KUMBA IRON ORE LIMITED ORE RESERVE (AND SALEABLE PRODUCT) AND MINERAL RESOURCE REPORT 2019

RE-IMAGINING MINING TO IMPROVE PEOPLE'S LIVES

AngloAmerican

Real Mining. Real People. Real Difference.

DISCIPLINED GROWTH FOR A SUSTAINABLE FUTURE

Navigating our 2019 reports

Our integrated reporting suite comprises the following reports:

Integrated report (IR)*

A succinct review of our strategy and business model, operating context, governance and operational performance, targeted primarily at current and prospective investors.

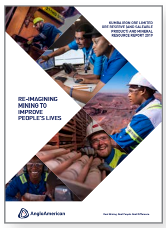
Annual financial statements (AFS)*

Detailed analysis of our financial results, with audited financial statements, prepared in accordance with International Financial Reporting Standards (IFRS).

Sustainability report (SR)*

Reviews our approach to managing our significant economic, social and environmental impacts, and to addressing those sustainability issues of interest to a broad range of stakeholders.

* Published on 15 April 2020.



Ore Reserve (and Saleable Product) and Mineral Resource report (ORMR)

Reported in accordance with the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC Code – 2016 Edition).

An abridged version of the 2019 ORMR report is chaptered within the 2019 Kumba Integrated report.
(https://www.angloamericankumba.com/investors/annual-reporting/reports-archive/2019.aspx)

Feedback (jean.britz@angloamerican.com)
Kumba appreciates any feedback regarding the competency, materiality and transparency with which its Ore Reserves (and Saleable Product) and Mineral Resources have been presented in this report.

Cover images

1. Erasmus Olivier, an Electrician at Kolomela mine, doing maintenance work on Komatsu 730E/7 Haul truck in the HME workshop
2. Keotshepile Babusi, a Mining Operator and Steven Farao, a Mine Dispatcher both from Kolomela mine in the new Mine Control room.
3. Ernest Jacobs is a plant Supervisor at the Sishen mine Primary crush plant. He is pictured at the Sishen viewpoint above the Jig Plant.
4. Louis le Grange a Geologist at Kolomela mine doing logging and inspection at Welgevonden farm house.
5. Neo Mabilo working at Kolomela mine pictured here doing sampling and core cutting work at Welgevonden farm house.

Online

Each of these reports, with additional updated information, is available on our website.

For more information see www.angloamericankumba.com

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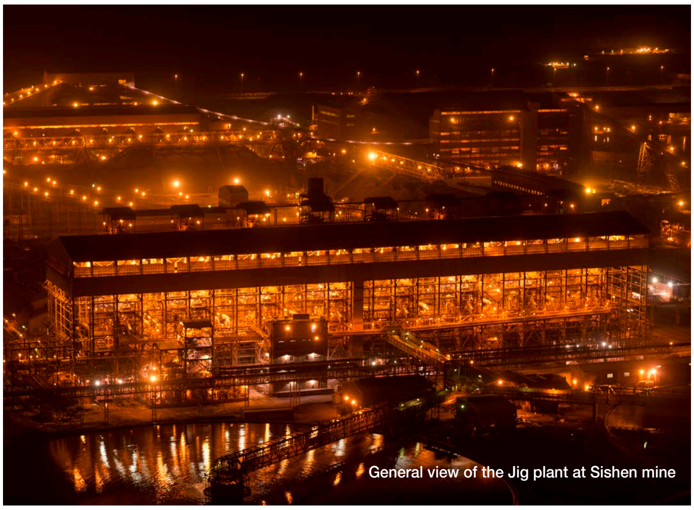
Kumba Iron Ore, a business unit of Anglo American (its largest shareholder), is a single commodity iron ore minerals company listed on the Johannesburg Stock Exchange in the Republic of South Africa (market cap – US$9.6 billion at 31 December 2019), focusing its business on competing in the global iron ore market through premium product delivery.

INTRODUCTION



General view of the Jig plant at Sishen mine

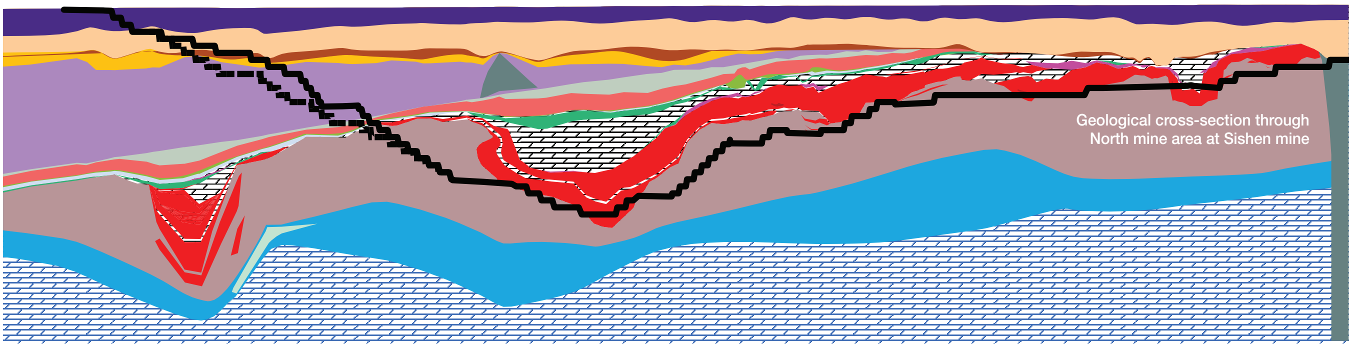
Kumba Iron Ore proudly operates two open-pit mines in the Northern Cape province of the Republic of South Africa. Kolomela mine is a predominantly direct shipping ore operation with a crushing-and-screening plant and a small-scale dense-media separation plant, while Sishen mine beneficiates its run-of-mine through large-scale beneficiation facilities, utilising dense-media separation and combined jigging (and ultra-high dense media separation for jig discard) technologies.

A range of high-grade Lump and Fine iron ore products are generated, which are globally (~95%) and domestically (~5%) marketed as three Kumba blend products:

- Premium Lump @ 65.2% Fe
- Standard Lump @ 64.0% Fe
- Standard Fines @ 63.5% Fe

Panoramic view of the Leeuwfontein pit at Kolomela mine

Both the Kolomela and Sishen mines are conventional drill and blast and truck and shovel open-pit operations with ex-pit ore at Kolomela mine hauled to designated finger stockpiles from which a run-of-mine blend is delivered, while at Sishen the run-of-mine originates directly from the pit as well as from designated buffer stockpiles. The Kolomela finger stockpiling is necessary to produce the correct run-of-mine blend for the predominantly direct shipping ore operation, while at Sishen the buffer stockpiling facilitates plant feed consistency through partial blending with ex-pit ore.



Geological cross-section through North mine area at Sishen mine

Kumba Iron Ore in the past 10 years has invested significantly in formulating an in-depth understanding of the genesis of the ancient supergene and hydrothermal-modified supergene iron-bearing lithologies in the narrow north-south "iron belt" between Kathu and Postmasburg in the Northern Cape province of the Republic of South Africa. The current 3D tectono-stratigraphic geological models defining the iron ore geometry (geological continuity) and associated 3D grade models (grade continuity), serve as a platform informing the mine planning, which applies state-of-the-art optimisation and scheduling techniques to derive life-of-mine plan scenarios informing business decisions.

THE STATEMENT

KUMBA IRON ORE LIMITED IS A JOHANNESBURG STOCK EXCHANGE LISTED MINERALS COMPANY THAT FOCUSES ITS BUSINESS (IRON ORE MINING AND EXPLORATION) IN THE NORTHERN CAPE PROVINCE OF THE REPUBLIC OF SOUTH AFRICA. IT PROUDLY OPERATES TWO OPEN-PIT MINES, NAMELY KOLOMELA AND SISHEN. BOTH OPERATIONS HAVE ESTABLISHED INFRASTRUCTURE, WHICH IS APPLIED TO CONVERT *IN SITU* HAEMATITE MINERALISATION INTO SALEABLE IRON ORE PRODUCT THAT EARNS THE COMPANY A PREMIUM IN THE GLOBAL IRON ORE MARKET. CURRENT PRODUCTION OUTPUT IS MOSTLY RAILED ACROSS A RAIL LINE LINKING THE MINING OPERATIONS WITH THE COMMODITY EXPORT HARBOUR FACILITY AT SALDANHA BAY ON THE WEST COAST OF SOUTH AFRICA, FROM WHERE IT IS SHIPPED TO THE VARIOUS GLOBAL CLIENT DESTINATIONS.

REPORTING CODE

The 2019 Kumba Iron Ore (Kumba) online Ore Reserve (and Saleable Product) and Mineral Resource Report is a condensed version of the full 2019 in-house Kumba Ore Reserve and Mineral Resource Statement and Audit Committee Report, derived from a comprehensive amount of information compiled in the form of site-specific Reserve and Resource Statements; the latter structured to address all aspects listed in the Checklist of Reporting and Assessment Criteria Table of the SAMREC Code (2016 Edition).

The Kumba Reserve and Resource Report therefore aims to meet the required minimum standards as set out in "The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC Code – 2016 Edition)". It is incorporated in the Company's business processes via a Reserve and Resource Reporting policy (website: http://www.angloamericankumba.com/sd_policies.php). The policy is supported by reporting standards and requirements documents and associated templates, which channel the reporting requirements down to a site-specific level, to ensure that Kumba meets section 12.11 of the Johannesburg Stock Exchange Listings Requirements.

The extent of the content in this Reserve and Resource Report demonstrates Kumba's commitment to the Material, Transparent and Competent reporting of its Ore Reserves and Mineral Resources.

REPORTING BASIS

The Ore Reserve (and Saleable Product) and exclusive Mineral Resource figures are stated on a 100% basis, irrespective of attributable shareholding. Kumba's attributable ownership in operations and projects is, however, stipulated per site in the Ore Reserve (and Saleable Product) and Mineral Resource tables as listed in this statement.

The Ore Reserves and exclusive Mineral Resources is not an inventory of all mineral occurrences identified, but is an estimate of those, which under assumed and justifiable technical, environmental, legal and social conditions, may be economically extractable at current (Ore Reserves) and has reasonable prospects for eventual economic extraction (Mineral Resources).

The term "Ore Reserves" in the context of this report has the same meaning as "Mineral Reserves", as defined by the SAMREC Code. In the case of Kumba, the term "Ore Reserves" is preferred because it emphasises the difference between these and Mineral Resources.

ORE RESERVE: ECONOMICS

A long-term iron ore price forecast (based on the Platts 62% index) and exchange rate, adjusted with Kumba-based forecasts of Lump and Fe premiums, deleterious element specifications and freight tariffs were agreed and form the basis of Ore Reserves and Mineral Resources presented in this document. The latter is applied to site-specific mining block models, in combination with a forward extrapolation of current site-specific budgeted cost figures, to derive a set of pit shells for each site during the annual pit optimisation process. A so-called optimal pit shell (revenue factor ~1) is chosen for each site and engineered into a pit design or layout, which spatially envelopes the currently economically mineable Ore Reserves.

The Ore Reserves are furthermore derived from the *in situ* Measured and Indicated Mineral Resource portion occurring within the approved pit layouts only, through the modification thereof into run-of-mine, to account for site-specific mining efficiencies and other design, technical, environmental, legal and social aspects. The resultant Proved and Probable Ore Reserves are further modified into Saleable Product, considering site-specific beneficiation capacity and efficiencies, the latter in relation to specific ore types planned for beneficiation.

Site-specific cut-off grades are assigned to run-of-mine schedules to achieve a sustainable delivery of Saleable Product that complies with Client product specifications*.

The 2019 Ore Reserve reporting format has also changed to distinguish between scheduled run-of-mine originating from the pit and from buffer stockpiles in the tables. In 2018, the run-of-mine buffer stockpile portion of the scheduled Ore Reserves was quoted in the footnotes.

* Although site-specific cut-off grades are assigned to run-of-mine schedules with the aim of achieving a sustainable delivery of Saleable Product that complies with Client product specifications, the 2019 life-of-mine plans do contain periods where Saleable Product contaminant grades (Al_2O_3, K_2O and P) slightly exceed current Client product specifications. Further work is ongoing to fully align to the cut-off grade assignments and the latest ore blending potential assumptions. Kumba has tabled this matter on its Marketing Forum meetings and it is being resolved. Once agreed, the optimised cut-off grade approach will be incorporated in the long-term mine planning process.

THE STATEMENT CONTINUED

MINERAL RESOURCE: REASONABLE PROSPECTS FOR EVENTUAL ECONOMIC EXTRACTION

Mineral Resources are declared exclusive of (in addition to) Ore Reserves. Apart from cut-off grades, which consider the current or at least concept-approved foreseen beneficiation processes, Kumba spatially distinguishes Mineral Resources from other mineral occurrences by applying a resource shell (1.6 x revenue factor "optimistic" shell). The latter is derived during the annual pit optimisation process conducted on the latest site-specific three-dimensional mining block models, considering mining bench configurations, etc. The resource shell is then subsequently applied to the geological block models, defining the classified ore occurring inside the resource shell as the resultant Mineral Resource portion considered to have reasonable prospects for eventual economic extraction.

A further condition is that the iron ore price corresponding with a 1.6 revenue factor pit shell must have been historically achieved in the global iron ore market. This process therefore considers site-specific beneficiation, mining practices as well as relevant pricing and cost.

Inferred Mineral Resources considered in life-of-mine plans are separately indicated in the exclusive Mineral Resource Statement, with the extrapolated Inferred portion of the Mineral Resources quoted in the footnotes of the exclusive Mineral Resource Statement.

The 2019 Mineral Resource reporting format has also changed to distinguish between *in situ* and long-term stockpiled Mineral Resources in the tables. In 2018 the long-term stockpiled portion of the Mineral Resources was quoted in the footnotes.

SECURITY OF TENURE

All of the Ore Reserves and Mineral Resources as stated occur within mining and prospecting rights which have been notarially executed and registered by Sishen Iron Ore Company Proprietary Limited (76.3% owned by Kumba Iron Ore Limited) and have not expired at the time of reporting. In the case of the Ore Reserves, the associated reserve life does not exceed the expiry date of the applicable right.

Louis le Grange a Geologist at Kolomela mine doing logging and inspection at Welgevonden farm house.

RESERVE AND RESOURCE FIGURES ARE NOT EXACT.

THE KUMBA RESERVE AND RESOURCE (R&R) FIGURES ARE DERIVED FROM INTERPRETATION AND ESTIMATION PROCESSES, INFORMED BY FORWARD LOOKING ASSUMPTIONS, WHICH MAY NOT MATERIALISE AS EXPECTED.

BY THEIR NATURE, THE R&R FIGURES QUOTED IN THIS REPORT ARE THEREFORE SUBJECT TO SEVERAL RISKS AND UNCERTAINTIES THAT COULD CAUSE ACTUAL FIGURES TO DIFFER FROM ESTIMATED FIGURES.

SALIENT FEATURES

What stood out in 2019

Reflecting on progress in 2019, the reserve and resource drive to support the Kumba full potential business transformation programme (Tswelelopele Programme) remained stable with efficiency improvements being realised.

THE TSWELELOPELE STRATEGY AIMS TO IMPROVE KUMBA'S MARGINS AND EXTEND THE LIFE OF MINE

- **Horizon 1** – significantly improve our margin through achieving benchmark productivities, maximising our resource utilisation (increasing yield and Lump : Fine ratio), cost control and obtaining the maximum price for our superior iron ore products.

  2019 progress – through a focused pit optimisation project, the overall stripping ratio at Kolomela was reduced from 4.1 to 3.8 by targeting and optimising high stripping ratio pushbacks. In total, 54 Mt of waste was removed from the life-of-mine at the expense of only 3 Mt of ore (stripping ratio of 10 : 1).

- **Horizon 2** – grow and sustain our core business which is the mining and beneficiation of high-grade ore bodies in the Northern Cape province of the Republic of South Africa. The focus in this horizon is extending our life-of-mine through incorporating the operational improvements realised in Horizon 1, development of low-grade beneficiation technologies and exploration in the Northern Cape.

  2019 progress – the feasibility study of the Sishen Ultra-High Dense Media Separation (UHDMS) project has been postponed for completion from 2019 to 2020 due to the re-basing of the project to operate within a 100% rail constraint and the resultant capital optimisation process. The project focus moved from producing an additional 2 Mtpa, to further increasing the Sishen product quality and realising value through exploiting the market premia as well as extending the life-of-mine.

  On the exploration front, SIOC has secured access to explore neighbouring properties close to Kolomela through an option agreement with the current right holders. If the properties are prospective, and meet Kumba's expected criteria, Kumba will have the right to take up 70% of the ownership in the assets.

- **Replenishing Ore Reserves (and Saleable Product) without compromising income margins and safety**
  Kumba's ambition, set in 2018, was to extend our life-of-mines to 20 years through efficiency improvements, resource utilisation and exploration. At that stage ~390 Mt of exclusive Mineral Resources was targeted for conversion in the near term (2018 to 2022) to Ore Reserves, thereby extending the life-of-mines.

  In line with this strategy, we have successfully increased the Ore Reserve by 124.9 Mt (before depletion) since 2018 as follows:
  - *+112.1 Mt in 2018 (before depletion); and*
  - *+12.8 Mt in 2019 (before depletion), as a result of improved resource to reserve conversion.*

  The Sishen UHDMS project is targeting the remainder of the Exclusive Mineral Resources quoted in 2018 and we continue our focused exploration initiatives to meet the 20-year life-of-mine ambition.

THE RESERVE AND RESOURCE MOVEMENTS FROM 2018 TO 2019

- **Saleable Product** decreased by 7% (-44.1 Mt) year-on-year, primarily as a result of annual production.

- **Ore Reserves** decreased by 6% (-41.1 Mt) year-on-year, mainly as a result of annual production.

- **Mineral Resources in addition to Ore Reserves** realised a material 46% (-490.7 Mt) decrease from 2018 to 2019, mainly due to the removal of the Zandrivierspoort (ZRP) Project Mineral Resources (419.1 Mt) from the Kumba resource portfolio, as the Zandrivierspoort prospecting right held by Sishen Iron Ore Company Proprietary Limited (SIOC) expires on 21 March 2020.

  The ZRP project is a 50 : 50 joint venture between SIOC and ArcelorMittal SA. SIOC and ArcelorMittal SA are still in discussions regarding the future of the project.

SALIENT FEATURES CONTINUED

OTHER SALIENT FEATURES OF THE 2019 RESERVE AND RESOURCE STATEMENT

- **The Saleable Product contaminant grades** – an optimisation of the plant feed scheduling strategy, implemented in the 2019 life-of-mine plans has improved scheduled Saleable Product contaminant grades; there are, however, still periods where some of the contaminant grades slightly exceed the current Client product grade specifications. This remains an area of focus for 2020.

- **Finalisation of mining right amendments** – where the following deeds of amendment/variation in terms of section 102 of the Mineral and Petroleum Resources Development Act 28 of 2002 were registered at the Mineral and Petroleum Titles Office: Pretoria for the SIOC Kolomela mining right on 31 July 2019 to amend:
  - Clause 8 ("Conditions on disposal of Minerals and/or Products Derived from Mining") of the mining right;
  - Clause 1 of the mining right by substituting the diagram/ marked as annexure C to the mining right with the approved SG Mining Right diagram N179/2015 and amending Clause 1 of the mining right by amending the extent as it appears under measurement from 16 941.92 ha to 16 954.1466 ha.

  The deed to amend the Kolomela mining right and the mining work programme to include Farm 364 (Heuningkranz) and portion 1 of Farm 432 (Langverwacht), formerly part of the Heuningkranz prospecting right, was registered on 2 October 2019.

  The following deeds of amendment/variation in terms of section 102 of the Mineral and Petroleum Resources Development Act 28 of 2002 were registered at the Mineral and Petroleum Titles Office: Pretoria for the SIOC Sishen mining right on 7 November 2019 to amend:
  - the Surveyor General (SG) diagram to include the railway properties formerly held under servitude by Transnet;
  - the SG diagram to include the former prospecting right areas adjacent to the mining right areas after being granted the conversion of the prospecting rights to a mining right; and
  - the mining right to reflect that the former 21.4% undivided share held by ArcelorMittal SA over a portion of the Sishen mining right reverted to SIOC, now owning 100% of the mining right.

ASSURANCE

The following audit/review was conducted as part of the three-year rolling audit schedule maintained by Kumba:

- **An external independent due diligence audit (including a one-week site visit) by Golder Associates of the 2018 Ploegfontein (deposit within Kolomela mining right) Mineral Resources and estimation processes**
  Two findings with a significant risk rating were recorded, the first pertaining to an overestimation of Mineral Resources based on geological ore domaining and over-extrapolation, and the second was the lack of geometallurgical information to characterise the beneficiation potential of the ore body, which differs from the rest of the ore bodies at Kolomela mine.

  The Ploegfontein model is scheduled to be updated as part of the 2020 life-of-mine planning process and apart from correcting for the domaining and over-extrapolation, will incorporate the additional drilling (geological and geometallurgical) conducted in 2019. The geometallurgical drilling programme that commenced in 2019 will continue until 2021 to fully characterise the beneficiation potential of the Ploegfontein Mineral Resource.

  The 2019 Sishen Mine Mineral Resource and Ore Reserve estimates and processes informing the estimates is scheduled for an external due diligence audit in 2020. Please note the audit requirements do not only address SAMREC reporting compliance but also full resource and reserve estimation validation.

HIGH-LEVEL OVERVIEW OF KUMBA'S SALEABLE PRODUCT, ORE RESERVES AND MINERAL RESOURCES

THE FOUNDATION ON WHICH KUMBA'S BUSINESS IS BASED AND CONTINUOUSLY DEVELOPED.

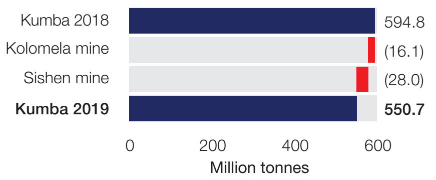
SALEABLE PRODUCT

Kumba Iron Ore treats or beneficiates its run-of-mine at its mining operations through crushing-and-screening, and various Dense media separation (DMS) processes as well as jigging to produce Lump and Fine iron ore products.

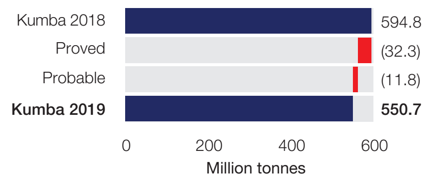
Saleable Product is derived through the application of fundamental and empirically derived beneficiation algorithms to the scheduled Ore Reserves (excluding estimated modified beneficiated Inferred Mineral Resources), considering the various site-specific types of run-of-mine, site-specific beneficiation capacities and site-specific beneficiation efficiencies.

SALEABLE PRODUCT SUMMARY

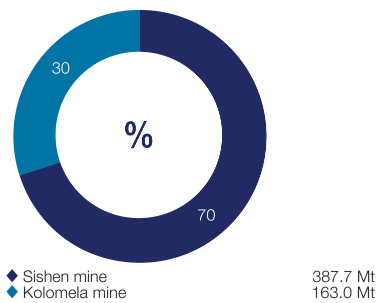
KUMBA SALEABLE PRODUCT MOVEMENT FROM 2018 TO 2019 (PER SITE)



KUMBA SALEABLE PRODUCT MOVEMENT FROM 2018 TO 2019 (PER CONFIDENCE CLASS)



KUMBA 2019 SALEABLE PRODUCT PORTFOLIO (PER SITE)



KUMBA 2019 SALEABLE PRODUCT PORTFOLIO (PER CONFIDENCE CLASS)

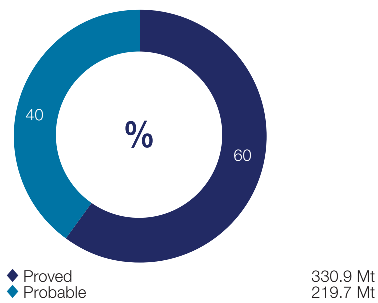


FIGURE 1: KUMBA IRON ORE 2019 (VERSUS 2018) SALEABLE PRODUCT SUMMARY

As at 31 December 2019, Kumba Iron Ore plans to produce 550.7 Mt of Saleable Product (excluding estimated modified beneficiated Inferred Mineral Resources) at an average beneficiated grade of 64.0% Fe from its two mining operations over its remaining reserve life:

KOLOMELA

163.0 Mt @ average 64.3% Fe

The 2019 Kolomela LoM plan delivers an average 60% Lump and 40% Fines Saleable Product.

SISHEN

387.7 Mt @ average 63.9% Fe

The 2019 Sishen LoM plan delivers an average 71.8% Lump and 28.2% Fines Saleable Product. Three different Lump (different top-size and Fe) and four different Fines (different Fe) products are produced on-site.

The Sishen products are co-located with the Kolomela products at the Saldanha export harbour to deliver the following Saleable Products:

- Premium Lump @ 65.2% Fe
- Premium 20mm Lump @ 64.0% Fe
- Standard Fines @ 63.5% Fe

The overall average Lump-to-Fine ratio of the Saleable Product is estimated at 68 : 32.

HIGH-LEVEL OVERVIEW OF KUMBA'S SALEABLE PRODUCT, ORE RESERVES AND MINERAL RESOURCES CONTINUED

YEAR-ON-YEAR MOVEMENT

A 7% decrease of 44.1 Mt is noted for the overall Kumba Saleable Product compared to 2018.

KOLOMELA

9% (-16.1 Mt) year-on-year decrease primarily because of annual production

Total movement balance is detailed in footnotes of **Table 5**.

SISHEN

7% (-28.0 Mt) year-on-year decrease mainly attributable to annual production

Total movement balance is detailed in footnotes of **Table 5**.

KUMBA SALEABLE PRODUCT PROFILE

The Kumba combined (Sishen and Kolomela) planned Saleable Product profile (including estimated modified and beneficiated Inferred material) is indicated in **Figure 2**.

KUMBA IRON ORE COMBINED 2019 LoMP SALEABLE PRODUCT PROFILE
(PER CONFIDENCE CLASS)

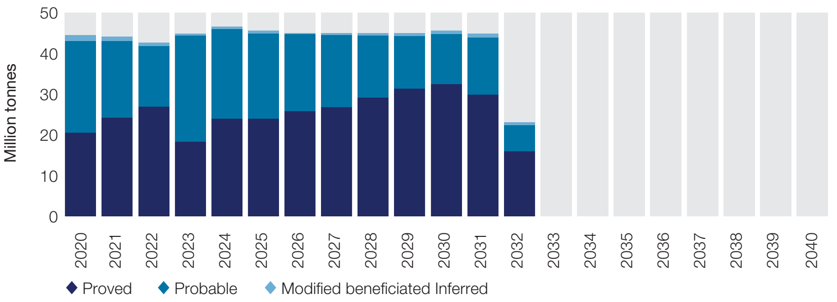


FIGURE 2: **KUMBA IRON ORE COMBINED SALEABLE PRODUCT PROFILE** (including estimated modified beneficiated Inferred Mineral Resources)

HIGH-LEVEL OVERVIEW OF KUMBA'S SALEABLE PRODUCT, ORE RESERVES AND MINERAL RESOURCES CONTINUED

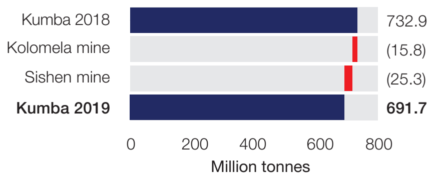
ORE RESERVES

Kumba's Ore Reserves are the economically mineable and beneficiable part of its Measured and Indicated Mineral Resources, making use of existing infrastructure and technology. It includes diluting materials and allowances for losses, which occurs when the material is mined and is defined as economically extractable by the latest life-of-mine plans. This includes the application of modifying factors and considers Kumba's latest view of economic parameters in terms of long-term pricing and exchange rate as well as cost.

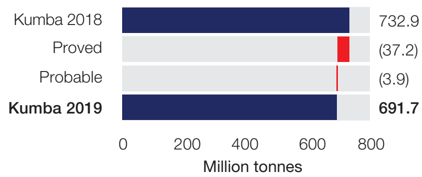
Where new infrastructure and/or technology are considered, Ore Reserves are only declared once a pre-feasibility or feasibility study has been approved by the relevant Anglo American and Kumba Iron Ore Investment Committees.

ORE RESERVE SUMMARY

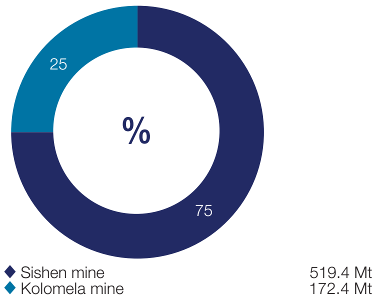
KUMBA ORE RESERVE MOVEMENT FROM 2018 TO 2019 (PER SITE)



KUMBA ORE RESERVE MOVEMENT FROM 2018 TO 2019 (PER CONFIDENCE CLASS)



KUMBA 2019 ORE RESERVE PORTFOLIO (PER SITE)



KUMBA 2019 ORE RESERVE PORTFOLIO (PER CONFIDENCE CLASS)

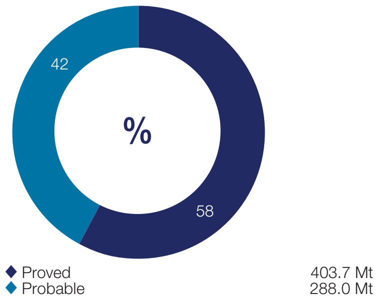


FIGURE 3: **KUMBA IRON ORE 2019 (VERSUS 2018) ORE RESERVE SUMMARY****

As of 31 December 2019, Kumba Iron Ore, from a 100% ownership reporting perspective, had access to an estimated haematite Ore Reserve of 691.7 Mt at an average unbeneficiated or feed grade of 59.0% Fe from its two mining operations:

KOLOMELA

172.4 Mt @ 63.1% Fe
against a 50.0% Fe cut-off grade.

SISHEN

519.4 Mt @ 57.6% Fe
against a 40.0% Fe cut-off grade.

** Please note that the Proved versus Probable tonnages in the pie chart (bottom right of **Figure 3**) were incorrectly quoted in 2018 as 544.6 Mt versus 188.2 Mt, whereas the correct 2018 Proved to Probable ratio was 440.9 Mt versus 291.9 Mt.

HIGH-LEVEL OVERVIEW OF KUMBA'S SALEABLE PRODUCT, ORE RESERVES AND MINERAL RESOURCES CONTINUED

YEAR-ON-YEAR MOVEMENT

A 6% net decrease of 41.1 Mt is noted for the overall Kumba Ore Reserves compared to 2018.

KOLOMELA

8% (-15.8 Mt) year-on-year decrease primarily as a result of annual production.

Total movement balance is detailed in footnotes of **Table 6**.

SISHEN

5% (-25.3 Mt) year-on-year decrease, mainly attributable to annual production.

total movement balance is detailed in footnotes of **Table 6**.

The decrease in the Proved to Probable Ore Reserve ratio from 60 : 40 in 2018 to 58 : 42 in 2019 is primarily as a result of a reduction in the size of the Kapstevel North pit layout at Kolomela Mine as well as the conversion of more Indicated medium-grade Mineral Resources to Probable Ore Reserves at Sishen Mine in the 2019 LoM plan.

KUMBA RUN-OF-MINE PROFILE (including modified Inferred Mineral Resources)

The Kumba combined (Sishen and Kolomela mine) planned run-of-mine profile is indicated in **Figure 4**. In line with the year-on-year reserve movement, the Kumba mine life and the reserve life decreased by one year from 2018 to 13 years in 2019.

KUMBA IRON ORE COMBINED 2019 LoMP RUN-OF-MINE PROFILE (PER CONFIDENCE CLASS)

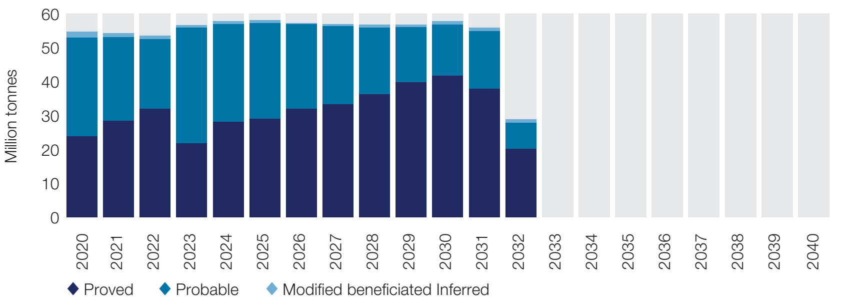


FIGURE 4: KUMBA IRON ORE COMBINED RUN-OF-MINE PROFILE (including estimated modified Inferred Mineral Resources)

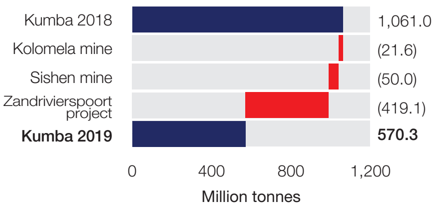
HIGH-LEVEL OVERVIEW OF KUMBA'S SALEABLE PRODUCT, ORE RESERVES AND MINERAL RESOURCES CONTINUED

MINERAL RESOURCES

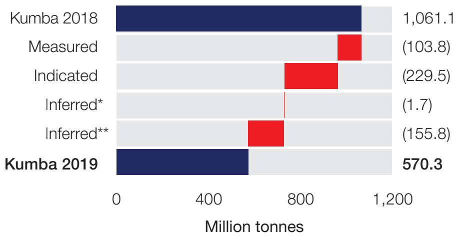
Kumba's Mineral Resources are the *in situ* iron ore of which the form, grade and quantity are spatially defined. In addition, long-term iron ore stockpiles with an average grade above the site-specific cut-off grades are also declared as Mineral Resources. The Mineral Resources are not an inventory of all mineral occurrences identified, but is an estimate of those, which under assumed and justifiable technical, environmental, legal and social conditions have reasonable prospects for its eventual economic extraction as per Kumba's current understanding of its value chain and market conditions. The location, quantity, grade, continuity and other geological characteristics of the Mineral Resources are known, interpreted and estimated from specific geological evidence and knowledge, including sampling.

EXCLUSIVE MINERAL RESOURCE SUMMARY

EXCLUSIVE MINERAL RESOURCE MOVEMENT FROM 2018 TO 2019 (PER SITE)

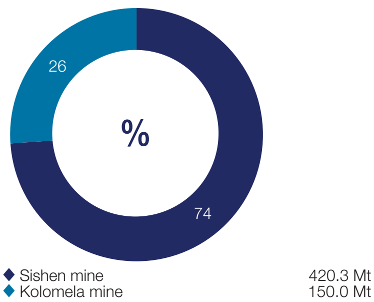


EXCLUSIVE MINERAL RESOURCE MOVEMENT FROM 2018 TO 2019 (PER CONFIDENCE CLASS)



* Considered in LoMP
** Outside LoMP

KUMBA 2019 EXCLUSIVE MINERAL RESOURCE PORTFOLIO (PER SITE)



KUMBA 2019 EXCLUSIVE MINERAL RESOURCE PORTFOLIO (PER CONFIDENCE CLASS)

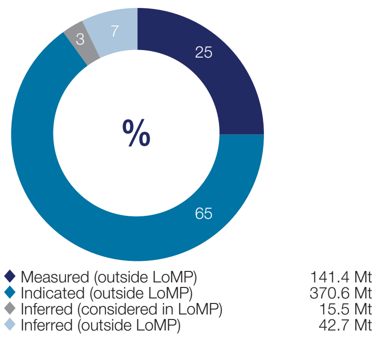


FIGURE 5: KUMBA IRON ORE 2019 (VERSUS 2018) EXCLUSIVE MINERAL RESOURCE SUMMARY

As at 31 December 2019, Kumba's remaining exclusive (in addition to Ore Reserves) Mineral Resource base is estimated at 570.3 Mt at an average *in situ* grade of 56.7% Fe.

HAEMATITE ORE BODIES

KOLOMELA MINE	**150.0 Mt @ average 62.8% Fe** against a 50.0% Fe cut-off grade.
SISHEN MINE	**420.3 Mt @ average 54.6% Fe** against a 40.0% Fe cut-off grade.

HIGH-LEVEL OVERVIEW OF KUMBA'S SALEABLE PRODUCT, ORE RESERVES AND MINERAL RESOURCES CONTINUED

YEAR-ON-YEAR MOVEMENT

A substantial 46% net decrease of 490.7 Mt is noted for the overall Kumba Mineral Resource compared to 2018.

KOLOMELA

13% (-21.6 Mt) year-on-year decrease

Primarily due to a decrease in the 1.6 revenue factor resource shells based on the annual pit optimisation validation of the reasonable prospects for eventual economic extraction principles, applying the Company's latest forward looking long-term economic parameters.

SISHEN

11% (-50.0 Mt) year-on-year decrease

Mainly due to the exclusion of a high contaminant portion of the low-grade (C-grade) ore from the Mineral Resource portfolio based on the re-evaluation of its reasonable prospects for eventual economic extraction as part of the Sishen UHDMS feasibility study.

ZANDRIVIERSPOORT

100% (-419.1 Mt) year-on-year decrease

The Sishen Iron Ore Company Proprietary Limited (SIOC) and ArcelorMittal SA 50 : 50 joint venture Zandrivierspoort project's exclusive Mineral Resource of 419.1 Mt is removed from the Kumba Mineral Resource as the prospecting right held by SIOC expires on 21 March 2020. SIOC and ArcelorMittal SA are still in discussions regarding the future of the project.

The change in the overall Measured to Indicated to Inferred Exclusive Mineral Resource ratio from 23 : 57 : 20 in 2018 to 25 : 65 : 10 in 2019, is the result of the removal of the substantial amount of Zandrivierspoort Mineral Resources from the Kumba resource portfolio.

PURPOSE

THIS STATEMENT DESCRIBES THE FOUNDATION FOR KUMBA IRON ORE'S LONG-TERM BUSINESS AS PER THE COMPANY'S CURRENT UNDERSTANDING, THINKING AND PLANNING

It is the objective of this statement to declare the Kumba Ore Reserves (and Saleable Product) and exclusive Mineral Resources as at 31 December 2019 and compare it with the corresponding 31 December 2018 figures. In addition, it aims to provide all relevant detail in support of the statement to explain how the Ore Reserve and Mineral Resource estimates were derived and what aspects thereto may be material for investment decisions.

It must be noted that the Mineral Resource and Ore Reserve figures presented in this statement are estimates, and although it has been derived to the best possible knowledge of the Competent Persons, it is inherently subject to some level of uncertainty and inaccuracy. The respective Competent Persons, however, take full responsibility for the Mineral Resource and Ore Reserve declarations.

This statement is the collective view of the Ore Reserve and Mineral Resource Competent Persons and strives to deliver a transparent and material view of the Kumba Ore Reserves and Mineral Resources to inform all relevant stakeholders.

Thabo Makhorole, a Technical Superintendent, and Dave Makumbila, a Senior Technician, in Geotechnical Services at the slope stability radar on the northern edge of the pit at Kolomela mine. The stability radar is mainly used to monitor any major slope changes and warns of any pit failures.

LOCATION

LOCATION OF OPERATIONS AND EXPLORATION PROJECTS IS DICTATED BY GEOLOGY.

All the Kumba sites for which Ore Reserves and/or Mineral Resources were declared in 2019 (and 2018) are located within the Republic of South Africa (**Figure 6**). As is the case with all mineral companies, the location of operations and exploration projects is dictated by geology.

The Kumba operations (Kolomela mine and Sishen mine) are located in the Northern Cape province. The Zandrivierspoort project location is still shown as it is referenced in the 2018 Mineral Resource figures in this statement.

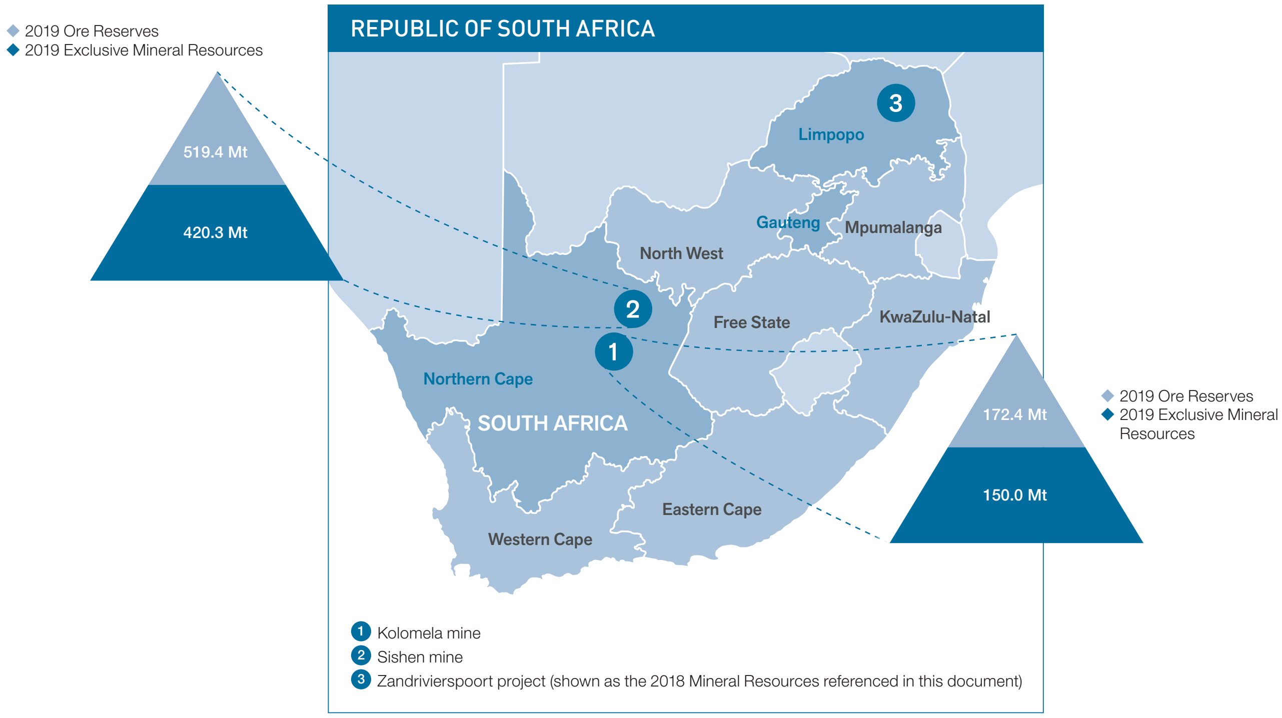


FIGURE 6: GEOGRAPHICAL LOCATIONS OF KUMBA OPERATIONS AND PROJECTS FOR WHICH ORE RESERVES AND MINERAL RESOURCES HAVE BEEN DECLARED

The WGS84 latitude/longitude geographical coordinate map references of the Kumba entities for which Ore Reserves and/or Mineral Resources have been declared in 2019 (and 2018) are listed below:

1 KOLOMELA MINE

Kolomela mine in the Northern Cape province near the town of Postmasburg

(28°23'30.05" S AND 22°58'46.88" E)

2 SISHEN MINE

Sishen mine in the Northern Cape province near the town of Kathu, which accounts for the bulk of Kumba's production

(27°44'02.29" S AND 23°00'39.95" E)

3 ZANDRIVIERSPOORT PROJECT

The Zandrivierspoort project, approximately 25km northeast of Polokwane in the Limpopo province

(23°40'17.65" S AND 29°35'41.08" E)

ATTRIBUTABLE OWNERSHIP

KUMBA HAS ACCESS TO ITS ORE RESERVES AND MINERAL RESOURCES THROUGH SISHEN IRON ORE COMPANY, IN WHICH IT HAS 76.29% ATTRIBUTABLE OWNERSHIP.

Kumba Iron Ore, a business unit of the Anglo American plc group as the major shareholder, has access to its iron ore Reserves and Resources through Sishen Iron Ore Company Proprietary Limited (SIOC). SIOC is the entity to which the mining and prospecting rights have been granted. The relevant Kumba Iron Ore ownership structure is illustrated in **Figure 7**.

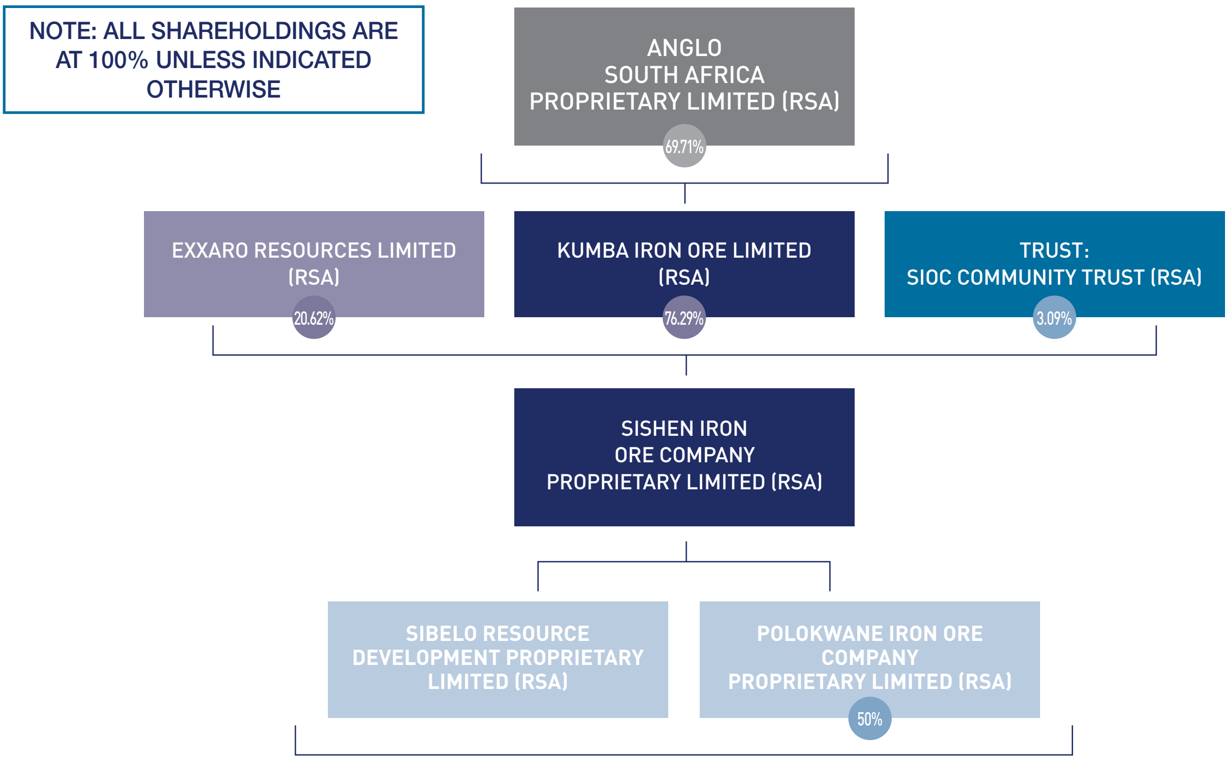


FIGURE 7: **KUMBA IRON ORE OWNERSHIP STRUCTURE**
(at the time of reporting)

For this statement, all Ore Reserve (and Saleable Product) and Mineral Resource estimates, whether Kumba Iron Ore's attributable ownership in the specific mineral asset is less than 100% or not, are reported as 100%; with the percentages attributable to Kumba Iron Ore indicated in the relevant tables. The overall proportion attributable to Sishen Iron Ore Company (SIOC), Kumba Iron Ore (KIO) and Anglo American plc is summarised in **Table 1**.

TABLE 1: **SIOC, KIO AND AA PLC MINERAL ASSET OWNERSHIP**
(at the time of report compilation - 30 November 2019)

	% owned by SIOC		% owned by Kumba Iron Ore		% owned by other shareholders		% owned by AA plc via KIO[1]	
Mineral asset	**2019**	2018	**2019**	2018	**2019**	2018	**2019**	2018
Kolomela mine	**100**	100	**76.3**	76.3	**23.7**	23.7	**53.2**	53.2
Sishen mine	**100**	100	**76.3**	76.3	**23.7**	23.7	**53.2**	53.2
Zandrivierspoort project[2]	**50**	50	**38.2**	38.2	**61.8**	61.8	**26.6**	26.6

[1] The holding company Sishen Iron Ore Company (SIOC) is 76.3% owned by Kumba Iron Ore (KIO). KIO is 69.7% owned by Anglo American plc (as at 30 November 2019 – time of report compilation).
[2] Zandrivierspoort is a 50 : 50 joint venture between ArcelorMittal SA and SIOC in a company called Polokwane Iron Ore Company.

SECURITY OF TENURE

KUMBA'S RIGHT TO MINE AND PROSPECT.

All Ore Reserves (and Saleable Product) and Mineral Resources (in addition to Ore Reserves) quoted in this document are held under notarially executed and registered mining and prospecting rights granted to Sishen Iron Ore Company Proprietary Limited (SIOC) in terms of the Mineral and Petroleum Resources Development Act No 28 of 2002 (MPRDA) by the Department of Mineral Resources (DMR) of the South African government. Kumba holds a 76.3% share in SIOC (at the time of reporting).

STATUS OF MINING RIGHTS

SIOC is the holder of mining rights for both its operations and the rights are of sufficient duration to enable the complete execution of the life-of-mine plans from which the Ore Reserves and Saleable Product have been derived. In terms of the MPRDA, SIOC also has the exclusive right to extend the period of these mining rights if so required.

The status of the mining rights are as follows:

Kolomela mine was granted a mining right for iron ore on 18 September 2008 for a 30-year mining period. An application to amend the supporting mining work programme (MWP) has been lodged in 2015 and a further amendment application to cater for *inter alia* the increase in production levels as per the 2016 LoM plan, was lodged on 31 January 2017, which application was subsequently approved on 7 July 2017. The approval of this made the application lodged in 2015 redundant.

The following deeds of amendment/variation in terms of section 102 of the Mineral and Petroleum Resources Development Act 28 of 2002 were registered at the Mineral and Petroleum Titles Office: Pretoria on 31 July 2019 to amend:

- Clause 8 ("Conditions on disposal of Minerals and/or Products Derived from Mining") of the mining right; and
- Clause 1 of the mining right by substituting the diagram/marked as annexure C to the mining right with the approved SG Mining Right diagram N179/2015 and amending clause 1 of the mining right by amending the extent as it appears under measurement from 16 941.92 ha to 16 954.1466 ha.

The deed to amend the Kolomela mining right and the mining work programme to include Farm 364 (Heuningkranz) and portion 1 of Farm 432 (Langverwacht) of the former Heuningkranz prospecting right, was registered on 2 October 2019.

Sishen mine was granted a mining right for iron ore and quartzite on 11 November 2009 for a 30-year mining period. The mining right area was extended in 2014, following a section 102 application to incorporate the old Transnet railway properties transecting the mining area from north to south, granted by the DMR on 28 February 2014. An outstanding 21.4% undivided share in the mining right, formerly held by ArcelorMittal South Africa, was also granted to SIOC in 2016, making it the sole owner of the right to mine iron ore and quartzite within the mining right area.

The following deeds of amendment/variation in terms of section 102 of the Mineral and Petroleum Resources Development Act 28 of 2002 were registered at the Mineral and Petroleum Titles Office: Pretoria for the SIOC Sishen mining right on 7 November 2019 to amend:

- the SG diagram to include the railway properties formerly held under servitude by Transnet;
- the SG diagram to include the former prospecting right areas adjacent to the mining right areas after being granted the conversion of the prospecting rights to a mining right; and
- the mining right to reflect that the former 21.4% undivided share held by ArcelorMittal SA over a portion of the Sishen mining right reverted to SIOC, now owning 100% of the mining right.

There are no outstanding mining right amendment applications for Sishen mine.

STATUS OF PROSPECTING RIGHTS

Kumba has until 2018, declared Mineral Resources on one prospecting right, referred to as the Zandrivierspoort project (50 : 50 joint venture between *SIOC* and *ArcelorMittal SA*), an undeveloped low-grade magnetite deposit in the Limpopo province.

The prospecting right is held by SIOC which initially expired on 17 November 2011 but a renewal application was granted for the period 22 March 2017 to 21 March 2020. *Sishen Iron Ore Company* is in discussions with its joint venture partner *ArcelorMittal SA* on future options.

STATUS OF ENVIRONMENTAL AUTHORISATIONS

All required permits and licensing to operate the Kolomela and Sishen mines have been granted with the exception of the following applications pending approval by the relevant authorities:

- Vegetation clearance permit for the planned Kapstevel South pit at Kolomela mine;
- Amendment of the Sishen environmental management programme (EMPr) to cater for a proposed high-energy fuel plant;
- Amendment of the Sishen EMPr to cater for the proposed conversion of the current dense media separation plant into a ultra-high dense media separation plant; and
- Amendment of the Sishen EMPr considering for the planned Lylyveld North and South expansions.

Other key applications required to support the 2019 LoM plan:

- Environmental authorisation and licensing/permitting for planned mining activities in the Far South area at Sishen mine.
- Deproclamation of the remaining Dingleton urban areas.

COMPETENCE

KUMBA CONSIDERS ITS RELEVANT TECHNICAL SPECIALISTS AS COMPETENT TO DECLARE ORE RESERVES AND MINERAL RESOURCES IN ACCORDANCE WITH THE SAMREC CODE – 2016 EDITION, TO PROVIDE THE DECISION MAKER WITH A TRANSPARENT AND MATERIAL INSIGHT INTO THE COMPANY'S ORE RESERVE AND MINERAL RESOURCE STATUS AT A GIVEN POINT IN TIME.

The Ore Reserve and Mineral Resource estimates were prepared by or under the direct supervision of Competent Persons as defined in the SAMREC Code (2016 Edition). All Competent Persons have sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which they are undertaking. All the Competent Persons consent to the inclusion in this statement of the information in the form and context in which it appears. All Competent Persons (**Table 2**, **Table 3** and **Table 4**) informing the 2019 Kumba Ore Reserve (and Saleable Product) and Mineral Resource Report assumed responsibility by means of signing a Competent Person appointment letter, kept by the Company's Principal – Mineral Resources, at Kumba's Centurion Gate Office in Pretoria, South Africa.

TABLE 2: CORPORATE RESPONSIBILITY – LEAD COMPETENT PERSONS REPUBLIC OF SOUTH AFRICA – KUMBA CORPORATE OFFICE

Business unit	Field	Name	Title	Employed by	Professional organisation	Registration number	Years' relevant experience
Kumba Iron Ore	Mineral Resources	Jean Britz	Principal Mineral Resources	Sishen Iron Ore Company Proprietary Limited	SACNASP Professional Natural Scientist	400423/04	15
	Ore Reserves*	Theunis Otto	Head Mining Engineering	Sishen Iron Ore Company Proprietary Limited	ECSA Professional Engineer	990072	15

* The term "Ore Reserves" in the context of this report has the same meaning as "Mineral Reserves", as defined by the SAMREC Code. The term "Ore Reserves" is preferred because it emphasises the difference between these and Mineral Resources.

TABLE 3: MINING OPERATION RESPONSIBILITY REPUBLIC OF SOUTH AFRICA – KUMBA IRON ORE OPERATIONS

Operations	Field	Name	Title	Employed by	Professional organisation	Registration number	Years' relevant experience
Kolomela mine	Mineral Resources	Hannes Viljoen	Section Manager, Exploration and Resource Geology	Sishen Iron Ore Company Proprietary Limited	SACNASP Professional Natural Scientist	400245/10	12
	Ore Reserves	Neil Rossouw	Manager, Operational Readiness	Sishen Iron Ore Company Proprietary Limited	ECSA Professional Engineer	2008143	9
Sishen mine	Mineral Resources	Nomawezo Mbele	Section Manager, Resource Geology	Sishen Iron Ore Company Proprietary Limited	SACNASP Professional Natural Scientist	400160/13	5
	Ore Reserves	Derek Esterhuysen	Principal Mining Engineer	Sishen Iron Ore Company Proprietary Limited	ECSA Professional Engineer	20040033	11

COMPETENCE CONTINUED

TABLE 4: PROJECT RESPONSIBILITY
REPUBLIC OF SOUTH AFRICA - KUMBA IRON ORE PROJECTS

Projects	Field	Name	Title	Employed by	Professional organisation	Registration number	Years' relevant experience
Zandrivierspoort project	Mineral Resources	Stuart J Mac Gregor	Head of Geosciences	Sishen Iron Ore Company Proprietary Limited	SACNASP Professional Natural Scientist	400029/09	13
	No Ore Reserve declared						

The Lead Competent Persons for Ore Reserves and Mineral Resources as appointed in 2019 can without any qualifications state that:

- The Ore Reserve and Mineral Resource figures presented in this statement are considered to be a true reflection of the Ore Reserve and Mineral Resource estimates as at 31 December 2019 for Kumba, and that public reporting is based on site-specific Reserve and Resource Statements that have been carried out in accordance with the minimum standards and guidelines of the SAMREC Code (2016 Edition) as verified and to the best of the knowledge of the Competent Persons.
- The Ore Reserve and Mineral Resource figures quoted in this statement have been reviewed by a panel of peers, including technical specialists from Anglo American.
- The Lead Competent Persons have not been unduly influenced by Kumba Iron Ore or any person commissioning the Ore Reserve and Mineral Resource Statement and are of the opinion that all critical assumptions are documented, and adequate disclosure is made of all material aspects that the informed reader may require, to make a reasonable and balanced judgement of the Ore Reserve and Mineral Resource figures.
- The Lead Competent Persons have sufficient experience relevant to the style and type of mineral deposit under consideration and to the activity which is being undertaken to qualify as a Competent Person as defined in the SAMREC Code (2016 Edition).
- The Lead Competent Persons consent to the inclusion in the Kumba Iron Ore Integrated Report as well as in the AA plc R&R Report and R&R summary section of the AA plc annual report, of the public R&R information (as defined in the Kumba R&R policy and reporting procedure documents) in the form and context in which it appears in this statement.

Kumba appreciates any feedback regarding the competency, materiality and transparency with which its Ore Reserves and Mineral Resources have been presented in this statement.

***Feedback**: (jean.britz@angloamerican.com)*

GOVERNANCE

KUMBA, THROUGH ANGLO AMERICAN PLC, APPLIES A RIGOROUS SCHEDULED GOVERNANCE PROGRAMME TO ENSURE REPRESENTATIVE ORE RESERVE (AND SALEABLE PRODUCT) AND MINERAL RESOURCE REPORTING.

Applicable codes and policies are applied throughout Anglo American plc (AA plc) via a governance document, i.e. the AA plc group technical standard (AA_GTS_22), which holistically governs Resource and Reserve reporting for all the AA plc business units, of which Kumba Iron Ore forms part. The standard is supported by a requirements document [AA_RD_22_25 – Version 10 (2019)] which sets out the minimum requirements for Resource and Reserve reporting throughout the Anglo group, to ensure a uniform approach to reporting and adherence to the latest applicable national reporting codes, which in the case of Kumba is the SAMREC Code (2016 Edition). The requirements document is revised annually prior to resource and reserve reporting, with refinements approved by the AA plc R&R Reporting Committee.

The Kumba reserve and resource reporting governance framework is summarised in **Figure 8**.

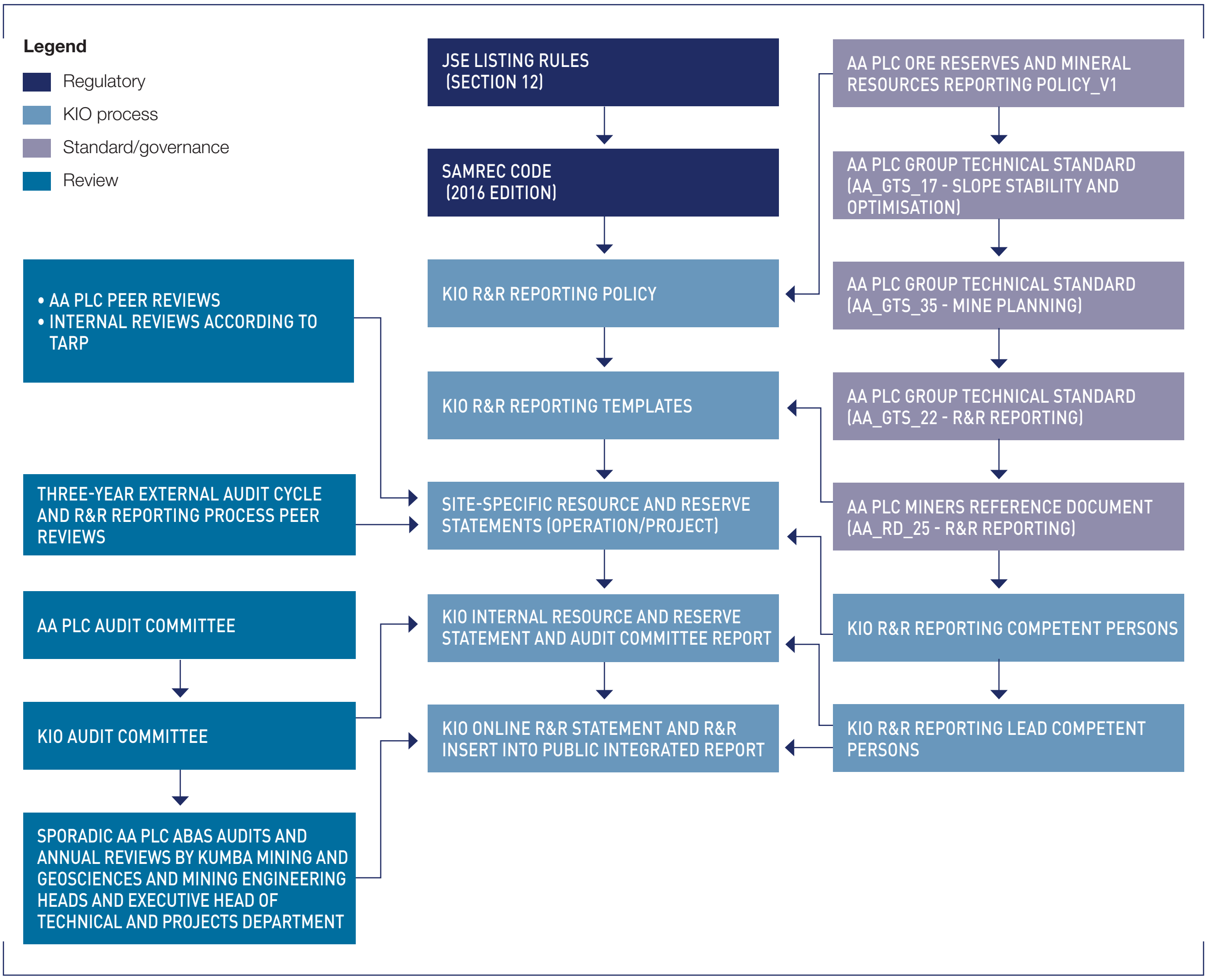


FIGURE 8: **KUMBA IRON ORE RESERVE AND RESOURCE REPORTING GOVERNANCE FRAMEWORK**

ASSURANCE

KUMBA FOLLOWS A STRUCTURED INTERNAL AND EXTERNAL REVIEW PROGRAMME TO VERIFY REPRESENTATIVE ORE RESERVES (AND SALEABLE PRODUCT) AS WELL AS MINERAL RESOURCES ESTIMATION.

The Anglo American and Kumba Iron Ore Audit Committees require all reporting entities (Operations, Projects and Exploration) to undergo a continuous and comprehensive programme of audits and reviews aimed at providing confidence and assurance in respect of all components contributing to the Ore Reserve and Mineral Resource estimation processes and the public reporting of those estimates.

As most of the Kumba Reserve and Resource estimation and reporting is conducted by Sishen Iron Ore Company Proprietary Limited employed technical specialists and Competent Persons, Kumba recognises the importance of independent external audits of its R&R estimation and reporting processes and associated output to provide assurance regarding its published R&R estimates. Since the inception of Kumba Iron Ore, its executive management has sustained a governance cost centre that sponsors or allows for the contracting of a reputable independent external mining consultancy firm, to be changed every four years.

Kumba requires that each operation/project for which Ore Reserves and/or Mineral Resources are declared, undergo an external independent due diligence audit once every three years. The scope of work required encompasses a due diligence (sign off) audit of about two to four weeks and must include an additional one-week site visit by the auditors. The audit should not only produce ranked findings but also ranked opportunities. Ranking is conducted according to the Anglo American Risk Matrix (**Figure 9**), a standard adopted by all disciplines/functions within the group as part of its risk management process, to allow for a uniform approach to the assessment and comparisons of risks across the value chain.

PROBABILITY		CONSEQUENCE (Where an event has more than one "consequence type", choose the "consequence type" with the highest rating) Insignificant	Minor	Moderate	High	Major
		RISK LEVEL				
Almost certain	90% and higher probability of occurring	11	16	20	23	25
Likely	Between 60% and less than 90% of occurring	7	12	17	21	24
Possible	Between 30% and 60% probability of occurring	4	8	13	18	22
Unlikely	Between 1% and 30% probability of occurring	2	5	9	14	19
Rare	Less than 1% probability of occurring	1	3	6	10	15

Risk rating	Risk level	Guidelines for risk matrix
21 to 25	High	A high risk exists that management's objectives may not be achieved. Appropriate mitigation strategy to be devised immediately.
13 to 20	Significant	A significant risk exists that management's objectives may not be achieved. Appropriate mitigation strategy to be devised as soon as possible.
6 to 12	Medium	A moderate risk exists that management's objectives may not be achieved. Appropriate mitigation strategy to be devised as part of the normal management process.
1 to 5	Low	A low risk exists that management's objectives may not be achieved. Monitor risk, no further mitigation required.

FIGURE 9: ANGLO AMERICAN RISK MATRIX

ASSURANCE CONTINUED

Currently, Golder Associates (Africa) is in its third year of contract to audit the Kumba Reserves and Resources. An independent external due diligence audit was conducted in 2019 whereby Golder Associates Africa were contracted to audit the Ploegfontein Mineral Resources at Kolomela mine in April.

The Ploegfontein Mineral Resource audit identified **two high/significant risks** associated with the 2018 Mineral Resources:

- Finding 1: High grade haematite domain models included the lithology FEM (Ferro-Manganese). This is a low iron and high manganese lithology and is markedly different to the haematite lithology it was combined with. Golder recommends that the geology model is rebuilt, with this lithology modelled as separate domain.
  Mitigation: A complete redo of the Ploegfontein solids model was conducted in 2019, separating the high-grade ore and Ferro-Manganese lithologies into separate domains. The results will, however, only reflect in the 2020 Kolomela Mineral Resource estimates.
- Finding 2: No geometallurgical data is available for the deposit. There is a risk that the metallurgical properties and the beneficiation recovery for Ploegfontein ore will be different to the other Kolomela deposits. The geological character of the Ploegfontein deposit is markedly different to the other deposits currently in production.
  Mitigation: A geometallurgical drilling campaign has been launched in 2019 to generate large-diameter borehole sample geometallurgical data for the Ploegfontein deposit according to the Kumba geometallurgical protocol. As of the end of October 2019, 21 PQ-sized boreholes were drilled at Ploegfontein.
  In terms of the sampling and testing, the geometallurgical protocol has been adjusted to also generate clay information, dividing the -1mm fraction into a -1+0.63mm and -0.63mm fraction to determine which fraction the bulk of the expected clay reports to and to determine the associated chemical characteristics. Kumba Geosciences is also conducting XRD and MLA to determine the type of clay present. Further, the logging has been refined to qualitatively capture the amount of clay present. Geometallurgical characterisation is ongoing.

For 2020, an independent external due diligence audit (including a one-week site visit) is planned for the Sishen 2019 Ore Reserves and Mineral Resources and associated estimation processes.

ORE RESERVES (AND SALEABLE PRODUCT)

KUMBA STRIVES TO ACCURATELY PLAN AND EXTRACT THE MAXIMUM VALUE FROM ITS MINERAL ENDOWMENT THROUGH SAFE, RESPONSIBLE AND COST EFFECTIVE PRODUCTION WHICH MEETS ITS CLIENTS' REQUIREMENTS.

Kumba applies a uniform Ore Reserve estimation process at all its sites as explained below:

RESERVE ESTIMATION

MINING BLOCK MODELLING	• The *in situ* Mineral Resource tonnages and grades as estimated and classified within 3D geological block models are initially modified by converting the geological block models into mining block models, considering aspects such as smallest mining unit and open-pit bench definitions. • In the mining block model, planned modifying factors such as dilution and mining losses are realised while other factors such as geological losses and mining recovery efficiencies, determined via value chain reconciliation of actual geological accuracies and extraction efficiencies, are applied to convert *in situ* ore to a run-of-mine ore equivalent. **Software: GEOVIA Surpac™ and Deswik™**.
PIT OPTIMISATION	• The resultant mining block model is constrained via pit optimisation, using various fiscal parameters and geotechnical slope inputs, to spatially distinguish between ore which is currently (optimal pit shell) and eventually economically extractable (optimistic pit shell). The fiscal parameters used for pit optimisation is explained in a separate section. **Software: GEOVIA Whittle 4X™**.
PIT DESIGN	• The optimal pit shell is engineered or designed into a safe practical pit layout, considering geotechnical slope stability parameters, equipment aligned haul road and ramp as well as bench definitions. The pit layout envelopes the current economically extractable ore volume, and forms the basis for the life-of-mine scheduling and resultant Ore Reserve and Saleable Product estimates. **Software: Trimble Open Pit Design™, GEOVIA Surpac™ and Deswik™**.
LIFE-OF-MINE SCHEDULING	• The mining blocks as constrained by the pit layout are then scheduled using various equipment utilisation, mining activity effectiveness, cut-off grade and blending and stockpile philosophy inputs. The modified ore is scheduled to the various beneficiation plants and/or stockpile destinations, as well as from stockpiles to honour annual Saleable Product targets and client off-take specifications, while the waste is scheduled to the various waste destinations. This is an iterative process as sequencing of mining activities must be such that consistent output is achieved over time. • Scenarios are generated considering strategic and tactical plans to be able to decide on a best fit life-of-mine plan for the business. **Software: RPM Open Pit Metals Solution™**.
INFRASTRUCTURE MATCH	• The infrastructure required to achieve the life-of-mine schedule is then compared with existing infrastructure and associated lifespans and if adjustments are required in terms of equipment purchases or stoppages or changes in terms of waste dumping, etc. it is indicated as such to timeously plan the subsequent infrastructure to match the life-of-mine schedule. • The placing of any additional permanent infrastructure is usually done outside the optimistic shell extents.
VALUATION	• The best fit plan is valuated through the assignment of value chain costs (including environmental, social and governmental costs) and long-term pricing and other fiscal parameters. This valuation is conducted including and excluding modified Inferred run-of-mine to indicate the risk associated with the modified Inferred run-of-mine included in the life-of-mine plan.
REPORTING	• The Proved and Probable Ore Reserves (as modified from the *in situ* Measured and Indicated Mineral Resources occurring inside the pit layout), excluding the modified Inferred run-of-mine, are then reported as Ore Reserves, and include all the planned Proved and Probable run-of-mine scheduled over the total life-of-mine period. The Proved and Probable product derived from applying relevant yield modifications to the Proved and Probable Ore Reserves, are quoted as the Saleable Product and include all the planned Proved and Probable Saleable Product derived over the total life-of-mine period.

ORE RESERVES (AND SALEABLE PRODUCT)

CONTINUED

COMMODITY PRICING PROCESS

Kumba prefers not to disclose its forward-looking iron ore price and therefore provides a breakdown of how it is derived. The long-term price, as obtained from the Anglo American Commodities Research Department, is adjusted by Kumba to convert it from a market figure to a site-specific figure used to define current and eventual economic extractability:

- The first adjustment made to the price is the sea freight adjustment and is done to reflect the long-term price at Saldanha (Kumba's export harbour) in US$/tonne Free-On-Board (FOB) terms at a 62% Fe grade.
- Higher Fe content, as well as Lump ore, gains a premium in the market. This is the second adjustment, considering site-specific planned Lump-Fine ratios and average Fe contents, i.e. prices are derived for the Lump and Fine products from each of the processing streams (for example the dense media separation and Jig processing streams at Sishen mine or direct shipping ore at Kolomela mine). Thereafter price averaging is applied based on a mass weighted average calculation.
- Once the average product prices are calculated in US$/tonne FOB terms, the long-term real exchange rate is applied to convert the price to a Rand/tonne FOB Saldanha base.
- To calculate the Rand/tonne Free-On-Rail (FOR) price for the products, the long-term rail cost is subtracted for each of the sites. The rail cost includes related logistics and marketing costs.
- As a final adjustment, contractual obligations are considered. This completes the long-term adjustment process.

Site-specific long-term pricing and a long-term exchange rate as well as current budget costs (representing the total mining value chain) escalated over time, are then used to derive an optimal pit shell (~1 revenue factor) and resource shell (1.6 revenue factor). The iron ore price required to obtain a 1.6 revenue factor has historically been achieved in the iron ore market and therefore supports reasonable prospects for eventual economic extraction as per Kumba's interpretation of iron ore price cycles.

2019 VERSUS 2018 SALEABLE PRODUCT

Saleable Product has been derived through the application of:

- beneficiation (yield and associated product grade) algorithms derived from densimetric borehole data and adjusted or scaled up to represent plant beneficiation using measured plant beneficiation efficiencies at Sishen mine; and
- empirically estimated yield performances at Kolomela mine applied to the scheduled run-of-mine (Ore Reserves).

Run-of-mine blending is one of the main levers used during scheduling to ensure that the resultant iron ore product is suitable for off-take in current market conditions.

The 2019 Kolomela and Sishen life-of-mine plans, considering current contract and Client supply agreement conditions, deliver a total estimated Saleable Product of 550.7 Mt at an average 64.0% Fe over the reserve life years for the two mining operations (**Table 5**).

ORE RESERVES (AND SALEABLE PRODUCT)

CONTINUED

TABLE 5: KUMBA'S SALEABLE PRODUCT FOR 2019 (referenced against 2018)

The reporting format has been changed to distinguish between Saleable Product, where plant feed originates from the pit versus plant feed originating from run-of-mine buffer stockpiles.

Operation/Project	Operation status	Mining method	Ore type	% owned by KIO	Saleable Product category	Metallurgical yield % 2019	Metallurgical yield % 2018	Saleable Product 2019 Tonnage (Mt)	Saleable Product 2019 Grade (% Fe) Average	Saleable Product 2018 Tonnage (Mt)	Saleable Product 2018 Grade (% Fe) Average
Mining operations											
Kolomela mine[1]											
Saleable Product from pit	Steady-state	Open pit	Haematite	76.3	Proved	**94.6**	95.2	101.3	64.4	Not separately tabled in 2018	
					Probable			54.3	64.2		
					Sub-total			**155.5**	**64.3**		
Saleable Product from run-of-mine buffer stockpiles					Proved			0.0	0.0	Not separately tabled in 2018	
					Probable			7.5	64.5		
					Sub-total			**7.5**	**64.5**		
Total Saleable Product					Proved			101.3	64.4	114.8	64.6
					Probable			61.8	64.2	64.3	64.6
					Total			**163.0**	**64.3**	179.1	64.6
Sishen mine[2]											
Saleable Product from pit	Steady-state	Open pit	Haematite	76.3	Proved	**74.6**	76.3	229.7	63.7	Not separately tabled in 2018	
					Probable			148.5	64.2		
					Sub-total			**378.1**	**63.9**		
Saleable Product from run-of-mine buffer stockpiles					Proved			0.0	0.0	Not separately tabled in 2018	
					Probable			9.5	64.6		
					Sub-total			**9.5**	**64.6**		
Total Saleable Product					Proved			**229.7**	**63.7**	248.4	64.8
					Probable			**158.0**	**64.2**	167.2	63.9
					Total			**387.7**	**63.9**	415.6	64.4
Company											
Kumba Iron Ore											
Grand total Saleable Product					Proved	**79.6**	81.2	**330.9**	**63.9**	363.3	64.7
					Probable			**219.7**	**64.2**	231.5	64.1
					Grand total			**550.7**	**64.0**	594.8	64.5

Footnotes to Saleable Product (Table 5)

- The tonnages are quoted in dry metric tonnes and million tonnes is abbreviated as Mt.
- Rounding of figures may cause computational discrepancies.
- Saleable Product figures are reported at 100% irrespective of percentage attributable ownership to Kumba Iron Ore.

Footnotes to Saleable Product (Table 5) explaining year-on-year differences:

1 Kolomela mine's Saleable Product decreased by 16.1 Mt (-9%) from 2018 to 2019

The overall decrease is a result of:

- annual production of 13.5 Mt (excluding depletion of modified beneficiated Inferred Mineral Resources);
- a 6.7 Mt decrease associated with the decrease in Ore Reserves due to a change in the method from which the dilution modification factor is derived (less dilution);
- product stockpile levels decreasing by 0.4 Mt year-on-year; and
- a 3.0 Mt decrease associated with the decrease in Ore Reserves based on a smaller Kapstevel North pit layout.

The decrease is offset by a 7.4 Mt net increase associated with the higher resource-to-reserve conversion rate. As a result the average life-of-mine plan yield did however reduce from 95.2% in 2018 to 94.6% in 2019 due to a change in the feed ratio to the direct shipping ore (DSO) crushing and screening plant versus dense media separation (DMS) plant, from 90 : 10 in 2018 to 88 : 12 in 2019 (the dense media separation plant feed consisting of medium-grade material with an estimated yield of ~55%).

2 Sishen mine's Saleable Product decreased by 28.0 Mt (-7%) year-on-year

The net annual decrease is a result of:

- annual production of 27.5 Mt (excluding depletion of modified beneficiated Inferred Mineral Resources); and
- a 2.2 Mt decrease in the product stockpile levels.

The decrease was offset by:

- a 0.7 Mt net increase associated with the higher resource-to-reserve conversion rate; as a result the average life-of-mine plan yield did however reduce from 76.3% in 2018 to 74.6% in 2019 (average Saleable Product Fe also reduced from 64.5% in 2018 to 64.0% in 2019), because the 2019 LoM plan utilises an optimised plant feed strategy to manage the risk associated with the dense media separation plant reliability; and
- an increase of 0.9 Mt with less product produced in Q4 of 2018 than forecasted at the time of reporting.

The Sishen products are co-stockpiled with the Kolomela products at the Saldanha export harbour to deliver the following final saleable products:

- Premium Lump @ 65.2% Fe;
- Standard Lump @ 64.0 % Fe; and
- Standard Fines @ 63.5% Fe.

ORE RESERVES (AND SALEABLE PRODUCT)

CONTINUED

2019 VERSUS 2018 ORE RESERVES

The 2019 Kolomela and Sishen life-of-mine plans, considering the latest technical and business inputs, estimate the Ore Reserves (Proved and Probable portion of scheduled run-of-mine) at 691.7 Mt at an average 59.0% Fe over the mine life years for the two mining operations (**Table 6**).

The reporting format has been changed to distinguish between Ore Reserves scheduled from the pit and from existing run-of-mine buffer stockpiles.

TABLE 6: KUMBA'S ORE RESERVES FOR 2019 (referenced against 2018)

						Ore Reserves							
						2019				2018			
Operation/ project	Operation status	Mining method	Ore type	% owned by KIO	Reserve category	Tonnage (Mt)	Average Grade (% Fe)	Grade Cut-off * (% Fe)	Reserve life** (Years)	Tonnage (Mt)	Average Grade (% Fe)	Grade Cut-off * (% Fe)	Reserve life** (Years)
Mining operations													
Kolomela mine[1]													
Ore Reserves from pit					Proved	103.9	63.5			Not separately tabled in 2018			
					Probable	55.4	64.0						
					Sub-total	**159.3**	**63.7**						
Ore Reserves from run-of-mine buffer stockpiles					Proved	0.0	0.0			Indicated in footnotes in 2018			
	Steady-state	Open pit	Haematite	76.3	Probable	13.1	55.4	50.0	12			50.0	14
					Sub-total	**13.1**	**55.4**						
Total Ore Reserves					Proved	103.9	63.5			117.9	64.3		
					Probable	68.5	62.4			70.4	63.2		
					Total	**172.4**	**63.1**			**188.2**	**63.9**		
Sishen mine[2]													
Ore Reserves from pit					Proved	299.8	58.5			Not separately tabled in 2018			
					Probable	207.3	56.2						
					Sub-total	**507.1**	**57.6**						
Ore Reserves from run-of-mine buffer stockpiles					Proved	0.0	0.0			Indicated in footnotes in 2018			
	Steady-state	Open pit	Haematite	76.3	Probable	12.2	58.7	40.0	13			40.0	14
					Sub-total	**12.2**	**58.7**						
Total Ore Reserves					Proved	299.8	58.5			323.0	58.7		
					Probable	219.5	56.3			221.6	55.6		
					Total	**519.4**	**57.6**			**544.6**	**57.5**		
Company													
Kumba Iron Ore					Proved	403.7	59.8			440.9	60.2		
Grand total Ore Reserves					Probable	288.0	57.8			291.9	57.5		
					Grand total	**691.7**	**59.0**			**732.9**	**59.1**		

ORE RESERVES (AND SALEABLE PRODUCT)

CONTINUED

Footnotes to the Ore Reserves (Table 6)

- The tonnages are quoted in dry metric tonnes and million tonnes is abbreviated as Mt.
- Rounding of figures may cause computational discrepancies.
- Ore Reserve figures are reported at 100% irrespective of percentage attributable ownership to Kumba Iron Ore.

* The cut-off grade assigned to Ore Reserves is variable and is dependent on the beneficiability and/or blending capacity of the modified ore scheduled as run-of-mine, which is iteratively determined during life-of-mine plan scheduling to achieve a scheduling grade target that is set to meet the Client product specifications. The % Fe cut-off illustrated is therefore the lowest of a range of variable cut-offs for the various mining areas. It includes dilution material and can therefore, in certain cases, be less than the Mineral Resource cut-off grade.

** Reserve life represents the period in years in the approved life-of-mine plan for scheduled extraction of Proved and Probable Reserves. The reserve life is limited to the period during which the Ore Reserves can be economically exploited. Where the scheduled Ore Reserves fall below 25% of the average annual production rate, the period beyond this is excluded from the reserve life.

Footnotes to the Ore Reserves (Table 6) – summarising reserve life

1 For Kolomela mine a 12-year remaining reserve life (13-year mine life)*, at an average 13.6 Mtpa Saleable Product output for 12 of the 12 years of reserve life has been quoted in 2019

It is derived from an average 14.4 Mtpa plant feed, which includes 2% modified Inferred run-of-mine ore.
To define the risk of having low confidence modified Inferred Mineral Resources in the LoM plan, Kolomela mine valuated a long-term mine plan scheduling scenario excluding the modified Inferred Mineral Resources. The plan remained economically viable, although at a 4% lower net present value (@ 8% real discount rate).

2 For Sishen mine, a 13-year reserve life (13-year mine life)*, at an average 31.1 Mtpa Saleable Product output for 12 of the 13 years of reserve life (ramp-down in last year) has been quoted in 2019

It is derived from an average 41.8 Mtpa plant feed, which includes 2% modified Inferred run-of-mine ore.

To define the risk of having low confidence modified Inferred Mineral Resources in the LoM plan, Sishen mine valuated a long-term mine plan scheduling scenario excluding the modified Inferred Mineral Resources. The plan remained economically viable, although at a 3% lower net present value (@ 8% real discount).

Footnotes to Ore Reserves (Table 6) – explaining annual Ore Reserve differences

1 Kolomela mine realised a year-on-year net decrease in Ore Reserves of 15.8 Mt (-8%)

The overall decrease is primarily a result of annual production of 14.8 Mt ex-pit (excluding depletion of modified Inferred Mineral Resources) as well as:

- a change in the methodology of determining the dilution modifying factor when considering unclassified waste material, resulting in a 7.3 Mt decrease in Ore Reserves (less dilution); and
- a decrease in the size of the Kapstevel North pit layout resulting in 3.0 Mt Ore Reserves re-allocated to Mineral Resources (with an associated reduction of ~54 Mt in waste) based on the 2019 pit optimisation with an associated year-on-year decrease in the overall stripping ratio of Kolomela mine from 4.1 : 1 to 3.8 : 1, offset by
- an 8.6 Mt year-on-year gain whereby more Mineral Resources were converted to Ore Reserves in the 2019 LoM plan compared to the 2018 LoM plan; and
- a 0.8 Mt year-on-year increase in the run-of-mine buffer stockpile levels.

In the case of the Kolomela mining operation the Ore Reserve reference point is the primary crusher feeders where the planned run-of-mine is delivered to either the crushing and screening plant (where direct shipping ore is produced), or the small-scale dense media separation (DMS) plant.

2 Sishen mine's Ore Reserves decreased by 25.3 Mt (-5%) year-on-year

Most of the annual decrease can be attributed to an estimated annual production (excluding modified Inferred Mineral Resources) of 39.2 Mt, offset by:

- an improved resource-to-reserve conversion rate in 2019 compared to 2018, resulting in a 10.1 Mt increase in Ore Reserves;
- an increase in the run-of-mine buffer stockpile level of 2.5 Mt; and
- a 1.3 Mt increase based on the reconciliation of the Q4 2018 production figures, where 1.3 Mt less were mined than estimated at the time of reporting.

In the case of the Sishen mining operation the Ore Reserve reference point is the primary crusher feeders where the planned run-of-mine is delivered to either the DMS plant or the Jig (+ small scale Ultra-high media separation – UHDMS) plant.

* Mine life represents the period in years in the approved Life-of-Mine plan for scheduled extraction of run-of-mine (including modified Inferred Mineral Resources) as per the long-term production schedule, while the reserve life definition requires that Proved and Probable Ore Reserves estimated per year should make up >25% of the average annual run-of-mine of the long-term production schedule.

EXCLUSIVE MINERAL RESOURCES

THIS IS THE ORE IN ADDITION TO THE ORE RESERVES, WHICH IS RECEIVING KUMBA'S UNDIVIDED ATTENTION AS PART OF "HORIZON 1" (IMPROVED RESOURCE UTILISATION) AND "HORIZON 2" (CONTINUED EXPLORATION, PROJECT STUDIES, TECHNOLOGY DEVELOPMENT AND POSSIBLE PARTNERSHIPS) OF ITS STRATEGY, IN AN ATTEMPT TO CONVERT IT TO ORE RESERVES (HORIZON 1). IT MUST BE NOTED THAT ONLY A PORTION OF THE CURRENT MINERAL RESOURCE PORTFOLIO CAN BE CONVERTED TO ORE RESERVES BY ACHIEVING IMPROVED RESOURCE UTILISATION TARGETS; CONVERSION OF THE REST IS DEPENDENT ON AN INCREASE IN KUMBA'S LONG-TERM IRON ORE PRICE OUTLOOK, THUS MARKET RELATED.

EXPLORATION

Kumba continued its exploration activities in the Northern Cape focusing on both on and off-mine opportunities. Exploration on the Heuningkranz deposit wound down following the successful inclusion into the Kolomela mining right and focus shifted to on-mine exploration and gaining access to new prospective targets:

- SIOC has secured access to explore neighbouring properties close to Kolomela through an option agreement with the current right holders. If the properties are prospective, and meet our expected criteria, Kumba will have the right to take up 70% of the ownership in the assets.
- At Kolomela mine exploration and infill drilling focused on the Kapstevel South and Ploegfontein deposits to increase the geological confidence and obtain large-diameter core samples for geometallurgical analyses.
- At Sishen mine exploration and infill drilling are currently focused in areas at Dingleton where the mine has obtained access after the relocation of most of the Dingleton community members, to increase the geological confidence of the area ahead of planned mining.

During 2018/2019 a comprehensive tender process was facilitated by the Anglo American Supply Chain Department for the Anglo American regional exploration and operational grade control drilling requirements. Tenders were issued to 16 drilling companies of which six tenders were received for the Kumba drilling requirements in the Northern Cape. A single service provider has been appointed in 2019 to provide drilling services for a period of five years. The partnership with the new service provider includes the latest drilling technology which will significantly reduce the exposure of employees to drilling related safety and health hazards. A comprehensive roll-out plan has been designed and the new generation drill rigs will be completely implemented across the Kumba operations by the end of 2021.

COST

Drilling activities decreased 13% (11,452 meters) year-on-year and the associated exploration spent decreased by 24% (R112.0 million) from 2018 to 2019. The decrease in the cost outweighs the decrease in the drill metres as a result of Kumba's effort to minimise direct and indirect exploration cost.

The unit cost for drilling decreased by 0.3% year-on-year.

The all-inclusive cost associated with exploration in 2019 is summarised in **Table 7**. The 2019 (10 actual +2 forecast) exploration expenditure comprises 0.6% of Kumba Iron Ore's 2019 (10 actual +2 forecast) revenue.

TABLE 7: SUMMARY OF 2019 VERSUS 2018 KUMBA EXPLORATION EXPENDITURE (10+2 forecast)

	Total exploration spend (10+2) x million		Drilling spend (10+2) x million		Number of holes drilled (10+2)		Metres drilled (10+2)		Average drilling cost per metre	
	2019	2018	**2019**	2018	**2019**	2018	**2019**	2018	**2019**	2018
Mining right areas	**R351.2**	R321.2	**R251.2**	R223.4	**367**	419	**77,436**	69,308	**R3,244.41**	R3,223.55
Prospecting right areas	**R0**	R142.1	**R0**	R66,0	**0**	80	**0**	19,580	**R0**	R3,369.13
Total	**R351.2**	R463.2	**R251.2**	R289.4	**367**	499	**77,436**	88,888	**R3,244.41**	R3,255.62

The exploration costs as set out in the table above is the combined costs of various types of core, reverse circulation and percussion drilling, of which the ratio of various drill types differ between the different Kumba sites where exploration is conducted..

EXCLUSIVE MINERAL RESOURCES CONTINUED

SAMPLING AND ASSAYING

All primary geological samples taken from drilled core (and in some instances RC and percussion chips) via normal exploration drilling at all the relevant Kumba sites in 2019, to be used for future Mineral Resource estimation, were prepared and assayed by the Chemistry Laboratory (company registration number: 1921/0067130/06) of the Technical Solutions (TS) Division of Anglo American plc.

All samples taken from drilled core of dedicated geometallurgical boreholes were prepared and tested for an array of metallurgical and other physical property measurements by the Metallurgical Laboratory of the Anglo American Technical Solutions (TS) Division of Anglo American plc, with subsequent assaying of these samples, where required, conducted by the AA plc Chemistry Laboratory.

The TS Chemistry Laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005 by the South African National Accreditation System (SANAS) under the Facility Accreditation Number T0051 (valid from 22 July 2016 to 30 April 2021) for the preparation and assaying of iron ore samples, applying methods that comply with the requirements of Kumba Iron Ore.

As per the 10+2 forecast, Kumba Geosciences submitted 28,388 (25,220 exploration and 3,168 grade control) borehole samples in 2019 directly to the TS Chemistry Laboratory to be prepared and analysed. In addition, 5,083 borehole samples were submitted to the TS Metallurgical Laboratory to be prepared and tested. A total of 33,471 primary samples were submitted to the TS Chemistry and TS Metallurgical Laboratories. A total of 33,471 samples were submitted.

Of the samples submitted, the TS Chemistry Laboratory prepared 24,764 samples and assayed 30,300 samples for the year (including samples from the TS Metallurgical Laboratory). Differences between submitted, prepared and assayed sample numbers are influenced by laboratory turnaround times. Differences between prepared and assayed samples are primarily because of samples delivered to the Chemistry Laboratory by the Metallurgical Laboratory as part of the geometallurgical sampling protocol, a backlog of samples carried over from 2018 as well as additional QC samples (5% coarse and 5% pulp duplicates with 5% blind matrix matched certified reference materials counting as a primary sample) as required by the Kumba Geosciences QA/QC protocol.

The TS Metallurgical Laboratory prepared 5,582 samples (including backlog of samples from 2018) in 2019. The samples were then composited based on lithology and chemistry to obtain minimum masses as required by certain geometallurgical tests. Geometallurgical test work conducted involved:

- 1,780 bulk density Archimedes tests;
- 580 geotechnical hardness tests;
- 659 comminution-related tests;
- 224 densimetric tests;
- 36 mineralogy tests; and
- 180 refinement (lump ore value-in-use) tests.

All the primary exploration samples were prepared, assayed and tested in the Republic of South Africa except for a total of 5% pulp replicate QC samples generated by the TS Chemistry Laboratory, which were analysed by the Bureau Veritas Laboratory in Perth, Australia, an ISO and National (Australian) Association of Testing Authorities (NATA) accredited laboratory for iron ores and a member of the ISO MN-002-02 Chemical Analysis Committee, as part of the Kumba Geosciences Department's required external independent QA/QC validation.

The 2019 (10+2 forecast) spend on sample preparation and assaying at the AA plc TS Chemistry Laboratory amounted to R30.5 million (9% of total exploration expenditure). The 2019 (10+2 forecast) spend on sample preparation and metallurgical testing at the AA plc TS Metallurgical Laboratory amounted to R31.2 million (9% of total exploration expenditure).

Kumba ensures sample representivity by means of applying a stringent QA/QC protocol (KIO QC protocol for exploration drilling, sampling and sub-sampling – Version 8) that governs all stages of sampling, sub-sampling and assaying, including blind validation of the sample preparation and assaying of laboratories.

EXCLUSIVE MINERAL RESOURCES CONTINUED

Kumba applies a uniform Mineral Resource estimation process at all its sites as explained below.

RESOURCE ESTIMATION

DATA ASSEMBLY AND QUALITY

- The data generated by exploration, primarily drilling, must be representative of the volume of material being sampled. Samples are generated through quasi regular sampling (drilling) grids and are validated by means of a stringent quality control programme which blindly monitors sample location, primary sampling, sample preparation and sample assaying. Because some of the historically drilled samples used for estimation do not have QA/QC metadata, Kumba introduced a sample representivity indexing method, which is considered during spatial geological confidence classification. **Software: acQuire™**.

SOLIDS MODELLING

- Validated exploration data is used to compile spatially referenced 3D tectono-stratigraphic models based on the geologists' understanding and interpretation of the regional and local geology and ore genesis.
- The solids model geometrically domains the various iron ore types in relation to the waste lithologies, within primary structural domains. Because of the pervasive nature of the iron ore mineralisation in the Northern Cape province of RSA, Kumba has to compile full 3D solids models and ferruginisation is often of such a nature that lower grade ore domains are distinguished from waste and higher grade ore applying soft boundaries or Fe cut-off grades.
- Each domain's bounding surface in effect provides an efficient volume description of the tectono-stratigraphical unit. **Software: Seequent Leapfrog Geo™ and Geovia Surpac™**.

EXPLORATORY DATA ANALYSIS

- The validated borehole grade data intersecting the various solids model domains is statistically analysed through univariate and multivariate statistical methods to understand its distributions and relations and to identify outliers.
- Thereafter the data is composited to achieve constant sample support and again statistically analysed per domain and sub-domaining based on grade is conducted if different populations within a single solids domain can be spatially distinguished. **Software: JMP™**.

GEOLOGICAL BLOCK MODELLING

- Iron ore is a typical multivariate grade commodity and Kumba geostatistically models sample density and the following sample grade parameters of the ore domains as a minimum, i.e. Fe, SiO_2, Al_2O_3, K_2O and P to establish its spatial variability.
- Experimental variograms for each variable is obtained and modelled and used as input to derive search parameters for subsequent estimation runs. **Software: Isatis™**.

CONFIDENCE CLASSIFICATION

- Kumba applies a scorecard approach whereby certain key site-specific parameters as identified by the Competent Person (CP), are indexed and used to measure geometry and grade continuity. Each block within the geological block model is populated with these indices. The individual grade indices and geometry indices are then weighted as per the CP's understanding of its impact. The weights are applied to derive a combined grade index as well as a combined geometry index, which in turn is weighted, as per the CP's understanding of the deposit to derive a final single geological confidence index. The final confidence index is then classed against index boundaries as derived by the CP to distinguish between Measured, Indicated and Inferred Mineral Resources. The CP also has the authority to override areas of indexed classification and downgrade it. **Software: Isatis™, Geovia Surpac™, DataMine Studio™**.

RESOURCE REPORTING

- Resources are reported as that portion of the ore in the 3D geological block model that has *in situ* grades above the Fe cut-off grade (derived from beneficiation potential), that are located within the 1.6 Revenue Factor resource shell (as derived through pit optimisation).

EXCLUSIVE MINERAL RESOURCES CONTINUED

2019 VERSUS 2018 EXCLUSIVE MINERAL RESOURCES

The Kumba Mineral Resources (in addition to Ore Reserves) for 2019 are detailed in **Table 8**. The reporting format has been changed to distinguish between *in situ* Mineral Resources and Mineral Resources located on long-term stockpiles.

TABLE 8: KUMBA'S EXCLUSIVE MINERAL RESOURCES FOR 2019 (referenced against 2018)

Operation/ project	Ore type	% owned by KIO	Resource category	2019 Tonnage (Mt)	2019 Average % Fe	2019 Average % Fe_3O_4*	2019 % Fe Cut-off**	2018 Tonnage (Mt)	2018 Average % Fe	2018 Average % Fe_3O_4*	2018 % Fe Cut-off**
Mining operations											
Kolomela mine[1]											
***In situ* Mineral Resources** (in addition to Ore Reserves)			Measured (outside LoMP)	34.1	63.2			Not separately tabled in 2018			
			Indicated (outside LoMP)	77.9	62.4						
			Measured and Indicated (outside LoMP)	**112.0**	62.6						
			Inferred (considered in LoMP)	4.5	66.1						
			Inferred (outside LoMP)	29.3	62.7						
			Total Inferred	**33.7**	**63.2**						
			Sub-total	**145.7**	**62.7**						
Long-term Stockpiled Mineral Resources (in addition to Ore Reserves)	Haematite	76.3	Measured (outside LoMP)	0.0	0.0			Indicated in footnotes in 2018			
			Indicated (outside LoMP)	4.2	55.7						
			Measured and Indicated (outside LoMP)	**4.2**	**55.7**	**Not applicable**	50.0			Not applicable	50.0
			Inferred (considered in LoMP)	0.0	0.0						
			Inferred (outside LoMP)	0.0	0.0						
			Total Inferred	**0.0**	**0.0**						
			Sub-total	**4.2**	**55.7**						
Total Mineral Resources (in addition to Ore Reserves)			Measured (outside LoMP)	34.1	63.2			36.4	63.2		
			Indicated (outside LoMP)	82.1	62.0			96.1	61.8		
			Measured and Indicated (outside LoMP)	**116.2**	**62.4**			**132.5**	**62.1**		
			Inferred (considered in LoMP)	4.5	66.1			5.3	64.7		
			Inferred (outside LoMP)	29.3	62.7			33.8	62.5		
			Total Inferred	**33.7**	**63.2**			**39.1**	**62.8**		
			Sub-total	**150.0**	**62.6**			**171.6**	**62.3**		
Sishen mine[2]											
***In situ* Mineral Resources** (in addition to Ore Reserves)			Measured (outside LoMP)	107.3	56.4			Not separately tabled in 2018			
			Indicated (outside LoMP)	266.3	54.8						
			Measured and Indicated (outside LoMP)	**373.7**	**55.3**						
			Inferred (considered in LoMP)	11.0	57.1						
			Inferred (outside LoMP)	13.4	48.2						
			Total Inferred	**24.5**	**52.2**						
			Sub-total	**398.1**	**55.1**						
Long-term Stockpiled Mineral Resources (in addition to Ore Reserves)	Haematite	76.3	Measured (outside LoMP)	0.0	0.0			Indicated in footnotes in 2018			
			Indicated (outside LoMP)	22.2	43.9						
			Measured and Indicated (outside LoMP)	**22.2**	**43.9**	**Not applicable**	40.0				40.0
			Inferred (considered in LoMP)	0.0	0.0						
			Inferred (outside LoMP)	0.0	0.0						
			Total Inferred	**0.0**	**0.0**						
			Sub-total	**22.2**	**43.9**						
Total Mineral Resources (in addition to Ore Reserves)			Measured (outside LoMP)	107.3	56.4			113.7	56.3		
			Indicated (outside LoMP)	288.5	54.0			325.2	53.4		
			Measured and Indicated (outside LoMP)	**395.8**	**54.7**			**438.9**	**54.2**		
			Inferred (considered in LoMP)	11.0	57.1			11.8	57.2		
			Inferred (outside LoMP)	13.4	48.2			19.6	47.9		
			Total Inferred	**24.5**	**52.2**			**31.4**	**51.4**		
			Sub-total	**420.3**	**54.6**			**470.3**	**54.0**		

EXCLUSIVE MINERAL RESOURCES CONTINUED

TABLE 8: continued

KUMBA'S EXCLUSIVE MINERAL RESOURCES FOR 2019 (referenced against 2018) continued

Operation/ project	Ore type	% owned by KIO	Resource category	2019 Tonnage (Mt)	2019 Average % Fe	2019 Average % Fe_3O_4*	2019 % Fe Cut-off**	2018 Tonnage (Mt)	2018 Average % Fe	2018 Average % Fe_3O_4*	2018 % Fe Cut-off**
Mining operations continued											
Kumba Iron Ore - mining operations											
Operations Mineral Resources (in addition to Ore Reserves)			Measured (outside LoMP)	141.4	58.0			150.1	58.0		
			Indicated (outside LoMP)	370.6	55.8			421.3	55.3		
			Measured and Indicated (outside LoMP)	**512.1**	**56.4**			**571.4**	**56.0**		
			Inferred (considered in LoMP)	15.5	59.7			17.2	59.5		
			Inferred (outside LoMP)	42.7	58.1			53.3	57.2		
			Total Inferred	**58.2**	**58.5**			**70.5**	**57.7**		
			Total	**570.3**	**56.6**			**641.9**	**56.2**		
Projects											
Zandrivierspoort[3]											
***In situ* Mineral Resources** (in addition to Ore Reserves)	Magnetite and Haematite	38.2	Measured (outside LoMP)	0.0	0.0	0.0		95.1	35.5	41.4	20.2
			Indicated (outside LoMP)	0.0	0.0	0.0		178.8	35.5	39.9	
			Measured and Indicated (outside LoMP)	**0.0**	**0.0**	**0.0**		**273.9**	**35.5**	**40.5**	
			Inferred (considered in LoMP)	0.0	0.0	0.0		0.0	0.0	0.0	
			Inferred (outside LoMP)	0.0	0.0	0.0		145.2	35.2	37.6	
			Total Inferred	**0.0**	**0.0**	**0.0**		**145.2**	**35.2**	**37.6**	
			Sub-total	**0.0**	**0.0**	**0.0**		**419.1**	**35.4**	**39.5**	
Kumba Iron Ore – projects											
Projects Mineral Resources (in addition to Ore Reserves)			Measured (outside LoMP)	0.0	0.0	0.0		95.1	35.5	41.4	
			Indicated (outside LoMP)	0.0	0.0	0.0		178.8	35.5	39.9	
			Measured and Indicated (outside LoMP)	**0.0**	**0.0**	**0.0**		**273.9**	**35.5**	**40.5**	
			Inferred (considered in LoMP)	0.0	0.0	0.0		0.0	0.0	0.0	
			Inferred (outside LoMP)	0.0	0.0	0.0		145.2	35.2	37.6	
			Total Inferred	**0.0**	**0.0**	**0.0**		**145.2**	**35.2**	**37.6**	
			Total	**0.0**	**0.0**	**0.0**		**419.1**	**35.4**	**39.5**	
Company											
Kumba Iron Ore											
Grand total (Operations and Projects) Mineral Resources (in addition to Ore Reserves)			Measured (outside LoMP)	141.4	58.0			245.2	49.2		
			Indicated (outside LoMP)	370.6	55.8			600.1	49.4		
			Measured and Indicated (outside LoMP)	**512.1**	**56.4**			**845.3**	**49.4**		
			Inferred (considered in LoMP)	15.5	59.7			17.2	59.5		
			Inferred (outside LoMP)	42.7	58.1			198.5	41.1		
			Total Inferred	58.2	58.5			**215.7**	**42.5**		
			Total	**570.3**	**56.6**			**1,061.0**	**48.0**		

EXCLUSIVE MINERAL RESOURCES CONTINUED

Footnotes to the exclusive Mineral Resources (Table 8)

- The tonnages are quoted in dry metric tonnes and million tonnes is abbreviated as Mt.
- Rounding of figures may cause computational discrepancies.
- Mineral Resource figures are reported at 100% irrespective of percentage attributable Kumba Iron Ore ownership.
- The term Inferred Mineral Resource (outside LoMP) refers to that portion of the Mineral Resources not utilised in the LoMP of the specific mining operation or project.
- The term Inferred Mineral Resource (considered for LoMP) refers to that portion of the Mineral Resources utilised in the LoMP of the specific mining operation; reported without having any modifying factors applied – therefore the term "considered for LoMP" instead of "inside LoMP".
- Due to the uncertainty that may be attached to some Inferred Mineral Resources, it cannot be assumed that all or part of an Inferred Mineral Resource will necessarily be upgraded to an Indicated or Measured Resource after continued exploration.

* Fe_3O_4 – Magnetite

** The cut-off grade quoted for all the Kumba sites except the Zandrivierspoort project, is a fixed grade cut-off grade. In the case of Zandrivierspoort, the 20.2% Fe cut-off grade is a minimum value, with the cut-off grade being spatially dynamic. A minimum yield of 35.6% is required to define eventual economic extractability. This yield is determined from beneficiation algorithms based on metallurgical test work conducted on borehole samples and is spatially estimated considering the total *in situ* % Fe as well as the *in situ* magnetite: haematite ratio, with the cut-off determined to achieve break-even cost.

Footnotes to Mineral Resources (Table 8) explaining year-on-year exclusive Mineral Resource differences:

1 Kolomela mine quotes a 21.6 Mt (-13%) decrease in exclusive Mineral Resources from 2018 to 2019

The overall decrease is the result of:

- A decrease in the size of the resource shells based on the 2019 pit optimisation considering the latest long-term economic assumptions, resulting in a 17.6 Mt decrease in Mineral Resources.
- A higher utilisation of medium-grade material by the 2019 LoM plan compared to the 2018 LoM plan, resulting in a 3.8 Mt decrease in Mineral Resources.
- Estimated (at the time of reporting) annual depletion of 1.3 Mt of Inferred Mineral Resources.

The decrease as explained above was offset by a 1.1 Mt increase in the level of the long-term stockpiled Mineral Resources. Of the 29.3 Mt Inferred Mineral Resources (outside the LoM plan), 19.8 Mt is extrapolated.

2 The Sishen mine exclusive Mineral Resources showed a material 11% decrease of 50.0 Mt year-on-year

The material year-on-year decrease is primarily the result of the removal of a 39.2 Mt portion from the low-grade Mineral Resource portfolio. The Sishen UHDMS project feasibility study has demonstrated that some of the low-grade ore declared as *in situ* Mineral Resources can only be recovered by selective mining, and since this is not considered a viable option considering the current long-term planned mining activities, it was decided that the material also does not have reasonable prospects for eventual economic extraction. This does not affect the business case of the Sishen low grade project.

The other major contributing factors are:

- an estimated (at the time of reporting) depletion of 11.0 Mt (3.2 Mt Inferred and 7.8 Mt low-grade Mineral Resources, the low-grade Mineral Resources not extracted as run-of-mine);
- a higher utilisation of medium-grade material by the 2019 LoM plan compared to the 2018 LoM plan, resulting in a 2.6 Mt decrease in Mineral Resources; and
- reconciliation of -1.5 Mt to account for the fact that the 1.5 Mt more Inferred Mineral Resources were depleted than forecast at the time of reporting in 2018.

The decrease as explained above was offset by a 4.3 Mt increase in the level of the long-term stockpiled Mineral Resources. Of the 13.4 Mt Inferred Mineral Resources (outside the LoM plan), 1.0 Mt is extrapolated.

3 The Zandrivierspoort project exclusive Mineral Resources decreased by a material 419.1 Mt (-100%) from 2018 to 2019

The SIOC-ArcelorMittal SA 50 : 50 joint venture Zandrivierspoort project's exclusive Mineral Resource of 419.1 Mt is removed from the Kumba Mineral Resource portfolio as the prospecting right expires on 21 March 2020.

The Zandrivierspoort project is managed by the Polokwane Iron Ore Company (PIOC), a 50 : 50 joint venture between SIOC and ArcelorMittal SA. The partners are still in discussion about the future of the project.

RISK

WHAT ARE THE MOST PROMINENT RISKS THAT CAN RESULT IN THE ORE RESERVES AND MINERAL RESOURCES NOT MATERIALISING AS ESTIMATED?

Apart from the Mineral Resource and Ore Reserve estimation confidence classifications, Kumba, on an annual basis, asks its Competent Persons to highlight prominent (high and significant ranked as per the standard Anglo American risk matrix) Reserve and Resource risks relevant to their specific sites. These risks are then re-evaluated and rated by the lead Competent Persons to consider its potential impact on the total Kumba business.

ORE RESERVE RISKS

The 2019 Ore Reserve estimates are subject to the following significant risks:

- Legal:
  - If the relocation of the final households of the Dingleton community (located south-west of Sishen mine) is delayed by a further 12 months, the mining of ~5.0 Mt Ore Reserves in 2022 and ~1.0 Mt Ore Reserves in 2023 will be deferred.

Mitigation: Subsequent Sishen LoM plans will have to consider the scheduling of alternative mining areas (albeit at a higher stripping ratio and increased mining cost), to sustain annual Saleable Product output to planned levels. Kumba has successfully relocated 99% of the households in Dingleton and will continue to use the strategy and approach that has proven successful up to now.

- Market:
  - Kumba Iron Ore is a relatively small player in the global iron ore market and its Ore Reserves are very sensitive to price changes. Should the iron ore price deteriorate over time, Kumba will have to accommodate for this by reducing the size of its pit layouts to manage costs in order to protect its income margin.

Mitigation: The pit designs conducted by Kumba are in the form of pushbacks, with different pushbacks having different stripping ratios. Pushbacks can be activated or deactivated to consider significant changes in the long-term iron ore price.

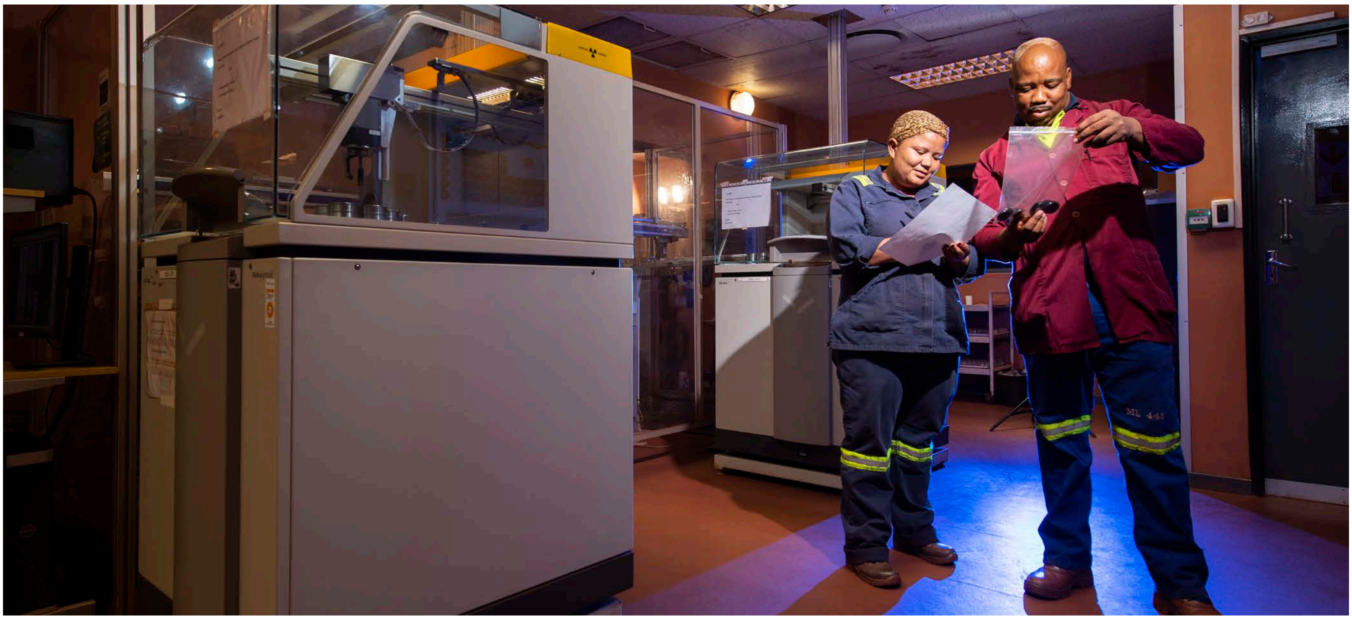
MINERAL RESOURCE RISKS

The 2019 Mineral Resource estimates are subject to the following significant risks:

- Legal
  - None.

- Technical:
  - Due to the uncertainty that may be attached to some Inferred Mineral Resources, it cannot be assumed that all or part of an Inferred Mineral Resource will necessarily be upgraded to an Indicated or Measured Resource after continued exploration. History has also shown that some geological losses may be experienced with the conversion of Indicated Mineral Resources to Measured Mineral Resources based on continued exploration.

    It must be noted that the Ploegfontein deposit at Kolomela mine consists of 100% Inferred and Indicated Mineral Resources (in pre-feasibility phase of project). Kumba is continuing with exploration to improve the geological confidence of the deposit to front-end load the pre-feasibility study.



Nassly Kiable and Otladisa Mokhutsane, XRF operators working in the Kolomela laboratory.

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT

ALL THE PRODUCTION-RELATED FIGURES QUOTED IN THIS SECTION ARE FORECAST (8+4) AS THE COMPILATION OF THE SITE RESOURCE AND RESERVE STATEMENTS, FROM WHICH THIS CONDENSED PUBLIC R&R STATEMENT WAS DERIVED FOR KUMBA, COMMENCED ON 1 OCTOBER 2019.

KOLOMELA MINE

GEOLOGICAL OUTLINE

Regional geology

Kolomela mine is located towards the southern end of the "Iron Ore Belt" in the Northern Cape province of South Africa (**Figure 10**).

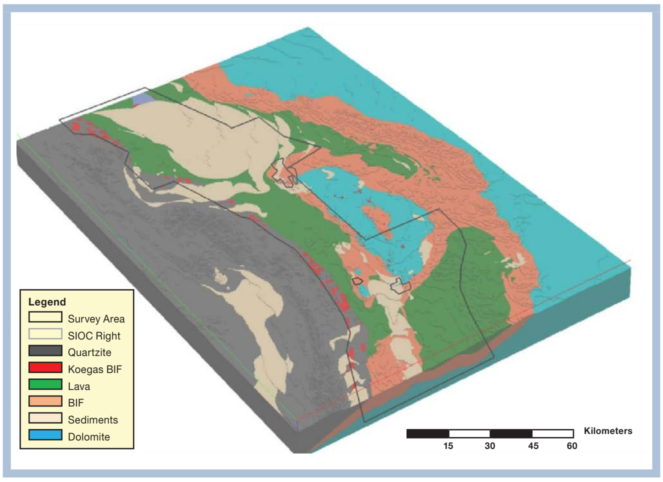


FIGURE 10: KOLOMELA MINE'S LOCATION IN THE NORTHERN CAPE PROVINCE "IRON ORE BELT" OF RSA

The Transvaal Supergroup (Eriksson et al, 1993; 1995), or Griqualand West Supergroup as it is referred to where it occurs in the Northern Cape, is host to all of the iron ore occurrences in the region. The Supergroup was deposited in fault-controlled basins on a basement of Archaean granite gneisses and greenstones and/or lavas of the Ventersdorp Supergroup (Beukes, 1983). In the Kathu-Postmasburg region, the oldest rocks of the approximately 8km thick Griqualand West Supergroup (Beukes, 1980) are the ~1.6km thick carbonate platform sediments (dolomites with minor limestone, chert and shale) of the Campbell Rand Subgroup of the Ghaap Group (Beukes, 1983; Altermann and Wotherspoon, 1995; Beukes, 1986).

Conformably overlying the carbonates is the banded iron formation unit, the Asbestos Hills Subgroup (Beukes, 1980), which is considered to be a Superior-type banded iron formation, that can be up to 500m thick. Locally the upper portion of the banded iron formation (Kuruman Iron Formation) has been enriched to ore grade, i.e. Fe > 60%, and the ores found within this unit comprise the bulk of the high-grade iron ores in the region. The Kuruman Iron Formation is conformably overlain by the Griquatown Iron Formation. The two iron formations differ in that the Griquatown Iron Formation, comprising mainly allochemical sediments, was deposited in a shallow-water, storm-dominated epeiric sea (Beukes, 1984), whereas the Kuruman Iron Formation, comprising orthochemical iron formations, was developed in the basin (Beukes, 1980). However, in the Maremane dome area, the Griquatown Iron Formation has been almost entirely removed by erosion along an unconformity separating the banded iron formations from the overlying clastic sediments of the Gamagara Formation.

During uplift and erosion solution and karstification of the upper dolomitic units of the lower Ghaap Group occurred and a 10 to 20m thick, residual solution breccia, referred to as the "Manganese Marker", "Wolhaarkop Breccia" (van Wyk, 1980; van Schalkwyk and Beukes, 1986) or Wolhaarkop Formation, developed between the basal dolomites and overlying banded iron formation. Locally, deep sinkholes developed in the dolomites, into which the overlying iron formation collapsed (Beukes, 1983).

A thick sequence of younger clastic sediments (shales, quartzites and conglomerates) of the Gamagara Formation unconformably overly the Ghaap Group rocks and some of the conglomerates, comprised almost entirely of haematite, constitute lower-grade iron ore. The Gamagara Formation, interpreted as the base of the Palaeoproterozoic (~2.1-1.83 Ga) Olifantshoek Supergroup is overlain by the Palaeoproterozoic (~2.35-2.1 Ga) Postmasburg Group along an interpreted thrust contact in the study area (van Schalkwyk and Beukes, 1986; Friese and Alchin, 2007). The thrust fault has been folded during subsequent deformation.

An altered gabbroic sill in the Kolomela area typically separates the iron ore from the underlying host banded iron formation, or is intrusive in the banded iron formation at Kolomela (Carney and Mienie, 2002). It is interpreted to have intruded into the Griqualand West Supergroup in late Proterozoic times (Friese and Alchin, 2007). The localised unit is prominent in the Leeuwfontein and Klipbankfontein ore bodies but absent in other areas.

Diamictite of the Makganyene Formation (de Villiers and Visser, 1977) and lava of the Ongeluk Formation (Postmasburg Group) have been thrust over the Gamagara Formation sediments in the vicinity of Postmasburg, which are now preserved only within the larger synclinal basins (Schütte, 1992).

The Makganyene diamictites comprise massive to poorly bedded diamictite, pebbly sandstone and siltstone, shale and mudstone up 100m thick, which are interpreted as piedmont glacial and glaciofluvial assemblages (Beukes, 1983; Visser 1971). A second facies within the Makganyene contains mainly stacked cycles of graded bedded diamictite-greywacke-siderite bandlutite, which have been interpreted as glaciomarine

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

deposits (Beukes, 1983). The Ongeluk lavas (600m thick; Schütte, 1992) were extruded under water in a marginal basin within the continental setting of the Kaapvaal craton (Schütte, 1992), and comprise essentially tholeiitic basaltic andesites.

The lavas have been dated at 2,240 ± 57 Ma (Walraven et al, 1982), 2,239 ±90 Ma (Armstrong, 1987) and 2,222 ± 13 Ma (Cornell et al, 1996).

A considerable portion of the upper parts of the stratigraphy was eroded during Dwyka glaciation and re-deposited as tillite (Visser, 1971) during the Cretaceous era. The entire, folded sequence was later truncated by Tertiary erosion and a thick blanket of calcrete, dolocrete, clays and pebble layers of the Kalahari Group were deposited unconformably over older lithologies.

Stratigraphy

Iron ore at Kolomela mine is associated with the chemical and clastic sediments of the Proterozoic Transvaal Supergroup. These sediments define the western margin of the Kaapvaal Craton in the Northern Cape province. The stratigraphy has been deformed by thrusting from the west and has

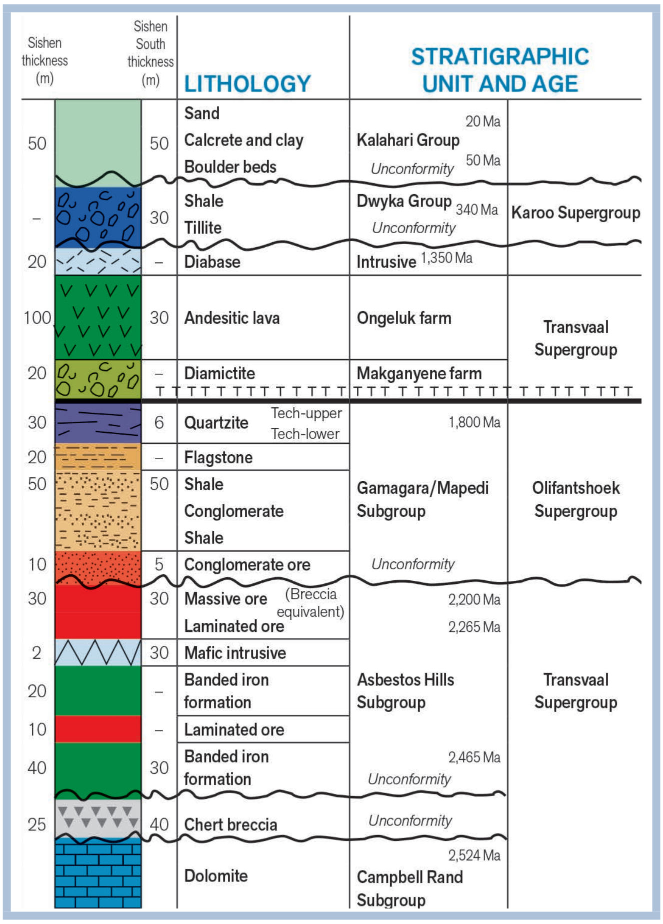


FIGURE 11: SIMPLIFIED STRATIGRAPHIC COLUMN DEPICTING THE KOLOMELA LOCAL GEOLOGY

undergone extensive karstification. The thrusting has produced a series of open, north-south plunging anticlines, synclines and grabens and karstification has been responsible for the development of deep sinkholes. The iron ore at Kolomela has been preserved from erosion within these geological structures. These structures are therefore important exploration targets. The Kolomela local stratigraphy is illustrated in **Figure 11**.

The Transvaal Supergroup lithologies were deposited on a basement of Archaean granite gneisses and greenstones, and/or lavas of the Ventersdorp Supergroup. In the Sishen-Postmasburg region, the oldest rocks of the Transvaal Supergroup form a carbonate platform sequence (dolomites with minor limestone, chert and shale) known as the Campbell Rand Subgroup. The upper part of the Transvaal Supergroup comprises a banded iron formation unit, the Asbestos Hills Subgroup, which has been conformably deposited on the carbonates. In places, the upper portion of the banded iron formation has been supergene-enriched to Fe ≥ 60%. The iron ore/banded iron formation zone is referred to as the Kuruman Formation. The ores found within this formation comprise the bulk of the higher-grade iron ores in the region.

Iron ore at Kolomela mine is associated with the chemical and clastic sediments of the Proterozoic Griqualand West Supergroup. These sediments define the western margin of the Kaapvaal Craton in the Northern Cape province.

The stratigraphy has been deformed by thrusting from the west and has undergone extensive karstification. The thrusting has produced a series of open, north-south plunging anticlines, synclines and grabens and karstification has been responsible for the development of deep sinkholes. The iron ore at Kolomela has been preserved from erosion within these geological structures. These structures are therefore important exploration targets.

The Griqualand West Supergroup lithologies were deposited on a basement of Archaean granite gneisses and greenstones, and/or lavas of the Ventersdorp Supergroup. In the Sishen – Postmasburg region, the oldest rocks of the Griqualand West Supergroup form a carbonate platform sequence (dolomites with minor limestone, chert and shale) known as the Campbell Rand Subgroup.

The upper part of the Griqualand West Supergroup comprises a banded iron formation unit, the Asbestos Hills Subgroup, which has been conformably deposited on the carbonates. In places, the upper portion of the

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

banded iron formation has been supergene-enriched to Fe ≥ 60%. The iron ore/banded iron formation zone is referred to as the Kuruman Formation. The ores found within this formation comprise the bulk of the higher-grade iron ores in the region.

An altered mafic intrusive sill (originally of gabbroic composition) usually separates the iron ore deposits from the underlying host iron formation. It is believed to have intruded the Griqualand West Supergroup in late Proterozoic times.

A thick sequence of younger clastic sediments (shales, quartzites and conglomerates) belonging to the Gamagara Subgroup unconformably overlies the banded iron formations. Some of the conglomerates comprise predominantly of haematite and are of lower-grade ore quality. The unconformity separating the iron formations from the overlying clastic sediments represent a period of folding, uplift and erosion.

During this time, dissolution and karstification took place in the upper dolomitic units. This resulted in the formation of residual solution breccias, referred to as the "Manganese Marker" or "Wolhaarkop Breccia", between the dolomites and overlying banded iron formations. In places, deep sinkholes developed in the dolomites, into which the overlying iron formation and iron ore deposits collapsed.

Diamictite of the Makganyene Formation and lava of the Ongeluk Formation have been thrusted over the Gamagara sediments in the Kolomela region. These are preserved only within larger synclinal structures.

A considerable portion of the upper parts of the stratigraphy were eroded and re-deposited as tillite during Dwyka glaciation. The entire folded sequence was then eroded during Tertiary times. A thick blanket of calcrete, dolocrete, clays and pebble layers (Kalahari Group) was deposited unconformably over the older lithologies.

Evidence of karst formation after the development of the calcretes of the Edin and Boudin Formation can be seen in the current Leeuwfontein pit.

Tectonic setting

Structurally, Kolomela mine lies on the western margin of the Kaapvaal Craton, and has been affected by Kheis Orogeny. The deformation intensity increases from east to west and the area is dominated by a regional-scale synforms and antiforms – the so-called Welgevonden Basin and Wolhaarkop antiform.

The area west of the Wolhaarkop antiform (including the western limb of the antiform), is characterised by tight overturned fold structures that verge towards the east. The overturned limbs of the fold structures are locally disrupted, which have produced thrusts with limited displacement. East of the antiform (Kolomela area), the folds are upright, tight to open structures that have variable inter-limb angles. All of the fold structures west of the antiform are the product of east-west crustal contraction during the Kheis Orogeny, which produced eastward-directed thrusting.

Thrust faults that were intersected in drill core in the Welgevonden north area caused duplication of the stratigraphy. The high degree of associated deformation is clearly illustrated in drill core from the Welgevonden area and duplication or elimination of iron ore may occur.

The Wolhaarkop area is structurally more intensely deformed than the Kapstevel and the Welgevonden areas. The folds are tight to isoclinal, over-folded with an eastwards vergence. With subsequent deformation the fold structures became disrupted, resulting in thrust structures with eastwards directed movement.

The high-strain zones (thrusts) are locally characterised by a high degree of ferruginisation of extensively brecciated BIF. In some places, the ore is preserved as narrow, tightly folded lenses within the high-strain zones.

Local geology

Four distinct high-grade iron ore types have been described at Kolomela mine in the various separate iron ore deposits:

- **High-grade (Fe-rich) Laminated ore**, which constitutes the main ore-type and comprises alternating micro bands of high-lustre haematite with equally thin, porous bands of lower-lustre haematite and specularite. The primary lamination of the precursor banded iron formation is still preserved, suggesting supergene enrichment (*in situ* replacement) of silica by iron.
- **High-grade (Fe-rich) Clastic textured ore**, comprising alternating haematite and specularite layers, thicker than those of the laminated ore and characterised by distorted, wavy bedding and occurs as lenses and massive units.
- **High-grade (Fe-rich) Collapse breccia-type ore**, comprising angular fragments of laminated and clastic-textured ore in chaotic arrangement. The fragments are cemented by fine-grained specularite and haematite. The brecciation is probably as a result of karstification of the underlying dolomites, i.e. the collapse breccia ore is the product of sudden, brittle collapse of laminated and clastic-textured ores into underlying solution cavities and is preserved in deep sinkhole structures.
- **High-grade (Fe-rich) Conglomeratic ore**, comprising poorly sorted, rounded to sub-rounded haematite pebbles and clasts in a ferruginised matrix representing, which usually occurs very localised and is considered to represent ferruginised Gamagara conglomerates.
- In addition, material defined in the geological models with an *in situ* 50% ≤ Fe < 61%, comprising ferruginised banded iron formation, conglomerates and collapse breccia material, is termed medium-grade ore.

The various iron ore deposits located within the Kolomela mining right area contains a unique combination of ore types as described above as well as associated waste lithologies. The proportion of high-grade ore to medium-grade ore for the inclusive Mineral Resources as stated in 2019 is 86 to 14.

Geological interpretations have been derived from a borehole database comprising 7,838 boreholes. No additional boreholes informed the 2019 Mineral Resource estimates as the geological models remained unchanged from 2018. The red dots in

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

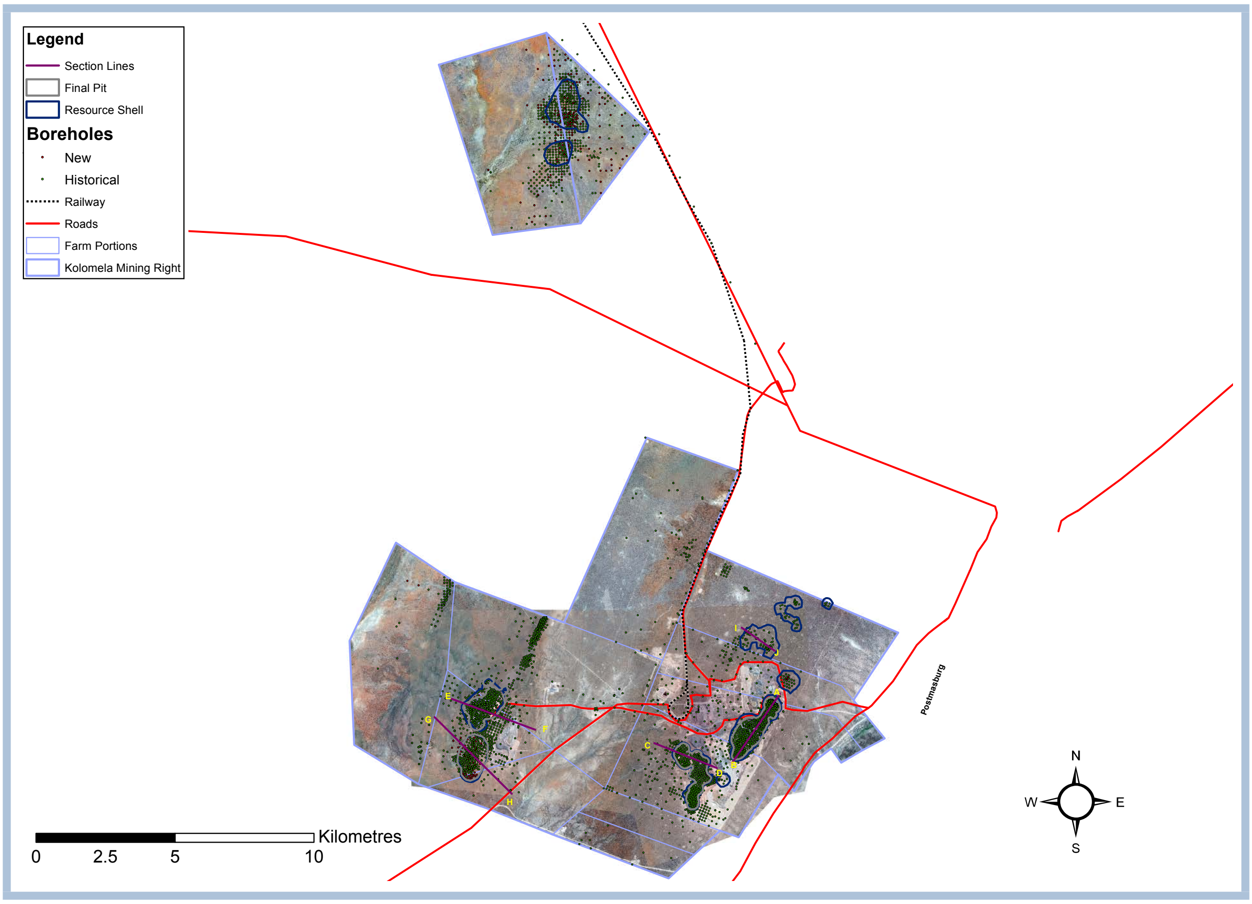


FIGURE 12: KOLOMELA MINING RIGHT AREA

Figure 12 depict the additional boreholes used in the 2018 geological model update.

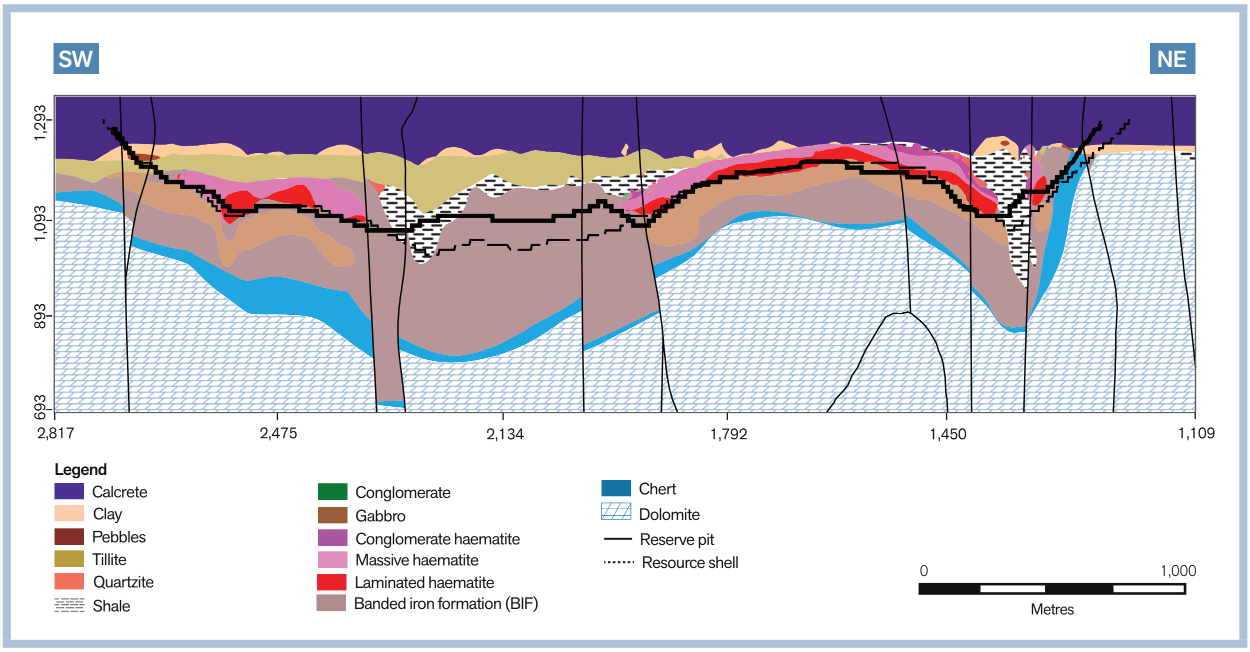
The geometry of the different ore bodies is depicted via cross-sections taken through the three-dimensional solids models of the various ore bodies:

- Cross-section AB (**Figure 13**) as referenced in plan (**Figure 12**)
  - North-east to south-west cross-section through the Leeuwfontein ore body.
- Cross-section CD (**Figure 14**) as referenced in plan (**Figure 12**)
  - West-north-west to east-south-east cross-section through the Klipbankfontein ore body.
- Cross-section EF (**Figure 15**) as referenced in plan (**Figure 12**)
  - West-north-west to east-south-east cross-section through the Kapstevel North ore body.
- Cross-section GH (**Figure 16**) as referenced in plan (**Figure 12**)
  - North-west to south-east cross-section through the Kapstevel South ore body.
- Cross-section IJ (**Figure 17**) as referenced in plan (**Figure 12**)
  - West-north-west to east-south-east cross-section through the Ploegfontein ore body.

It can be noticed in some of these figures that the pit layout boundaries in some instances exceed the resource shell in size. This is possible where during pit optimisation ore geology is the limiting factor and not economic viability, and when the pit shell is engineered into a safe pit layout or design, the layout boundaries in some areas exceed the resource shell.

Also, the vertical scale has been exaggerated in all the cross-sections, for better illustrative purposes, resulting in ore body dip angles appearing steeper than actual.

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED



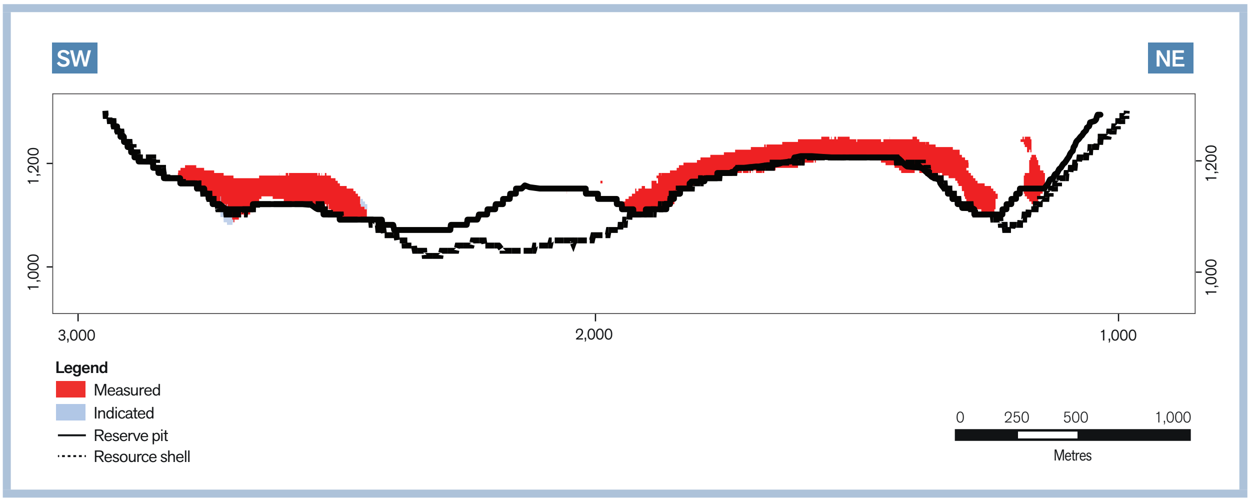


FIGURE 13: **SW-NE CROSS-SECTION THROUGH THE LEEUWFONTEIN ORE BODY (TOP) WITH ASSOCIATED GEOLOGICAL CONFIDENCE CLASSIFICATION (BOTTOM)**

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

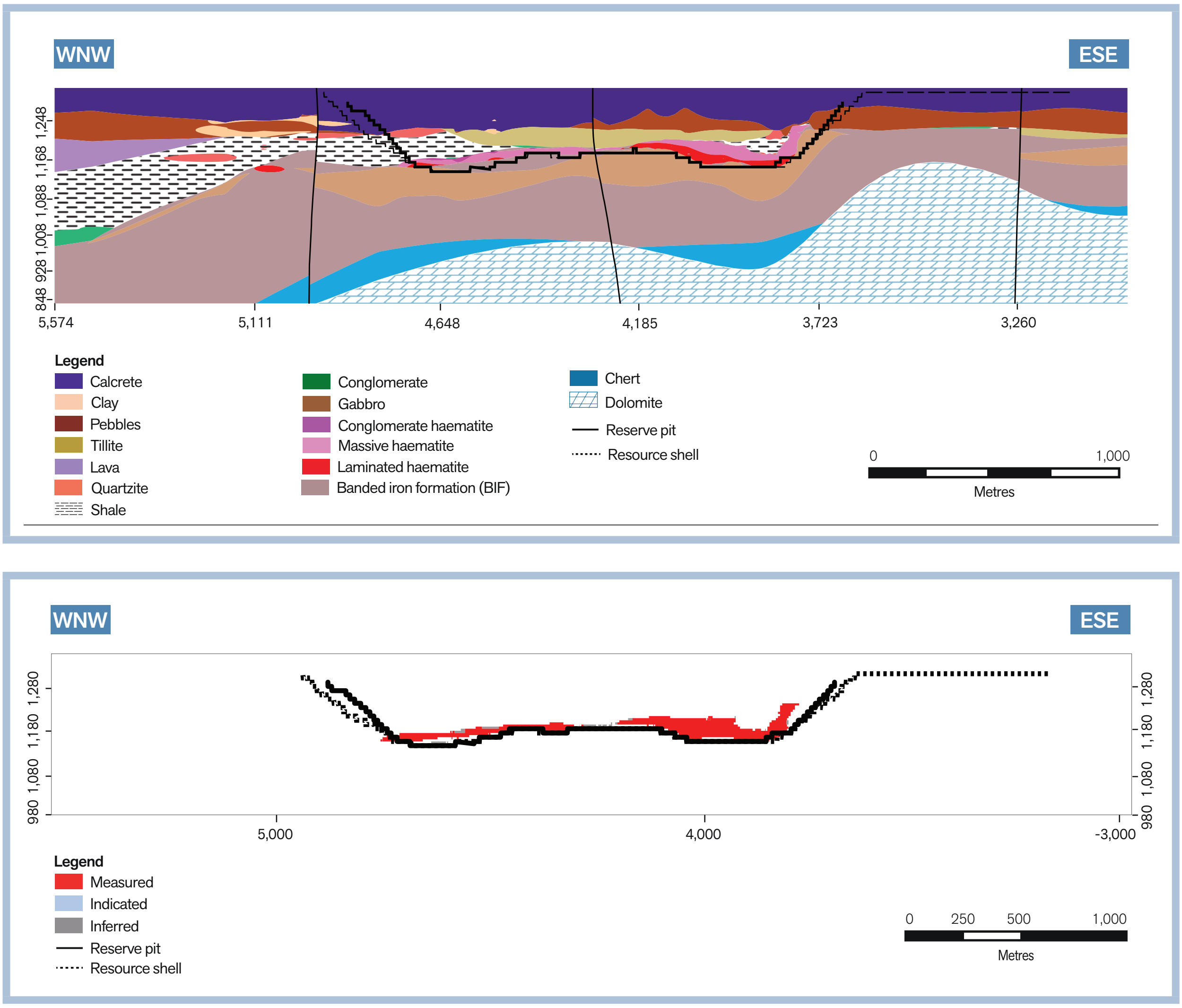


FIGURE 14: **WNW-ESE CROSS-SECTION THROUGH THE KLIPBANKFONTEIN ORE BODY (TOP) WITH ASSOCIATED GEOLOGICAL CONFIDENCE CLASSIFICATION (BOTTOM)**

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

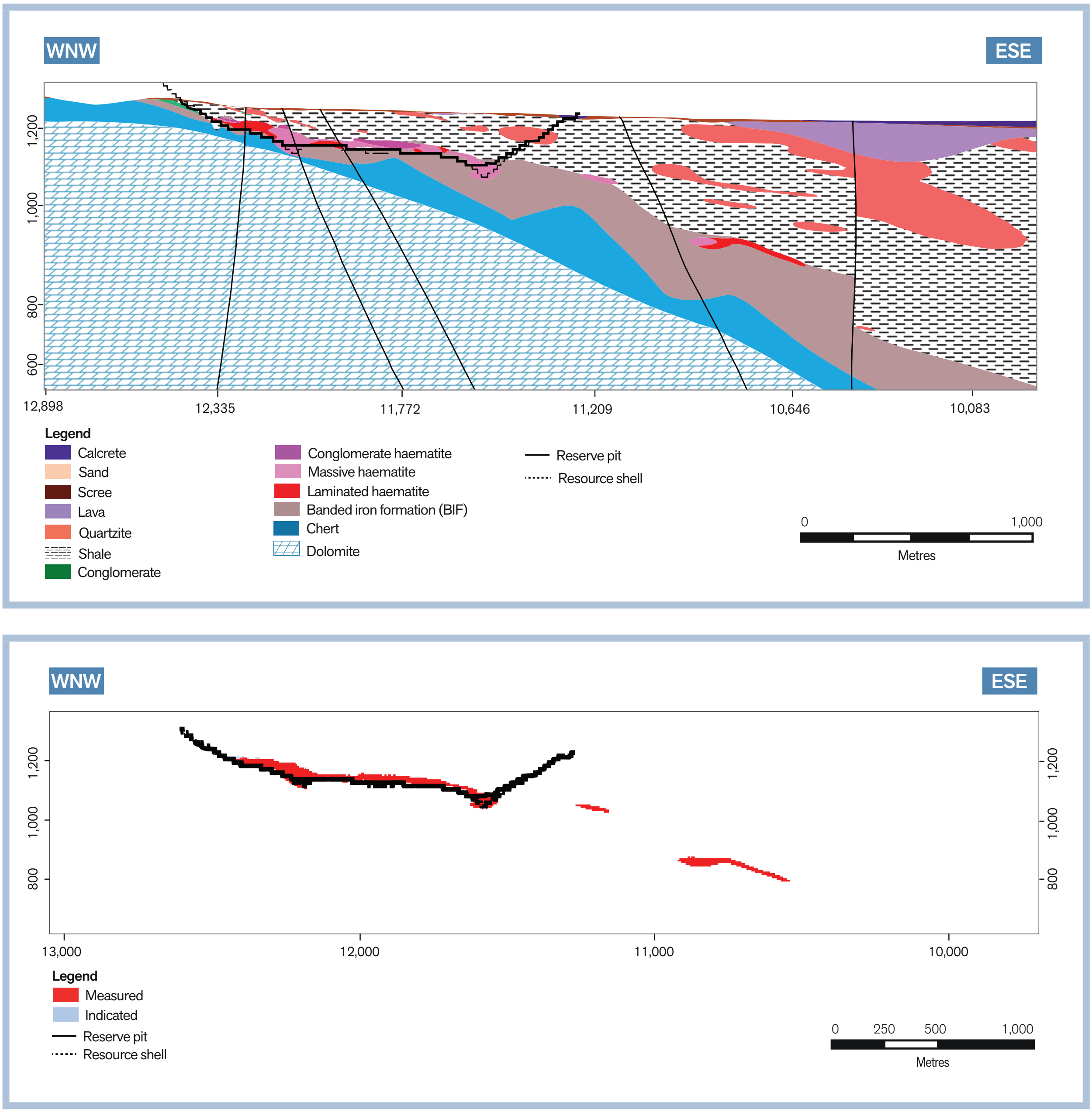


FIGURE 15: **WNW-ESE CROSS-SECTION THROUGH THE KAPSTEVEL NORTH ORE BODY (TOP) WITH ASSOCIATED GEOLOGICAL CONFIDENCE CLASSIFICATION (BOTTOM)**

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

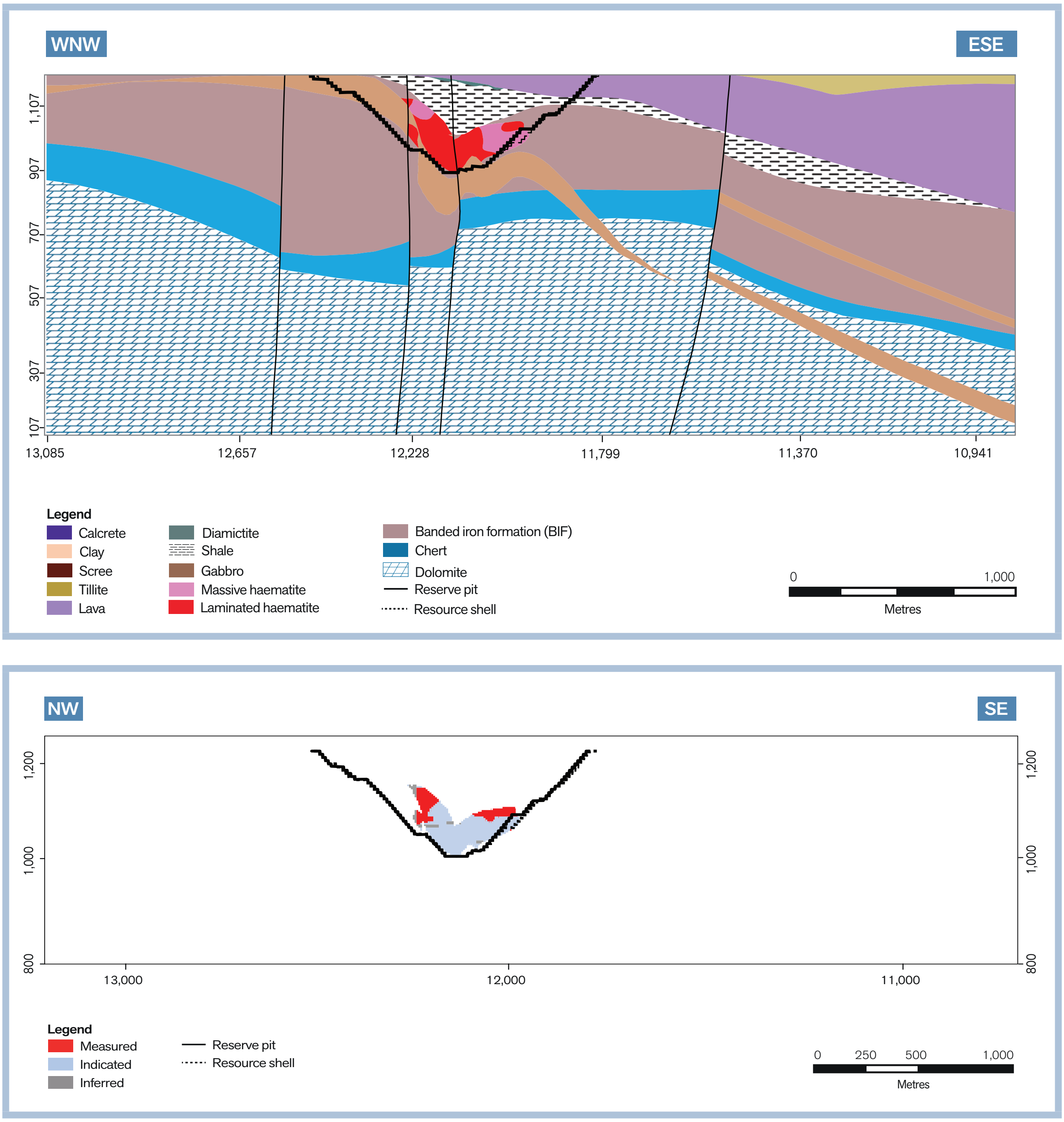
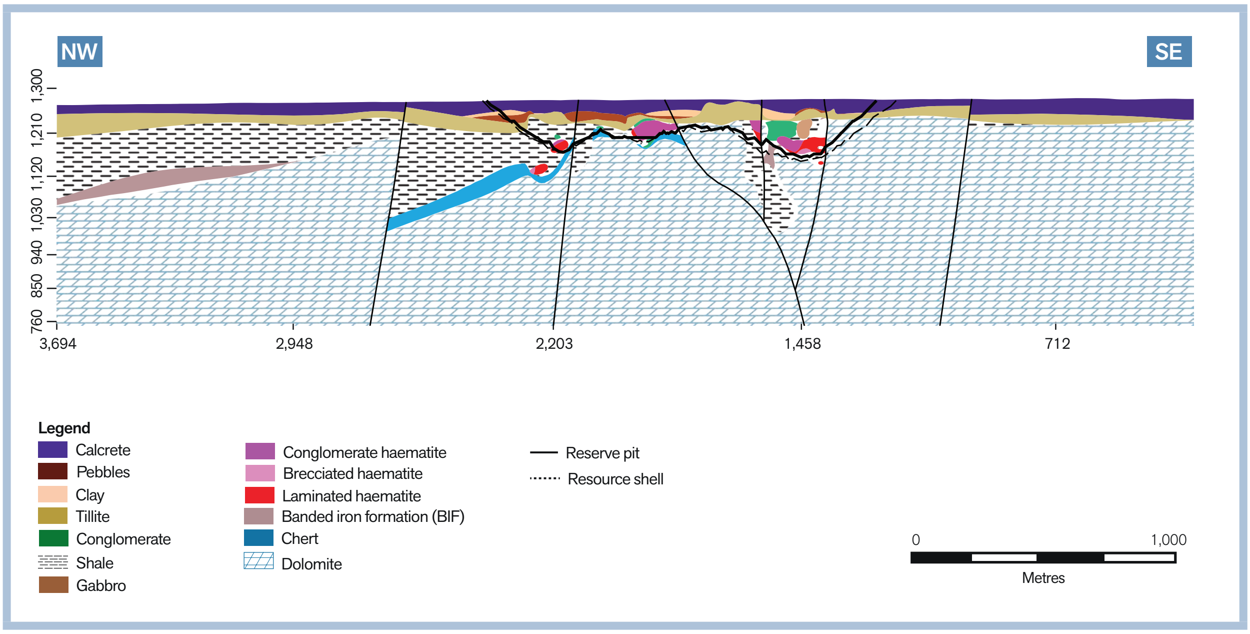


FIGURE 16: WNW-ESE CROSS-SECTION THROUGH THE KAPSTEVEL SOUTH ORE BODY (TOP) WITH ASSOCIATED GEOLOGICAL CONFIDENCE CLASSIFICATION (BOTTOM)

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED



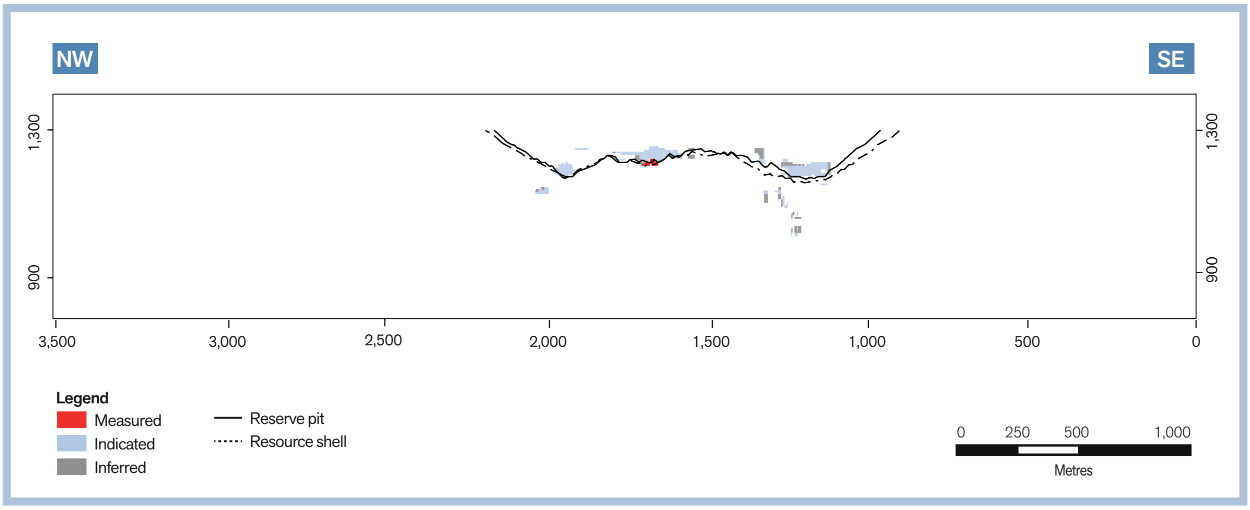


FIGURE 17: **NW-SE CROSS-SECTION THROUGH THE PLOEGFONTEIN ORE BODY (TOP) WITH ASSOCIATED GEOLOGICAL CONFIDENCE CLASSIFICATION (BOTTOM)**

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

OPERATIONAL OUTLINE

Kolomela mine has been designed as a direct shipping ore operation, where conventional open-pit drilling-and-blasting, truck-and-shovel loading and hauling mining processes are applied to generate plant feed. Currently the Leeuwfontein, Klipbankfontein and Kapstevel North ore bodies are mined, but the 2019 LoMP also includes future mining of the Kapstevel South ore body.

The iron ore is loaded according to blend (grade) requirements and transported to designated run-of-mine finger stockpiles dependent on the Fe grade and contaminant grade of the load. The primary crushing and screening direct shipping ore (DSO) plant is fed from the finger stockpiles in blend ratios ensuring that the Lump and Fine product is suitable for client uptake (considering subsequent blending with Sishen mine product at the Saldanha harbour stock yard). A modular small-scale dense media separation (DMS) plant was commissioned in 2016 and contributes an average 7% to the Saleable Product output of Kolomela mine, through the treatment of medium-grade ore material.

The iron ore product (on average 60% Lump to 40% Fine) is railed to the Saldanha export harbour via the OREX iron ore export line. The product is marketed to SIOC's current overseas customer base as part of the SIOC marketing strategy and are blended with Sishen mine's product. Kolomela mine produces Lump and Fine ore, with the grade and physical properties of the Lump ore of such a high standard that it meets niche demand.

Kolomela mine's key operational parameters are summarised in Table 9.

TABLE 9: KOLOMELA MINE OPERATIONAL OUTLINE SUMMARY

Key details	
Ownership (AA plc)	53.2%
Ownership (KIO)	76.3%
Commodity	Iron ore
Country	Republic of South Africa
Mining method	Open pit – conventional
Reserve life*	12 years
Mine life	13 years
Estimated Saleable Product	
Lump : Fine ratio	60 : 40
Saleable Product design capacity	15.0 Mtpa
Estimated 2019 run-of-mine production	15.3 Mt
Estimated 2019 Saleable Product	14.7 Mt
Estimated 2019 waste production	63.2 Mt
Overall planned stripping ratio (2019 LoM plan)	3.8 : 1
Estimated product sold in 2019	14.5 Mt
Product types	Lump and Fine
Mining right expiry date	17 September 2038

* Reserve life includes all consecutive years in the life-of-mine plan where the Proved and Probable Ore Reserves make up >25% of the year's run-of-mine.

The total tonnes extracted from three pits (Leeuwfontein, Klipbankfontein and Kapstevel North) at Kolomela mine increased by 2% from 72.0 Mt (in 2018) to an estimated (at the time of reporting) 79.2 Mt in 2019. The 2019 mining performance (as estimated at the time of reporting) comprises 63.2 Mt of ex-pit waste and 16.0 Mt (14.8 Mt Ore Reserves and 1.2 Mt modified Inferred Mineral Resources) of ex-pit ore, of which 15.3 Mt was delivered to the crushing and screening direct shipping ore (DSO) and dense media separation (DMS) plants as run-of-mine with a year-on-year run-of-mine stockpile growth of 0.8 Mt.

In total, 14.7 Mt of Saleable Product is expected to be produced on-site from the run-of-mine delivered to the crushing and screening and DMS plants in 2019, compared to 13.9 Mt in 2018. In total, 14.5 Mt is expected to be railed to the Saldanha Port for export in 2019.

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

Production history

Kolomela mine's production history of Saleable Product is summarised in **Figure 18**.

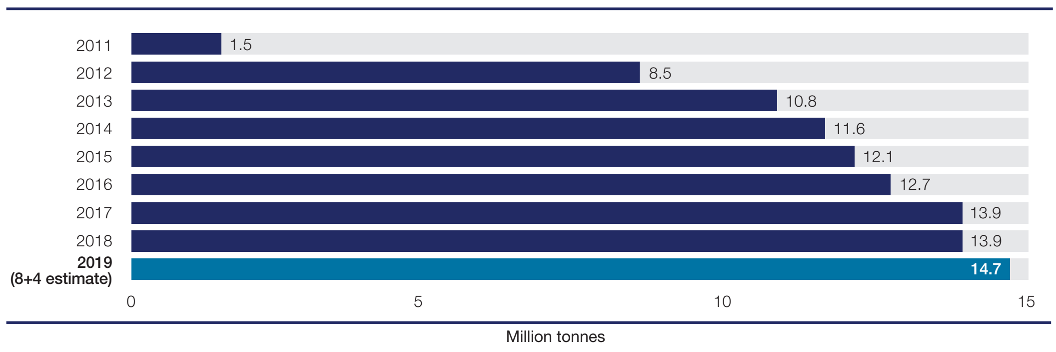


FIGURE 18: **KOLOMELA MINE PRODUCTION HISTORY**

Latest life-of-mine plan Saleable Product profile

The 2019 LoMP Saleable Product profile is depicted in **Figure 19**.

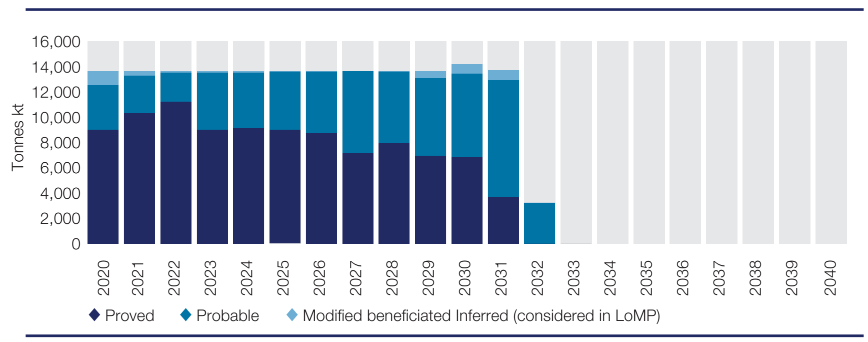


FIGURE 19: **KOLOMELA MINE'S 2019 LIFE-OF-MINE PLAN ANNUAL SALEABLE PRODUCT PROFILE (INCLUDING MODIFIED BENEFICIATED INFERRED MINERAL RESOURCES)**

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

ORE RESERVE ANCILLARY INFORMATION

The Kolomela mine Ore Reserve ancillary information is summarised in **Table 10A** (background information) and **Table 10B** (Leeuwfontein Ore Reserve estimation parameters – as an example).

TABLE 10A: KOLOMELA MINE'S 2019 VERSUS 2018 ORE RESERVE BACKGROUND INFORMATION

KOLOMELA MINE	2019	2018
LOCATION		
Country	Republic of South Africa	Republic of South Africa
Province	Northern Cape	Northern Cape
OWNERSHIP		
Sishen Iron Ore Company Proprietary Limited	100%	100%
Kumba Iron Ore Limited	76.3%	76.3%
AA plc	53.2%	53.2%
OPERATIONAL STATUS		
Operation status	Steady-state	Steady-state
Mining method	Open pit (conventional drilling and blasting and truck and shovel operation)	Open pit (conventional drilling and blasting and truck and shovel operation)
Beneficiation method	Direct shipping ore (only crushing and screening of high-grade RoM) as well as dense media separation plant for B-grade material	Direct shipping ore (only crushing and screening of high-grade RoM) as well as dense media separation plant for B-grade material
Annual Saleable Product (Mtpa)	13.6	13.6
Annual supply to domestic market (Mtpa)	0.0	0.0
Annual supply to export market (Mtpa)	13.6	13.6
Number of products	2 product types (Lump and Fine)	2 product types (Lump and Fine)
GOVERNANCE		
Code	THE SAMREC CODE – 2016 EDITION	
AA plc group policy	Group Policy for Reporting of Ore Reserves and Mineral Resources Version 1	
AA plc group technical standard	AA_GTS_22 (Reporting of Exploration Results, Mineral Resources and Ore Reserves in Anglo American)	
AA plc requirements document	AA_RD22-25 (Exploration Results, Mineral Resources and Ore Reserves Reporting Requirements Document – Version 10)	
KIO reporting policy	http://www.angloamericankumba.com/sd_policies.php	
KIO reporting protocols	KIO Reserve Classification Guideline (Version 1)	
KIO reporting template	Ore Reserve (and Saleable Product) Reporting Template (2019)	Ore Reserve (and Saleable Product) Reporting Template (2017)

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

TABLE 10A: continued

KOLOMELA MINE'S 2019 VERSUS 2018 ORE RESERVE BACKGROUND INFORMATION continued

KOLOMELA MINE continued	**2019**	2018
REPORTING METHOD		
Approach	Ore Reserves are those derived from Measured and Indicated Mineral Resources only (through application of modifying factors) and do not include Inferred Mineral Resources. In the case of Kumba Iron Ore all Ore Reserves are constrained by practical pit layouts, mining engineered from pit shells that define "current economically mineable". The geological block model(s) is converted into a mining block model considering a site-specific practical mineable smallest mining unit. Furthermore, protocols ensure that Kumba Iron Ore's operations/projects consider expected long-term revenues versus the operating and production costs associated with mining and beneficiation as well as legislative, environmental and social costs, in determining whether or not a Mineral Resource could be economically extracted and converted to an Ore Reserve. This is performed by applying a Lerchs-Grosmann algorithm to the mining model to derive an optimised pit shell. This optimised pit shell is then iteratively converted to a practical layout by applying geotechnical slope stability parameters and haul road and ramp designs, legal restrictions etc., with safety being one of the most considered parameters. Once a practical pit layout has been established the material within the pit is scheduled over time to achieve client specifications and thus a LoM schedule is produced. The average % Fe grade and metric tonnage estimates of "Saleable Product" are also reported to demonstrate that beneficiation losses have been taken into account.	
Scheduled run-of-mine metric tonnes (dry/wet)	Dry	
Tonnage calculation	Tonnages are calculated from the life-of-mine schedule, originating from the mining block models, and are modified tonnages considering geological losses, the effect of dilution, mining losses, mining recovery efficiencies and design recovery efficiencies to derive the run-of-mine tonnages delivered to the crushing and screening plant.	
Fe grade	Ore Reserve % Fe grades reported, represent the weighted average grade of the "plant feed" or "run-of-mine" (RoM) material and take into account all applicable modifying factors.	
Cut-off grade (Fe)	50%	50%
Ore type	Haematite ore	Haematite ore
Optimised pit shell revenue factor	1.0	Not reported
Life-of-mine scheduling		
Software	*OPMS*	*OPMS*
Method	Product tonnage and grade target driven to achieve required client product specifications	Product tonnage and grade target driven to achieve required client product specifications
Stripping strategy	Deferred waste stripping strategy	Deferred waste stripping strategy
Reserve life years	12	14
LoMP run-of-mine tonnes (including modified Inferred) (expressed in million tonnes)	176.5	192.5
Overall average stripping ratio (including Inferred Mineral Resources)	1 : 3.8	1 : 4.1
Production data cut-off date (date where after short-term plan instead of actual figures are used to estimate the annual run-of-mine and Saleable Product production for the mine until 31 December of year of reporting)	31 August 2019	30 September 2018
Topography and pit progression assigned	31 December 2019	31 December 2018
Reserve schedule ID (schedule file name + extension)	2019 LoM RnR.xlsx	2018 LoM Base Case Optimised Report.xlsx
Reserve schedule completion date	15 October 2019	15 October 2018

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

TABLE 10B: KOLOMELA MINE'S 2019 VERSUS 2018 LEEUWFONTEIN ORE RESERVE ESTIMATION PARAMETERS
(similar tables exist for the Klipbankfontein, Kapstevel North and Kapstevel South mining areas)

	2019	2018
ESTIMATION		
Leeuwfontein		
Mining block model name	lft_smultmod0318v3.1.dm	lft_smultmod0318v3.1.dm
Smallest mining unit	10m(X) x 10m(Y) x 10m(Z)	10m(X) x 10m(Y) x 10m(Z)
Practical mining parameters		
Bench height	10m	10m
Ramp gradient	8% to 10.0% (1 in 8 to 1 in 10)	8% to 10.0% (1 in 8 to 1 in 10)
Road width	35m	35m
Minimum mining width	80m (hydraulic truck-and-shovel mining)	80m (hydraulic truck-and-shovel mining)
Geohydrology	Groundwater level maintained 20m below pit floor	Groundwater level maintained 20m below pit floor
Pit slopes	Designed according to a defendable risk matrix, guided by an appropriate factor of safety of 1.3 and a probability of failure of 10%	Designed according to a defendable risk matrix, guided by an appropriate factor of safety of 1.3 and a probability of failure of 10%
Pit optimisation		
Software	*Whittle 4X*	*Whittle 4X*
Method	Lerchs-Grosmann (marginal cost cut-off analysis)	Lerchs-Grosmann (marginal cost cut-off analysis)
Modification		
Modifying factors		
Geological loss (%)	0	0
Dilution (%)	1	4
Mining loss (%)	-6	-7
Mining recovery efficiency (%)	93	94
Design recovery efficiency (%)	100	100
Ore Reserves reallocated to Mineral Resources (%)	-3	-3
Metallurgical yield (%) to convert to Saleable Product	98.8	98.8
Estimator		
Reserve estimator	Sthembile Nkambule	Grant Crawley
Reserve estimator status	Internal Technical Specialist	External Competent Person
Estimator employer	Sishen Iron Ore Company Proprietary Limited	RPMGlobal

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

MINERAL RESOURCE ANCILLARY INFORMATION

The Kolomela mine Mineral Resource ancillary information is summarised in **Table 11A** (background information) and **Table 11B** (Leeuwfontein Mineral Resource estimation parameters – as an example).

TABLE 11A: KOLOMELA MINE'S 2019 VERSUS 2018 MINERAL RESOURCE BACKGROUND INFORMATION

KOLOMELA MINE	2019	2018
LOCATION		
Country	Republic of South Africa	Republic of South Africa
Province	Northern Cape	Northern Cape
OWNERSHIP		
Sishen Iron Ore Company Proprietary Limited	100	100
Kumba Iron Ore Limited	76.3	76.3
Anglo American plc	53.2	53.2
SECURITY OF TENURE		
Number of applicable mining rights	1	1
Mining right status	Registered (amendments registered)	Registered (amendments executed)
Mining right expiry date(s)	17 September 2038	17 September 2038
EXPLORATION STATUS		
Exploration type	Geological confidence (on mine)	Geological confidence (on mine)
Exploration phase	In execution	In execution
Ore type	Haematite ore	Haematite ore
GOVERNANCE		
Code	THE SAMREC CODE – 2016 EDITION	
AA plc group policy	Group Policy for Reporting of Ore Reserves and Mineral Resources Version 1	
AA plc group technical standard	AA_GTS_22 (Reporting of Exploration Results, Mineral Resources and Ore Reserves in Anglo American)	
AA plc requirements document	AA_RD22-25 (Exploration Results, Mineral Resources and Ore Reserves Reporting Requirements Document – Version 10)	
KIO reporting policy	http://www.angloamericankumba.com/sd_policies.php	
KIO reporting protocols	KIO Resource Classification Guideline (Version 2)	KIO Resource Classification Guideline (Version 2)
KIO reporting template	Mineral Resource (and Mineral Inventory) Reporting Template (2019)	Mineral Resource (and Mineral Inventory) Reporting Template (2017)
REPORTING METHOD		
Approach	Mineral Resources are reported exclusive of Ore Reserves and not factoring in attributable ownership and only if: (1) spatially modelled; (2) spatially classified; (3) spatially constrained in terms of reasonable and realistic prospects for eventual economic extraction (occurring within an RRPEEE defined envelope, in other words not all mineral occurrences are declared as Mineral Resources); (4) declared within (never outside) executed tenement boundaries	
In situ metric tonnes (dry/wet)	Dry	Dry
Tonnage calculation	Tonnages are added from cells in geological block model of which the centroids intersect the relevant geological ore domains in the solids models which occur inside the resource shell. The volume of each ore cell is multiplied with the estimated relative density of the same cell)	Tonnages are added from cells in geological block model of which the centroids intersect the relevant geological ore domains in the solids models which occur inside the resource shell. The volume of each ore cell is multiplied with the estimated relative density of the same cell)
Fe grade	Weighted average above cut-off grade	Weighted average above cut-off grade
Fe calculation	Tonnage-weighted mean of the estimated *in situ* Mineral Resource Fe grades contained within geological block models, constrained by the relevant Resource geological ore domains and RRPEEE resource shell	Tonnage-weighted mean of the estimated *in situ* Mineral Resource Fe grades contained within geological block models, constrained by the relevant Resource geological ore domains and RRPEEE resource shell
RPEEE		
Cut-off grade	50% Fe	50% Fe
Resource shell revenue factor	1.6	1.6

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

TABLE 11B: KOLOMELA MINE'S 2019 VERSUS 2018 LEEUWFONTEIN MINERAL RESOURCE ESTIMATION PARAMETERS – AS AN EXAMPLE (similar tables exist for the Klipbankfontein, Kapstevel North, Kapstevel South, Ploegfontein and Wolhaarkop ore bodies but are not stated in this report)

	2019	2018
ESTIMATION		
Leeuwfontein geological model		
Input data		
Borehole type	Core and percussion borehole lithological logs and associated chemical analyses	
Relative density measurement	Picnometer analyses on pulp samples	Picnometer analyses on pulp samples
KIO QA/QC protocol	KIO QC Protocol for Exploration Drilling Sampling and Sub-sampling (Version 8)	
Primary laboratory	Anglo American Research Division of Anglo Operations Limited Chemistry Laboratory (company registration number: 1921/006730/07)	Anglo American Research Division of Anglo Operations Limited Chemistry Laboratory (company registration number: 1921/006730/07)
Accreditation	Accredited under International Standard ISO/IEC 17025:2005 by the South African National Accreditation System (SANAS) under the Facility Accreditation Number T0051 (valid from 1 May 2016 to 30 April 2021)	Accredited under International Standard ISO/IEC 17025:2005 by the South African National Accreditation System (SANAS) under the Facility Accreditation Number T0051 (valid from 1 May 2016 to 30 April 2021)
Borehole database software	*acQuire*	*acQuire*
Borehole database update cut-off date	30 April 2017	30 April 2017
Database validation conducted	Yes	Yes
Segmentation conducted	Yes. To allow for simplification of logged lithologies for spatial correlation purposes	
STATISTICAL AND GEOSTATISTICAL EVALUATION		
Data compositing interval	1m	1m
Data compositing method	Length weighted average per lithology	Length weighted average per lithology
Grade parameters evaluated	% Fe, % SiO2, % Al2O3, % K2O, and % P as well as Relative Density	% Fe, % SiO2, % Al2O3, % K2O, and % P as well as Relative Density
Variography updated in current year	No	Yes
Search parameters updated in current year	No	Yes
SOLIDS MODELLING		
Solids modelling software	*Leapfrog*	*Leapfrog*
Input	Updated solids models	Updated solids models
Method	Implicit solids modelling for all domains	Implicit solids modelling for all domains
Domaining	Yes, by lithology and structural controls	Yes, by lithology and structural controls
Topography and pit progression assigned	31 December 2019 (planned boundary)	31 December 2018 (planned boundary)
Validation conducted	Yes (for gaps and overlaps by software queries as well as honouring of borehole contacts) and by standard software validation tools (open sides, self-intersecting triangles)	Yes (for gaps and overlaps by software queries as well as honouring of borehole contacts) and by standard software validation tools (open sides, self-intersecting triangles)

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

TABLE 11B: continued

KOLOMELA MINE'S 2019 VERSUS 2018 LEEUWFONTEIN MINERAL RESOURCE ESTIMATION PARAMETERS – AS AN EXAMPLE (similar tables exist for the Klipbankfontein, Kapstevel North, Kapstevel South, Ploegfontein and Wolhaarkop ore bodies but are not reported) continued

	2019	2018
GRADE ESTIMATION METHODOLOGY		
Ore segments	Ordinary (Co-) kriging	Ordinary (Co-) kriging
Waste segments	Global estimate	Global estimate
GEOLOGICAL BLOCK MODELLING		
Block modelling software	*Surpac*	*Surpac*
Model type	Centroid model	Centroid model
Parent cell size	40m(X) x 40m(Y) x 10m(Z)	40m(X) x 40m(Y) x 10m(Z)
Minimum sub-block cell size	5m(X) x 5m(Y) x 5m(Z)	5m(X) x 5m(Y) x 5m(Z)
CELL POPULATION METHOD		
Tonnage	Volume of lithology intersected by cell centroid and constrained by cell limits, multiplied with relative density estimate of the same lithology at same unique cell centroid position in space	Volume of lithology intersected by cell centroid and constrained by cell limits, multiplied with relative density estimate of the same lithology at same unique cell centroid position in space
Grade	Estimate of grade at unique cell centroid position in space applicable to total volume or tonnage constrained by the cell	Estimate of grade at unique cell centroid position in space applicable to total volume or tonnage constrained by the cell
Updated geological block model ID (file name + extension)	LFT18_Miningv1_3.dm	LFT18_Miningv1_3.dm
Update completion date	28 February 2018	28 February 2018
ESTIMATOR		
Resource estimator	Fanie Nel	Fanie Nel
Resource estimator status	Internal Technical Specialist	Internal Technical Specialist
Estimator employer	Sishen Iron Ore Company Proprietary Limited	Sishen Iron Ore Company Proprietary Limited

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

SISHEN MINE

GEOLOGICAL OUTLINE

Regional geology

Falls within same regional geological environment (towards northern end of Northern Cape province "Iron Ore Belt") as Kolomela mine – please see Kolomela mine "Regional geology" section (page 34).

Stratigraphy

The carbonates of the Campbell Rand Subgroup are separated from the overlying Banded Iron Formation (BIF) of the Asbestos Hills Subgroup by a siliceous, residual breccia. This breccia is known locally as the Wolhaarkop Breccia and is developed on an irregular, karst surface.

The BIFs of the Asbestos Hills Subgroup are characteristically fractured and brecciated, especially near the contact with the Wolhaarkop Breccia. Both upper and lower contacts are erosion surfaces and together with the lack of easily identifiable marker horizons make correlation of individual beds virtually impossible.

A highly altered, slickensided, intrusive sill is commonly found separating the BIF from the overlying laminated ore. At Sishen mine it is generally less than 2m thick. The sill is invariably folded into the basinal geometry and only rarely cross-cuts (intrudes) the ore bodies.

At the Sishen deposit, the upper parts of the Asbestos Hills Subgroup have been ferruginised to ore grade. These stratiform, laminated and massive ores constitute the bulk of the resource. The laminated and massive ores are commonly folded and faulted into basinal and pseudo-graben structures.

Deep palaeo-sinkholes, filled with brecciated ore and Gamagara sedimentary rocks, are found on the southern parts of the Sishen properties. The sinkholes are restricted to antiformal structures close to the Maremane Dome on the southern portions of the mine. They are an important mechanism for preserving collapse breccia ore.

They are unconformably overlain by a thick package of sedimentary rocks (conglomerates, shales, flagstones and quartzite) termed the Gamagara Subgroup (S.A.C.S., 1995). Many researchers including Beukes and Smit (1987) and Moore (pers. comm.) have correlated this unit with the Mapedi Formation, which constitutes the lowermost unit of the Olifantshoek Supergroup.

The Olifantshoek Supergroup is the oldest recognised red-bed sequence in the region. It is some 400 Ma younger than the Transvaal Supergroup.

Conglomerates of ore-grade with well-rounded clasts and fine-grained, well-sorted, gritty ores are common at Sishen mine. Partly ferruginised shales, interbedded with ore conglomerates and thick flagstones are also a feature of the Gamagara Subgroup.

Along the western margin of Sishen mine, diamictite of the Makganyene Formation and lavas of the Ongeluk Formation have been thrust over the sedimentary rocks of the Gamagara Subgroup. The diamictite and lava have been eroded by later events. Tillite of the Dwyka Group and pebble beds, clay and calcrete of the Kalahari Group have been deposited on these erosional unconformities.

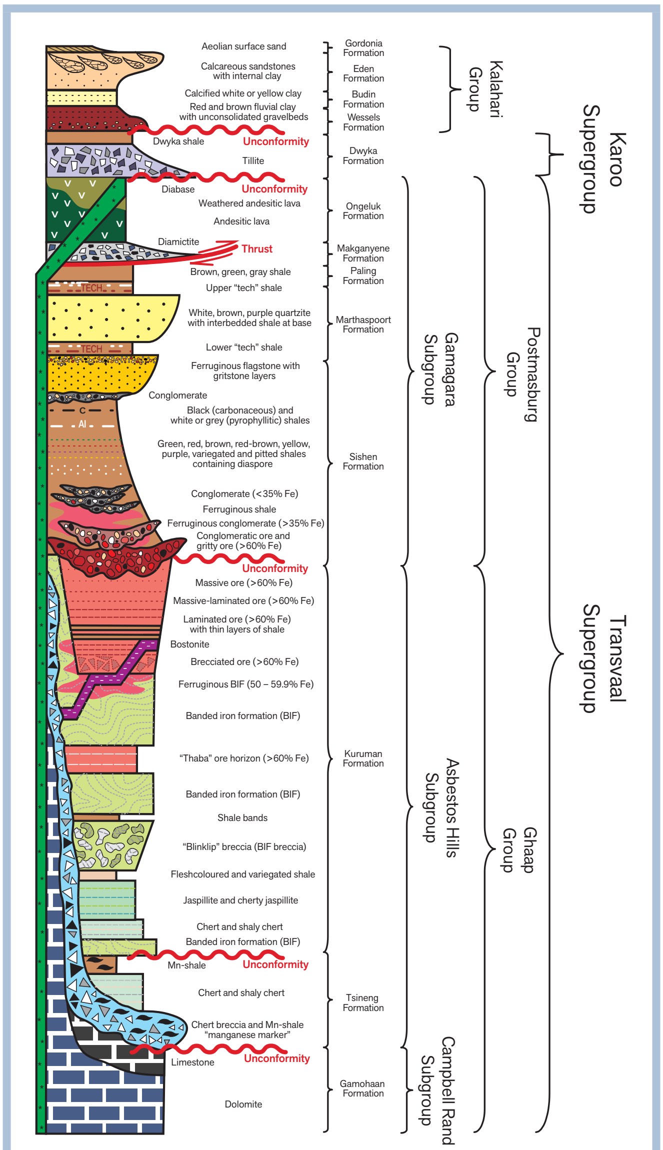
A few thin, diabase dykes with north-south and northeast-southwest orientations have intruded the stratigraphic sequence. They form impervious barriers and compartmentalise the groundwater.

A buried glacial valley, filled with Dwyka tillite and mudstones has been identified with reconnaissance drilling. The valley is located between the mine and Kathu. It has a north-south orientation that changes to northwest-southeast between Dibeng and the mine. The valley does not fall within the planned open pit.

The Kalahari Group comprises boulder beds, clays, calcrete, dolocrete and windblown sands. The Kalahari Group is developed to a maximum thickness of 60m. The clay beds at Sishen can attain a thickness of up to 30m on the northern parts of the deposit. The Kalahari beds of calcrete, limestone and clay and Quaternary sand and detritus, blanket more than 90% of the Sishen mining area.

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

A generalised version of the Sishen mine stratigraphy is depicted in Figure 20.



Citation: Venter, L.J., Deacon, J. (2017) Sishen detailed stratigraphic succession, internal company presentation, Kumba Iron Ore.

FIGURE 20: SIMPLIFIED STRATIGRAPHIC COLUMN DEPICTING THE SISHEN LOCAL GEOLOGY

Tectonic setting

Structural studies by Stowe (1986), Altermann and Hälbich (1991) and Hälbich et al (1993) concluded that the lower Transvaal Supergroup exhibits at least three major phases of compressional tectonism at the western edge of the Kaapvaal Craton. The overall number of events may be significantly higher; for example, Altermann and Hälbich (1991) suggested that there were seven events.

The development of this part of the Kaapvaal Craton is summarised below, in chronological order and using current azimuths, from Stowe (1986), Altermann and Hälbich (1991), Hälbich et al (1993), Friese (2007a, b) and Friese and Alchin (2007):

- ~2.78-2.64 Ga: Ventersdorp rift basin development. NE-SW trending faults, which formed graben boundaries, developed due to basin initiation and subsidence;
- ~2.64-2.6 Ga: Extrusion and deposition of the volcano sedimentary Vryburg Formation and Ventersdorp lavas;
- ~2.60-2.52 Ga: Development of a carbonate platform, during widespread marine transgression; consequent conformable deposition of the Schmidtsdrif and Campbell Rand Subgroup dolomites;
- ~2.52-2.46 Ga: Off-craton/oceanic rifting to the west, accompanied by hydrothermal deposition of manganiferous chert of the Wolhaarkop Formation. This was followed by deposition of the Asbestos Hill Subgroup (banded iron formation/Kuruman Formation);
- ~2.46-2.35 Ga: Incipient break-up and rifting, along a set of N-S trending, W-dipping normal faults in the Kaapvaal Craton during a "second extensional stage" (Friese and Alchin, 2007). According to Dalstra and Rosière (2008), "E1" or their first extensional event occurred immediately before the "Kalahari Orogeny";
- ~2.35-2.25 Ga: The first phase of folding (F1) resulted from the E-verging "Kalahari Orogeny". Altermann and Hälbich (1991) cite the >2.24 Ga or pre-Makganyene development of the Uitkomst cataclasite as part of this event, which they attribute to a bedding-parallel thrust. F1 folds were predominantly N-S trending; therefore, the main axis of the Maremane Dome is effectively a 2.35-2.25 Ga F1 anticline or an F2-tightened F1 anticline. Pre-existing, predominantly rift-related normal faults were inverted and underwent a component of strike-slip reactivation, concomitant with this eastward tectonic vergence; their adjacent, uplifted blocks were eroded. An additional feature of this event appears to be the formation of conjugate NE- and SE-trending

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

strike-slip faults which are radially distributed around the eastern curve of the Maremane Dome. This orogeny also caused uplift and erosion of underlying units, including the Ghaap Group, to form the Postmasburg Unconformity, which is pivotal in regional ore development and/or preservation. The deposition of the Makganyene Formation of the Lower Postmasburg Group, which has a minimum age of 2.22 Ga, probably resulted from this event;

- ~2.24-1.83 Ga: Reactivation of faults related to both the N-S-trending passive margin rift and the Ventersdorp Rift, causing deposition of the fault-controlled or fault-bounded, volcano-sedimentary/volcanoclastic Upper Postmasburg Group. Ongeluk lavas signify the peak of mafic lava extrusion at c. ~2.22 Ga, via feeder dykes that exploited reactivated NNE- to NE-trending faults (Friese and Alchin, 2007; Figure 1). Dalstra and Rosière (2008) correctly inferred that dykes locally recrystallised ores. Within this interval, deposition of clastic sediments in the form of conglomerate, "grit", quartzite and shale of the lower Olifantshoek Supergroup took place at ~2.05-1.93 Ga, thereby forming and terminating the deposition of the Gamagara/Mapedi Formation, which formed within a shallow-water rift environment (Beukes, 1983). The second extensional event or "E2" of Dalstra and Rosière (2008) occurred during or shortly after this period, as reactivated normal faults displaced or offset the lower Olifantshoek Group, although such structures tend to pre-date the Kheis Orogeny (see below). Apparently overlapping in age with this extensional event is the formation of south-verging folds and thrusts, which, according to Altermann and Hälbich (1991), are the oldest post-Matsap event at 2.07-1.88 Ga;
- ~1.83-1.73 Ga: The Kheis Orogeny or tectono-metamorphic event, like the Kalahari Orogeny, showed eastward tectonic vergence that was accompanied by thrusting and folding (Stowe, 1986; Beukes and Smit, 1987; Altermann and Hälbich, 1991; Hälbich et al (1993)). The Kheis Orogeny is more precisely dated at ~1,780 Ma, using a 39Ar-40Ar metamorphic age derived from the Groblershoek Schist Formation of the Olifantshoek Supergroup (Schlegel, 1988). Rift structures of the Postmasburg Group and Olifantshoek Supergroup depositional settings were reactivated while F2 folding and thin-skinned thrusting occurred along major unconformities and lithological contacts. In some areas, F1 folds were tightened co-axially during F2 folding. In the Sishen area, thrusting was concentrated at the shale-dominated, tectonised margins of a quartzite member within the upper Olifantshoek Group; these horizons are termed "tectonised shale" in drill core, although this sequence appears to be very poorly developed at the Heuningkranz prospect. Friese (2007a, b) and Friese and Alchin (2007) have termed these and other low-angle thrusts "principal décollements"; and
- ~1.15-1.0 Ga: The NNW-directed Lomanian (Namaqua-Natal) Orogeny caused deformation along the southern margin of the Kaapvaal Craton. The effects of this were manifold: reactivation and buckling of N-S trending normal and inverted normal faults, reactivation of the 2.35-2.24 Ga NE- and SE-trending conjugate strike-slip faults, usually with upthrow to the SE and SW, respectively, the development of ENE-trending F3 folds, which may have contributed to broad F2/F3 fold interference patterns (q.v. Mortimer, 1994, 1995). This may also have contributed to the geometry of the Maremane Dome, which is effectively a large-scale "Ramsay style" interference fold with a radial set of fractures/faults, in which conjugate relationships may still be observed. The Dimoten and Ongeluk-Witwater Synclines, wherein the Postmasburg Group is preserved, are situated towards the eastern foreland of the Maremane Dome.

It has been suggested that the interference or intersection of F2 synclines and F3 synclines have resulted in deep, steep-sided, circular or ovoid depressions in which ore (and banded iron formation) is notably thicker (e.g. Mortimer, 1994; 1995). This must be weighed against other models which suggest that areas of very thick, deep ore occupy palaeo-sinkholes, i.e. occur within palaeokarst topography within the Campbell Rand Subgroup (Beukes et al (2002)).

A third model is that of Dalstra and Rosière (2008), which advocates a close association between structures and mineralisation and/or between structures and the preservation of mineralisation. Due to the complex structural and stratigraphic evolution of the area, it is entirely possible that there is a component of all three mechanisms present in a given deposit, albeit substantially complicated by variable preservation.

Subsequent tectonism, including the breakup of Gondwana and Pan-African reworking, had only a minor effect on the modelled volume. Regionally, Bushveld-age gabbroic rocks intruded into the Ghaap and Postmasburg Groups within a clearly defined NE-trending graben, essentially accommodated by the reactivation of Ventersdorp faults (Friese and Alchin, 2007).

Local geology

A total of 17,186 core, reverse-circulation and percussion exploration drill holes (approximately 1,685,000m) as per **Figure 21** have been drilled at the operation, resulting in a highly developed understanding of the mineral asset.

Sishen mine is situated on the northern extremity of the Maremane anticline. At this location the lithologies strike north-south and plunge from the centre of the anticline in a northerly direction. The bulk of the resource comprises high-grade, laminated and massive ores belonging to the Asbestos Hills Subgroup.

The ore bodies are intensely folded and faulted. Dips vary according to local structures, but at Sishen, a regional dip of 11° in a westerly direction prevails.

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

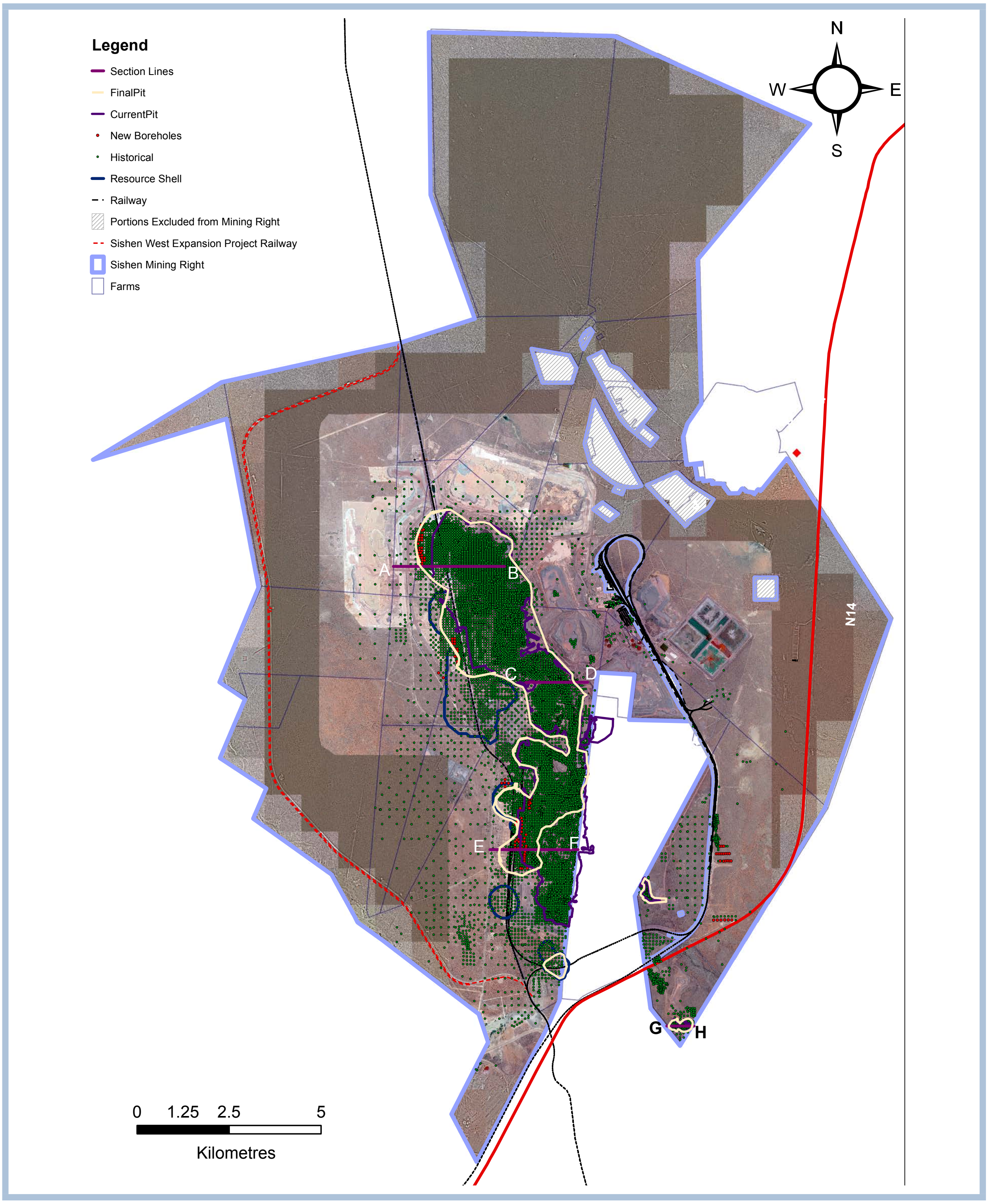


FIGURE 21: SISHEN MINING RIGHT AREA

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

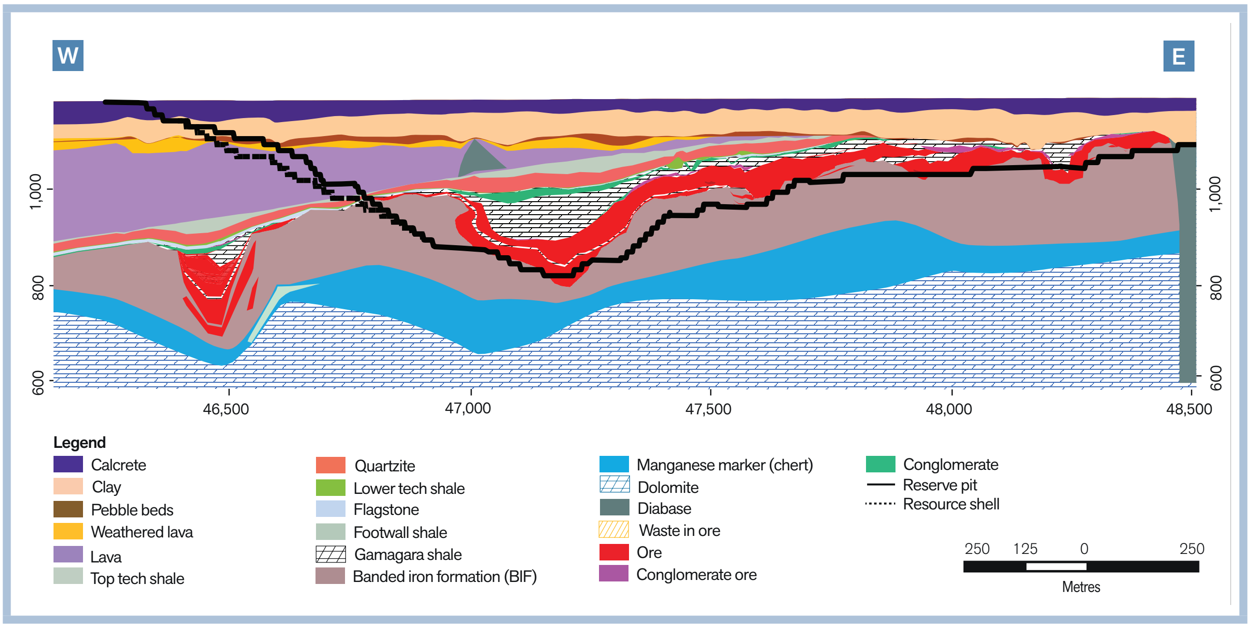
The geometry of the lithologies are depicted via cross-sections (referenced in **Figure 21**) taken through the latest three-dimensional Sishen geological model:

- **Figure 22** is a west-east cross-section (line AB in **Figure 21**) through the Sishen north mine area; the top frame depicting the geology; the bottom frame the spatial geological confidence classification of the high-, medium-, and low-grade ore portions.
- **Figure 23** is a west-east cross-section (line CD in **Figure 21**) through the Sishen middle mine area; the top frame depicting the geology; the bottom frame the spatial geological confidence classification of the high-, medium-, and low-grade ore portions.
- **Figure 24** is a west-east cross-section (line EF in **Figure 21**) through the Sishen south mine area; the top frame depicting the geology; the bottom frame the spatial geological confidence classification of the high-, medium-, and low-grade ore portions.
- **Figure 25** is a west-east cross-section (line GH in **Figure 21**) through the Lylyveld satellite mine area; the top frame depicting the geology; the bottom frame the spatial geological confidence classification of the high-, medium-, and low-grade ore portions.

It can be noticed in some of these figures that the pit layout boundaries in some instances exceed the resource shell in size. This is possible where during pit optimisation ore geology is the limiting factor and not economic viability, and when the pit shell is engineered into a safe pit layout or design, the layout boundaries in some areas exceed the resource shell.

Also, the vertical scale has been exaggerated in all the cross-sections, for better illustrative purposes, resulting in ore body dip angles appearing steeper than actual.

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED



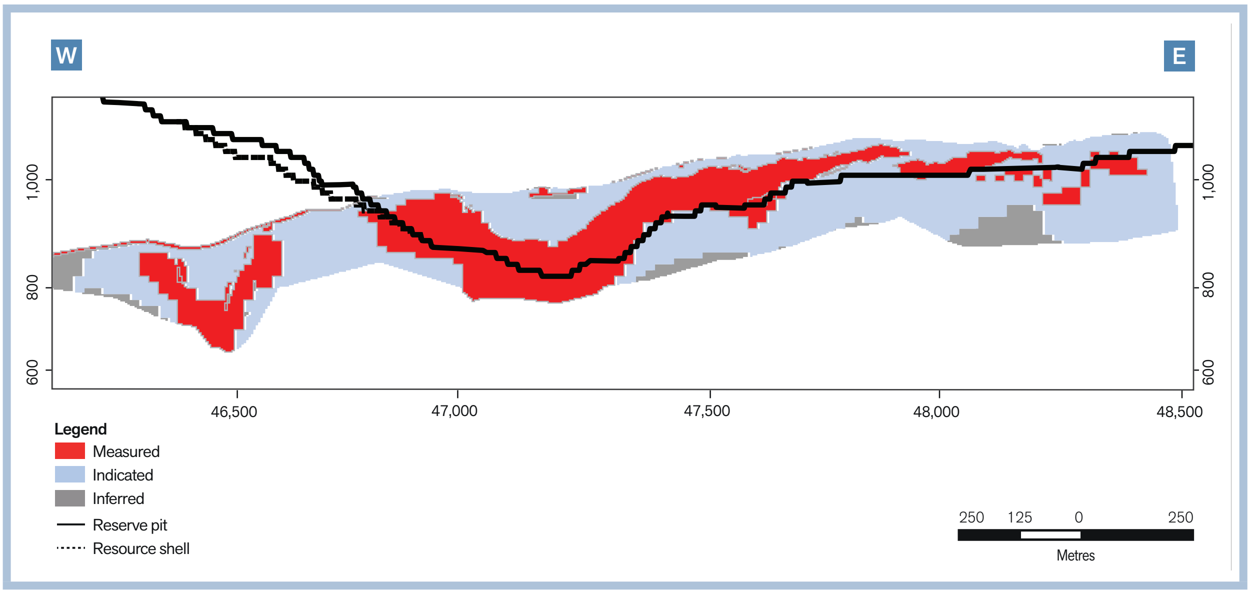


FIGURE 22: **WEST-EAST CROSS-SECTION DEPICTING THE LOCAL GEOLOGY OF THE SISHEN NORTH MINE AREA (TOP), AND ASSOCIATED GEOLOGICAL CONFIDENCE CLASSIFICATION OF HIGH-, MEDIUM- AND LOW-GRADE ORE PORTIONS (BOTTOM)**

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

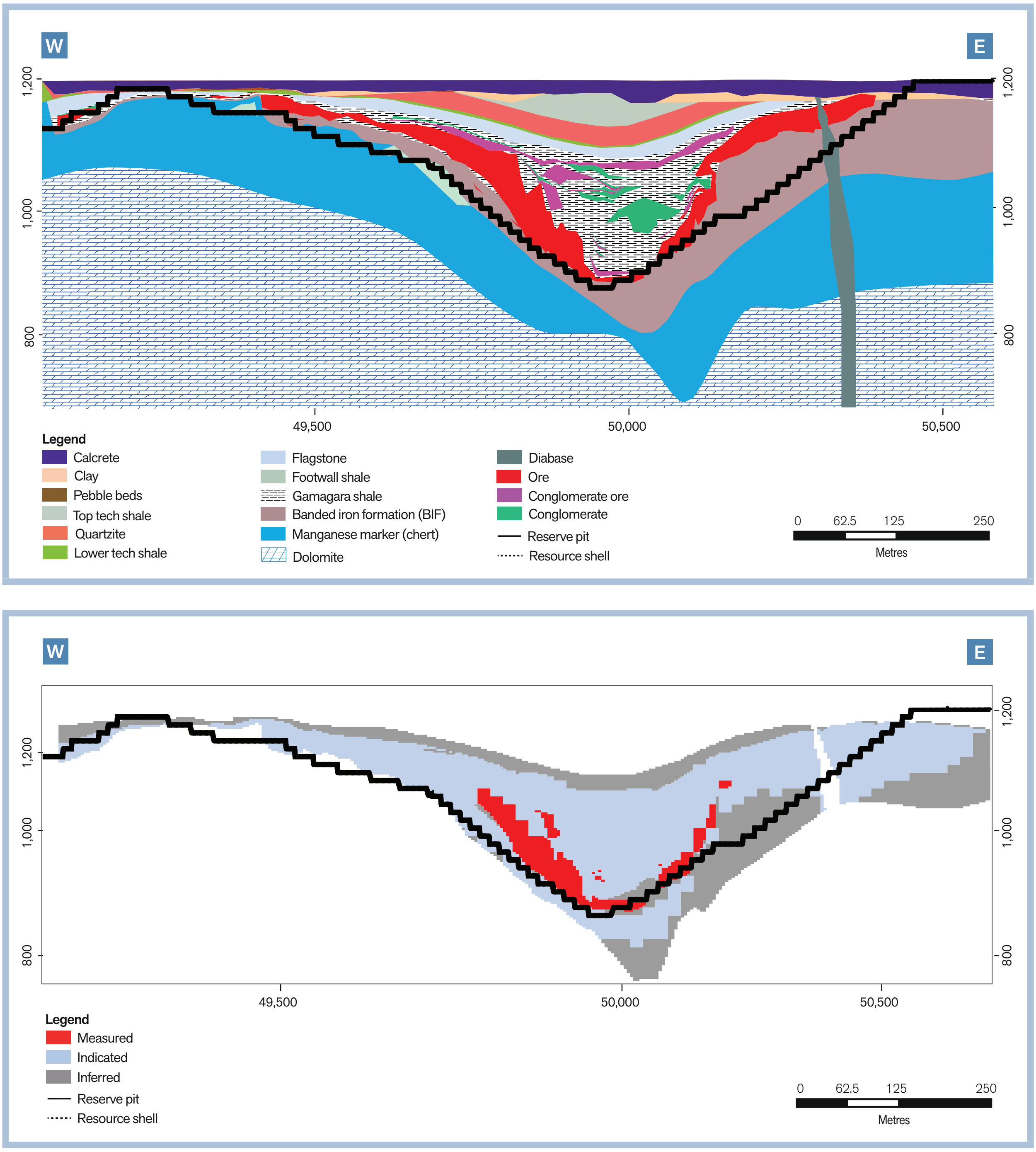
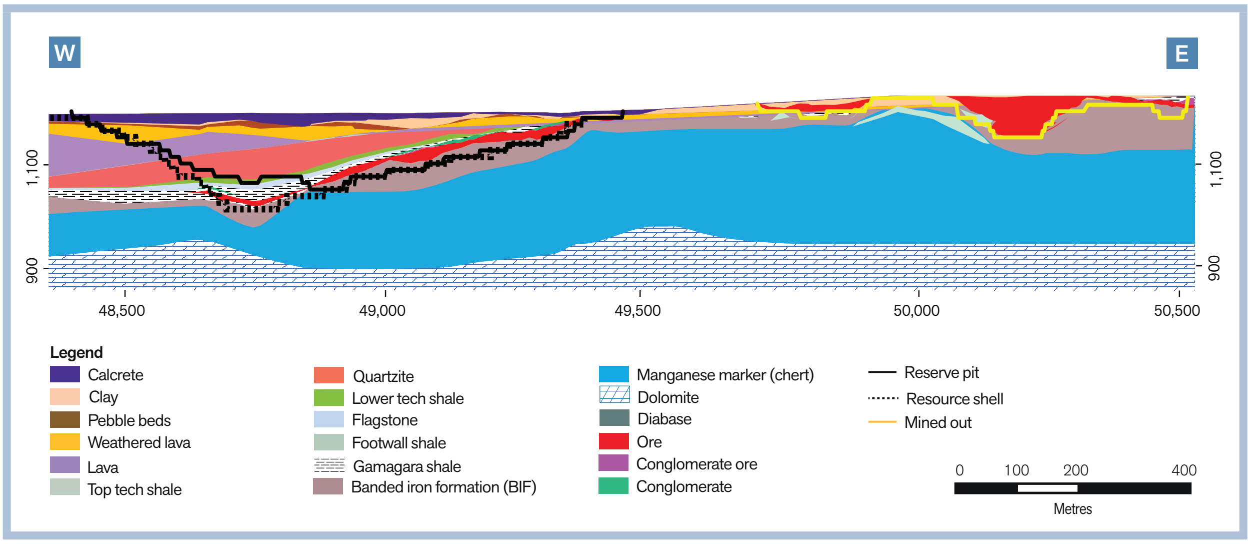


FIGURE 23: **WEST-EAST CROSS-SECTION DEPICTING THE LOCAL GEOLOGY OF THE SISHEN MIDDLE MINE AREA (TOP), AND ASSOCIATED GEOLOGICAL CONFIDENCE CLASSIFICATION OF HIGH-, MEDIUM- AND LOW-GRADE ORE PORTIONS (BOTTOM)**

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED



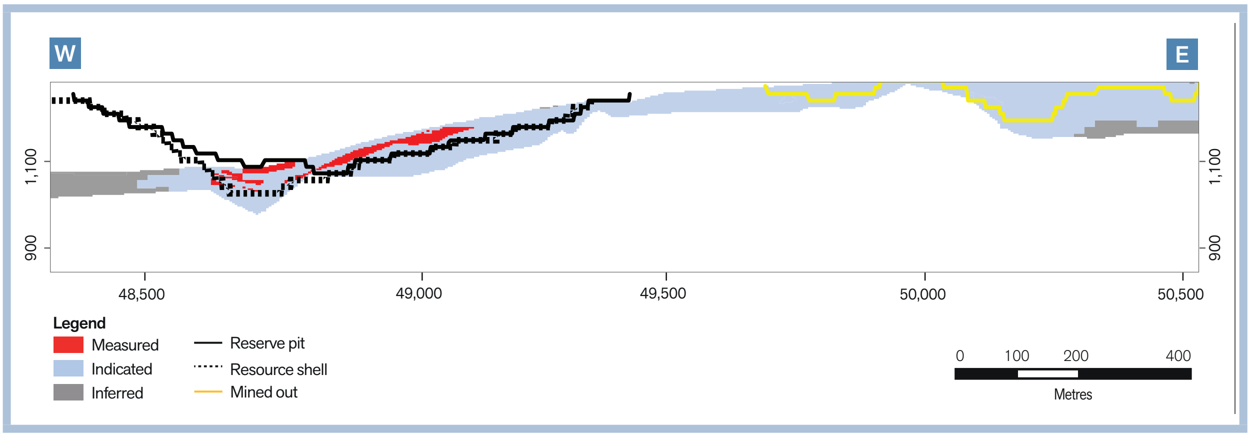


FIGURE 24: **WEST-EAST CROSS-SECTION DEPICTING THE LOCAL GEOLOGY OF THE SISHEN SOUTH MINE AREA (TOP), AND ASSOCIATED GEOLOGICAL CONFIDENCE CLASSIFICATION OF HIGH-, MEDIUM- AND LOW-GRADE ORE PORTIONS (BOTTOM)**

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

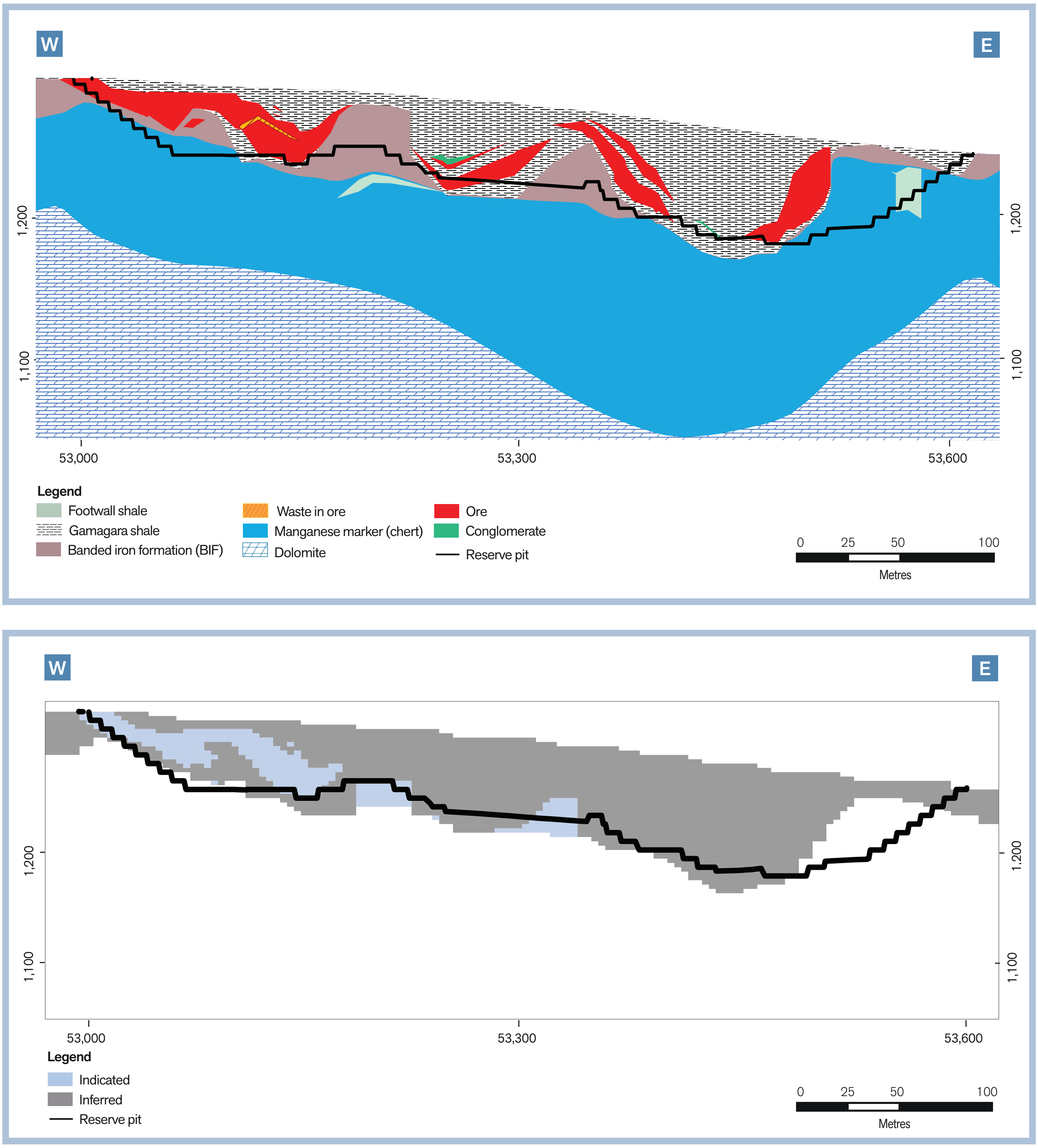


FIGURE 25: **WEST-EAST CROSS-SECTION DEPICTING THE LOCAL GEOLOGY OF THE SISHEN LYLYVELD SATELLITE MINING AREA (TOP), AND ASSOCIATED GEOLOGICAL CONFIDENCE CLASSIFICATION OF HIGH-, MEDIUM- AND LOW-GRADE ORE PORTIONS (BOTTOM)**

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

OPERATIONAL OUTLINE

Sishen mine currently comprises a conventional truck and shovel open-pit operation, processing run-of-mine (RoM) material through two processing facilities: a dense media separation (DMS) plant and a Jig plant that includes a modular ultra-high dense medium separation (UHDMS) facility on a portion of the Jig plant discard stream. The combined RoM capacity of the processing facilities is 47 Mtpa (26 Mtpa for the DMS plant and 21 Mtpa for the Jig plant), which relates to a 34.6 Mtpa Saleable Product output design capacity.

The current mining process entails topsoil removal and stockpiling for later use during the waste dump rehabilitation process, followed by drilling and blasting of waste and ore. The waste material is in-pit dumped where such areas are available, or hauled to waste rock dumps. The iron ore is loaded according to blend (grade) requirements and hauled to designated run-of-mine buffer stockpiles or the beneficiation plants, where it is crushed, screened and beneficiated. The screened ore size fractions are beneficiated using a ferrosilicon dense media (DMS or UHDMS) or through a jigging process before being stockpiled on the product beds. Plant slimes are not beneficiated and are pumped to evaporation dams while the DMS and Jig (and UHDMS) discard material is stacked on a plant discard dump.

Seven iron ore products (conforming to different chemical and physical specifications are produced. The ores are reclaimed from the product beds and loaded into trains, to be transported to local steel mills and Saldanha Bay for export to international markets.

Kumba has an agreement with ArcelorMittal SA to deliver if required, a maximum off-take of 6.25 Mtpa of product. The maximum off-take has not been requested by ArcelorMittal SA in the last few years. The remainder of the production is exported via the Saldanha Port to various international steel markets. The closure of the Saldanha Steel Works as announced by ArcelorMittal SA in Q4 of 2019, will result in a material decrease in the domestic off-take of the Saleable Product. Considering the current rail and Saldanha harbour infrastructure and agreements between Kumba and the applicable governmental institutes, it is not foreseen that Kumba would be able to export the equivalent decrease in domestic off-take. Alternative medium- and long-term plans will have to be considered to cater for this to minimise the impact of the lower domestic off-take on the Kumba bottom line. This decrease in off-take has not been considered by the 2019 Sishen LoM plan, as it was already completed and signed off by the time the ArcelorMittal SA announcement was made.

It is estimated at the time of reporting that the total tonnes (227.5 Mt) extracted from the pit at Sishen mine in 2019 increased by 3% compared to the 2018 figure of 220.5 Mt, of which ex-pit waste mined in 2019 equates to 178.3 Mt, with ex-pit ore equating to 49.2 Mt. Total run-of-mine production at Sishen mine for 2019 is estimated at 40.1 Mt (39.3 Mt Ore Reserves plus 3.3 Mt modified Inferred Mineral Resources minus 2.5 Mt mined to run-of-mine buffer stockpiles. The resulting Saleable Product is estimated at 29.9 Mt at an average annual yield of 74.6%.

The forecast sales for 2019 are 29.7 Mt.

The difference between the ex-pit ore figure and the combined run-of-mine figure and annual stockpile growth figure is 4.3 Mt. This is low-grade ore material (classified as Mineral Resources but not yet declared as Ore Reserves) that is being stockpiled on long-term stockpiles.

Sishen mine's key operational parameters are summarised in **Table 12**.

TABLE 12: SISHEN MINE OPERATIONAL OUTLINE SUMMARY

Key details	
Ownership (AA plc)	53.2%
Ownership (KIO)	76.3%
Commodity	Iron ore
Country	Republic of South Africa
Mining method	Open pit-conventional
Reserve life	13 years
Mine life	13 years
Estimated Saleable Product Lump : Fine ratio	71.8 : 28.2
Saleable Product design capacity	34.7 Mt
Estimated 2019 run-of-mine production	40.1 Mt
Estimated 2019 Saleable Product	29.9 Mt
Estimated 2019 waste production	178.3 Mt
Overall planned stripping ratio	3.4 : 1
Estimated product sold in 2019	29.7 Mt
Product types	In total three Lump and four Fine product types of varying grade is produced
Mining right expiry date	10 November 2039

* Reserve life includes all consecutive years in the LoMP where the Proved and Probable Ore Reserves make up >25% of the year's run-of-mine.

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

Production history

The historical production (actual depletion of Saleable Product tonnes) of Sishen mine is summarised in **Figure 26**.

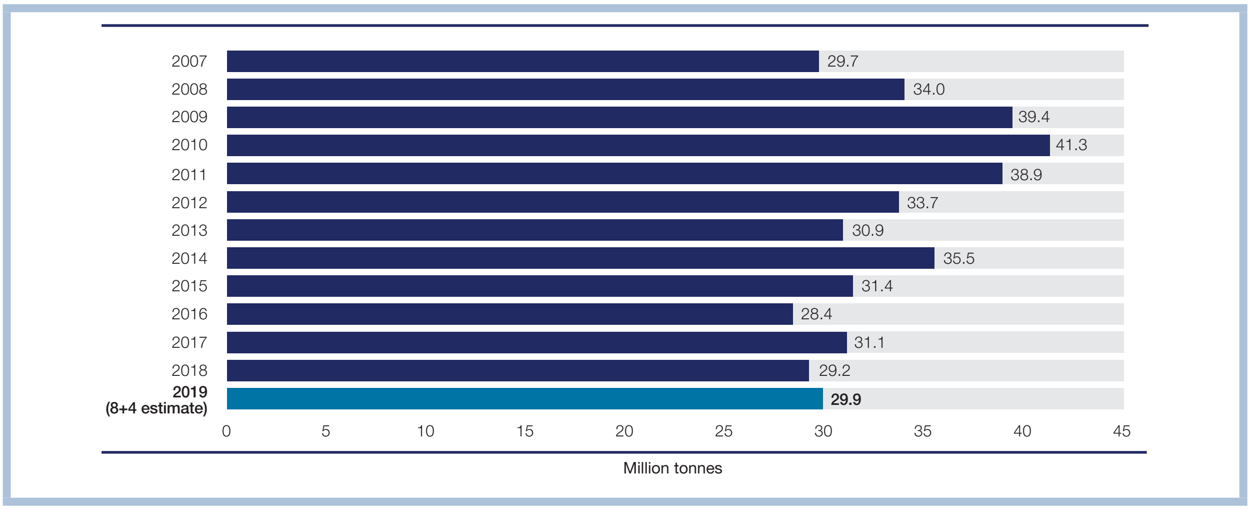


FIGURE 26: **SISHEN MINE PRODUCTION HISTORY**

Latest LoMP Saleable Product profile

The Sishen mine 2019 LoMP Saleable Product profile is depicted in **Figure 27**.

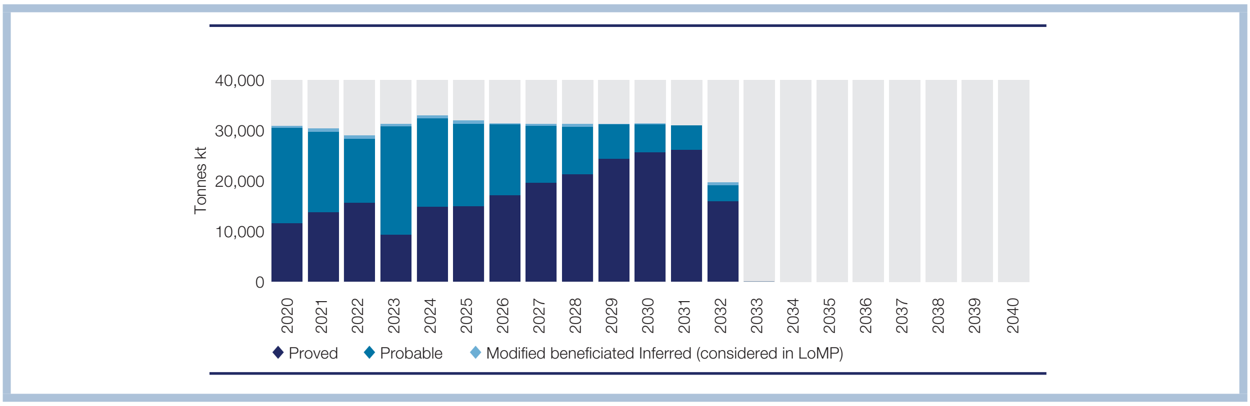


FIGURE 27: **SISHEN MINE'S 2019 LOMP ANNUAL SALEABLE PRODUCT PROFILE** (including modified beneficiated Inferred Mineral Resources)

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

ORE RESERVE ANCILLARY INFORMATION

The Sishen mine Ore Reserve ancillary information is summarised in **Table 13A** (background information) and **Table 13B** (Main pit Ore Reserve estimation parameters – as an example).

TABLE 13A: SISHEN MINE'S 2019 VERSUS 2018 ORE RESERVE BACKGROUND INFORMATION

SISHEN MINE	2019	2018
LOCATION		
Country	Republic of South Africa	Republic of South Africa
Province	Northern Cape	Northern Cape
OWNERSHIP		
Sishen Iron Ore Company Proprietary Limited	100%	100%
Kumba Iron Ore Limited	76.3%	76.3%
AA plc	53.2%	53.2%
OPERATIONAL STATUS		
Operation status	Steady-state	Steady-state
Mining method	Open pit (conventional drilling and blasting and truck and shovel operation)	Open pit (conventional drilling and blasting and truck and shovel operation)
Beneficiation method	Dense media separation, Jig beneficiation combined with Ultra High Dense Media separation	Dense media separation as well as Jig beneficiation combined with Ultra High Dense Media separation
Annual Saleable Product (Mtpa)	31.1	31.6
Annual supply to domestic market (Mtpa)	1.3	3.6
Annual supply to export market (Mtpa)	29.8	28.0
Number of products	Three final saleable products from Saldanha: Premium Lump, Standard Lump and Standard Fines, but with more intermediate products produced at Sishen	Three final saleable products from Saldanha: Premium Lump, Standard Lump and Standard Fines, but with more intermediate products produced at Sishen
GOVERNANCE		
Code	THE SAMREC CODE – 2016 EDITION	
AA plc group policy	Group Policy for Reporting of Ore Reserves and Mineral Resources Version 1	
AA plc group technical standard	AA_GTS_22 (Reporting of Exploration Results, Mineral Resources and Ore Reserves in Anglo American)	
AA plc requirements document	AA_RD22-25 (Exploration Results, Mineral Resources and Ore Reserves Reporting Requirements Document – Version 10)	
KIO reporting policy	http://www.angloamericankumba.com/sd_policies.php	
KIO reporting protocols	KIO Reserve Classification Guideline (Version 1)	
KIO reporting template	Ore Reserve (and Saleable Product) Reporting Template (2019)	Ore Reserve (and Saleable Product) Reporting Template (2017)

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

TABLE 13A: continued

SISHEN MINE'S 2019 VERSUS 2018 ORE RESERVE BACKGROUND INFORMATION continued

SISHEN MINE	2019	2018
REPORTING METHOD		
Approach	Ore Reserves are those derived from Measured and Indicated Mineral Resources only (through application of modifying factors) and do not include Inferred Mineral Resources. In the case of Kumba Iron Ore all Ore Reserves are constrained by practical pit layouts, mining engineered from pit shells that define "current economically mineable". The geological block model(s) is converted into a mining block model considering a site-specific practical mineable smallest mining unit. Furthermore protocols ensure that Kumba Iron Ore's operations/projects consider expected long-term revenues versus the operating and production costs associated with mining and beneficiation as well as legislative, environmental and social costs, in determining whether or not a Mineral Resource could be economically extracted and converted to an Ore Reserve. This is performed by applying a Lerchs-Grosmann algorithm to the mining model to derive an optimised pit shell. This optimised pit shell is then iteratively converted to a practical layout by applying geotechnical slope stability parameters and haul road and ramp designs, legal restrictions, etc., with safety being one of the most considered parameters. Once a practical pit layout has been established the material within the pit is scheduled over time to achieve client specifications and thus a LoM schedule is produced. The average % Fe grade and metric tonnage estimates of "Saleable Product" are also reported to demonstrate that beneficiation losses have been taken into account.	
Scheduled run-of-mine metric tonnes (dry/wet)	Dry	
Tonnage calculation	Tonnages are calculated from the life-of-mine schedule, originating from the mining block models, and are modified tonnages considering geological losses, the effect of dilution, mining losses, mining recovery efficiencies and design recovery efficiencies to derive the run-of-mine tonnages delivered to the crushing and screening plant.	
Fe grade	Ore Reserve % Fe grades reported, represent the weighted average grade of the "plant feed" or "run-of-mine" (RoM) material and take into account all applicable modifying factors.	
Cut-off grade (Fe)	40%	40%
Ore type	Haematite ore	Haematite ore
Optimised pit shell revenue factor	1.00	Not reported
Life-of-mine scheduling		
Software	*OPMS*	*OPMS*
Method	Product tonnage and grade target driven to achieve required client product specifications	Product tonnage and grade target driven to achieve required client product specifications
Stripping strategy	A stripping strategy that follows a constant annual tonnage target, which remains between the minimum and maximum stripping limits, were chosen for the LoM scheduling. A deferred waste stripping strategy was applied to save costs in the medium term	A stripping strategy that follows a constant annual tonnage target, which remains between the minimum and maximum stripping limits, were chosen for the LoM scheduling. A deferred waste stripping strategy was applied to save costs in the medium term
Reserve life years	13	14
LoMP run-of-mine tonnes (including modified Inferred) (expressed in million tonnes)	527.7	556.3
Overall average stripping ratio (including Inferred Mineral Resources)	1 : 3.4	1 : 3.4
Production data cut-off date (date where after short-term plan instead of actual figures are used to estimate the annual run-of-mine and Saleable Product production for the mine until 31 December of year of reporting)	31 August 2019	30 September 2018
Topography and pit progression assigned	31 December 2019	31 December 2018
Reserve schedule ID	2019_LOM_Base_Schedule_RR.xls	Sishen_2018_LOM_Base_Schedule_v7.xls
Reserve schedule completion date	30 September 2019	30 September 2018

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

TABLE 13B: SISHEN MINE'S 2019 VERSUS 2018 MAIN PIT ORE RESERVE ESTIMATION PARAMETERS
(a similar table exists for the Lylyveld satellite pit mining area)

	2019	2018
ESTIMATION		
Main pit		
Mining block model name	north_2019_smu.mdl; south_2019_smu.mdl; lvd_b_2018_comb.mdl; lvd_c_2018_comb.mdl	north_2018_comb.mdl; south_2018_comb.mdl; lvd_b_2018_comb.mdl; lvd_c_2018_comb.mdl
Smallest mining unit	20m(X) x 20m(Y) x 12.5m(Z)	20m(X) x 20m(Y) x 12.5m(Z)
Practical mining parameters		
Bench height	12.5m	12.5m
Ramp gradient	8% to (1 in 12.5)	8% (1 in 12.5)
Road width	30m to 56m	30m to 56m
Minimum mining width	80m (rope shovel and truck mining)	80m (rope shovel and truck mining)
Geohydrology	Groundwater level maintained 12.5m below pit floor	Groundwater level maintained 12.5m below pit floor
Pit slopes	Designed according to a defendable risk matrix, guided by an appropriate factor of safety of 1.3 and a probability of failure of 10%	Designed according to a defendable risk matrix, guided by an appropriate factor of safety of 1.3 and a probability of failure of 10%
Pit optimisation		
Software	*Whittle 4X*	*Whittle 4X*
Method	Lerchs-Grosmann (primary LoM maximisation, secondary NPV maximisation)	Lerchs-Grosmann (primary LoM maximisation, secondary NPV maximisation)
Modification		
Modifying factors		
Geological loss (%)	0	0
Dilution (%)	12	14
Mining loss (%)	-3	-4
Mining recovery efficiency (%)	96	95
Design recovery efficiency (%)	100	99
Ore Reserves reallocated to Mineral Resources (%)	-1	-1
Metallurgical yield (%) to convert to Saleable Product	74.6	76.3
Estimator		
Reserve estimator	Alfred April	Alfred April
Reserve estimator status	Internal Technical Specialist	Internal Technical Specialist
Estimator employer	Sishen Iron Ore Company Proprietary Limited	Sishen Iron Ore Company Proprietary Limited

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

MINERAL RESOURCE ANCILLARY INFORMATION

The Sishen mine Mineral Resource ancillary information is summarised in **Table 14A** (background information) and **Table 14B** [nn1(a to c) geological models' Mineral Resource estimation parameters – as an example].

TABLE 14A: SISHEN MINE'S 2019 VERSUS 2018 MINERAL RESOURCE BACKGROUND INFORMATION

SISHEN MINE	2019	2018
LOCATION		
Country	Republic of South Africa	Republic of South Africa
Province	Northern Cape	Northern Cape
OWNERSHIP		
Sishen Iron Ore Company Proprietary Limited	100	100
Kumba Iron Ore Limited	76.3	76.3
Anglo American plc	53.2	53.2
SECURITY OF TENURE		
Number of applicable mining rights	1	1
Mining right status	Registered (amendments registered)	Registered (amendments executed)
Mining right expiry date(s)	10 November 2039	10 November 2039
EXPLORATION STATUS		
Exploration type	Geological confidence (on mine)	Geological confidence (on mine)
Exploration phase	In execution	In execution
Ore type	Haematite ore	Haematite ore
GOVERNANCE		
Code	THE SAMREC CODE – 2016 EDITION	
AA plc group policy	Group Policy for Reporting of Ore Reserves and Mineral Resources Version 1	
AA plc group technical standard	AA_GTS_22 (Reporting of Exploration Results, Mineral Resources and Ore Reserves in Anglo American)	
AA plc requirements document	AA_RD22-25 (Exploration Results, Mineral Resources and Ore Reserves Reporting Requirements Document – Version 10)	
KIO reporting policy	http://www.angloamericankumba.com/sd_policies.php	
KIO reporting protocols	KIO Resource Classification Guideline (Version 2)	KIO Resource Classification Guideline (Version 2)
KIO reporting template	Mineral Resource (and Mineral Inventory) Reporting Template (2019)	Mineral Resource (and Mineral Inventory) Reporting Template (2017)
REPORTING METHOD		
Approach	Mineral Resources are reported exclusive of Ore Reserves and not factoring in attributable ownership and only if: (1) spatially modelled; (2) spatially classified; (3) spatially constrained in terms of reasonable and realistic prospects for eventual economic extraction (occurring within an RRPEEE defined envelope, in other words not all mineral occurrences are declared as Mineral Resources); (4) declared within (never outside) executed tenement boundaries.	
In situ metric tonnes (dry/wet)	Dry	Dry
Tonnage calculation	Tonnages are added from cells in geological block model of which the centroids intersect the relevant geological ore domains in the solids models which occur inside the resource shell. The volume of each ore cell is multiplied with the estimated relative density of the same cell)	Tonnages are added from cells in geological block model of which the centroids intersect the relevant geological ore domains in the solids models which occur inside the resource shell. The volume of each ore cell is multiplied with the estimated relative density of the same cell)
Fe grade	Weighted average above cut-off grade	Weighted average above cut-off grade
Fe calculation	Tonnage-weighted mean of the estimated *in situ* Mineral Resource Fe grades contained within geological block models, constrained by the relevant Resource geological ore domains and RPEEE resource shell	Tonnage-weighted mean of the estimated *in situ* Mineral Resource Fe grades contained within geological block models, constrained by the relevant Resource geological ore domains and RPEEE resource shell
RPEEE		
Cut-off grade	40% Fe	40% Fe
Resource shell revenue factor	1.6	1.6

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

TABLE 14B: **SISHEN MINE'S 2019 VERSUS 2018 NN1(A TO C) GEOLOGICAL MODELS' MINERAL RESOURCE ESTIMATION PARAMETERS – AS AN EXAMPLE** (similar tables exist for the NN2(A to C), NN3(A to C), NN4(A to C), MM1(A to C), SS1(A to C), SS2(A to C), SS3(A to C), LVD(A to C) and DNV(A to C) geological models but are not stated in this report)

	2019	2018
ESTIMATION		
NN1(A to C) geological models		
Input data		
Borehole type	Core and percussion borehole lithological logs and associated chemical analyses	
Relative density measurement	Minidense (pre 2010) and Picnometer analyses on pulp samples (2010 to present)	Minidense (pre 2010) and Picnometer analyses on pulp samples (2010 to present)
KIO QA/QC protocol	KIO QC Protocol for Exploration Drilling Sampling and Sub-sampling (Version 8)	
Primary laboratory	TECHNICAL SOLUTIONS Division of Anglo Operations Limited CHEMISTRY LABORATORY (Company registration number: 1921/006730/07)	TECHNICAL SOLUTIONS Division of Anglo Operations Limited CHEMISTRY LABORATORY (Company registration number: 1921/006730/07)
Accreditation	Accredited under International Standard ISO/IEC 17025:2005 by the South African National Accreditation System (SANAS) under the Facility Accreditation Number T0051 (valid from 1 May 2016 to 30 April 2021)	Accredited under International Standard ISO/IEC 17025:2005 by the South African National Accreditation System (SANAS) under the Facility Accreditation Number T0051 (valid from 1 May 2016 to 30 April 2021)
Borehole database software	*acQuire*	*acQuire*
Borehole database update cut-off date	30 September 2017	30 September 2017
Database validation conducted	Yes	Yes
Segmentation conducted	Yes. To allow for simplification of logged lithologies for spatial correlation purposes	
STATISTICAL AND GEOSTATISTICAL EVALUATION		
Data compositing interval	3m	3m
Data compositing method	Length multiplied with density used to weight per lithology	Length multiplied with density used to weight per lithology
Grade parameters evaluated	% Fe, % SiO2, % Al2O3, % K2O, and % P as well as Relative density	% Fe, % SiO2, % Al2O3, % K2O, and % P as well as Relative density
Variography updated in current year	No	Yes
Search parameters updated in current year	No	Yes
SOLIDS MODELLING		
Solids modelling software	*Surpac*	*Surpac*
Input	Updated solids models	Updated solids models
Method	Digital wireframe modelling for ore segments and some waste segments (waste in contact with ore zones)	
Digital terrain models for other waste segments	Digital wireframe modelling for ore segments and some waste segments (waste in contact with ore zones)	
Digital terrain models for other waste segments		
Domaining	Primary lithological domains are subdomained based on structural discontinuities, and distinguishable variation in grade, i.e. K2O as well as where volumes have been informed predominantly by core or percussion borehole data, i.e. different data populations	Primary lithological domains are subdomained based on structural discontinuities, and distinguishable variation in grade, i.e. K2O as well as where volumes have been informed predominantly by core or percussion borehole data, i.e. different data populations
Topography and pit progression assigned	31 December 2019 (planned boundary)	31 December 2018 (planned boundary)
Validation conducted	Yes (for gaps and overlaps by software queries as well as honouring of borehole contacts) and by standard software validation tools (open sides, self-intersecting triangles)	Yes (for gaps and overlaps by software queries as well as honouring of borehole contacts) and by standard software validation tools (open sides, self-intersecting triangles)

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

TABLE 14B: continued

SISHEN MINE'S 2019 VERSUS 2018 NN1(A TO C) GEOLOGICAL MODELS' MINERAL RESOURCE ESTIMATION PARAMETERS – AS AN EXAMPLE (similar tables exist for the NN2(A to C), NN3(A to C), NN4(A to C), MM1(A to C), SS1(A to C), SS2(A to C), SS3(A to C), LVD(A to C) and DNV(A to C) geological models but are not stated in this report) continued

	2019	2018
GRADE ESTIMATION METHODOLOGY		
Ore segments	Ordinary (Co-) kriging	Ordinary (Co-) kriging
Waste segments	Global estimate	Global estimate
GEOLOGICAL BLOCK MODELLING		
Block modelling software	*Isatis / Surpac*	*Isatis / Surpac*
Model type	Centroid model	Centroid model
Parent cell size	20m(X) x 20m(Y) x 12.5m(Z)	20m(X) x 20m(Y) x 12.5m(Z)
Minimum sub-block cell size	5m(X) x 5m(Y) x 3.125m(Z)	5m(X) x 5m(Y) x 3.125m(Z)
CELL POPULATION METHOD		
Tonnage	Volume of lithology intersected by cell centroid and constrained by cell limits, multiplied with relative density estimate of the same lithology at same unique cell centroid position in space	Volume of lithology intersected by cell centroid and constrained by cell limits, multiplied with relative density estimate of the same lithology at same unique cell centroid position in space
Grade	Estimate of grade at unique cell centroid position in space applicable to total volume or tonnage constrained by the cell	Estimate of grade at unique cell centroid position in space applicable to total volume or tonnage constrained by the cell
Updated geological block model ID (file name + extension)	nn1 (a to c).mdl	nn1 (a to c).mdl
Update completion date	28 February 2018	28 February 2018
ESTIMATOR		
Resource estimator	Jacques Deacon / Marianne van den Heever / Johan van Zyl	Jacques Deacon / Marianne van den Heever / Johan van Zyl
Resource estimator status	Internal Technical Specialist / Internal Technical Specialist / External Technical Specialist	Internal Technical Specialist / Internal Technical Specialist / External Technical Specialist
Estimator employer	Sishen Iron Ore Company Proprietary Limited / Sishen Iron Ore Company Proprietary Limited / ZStar Mineral Resource Consultants	Sishen Iron Ore Company Proprietary Limited / Sishen Iron Ore Company Proprietary Limited / ZStar Mineral Resource Consultants

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

ZANDRIVIERSPOORT PROJECT

GEOLOGICAL OUTLINE

Regional geology

Zandrivierspoort (ZRP) is a low-grade magnetite deposit in the Palaeo proterozoic Rhenosterkoppies Greenstone Belt or Rhenosterkoppies Fragment (RF), which occurs to the northwest of the main, northeast-trending Pietersburg Greenstone Belt (**Figure 28**).

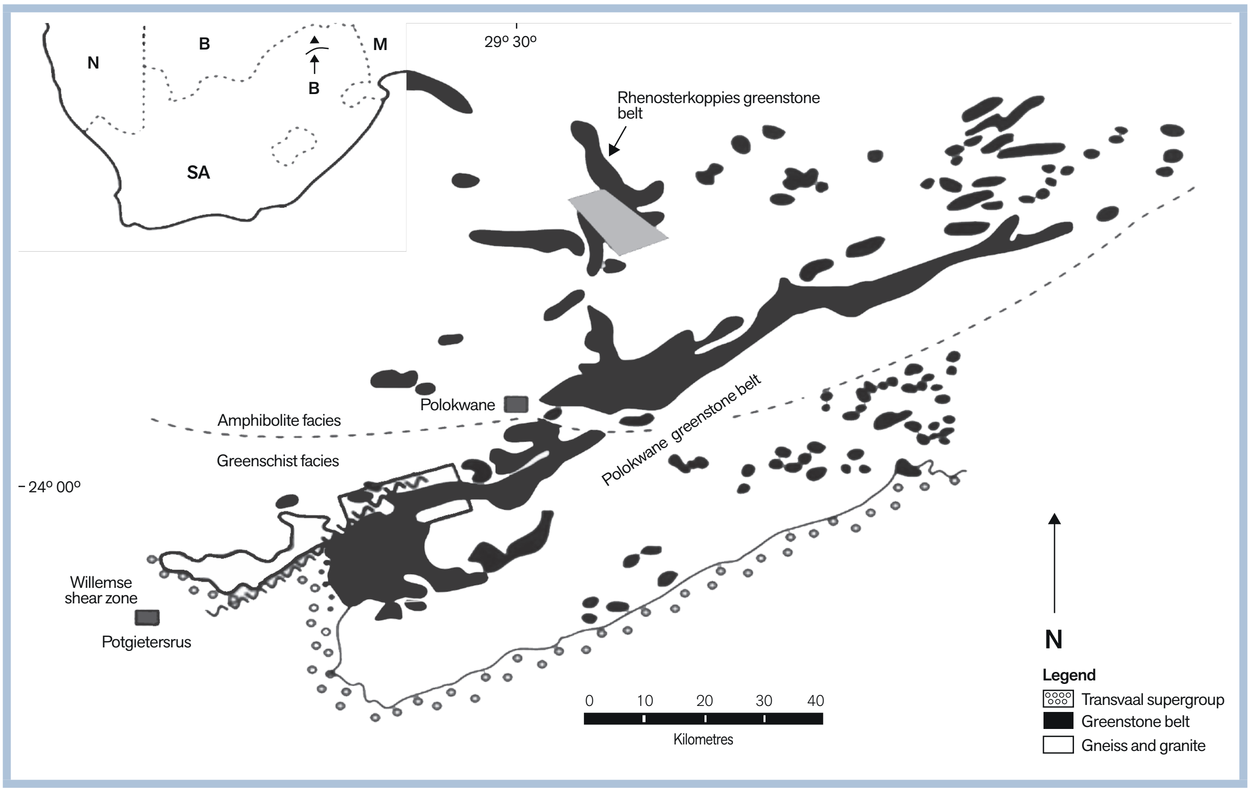


FIGURE 28: **SIMPLIFIED GEOLOGICAL MAP OF GREENSTONE BELTS IN THE VICINITY OF POLOKWANE.** The approximate position of the Zandrivierspoort prospect, within the Rhenosterkoppies Greenstone Belt or Fragment, is shown as a light-grey polygon (base map modified from Franey, 1987).

The ZRP prospect occurs within the SE-trending fold hinge zone of the RF, a feature which some authors have considered to be significant in the thickening or duplication of relatively thin banded ironstone (BIS) units. Both the Pietersburg and the Rhenosterkoppies Greenstone Belts are enclosed in granites, which display the "pinched-in" or "keel-like" morphology that is typical of greenstone belts within granite-gneiss terrains of southern Africa.

The RF is unique in that it firstly contains relatively little of the Archaean Uitkyk formation, which consists of greenschist to amphibolite facies immature sandstones, siltstones, "grits", conglomerates and breccias (Kalbskopf and Barton, 2003). Rather, it is dominated by metavolcanics – in the form of amphibolites – and relict banded ironstone units. Secondly, the RF does not trend NE, in contrast to the majority of southern African greenstone belts.

The form of underlying gneisses resulted in a certain "compartmentalisation" of the RF in the vicinity of the Zandrivierspoort project. Such compartmentalisation is accentuated in outcropping geology and is also defined by major lineaments, interpreted from regional aeromagnetic data. A large diabase dyke runs NNE across the approximate centre of the ZRP prospect.

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

Stratigraphy

The stratigraphic column depicting the local geology of the Zandrivierspoort project is illustrated in **Figure 29**.

STRATIGRAPHIC COLUMN AT ZANDRIVIERSPOORT
Overburden: scree, alluvium (sand, pebble bands), canga
Chlorite-actinolite schist
Calc-silicate rock with occasional thin bands of muscovite biotite, and amphibolite
Schist (quartz, amphibolite, biotite, garnet)
Quartzite, pyrrhotite-quartzite and calcite amphibole quartzite
BIS (upper)
Quartzite, pyrrhotite-quartzite and calcite amphibole quartzite
Schist (quartz, amphibolite, biotite, garnet)
Quartz-amphibole schist and amphibolite (massive and schistose) with subordinate schist (amphibolite, biotite, garnet)
Schist (quartz, amphibolite, biotite, garnet)
Quartzite, pyrrhotite-quartzite and calcite amphibole quartzite with various schist bands
BIS (lower 1)
Quartzite, pyrrhotite-quartzite and calcite amphibole quartzite with various schist bands
Schist (quartz, amphibolite, biotite, garnet)
Quartz-amphibole and amphibolite (massive and schistose) with subordinate schist (amphibolite, biotite, garnet)
Schist (quartz, amphibolite, biotite, garnet)
Quartzite, pyrrhotite-quartzite and calcite amphibole quartzite with various schist bands
BIS (lower 2)
Quartzite, pyrrhotite-quartzite and calcite amphibole quartzite with various schist bands
Schist (quartz, amphibolite, biotite, garnet)
Amphibolite (massive and schistose) with subordinate schist (amphibolite, biotite, garnet)
Various lower BIS bands

FIGURE 29: SIMPLIFIED STRATIGRAPHIC COLUMN DEPICTING THE LOCAL ZANDRIVIERSPOORT PROJECT GEOLOGY

Tectonic setting

It is Kumba's understanding that the geology of the Zandrivierspoort project has been influenced by three tectonic events.

- D1 – First Ductile Deformation Event: D1 is attributed either to "atectonic" processes, such as soft-sediment slumping during early basinal deformation (Collins, 1986), the major fold orientations of which were constrained by the local down-dip direction of the developing basin. Moore (1975), Sweby (1984), Pearce (1983) and Pearce and Pearce (1983, 1984) attribute the local thickening and duplication of BIS and surrounding units to recumbent isoclinal folding. Thickening or duplication is particularly well-developed in areas where there are stacked isoclinal fold hinge zones. Sweby (1984) also cites evidence for very low-angle, northward-verging thrusting in the NW portion of the project area as being the cause of, or at least being related to, isoclinal folding. "D1" may have been preceded by earlier deformation phases, such as southward-directed thrusting or back-thrusting, but these phases will be obscured by the dominant D1/F1 event. Post-D1/F1 deformation events appear to have had only a minor effect on the structural morphology.
- D2 – Second Ductile Deformation Event: There is confusion regarding D2/F2 and D3/F3. Collins (1986) proposed extensive, EW- to ESE-trending F2 folds across the ZRP area (see Figures 2 and 3). These open or gentle folds merely reorient the dominant S1 such that it is locally either very shallowly N- or S-dipping. A further effect of D2 is apparently the development of laterally extensive, E-W to ESE-trending faults that truncate BIS units. These faults effectively exploit the incipient fracture cleavage developed in the hinge zones of F2 faults. A fault of this type possibly occurs to the NNE of the exposed BIS mapped by Pearce and Pearce. Due to the sub-vertical drilling and the minor offset proposed by previous authors, it's not clear what effect, in terms of offset or a "damage or contact strain" zone, these faults will have on BIS units. One possible effect, when combined with more easily observed, NE-trending diabase dykes, is to segment the BIS units into a series of blocks along NE- and ESE-trending lines. Further data is needed to confirm or disprove this. Upright, open, NE-SW-trending, gently plunging folds are attributed by Sweby (1984) as D2 in age, while Collins (1986) suggests that they are superimposed on the broad, open E-W to ESE-trending folds produced in his D2/F2 classification (described above), i.e. that they are D3 in age/sequence.
- D3 – Third Ductile Deformation Event: As detailed in the preceding paragraphs, D3 of Collins comprises NE-SW-trending, shallowly plunging folds, with moderately developed axial planar cleavage. This cleavage is exploited by the later intrusion of NE-SW-trending diabase dykes. The D3 event of Sweby (1984) and the D4 event of Collins (1986) bear a strong resemblance to the D2 event of Collins (1986), i.e. NW-SE trending gentle refolding of "F1" and "F2". Therefore, it's not clear if the gentle, flat-lying E-W to ESE trending folds refold the NE-SW trending upright folds, or vice versa.

In summary, the main or controlling deformation events produced early, isoclinal, recumbent folds, which were refolded by essentially co-axial, open to closed, upright folds. The combination of these events resulted in NE-SW-trending, non-cylindrical folds, i.e. folds which die out along strike and which appear to have very gently refolded axes.

This structural style is, moreover, suggested by Moore (1975) and Sweby (1984). Such folds appear to be largely N- or NNW-verging, according to Kalbskopf and Barton (2003) and from observations made by Kumba.

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

Local geology

The banded ironstone (BIS) occurs as fine to medium grained units with well-banded layers of predominantly magnetite and quartz.

Three BIS units have been identified by Kumba and spatially modelled as separate units, i.e. the Upper BIS, the Lower 1 BIS and the Lower 2 BIS, with BIS units beneath the Lower 2 BIS unit ignored in the geological modelling because of insufficient data to prove geometric continuity. The top portion of the Upper BIS has been weathered into what KIO refers to as a haematite cap and this has been sub-domained.

The geometry of the lithologies are depicted via cross-sections (referenced in **Figure 30**) taken through the latest three-dimensional Sishen geological model:

- **Figure 31** is a west-east section through the centre of the Zandrivierspoort deposit, depicting the local geology (top) as well as the associated spatial geological confidence classification of the ore body portions of the lithology for the same cross-section (bottom).
- **Figure 32** is a north-west-south-east section through the western portion of the Zandrivierspoort deposit, depicting the local geology (top) as well as the associated spatial geological confidence classification of the ore body portions of the lithology for the same cross-section (bottom).
- **Figure 33** is a north-west-south-east section through the eastern portion of the Zandrivierspoort deposit, depicting the local geology (top) as well as the associated spatial geological confidence classification of the ore body portions of the lithology for the same cross-section (bottom).

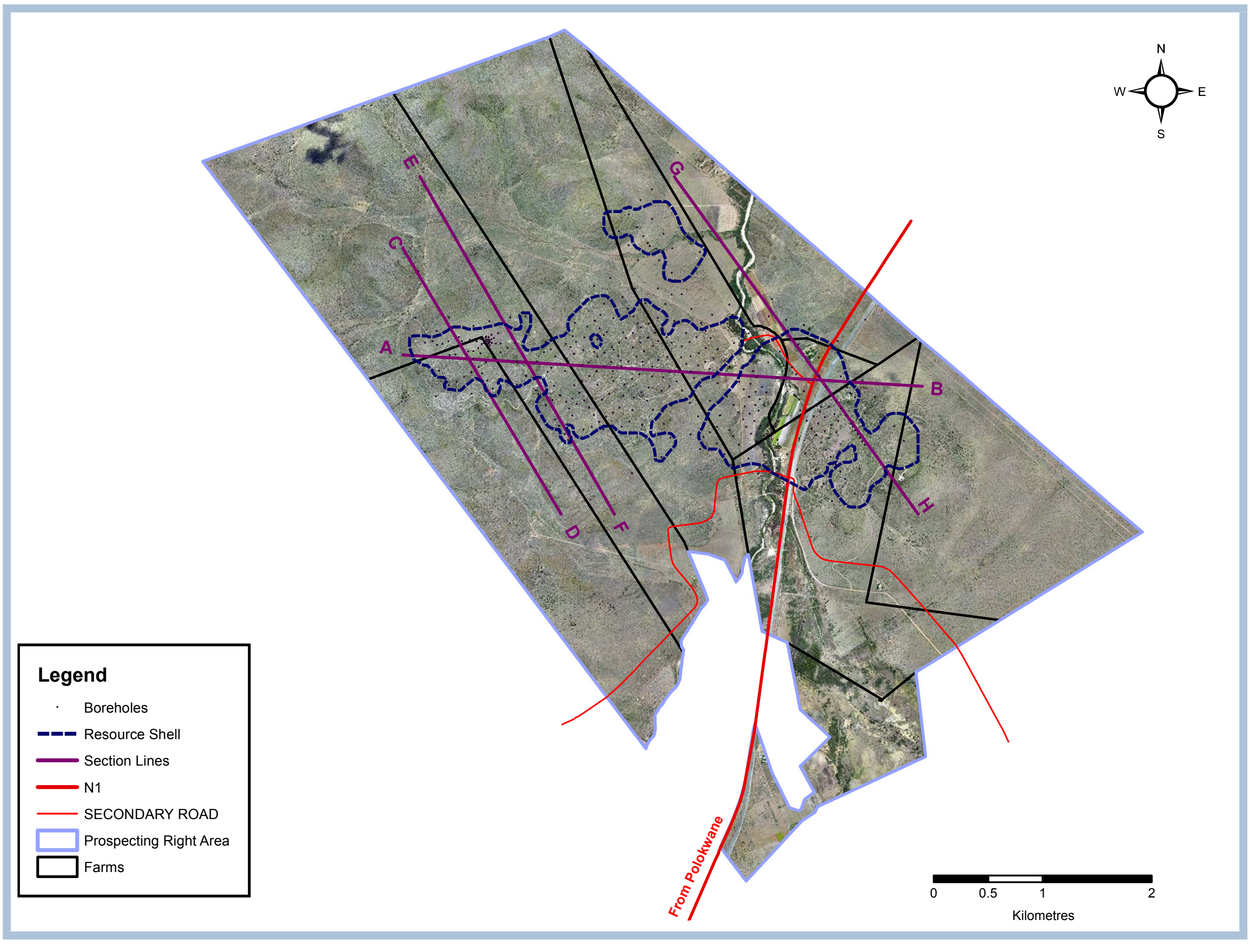
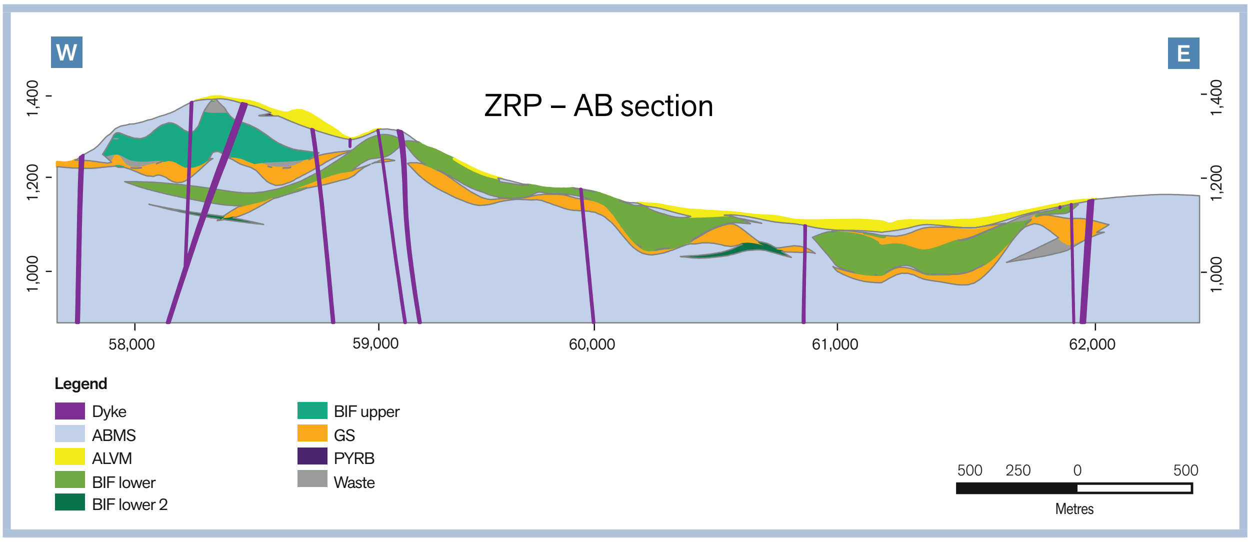


FIGURE 30: **ZANDRIVIERSPOORT REFERENCE MAP FOR GEOLOGICAL CROSS-SECTIONS**

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED



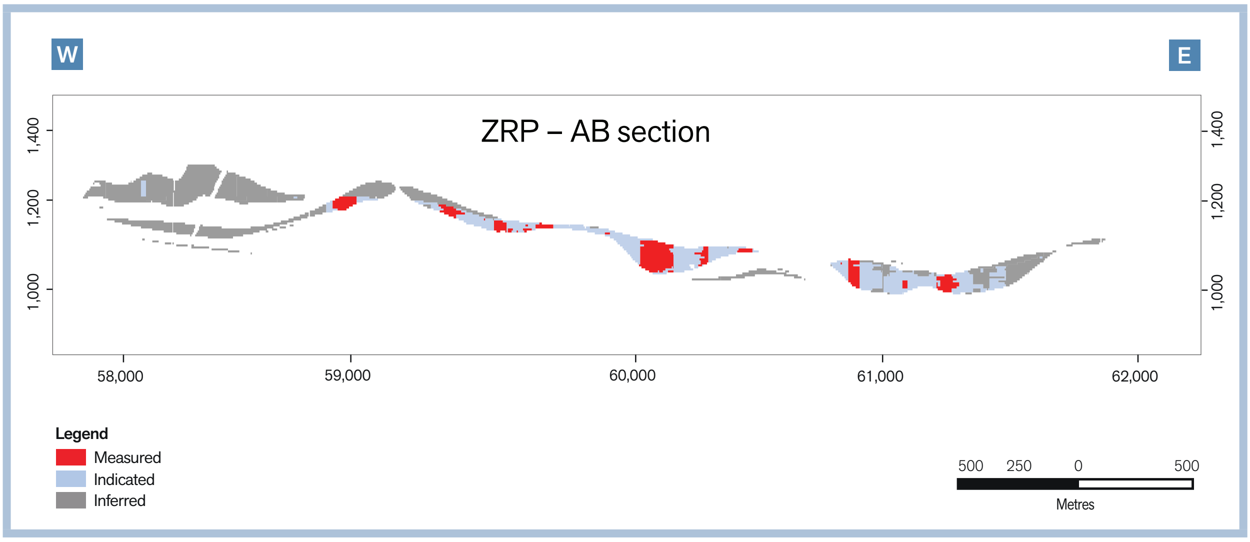


FIGURE 31: **WEST-EAST CROSS-SECTION (LINE AB IN FIGURE 30) DEPICTING THE LOCAL GEOLOGY (TOP) AND THE ASSOCIATED GEOLOGICAL CONFIDENCE CLASSIFICATION (BOTTOM) THROUGH THE CENTRE PORTION OF THE ZANDRIVIERSPOORT DEPOSIT**

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

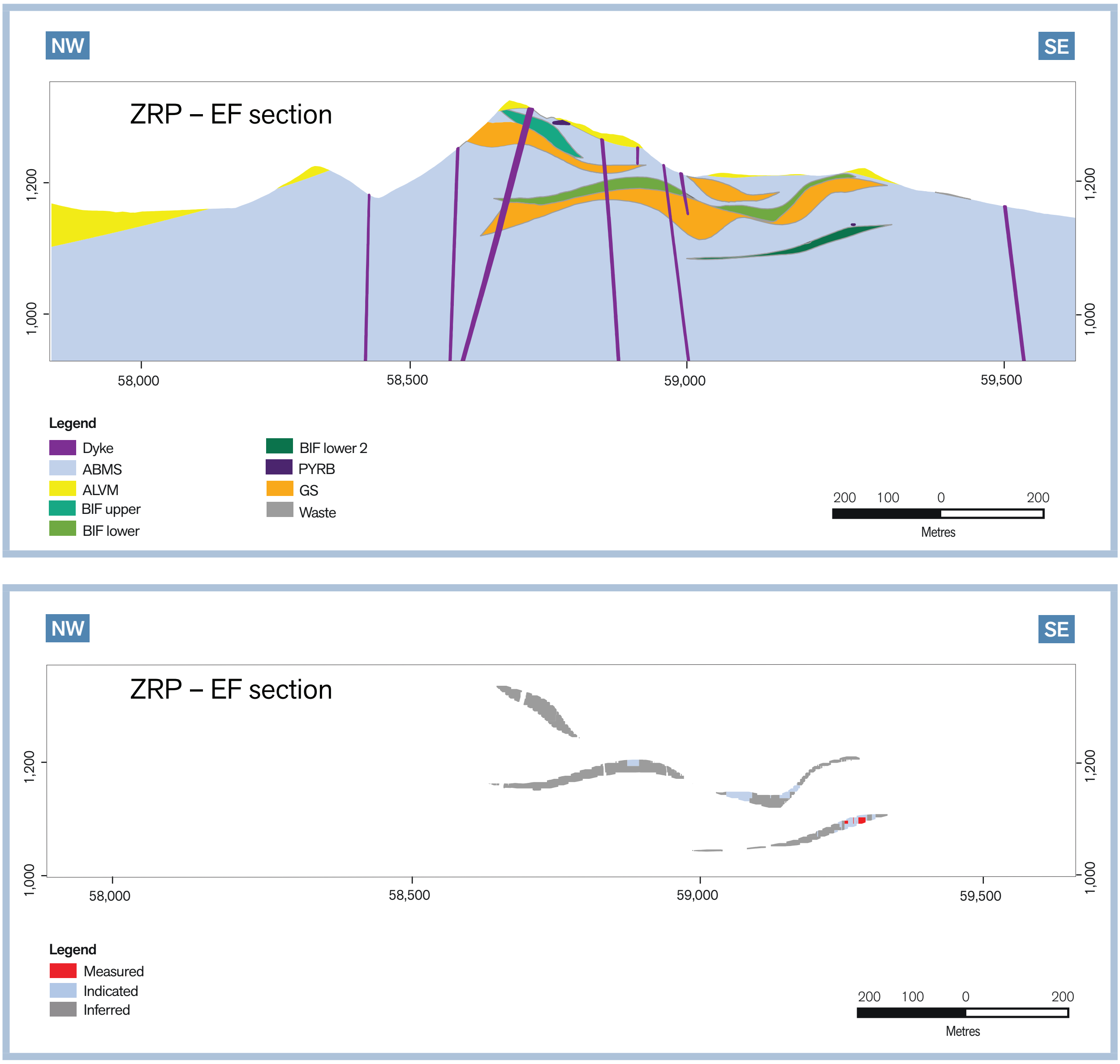


FIGURE 32: **NORTH-WEST-SOUTH-EAST CROSS-SECTION (LINE EF IN FIGURE 30) DEPICTING THE LOCAL GEOLOGY (TOP) AND THE ASSOCIATED GEOLOGICAL CONFIDENCE CLASSIFICATION (BOTTOM) THROUGH THE WESTERN PORTION OF THE ZANDRIVIERSPOORT DEPOSIT**

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

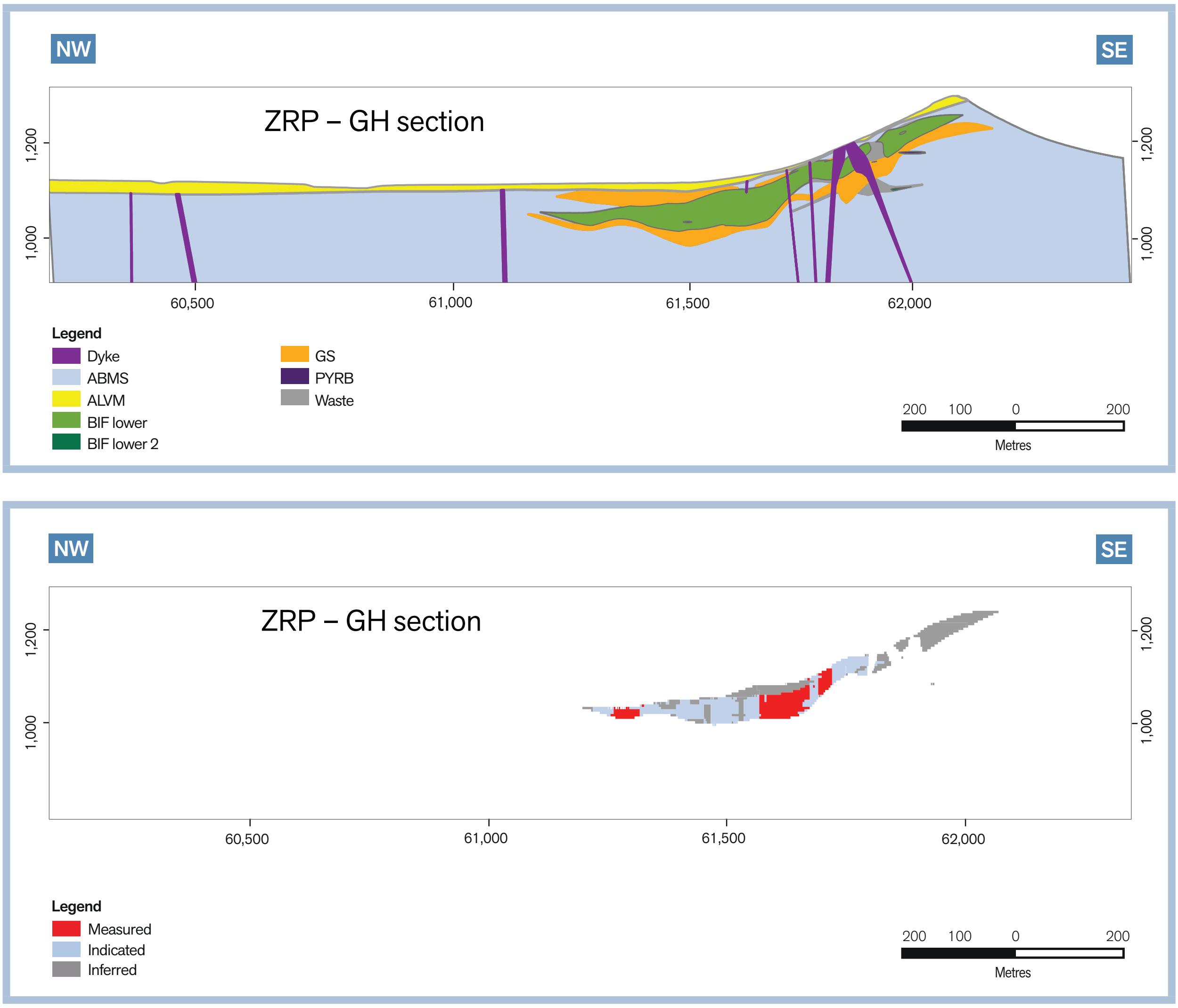


FIGURE 33: NORTH-WEST-SOUTH-EAST CROSS-SECTION (LINE GH IN FIGURE 30) DEPICTING THE LOCAL GEOLOGY (TOP) AND THE ASSOCIATED GEOLOGICAL CONFIDENCE CLASSIFICATION (BOTTOM) THROUGH THE EASTERN PORTION OF THE ZANDRIVIERSPOORT DEPOSIT

PROJECT OUTLINE

The Zandrivierspoort project's exclusive Mineral Resource of 419.1 Mt is removed from the Kumba Mineral Resource portfolio as the renewed prospecting right as held by Sishen Iron Ore Company Proprietary Limited (SIOC) expires on 21 March 2020.

The Zandrivierspoort project is managed by the Polokwane Iron Ore Company (PIOC), a 50 : 50 joint venture between SIOC and ArcelorMittal SA. The partners are still in discussion about the future of the project.

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

MINERAL RESOURCE ANCILLARY INFORMATION

The Zandrivierspoort 2018 Mineral Resource ancillary information is summarised in **Table 15A** (background information) and **Table 15B** (Mineral Resource estimation parameters).

TABLE 15A: ZANDRIVIERSPOORT PROJECT'S 2019 VERSUS 2018 MINERAL RESOURCE BACKGROUND INFORMATION

ZANDRIVIERSPOORT PROJECT	2019	2018
LOCATION		
Country	Republic of South Africa	Republic of South Africa
Province	Limpopo	Limpopo
OWNERSHIP		
Sishen Iron Ore Company Proprietary Limited	50.0%	50.0%
Kumba Iron Ore Limited	38.2%	38.2%
AA plc group	26.6%	26.6%
SECURITY OF TENURE		
Number of applicable prospecting rights	1	1
Prospecting right expiry date(s)	21 March 2020	21 March 2020
EXPLORATION STATUS		
Exploration type	Greenfields	Greenfields
Exploration phase	Pre-feasibility	Pre-feasibility
Ore type	Magnetite ore (with Haematite cap)	Magnetite ore (with Haematite cap)
GOVERNANCE		
Code	THE SAMREC CODE – 2016 EDITION	
AA plc group policy	Group Policy for Reporting of Ore Reserves and Mineral Resources Version 1	
AA plc group technical standard	AA_GTS_22 (Reporting of Exploration Results, Mineral Resources and Ore Reserves in Anglo American)	
AA plc requirements document	AA_RD22-25 (Exploration Results, Mineral Resources and Ore Reserves Reporting Requirements Document – Version 10)	
Kumba reporting policy	http://www.angloamericankumba.com/sd_policies.php	
Kumba reporting protocols	KIO Resource Classification Guideline (Version 4)	
KIO reporting template	Not applicable	KIO_R&R_Reporting_Template_092013
REPORTING METHOD		
Approach	Mineral Resources are reported exclusive of Ore Reserves and not factoring in attributable ownership and only if: (1) spatially modelled; (2) spatially classified; (3) spatially constrained in terms of reasonable and realistic prospects for eventual economic extraction (occurring within an RRPEEE defined envelope, in other words not all mineral occurrences are declared as Mineral Resources) and (4) declared within (never outside) executed tenement boundaries.	
In situ metric tonnes (dry/wet)	Not applicable	Dry
Tonnage calculation	Not applicable	Tonnages are added from cells in geological block model of which the centroids intersect the relevant geological ore domains in the solids models which occur inside the resource shell. The volume of each ore cell is multiplied with the estimated relative density of the same cell)
Fe_3O_4 grade	Not applicable	Weighted average above cut-off grade
Fe_3O_4 calculation	Not applicable	Tonnage-weighted mean of the estimated *in situ* Mineral Resource Fe_3O_4 grades contained within geological block models, constrained by the relevant Resource geological ore domains and RRPEEE resource shell.
RPEEE		
Cut-off grade	Not applicable	20.2% Fe
Resource shell revenue factor	0.0	1.6 (not reported in 2018)

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

TABLE 15B: ZANDRIVIERSPOORT PROJECT'S 2019 VERSUS 2018 MINERAL RESOURCE ESTIMATION PARAMETERS

	2019	2018
ESTIMATION		
Zandrivierspoort geological model		
Input data		
Borehole type	Core and percussion borehole lithological logs and associated chemical analyses	
Relative density measurement	Not applicable	Picnometer analyses on pulp samples (2010 to present)
KIO QA/QC protocol	KIO QC Protocol for Exploration Drilling Sampling and Sub-sampling (Version 2)	
Primary laboratory	Not applicable	Technical Solutions Division of Anglo Operations Limited Chemistry Laboratory (company registration number: 1921/006730/07)
Accreditation	Not applicable	Accredited under International Standard ISO/IEC 17025:2005 by the South African National Accreditation System (SANAS) under the Facility Accreditation Number T0051 (valid from 1 May 2011 to 30 April 2016)
Borehole database software	Not applicable	*acQuire*
Borehole database update cut-off date	Not applicable	17 July 2018
Database validation conducted in current year	Not applicable	No
Segmentation conducted	Not applicable	Yes. To allow for simplification of logged lithologies for spatial correlation purposes and to simplify the assay composite extractions
STATISTICAL AND GEOSTATISTICAL EVALUATION		
Data compositing interval	Not applicable	1m
Data compositing method	Not applicable	Length used to weight per lithology
Grade parameters evaluated	Not applicable	% Fe, % SiO_2, % Al_2O_3, % K_2O, % P, % S, % Fe^{2+}, % Fe_2O_3, % Fe_3O_4, Relative Density
Variography updated in current year	Not applicable	Yes
Search parameters updated in current year	Not applicable	Yes
Solids modelling		
Solids modelling software	Not applicable	*Leapfrog*
Input	Not applicable	Previous explicit solids model and associated structural features
Method	Implicitly captured lithological contacts from boreholes coded accordingly	Implicitly captured lithological contacts from boreholes coded accordingly Solid models for all ore and waste domains
Domaining	Not applicable	Domaining conducted per lithology. Lenses smaller than 1.5m in thickness are not separately domained
Topography and pit progression assigned	Not applicable	Surface DTM based on high resolution aerial survey
Validation conducted	Not applicable	Yes (for gaps and overlaps by software queries as well as honouring of borehole contacts) and by standard software validation tools (open sides, self-intersecting triangles) as well as a visual peer review by exploration geologists

ANCILLARY RESERVE AND RESOURCE INFORMATION PER OPERATION AND PROJECT CONTINUED

TABLE 15B: continued

ZANDRIVIERSPOORT PROJECT'S 2019 VERSUS 2018 MINERAL RESOURCE ESTIMATION PARAMETERS continued

	2019	2018
GRADE ESTIMATION METHODOLOGY		
Ore segments	Not applicable	Ordinary (Co-) kriging
Waste segments	Not applicable	Simple (Co-) kriging
GEOLOGICAL BLOCK MODELLING		
Block modelling software	Not applicable	*Isatis and Datamine*
Model type	Not applicable	Centroid model
Parent cell size	Not applicable	40m(X) x 40m(Y) x 10m(Z)
Minimum sub-block cell size	Not applicable	5m(X) x 5m(Y) x 5m(Z)
Cell population method		
Tonnage	Not applicable	Volume of lithology intersected by cell centroid and constrained by cell limits, multiplied with relative density estimate of the same lithology at same unique cell centroid position in space
Grade	Not applicable	Estimate of grade at unique cell centroid position in space applicable to total volume or tonnage constrained by the cell
Updated geological block model ID (file name + extension)	Not applicable	ZRP180831f_am
Update completion date	Not applicable	31 August 2018
ESTIMATOR		
Resource estimator	Not applicable	Elelwani Machaka
Resource estimator status	Not applicable	Internal Technical Specialist
Estimator employer	Not applicable	Sishen Iron Ore Company Proprietary Limited

ENDORSEMENT

THE PERSONS THAT ACCEPT OVERALL RESPONSIBILITY (LEAD COMPETENT PERSONS) AND ACCOUNTABILITY (CHIEF EXECUTIVE OFFICER) FOR THE DECLARATION OF THE 2019 KUMBA ORE RESERVE AND MINERAL RESOURCE ESTIMATES.

The persons at Kumba Iron Ore who are designated to take respective "corporate responsibility" for Mineral Resources and Ore Reserves are Jean Britz and Theunis Otto. They have extensively reviewed the Mineral Resource and Ore Reserve estimates reported for 2019 and consider it to be SAMREC compliant, and consent to the inclusion of these estimates in the form and context in which they appear in this online statement.

Jean Britz is a professional natural scientist, registered (400423/04) with the South African Council for Natural Scientific Professions. He has a BSc (Hons) in Geology and an MEng in Mining and has 27 years of experience as a mining and exploration geologist in coal and iron ore, of which 15 are specific to iron ore Mineral Resource estimation and evaluation.

Jean Britz
Principal, Mineral Resources and Geometallurgy – Kumba Iron Ore Geosciences

Theunis Otto is a professional mining engineer, registered (990072) with the Engineering Council of South Africa. He has an MSc in Mining Engineering and has 24 years of experience as a mining engineer in production management and technical roles in coal and iron ore mining, of which 15 are specific to iron ore Mineral Reserve estimation and evaluation.

Theunis Otto
Head, Kumba Iron Ore Mining Engineering

Kumba Iron Ore's CEO and board member, Mr Themba Mkhwanazi, endorses the Mineral Resource and Ore Reserve estimates presented in this document, and acknowledges that the Kumba Iron Ore Policy which governs Mineral Resource and Ore Reserve reporting has been adhered to.

Themba Mkhwanazi
Chief Executive Officer, Kumba Iron Ore

GLOSSARY OF TERMS AND ACRONYMS

AA plc	Anglo American plc
ABAS	Anglo American's Business Assurance Services
AFS	Annual financial statements
BIF	Banded iron formation
BIS	Banded ironstone
CP	Competent Person
DMR	Department of Mineral Resources
DMS	Dense media separation
DSO	Direct shipping ore
ECSA	Engineering Council of South Africa
FEM	Ferro-manganese
FOB	Free-on-board
FOR	Free-on-rail
IFRS	International Financial Reporting Standards
IR	Integrated report
JSE	Johannesburg Stock Exchange
KIO	Kumba Iron Ore
Kumba	Kumba Iron Ore
LoM	Life-of-mine
LoMP	Life-of-mine plan
MLA	Mineral Liberation Analysis
MPRDA	Mineral and Petroleum Resources Development Act No 28 of 2002
Mt	Million tonnes
Mtpa	Million tonnes per annum
MWP	Mining work programme
NATA	National (Australian) Association of Testing Authorities
OREX	Ore export line Sishen-Saldanha line
ORMR	Ore reserve (and Saleable Product) and Mineral Resources Report

GLOSSARY OF TERMS AND ACRONYMS CONTINUED

QA/QC	Quality assurance and quality control
RC	Reverse circulation drilling
RF	Rhenosterkoppies fragment
RoM	Run-of-mine
R&R	Resource and reserve
RPEEE	Reasonable prospects for eventual economic extraction
RRPEEE	Reasonable and realistic prospects for eventual economic extraction
SACNASP	South African Council for Natural Scientific Professions
SAMREC Code	The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves – SAMREC Code 2016 Edition
SANAS	South African National Accreditation System
SIOC	Sishen Iron Ore Company Proprietary Limited
SR	Sustainability report
TARP	Trigger action response plan
TS	Anglo Technical Solutions
UHDMS	Ultra-high density media separation
XRD	X-Ray Diffraction
ZRP	Zandrivierspoort

Kumba Iron Ore
Centurion Gate – Building 2B
124 Akkerboom Road
Centurion
0157

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