

Stock Data

Share Price: 2.4p
Market Cap.: £3.9m
Shares in issue: 161m

Company Profile

Sector: Mining
Ticker: KAV.L
Exchange: LSE

Activities

Kavango Resources is an exploration company focused on base and precious metals in Botswana.

Share price performance



Source: LSE. Note that past performance is not a reliable indicator of future performance.

Turner Pope contact details

Turner Pope Investments (TPI) Ltd
8 Fredrick's Place
London
EC2R 8AB

Tel: 0203 657 0050
Email: info@turnerpope.com
Web: www.turnerpope.com

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Sheldon Modeland, P.Geo.
Research analyst
Tel: 0203 657 0050
sheldon.modeland@turnerpope.com

Andrew Thacker,
Corporate Broking & Sales
Tel: 0203 657 0050
andy.thacker@turnerpope.com

Zoe Alexander,
Corporate Broking & Sales
Tel: 0203 657 0050
zoe.alexander@turnerpope.com

Kavango Resources plc

Exploration along the highly prospective Kalahari Suture Zone

Kavango Resources (KAV.L) is an early stage exploration company focused on discovery of world-class copper, nickel, and platinum group mineral deposits in Botswana. The Company was formed by a team of geologists with a history of exploration success in Africa. Kavango's strategy is to repeat past success through new discoveries of world-class deposits.

Kavango's highly prospective Kalahari Suture Zone (KSZ) project in Botswana is a good place to start. The KSZ is a 450km long interpreted deep-seated structural feature (as outlined by magnetic and gravity surveys) with a similar geological setting to other massive sulphide-deposits which are known to host copper, nickel and platinum group elements (PGE). The Company has selected three drill targets for the KSZ project and is currently working on a 1000m drill programme. In addition, Kavango has targets within the highly prolific Kalahari Copper Belt in northern Botswana, which has seen a number of significant high-grade copper discoveries. We believe a successful drill programme demonstrating sulphide-mineralisation should support a higher share price.

Promising pipeline of projects in Botswana

Kavango is exploring for world class magmatic sulphide orebodies and currently holds 15 prospecting licences covering more than 10,000km² along the KSZ. Work to date on KSZ reveals some analogies with the largest nickel district, Noril'sk-Talnakh in Siberia. Kavango also has an interest in two strategically located licences within the Kalahari Copper Belt (KCB). Recent exploration success along the KCB has resulted in the development of two copper mines. Also part of the KSZ, the Ditau project has several ring structures identified from magnetic surveys. These ring structures are thought to be associated with carbonatite intrusives, which are the primary source for rare earth elements (REE).

Botswana: mining friendly jurisdiction

Botswana is the highest ranked African country according to the Fraser Institute 2018 survey for investment attractiveness. Its economy is based on mining, tourism and farming as well as being the largest diamond producer, by value, in the world.

Drill programme on the KSZ commenced

So far, Kavango has identified 77 conductors through two airborne electromagnetic surveys covering some 4,000km along the KSZ. Management has filtered these down to 15 priority drill targets following ground survey work. Of these, three drill targets have been selected as the most prospective and drilling has recently commenced. A 1,000m drill programme will focus on relatively shallow targets. One of the targets selected is hosted within a 10km x 6km magnetic anomaly, which is interpreted as a high level gabbroic intrusive. The other two targets correspond to significant linear magnetic and conductive structures. With a current undemanding market capitalisation, we believe the share price could rally on the back of a successful drill programme.

Investment Summary

Company description

Kavango is exploring for massive sulphide ore bodies within the highly prospective Kalahari Suture Zone (KSZ) in mining friendly Botswana. This large area, which is entirely covered by Cretaceous sediments, has not been previously explored using modern techniques. The Company has identified a number of targets that share similar characteristics in terms of geology and geophysical signatures with the giant Noril'sk-Talnakh nickel-copper-PGE deposit in Siberia, the largest known nickel accumulations in the world. Management believes the presence of copper and nickel sulphide mineralisation could be associated with high-level gabbroic sills that intruded into the Karoo sediments c. 180 million years ago. The current drill programme will test for possible sulphide mineralisation at a target depth of c. 400m.

Grassroots exploration

The primary licenses are in the KSZ and are targeting the discovery of a world class sulphide deposits in SW Botswana. The Company currently has 15 Prospecting Licences totalling over 10,000km², although some licences are likely to be relinquished in order to concentrate efforts in high priority areas while others that can be continued with reductions in size and changed to a mining licence as required. Approximately US\$3m has been spent on exploration to date. The licenses are based on an underexplored 450km long structural feature and work in 2018 included 2,000km airborne aeromagnetics identifying 26 potential conductors that need to be drill tested. Whilst Kavango's projects remain at early stage exploration, the geologic setting and geophysical anomalies warrant a major exploration programme.

Experienced team with a solid track record of success in Africa

Kavango's management team is well versed in the African mining space. The Group has an impressive track record in the project generation and have created value for shareholders through the vending of projects to major mining companies. Board and management are very experienced, with Michael Foster and Mike Moles bringing-in over 65-years aggregate industry experience including appointments at De Beers, Reunion Mining, Lonmin and Impala. They have been responsible for several mineral and coal project discoveries and trade sales. Exploration manager and Kavango co-founder Hillary Gumbo has been involved in a number of discoveries, including chrome at Anglo America's Inyala mine, Zimbabwe, the Maligreen gold deposit and many kimberlites in Zimbabwe.

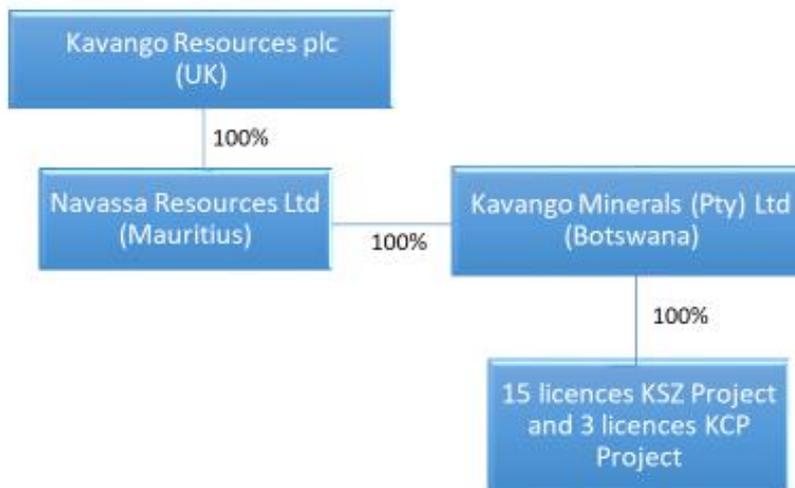
Risks and sensitivities

According to the Fraser Institute 2018 survey, Botswana ranks 32 out of 83 mining jurisdictions for investment attractiveness representing the highest rated of all African countries. As Kavango is an early stage exploration company there are no guarantees that a discovery will lead to a commercially viable deposit. As such, Kavango may require further funding in the future.

Overview: Company description and history

Kavango Resources plc was formed in March 2017 with the aim of acquiring and developing natural resource assets. On 7 December 2017, the Company acquired Navassa Resources Ltd which held 17 prospecting licences in Botswana. Currently, Kavango has three highly prospective projects within Botswana consisting of the Kalahari suture zone (KSZ), Kalahari copper belt (KCB) and the Ditau projects. Kavango Resources plc was admitted to the Standard List segment on the Main Market of the London Stock Exchange in August 2018.

Figure 1. Company structure

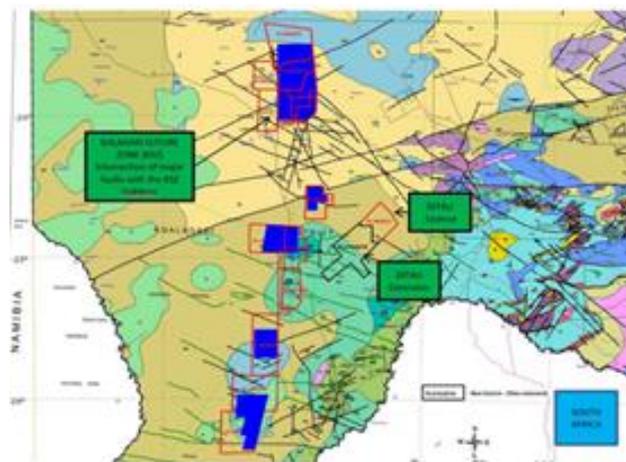


Source: Kavango Resources

Figure 2. Kavango's project locations



Figure 3. Kavango's prospecting licences



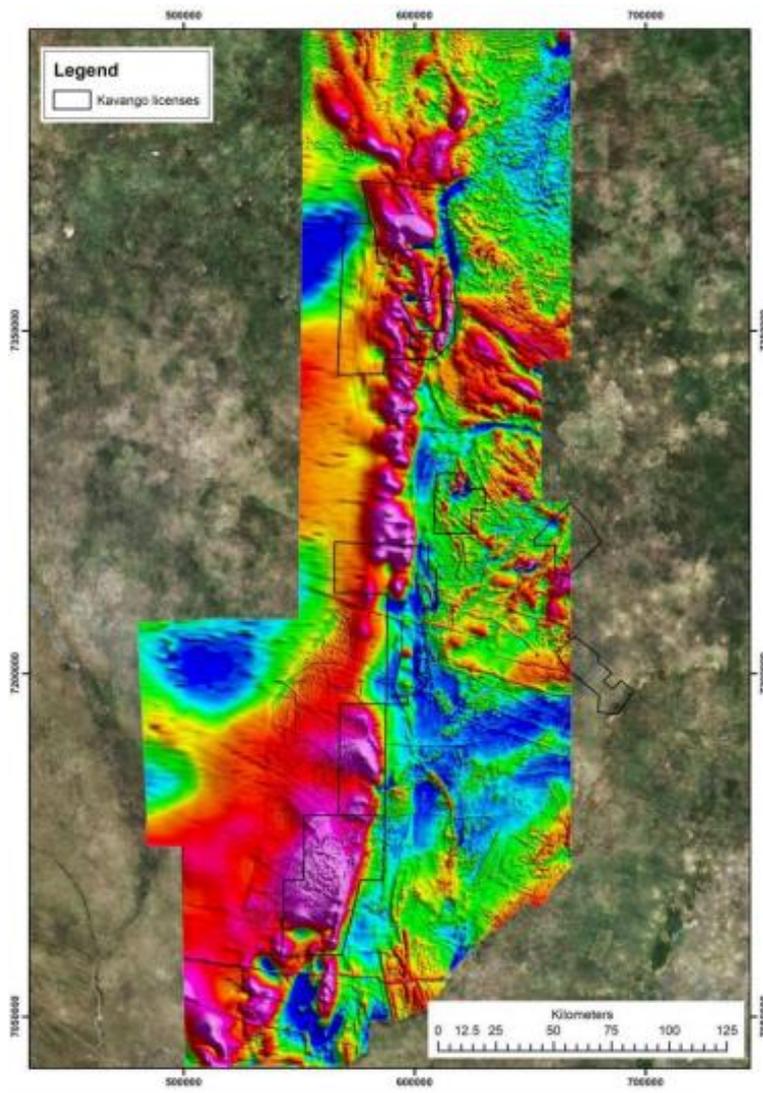
Source: Kavango Resources.

Projects

Kalahari suture zone

The Kalahari suture zone (KSZ) is a 450km long crustal-scale magnetic discontinuity first recognised during a regional aeromagnetic survey flown over Botswana and confirmed by a steep gravity gradient in the national Botswana gravity survey (1973). The magnetic anomalies were interpreted to be related to the Tshane Complex comprising large volumes of mafic magma which are believed to have been emplaced in the late to middle Proterozoic (1.1Ga) during a major rifting event. A much later (180Ma) magmatic episode thought to be related to the break-up of the Gondwana super-continent emplaced a sequence of gabbros and dolerites into the Karoo sediments. These gabbros have been interpreted as feeder zones to the vast basalt lava flows which once covered much of southern Africa. This type of geological setting with mafic rocks intruded into existing sediments is prospective for nickel-copper-PGE deposits and has similarities to the extensive Norilsk-Talnakh deposits in Russia.

Figure 4. Kalahari Suture Zone – major structural fault based on regional aeromagnetic survey



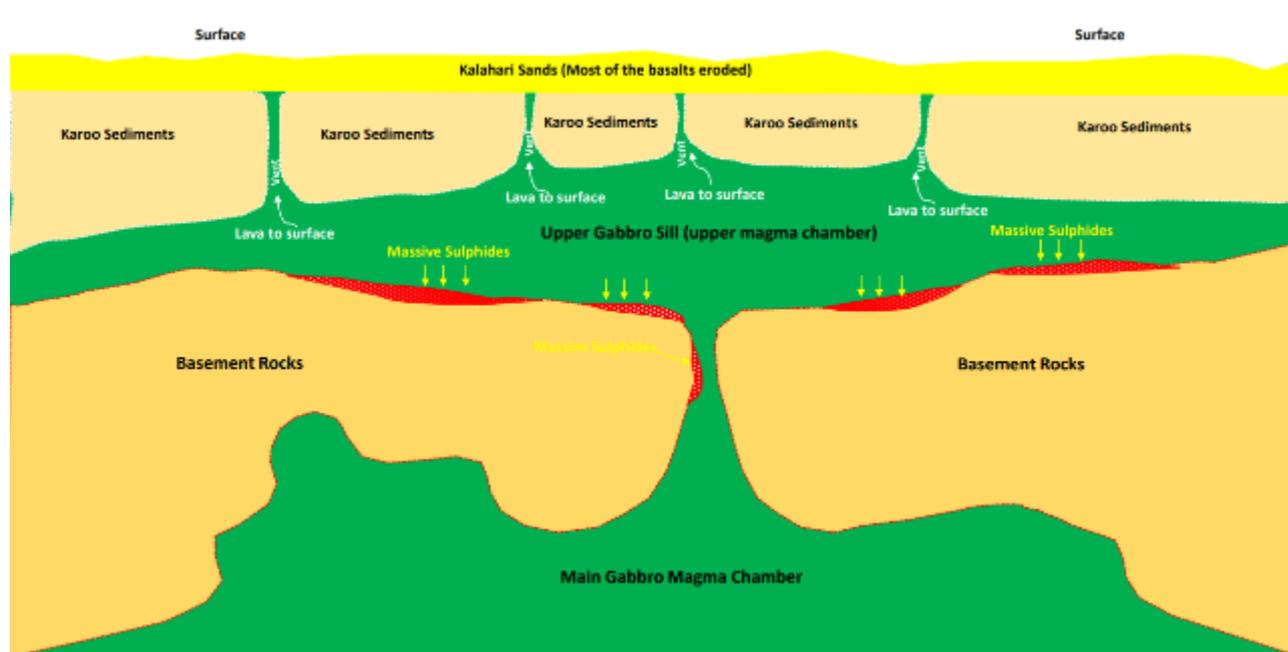
Source: Kavango Resources

The area was drilled in the early 1980s by the Botswana Geological Survey, and later in the 1990s, by the Canadian mining firm, Falconbridge, which at that time owned the Raglan Ni mine in Quebec, Canada. Numerous gabbros were intersected, but were often missed due to technical drilling issues. Drill holes that did intersect gabbros were interpreted to have been barren, non-mineralised gabbroic units.

Fancamp Resources Limited of Montreal, Canada, commenced exploration of the Kalahari Suture Zone in southwest Botswana in 1996, following the interpretation of airborne magnetic surveys covering 400 km of strike along the Kalahari Suture Zone. Initial focus was on mafic/ultramafic intrusions associated with the Tshane Complex as potential targets for Cu-Ni-PGM mineralization, but these targets were considered to be deep (> 700 m) to be of economic significance at the time. The exploration focus was redirected to several prospective large coincident magnetic/gravity anomalies. These were considered prospective targets for Olympic Dam-type Cu-Co mineralisation associated with alkaline intrusive complexes, and/or Ni-Cu-Co PGM mineralisation associated with basic intrusive complexes. There has been limited systematic exploration over the KSZ due to the Kalahari sand cover and the Karoo Supergroups. Advances in geochemical and geophysical techniques now enable prospecting under the Kalahari and Karoo cover.

More recently, Kavango re-logged and re-analysed core from the historic drilling. The core was also analysed with a handheld Niton™ XRF and tested for magnetic susceptibility. In addition, assay samples were taken from the re-logged gabbros. Whilst initial results from core samples and XRF were uneconomic, analysis suggest that copper, nickel and platinum group elements may have been leached from the magma and crystallised as discrete massive sulphide deposits either within or outside of the intrusive bodies. This interpretation has been put forth by Dr Martin Prendergast, a world expert in mineral deposits associated with mafic/ultramafic intrusives. Dr Prendergast concluded that it seemed likely that many of the metals appeared to have been removed from the crystallising magma probably by “free” sulphur in the system introduced by the assimilation of significant amounts of sulphur rich sedimentary rock (coal measures) into the magma. Dr Prendergast’s report suggests that free sulphur may have combined with metal elements (Fe, Cu, Ni, PGEs) to form an immiscible liquid during magma crystallisation and that this dense liquid could have been concentrated (by gravity or mechanical pressure) into discrete locations either within or adjacent to the main gabbroic body.

Figure 5. Conceptual model massive sulphide mineralisation along the KSZ



Source: Kavango Resources

There are a number of important processes required for the formation of magmatic Ni-Cu-PGE deposits as characterised by world-class deposits such as Noril'sk-Talnakh (Siberia), Pechanga (Russia), Voisey's Bay (Canada) and Kabanga (Tanzania). While these massive deposits have different styles of mineralisation the overall genetic model is broadly similar and well understood and outlined below:

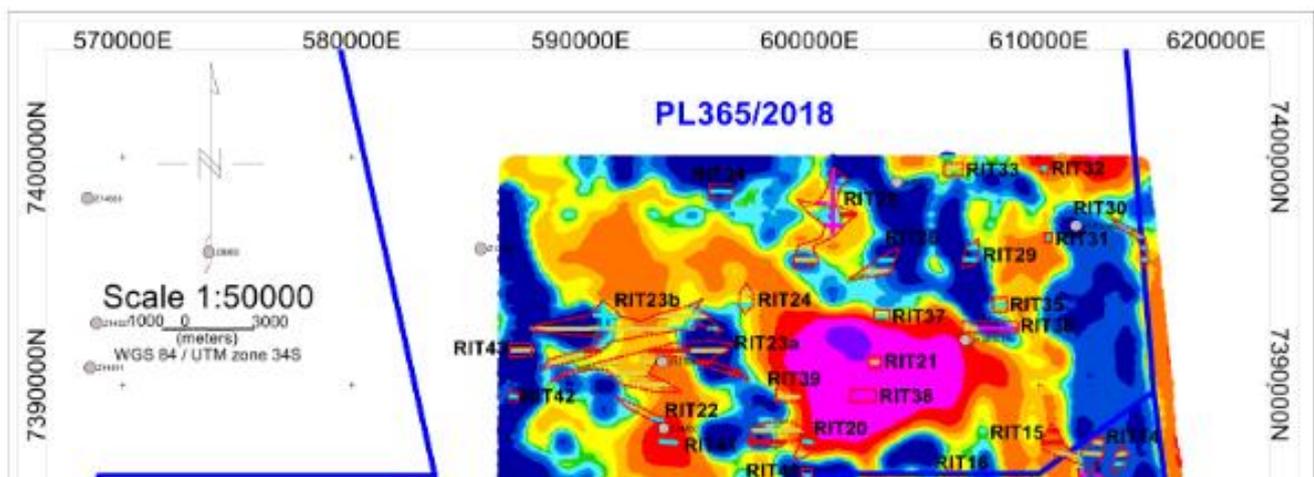
- Sufficient concentration of ore metals in the magma
- Sulphur saturation of the magma
- Concentration of the sulphides to form economic deposit

Magmatic Ni-Cu sulphide deposits like Noril'sk-Talnakh form as a result of segregation and concentration of liquid sulphide from mafic or ultramafic magmas and the partitioning of chalcophile elements (i.e. Cu, Ni, Pb, In, Au and PGE) into the immiscible sulphide melt from the silicate melt.

Exploration along the KSZ

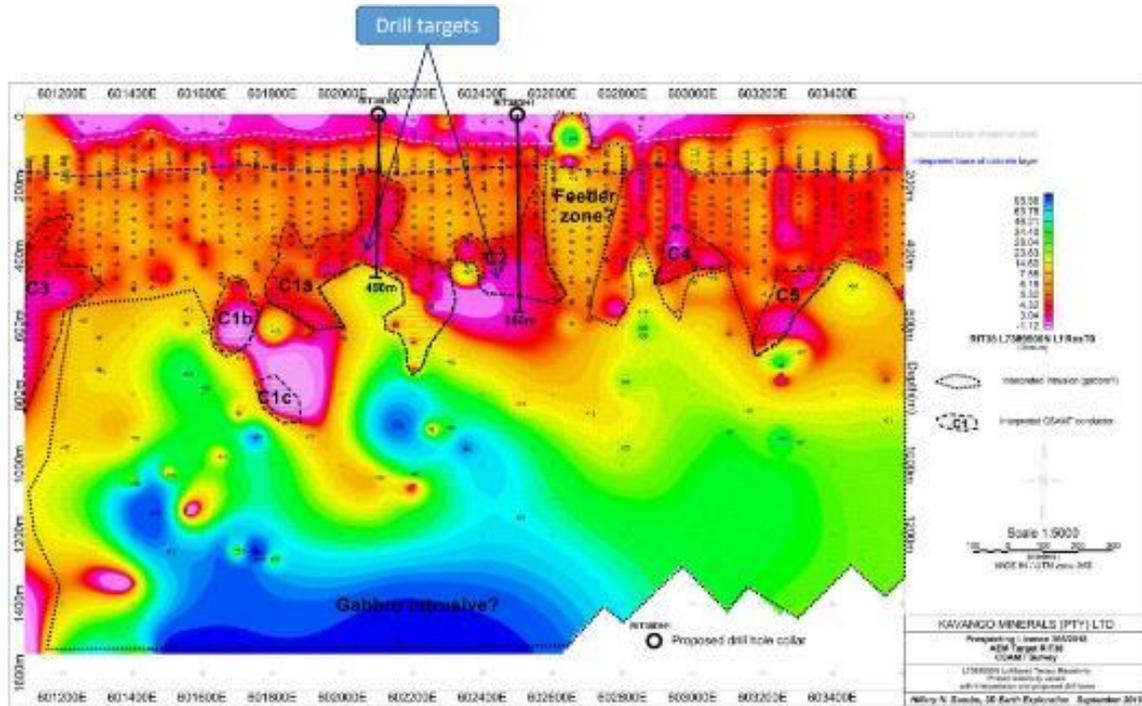
Kavango holds 15 prospecting licences covering over 10,000km² along the KSZ and has conducted an airborne electromagnetic (EM) survey over the northern part of the structure, representing about a third of the company's holdings. Airborne EM surveys are the most suitable technique to detect buried massive and semi-massive sulphide bodies and can detect anomalies to depths in excess of 1km. However, due to the highly conductive nature of the surficial Kalahari sands, clays and calcretes, average depth penetration of the Phase 1 survey was only 167m. Not enough to identify the deeper conductors. By December 2018, a new 12.5hz (deep penetrating) system developed by SkyTEM had become available and the company was contracted to fly the Phase 2 survey (2,200 line/kms). Depth penetration was improved dramatically, achieving an average of 398m. As a result, fifty-one conductive targets were identified, many of them covering multiple flight lines (500m apart). Conductors were prioritised and followed up with CSAMT resistivity surveys.

Figure 6. Conductor anomalies identified in plan view sliced at 420m level



Source: Kavango Resources

Figure 7. Cross section of drilling targets



Source: Kavango Resources

Figure 8. Drill rig on site



Source: Kavango Resources

Fig. 11 Key features and complexes in Botswana

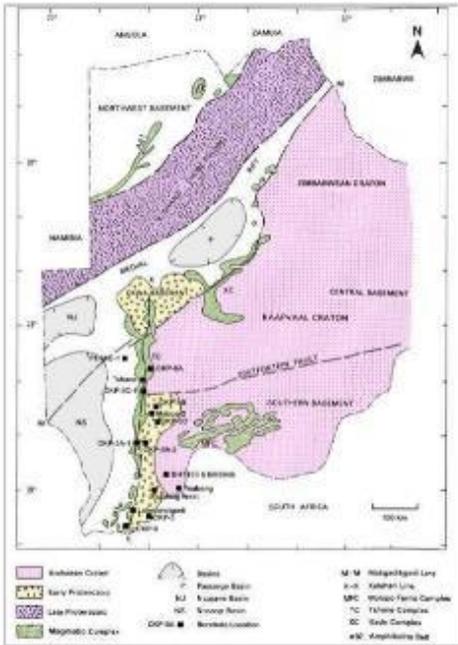
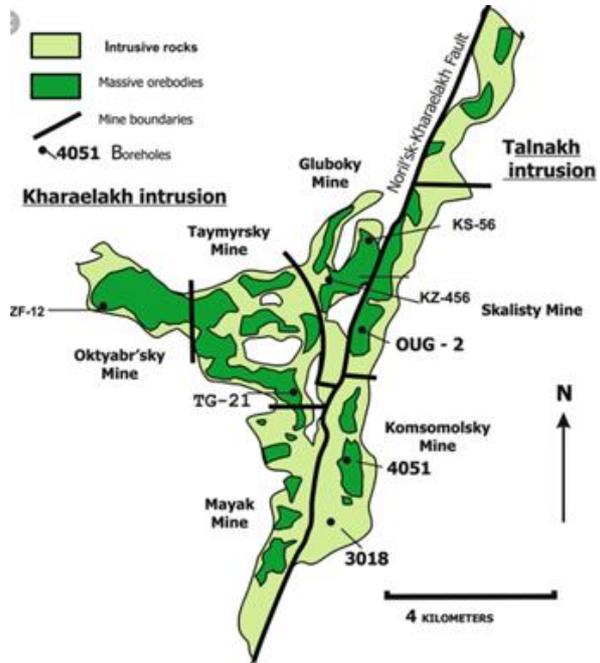


Fig. 12 Plan map of the Norsil'sk intrusives



Source: Kavango Resources modified after Meixner and Peart, 1984.

Geological setting is also similar with high-level gabbro sills intruding sulphur-bearing sediments.

Fig. 13 Conceptual model for Ni-Cu-PGE deposits

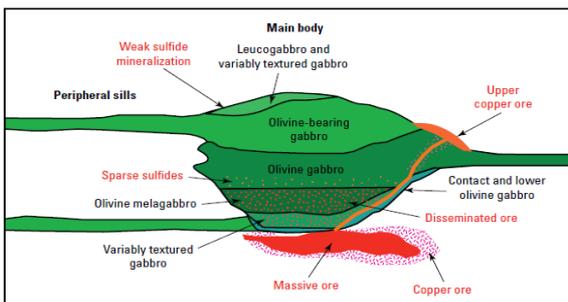


Fig. 14 Conceptual model for KSZ sulphide deposits



Source: Model for Ni Cu PGE deposits, USGS Report 2010. Kavango Resources.

Other projects

Kalahari copper belt

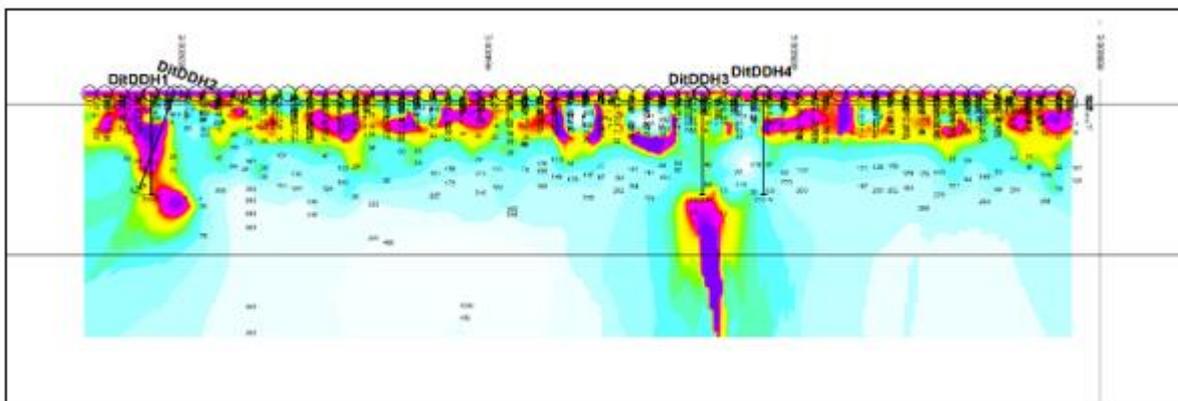
On 2 September 2019, Kavango announced the signing of a Memorandum of Understanding (“MOU”) with the Botswana company, LVR GeoExplorers (Pty) Ltd (“LVR”), to farm into two Prospecting Licences in the Botswana section of the highly prospective sedimentary copper province known as the Kalahari Copper Belt (“KCB”). The MOU provides for a staged Farm-In, which will give Kavango the right to earn up to a 90% interest in both or either of the licences. During the first 12 months following the signing of the Farm-In Agreement, Kavango will be obliged to spend £92k on each licence to earn a 25% interest. A 90% interest in either licence can be earned by taking the project through a definitive feasibility stage. Kavango will be operators of the project and can withdraw at any time following a two month notice period.

Ditau

The Ditau project comprises two prospecting licences (PL169/2012 and PL010/2019) totalling an area of 1,386km². Prospecting licence PL169/2012 was originally applied for as having potential to host Banded Ironstone Formation (BIF) iron ore deposits. Whilst no BIFs were discovered, a number of magnetic ring features within the licence area were noted from magnetic surveys. A regional soil geochemistry survey was conducted over many of the features and one of them returned Fe and Zn anomalies that coincided with the magnetic anomaly outlining the ring structure. This was followed up by a more detailed soil geochemical and geophysical surveys.

During the course of 2017 and 2018 more detailed soil geochemistry suggested that Zn and Fe anomalies were aligned along interpreted faults and fractures from magnetic anomalies. This was followed by a resistivity survey (CSAMT) over a number of lines that cut across the anomaly. The CSAMT profiles identified two very pronounced conductors (1.8km apart) down to at least 400m in depth. It was suggested that these conductors could represent massive sulphide deposits and should be drilled tested.

Figure 15. Cross section of drilling targets.



Source: Kavango Resources

In February 2019, approximately 1,000m of drilling was completed with c 700m of diamond core drilling. Only holes DitDDH1 and DitDDH3 were drilled due to the deeper than expected conductor source.

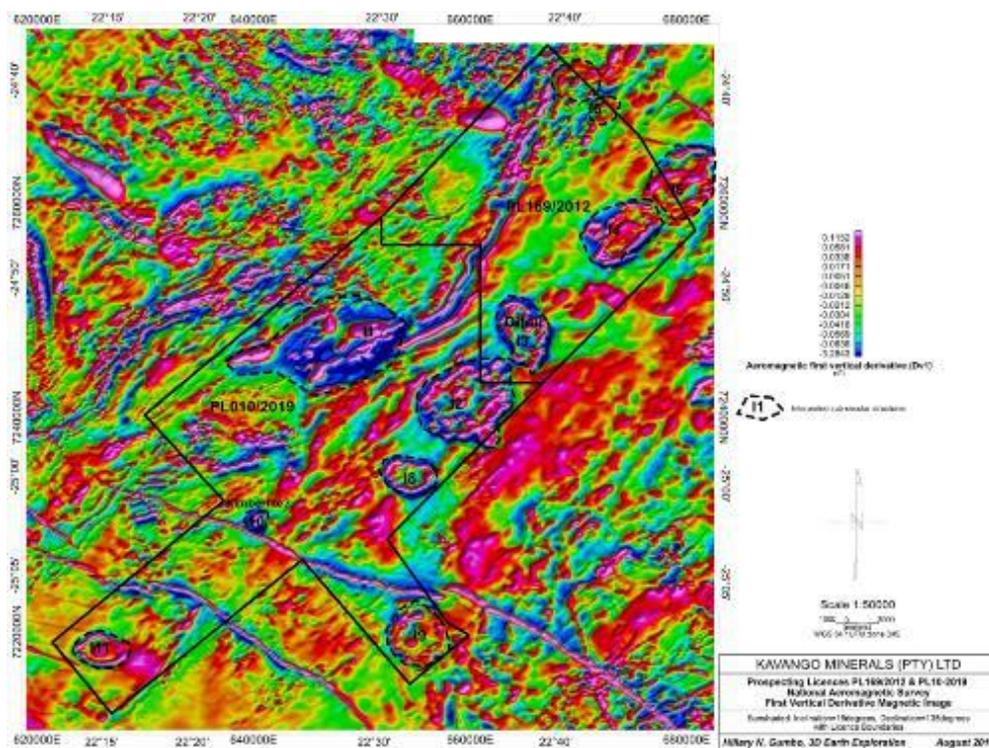
Unfortunately, no massive sulphides were intersected and the cause of the conductors remains unknown. Hole No. DitDDH1 intersected 75m of Kalahari sands and calcrete and thereafter remained in Karoo sediments until the hole was abandoned at 340.5m. In DitDDH3 (subsequently re-named DitDDH2) the Karoo sediments extended to 479m before

intersecting altered gabbro. However, in some areas the Karoo sediments appeared to show fairly intense alteration together with pyrite and small amounts of chalco-pyrite (CuFeS₂).

The presence of elevated REEs in some sections of the Ditau core, together with elevated uranium, iron, potassium and calcium suggests that hydrothermal fluids related to alkali magmatism (including carbonatite) may have penetrated the Karoo sediments (fenite).

Within the Ditau licences, at least 10 “ring structures” have been identified from interpretation of the regional magnetics by Kavango. These structures are frequently associated with alkali intrusives and carbonatites.

Figure 16. 1st Vertical Derivative map showing location Kavango’s licences and a number of ring structures.



Source: Kavango Resources

The presence of carbonatite within the Ditau licences is supported by the discovery of three carbonatites by Falconbridge in 1973 about 50km north of Ditau while exploring for kimberlites. Apparently, Falconbridge intersected the carbonatites close to surface and one of them was reported to contain niobium. Kavango’s current strategy is to use gravity and ground magnetic surveys to identify potential carbonatite targets associated with the ring structures. These targets will then be tested with fence lines of shallow percussion holes to confirm the presence of carbonatite and carry out initial geochemical analysis for potential economic mineralisation.

Whilst Kavango is optimistic that economic mineralisation might be found at Ditau, the company does not currently have the resources to undertake the necessary exploration. It is therefore undertaking preliminary discussions with a number of industry partners with a view farming out the project (both licences).

Conclusion

Kavango's KSZ, KCB and Ditau projects offer a diverse pipeline of potential discoveries of Cu-Ni-PGE, copper and rare-earth elements. Whilst currently all three projects are early stage exploration plays, the geological setting, geochemistry and geophysical characteristics are intriguing and warrant a major exploration programme. As such, we look forward to results from the current drill programme on the KSZ and we believe there is potential for a significant Ni-Cu-PGE discovery.

Management

Mike Moles – Non-executive Director & Founder

Mike has over 30 years' in mineral exploration in southern Africa including tenures with Delta Gold, Reunion Mining and Lonmin. He has an impressive track record in selling valuable exploration assets including PGEs to Impala Platinum and coal in Mozambique to Riversdale Mining, (subsequently sold to Rio Tinto for \$4bn). Mike holds a BSc in Geology from the University of Aston and a BSoc Sci in African Studies from Birmingham University.

Douglas Wright – Non-executive Chairman

Douglas has over 35 years' finance experience, mainly in the City of London. He has held a variety of senior positions including Director at the at the Stockbrokers Tilney's, and former partner of corporate finance Firm City and Westminster. Douglas has a strong track record of raising funds in the city, especially in the natural resources sector. Douglas holds a business studies qualification from NESCOL College.

Michael Foster – Managing Director

Michael has over 35 years' experience of all aspects of the mining industry, including exploration, mine development, operations and finance in a variety of commodities. His experience includes 8 years with De Beers, including time spent in Botswana. He was the former Exploration Director of Reunion Mining & ZincOx, and founding director of Casa Mining (DRC) Copperbelt Minerals (DRC), & Kaminex (DRC). Michael has a successful track record of both discovery and creating value from exploration projects. Michael is a geologist (St Andrews University in Scotland) and also holds an MBA in Business Administration from the London Business School.

Chuck Forrest – Chief Financial Officer

Chuck is an experienced accountant, with over 30 years' experience covering the minerals, financial and legal sectors in Asia and Africa, based in Toronto and for the last 12yrs in London. He is a Chartered Professional Accountant in Canada. Chuck was FD of Copperbelt Minerals which raised \$70m privately in DRC and sold for \$197m. Chuck has been responsible for IPO's on AIM and the TSX markets.

Hillary Gumbo – Executive Director (Kavango Minerals Limited)

Hillary has over 30 years' experience in southern African exploration. This includes periods with Reunion Mining, Cannister Resources and Rockover. Hillary is the owner of a successful geophysical consulting company in Botswana which has undertaken projects in the DRC, Angola, Botswana and Zimbabwe.

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