

# “NORTHERN CAPE: COMMODITY DAY 2024” – 1<sup>ST</sup> & 2<sup>ND</sup> November 2024

## Programme and Information

**Date: 1<sup>st</sup> November 2024 (Day 1): Sishen Golf Club/Kalahari Country Club, Kathu, NC.**

- Continuous Professional Development Points (6).
- Dinner included in registration cost.
- Five speakers (Talk Summary and Speaker Biography within flyer).

Time Slot	Speaker	Title of Talk
<b>16:15 – 16:50</b>	<b>REGISTRATION</b>	
16:50 – 17:00	<b>Loni Gallant</b> (NC Branch Chairperson)	NC Branch Introduction, welcome and acknowledgements.
17:00 – 17:20	<b>Graham Duncan</b>	Exploring for Battery Metals in 2024.
17:20 – 17:40	<b>Louw Van Schalkwyk</b>	The Geology of the Okiep Copper Mines.
17:40 – 18:00	<b>Prof. Bertus Smith</b>	The pre-Gamagara unconformity: Ore deposit creation through geological destruction.
<b>18:00 – 18:30</b>	<b>BREAK</b>	
18:30 – 18:50	<b>Richard Hornsey</b>	Ni-Cu-PGE Sulphide Exploration – Strategic, Mineral Systems, Economic Considerations, and Toolkit Development.
18:50 – 19:10	<b>Errol Smart</b>	Critical Minerals: What? Where? Why? How?
<b>19:10 – 20:00</b>	<b>DINNER</b>	
<b>20:00 to Late</b>	<b>DRINKS</b>	

**Date: 2<sup>nd</sup> November 2024 (Day 2): Field Trip/Mine Site visit, Kathu, NC.**

- Continuous Professional Development Points (4).
- Breakfast will be for attendee's own account.
- Core viewing and Field trip to Outcrops/Pits and Mine Site visit.

Time Slot	Field Guide	Description
08:30 – 13:00	Johan Pretorius (Afrimat) Eveline Kekana (Assmang Khumani)	Guided field trip looking at Assmang core and outcrops/pits in the area and Afrimat Jenkins Fe Mine site visit. Please bring own PPE – Hard hat, steeltoe cap safety boots and reflector vests.

Venues: Friday, 1<sup>st</sup> November – Sishen Golf Club, Kathu / Saturday, 2<sup>nd</sup> November – Field Trip, Kathu, NC.  
 Registration costs: Attendees: R1400 - Day 1 (Event) R800 - Day 2 (Field Trip)  
 Students: R800 - Day 1 (Event) R600 - Day 2 (Field Trip)

Registration Link:

<https://www.cognitofrms.com/GeologicalSocietyOfSouthAfrica/NorthernCapeCommodityDayEventExcursion12November2024>

Accommodation:

At Cost of attendees – research Kathu - <https://www.lekkeslaap.co.za/accommodation-in/kathu>

For further enquiries and any other general enquiries use the following email:

[admin.nc@gssa.org.za](mailto:admin.nc@gssa.org.za)

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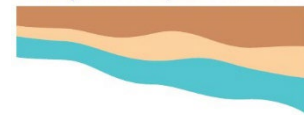


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## Northern Cape Commodity Day: Excursion Details – 2<sup>nd</sup> November 2024

Time Slot	Area & Geology
08:30 – 13:00	Guided field trip looking at Assmang core and outcrops/pits in the area and Afrimat Jenkins Fe Mine site visit. Further information within flyer and to be provided.

### Guides:

Johan Pretorius (Afrimat), Eveline Kekana (Assmang Khumani)

### Transportation:

Own Transportation: SUV/Bakkies recommended, but not compulsory. A mine bus will be used to transport delegates from venue to Afrimat Jenkins mine.

### PPE:

Steeltoe cap safety shoes, hard hat and reflective vest.

### ACCESS:

Identity number/documentation will be requested from each delegate for access.  
 Timing to be strictly adhered to for the mine site visit for induction.



## SPEAKERS: SUMMARY OF TALKS

### Errol Smart

*Managing Director and Chief Executive Officer*  
 Orion Minerals Ltd



### Louw Van Schalkwyk

*Executive Exploration*  
 Orion Minerals Ltd



### Prof. Bertus Smith

*Professor*  
 University of Johannesburg



### Graham Duncan

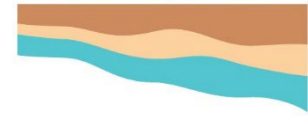
*HOD: Mineral Resource Modelling & GIS*  
 Minrom



### Richard Hornsey

*Consulting Geologist*  
 Richard Hornsey Consulting (Pty) Ltd





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**ERROL SMART**

**“CRITICAL MINERALS: WHAT? WHERE? WHY? HOW?”**

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**LOUW VAN SCHALKWYK**

**“THE GEOLOGY OF THE OKIEP COPPER MINES”**

The Okiep Copper District (OCD) lies within the western Namaqua Mobile Belt (NMB). It is the oldest formal mining district in South Africa and produced two million tonnes of copper from hundred and five million tonnes of ore mined from thirty-two mines since 1852.

The copper mineralisation is of the orogenic type and hosted by a polyphase anorthosite complex called the Koperberg Suite, of which there are some 1700 outcrops, constituting 0.7% of the outcrop area. The Koperberg Suite was emplaced under high temperature, low pressure conditions in an extensional back-arc basin. Four phases of deformation (D1 to D4) are recognized. The mafic rocks intruded late during the D3 event at 1.2 to 1.0 Ga. There is both a strong structural and stratigraphic control on the emplacement of the mafic rocks and the mineralisation.

The Okiep Copper Company started mining in 1937, embarking on an aggressive exploration policy. Between 1949 and 1984, exploration successfully added resources to replace mined ore. Detailed field mapping, magnetic surveys, gravity surveys and diamond drilling were relied on for finding new deposits while underground drilling was the main tool for increasing ore in existing mines. Electrical methods only became available and were used during later stages of exploration. The exploration division of the Okiep Copper Company meticulously recorded and filed data. These records are now available to be reinterpreted utilizing GIS systems. This allows for sound geological reasoning that with modern high powered geophysical techniques offers potential for new discoveries.

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**RICHARD HORNSEY**

**“NI-CU-PGE SULPHIDE EXPLORATION – STRATEGIC, MINERAL SYSTEMS, ECONOMIC CONSIDERATIONS AND TOOLKIT DEVELOPMENT.”**

What a difference a year makes! Last year, when this event was planned to take place, the Ni-Cu-PGE sulphide sector, following years in the doldrums, had dramatically resurged over the previous two years. Subsequently, the Global commodities sector is in a severe slump, the Ni sector in particular influenced by Indonesian laterite production. The recent movement to separate “clean vs dirty” Ni is unlikely to revive the lower grade end of the sulphide sector.

Therefore, massive Ni sulphide is the only viable exploration target. An ongoing challenge is a severe lack of detailed industry expertise and understanding of the sector. This presentation draws upon >30 years of experience in Ni and PGE-focussed exploration and project development to provide guidelines to developing an exploration strategy. The economic fundamentals underpinning the sector are examined, together with analysis of the various styles and settings of the larger global deposits. An experiential, fact-based minerals systems approach is used to investigate and characterise the fundamental aspects of orebody genesis. This includes understanding intrusion setting, style, location, crustal depth, contamination and sulphur saturation, geochemistry, physical processes that take place during emplacement, and the impact of progressive, multi-phase magma flux within an evolving system. This is distilled into a holistic model that characterises ubiquitous versus unique processes, enabling development of exploration strategy. The use of litho-geochemistry for targeting and terrane characterisation is outlined in greater detail, together with its use for discriminating the best targets within an intrusion cluster. Several conclusions pertaining to the Ni-sulphide sector and exploration strategy are provided.

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**Prof. Bertus Smith**

**“THE PRE-GAMAGARA UNCONFORMITY: ORE DEPOSIT CREATION THROUGH GEOLOGICAL DESTRUCTION.”**

The pre-Gamagara unconformity is a major Paleoproterozoic erosional unconformity intersecting multiple units of the underlying Transvaal Supergroup in the Griqualand West region, and has completely removed up to 400 million years of geological record. However, it is also likely the most important exploration vector for ore deposits in the region. This talk will present the geological characteristics of this horizon, including its paleoenvironmental and ore-forming implications while touching upon the controversies surrounding it.

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**Graham Duncan**

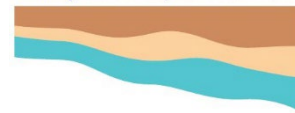
**“EXPLORING FOR BATTERY METALS IN 2024.”**

The growing demand for battery metals, driven by the global transition to renewable energy, has intensified exploration efforts for critical minerals such as copper, cobalt, lithium, graphite, and manganese. This presentation will provide an overview of the geological characteristics and exploration strategies associated with these key battery metals. Particular emphasis will be placed on the practical application of rudimentary geostatistics and simple machine learning in enhancing exploration, even during initial phases.

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## SPEAKERS: BIOGRAPHY

### Errol Smart

**Errol Smart, Managing Director and Chief Executive Officer of Orion Minerals Ltd:** Errol is a geologist, registered for JORC purposes, and has 30 years of industry experience across all aspects of exploration, mine development and operations with experience in precious and base metals. He has held positions in Anglogold, Cluff Mining, Metallon Gold, Clarity Minerals, LionGold Corporation and African Stellar Group. Errol's senior executive roles have been on several boards of companies listed on both the TSX and ASX and he currently serves as Chairman of the Junior Mining Leadership Forum of the Minerals Council South Africa and is a Director on the Board of the Minerals Council South Africa.

### Louw Van Schalkwyk

Louw holds a BSc Geology Honours degree from the University of Stellenbosch. He started his career as a geologist with Gold Fields of South Africa, followed by a number of years working in sub-Saharan Africa countries before joining Anglo America as exploration consultant and project manager for Anglo American. He served as technical director on the boards of two junior exploration companies before joining Vedanta Zinc International. Louw specialises in structural and exploration geology and was part of the team that discovered the 60 Mt Gamsberg East Zinc Deposit in 2005, which is one of the highlights of his career. Other notable achievements include the discovery and drill out of the 250,000oz Byumba Gold deposit in Rwanda in 2008.

### Richard Hornsey

Richard Hornsey is a leading nickel sulphide and PGM economic geology specialist whose early career involved working at Lonhro's Western Platinum Mine; developing the Nkomati MSB and open pit Ni-sulphide mines, and leading the Two Rivers Platinum mine geological feasibility and development. He subsequently joined Lonmin (Exploration Manager: Southern Hemisphere PGM exploration), exploring in South Africa, Gabon, Tanzania, and Kenya. In 2007, recruited by African Nickel (Chief Operating Officer), he led exploration in Angola, Botswana, Namibia, Mozambique, Mauritania, South Africa, and Tanzania. In 2013 he joined MMG (Global Nickel Project Generation Leader) consulting to the North America, Australia, and African regions, while leading entry into Tanzania, Brazil, and the Australian Fraser Range. Since late 2017, as an independent consultant, he has provided consulting services to various major, junior, and private companies. He is a founding partner in two new Ni-sulphide companies. He graduated with a BSc Hons Geology in 1990 and completed a research MSc (cum laude) during 2000 on the genetics of the Nkomati massive sulphide orebody. He has provided Ni-PGE-sulphide workshops to the Grahamstown and Witwatersrand University Exploration MSc courses, delivered original conference papers, and co-authored research papers on various Ni-PGE projects.

### Prof. Bertus Smith

Bertus Smith is an Associate Professor at the Department of Geology at the University of Johannesburg, where he has been employed since 2008. His main research interests are iron and manganese in chemical sedimentary environments from both an economic and a paleoenvironmental point of view. Secondary research interests include applied mineralogy and early Earth paleoenvironments.

### Graham Duncan

Graham has over 10 years' experience in mineral exploration and exploration projects throughout Africa and the Middle East. He holds a BSc and Honours Degree in Geology from the University of Johannesburg, a Citation in Geostatistics from the University of Alberta, and a Post-Graduate Diploma in Business Management from the University of Stellenbosch. Graham is a seasoned resource geologist with a strong exploration background, specializes in crafting intricate 3D geological models and mineral resource estimates. With personal experience exploring for battery metals at multiple stages of the exploration lifecycle, Graham is in continual pursuit of improved ways to identify, define and qualify mineral resources.

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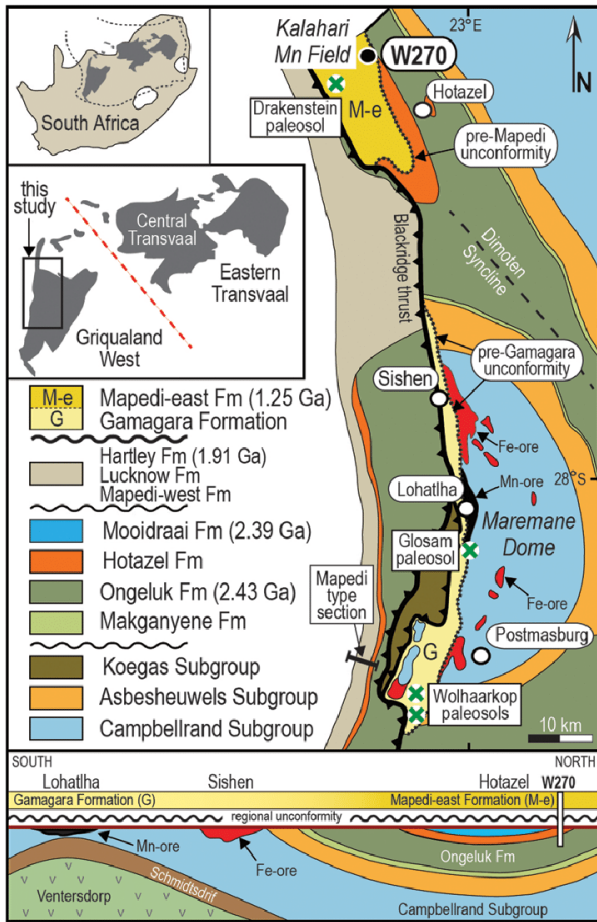


Figure 1: Regional geology of the Griqualand west basin, Rasmussen et al. (2019).

The **Afrimat Jenkins mine** is situated within a sequence of early Proterozoic sediments of the Transvaal Supergroup. The mine is located on the Maremane Anticline in the Griqualand West Basin of the Transvaal Supergroup, with the Elim Group quartzites of the Keis Supergroup overlying the Transvaal sediments.

In general, two ore types are present in the area: laminated hematite ore, forming part of the Manganore Iron Formation, and conglomerate ore, belonging to the Doornfontein Conglomerate Member at the base of the Gamagara Formation with the later occurring predominately on the Jenkins property.

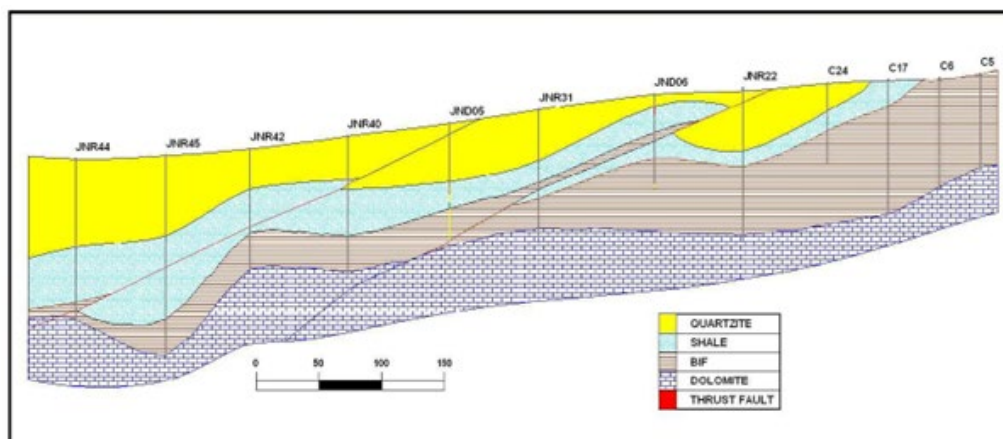
The laminated ore types occurring more towards the north at the Khumani Bruce and King mines occur stratigraphically in the upper portion of the Manganore Iron Formation as enriched high-grade supergene hematite bodies. The boundaries of high-grade hematite orebodies cross-cut primary sedimentary bedding, indicating that secondary hematitization of the iron formation took place. In all of these, some of the stratigraphic and sedimentological features of the original iron formation are preserved. These ores are visible at the N14 outcrop between Sishen in the North and Khumani in the south.

The conglomeratic ore found in the Doornfontein Conglomerate Member of the Gamagara Formation is lenticular but not consistently developed along strike. It consists of stacked, upward fining conglomerate-gritstone-shale sedimentary cycles and is the main ore type at Jenkins.

The lowest conglomerates and gritstones tend to be rich in subrounded to rounded hematite ore pebbles and granules and form the largest part of the resource. The amount of iron ore pebbles decreases upwards in the sequence so that upper conglomerates normally consist of poorly sorted, angular to rounded chert and banded iron formation pebbles. Hematite is the predominant ore mineral, but limonite and specularite also occur.

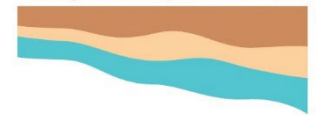
Jenkins is characterized by larger prominent stratiform north-south striking orebodies dipping to the west. The down-dip portions are well preserved and developed, but in the outcrop, the deposits are thin and isolated. Numerous deeper iron ore extensions occur into the basins due to karst development.

Figure 2: Cross section of the Jenkins orebody (Afrimat Website).



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## NORTHERN CAPE: COMMODITY DAY

### Event & Excursion

**Date:** 1st & 2nd November 2024

**Venue:** Sishen Golf Club, Kathu, Northern Cape

**Louw Van Schalkwyk**  
 Executive Exploration  
 Orion Minerals Ltd

**Errol Smart**  
 Managing Director and Chief Executive Officer  
 Orion Minerals Ltd

**Richard Hornsey**  
 Consulting Geologist  
 Richard Hornsey Consulting (Pty) Ltd

**Prof. Bertus Smith**  
 Professor  
 University of Johannesburg

**Graham Duncan**  
 HOD: Mineral Resource Modelling & GIS  
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Event Programme to follow

CPD POINTS

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# "NORTHERN CAPE: COMMODITY DAY"

\*(Cu, Zn, Fe, Mn, Ni, Li)\*

## EVENT & EXCURSION 2024

**VENUE:** SISHEN GOLF CLUB,  
KATHU, NC.

**DATE:** 1 & 2 NOVEMBER 2024

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\*Page 2 for Event Speakers

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