



**AFRIMAT**<sup>®</sup>  
LIMITED

**CONSISTENTLY  
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# **BULK COMMODITIES DIVISION**

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**RESOURCE REGISTER**  
FEBRUARY 2022

Sphynx Consulting CC  
2007/091758/23  
PO Box 19904, Noordbrug, 2522

by PJ van der Merwe (Pr. Sci. Nat)

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## 1. EXECUTIVE SUMMARY

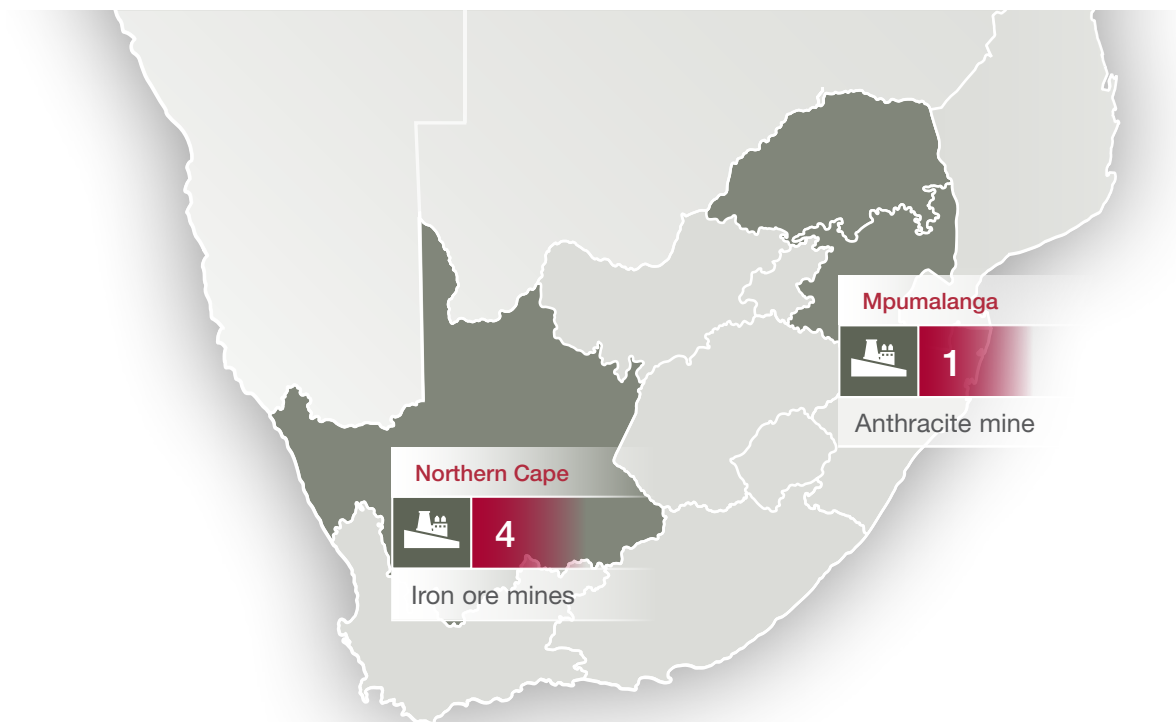
### 1.1 Introduction

Afrimat Limited ('Afrimat') is a leading black empowered Group with its main business and core competence in open pit mining. It is listed on the 'Construction and Materials' sector of the JSE Main Board since 2006.

The Group supplies a broad range of products ranging from Construction Materials (aggregates, bricks, blocks, pavers and readymix concrete), Industrial Minerals (lime and lime products) and Bulk Commodities (iron ore, anthracite and manganese).

Afrimat's Bulk Commodities Division was established in 2016 with the acquisition of an iron ore mine in the Northern Cape. The division was subsequently expanded to include high-quality Anthracite in Mpumalanga.

**Figure 1. Locality map of the Afrimat Bulk Commodities Division mineral assets**



The report is issued annually to inform shareholders and potential investors of the mineral assets held by Afrimat. The report is a summary of competent persons' reports or technical reports on Mineral Resources and Mineral Reserves for Afrimat's mining operations and projects.

This report is available on the website [www.afrimat.co.za](http://www.afrimat.co.za). An abridged version is included in the Afrimat integrated annual report for 2022.

### 1.2 Property description and ownership

The properties covered by this report are situated in the Northern Cape and Mpumalanga Provinces of South Africa as illustrated by the map above. The Anthracite property comprises the Nkomati Anthracite mine. The Iron Ore properties comprise the Demaneng Iron Ore Mine, Jenkins Iron Ore Mine and the Driehoekspan and Doornpan Iron Ore projects.

### 1.3 Mineral resource estimates

A summary of the South African code for the reporting of exploration results, mineral resources and mineral reserves ('SAMREC') and the Joint Ore Reserves Committee ('JORC') compliant resources were defined for the properties and comprise 30.4 Mt Anthracite and 49.01 Mt Iron Ore. Further detail is presented in the tables below:

**Table 1. SAMREC Classified Combined Anthracite Resources – January 2022**

Nkomati Anthracite	MTIS Mt	Yield %	CV MJ/kg	Ash %	Vol %	Fixed Carbon %	Sulph %	Phos %
Total								
Measured+indicated	30,4	70,2	26,6	17,8	6,5	72,5	0,33	0,02
Total inferred	20,8	69,8	26,3	18,0	6,1	72,1	0,34	0,26

**Table 2: SAMREC Classified Combined Iron Ore Resources**

Category	Mt	Fe %	K <sub>2</sub> O %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %	P <sub>2</sub> O <sub>5</sub> %	S %	Mn %
Measured	41,54	61,25	0,348	4,43	2,651	0,071	0,099	1,561
Indicated	7,47	60,13	0,338	4,67	3,654	0,098	0,020	1,727
Total	49,01	61,08	0,346	4,47	2,804	0,075	0,087	1,586
Inferred	4,57	60,48	0,366	4,10	2,960	0,074	0,020	2,166

### 1.4 Conclusions and recommendations.

Afrimat's Bulk Commodities Division comprises a diverse collection of Ferrous metals and Anthracite. It is recommended that the reserves and depletion histories of operating mines be included in future versions of this report.

## 2. INTRODUCTION

### 2.1 Issuer

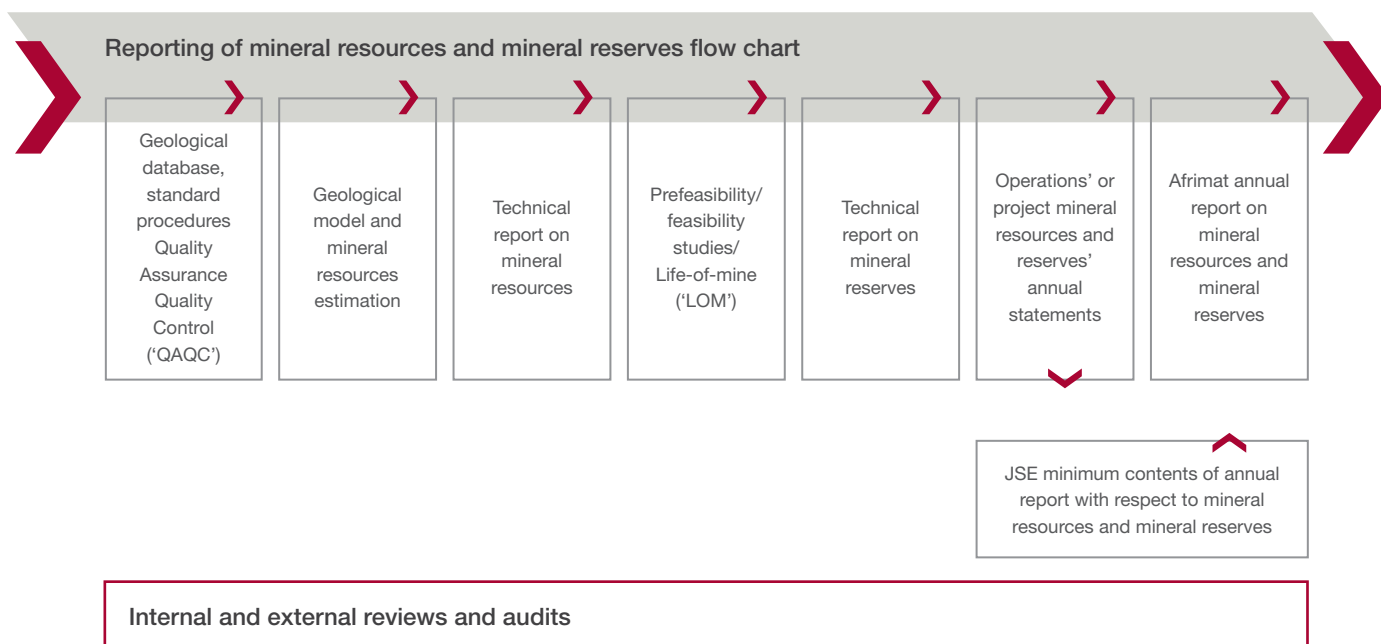
This report has been compiled on behalf of Afrimat in accordance with the scope of work determined for Sphynx Consulting CC ('Sphynx'). The observations and comments presented in the report represent Sphynx's opinion as of February 2022 and are based on the review of the data provided to Sphynx. Sphynx is independent to Afrimat mentioned above.

### 2.2 Terms of reference

Afrimat's method of reporting Mineral Resources and Mineral Reserves complies with the SAMREC Code of 2016, the South African Code for reporting of Mineral Asset Valuation ('SAMVAL Code, 2016') and section 12.13 of the JSE Listings Requirements.

The SAMREC Code of 2016 sets out minimum standards, recommendations and guidelines for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves in South Africa. It was launched and adopted by the Johannesburg Stock Exchange (JSE) in May 2016. The 2020 Afrimat Mineral Resources and Mineral Reserves Report is based on the SAMREC Code of 2016.

The reporting of Mineral Resources and Mineral Reserves is done annually according to the following flow chart:



The convention adopted in this report is that the Measured and Indicated Mineral Resources estimates are reported inclusive of that portion converted to Mineral Reserves. Inferred Mineral Resources have not been included in feasibility studies or LOM plans.

Underground Mineral Resources are *in situ* tonnages at the postulated mining width, after deductions for geological losses that have reasonable prospects for eventual economic extraction ('RPEEE').

Open pit Mineral Resources are quoted as *in situ* tonnages that have RPEEE.

The classification into Measured, Indicated and Inferred Mineral Resources is done by consideration of geostatistical parameters, spacing of boreholes, geological structures and continuity of the mineralisation.

External consulting firms audit the Mineral Resources of the Afrimat operations when substantial geological borehole data has been added to the previously established database or every three years whichever comes first.

The Mineral Resources are reported on a 100% basis. Maps, plans and reports supporting Mineral Resources are available for inspection at Afrimat's registered office and at the relevant mines.

Afrimat's Prospecting and Mining Rights details are provided in this report for each project and operation (refer to the relevant sections of the operations and projects). Rounding of figures may result in minor computational discrepancies on the Mineral Resources and Mineral Reserves tabulations.

### 2.3 Resource Definitions

The following Resource definitions have been extracted from the SAMREC Code of 2016.

A **'Mineral Resource'** is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

An **'Inferred Mineral Resource'** is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

An **'Indicated Mineral Resource'** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation.

A **'Measured Mineral Resource'** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proved Mineral Reserve or to a Probable Mineral Reserve.

## 2.4 Coal Resource Definitions

The following Coal Resource definitions have been extracted from the SAMREC Code of 2016.

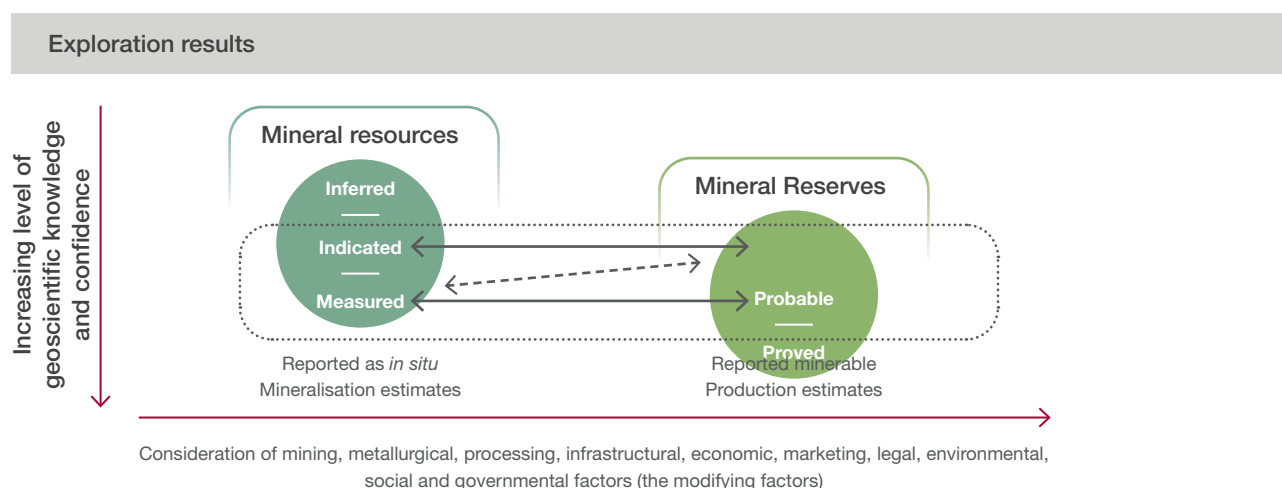
An **'Inferred Coal Resource'** is that part of a Coal Resource for which quantity and coal quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Coal Resource has a lower level of confidence than that applying to an Indicated Coal Resource and must not be converted to a Coal Reserve. It is reasonably expected that the majority of Inferred Coal Resources could be upgraded to Indicated Coal Resources with continued exploration. An Inferred Coal Resource is defined by the coal in the full seam above the minimum thickness cut-off and relevant coal quality cut-offs, as defined by the Competent Person ('CP'), which meets the criteria for reasonable and realistic prospects of eventual economic extraction. The South African guide to the systematic evaluation of coal exploration results, coal resources and coal reserves (SANS10320:2020), recommends that an industry guideline minimum of one (1) cored drill hole with coal quality data per 100ha (approximately 1km spacing) be used to define Inferred Coal Resources in multiple seam deposit types.

An **'Indicated Coal Resource'** is that part of a Coal Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Coal Resource has a lower level of confidence than that applying to a Measured Coal Resource and may only be converted to a Probable Coal Reserve. An Indicated Coal Resource is defined by the coal in the full seam above the minimum thickness cut-off and relevant coal quality cut-offs, as defined by the CP, which meets the criteria for reasonable and realistic prospects of eventual economic extraction. SANS10320:2020 recommends that an industry guideline minimum of four (4) cored drill holes with coal quality data per 100ha (approximately 500m spacing) be used to define Indicated Coal Resources in multiple seam deposit types.

A **'Measured Coal Resource'** is that part of a Coal Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Coal Resource has a higher level of confidence than that applying to either an Indicated Coal Resource or an Inferred Coal Resource. It may be converted to a Proved Coal Reserve or to a Probable Mineral Reserve. A Measured Coal Resource is defined by coal in the full seam above the minimum thickness cut-off and relevant coal quality cut-offs, as defined by the CP, which meets the criteria for reasonable and realistic prospects of eventual economic extraction. SANS10320:2020 recommends that an industry guideline minimum of eight (8) cored drill holes with coal quality data per 100ha (approximately 350m spacing) be used to define Measured Coal Resources in multiple seam deposit types.

The classification of Coal Resources into Inferred, Indicated and Measured categories is therefore a function of increasing geological confidence in the estimate based on the density of points of observation, the physical continuity of the coal seams, the distribution and the reliability of the coal sampling data, the coal quality continuity, the reliability of the geological model, and the evaluation method. Factors that contribute to the uncertainty in Coal Resource estimation include the key constraints used to construct the geological model, seam thickness variations and coal quality distribution within the geological model.

## 2.5 Relationship between Exploration Results, Mineral Resources and Mineral Reserves



### 3. RELIANCE ON OTHER EXPERTS

This report was compiled from information obtained from various Competent Persons reports.

#### 3.1 Anthracite Resources

Information for the Anthracite Resource was obtained from a report titled 'Nkomati Anthracite Mine Coal Resources and Coal Reserves ('CRR') as at 30 June 2020'.

This CRR statement was compiled under the supervision of Mrs Catherine Telfer, as Lead CP. Mrs Telfer is a qualified Geologist, a long-term member in good standing with the AusIMM, a Fellow of the Geological Society of South Africa ('GSSA') and registered with the South African Council for Natural Scientific Professionals as a Professional ('SACNSP') Natural Scientist (Reg. No. 400049/02).

Mrs Telfer's qualifications include BSc Hons (Geology), (DMS) Dip Bus Man. She has 28 years' experience in exploration, geology, mining and the estimation of Mineral Resources, including coal. Mrs Telfer has co-authored over 50 Competent Persons Reports ('CPR'), Mineral Experts Reports and NI43-101 Technical Reports for both local and international stock exchanges. Mrs Telfer is currently a director of mining industry consulting firm Tenement Mining (Pty) Limited (Tenement) of Ground and 1st Floor, Gateway West, Waterfall City, Allandale Road, Midrand, Johannesburg, 2066, South Africa.

The current Nkomati Anthracite Resource estimate, dated 30 June 2020, has been prepared and signed off by Mrs Karin van Deventer as CP. Mrs van Deventer is a qualified geologist, a Fellow of the GSSA, a member of the Fossil Fuel Foundation ('FFF') and is registered with the SACNSP as a Professional Natural Scientist (Reg. No.400705/15).

Her highest qualification is an M.Sc. (Geochemistry) degree from the University of Stellenbosch. Mrs van Deventer has over 23 years' experience in exploration, geology, mining and the estimation of Mineral Resources, specifically anthracite. Mrs van Deventer is currently a director of Sugar Bush Consultancy (Pty) Limited (Sugar Bush) of 76 Eeufees Street, Clubville, Middelburg, 1050, South Africa.

#### 3.2 Iron Ore Resources

Information for the Iron Ore Resources was obtained from a report titled "Technical report on the Iron ore prospecting work program conducted on the farms Jenkins, Driehoekspan and Doornpan in the Northern Cape Province of South Africa by AI Pretorius. 31 May 2013".

Geological modelling, QAQC and open pit design work was undertaken by AI Pretorius of Sphynx. Geostatistical analyses and Resource estimation was done by Paul van der Merwe, an independent geostatistical consultant.

Abraham Izak (Awie) Pretorius, MSc (Geology) graduated from the Rand Afrikaans University (RAU) in 1983. He is the owner of Sphynx Consulting CC ('Sphynx'), P.O. Box 19904, Noordbrug, South Africa, 2522.

Awie Pretorius is a registered Professional Natural Scientist with the SACNSP (SACNASP-400060/91).

He had worked as a Geologist/Geoscientist for a total of 39 years since his graduation. His professional experience includes geological and resource modelling of mineral properties in South Africa (Manganese, Iron Ore & Chrome), Namibia (Gold), Tanzania (Gold), Zimbabwe (Gold), Botswana (Copper), Zambia (Copper), and the Democratic Republic of Congo (Copper).

Awie Pretorius is an independent geological consultant and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking, to qualify as a CP.

Information for the Demaneng Iron Ore Resources was provided by J.J. Pretorius. Johannes Jacobus Pretorius (Johan), MSc (Geology), graduated from Free State University in 1986. He has been appointed as Head Geology and Grade Control at Demaneng Iron Ore Mine on 3 April 2017 to present and Head Geology and Grade Control at Jenkins Iron Ore Mine and Driehoekspan and Doornpan projects from October 2021 to the present.

Johan Pretorius is a registered Professional Natural Scientist with the SACNASP (SACNASP-400100/00).

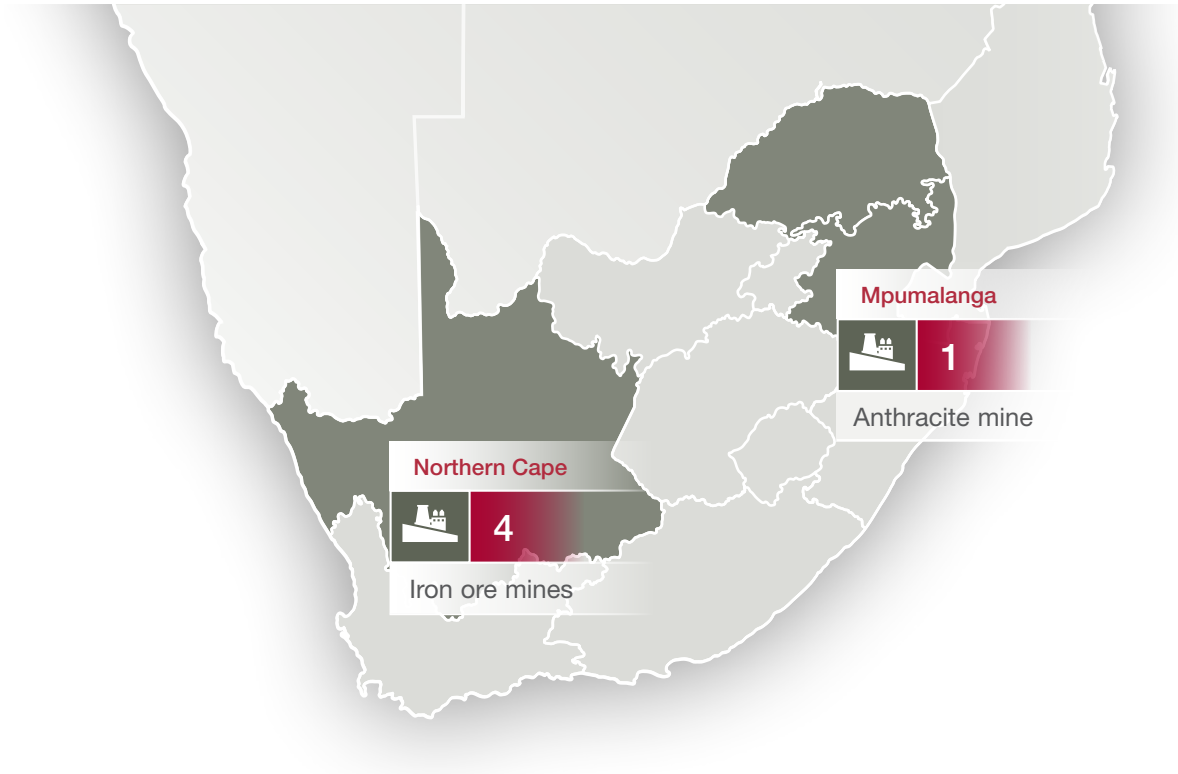
Previously, he was employed by Kumba at Thabazimbi (November 1986 to March 1987) as Geologist in Training, ISCOR Base Metal Exploration as Exploration Geologist (1989 to 1990), Rosh Pinah (1990 to 1995) as Production Geologist and Sishen Mine (1995 to 2016) as Senior Resource Geologist and Chief Resource Geologist.

## 4. PROPERTY DESCRIPTION AND LOCATION

### 4.1 Locality

The properties covered by this report are situated in the Northern Cape and Mpumalanga Provinces of South Africa as illustrated by the map below. The Anthracite property comprises the Nkomati Anthracite mine. The Iron Ore properties comprise the Demaneng Iron Ore Mine, Jenkins Iron Ore Mine and the Driehoekspan and Doornpan Iron Ore projects.

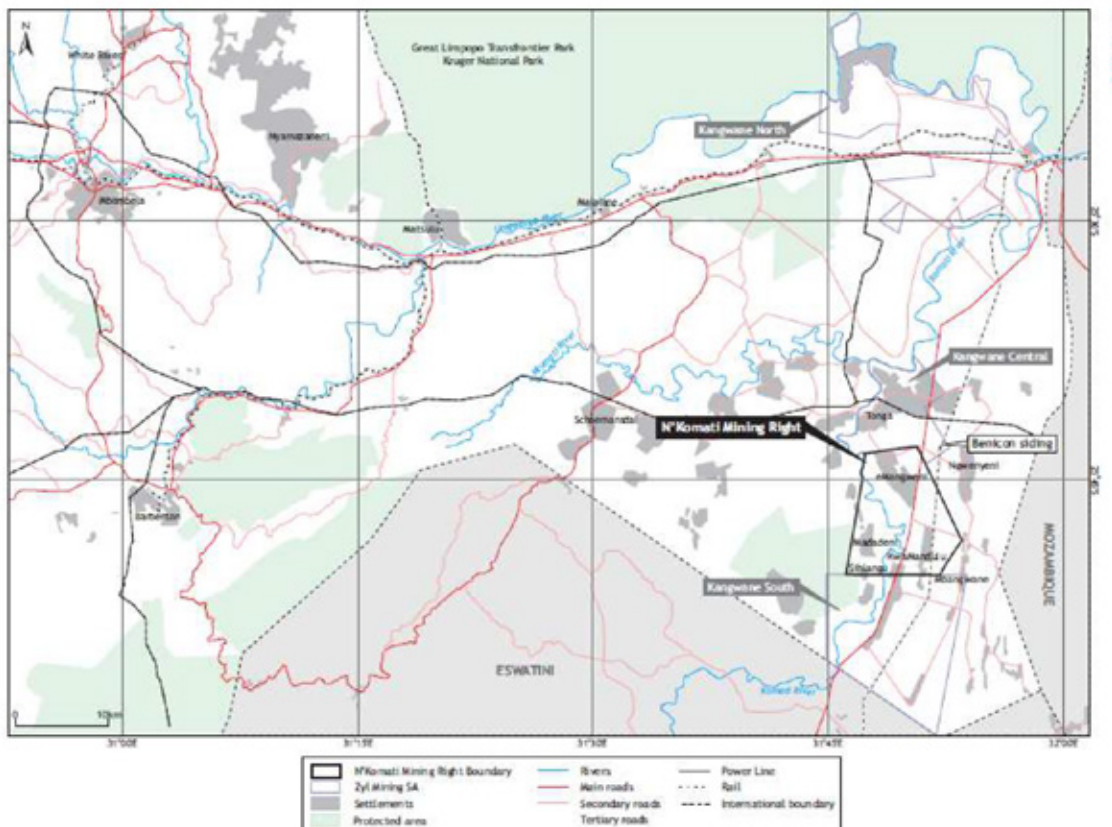
**Figure 2. Regional locality map of the Anthracite and Iron Ore Properties**



#### 4.1.1 Nkomati Anthracite Mine

Nkomati is an anthracite mine located in eastern Mpumalanga Province, South Africa, close to the borders of Mozambique and Swaziland. Nkomati currently operates only the Madadeni opencast sections under a Mining Right covering approximately 11,812 hectares (ha).

**Figure 3. Locality map of the Nkomati Anthracite Mine**





4.1.2 Demaneng Iron Ore Mine

The Demaneng Iron Ore mine is situated approximately 15km south of the mining town of Kathu in the Northern Cape Province as illustrated by the figure below.

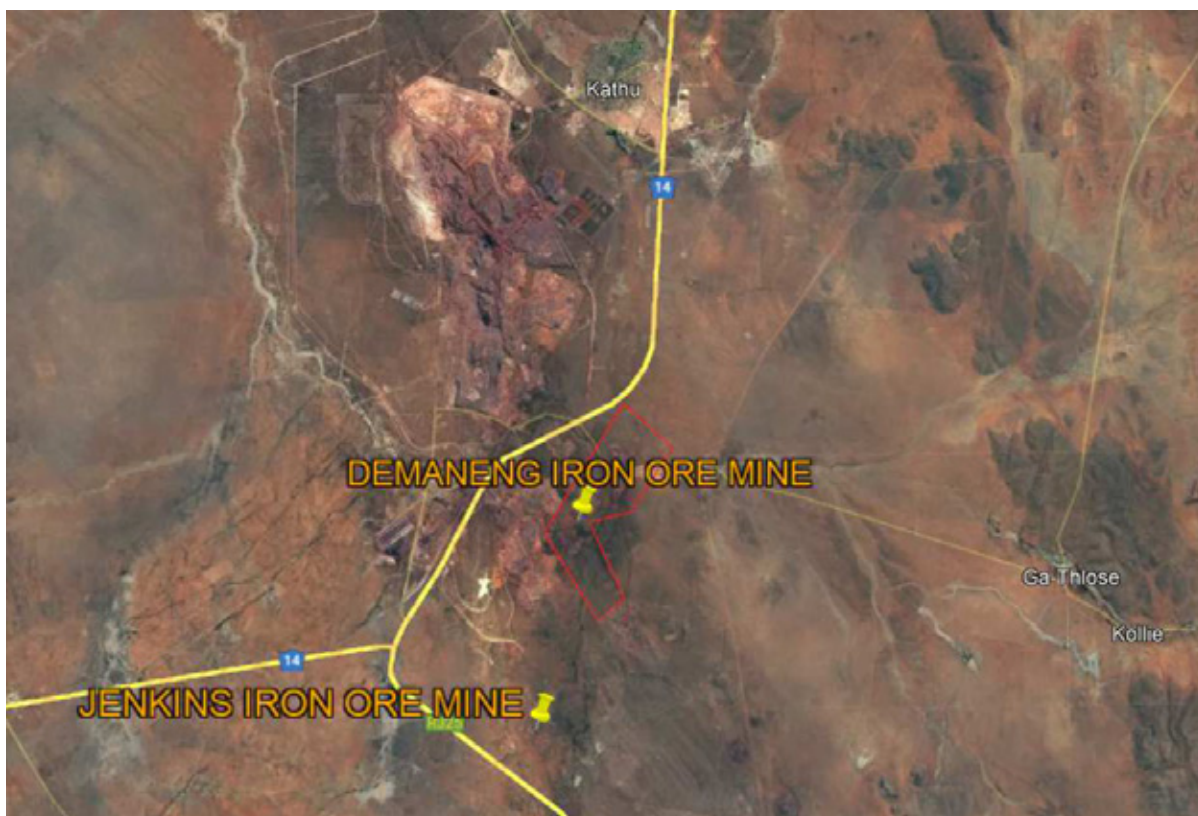
Figure 4. Locality map of the Demaneng Iron Ore Mine



4.1.3 Jenkins Iron Ore Mine

The Jenkins Iron Ore Mine is situated approximately 8km due South of the Demaneng Iron Ore Mine and about 23km South of the mining town of Kathu.

Figure 5. Locality map of the Jenkins Iron Ore Mine



#### 4.1.4 Driehoekspan Iron Ore Project

The Driehoekspan Iron Ore project is situated approximately 19km north of the Postmasburg town and about 25km south of the Jenkins Iron Ore Mine.

Figure 6. Locality map of the Driehoekspan Iron Ore Project



#### 4.1.5 Doornpan Iron Ore Project

The Doornpan Iron Ore project is situated approximately 13km north of the Postmasburg town and about 6km south of the Driehoekspan Iron Ore Project.

Figure 7. Locality map of the Doornpan Iron Ore Project



## 4.2 Mineral Tenure

### 4.2.1 Nkomati

Security of tenure for the Nkomati properties is held in the form of Mining Right MP30/5/12/2/89/MR issued on 22 January 2022. The mining right is valid until 21 January 2052.

### 4.2.2 Demaneng

Security of tenure for the Demaneng property is held in the form of Mining Right NC 270 MR issued on 28 May 2011. The mining right is valid until 27 May 2028.

#### 4.2.3 Jenkins

Security of tenure for the Jenkins property is held in the form of Mining Right NC 10094 MR issued on 24 March 2021. The mining right is valid until 23 March 2051.

#### 4.2.4 Driehoekspan

Security of tenure for the Driehoekspan property is held in the form of Mining Right NC 10082 MR issued on 15 October 2020. The mining right is valid until 14 October 2050.

#### 4.2.5 Doornpan

Security of tenure for the Doornpan property is held in the form of Mining Right NC 10034 MR issued on 4 December 2017. The mining right is valid until 3 December 2023.

## 5. HISTORY

### 5.1 Anthracite Properties

Nkomati has operated intermittently for over 30 years from 1985. It was acquired by Benicon Coal (Pty) Ltd ('Benicon') in 1993 and operated as an opencast mine until 2006. In 2007 Scharrihuisen Opencast Mining (Pty) Limited (Scharrihuisen) (later renamed Sentula Mining Limited (Sentula)) acquired a 100% share in Benicon. The underground mine at Mangweni was opened in 2009. In June 2011 Nkomati was placed on care and maintenance pending the submission of its outstanding Environmental Management Plan ('EMP').

Opencast production recommenced at Madadeni in February 2015.

Although anthracite was extracted from the underground between January and April 2018, underground production commenced in earnest from August 2018.

Nkomati is currently mining the Madadeni opencast section at an average rate of 21,733 tonnes per month (tpm) (October 2017 to June 2020). Prior to its suspension during October 2019 the Mangweni underground section produced at an average rate of 4,752tpm (August 2018 to October 2019).

### 5.2 Iron Ore Properties

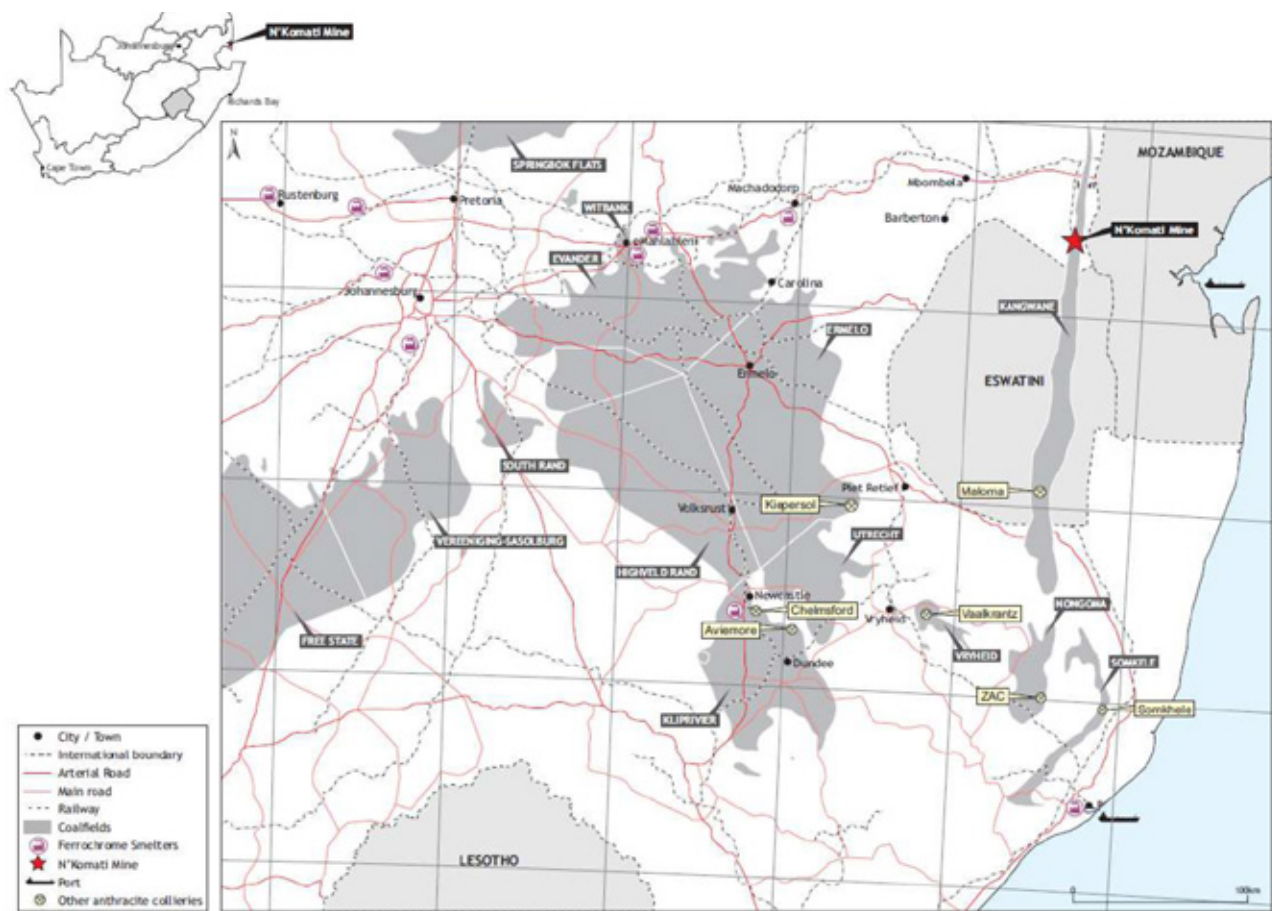
A first phase exploration on the Jenkins, Doornpan and Driehoekspan properties was conducted in 2009 and 2010. Coza Mining (Pty) Ltd conducted a follow-up exploration programme on the properties from 2012 to 2013.

## 6. GEOLOGICAL SETTING AND MINERALISATION

### 6.1 Regional Geology Anthracite

The majority of the Nkomati Mining Right is located within a narrow sliver of the north/south trending rocks belonging to the Karoo Supergroup which are situated between the granites and greenstones associated with the Barberton Greenstone Belt to the west and the Lebombo syncline to the east. Nkomati is located in the Ka'Ngwane Coalfield as illustrated in the figure below.

Figure 8. Location of Nkomati relative to the South African Coalfields



The Ka'Ngwane coalfield extends along the eastern border of South Africa, north of Swaziland and west of the Kruger National Park, for approximately 70km by 40km and is subdivided into northern, central and southern sections. Although named the Ka'Ngwane Coalfield north of Swaziland, the coalfield continues southwards through Swaziland and is believed to be an extension of the Somkhele Coalfield.

The regional geology is dominated by sedimentary sequences including sandstones, mudstones, shales and coal seams of the Karoo Supergroup. The Karoo Supergroup, in chronological order, comprises thin glacial sediments of the Dwyka Group; coal hosted in Eccca Group sediments; coarse sandstones of the Beaufort Group; and basalt of the Stormberg Group. Coal sequences occur in the Volksrust and Vryheid Formations of the Eccca Group. As a result of the deep sand cover, outcrops are limited, and geological mapping was essentially based on drill hole information. No clear marker beds are present.

Strata dip regionally to the east at between 3° to 20°, with a down dip steepening. The strike is north northeast/south southwest. The steepening dip defines the Lebombo monocline with a north northeast/south southwest trending fold axis.

Prominent faults which have affected the coal horizons appear to be strike faults with vertical throws of up to 100m. These faults dissect the coal measures into isolated blocks or grabens and accentuate the regional dip of the area. Tensional forces that prevailed during the deformation history of the area probably contributed to fault formation including graben structures as delineated in the exploration drilling.

Wide dolerite dykes and sills, associated with formation of the Stormberg Group are common and can reach thicknesses of 100m and 170m, respectively. The intrusive dolerites in the Ka'Ngwane Coalfield have caused the formation of the anthracite. However, the large number of dykes, sills and faults within the coalfield create local loss of coal and difficult roof conditions for mining.

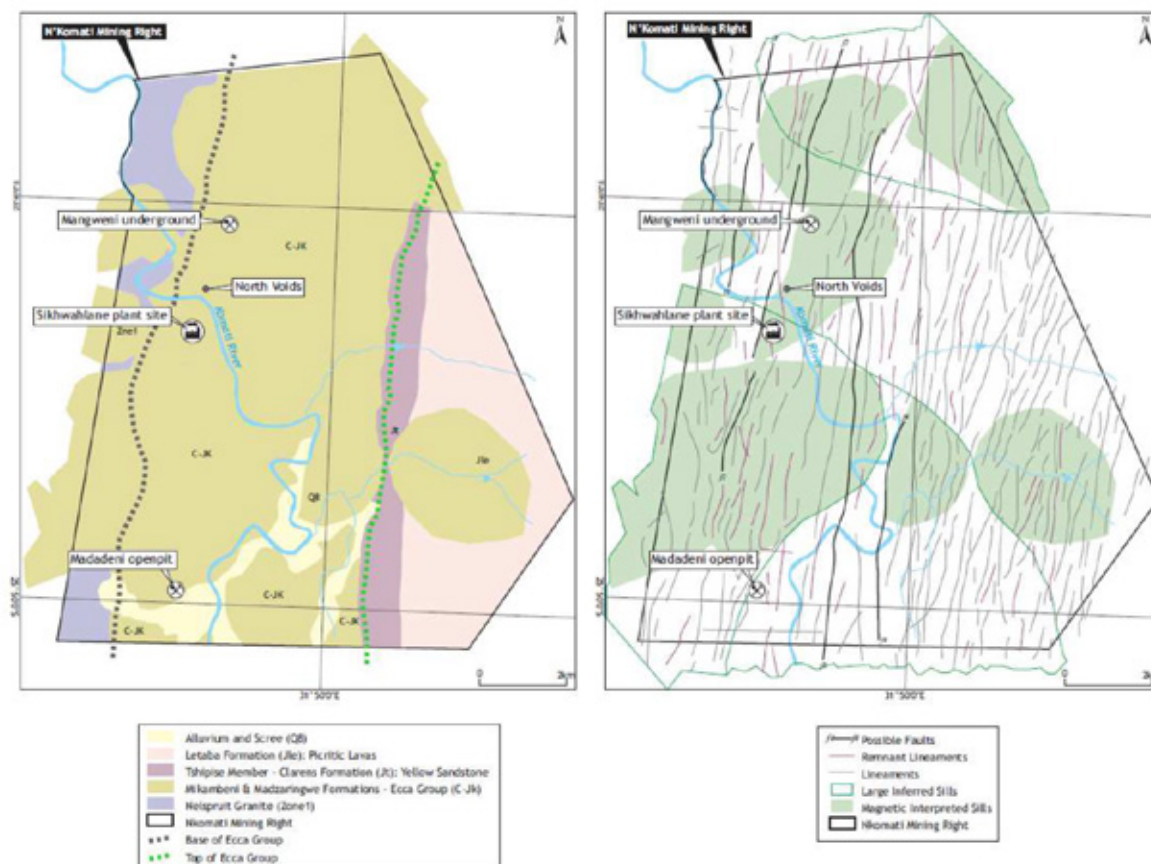
Coal has been devolatilised on a regional scale and locally where adjacent to intrusives. The regional alteration is due to major and common regional faulting and volcanic activity throughout the coalfield. Faulting and dykes are generally post coal deposition.

### 6.1.1 Local Geology Nkomati

The local surface geology within the Nkomati Mining Right typically comprises sediments, coal seams and extrusive lava flows associated with the Karoo Supergroup along with the granites associated with the Nelspruit Suite (post Barberton Sequence).

The local surface geology is presented in the figure below. At Nkomati, seams 1, 2 (comprising 2L, 2U(1), 2U(2) subseams), 3, 4, 6 and 8 occur within the late Permian age, Vryheid Formation. The Volksrust Formation has not been encountered at Nkomati. The Nkomati area has been divided into two areas namely Mangweni to the north and Madadeni to the south. There are generally four to five coal seams present of economic significance within the Vryheid Formation, dipping approximately 8° to 10° east and a 2° dip towards the south. The sedimentary succession at Nkomati comprises sandstones, mudstones and shales.

Figure 9. Local Geology of Nkomati



The coal seams are numbered from bottom to top, with the 1 seam being lowermost and the 8 seam being the uppermost, stratigraphically.

The upper seams are only encountered in drill holes located towards the east. The occurrence of the various coal seams varies from Mangweni in the north to Madadeni in the south.

At Mangweni the 2L seam is well developed and of significant thickness (on average 5.5m thick) and is the only seam of economic interest. The seam can be split into two horizons based upon its phosphorous content, with the upper portion being significantly lower phosphorus content than the lower portion.

The lowermost 1 seam does not occur at Mangweni. The upper coal seams of the 4, 3 and 2U are less well developed and significantly thinner with approximately thicknesses of 0.6m, 1.1m and 1.2m, respectively, totalling approximately 3m.

At Madadeni, the 1, 2L and 2U (1) seams are well developed and of economic interest. The seams are on average 1.2m, 4.0m, 3.5m thick, respectively, totalling approximately 8.7m. The 2U (2) is approximately 0.3m thick and therefore not of economic interest. All of the 2L coal seam is classified as low phosphorus coal. The 2L seam is the main seam mined within the Mining Right, and is the seam targeted for underground mining. All seams are extracted within the opencast mining area.

Structurally, the mining area is affected by multiple north northeast/south southwest trending faults and, to a lesser extent, east/west faults resulting in the Mining Right being divided into a series of fault-bounded blocks. Although the geological modelling has been undertaken across these structures, mining areas have been defined by the fault bounded blocks separated by large fault throws. The local structure has had a significant impact on the selection of the mining method, with up faulted blocks enabling opencast methods to be implemented due to lower stripping ratios. Down faulted blocks may only be considered for underground extraction methods.

The area is intruded by two major sills, which appear to have been intruded before the dykes and the thermal effects of these sills have resulted in the formation of anthracite. These sills have not been mapped in detail on surface, with the information pertaining to their extent being interpreted from the geophysical survey results. The sills have not been separately identified in drill holes using lithological characteristics and therefore they have not been named.

Vertical to semi-vertical dolerite dykes are regularly encountered in exploration drill hole cores and are visible in both the opencast and underground mining areas. These dykes appear to be secondary intrusions cross cutting the sills and coal seams. The dykes are generally cool and do not show significant burning or devolatilisation of the adjacent coal seams. The dolerite dykes and sills, however, cause poor ground conditions which have an adverse effect on exploration drilling and underground mining. The presence of the dolerites and sills have been mapped in the opencast and underground mining sections and using drill hole results. Nkomati has prepared maps for the economic seams (2L and 2U) indicating the presence and effect of these intrusions on the seams.

#### 6.1.2 *Geology and Orebody modelling*

The most recent geological models include exploration drilling and sampling results up to and including 30 June 2020. Dassault Systèmes GEOVIA Minex™ Version 6.5.5 (Minex), Golden Software Surfer® Version 17 (Surfer) and Model Maker® Version 12.02 were used for the structural, physical and quality modelling.

A 25m x 25m grid cell size was used throughout. Coal seam floor elevations and coal seam thicknesses were gridded from which the coal seam roof elevations were calculated. All raw coal qualities were gridded for the seams of interest (CV, Ash, IM, RD, VM, FC and TS) as well as the same qualities and theoretical yield variables within the wash curve. It is noted that over time different wash fractions have been analysed in the various exploration campaigns. These cumulative fractions have been regularised using Micromine's Geobank data management software to estimate the missing fractions between analysed fractions.

Phosphorous has only been analysed on certain wash fractions (float density 1.55 and 1.65) which was not necessarily consistent with the product reported. Fortunately, this still does provide a rigorous indication of the expected phosphorous content of the saleable product.

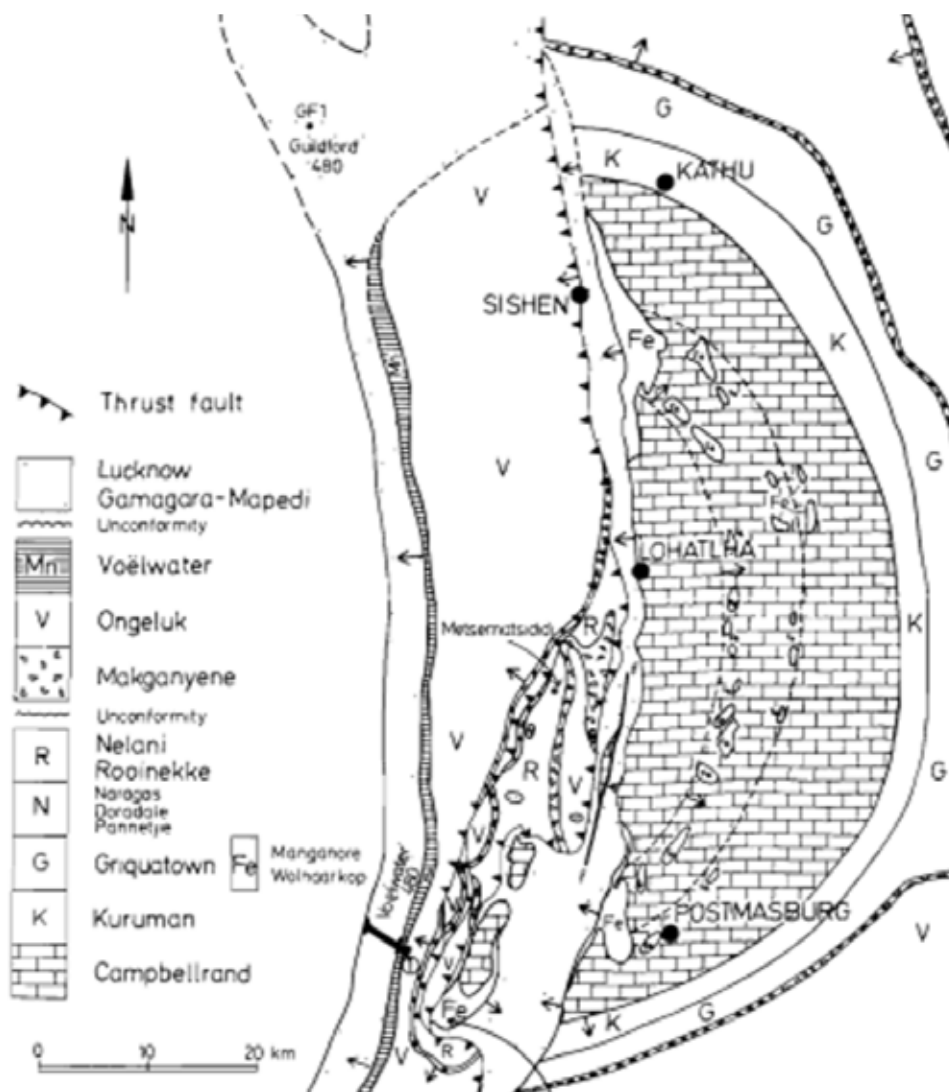
Minex's Coal Quality Database module was used to wash for a theoretical product of 18% ash per drill hole and per coal seam. These results were then gridded and were used to report the theoretical product yield and quality per Coal Resource block.

## 6.2 **Regional Geology Iron Ore**

The central part of the Maremane dome comprises a flat lying erosional plain consisting of dolomite of the Campbellrand Subgroup, with an eastern and western limb consisting of the iron formation of the Asbesheuwels Subgroup of the Transvaal Supergroup.

The dome is a north-south plunging anticline elongated to form a semi-arcuate feature, with the eastern limb dipping gently to the east and the western limb dipping to the west. The structure of the dome has been considerably modified by later tectonics and is a remnant of a much larger palaeo feature with considerable amounts of ore material, mainly from the Griquatown Iron Formation, having been removed by erosion. Only the eastern half of the dome is exposed with the western half covered unconformably by the Gamagara succession of diamictite, quartzite and basaltic andesites, with an unconformity produced by thrusting from the west caused by the low angle Black Ridge thrust fault.

Figure 10. Regional geological map of the area between Kathu and Postmasburg



High to medium grade hard hematite iron ore deposits are considered as type examples of the ancient enrichment of Precambrian Banded Iron Formations. These deposits are situated on the Klipfontein hills ridge, part of the eastern edge of the Maremane dome where BIF overlies the core of dolomite.

Along the Klipfontein hills forming the eastern edge of the dome structure, scattered outcrops of BIF and chert breccia occur. The Sishen and Beeshoek iron ore deposits are hosted within the Manganore Iron Formation which is generally regarded as an altered equivalent of the Kuruman Iron Formation and the Griquatown Iron Formation of the Asbesheuwels Subgroup.

The distribution of chert bearing dolomite has influenced the development of karst type sub-surface into which high grade iron ore deposits have developed and been preserved. The two major types of iron ore deposits are the micro-crystalline hematite ores derived from supergene enrichment of the Asbesheuwels Iron Formation below the angular Gamagara unconformity and the conglomeratic ore derived from erosion of the underlying laminated ores. The conglomeratic ores can thicken considerably into karst (solution) palaeo lows in the dolomite which can produce ore deposits with irregular floor and thickness distributions.

### 6.2.1 Local Geology Demaneng

#### PIT H

The lithological sequence consists of shale and conglomerate of the Gamagara Formation that is unconformably underlain by BIF of the Manganore Iron Formation which is overlying an undulating Wolhaarkop chert breccia.

The majority of the mineralisation on Pit H occurs in a zone of structurally controlled haematite alteration in the BIF. The mineralisation is interpreted to occur within a series of repeated/duplicated zones of faulting or thrusting, which are orientated north-south. Duplication is evident with older stratigraphy observed to overlie younger stratigraphy. A set of northwest-southeast linear structures can be seen in the open-pit and are considered to be associated with the faulting and thrusting seen in the drillholes. These linear features are perpendicular to the strike of the thrust orientations with recorded measurements of 90° to 110° dipping at approximately 75° to 90° to the northeast.

Three distinct zones of mineralisation are evident in the drill holes, massive, homogenous haematite (>60% Fe), layered BIF with minor zones of haematite enrichment 45% to 55% Fe and a conglomerate.

The zones of partially replaced BIF that contain haematite are interpreted to form a “halo” around the massive mineralisation which is orientated approximately northwest-southeast. Overlying the host BIF is the Doornfontein Conglomerate. The pebbles and matrix of the conglomerate are often seen to be replaced by haematite. The conglomerate is flat lying, with grades ranging from 50% to 55% Fe.

#### PIT A

The geology on Pit A is similar to that seen on Pit H, without the preservation of the Gamagara shales and quartzites. Haematite mineralisation follows the same structural orientations of those observed in Pit H. Joint sets measured on surface at Pit A show 110°/85° orientations, consistent with the haematite mineralisation.

Two separate zones of haematite alteration are apparent. The grade of the mineralisation ranges from haematite (>60% Fe) into a banded haematite (45% to 55% Fe) and then into a chert banded BIF of <45% Fe.

The ridge line that forms Pit A is interpreted to be composed of a series of thrust faults, interpreted on surface from older Wolhaarkop breccia overlying younger BIF. Thrust contacts are associated with BIF breccia which is observed on surface. The apparent slump structure interpreted at Pit H is also mirrored at Pit A. Dip and dip directions measured in outcrop tend to be concentric, and support this slump interpretation.

**PIT Demaneng West**

The geology on Pit Demaneng West is similar to that seen on Pit H, without the preservation of the Gamagara shales and quartzites. Three distinct zones of mineralisation are evident in the drill holes, massive, homogenous high-grade haematite (>60% Fe), layered BIF with minor zones of haematite enrichment 45% to 55% Fe and Wolhaarkop chert breccia.

**PIT Rust en Vrede**

The lithological sequence consists of shale and conglomerate of the Gamagara Formation that is unconformably underlain by BIF of the Manganore Iron Formation which is overlying an undulating Wolhaarkop chert breccia.

The majority of the mineralisation occurs in a zone of structurally controlled haematite alteration in the BIF. The mineralisation is interpreted to occur within a series of repeated/duplicated zones of faulting or thrusting, which are orientated north-south. Duplication is evident with older stratigraphy observed to overlie younger stratigraphy. A set of northwest-southeast linear structures can be seen in the open-pit and are considered to be associated with the faulting and thrusting seen in the drill holes.

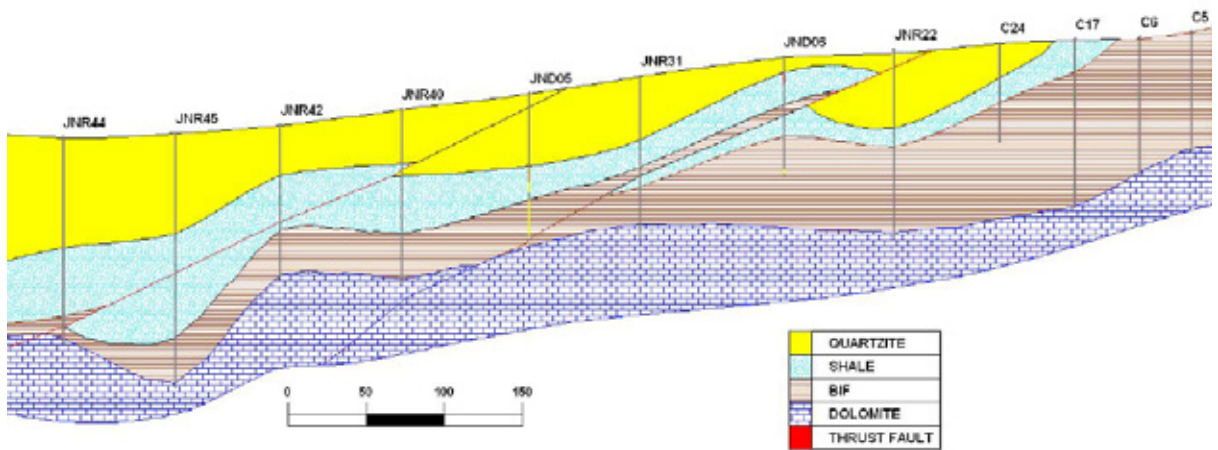
Overlying the host BIF is the Doornfontein Conglomerate. The pebbles and matrix of the conglomerate are often seen to be replaced by haematite. The conglomerate is flat lying, with grades ranging from 50% to 60% Fe.

**6.2.2 Local Geology Jenkins**

The eastern part of Jenkins contains well exposed outcrops of dense black hematite, dipping at around 17° to west. At approximately 200m down slope, the hematite is overlain by the younger Gamagara quartzite and ferruginous shale, on an angular unconformity. Thrust faulting has been reported in the literature between the oxide layers and the underlying dolomite. Further to the west, the sedimentary rocks are overlain by the basaltic andesite of the Ongeluk Lava along the Black Ridge thrust fault plane.

Variations occur in the thickness of the various layers due to undulations of the dolomite floor (probably collapsed solution cavities in the dolomite), variations of the overlying sedimentary events and compression flexing from the west.

**Figure 11. East-West geological section through the Jenkins Iron Ore Deposit**

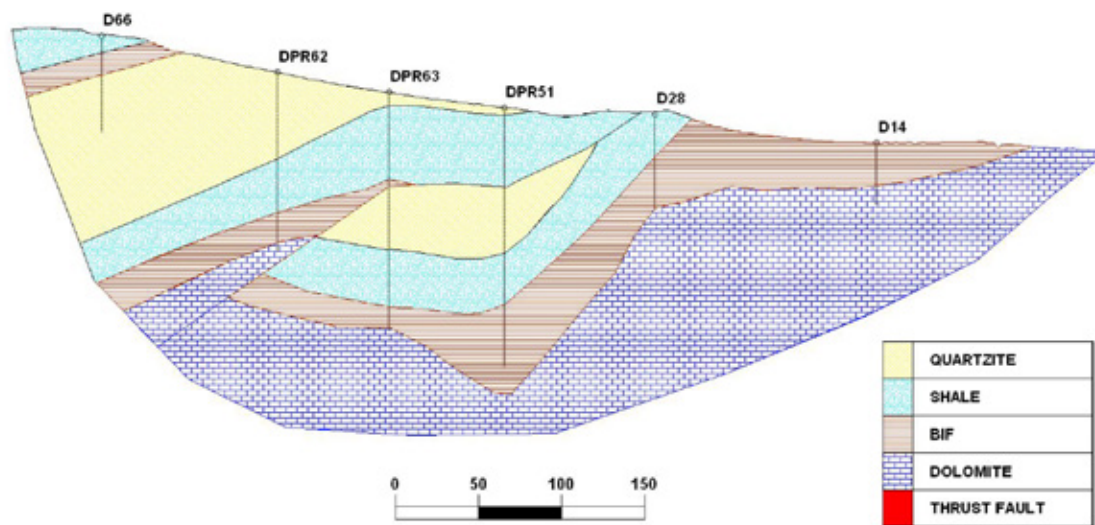


### 6.2.3 Local Geology Driehoekspan

On Driehoekspan, only the western extremity of the farm contains the ore zone which outcrops on three distinct topographic ridges with opposing and overturned dips on the western most exposures, the eastern remainder of the farm being the central flat lying erosional dolomite plain with occasional low hills of dolomite.

Compression tectonics from the west has produced steep to vertical and possibly overturned isoclinal folding, the frequency and amplitude of which decreases rapidly eastwards. This is evidenced by three separate outcrop exposures of both ferrous and ferro-manganiferous oxide material, decreasing in altitude from the west.

Figure 12. East-West geological section through the Driehoekspan Iron Ore Deposit

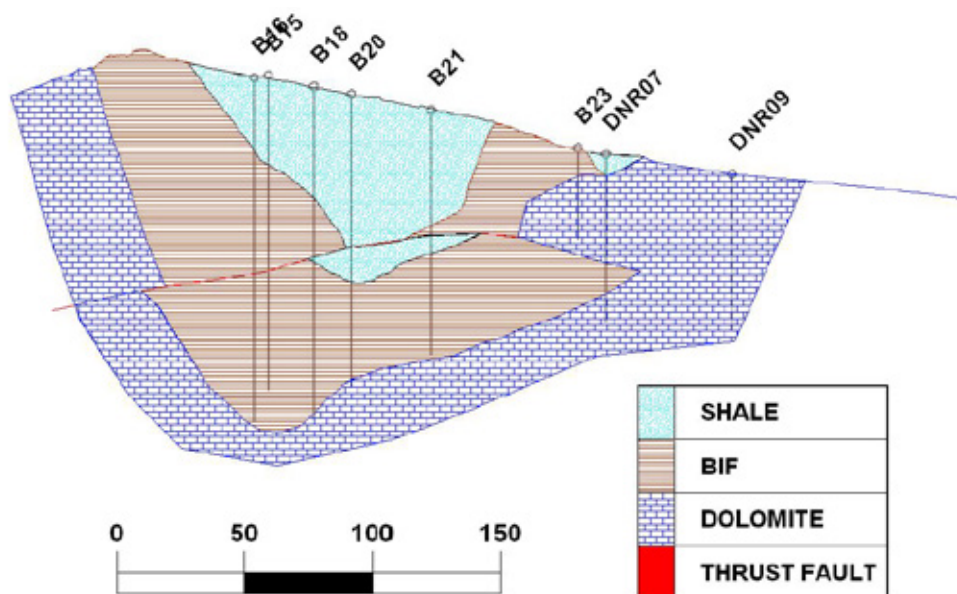


### 6.2.4 Local Geology Doornpan

Doornpan lies on the flat lying central Maremane dome dolomite plain with the Bleskop Hill forming an isolated topographic high containing a semi-elliptical crown outcrop of hematite. Outcropping black hematite is visible both at the apex and at the base of the hill.

Topographically, the top of the hill forms a shallow inwardly dipping which shows that the hill is a remnant overlying a collapsed solution cavity forming a slump structure, the base of which is some 70m below the present-day dolomite erosional surface.

Figure 13. East-West geological section through the Doornpan Iron Ore Deposit



### 6.2.5 Geology and Orebody modelling

The Datamine software package was used for geological modelling and geostatistical analyses and mineral resource determination and classification.

The orebody top and bottom contacts were established using a 55% Fe cut-off value.

A set of rules are required to decide whether >55% Fe samples near to the ore body (in both hanging and footwall) should be included in the optimised section or not. The weighted grade of the outlier and the waste separating it from the ore body was calculated. If this weighted grade exceeded 55% Fe the outlier (and waste) was included in the ore body.

The orebody top and bottom were constructed as two separate DTM surfaces and the volume between was filled with blocks. The orebody was terminated 50m beyond the last line of boreholes.

In order to avoid overestimating of the resource a geological loss was calculated for the orebody model. The number of samples at grades less than 55% Fe within the ore envelope was expressed as a percentage of the total samples and quoted as a loss.



Data was composited to 1m intervals. Summary statistics as histograms were generated on the composited file for the three different ore bodies.

The elements studied are Iron, Potassium, Silica, Alumina, Sulphur, Phosphate, Magnesium, Sodium and Titanium. The elements mainly follow the Normal distribution.

Ordinary kriging was used in the interpolation process. The number of Discretisation points is 4\*4\*4 in the X, Y, Z directions respectively. The Datamine software package was used for geological and grade modelling.

Swath analyses for the Fe and K<sub>2</sub>O elements were done to compare Borehole input against the predicted Block model value. A 50m corridor along the Y-axis of the deposit through the borehole file and the same corridor through the block model was compared to assess if the same trend is present, i.e. is the kriging interpolation following the borehole values.

## 7. MINERAL RESOURCE ESTIMATES

### 7.1 Mineral Resource estimates Anthracite

#### 7.1.1 Mineral Resources Nkomati

The current Coal Resource estimate has been prepared to take into account the results of the exploration programme which was completed by 30 June 2020 and mining depletions to this date. This Coal Resource estimate was prepared in accordance with the SAMREC Code of 2016 and has also taken cognisance of SANS10320:2020. The location of the Coal Resources in relation to the Mining Right and drill holes is presented in the figure below. The Coal Resource includes only those coal seams above the minimum thickness cut-off of 0.5m for opencast and 1.2m for underground. The Coal Resource is reported on an air dried and *in situ* moisture basis. The Coal Resources are reported inclusive of Coal Reserves.

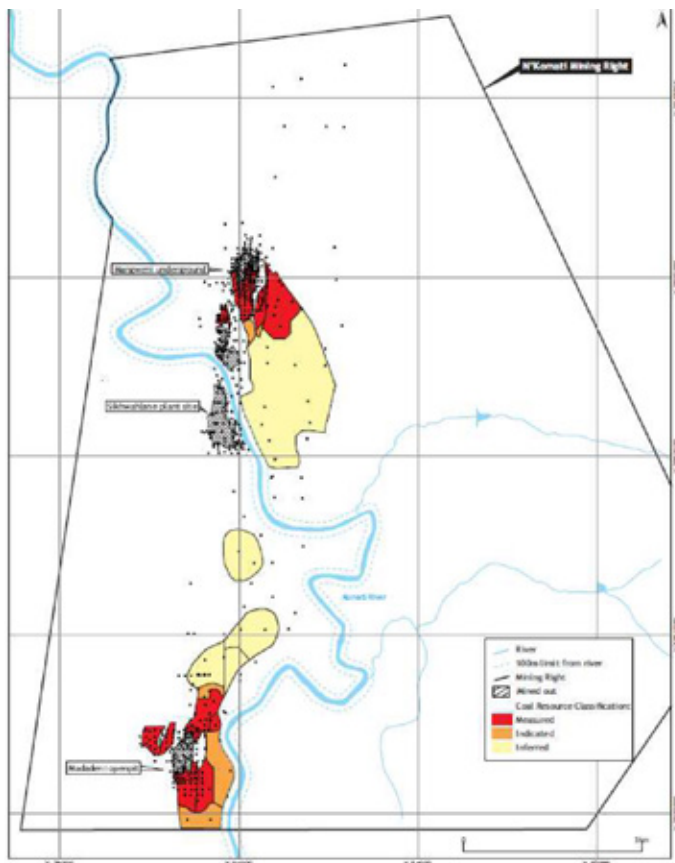
**Table 3. SAMREC Classified Anthracite Resources for Nkomati mines – January 2022**

Deposit and seam	MTIS Mt	Yield %	CV MJ/kg	Ash %	Vol%	Fixed Carbon %	Sulphur %	Phos %
Mangweni Measured 2L	7,1	70,1	26,3	17,9	6,6	72,0	0,38	0,04
Mangweni Indicated 2L	0,37	51,7	26,9	18,0	7,2	71,7	0,96	0,05
Mangweni Inferred 2L	16,06	76,2	26,4	18,0	6,1	72,1	0,33	0,33
Total mangweni Measured+indicated	7,5	69,2	26,3	17,9	6,6	71,9	0,41	0,04
Madadeni Measured 1, 2L, 2U	18,9	68,5	26,7	17,8	6,6	72,6	0,33	0,019
Madadeni Indicated 1, 2L, 2U	3,96	79,8	26,4	18,0	5,6	73,4	0,2	0,02
Madadeni Inferred 1, 2L, 2U	4,78	48,3	26,1	18,0	5,8	73,4	0,36	0,02
Total Madadeni Measured+indicated	22,9	70,5	26,7	17,8	6,4	72,7	0,31	0,02
Total Afrimat Measured+indicated	30,4	70,2	26,6	17,8	6,5	72,5	0,33	0,02
Total Afrimat Inferred	20,8	69,8	26,3	18,0	6,1	72,1	0,34	0,26

(Air dried wash qualities @ 18% ash)

Resources updated January 2022. Totals are rounded off.

**Figure 14. Plan showing 2020 SAMREC compliant resource distribution and boreholes**



## 7.2 Mineral Resource estimates Iron Ore Properties

### 7.2.1 Mineral Resources Demaneng

The following table gives an estimate of the *in situ* Mineral resources.

**Table 4. Iron Ore Resources for Demaneng**

PIT	MTonnes	Fe %	K <sub>2</sub> O %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %	P <sub>2</sub> O <sub>5</sub> %	Mn %
Demaneng West	0,026	60,27	0,040	7,54	2,340	0,030	0,010
Rust & Vrede	1, 418	57,12	0,480	5,21	1,775	0,019	1,422
PIT F	0,147	55,82	0,164	13,6	1,149	0,045	0,069
PIT G	0,018	54,99	0,269	13,31	1,384	0,010	0,007
PIT H	0,970	61,78	0,159	8,16	1,408	0,054	0,010
Rust & Vrede South	0,456	55,66	0,383	3,85	2,239	0,012	1,921
Bobajaangat	0,037	52,19	0,315	4,01	0,948	0,011	6,852
JC Orebody	0,563	55,45	0,404	8,81	1,420	0,018	0,598
Total	3,638	57,83	0,352	6,77	1,649	0,028	0,963

### 7.2.2 Mineral Resources Jenkins

The following table gives an estimate of the *in situ* Mineral resources.

Resource classification was done as follows. A weighted classification estimator was developed by combining the statistical parameters of Kriging Efficiency (KE), Regression Slope (RS), Kriging Variance (KV) and Search Neighbourhood + Number of informing samples (NV). A weight was assigned to each statistical parameter (KE=0.25, RS=0.25, KV=0.20 and NV=0.30) and a CLASS Field was calculated in the block model. A histogram was generated from the CLASS field in the block model and the classification assigned based on the populations observed on the histogram.

For Jenkins CLASS <1.21 = Measured Resource, CLASS 1.21-1.62 = Indicated Resources and CLASS > 1.62 = Inferred Resources.

**Table 5. SAMREC Classified Iron Ore Resources for Jenkins**

Category	Mt	Fe %	K <sub>2</sub> O %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %	P <sub>2</sub> O <sub>5</sub> %	S %	Mn %
Measured	21,5	62,66	0,38	3,5	2,2	0,08	0,02	1,8
Indicated	2,3	60,73	0,48	4,5	3,3	0,12	0,02	1,9
Total	23,8	62,47	0,39	3,6	2,31	0,08	0,02	1,81
Inferred	2,5	62,3	0,39	3,6	2,2	0,07	0,02	2,1

10% Geological Loss Applied

### 7.2.3 Mineral Resources Driehoekspan

The following table gives an estimate of the *in situ* Mineral resources.

Resource classification was done as follows. A weighted classification estimator was developed by combining the statistical parameters of Kriging Efficiency (KE), Regression Slope (RS), Kriging Variance (KV) and Search Neighbourhood + Number of informing samples (NV). A weight was assigned to each statistical parameter (KE=0.25, RS=0.25, KV=0.20 and NV=0.30) and a CLASS Field was calculated in the block model. A histogram was generated from the CLASS field in the block model and the classification assigned based on the populations observed on the histogram.

For Driehoekspan the CLASS <1.45 = Measured Resource, CLASS 1.45-1.95 = Indicated Resources and CLASS > 1.95 = Inferred Resources.

**Table 6: SAMREC Classified Iron Ore Resources for Driehoekspan**

Category	Mt	Fe %	K <sub>2</sub> O %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %	P <sub>2</sub> O <sub>5</sub> %	S %	Mn %
Measured	15,1	60,1	0,31	4,9	3,6	0,07	0,01	1,73
Indicated	4,9	59,8	0,28	4,6	3,9	0,09	0,02	1,74
Total	20,0	60,03	0,3	4,8	3,7	0,07	0,01	1,73
Inferred	1,96	58,2	0,35	4,5	3,9	0,08	0,02	2,37

27% Geological Loss Applied

### 7.2.4 Mineral Resources Doornpan

The following table gives an estimate of the *in situ* Mineral resources.

Resource classification was done as follows. A weighted classification estimator was developed by combining the statistical parameters of Kriging Efficiency (KE), Regression Slope (RS), Kriging Variance (KV) and Search Neighbourhood + Number of informing samples (NV). A weight was assigned to each statistical parameter (KE=0.25, RS=0.25, KV=0.20 and NV=0.30) and a CLASS Field was calculated in the block model. A histogram was generated from the CLASS field in the block model and the classification assigned based on the populations observed on the histogram.

For Doornpan the CLASS <1.25 = Measured Resource, CLASS 1.25-1.60 = Indicated Resources and CLASS > 1.60 = Inferred Resources.

**Table 7: SAMREC Classified Iron Ore Resources for Doornpan**

Category	Mt	Fe %	K <sub>2</sub> O %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %	P <sub>2</sub> O <sub>5</sub> %	S %	Mn %
Measured	1,3	60,92	0,24	7,73	1,9	0,05	0,01	0,02
Indicated	0,27	61,12	0,19	7,45	2,2	0,05	0,013	0,02
Total	1,6	60,95	0,23	7,68	1,95	0,05	0,01	0,02
Inferred	0,11	59,8	0,12	8,2	3,5	0,05	0,014	0,02

10% Geological Loss Applied

## 8. MINERAL RESERVE ESTIMATES

Mineral Reserves estimates fall outside the scope of this report and should be dealt with in a follow-up report.

## 9. CONCLUSIONS and RECOMMENDATIONS

Afrimat's Bulk Commodities Division comprises a diverse collection of Ferrous metals and Anthracite. It is recommended that the reserves and depletion histories of operating mines be included in future versions of this report.

## 10. COMPETENT PERSON

Paul van der Merwe BSc Hons (Geology) graduated from the Free State University (UOVS) in 1975.

He is a registered Professional Natural Scientist with the SACNSP (SACNASP-400498/83). After 40 years in the mining industry he is now a private geostatistical consultant, domicilium: 361 Long Avenue, Ferndale, Randburg, South Africa.

He had worked as a Geologist/Geo-statistician for a total of 48 years since his graduation. His professional experience includes geological and resource modelling of mineral properties in South Africa (Uranium, Gold, Phosphate, Manganese, Iron Ore, Chrome, Andalusite, Platinum, Nickel), Namibia (Gold, Copper), Tanzania (Gold), Botswana (Copper), Zambia (Copper, Cobalt), and the Democratic Republic of Congo (Copper).

Paul van der Merwe has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking, to qualify as a Competent Person.



**PJ van der Merwe B.Sc. Hons (Pr. Sci. Nat)**

Dated in Randburg  
South Africa

24 June 2022