enhance our industry-leading safety performance while consistently delivering high-quality ounces consistent with our production guidance of approximately 100,000oz per annum from the Barberton Mines complex. Additionally, we are actively pursuing value-accretive growth opportunities within our orebodies.

Our track record demonstrates our ability to replenish Mineral Resources and Mineral Reserves through effective brownfield exploration. We are also exploring organic growth projects, such as the Royal Sheba project, to further bolster the sustainability and longevity of our operations.

For the upcoming 2024 financial year, our key focus areas are as follows:

- Reducing underground unit costs
- Increasing production flexibility
- Enhancing Barberton Mines' infrastructure utilisation by advancing the Royal Sheba project
- Commencing the development of a chairlift decline adjacent to Fairview Mine's 3 Decline
- Extending the mines' Mineral Reserves through comprehensive definition and infill drilling programmes
- Identifying additional exploration targets using advanced geophysical techniques and following up with exploration drilling
- Installing a grout backfill plant and underground piping infrastructure at Fairview Mine to optimise the extraction of the high-grade MRC orebody and alleviate congestion in the 3 Decline, the deepest section of the mine
- Commissioning the Fairview Mine solar plant to reduce carbon emissions and operating costs, while also ensuring a reliable electricity supply at Barberton Mines.

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