“We want to be first movers in the African lithium space,”
Sam Hosack, Prospect Resources MD
Ivanplats’ Platreef project intersects the ‘Flatreef’ PGM deposit

Marks the start of a PGM revolution in South Africa

Ivanplats, the mine developer that is 64%-owned by Ivanhoe Mines, celebrated a significant achievement on 26 September this year when its initial shaft intersected the top of the mineralised reef 782 m below the surface at its Platreef project on the Northern Limb of South Africa’s legendary Bushveld Complex. Capping many years of anticipation, Ivanplats’ mine builders for the first time can see and touch a tip of the high-grade “Flatreef” ore body, with its partially identified trove of platinum group metals: nickel, copper and gold. At an estimated thickness of 26 m in Shaft 1, the “Flatreef” ore body lends itself to full-scale, mechanised mining that is expected to drive down the project’s operating costs and enhance profits – a model that could transform the future of the PGM sector in South Africa. Ivanplats’ Vice President & Project Director GERICK MOUTON hosted LAURA CORNISH on site, where she had the opportunity to go underground in Shaft 1 and touch the reef for herself.
The global investment market may be questioning the need to develop new, large-scale greenfield PGM mines in an era where most of South Africa’s high-cost platinum mines are under significant financial pressure as a result of low prices and declining demand for the commodities.

Some observers predict that 40 to 50% of current PGM supply ounces will be lost in coming years as their uneconomic status escalates. "Narrow-vein Merensky mines, typical across the Western Limb, are under enormous pressure to reduce costs and sustain their production methodologies. I believe high-quality, low-cost mines, situated in the Eastern and Northern limbs of the Bushveld Complex, will supplement this lost production, taking the future of South Africa PGM mining in an entirely new direction," says Mouton.

Located on the Northern Limb of the Bushveld Complex and adjacent to Anglo American Platinum’s Mogalakwena mine, the Platreef project will mine a strongly mineralised, polymetallic belt that extends northward from the town of Mokopane for more than 30 km. Platreef represents a new era; it will comfortably operate on the first quartile side of the cash-cost curve and generate healthy profits and a guaranteed return on investment.

International engineering firm DRA Global first became involved in the early stages of the project through the overall management of the pre-feasibility study (PFS) and feasibility study (FS) to the NI43-101 disclosure standard in 2015, as well as the design and project support services during Shaft 1’s sinking phase. DRA Global is continuing to partner with Ivanplats and will be responsible for the management of civil engineering, early works and associated infrastructure during the Shaft 2 box cut and hitch construction phase.

DRA has also been involved in the N11 access road, perimeter fencing, tailings storage facility (TSF), corridor fencing and a new, ‘modern concept’ design for the community skills development and training facility located close to the mine.

The ore body is real and visible to the naked eye
Work to develop the Platreef mine has been a massive labour of love, to which Mouton and the Ivanplats team have been committed since discovery of the ore body was first confirmed eight years ago and the subsequent start of development in 2013. "In a market where deep-level shaft-sinking projects are few and far between, the intersection of the ‘Flatreef’, 782 m below surface, will be recorded as one of the most significant landmark achievements in this project’s history and perhaps also in the history of PGM mining in South Africa," Mouton says.

It is the first time that the “Flatreef”, 782 m below surface, will be formed a close working relationship with shaft-sinking contractor Aveng Mining and, as a single-focused...
When one travels 782 m down the access shaft, the T1 reef is clearly visible to the naked eye.

A well-developed chromitite stringer, marking the stratigraphic contact between the T1 and T2 mineralised zones, is expected to be intersected at a shaft depth of approximately 795 m. This will be followed by the T2 mineralised zone, which grades 4.14 g/t 3PE plus gold, 0.35% nickel and 0.18% copper over a vertical thickness of 11.26 m (at a 2 g/t 3PE plus gold grade cut-off).

The full expected 26 m intersection of reef in Shaft 1 will yield approximately 3 000 t of ore, estimated to contain more than 400 oz of PGMs.

The next steps

A horizontal station at Shaft 1, completed a few months ago and situated 750 m below surface, will provide initial, underground access to the ore body, enabling mine development to proceed during the construction of Shaft 2, which will become the mine’s main production shaft.

The mining zones in the current Platreef mine plan occur at depths ranging from approximately 700 metres to 1 200 m below surface.

Shaft 1’s 750 m station will also allow access for the first raise-bore shaft, which will have an internal diameter of six metres and provide ventilation to the underground workings during the mine’s ramp-up phase.

As shaft-sinking advances, two additional shaft stations will be developed at mine-working depths of 850 m and 950 m. Shaft 1 is expected to reach its projected, final depth of 980 m below surface, complete with the stations, in early 2020.

Excavation of the adjacent Shaft 2 box cut to a depth of approximately 29 m below surface is also progressing well. When the box cut is completed, the concrete hitch (foundation) will be built for the 103 m-tall concrete headgear that will house the shaft’s permanent hoisting facilities and support for the shaft collar will commence.

Shaft 2, to be located approximately 100 m north-east of Shaft 1, will have an internal diameter of 10 m, be lined with concrete and sunk to...
a planned, final depth of 1 104 m below surface. It will be equipped with two 40 t rock-hoisting skips with the capacity to hoist a total of 6 Mt of ore per year – the single largest hoisting capacity at any underground mine on the African continent.

Headgear for the permanent hoisting facility was designed by South Africa-based Murray & Roberts Cementation. Mouton explains that to ensure the project maintains its critical development path, the team has chosen to unbundle the complete Shaft 2 contract into smaller commitment portions.

“A major advantage Murray & Roberts Cementation brings to the Platreef reef intersect project is its overall ability, as a specialist shaft-sinking contractor, to view the entire headgear and the shaft design from a best practice constructability point-of-view,” says Murray & Roberts Cementation director of business development Allan Widlake.

Significantly, the company’s involvement in the project goes back to the feasibility stages when it carried out the full, detailed design of Shaft 2, which will be the mine’s main production shaft. This work was subsequently followed by Murray & Roberts Cementation designing the entire shaft barrel with the full integration of the two designs, i.e. between the headgear and the shaft. Murray & Roberts Cementation has mobilised on site and is in the process of constructing the hitch foundation for the headgear itself. This will be finished in the next few months.

Impressively, approximately 40% of Platreef’s shaft-sinking team is now comprised of employees from local Mokopane communities who had no previous underground mining experience. New employees receive intensive, on-site training for underground mining and complete a workplace-safety induction course on safe operating procedures.

**Palladium-rich**

As with any developing mine project, Ivanplats requires additional access to project finance. “We appointed five leading financial institutions who will make best efforts to arrange a total debt financing of up to US$1 billion for the development of Platreef’s first-phase, 4 Mtpa mine.

“Preliminary expressions of interest have been received for approximately US$900 million of the targeted US$1 billion financing. Negotiation of a term sheet is ongoing. Unlike most greenfield projects, we have a lot to show on the development front and this gives investors confidence that we can deliver on our commitments,” Mouton highlights.

“Our focus is to keep advancing the Platreef project along its critical path. We remain true to our commitment to build Platreef into the world’s next great PGM mine; a showcase for South Africa and the international investors that have financed the exploration and development work,” says Makhesha.

Ivanhoe Mines’ executive co-chairman Robert Friedland emphasises that Platreef also has massive quantities of palladium, nickel and copper, as well as rhodium and gold – a major advantage offsetting any potential concern about the effect of low platinum prices on securing project investment. The steady surge in the price of palladium in fact could see the metal become more valuable than gold for the first time in 16 years, and rhodium prices are near eight-year highs.

The platinum-to-palladium ratio at the Platreef mine is approximately 1:1 – again, making the mine an even more valuable asset within the PGM sector.

**Building digitally inclusive mining communities**

In what can only be described as one of the most innovative community sustainability initiatives ever undertaken in the South African mining sector, Ivanplats has invested in the delivery of a project that has provided Platreef’s surrounding communities with access to the internet, providing residents with opportunities to participate in the digitally-connected world and develop their own means to enhance and improve the qualities of their lives.

Driven by Ivanplats’ social and labour planning team and the Bonega Communities Trust, the project, headed by project manager Lisl Fair, has...
provided free WiFi access to all 20 communities surrounding the mine within the Mogalakwena municipality, with a combined population of about 150 000.

“The project, officially launched on Youth Day, 16 June 2017, was designed to encourage stakeholder engagement – using fair and transparent communication on an individual level. We wanted our community members to have a two-way access between themselves and the mine, establish ourselves as an accurate, reliable and responsive source of information about the mine and, from there, build on to creating sustainability and independent opportunities for our communities,” explains Fair.

“Ultimately, we wanted to establish a digital platform that would encourage skills development and education, open the digital doorway to look for work, aid education, supplement school work, apply for bursaries, etc,” Fair adds.

With the objectives clearly outlined and Makhesha’s “Year of the Youth” declaration in 2017, Ivanplats and service provider CanPro constructed a browser-based app called Maru a Mokopane, or The Clouds of Mokopane.

When close to one of 20 WiFi hotspots located throughout the communities, residents have access not only to the internet but also to the Maru a Mokopane app that facilitates the above-stated objectives and so much more.

“To ensure our communities understand the app and know how to navigate it, Ivanplats recruited young members within the community [41 in total], and trained them as individual small enterprises. Their responsibility as entrepreneurs is to deliver against their contracts to train their neighbours how to use the app and understand the benefits it offers,” Fair continues.

The platform includes job opportunities with the mine and within the broader Limpopo region, local news, advertisements for local businesses, information on health and safety, direct messaging with the mine, the ability to create and post professional CVs to access information about the local trust fund. Through an established community trust, the communities have 20% ownership of the mine. It was through this trust fund that community members collaborated with the mine to expand the WiFi reach from an initial eight communities to all 20.

“This shows true collaboration between the mine and the communities and proves mines can successfully operate in harmony with their communities,” Fair states.

With over 21 000 registered users, Fair adds that the majority of individuals are using the free access to upskill themselves and communicate with the mine, which, to date, has responded to over 10 000 messages. “Generally, we can see they are looking to improve their lives and they use the internet for this. Our communities are using the app for the purposes intended — we eurate this to phenomenal project success.” In addition to free access to educational, business and government websites, each user also gets 300 Mb of data per day free to use at their discretion.

“Ivanplats’ Maru a Mokopane project is the most recent manifestation of our solution that is designed to help companies bridge the digital divide with meaningful, user-friendly and accessible digital services delivered via customised community portals. As our network of clients expands, we are also in a better position to foster collaboration between communities and engage other companies that wish to add value in particular locations by investing in digital services for their stakeholders,” Liesel Kirsten, MD of CanPro concludes.

**STATE-OF-THE-ART UNDERGROUND MINE AT A QUICK GLANCE**

- **Estimated annual production rate:** 476 000 oz of platinum, palladium, rhodium and gold plus 21 million pounds of nickel and 13 million pounds of copper (based on definitive feasibility study estimation).
- **Three-phase development plan:**
  - An initial rate of 4 Mtpa to establish an operating platform to support future expansions; a doubling of production to 8 Mtpa; and expansion to a steady-state 12 Mtpa.
  - Given the size and potential of the Platreef mineral resource, Shaft 2 has been engineered with a crushing and hoisting capacity of 6 Mtpa. This allows for a relatively quick and capital-efficient first expansion of the Platreef project to 6 Mtpa by increasing underground development and commissioning of a third, 2 Mtpa processing module and associated surface infrastructure as required.
  - A further expansion to more than 8 Mtpa would entail converting Shaft 1 from a ventilation shaft into a hoisting/ventilation shaft. This would require additional ventilation exhaust raises, as well as a further increase of underground development, commissioning of a fourth, 2 Mtpa processing module and associated surface infrastructure.