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POWERING POSSIBILITY

Exxaro Resources Limited Consolidated Mineral Resources and Mineral Reserves report 2018

FEEDBACK

Ongoing feedback from stakeholders helps us contextualise certain issues better for more informed understanding by readers. We welcome your suggestions, which should be directed to:

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FOREWORD

Exxaro Resources continuously strives to enhance the level of estimation and reporting of Mineral Resources and Reserves. The group is committed to the principles of transparency, materiality and competency in reporting its Mineral Resources and Mineral Reserves.

The information in this report is aligned with the JSE Listings Requirements (section 12) and encapsulates information on reporting governance, competence, tenure, risk, liabilities and assurance as well as auxiliary descriptions of applicable projects, operations and exploration activities.

Mineral Resources and Mineral Reserves were estimated by competent persons on an operational or project basis, and in line with the South African Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves, 2016 edition (SAMREC Code 2016) for African properties (coal), except for Vedanta's base metal property, and the Australasian Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves, 2012 edition (JORC Code) for Australian (coal and mineral sands) and Vedanta's properties.

For Coal Resources and Reserves under Exxaro's management control, estimation is in line with the South African National Standard: South African guide to the systematic evaluation of Coal Resources and Coal Reserves (SANS 10320:2004). Resource and Reserve estimates are quoted in full, irrespective of Exxaro shareholding. The report primarily encapsulates all aspects relating to Exxaro's coal estimation and reporting, and we therefore predominantly use the terminology of Coal Resources and Coal Reserves throughout the report. We do, however, apply the terminology of Mineral Resources and Mineral Reserves where the content collectively refers to coal, base metal and mineral sands estimates.

Exxaro reports mineral estimates that are directly under its management control and includes estimates for entities in which we hold a 25% interest or more. Supplementary descriptions are provided for projects and operations directly under our management control. For projects and operations included in the Exxaro Mineral Resource and Mineral Reserve statement, but in which Exxaro does not have management control, the reader is referred to that company's website, shown below, for supplemental information. This approach ensures maximum compliance to the principles of materiality and transparency.

Anglo American Coal operations and projects:
http://www.angloamerican.com/investors/annual-reporting
Kumba Iron Ore:
http://www.angloamericankumba.com/investors.aspx
Tronox:
http://investor.tronox.com/secfiling.cfm?filingID=1140361-17-8936&CIK=1530804
Vedanta Resources plc base metal operations and projects:
http://www.vedantaresources.com/investor-relations/

CERTIFICATE BY GROUP COMPANY SECRETARY

In terms of section 88(2)(e) of the Companies Act 71 of 2008, as amended (Companies Act), I, Saret van Loggerenberg, in my capacity as group company secretary and legal, confirm that, to the best of my knowledge, for the year ended 31 December 2018, Exxaro Resources Limited (Exxaro) has filed with the Companies and Intellectual Property Commission all such returns and notices as required of a public company in terms of the Companies Act and that all such returns and notices appear to be true, correct and up to date.

SE van Loggerenberg
Group company secretary
Pretoria

7 April 2018

The Exxaro lead competent persons are appointed by the Exxaro executive management team.

The Exxaro lead Mineral Resource competent person is Henk Lingenfelder, a member of the Geological Society of South Africa and registered (400038/11) with the South African Council for Natural Scientific Professions. He has a BSc (hons) in geology and 23 years of experience as a geologist in coal, iron ore and industrial minerals.

The person in Exxaro designated to take corporate responsibility for Coal Resources, Henk Lingenfelder, the undersigned, has reviewed and endorsed the reported estimates.

JH Lingenfelder
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Pr Sci Nat (400038/11)
Group manager geoscience
Roger Dyason Road
Pretoria West
0183

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The Exxaro lead Mineral Reserve competent person is Chris Ballot, a mining engineer registered (20060040) with the Engineering Council of South Africa. He has 22 years of experience in iron ore, mineral sands and coal in various technical and management roles. His qualifications include BEng (mining), GDE and MBA.

The person in Exxaro designated to take corporate responsibility for Mineral Reserves, C Ballot, the undersigned, has reviewed and endorsed the reported estimates.

CC Ballot
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ECSA 20060040
Manager mining processes
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Gauteng
South Africa

Both parties are in the full-time employment of Exxaro, Mr Lingenfelder as the group manager geosciences and Mr Ballot as the group manager mining. Both parties have consented to the inclusion of resources and reserves estimates in the integrated report 2018. Exxaro has written confirmation from the competent persons that the reporting is compliant with the SAMREC Code, the relevant portions of table 1 and the JSE section 12 requirements, and they consent to the publication of the report.

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PERFORMANCE AT A GLANCE

We continuously strive to unlock maximum value in our Coal Resources and Coal Reserves.

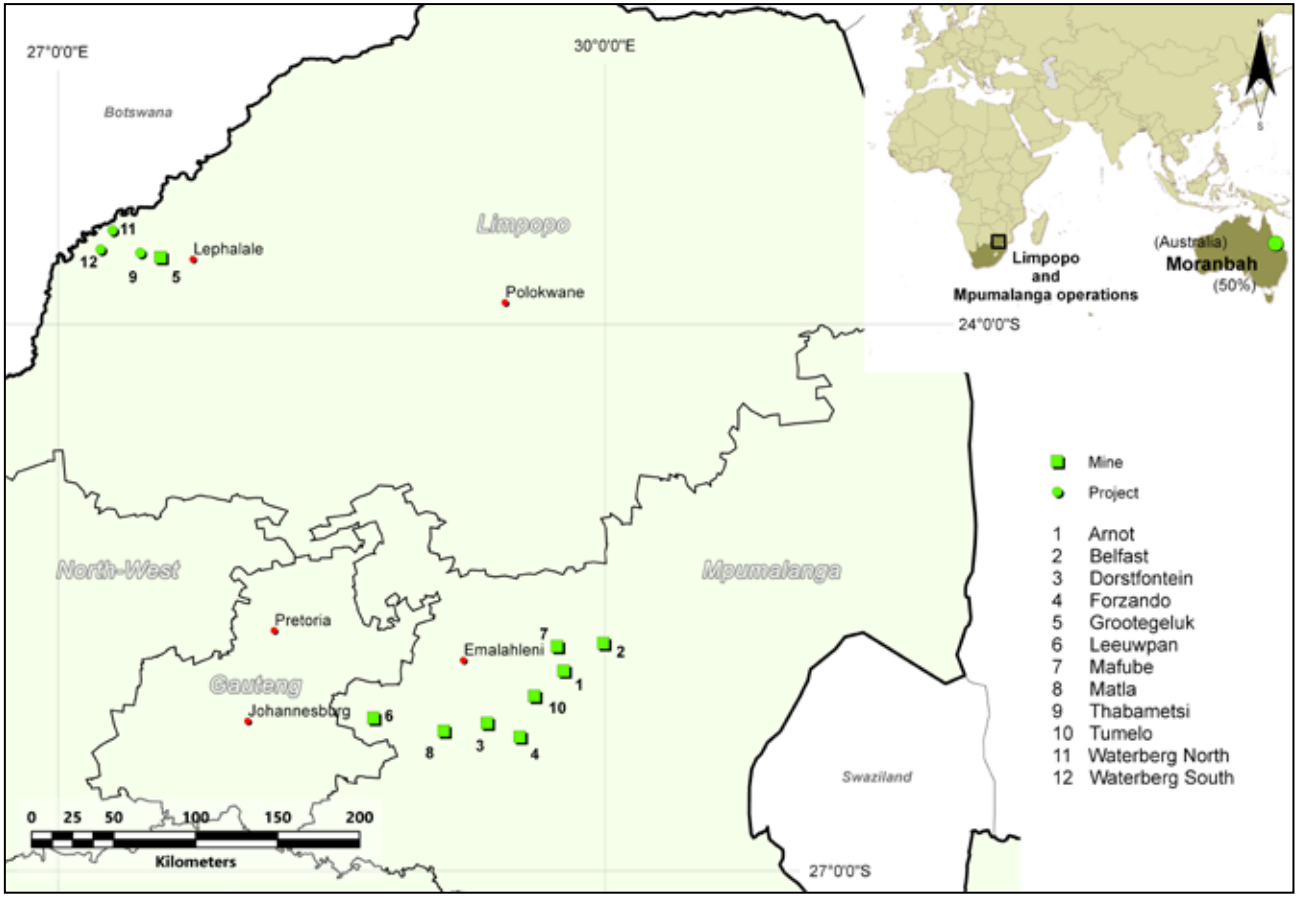
Exxaro broke ground on its **R3.3 billion**, first-of-its-kind **digital mine** on 5 July 2018. **Belfast Coal** is currently under construction and will start producing thermal coal in 2019. As a truly digital and connected mine, Belfast will contribute to a thriving coal business in the region and demonstrate Exxaro's purpose of powering better lives in Africa and beyond.

The **R4.8 billion** expansion of the **Grootegeluk** complex, the GG6 beneficiation plant, will ensure **increased** throughput and enhanced processing efficiencies to **ramp-up export coal production** at this important site. The project aims to triple the **capacity** of the current **GG6 plant**, producing semi-soft coking coal suitable for the **export market**, as well as **power station coal**.

Operations	Product	2017 (Mt)	2018 (Mt)
Grootegeluk	Thermal coal	23.41	27.38
Grootegeluk	Metallurgical coal	2.13	2.32
Matla	Thermal coal	7.40	6.61
Exxaro Coal Central (ECC)	Thermal coal	4.06	3.80
Leeuwpan	Thermal coal	3.36	4.22
North Block Complex (NBC)	Thermal coal	2.96	1.43
Mafube	Thermal coal	1.66	0.99

OVERVIEW OF RESOURCE AND RESERVE ESTIMATES

Figure 1: Locations of our coal operations and projects



Exxaro has a world-class Coal Resource portfolio, comprising fully owned operations and projects and a number of jointly owned operations and projects in South Africa and Australia. The fully owned operations and projects in South Africa lie in both the large and highly prospective Waterberg coalfield in Limpopo and the more mature Highveld and Witbank coalfields in Mpumalanga.

Since inception in 2006, Exxaro's total attributable Coal Resource and Reserve figures have been relatively stable. This trend can primarily be ascribed to the relatively large Waterberg coal deposits, particularly the remarkable Grootegeluk complex. Estimated to contain 40% to 50% of South Africa's remaining Coal Resources, the Waterberg is viewed as the future of South African coal mining. Exxaro holds an estimated 3 billion tonnes of Measured and around 1.8 billion tonnes of Indicated Coal Resources in the Waterberg, primarily in Grootegeluk mine and the adjacent mining right of Thabametsi. The complex provides thermal Coal Reserves to Eskom's Matimba and new Medupi power stations and produces semi-soft coking and metallurgical coal through eight beneficiation plants (annual production of 30 million tonnes (Mt)).

The Grootegeluk complex is continuously evolving, illustrated by several large value-unlocking projects. While these projects underline the resourcefulness of our people, they also demonstrate the successful implementation of innovative and breakthrough technology. To an extent, the size of the Grootegeluk complex obscures changes in Coal Resource and Reserve figures from events in the smaller Witbank and Highveld coalfields. Divestment from the NCC (New Clydesdale Colliery) coal mine, closure of Inyanda mine (both 2014),

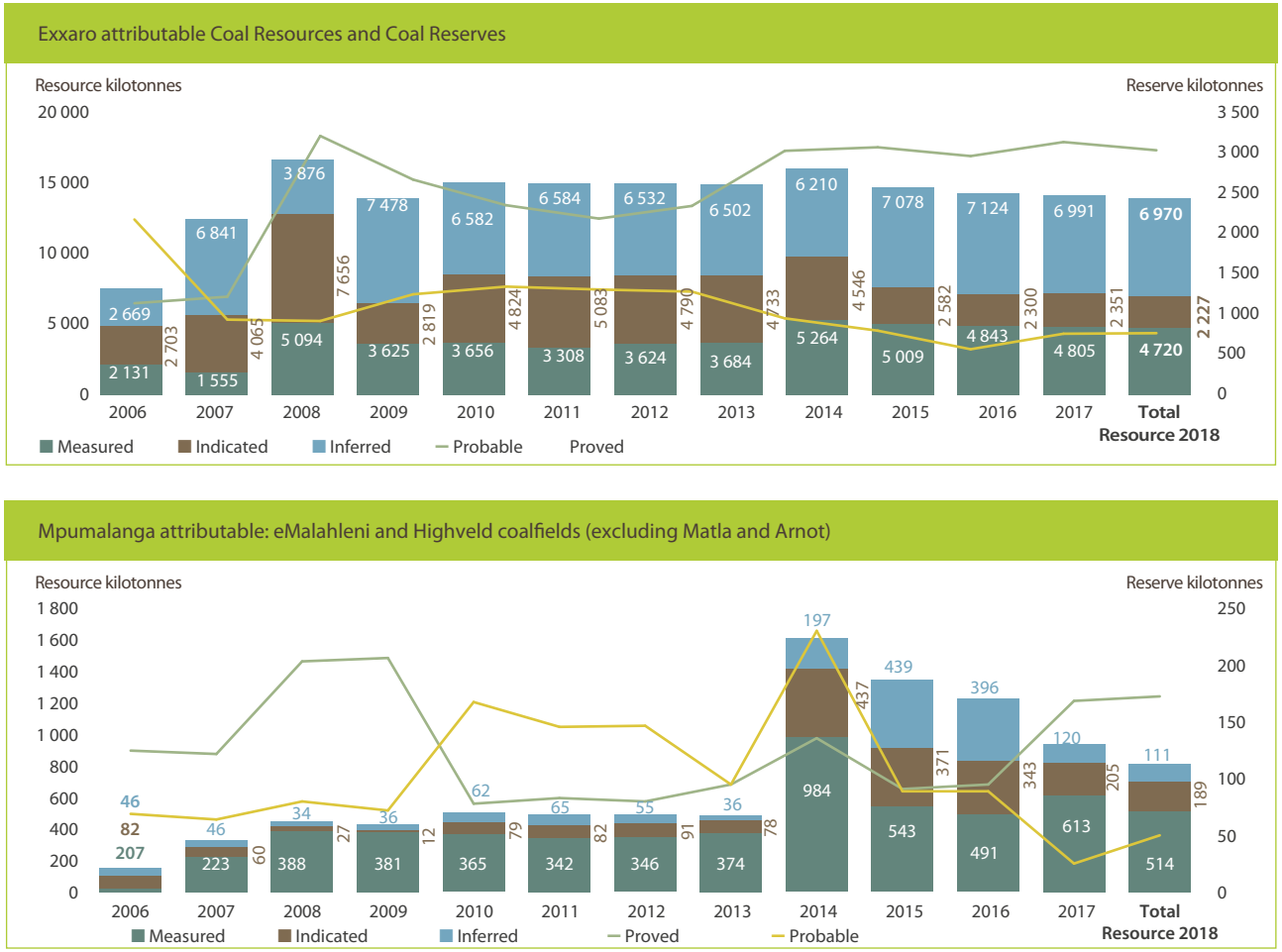
OVERVIEW OF RESOURCE AND RESERVE ESTIMATES (CONTINUED)

incorporation of Total Coal South Africa (renamed Exxaro Coal Central or ECC) in 2014 and divestment from the Eloff project (2017) affected Exxaro's reported figures in recent years.

In 2018, the Exxaro total attributable Coal Resource decreased slightly, mainly due to mining and the decision to divest from North Block Complex (NBC) near the town of Belfast in Mpumalanga. For Coal Reserves, an increase at ECC was offset by mining depletion at various operations, disinvestment from NBC and changes to pillar-extraction recovery at Matla, resulting in a slight decrease in the total Exxaro attributable Coal Reserve.

For most operations, other than normal life-of-mine (LoM) depletion, no material changes to Coal Resources and Coal Reserves estimates are reported. However, there was an increase of 56% in the run-of-mine (RoM) Coal Reserves at ECC by incorporating the 2017 geological model to update the life-of-mine (LoM) and Coal Reserve classification for the Dorstfontein West and Dorstfontein East operations. This resulted in a material amount of seam 2 and 4 lower being included in underground Coal Reserves for Dorstfontein. At Matla mine, the update of the geological model and resource classification and subsequent review of LoM resulted in a 5.7% decrease in Coal Reserves. In addition, a reduction of the pillar-extraction recovery based on reviewing the extraction process to enhance ventilation and safety, as well as considering actual extraction figures in the reporting period, resulted in a further 13% decrease of the Coal Reserve at this operation.

Figure 2: Exxaro estimates over time



There was a **slight decrease** in the total Exxaro attributable Coal Resources and Coal Reserves from 2017 to 2018.

Unlocking value

In 2018, we continued to focus on unlocking value at our operations. We are acutely aware that our success as a mining company is built on the integrity of our Coal Resources and the effectiveness with which we exploit and extract these resources.

Increasing level of geoscientific knowledge and confidence

Considering mining, metallurgical, processing, infrastructural, economic, marketing, legal, environmental, social, governmental modifying factors

COAL RESOURCES

Continuously improving our level of geoscientific understanding, minimising risk and unlocking opportunities

Executing integrated exploration plans: Dorstfontein, Forzando, Matla, Belfast, Grootegeluk

Update of geological and structural models: Forzando, Matla, Grootegeluk, Belfast

Innovation

- Implementing centrally managed geological and hydrogeological databases.
- Testing sonic as well as surface directional drilling to mitigate geological challenges.
- Applying Audio Magnetotelluric (AMT) geophysical surveys to outline geological structure.

UNLOCKING VALUE

Modifying factors
Our ability to extract our resources

Increasing extraction through innovation and knowledge:

- Autonomous drilling strategy at Grootegeluk
- Continuous radar scanning for slope stability monitoring
- Terrestrial lidar scanning of pit faces to enhance reconciliation and resource use
- Application of a geo-metallurgical approach to multi-bench mining at Grootegeluk.

COAL RESERVES

Optimising our plans to create the best fit to market use

Optimised life-of-mine plans (LoMP):

- Update LoM for Dorstfontein, Matla and Leeuwpan
- Construction under way on Dorstfontein West seam 4 project
- Conclusion of Leeuwpan OI life extension box-cut and initiation of Matla north-west access incline and decline projects.

ENHANCING GOVERNANCE

From 2017, we aligned our reporting with SAMREC 2016 and JSE 2016 amendments for minimum contents of annual reports and have subsequently updated our life-of-mine mineral assets policies and estimation procedures. We have updated our internal competent persons' reports (CPR) for 2017 and 2018 to accommodate the SAMREC 2016 'if not, why not' principle.

ASSURANCE

Conducted tier 1 reviews on Grootegeluk, Forzando, Leeuwpan and Matla, resulting in optimised life-of-mine plans.

Conducted tier 3 (external) reviews on Corporate Centre, Forzando and Grootegeluk mines. Corrective measures have been implemented to address the 28 findings to enhance our estimating and reporting processes.

OVERVIEW OF RESOURCE AND RESERVE ESTIMATES (CONTINUED)

Continuous drive to unlock value for our Exxaro operations and projects

Case study: Belfast

The extraction strategy of the Belfast Coal Reserve was reconsidered in 2018. With a value lens of early extraction, a study was done to consider whether coal sales could begin before commissioning the coal-washing plant. Areas were identified where a crush-and-screen product could be mined and produced, while seamlessly integrating with the medium- and long-term exploitation strategy. Not only will this produce early revenue in 2019, it will lower the commissioning risk of the plant, with more knowledge available of the coal ore body.

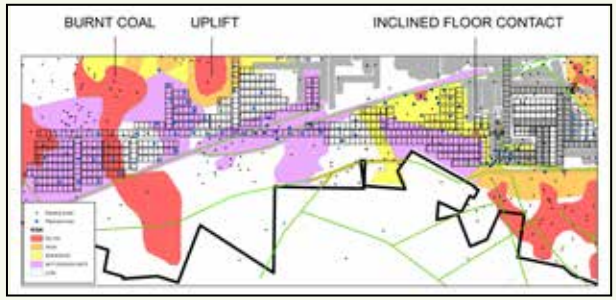
Case study: Forzando North

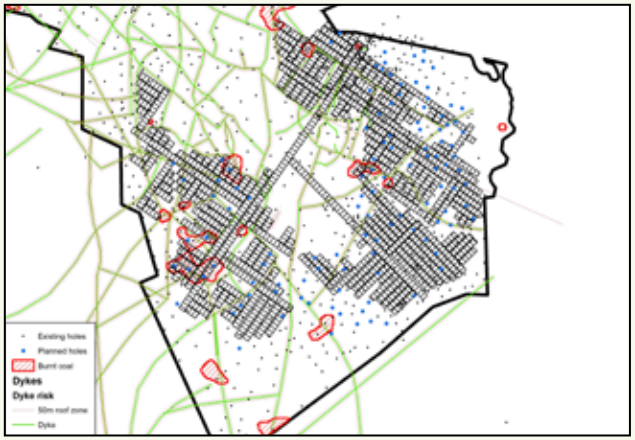
The LoMP was reconsidered, and areas under care and maintenance in Forzando North were identified that could be brought into production immediately to supplement current mining areas. The first section began production in the fourth quarter of 2018. Total production was increased, and the quality of the overall coal mix improved.

Case study: Matla Coal integrated resource review and exploration strategy

At Matla Coal, future mining will occur between 40 years of historical mined-out areas and periphery of the available Coal Resource, resulting in increasingly challenging mining conditions. The push for more information in new areas has underpinned an innovative approach to understanding the remaining resource; the mine's risk and opportunity domain analysis (RODA). The RODA spatially integrates all known and inferred geological risks to create weighted geological risk domains. The domains are applied during exploration and mine planning, as well as establishing geotechnical accessibility and mine-ability of Coal Reserves.

Exploration drilling at the mine is focused on targeting areas of potential risk (risk domains) in and around future mining areas to ensure that geological structures and expected underground conditions are better understood and effectively communicated to the mine planning team. The continuous correlation between exploration interpretation and underground conditions in those areas improves the understanding of how to better predict and prepare for the impacts of conditions in future.





Left: Geotechnical risk domains used to focus exploration drilling. Right: Burnt coal domains and variable seam elevation parameters associated with aeromagnetic structures (dolerite dykes) used to focus exploration drilling and mine planning.

UNLOCKING VALUE IN THE ESTIMATION PROCESS

The purpose of the life-of-mine planning underlying our resource and reserve estimation is to unlock maximum value from the coal in the ground, for Exxaro, taking margin and net value into consideration. Each orebody has a unique mining methodology, processing parameters and targeted market segment that delivers maximum value to shareholders. This is impacted by updated resource information, developments in mining and processing technology and changes in market dynamics.

Consequently, the optimum exploitation strategy needs to be continually reviewed to ensure applicable resources end up in the most lucrative markets. This ongoing iterative process is conceptually illustrated below. A relentless drive to reduce the environmental footprint of operations is embedded in the process, and the continuous impact of the evolving legislative landscape is reflected in designs.

Figure 3: Resource-to-market model

OUR CONSOLIDATED MINERAL RESOURCE AND RESERVE REPORT

The content of this report is compiled from detailed independent reports received from appointed competent persons at our various operations and projects, and available on request from the group company secretary. The reported Coal Resources and Coal Reserves presented are therefore summarised versions of these reports.

The information in the Consolidated Mineral Resource and Reserve Report (CMRR) is aligned with the JSE Listings Requirements (Section 12) and includes information on reporting governance, competence, tenure, risk, liabilities and assurance as well as auxiliary descriptions of applicable projects, operations and exploration activities.

In addition, each operation and project maintain an individual competent person's report (CPR) that encapsulates the systematic and detailed estimation process conducted or supervised by that person. These reports are aligned with the checklist and guideline of the reporting and assessment criteria of the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC 2016), and scrutinised and updated when required. Exxaro continuously examines various aspects of the Mineral Resource estimation process and we have revised and aligned our reporting with the guidelines of SAMREC 2016. Exxaro updated internal CPRs for our mineral assets in 2017 and repeated this process in 2018 to optimise the content. No material changes as defined in the code triggered the CPR updates, but we considered the introduction of the 'if not, why not' principle (SAMREC 2016) as significant enough to warrant the updates.

Our reporting principles

Exxaro is committed to the principles of materiality, transparency and competence, and continuously strives to enhance the level of estimating and reporting of Coal Resources and Coal Reserves.

We provide all **relevant information** that **investors** and their **professional advisers** would reasonably require, and expect to find, to make a **reasoned and balanced judgement**

We provide **sufficient**, **clear** and **unambiguous information**

We have **qualified** and **experienced competent persons** who are subject to an **enforceable professional code of ethics**

HOW DO WE REPORT?

The annual estimation and reporting process is managed through the Exxaro geosciences policy and associated Coal Resource and Reserve reporting procedure. The documents dictate technical requirements for estimation and reporting, and include guidelines on methodologies, templates and assurance.

Both the policy and procedures are aligned with the guidelines of the SAMREC Code 2016 and, for South African coal reporting, SANS 10320:2004. Processes and calculations associated with the estimation process have been audited by internal competent persons and are audited by external consultants when deemed applicable. For mines or projects in which Exxaro does not hold the controlling interest, figures have been compiled by competent persons from the applicable companies and not audited by Exxaro.

Resource estimations are based on the latest available geological models, which incorporate all new validated geological information and, if applicable, revised seam, resource definitions and resource classifications. For Exxaro operations and projects, we use a systematic review process that measures the level of maturity of exploration work done, extent of geological potential, mineability, licence-to-operate considerations and associated geological risks/opportunities to establish eventual extraction (EE). We have enhanced our methodology to ensure that all factors for reasonable and realistic prospects for eventual and economic extraction as outlined in table 1 (4.3) of SAMREC 2016 have been reasonably considered.

For Exxaro's Coal Resources, the location, quantity, quality and continuity of quality and geology are known to varying degrees of confidence and continuously tested through exploration activities such as geophysical surveys, drilling and bulk sampling. Coal Resources are classified into Inferred, Indicated or Measured categories, based on the degree of geological confidence. Distribution of points of observation (drilling positions, trenches, etc), quality assurance and quality control in sample collection, evaluation of structural complexities and, in the case of operations, reconciliation results, are considered in classifying resources. An annually compiled exploration strategy outlines activity planned to investigate areas of low confidence and/or geological or structural complexities to ensure resources of a high level of geological confidence are considered for mine planning.

Coal Reserves are estimated using relevant modifying factors at the time of reporting (mining, metallurgical, processing, infrastructure, economic, marketing, legal, environmental, social and governmental requirements). Modifying factors are reviewed before and after reserve estimation by the persons responsible for ensuring all factors are timeously and appropriately considered. Signed-off reserve fact packs that record losses, recoveries/yields, cost, commodity prices, exchange rates and other required factors applied, are documented in each LoMP and independent competent person's report.

Reported Coal Reserves are primarily derived from Indicated and Measured Coal Resources, although limited Inferred Resources may be included in the LoMP at the discretion of the competent person. These inclusions are scrutinised and tested, and their impacts are known.

Coal Resources and Coal Reserves quoted fall within existing Exxaro mining or prospecting rights. Rights are of sufficient duration (or convey a legal right to convert or renew for sufficient duration) to enable all reserves to be mined in line with current production schedules. The only exceptions are the Grootegeluk (executed March 2011 for 30 years), Matla (executed March 2015 for 10 years) and Forzando (executed June 2013 for 16 years) operations, where adequate Reserves exist for LoMPs extending well beyond the period for which they were granted.

Environmental management including applicable authorisations that support our estimates, closure plans and allocated funding is discussed in detail in the Exxaro supplementary report, available on our website at https://www.exxaro.com/investor/integrated-reports2018/supplementary/about-this-report.php.

OUR MINERAL RESOURCES AND RESERVES STATEMENT

The Mineral Resources and Mineral Reserves summarised on pages 25 to 36 are reported as those remaining on 31 December 2018 and compared with the corresponding estimates reported on 31 December 2017. Mineral Resources are reported including Mineral Resources that have been converted to Mineral Reserves and at 100% Exxaro ownership, irrespective of the individual operation or project's attributable shareholding. An exception is our reporting for Gamsberg and Black Mountain, as base metal figures from Vedanta Resources plc represent resources excluding those Mineral Resources converted to Mineral Reserves.

It is important to note that reported estimates are not an inventory of all mineral occurrences identified, but a reasonable estimate of those, which under assumed and justifiable technical, environmental, legal and economic conditions, may be economically extractable at present (Mineral Reserves) and eventually in future (Mineral Resources).

Mineral Resources and Mineral Reserves are estimated on an operational or project basis and in line with the SAMREC Code for African properties, except for Vedanta's property, and the JORC Code 2012 for Australian and Vedanta properties. For Coal Resources and Coal Reserves under Exxaro's management control, estimation is in line with the South African National Standard: South African guide to the systematic evaluation of Coal Resources and Coal Reserves (SANS 10320:2004).

Comprehensive information on each operation that supports the Mineral Resource and Mineral Reserve estimates is provided in the ancillary section.

Limpopo province

There is no material change at our Grootegeluk mine for the 2018 reporting period. This is a surface coal-mining operation where a series of parallel benches are advanced progressively across the deposit via a process of drilling, blasting, loading and hauling with truck and shovel fleets. The mining bench definitions in both the Vryheid and overlying Volksrust formations coincide with the geological boundaries, resulting in 14 mining benches for both saleable products and waste. The largest portion of the beneficiated product is power station coal (at 25.8Mt representing 87% of the product stream), dispatched to the Matimba and Medupi power stations. The remnant is made up of several sized metallurgical coal products and semi-soft coking coal railed to local and international customers.

Geological challenges are increasing as the mine advances to the west. The upper top benches are thinning and will eventually discontinue due to weathering, with only a small portion of bench 2 remaining in the next few years. Weathering is highly irregular, specifically in faulted areas, and impacts on mining as well as disrupting downstream beneficiation plant throughput. The impact to date of geological faulting on mining is limited since its influence only occurs over short lateral distances and the effected coal can be mined and routed correctly to the appropriate coal-handling facilities. An increase in faulting, both in offset and frequency, is however observed to the south and north of the current pit and poses a higher risk for future mining. Continuous pit mapping, surface and downhole geophysical surveys and close-spaced open-hole drilling are employed to target geological structure complexity, overburden characterisation and to outline weathering in the upper benches. The high-resolution information obtained is used in proactive mine planning and largely mitigates the various geological challenges.

The geological model is updated biannually, and information from drilling campaigns in 2017/18 will be used to update the geological model in early 2019. A review of the Grootegeluk exploitation strategy was initiated in the last quarter of 2018. The update will incorporate new geological information, consider several expansion initiatives and review the current pit turnaround and backfill strategies. An important project, the Grootegeluk integrated water use management strategy (GGIWMS), also began in the reporting year. The objective is to clearly define all water-related aspects and present a strategy for the optimal use of water throughout the value chain. This project will integrate with the exploitation strategy and is expected to enhance water-use efficiency.

The construction of the GG6 project plant was initiated in 2018. The existing Grootegeluk 2 (GG2) plant historically produced power station coal and the project aimed to convert the single-stage beneficiation plant to a new double-stage plant, namely Grootegeluk 6 (GG6). The project introduced a new small-coal beneficiation plant (SCP), enabling fragments smaller than 10mm to be processed and improving plant fines beneficiation using reflux classifier technology. Associated benefits are the addition of a dewatering plant, an upgrade of the two tip-bins to higher capacity and expanding the current stockyard. The project aims to triple the capacity of the current GG6 plant, producing a high-ash semi-soft coking coal (SSCC) suitable for the export market, as well as power station coal.

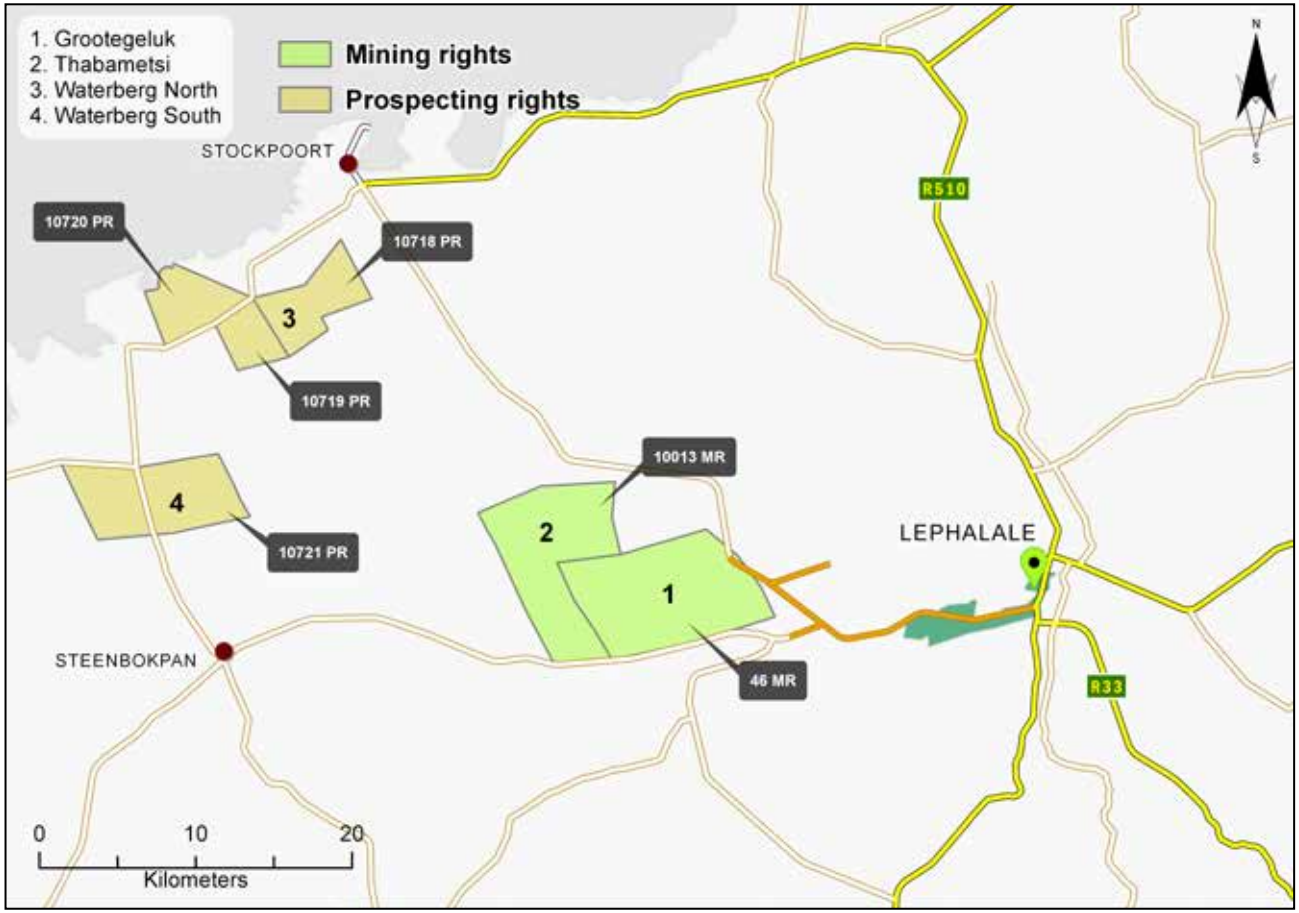
Overburden mining at Grootegeluk is evolving in volume and complexity. A study to address this challenge is the in-pit crushing and conveying overburden (IPCC OVB) project. The project investigated options to replace the existing load-and-haul mining method with a more cost-effective alternative by considering mining and transporting overburden material via a bulk-materials handling system. The prefeasibility study (PFS) is still under way to identify the preferred alternative. An approval for ministerial consent (section 102) was submitted in September 2017 to include two mine-dump areas that currently fall outside the mining right. Approvals are pending and the legislative process following the submission is under way.

Exxaro is considering options on four prospecting rights some 30km north-west of Grootegeluk mine. These prospecting rights are grouped in two projects, Waterberg North and Waterberg South, and include around 3 billion tonnes of Inferred Resources. Renewals for all the rights have been granted and Exxaro is currently studying the strategic fit of these rights.

Mpumalanga province

Arnot, an Eskom tied mine, is in closure after the coal-supply agreement (CSA) with Eskom ended on 31 December 2015. The mine produced thermal coal for over 40 years, using various mining methods, predominantly bord-and-pillar (currently mechanical), open-casting and short-walling between 1995 and 2005. A prefeasibility study on the commercial viability of Arnot in 2016 found that there are several areas that can be profitably mined for the thermal coal market. However, due to the absence of a confirmed contractual service agreement (CSA), no Coal Reserves are declared.

Figure 4: Exxaro's mining and prospecting rights in the Waterberg



OUR MINERAL RESOURCES AND RESERVES STATEMENT (CONTINUED)

During the reporting period, Exxaro disinvested from the North Block Complex (NBC) coal mine and adjacent coal project of Paardeplaats and are therefore not included in the 2018 statement.

Matla, an Eskom tied underground operation, is some 20km west of Kriel in Mpumalanga. The operation is an underground mine that extracts coal through three underground mines. Mining activities at Mine 1 ceased in 2015 due to pillar instability but a relocation study that entails developing a new box-cut and tunnels to access Coal Reserves was completed and received approval in principle from Eskom in the reporting year. Mine 2 and Mine 3 use both bord-and-pillar, continuous-mining (CM) and shortwall (SW) coal-mining methods, but geological conditions to support SW mining methods are decreasing and will end. A project to replace the soon-to-be redundant SW equipment with its CM equivalent was presented to Eskom.

Mines 2 and 3 produce coal from seams 2 and 4, which is blended to provide the quality of product necessary for Matla power station. Both coal seams' mineable reserves are rapidly diminishing, and both mines will have to access additional reserves. Two expansion projects, consisting of a decline and incline (respectively) below and above current workings at Mine 2 and 3 were approved by Eskom in 2018, unlocking seams 2 and 4 Coal Reserves. A new vent shaft at Mine 3 to support the expansion awaits Eskom approval.

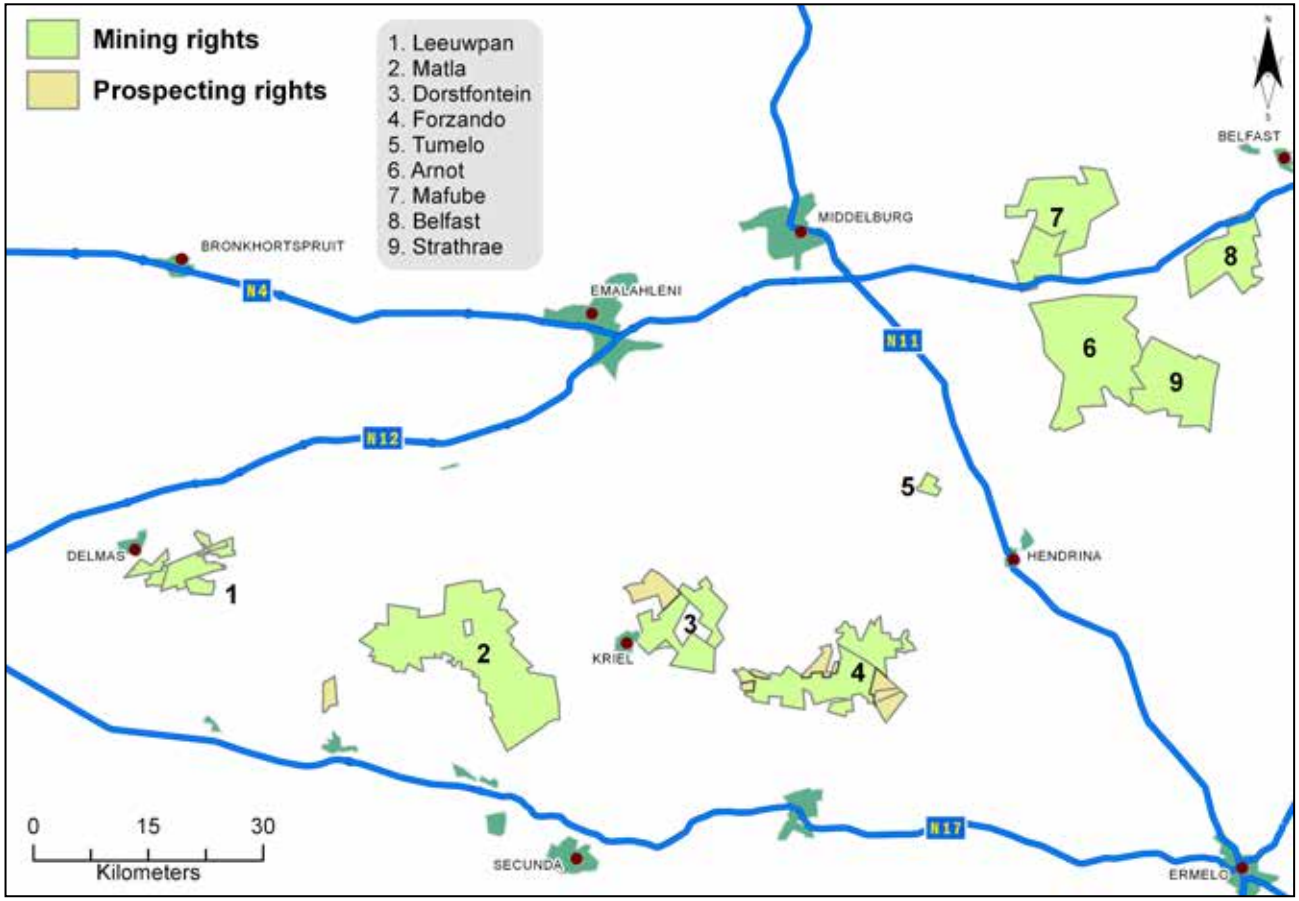
Matla accesses Coal Reserves under challenging geological and mining conditions. Thinning coal seams, variability in coal quality and roof conditions due to the impact of intrusive dykes and sills, as well as geological faulting, present challenges for coal extraction in a number of mining sections. Focused exploration activities, including surface and downhole geophysical surveys and vertical and horizontal drilling, are employed to proactively outline and align the impacts on mine planning. New information from the 2017/18 drilling campaign and results from a revision of historical information were used to update the geological model and scrutinise the classification of Coal Resources. The results improved the outline of the Indicated and Measured Resource strings, and this refinement is reflected in the movement between the various Coal Resources categories. The change in the resource base resulted in a 5.7% decrease in the Coal Reserve after the LoMP was revised. The reduction of pillar-extraction recovery based on the review of the extraction process to enhance ventilation and safety as well as considering actual extraction figures in the reporting period resulted in a further 13% decrease in Coal Reserves.

In line with Exxaro's commitment to unlock value, an expansion project to extend the life-of-mine of Leeuwpan, an open-pit operation in Delmas, Mpumalanga, by ten years was implemented in 2018. The updated plan incorporates changes in the price structure of the export market, with higher prices for lower-energy products leading to higher yields. The R500-million optimisation project will enhance Leeuwpan's performance by better aligning access roads to the site, as well as upgrading the existing plant and producing high-quality thermal and metallurgical coal for domestic and export markets. The road relocation and box-cut of the expansion project were successfully concluded in the reporting period. An investigation surrounding the OI reserve resulted in unlocking additional Coal Resources (~2.7Mt) and are included as Probable Reserves in the LoM until all environmental approvals are secured. Significant dyke activity and a prominent dolerite sill that overlies both the resource blocks of UB and OI (Leeuwpan expansion), negatively affecting both slope stability and coal quality, are investigated through open-hole drilling and down-hole geophysical surveying. The impacts are proactively accommodated in mine planning.

The ECC complex comprises the Dorstfontein, Forzando and Tumelo operations (figure 5). Dorstfontein complex lies just north-east of the town of Kriel, in Mpumalanga. The complex comprises DCMW (West), an underground mine, and DCME (East), an open-cast operation, as well as Rietkuil (Vhakoni), an adjacent project for which approval is pending of a section 102 of the Mineral and Petroleum Resources Development Act (MPRDA) to incorporate this right into the DCME mining right. New information (130 holes) triggered an update of the geological model in 2017. A revision of the LoM in the reporting period, specifically considering the 2017 geological model, resulted in a significant amount of seams 2 and 4 material being included in underground Coal Reserves. The DCMW seam 4 project was implemented in 2018, unlocking seam 4's lower Coal Reserves through an incline in existing mine infrastructure. Expansions of the Dorstfontein assets illustrate the continuous and successful drive to unlock value for ECC.

The Forzando complex (FZO), a part of ECC, is 10km north of Bethal, and just south of the Dorstfontein complex. FZO complex comprises two underground mines, Forzando North (FZON) and Forzando South (FZOS), and both mining rights were executed in 2013 for a period of 16 years. Forzando accessed some historical workings at FZON (under care and maintenance since 2014) successfully in the reporting year, increasing production and quality of the overall coal product mix. Mining in general is affected by geological faulting and dolerite (sill and dyke) activity, resulting in poor roof conditions and restricting access to potential resource areas. These challenges are thoroughly investigated and accommodated in mine planning and the team is addressing the impact through focused infill drilling (characterisation) and effective grade-control practices (managing mining losses).

Figure 5: Exxaro's mining and prospecting rights in Mpumalanga



PROSPECTING AND MINING TENEMENT INFORMATION

Coal Resources and Coal Reserves quoted for Exxaro-managed assets fall within existing Exxaro mine or prospecting rights. Rights are of sufficient duration (or convey a legal right to convert or renew for sufficient duration) to enable all reserves to be mined in line with current production schedules. The only exceptions are the Grootegeluk (executed March 2011 for 30 years), Matla (executed March 2015 for ten years) and Forzando (executed June 2013 for 16 years) operations where adequate Coal Reserves exist for LoMPs extending well beyond the period for which they were granted. Significant developments within the mineral right authorisations are discussed. Exxaro prospecting and mining authorisations are managed to ensure reporting compliance as required by the Mineral and Petroleum Resources Development Act (MPRDA) and National Environmental Management Act (NEMA).

The status of prospecting and mining rights indicating the right type, name, reference number, status, expiry date and ownership (% attributable to Exxaro) is presented in table 81 and table 82 (in appendix A). The prospecting and mining right boundaries are shown in the discussion of individual operations and projects in the ancillary section.

Mpumalanga

Exxaro manages several operations in Mpumalanga (figure 5).

Arnot is currently under care and maintenance. The converted mining right is executed but registration is pending. The right was timeously submitted for registration but referred to correct historical property-naming conventions. The corrections were made, and the right was resubmitted for registration.

The converted mining right for Matla mine was executed in March 2015 and timeously submitted for registration, which is pending. Matla encountered a similar historical property-naming correction request as at Arnot. The corrections were made, and the right was resubmitted for registration.

The converted mining right and adjacent new mining right at Leeuwpan mine have both been executed and registered. Approval of a ministerial consent (section 102 of the MPRDA) submitted to amalgamate the two rights has been granted, and execution is pending.

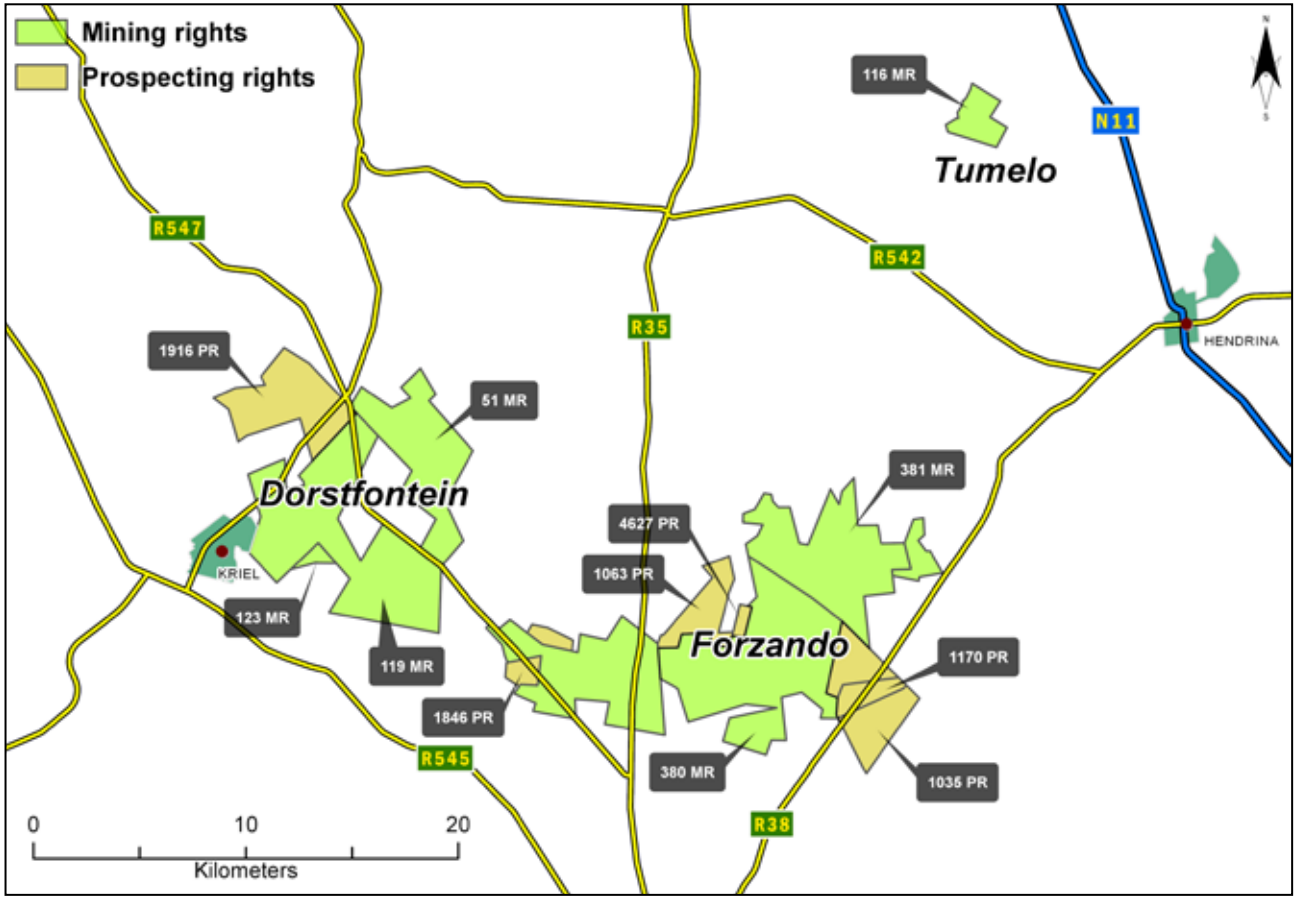
Exxaro has disinvested from NBC, which includes the mining areas of Glisa (converted mining right), Eerstelingsfontein and Paardeplaats, both new mining rights.

The Belfast mining right was executed in October 2013 and registered in March 2015. All pending licensing appeals lodged against the operation were resolved in 2018 and construction is under way.

ECC complex comprises the Dorstfontein, Forzando and Tumelo operations. The Tumelo mining right was registered in January 2013 and lapsed in 2015. A renewal was timeously submitted, and approval is pending. The operation is currently under care and maintenance.

The Dorstfontein complex comprises three mining rights. The mining rights of Dorstfontein West (123MR – executed June 2012), Dorstfontein West and Vlakfontein (119MR – executed June 2012) and Dorstfontein East (51MR – executed June 2006) were granted for 30 years. A ministerial consent (section 102 of the MPRDA) application to include the Rietkuil Vhakoni (1916PR) prospecting right into the Dorstfontein West mining right was timeously submitted in July 2015 and approval is pending.

Figure 6: Locality map for ECC mining and prospecting rights



The Forzando complex comprises two mining rights, Forzando South (380MR) and Forzando North (381MR), both executed in June 2013 for 16 years. The application to renew the prospecting right of Legdaar (1846PR) was submitted in early 2015 and approval is pending. A section 102 application to include the Kalabasfontein prospecting rights (1170PR and 1035PR) into the Forzando South mining right was timeously submitted in June 2018 and approval is pending.

ECC also holds a 49% interest in the prospecting right of Schurvekop (1063PR), with Mmakau Coal as the majority owner. A mining right was submitted by Mmakau Coal in 2017 and approval is pending. The legislative process following submission is progressing well.

PROSPECTING AND MINING TENEMENT INFORMATION (CONTINUED)

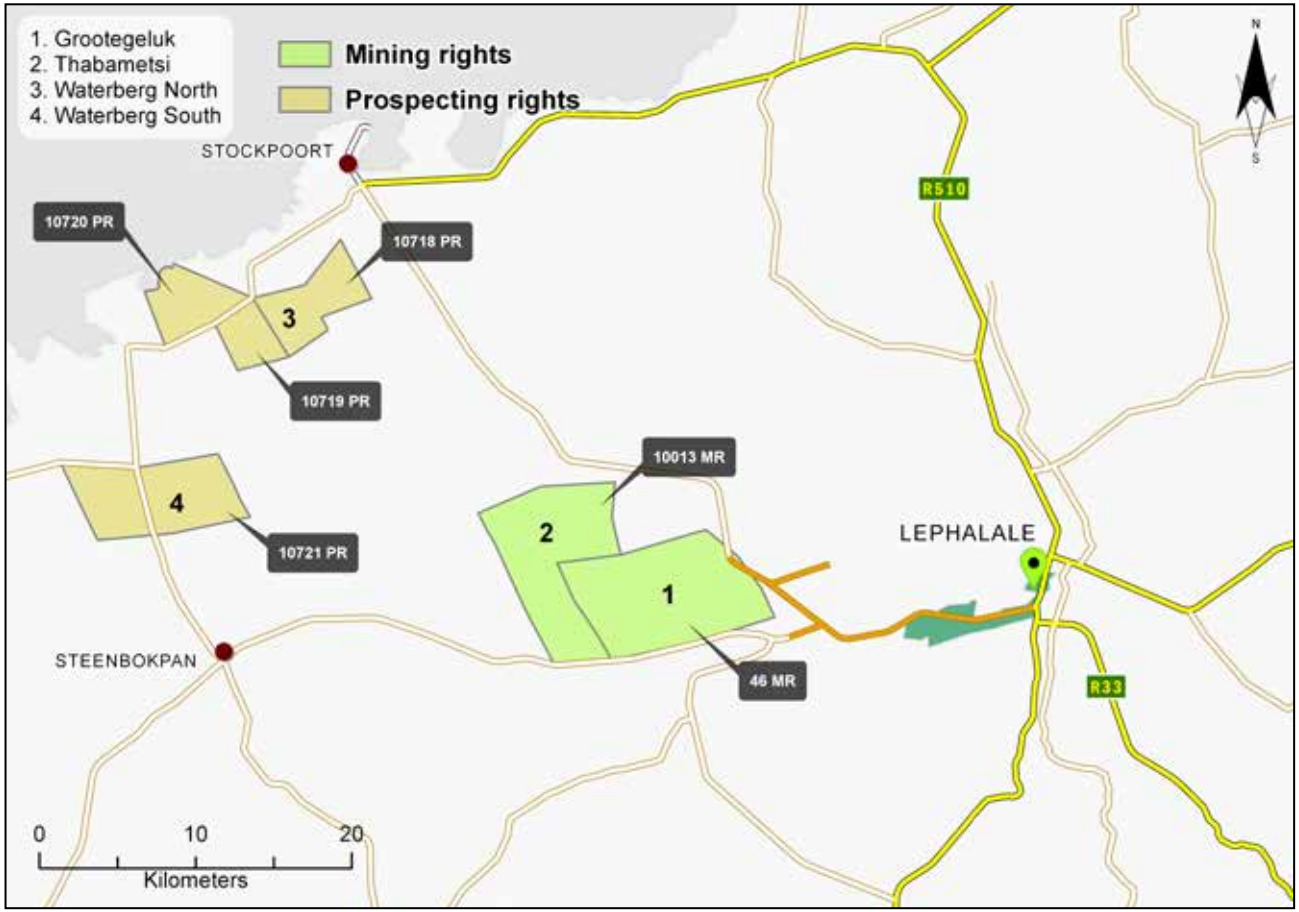
Limpopo

Exxaro manages three operations in Limpopo: the Grootegeluk complex (Grootegeluk and adjacent Thabametsi mining rights) (figure 7) and the Waterberg North and South prospecting rights.

The converted mining right of Grootegeluk mine (46MR) was executed in March 2011 and registered in May 2012 for a period of 30 years. An approval for ministerial consent (section 102 of the MPRDA) was submitted in September 2017 to include two mine dump areas that currently fall outside the mining right. The application was approved. Thabametsi mine, a development adjacent to Grootegeluk, was granted a mining right (10013MR) for 30 years. The mining right was executed in June 2016 and registered in July 2016.

The Waterberg prospecting rights are grouped in two projects: Waterberg North and Waterberg South. All the Waterberg North prospecting rights (Pentonville: 10719PR, Carolina: 10718PR and Dartmoore: 10720PR) as well as the Waterberg South prospecting right (Swelpan: 10721PR) have been granted. Exxaro is currently considering the strategic fit for these rights.

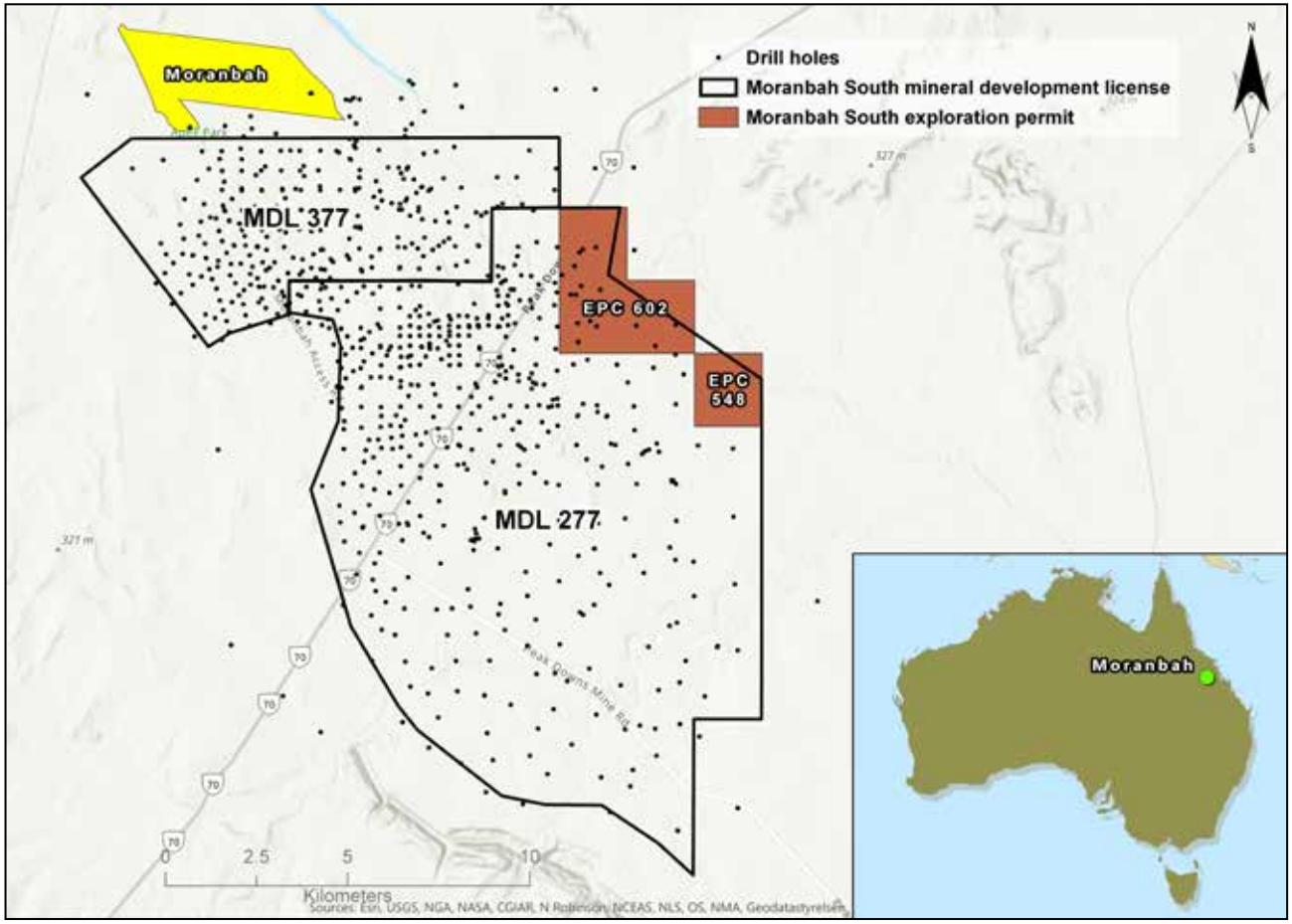
Figure 7: Locality map for Limpopo mining and prospecting rights



Australia

The Moranbah South project area in Australia includes two mineral development licences (MDLs 277 and 377) and two exploration permits for coal (EPCs 548 and 602). The mineral development licence MDL 277 will expire in June 2021 and MDL 377 on 30 September 2018. The current term of EPC 548 expires on June 2022 and EPC 602 in December 2018. Applications for both MDL 377 and EPC 602 were timeously submitted.

Figure 8: Locality of the Australian MDL and EPCs



GOVERNANCE

The Exxaro annual estimation and reporting process is managed through the Exxaro geosciences policy and associated Coal Resource and Reserve reporting and estimation procedures. Both policy and procedures are aligned with the guidelines of JSE section 12, SAMREC Code 2016 and, for South African coal reporting, SANS 10320:2004.

The policy and procedures dictate technical requirements for estimation and reporting, and include guidelines on methodologies, processes and deliverables. Procedures are also implemented for the geophysical, rock engineering, geotechnical, structural geology, tenure management, hydro-geological, exploration and mine-planning disciplines that prescribe methodologies and minimum standards for compliance.

To align with the SAMREC 2016 code, Exxaro has updated its internal competent persons' reports (CPRs) in 2017 and again in 2018. No material changes as defined in the code have occurred, but we considered the introduction of the 'if not, why not' principle as significant enough to warrant the updates. The reports followed guidelines under appendix 1 of SAMREC 2016.

Table 1: Exxaro reporting structure

EXXARO REPORTING GOVERNANCE FRAMEWORK			
Regulatory	**Governance**	**Deliverables**	**Assurance**
JSE Listings Requirements (section 12)	Geosciences policy	Annual resource and reserve estimation schedule	Annual review and update of procedures
2016 amendments to 'minimum contents of annual report, point 12.13' were considered	*2017 update to align with our functional model strategy was considered*	*2018 estimation schedule for operations under Exxaro control was followed*	*2017 update was considered*
SAMREC Code (2016) table 1	Exxaro Mineral Resource and Reserve reporting procedure	Mineral reserve fact packs	Competent person's register update and review
2016 updated table 1 was considered	*2016 version was updated to include external audit findings and recommendations*	*ECC, Matla and Leeuwpan fact packs containing all modifying factor considerations were updated*	*Updated for 2018*
SANS (SANS 10320:2004)	Exxaro Mineral Resource estimation procedure	Annual operation/project Mineral Resource and Reserve report	CMRR review and lead competent person sign-off
SANS guidelines were considered	*2016 version was updated to include external audit recommendations*	*Belfast annual report was updated*	*Review concluded in March 2018 by SRK Consultants*
JORC Code (2012)	Exxaro Mineral Reserve estimation procedure	Consolidated Mineral Resource and Reserve report (CMRR)	Applicable competent person and technical team sign-off
	2017 LoMP update was considered	*Incorporated 2017 external review findings*	*Included in individual CPR reports, available on request*
		When required: Mineral resource and reserve competent person report/s	Internal review and external audit process
		Given the new SAMREC Code, we have updated individual CPRs for 2018	*External process audits were conducted on Central, Grootegeluk, and Forzando. Reviews were conducted on Matla and Moranbah*

Comments on 2018 estimation shown in blue italics

COMPETENT PERSONS

Exxaro applies three levels of 'competency' to estimating Coal Resources and Coal Reserves:

- Competent person (as defined in the SAMREC and JORC codes) at each operation who officially takes responsibility for estimating and reporting Coal Resources and/or Coal Reserves at operational or project level. These competent persons have been appointed and acknowledged their acceptance of accountabilities. Their names, qualifications, affiliations and relevant experience are included in the independent operational and project reports in the format of a competent person certificate.
- Technical specialists who contribute in any way to estimating Mineral Resources and/or Mineral Reserves and are named on each operation's Mineral Resource and Mineral Reserve statement. Technical specialists could include geologists, mining engineers, geohydrologists, geotechnical engineers, financial experts, economists, etc. Technical specialists who contributed to estimating the operation's Coal Resources and Coal Reserves are included in the original CPR documentation, where their contributions are specified, and their names and signatures appear.
- Person/s designated to take corporate responsibility for the Mineral Resource and Mineral Reserve estimates presented in the consolidated report. This definition clearly differentiates the competent person on an operational level from the person(s) who takes overall corporate responsibility for the Mineral Resource and Mineral Reserve estimates presented in this report.

Exxaro's Coal Resources and Coal Reserves have been estimated or supervised by the competent persons listed in Table 83 on an operational basis in accordance with the SAMREC Code 2016 for South African properties and the JORC Code 2012 for Australian properties. All competent persons have sufficient relevant experience in the style of mineralisation, type of deposit and/or mining method(s) under consideration and/or being mined and for the activity they have taken responsibility for, to qualify as 'competent persons' as defined in the applicable codes at the time of reporting.

The appointed competent persons have signed off their respective estimates in the original Mineral Resource and Reserve statements for the various operations, and consent to the inclusion of the information in this report in the form and context in which it appears in the CMRR. Technical specialists who contributed to estimating the operation's Mineral Resources and Mineral Reserves are included in the original documentation, where their contributions are specified, and their names and signatures appear.

The various appointed competent persons are either full-time employees at the operation they are reporting on (ie resident geologist, Mineral Resource manager) or, in the case of projects, the competent persons have conducted appropriate site visits to the mineral property being evaluated. All operations under Exxaro's control have been visited by the applicable competent persons.

Exxaro lead competent persons are appointed by the Exxaro management team. The Exxaro lead Mineral Resource competent person is Henk Lingenfelder, a member of the Geological Society of South Africa (GSSA) and registered (400038/11) with the South African Council for Natural Scientific Professions. He has a BSc (Hons) in geology and 23 years of experience as a geologist in coal, iron ore and industrial minerals.

The Exxaro lead Mineral Reserve competent person is Chris Ballot, a mining engineer registered (20060040) with the Engineering Council of South Africa. He has 22 years of experience in iron ore, mineral sands and coal in various technical and management roles.

RISK AND ASSURANCE

Tier 1

Resource and Reserve estimation is undertaken as per Exxaro's **governance framework**. Sign-offs are required at each stage and the process is **concluded** in a **formal sign-off session** by a panel comprising Exxaro lead **resource and reserve competent persons, competent persons, domain experts and technical specialists**. Technical **assurance** is managed against **dedicated standards**.

Tier 2

Internal reviews scheduled on a **three-year cycle**. The intent is to **verify compliance** with Exxaro's **governance framework** while **ensuring accountability** and **consequence management**.

Tier 3

External audits scheduled on a **three-year cycle** or at the discretion of the lead competent persons and entailing a **full review** of the **Mineral Resource and Reserve estimation process**, from **borehole logging** to reserve **evaluation**.

Assurance is implemented on a three-tier system, aligned with the guidelines of the Exxaro Mineral Resource and reserve reporting procedure and summarised as follows:

In 2018, tier 1 assurance was undertaken for the Matla, ECC and Leeuwpan coal mines. The resource fact packs indicated that an update of the Coal Resource estimate was required, either due to additional information being available or on recommendations from previous audits. Geological data validation, data analysis and subsequent update of geological and structural models were concluded in the reporting period. The models were signed off by the applicable CPs and their supporting technical teams. On the reserve side, the Matla plan was reviewed, resulting in an update and subsequent sign-off in December 2018. In addition, the Dorstfontein and Leeuwpan operations were reviewed, leading to optimisation of the Dorstfontein and Leeuwpan life-of-mine plans.

On **tier 2**, technical assurance on the Matla 1 relocation and Matla Mine 3 vent shaft were conducted in the latter part of 2018. Findings included the update of geotechnical reviews of both the vent shaft and Mine 1 relocation site. These studies are progressing well. Assurance on the Grootegeluk in-pit crushing and conveyor project was concluded in the second quarter of 2018. In addition, a review of Matla's exploration strategy, standards and procedures, data management, geological modelling, resource estimation (including classification and reconciliation) and reporting were tested. There were no findings that could materially impact (>10%) the integrity of reported Mineral Resource estimates.
A number of findings related to SAMREC 2016 requirements in terms of sampling chain of custody were documented.
A response plan to address findings is being executed.

Tier 3 process audits were done by Ernst & Young (EY), for the Central, Grootegeluk and Forzando areas, with 28 audit findings documented. We note that none of the findings was critical (constitutes a material risk for the company). Several findings related to public reporting compliance, but these have been adequately addressed in the 2018 CPR update.
Corrective measures on all findings have been actioned and no material changes to either estimates (tonnage figures reported) or operational compliance are reported.

Table 2: Findings, impact and corrective measures for tier 3 audit

		Finding	Impact	Corrective measure
General	1	Inadequate safeguarding of documents	Data	Estimation procedure enforced, and gaps addressed
	2	No evidence that all competent persons were duly registered for the reporting period	Competence	Include annual proof in 2018 CPR update
	3	SAMREC table 1 reporting in CPRs did not cater for sub items	Reporting	Addressed in 2018 CPR update
	4	Outdated terminology used in the CPR report	Reporting	Addressed in 2018 CPR update
	5	Laboratory performance not reviewed by business units and not adequately discussed in the report	Reporting	Documented in 2018 CPR update and estimation procedure reviewed
	6	Reasonable Prospect for Eventual Economic Extraction (RPEEE) not standardised and does not cover all items in SAMREC Code table 1 considered in resource CPR	Reporting	Standardise and included in 2018 CPR update
Grootegeluk	1	Limited explanation for geological domain delineation	Resource estimation	Reviewed, tested but applicable to deposit
	2	Insufficient description of Coal Resource changes	Reporting	Addressed in 2018 CPR update
	3	Unobserved geological loss factors not adequately accounted for	Resource estimation	Reviewed, current factors are valid
	4	Insufficient definitions on Coal Resource tables	Reporting	Addressed in 2018 CPR update
	5	Laboratory sample preparation not sufficiently described	Reporting	Comprehensively addressed in 2018 CPR update Estimation procedure under review
	6	No evidence of the close-out of validation findings and sign-off of geological model	Handover	Sign-off is done. Estimation procedure updated to reflect any correction done during LoMP process
	7	Coal reserve classification does not give due consideration to confidence in modifying factors	Reserve estimation	Captured in fact pack, but also include full list in CPR
	8	Sustaining capital expenditure forecast in the LOM financial model appears insufficient relative to historical spend	Reserve estimation	To be review when business plan and budget are revised
	9	The reserve competent person at operation role not clarified re Coal Reserve estimation and reporting process	Reserve estimation	Process reviewed, specific role clarified and reappointed
	10	No remedial actions recorded for deficiencies identified during management review	Reserve estimation	Standard operating procedure for management audits put in place
Forzando	1	No coal processing test work completed	Modifying factor	Validated. Comprehensive historical operational information available to support
	2	Reliability of Digital Terrain Model (DTM)	Reserve estimation	Reviewed, new survey in 2019 to update DTM
	3	Insufficient footnotes on summarised Coal Resource table	Reporting	Comprehensively addressed in 2018 CPR update, in statement and resource chapter
	4	Outline laboratories used by Forzando over the years and changes between sample preparation over time	Reporting	Comprehensively addressed in 2018 CPR update
	5	No evidence of the close-out of validation findings and sign-off of the geological model	Resource estimation	Sign-off is done. Estimation procedure updated to reflect any correction done during LoMP process
	6	Insufficient disclosure relating to Forzando South opencast Coal Reserves	Reporting	Revise fact pack to align with SAMREC table 1
	7	Coal reserve classification does not appear to give due consideration to confidence in modifying factors	Reserve estimation	Reviewed and validated. Comprehensively addressed in 2018 CPR update
	8	There was no alignment of the increasing trend in costs on the operation to the operating expenditure forecast	Reserve estimation	Continuously review costs in business unit financial model
	9	Coal reserves for Forzando North were not economically viable	Reserve estimation	Show current value, continuously review
	10	Sustaining capital expenditure forecast in the LOM financial model appears insufficient relative to historical spend	Economic assessment	To be reviewed when business plan and budget are revised
	11	Management and peer reviews have not been documented	Reporting	Outlined in 2018 CPR update
	12	A portion of the Forzando South Coal Reserves may be sterilised due to poor ground conditions	Reserve estimation	Not applicable, already mined

GROUP SUMMARY OF RESOURCE AND RESERVE ESTIMATES

This document indicates Exxaro's Coal Resources and Coal Reserves remaining as at 31 December 2018. Mineral Resource and Mineral Reserve figures are not an inventory of all mineral occurrences drilled or sampled, but a realistic record of those which, under assumed and justifiable technical and economic conditions, may be economically extractable currently and in future.

Mineral Resources and Mineral Reserves are reported inclusive of Mineral Resources that have been converted to Mineral Reserves. An exception is reporting for Gamsberg and Black Mountain Mining, because figures received from Vedanta plc (JORC Code) represent Mineral Resources excluding Mineral Reserves.

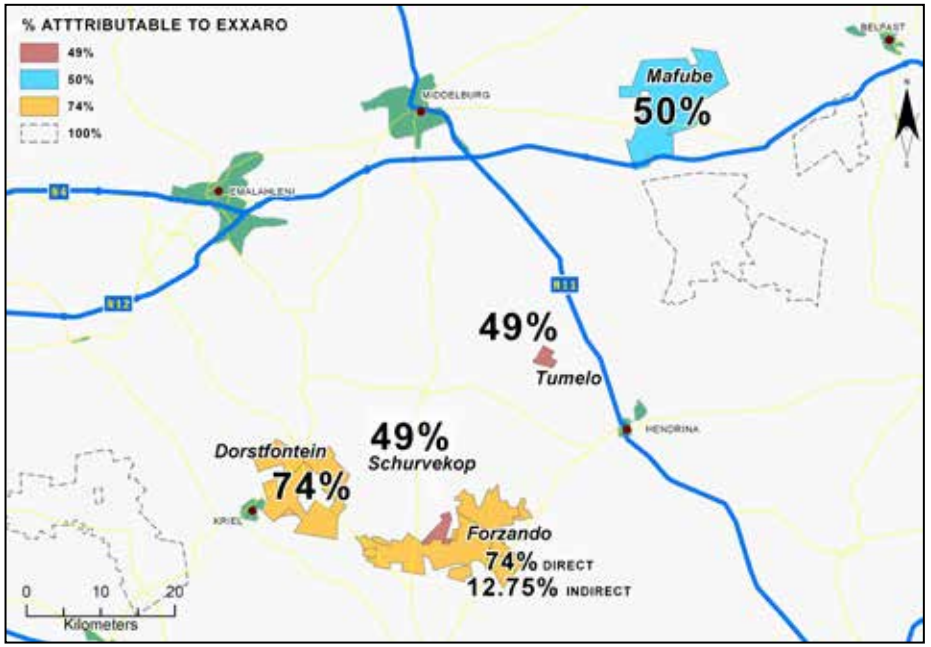
Exxaro includes all estimates directly under its management control and estimates of entities in which Exxaro holds a 25% interest or larger. Mineral resources and Mineral Reserves are reported at 100%, irrespective of the percentage attributable to Exxaro.

The percentage attributable tonnage (only coal) can be deduced from the attributable ownership (figure 9) stated in the Coal Resources and Coal Reserves tables and the summarised tonnages are shown in table 3. Explanations for material changes are provided as footnotes in the Coal Resources and Coal Reserves tables and detailed explanations for year-on-year movements are provided.

Table 3: Attributable Coal Resource and Coal Reserve tonnages

Commodity – Coal		2018 MTIS (Mt)
Exxaro attributable tonnes	Measured	4 720
	Indicated	2 227
	Inferred	6 970
	Total resources	13 918
	Proved	3 030
	Probable	763
	Total reserves	3 793

Figure 9: Coal joint-venture operations in Mpumalanga province



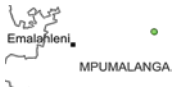
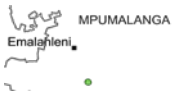
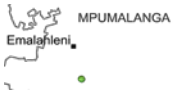
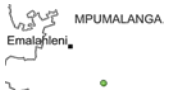
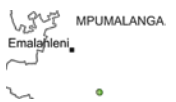
Coal Resources

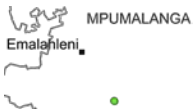
Table below details the total inclusive Coal Resources estimated as at 31 December 2018.

Table 4: Coal Resources and qualities for 2018

			2018 – tonnes and grade[4]						2017 – tonnes and grade[4]					
Operation[1]	Location[3]	Resource category	Tonnes (Mt)	CV MJ/kg	% Ash	% IM	% VM	% S	Tonnes (Mt)	CV MJ/kg	% Ash	% IM	% S	% change in tonnes[5]
Arnot mine[6]		Measured	20.2	24.2	26.6	4.0		1.0	20.2	24.2	26.6	4.0	1.0	0
(OC)		Indicated	18.9	24.5	26.7	3.8		0.9	18.9	24.5	26.7	3.8	0.9	0
(in closure)		Inferred	8.8	24.0	26.7	3.9		0.8	8.8	24.0	26.7	3.9	0.8	0
Mpumalanga		**Total**	47.9	24.3	26.7	3.9		1.0	47.9	24.3	26.7	3.9	1.0	0
100% attributable to Exxaro[2]	Resources inside life-of-mine plan[5] (LoMP)													
Arnot mine[6]		Measured	118.3	23.6	22.0	4.0		1.0	118.3	23.6	22.0	4.0	1.0	0
(UG)		Indicated	45.4	23.4	22.6	4.2		0.9	45.4	23.4	22.6	4.2	0.9	0
(in closure)		Inferred	12.5	23.8	21.4	4.3		0.9	12.5	23.8	21.4	4.3	0.9	0
Mpumalanga		**Total**	176.2	23.5	22.1	4.1		1.0	176.2	23.5	22.1	4.1	1.0	0
100% attributable to Exxaro[2]	Resources inside LoMP													
Matla mine[7]		Measured	713	20.2	30.6	4.5		1.0	641	20.1	30.9	4.5	1.0	11
(UG)		Indicated	97	20.8	28.1	4.4		0.9	204	20.0	30.3	4.5	0.9	(52)
(captive market)		Inferred	240	19.6	30.9	4.5		0.9	251	19.9	29.6	4.6	0.9	(4)
Mpumalanga		**Total**	1 050	20.1	30.4	4.5		1.0	1 096	20.0	30.5	4.5	1.0	(4)
100% attributable to Exxaro[2]	Resources inside LoMP		327	21.1	27.7	4.7		1.0	354	21.1	27.8	4.6	1.0	(8)
Leeuwpan mine[8]		Measured	101.1	20.1	31.3	3.2	18.7	1.1	115.6	20.5	31.2	3.2	1.1	(13)
(OC)		Indicated	2.6	20.7	29.1	2.8	21.1	1.2						
(commercial market)		Inferred	3.6	21.0	32.3	2.3	14.0	1.1	3.7	21.1	32.1	2.3	1.2	(2)
Mpumalanga		**Total**	107.3	20.1	31.3	3.2	18.6	1.1	119.3	20.5	31.3	3.2	1.1	(10)
100% attributable to Exxaro[2]	Resources inside LoMP		71.7	20.0	31.1	3.1	19.6	1.2	94.7	20.4	31.5	3.1	1.2	(24)
Mafube mine[9]		Measured	124.5	21.5	26.9	3.8		1.0	129.3	21.6	26.8	3.8	1.0	(4)
(OC)		Indicated	10.1	22.0	25.7	3.9		0.9	10.1	22.0	25.7	3.9	0.9	0
(commercial market)		Inferred												
Mpumalanga		**Total**	134.7	21.6	26.8	3.8		1.0	139.4	21.6	26.7	3.8	1.0	(3)
50% attributable to Exxaro[2]	Resources inside LoMP		61.7	21.9	25.6	3.7		1.0	64.6	22.0	25.6	3.7	1.0	(4)
NBC mine[10]		Measured							15.0	21.1	27.3	3.9	0.9	
(OC)		Indicated												
(commercial market)		Inferred				Disinvested								
Mpumalanga		**Total**							15.0	21.1	27.3	3.9	0.9	
100% attributable to Exxaro[2]	Resources inside LoMP								4.1	20.5	29.4	3.8	0.7	

GROUP SUMMARY OF RESOURCE AND RESERVE ESTIMATES (CONTINUED)

Operation[1]	Location[3]	Resource category	2018 – tonnes and grade[4] Tonnes (Mt)	CV MJ/kg	% Ash	% IM	% S	2017 – tonnes and grade[4] Tonnes (Mt)	CV MJ/kg	% Ash	% IM	% S	% change in tonnes[5]
Glisa South project[11]		Measured	Disinvested					62.1	19.0	31.6	3.4	0.9	
(prospecting)		Indicated						16.2	20.7	28.6	3.5	1.0	
Mpumalanga		Inferred						13.2	20.3	29.4	3.4	1.2	
100% attributable to Exxaro[2]		**Total**						91.5	19.5	30.8	3.4	1.0	
Belfast project[12]		Measured	81.1	24.8	18.7	3.6	1.1	81.1	24.8	18.7	3.6	1.1	0
(OC)		Indicated	22.4	21.6	26.9	3.7	1.1	22.4	21.6	26.9	3.7	1.1	0
(mining right)		Inferred	34.4	20.0	31.2	3.4	1.0	34.4	20.0	31.2	3.4	1.0	0
Mpumalanga		**Total**	137.8	23.1	23.2	3.6	1.1	137.8	23.1	23.2	3.6	1.1	0
100% attributable to Exxaro[2]		Resources inside LoMP	47.1	25.2	17.6	3.6	1.2	47.1	25.2	17.6	3.6	1.2	0
Dorstfontein complex[13]		Measured	156.4	19.9	33.3	2.9	1.1	158.1	19.9	33.4	2.9	1.1	(1)
(OC/UG)		Indicated	137.5	19.3	34.2	3.2	1.2	142.4	19.2	34.6	3.1	1.2	(3)
(commercial market)		Inferred	52.8	19.3	34.6	2.9	1.1	47.4	19.4	34.4	2.9	1.1	11
Mpumalanga		**Total**	346.7	19.6	33.9	3.0	1.1	347.9	19.5	34.1	2.9	1.1	(0)
74% attributable to Exxaro[2]		Resources inside LoMP	228.8	19.9	32.7	3.0	1.1	62.3	21.3	29.1	3.1	1.0	267
Rietkuil Vhakoni		Measured	81.9	19.1	36.0	2.5	1.1	82.3	19.0	36.2	2.6	1.0	0
(prospecting right)		Indicated	11.6	18.6	37.4	2.8	1.2	11.6	18.6	37.4	2.8	1.2	0
Mpumalanga		Inferred	8.3	18.5	37.7	2.8	1.0	8.6	18.5	37.2	2.6	1.0	(3)
74% attributable to Exxaro[2]		**Total**	101.8	19.0	36.3	2.6	1.1	102.5	18.7	37.0	2.6	1.0	(1)
Forzando mine		Measured	81.5	21.6	29.1	2.8	1.1	83.1	21.6	29.1	2.8	1.1	(2)
(OC/UG)		Indicated	35.9	22.3	27.5	2.8	1.2	35.2	22.2	27.6	2.8	1.2	2
(commercial market)		Inferred	25.8	21.3	30.1	2.9	1.2	26.1	21.2	30.2	2.9	1.2	(1)
Mpumalanga		**Total**	143.2	21.8	28.9	2.8	1.2	144.4	21.7	28.8	2.8	1.2	(1)
87% attributable to Exxaro[2]		Resources inside LoMP	70.3	21.2	30.0	2.8	1.1	74.1	21.4	29.6	2.8	1.1	(5)
Forzando projects		Measured	0.9	21.8	28.8	3.3	1.3	0.2	21.4	30.6	2.5	0.5	291
(prospecting right)		Indicated	16.5	20.4	21.3	3.1	1.5	16.5	20.4	21.3	3.1	1.5	0
Mpumalanga		Inferred	4.3	20.9	32.9	2.5	1.4	4.3	20.9	32.9	2.5	1.4	(1)
86.75% attributable to Exxaro[2]		**Total**	21.7	20.6	23.9	3.0	1.5	21.0	20.6	24.9	2.9	1.5	3

Operation[1]	Location[3]	Resource category	2018 – tonnes and grade[4] Tonnes (Mt)	CV MJ/kg	% Ash	% IM	% S	2017 – tonnes and grade[4] Tonnes (Mt)	CV MJ/kg	% Ash	% IM	% S	% change in tonnes[5]
Schurvekop 1063 PR[14]		Measured	35.0	20.2	31.7	3.3	1.2	35.0	20.2	31.7	3.3	1.2	0
(prospecting right)		Indicated	5.6	20.1	31.7	3.4	1.1	5.6	20.0	31.8	3.3	1.1	0
Mpumalanga		Inferred	0.2	19.7	32.3	3.8	0.8	0.2	19.7	32.3	3.8	0.8	(1)
86.75% attributable to Exxaro[2]		**Total**	40.8	20.1	31.7	3.3	1.2	40.8	20.2	31.7	3.3	1.2	0
Tumelo mine		Measured	8.7	21.7	29.7	2.5	1.5	8.7	21.7	29.7	2.5	1.5	0
(UG)		Indicated	0.2	20.6	32.8	2.5	1.6	0.2	20.6	32.8	2.5	1.6	0
Mpumalanga		Inferred	1.8	21.4	31.0	2.4	1.8	1.8	21.4	31.0	2.4	1.8	0
49% attributable to Exxaro[2]		**Total**	10.7	21.6	29.9	2.5	1.6	10.7	21.6	29.9	2.5	1.6	0
Grootegeluk mine		Measured	2 844	16.7	47.8	1.7	1.5	2 902	16.7	47.8	1.7	1.5	(2)
(OC)		Indicated	1 017	16.5	48.4	1.6	1.4	1 017	16.5	48.4	1.6	1.4	0
(commercial market)		Inferred	653	16.5	48.0	1.8	1.5	653	16.5	48.0	1.8	1.5	0
Limpopo		**Total**	4 514	18.2	48.0	1.7	1.5	4 572	16.6	48.0	1.7	1.5	(1)
100% attributable to Exxaro[2]	Resources inside GG open-cast LoMP		3 780	16.3	48.8	1.7	1.5	3 837	16.3	48.8	1.7	1.5	(1)
Thabametsi project[15]		Measured	270	13.0	52.3	1.9	1.2	270	13.0	52.3	1.9	1.2	0
(OC/UG)		Indicated	749	12.6	53.1	1.8	1.1	749	12.6	53.1	1.8	1.1	0
(mining right)		Inferred	2 916	12.7	52.7	1.9	1.3	2 916	12.7	52.7	1.9	1.3	0
Limpopo		**Total**	3 935	12.7	52.7	1.9	1.3	3 935	12.7	52.7	1.9	1.3	0
100% attributable to Exxaro[2]	Resources inside IPP LoMP		133	12.0	54.7	1.9	1.0	133	12.0	54.7	1.9	1.0	0
Waterberg North project[16]		Measured											
(prospecting)		Indicated											
Limpopo		Inferred	2 147	13.3	49.7	2.5	1.2	2 147	13.3	49.7	2.5	1.2	0
100% attributable to Exxaro[2]		**Total**	2 147	13.3	49.7	2.5	1.2	2 147	13.3	49.7	2.5	1.2	0

GROUP SUMMARY OF RESOURCE AND RESERVE ESTIMATES (CONTINUED)

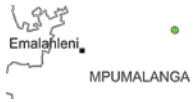
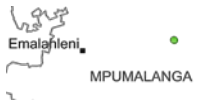
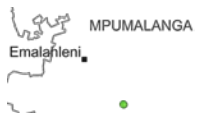
Operation[1]	Location[3]	Resource category	2018 – tonnes and grade[4] Tonnes (Mt)	CV MJ/kg	% Ash	% IM	% S	2017 – tonnes and grade[4] Tonnes (Mt)	CV MJ/kg	% Ash	% IM	% S	% change in tonnes[5]
Waterberg South project[17]		Measured											
(prospecting)		Indicated											
Limpopo		Inferred	869	15.9	39.6	2.9	1.7	869	15.9	39.6	2.9	1.7	0
100% attributable to Exxaro[2]		**Total**	869	15.9	39.6	2.9	1.7	869	15.9	39.6	2.9	1.7	0
Moranbah South project[18]		Measured	482	26.7	23.7	2.6	0.6	482	26.7	23.7	2.6	0.6	0
(UG) (prospecting)		Indicated	222	27.3	21.7	2.6	0.6	222	27.3	21.7	2.6	0.6	0
Australia		Inferred	28	28.5	18.9	2.7	0.5	28	28.5	18.9	2.7	0.5	0
50% attributable to Exxaro[2]		**Total**	732	27.0	22.9	2.6	0.6	732	27.0	22.9	2.6	0.6	0

•Rounding figures may cause computational discrepancies
•All changes more than 10% are explained
•Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt
•Coal Resources and qualities (raw coal) are quoted on a mineable tonnage in-situ (MTIS) and air-dried basis
•Coal Resources are quoted inclusive of coal resources that have been modified to Coal Reserves unless otherwise stated
•Resources inside life-of-mine plan (LoMP) refer to total mineable tonnes in-situ (MTIS) resources in LoMP layout
[1] Operation refers to operating mine or significant project. Mining method: OC – opencut, UG – underground
[2] Figures are reported at 100% irrespective of percentage attributable to Exxaro and refer to 2018 only
[3] Locality maps are for illustrative purposes only. Detailed maps are provided in the ancillary section
[4]Raw coal qualities (air-dried basis). CV: calorific value (gross), IM: inherent moisture, S: total sulphur, VM: volatile matter
[5] The percentage difference between 2018 reported MTIS and 2017 reported MTIS. Brackets signify a negative
[6] Mine is in closure. The remaining Coal Resources have reasonable prospects for eventual economic extraction
[7]Movements within resource categories are the result of updated geological model and revised resource classification
[8]Decrease is primarily the result of mining depletion (6.9Mt) and disposals due to environmental and infrastructure considerations (7.9Mt)
[9] Estimates are received from Anglo American Coal Proprietary Limited and not audited by Exxaro
[10] Exxaro divested from the operation
[11] The project forms part of the North Block Complex (NBC). Exxaro divested from NBC
[12] Mine is currently under construction
[13] The complex comprises the East (opencast) and West (underground) operations
[14] Estimates are received from Mmakau Mining, the majority (51%) owner of the project
[15] Project is adjacent to the operating Grootegeluk mine
[16]Reasonable prospects for eventual economic extraction are guided by potential economic value as indicated by a concept mining exploitation strategy
[17]Reasonable prospects for eventual economic extraction are guided by potential economic value as indicated by a concept mining exploitation strategy
[18] Estimates are received from Anglo American Metallurgical Coal Proprietary Limited and not audited by Exxaro

Coal Reserves

The table below details the total Coal Reserves estimated as at 31 December 2018.

Table 5: Coal Reserves reported for 2018

Operation[1]	Location[3]	Life of mine (years)[4]	Category	2018 – ROM and saleable tonnes[5] ROM (Mt)	ROM moisture %	Export (Mt)	Thermal (Mt)	Metal-lurgical (Mt)	2017 – ROM and saleable tonnes[5] ROM (Mt)	Export (Mt)	Thermal (Mt)	Metal-lurgical (Mt)	% change in ROM[6]
Matla mine[7]		**6+**	Proved	171.6	7.8		171.6		194.9		194.9		(12)
(UG)			Probable	16.3	6.3		16.3		36.8		36.1		(56)
(captive market)			**Total**	187.9	7.6		187.9		231.7		231.0		(19)
100% attributable to Exxaro[2]			Inferred resources inside life-of-mine plan (LoMP)	25.6					9.3				176
Leeuwpan		**12**	Proved	53.7	3.2		38.8		61.9		43.2	1.0	(13)
(OC)			Probable	6.2	2.7		2.3	0.4	3.3		2.0		90
(commercial market)			**Total**	59.8	3.1		41.0	0.4	65.1		45.2	1.0	(8)
100% attributable to Exxaro[2]			Inferred resources inside LoMP										
Mafube[8]		**12**	Proved						0.8	0.5	0.2		(100)
(OC)			Probable	62.0	8.3	26.5	13.9		64.0	27.4	14.3		(3)
(commercial market)			**Total**	62.0	8.3	26.5	13.9		64.8	27.9	14.5		(4)
50% attributable to Exxaro[2]			Inferred resources inside LoMP										
NBC mine[9]		**–**	Proved						1.5		1.1		
(OC)			Probable						1.4		1.3		
(commercial market)			**Total**			Disinvest			2.9		2.4		
100% attributable to Exxaro[2]			Inferred resources inside LoMP										
Belfast project		**17**	Proved	45.7	3.6	35.3	8.1		45.7	35.3	8.1		0
(OC)			Probable										
(commercial market)			**Total**	45.7	3.6	35.3	8.1		45.7	35.3	8.1		0
100% attributable to Exxaro[2]			Inferred resources inside LoMP	0.5					0.5				0
Dorstfontein complex[10]		**23**	Proved	54.3	2.7	29.4			36.5	20.4			49
(OC/UG)			Probable	40.5	3.1	24.6			7.7	4.6			426
(commercial market)			**Total**	94.8	2.9	54.0			44.2	25.0			114
74% attributable to Exxaro[2]			Inferred resources inside LoMP	5.7	2.8	2.8			2.3				148
Forzando mine		**10+**	Proved	38.6	2.2	19.9			37.8	20.8			2
(UG)			Probable	15.9	2.8	9.3			16.3	9.4			(2)
(commercial market)			**Total**	54.5	2.4	29.2			54.1	30.1			1
74% attributable to Exxaro[2]			Inferred resources inside LoMP	7.5	2.5	4.0			7.1				6

GROUP SUMMARY OF RESOURCE AND RESERVE ESTIMATES (CONTINUED)

Operation[1]	Location[3]	Life of mine (years)[4]	Category	2018 – ROM and saleable tonnes[5] ROM (Mt)	ROM moisture %	Export (Mt)	Thermal (Mt)	Metal-lurgical (Mt)	2017 – ROM and saleable tonnes[5] ROM (Mt)	Export (Mt)	Thermal (Mt)	Metal-lurgical (Mt)	% change in ROM[6]
Waterberg Complex													
Grootegeluk mine		**22+**	Proved	2 576	3.0	149	1 039	72	2 633	151	1 065	73	(2)
(OC)			Probable	645	3.0	60	398	26	645	60	398	26	0
(commercial market)			**Total**	3 221	3.0	209	1 437	98	3 278	211	1 463	99	(2)
100% attributable to Exxaro[2]			Inferred resources inside LoMP	510					510				0
Thabametsi project		**27+**	Proved	109.0	3.0		107.0		109.0		107.0		0
(OC)			Probable	21.0	3.0		20.0		21.0		20.0		0
(IPP market)			**Total**	130.0	3.0		127.0		130.0		127.0		0
100% attributable to Exxaro[2]			Inferred resources inside LoMP										

•Rounding figures may cause computational discrepancies
•Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt
•Inferred Resources inside life-of-mine plan (LoMP) refer to Inferred Resources considered for the LoMP. These resources have not been converted to reserves
•Coal Reserves are quoted on a run-of-mine (ROM) reserve tonnage basis which represents tonnages delivered to the plant at an applicable moisture and quality basis
•Saleable reserve tonnage represents the product tonnes of coal available for sale on an applicable moisture basis
•All changes more than 10% are explained
[1] Operation refers to operating mine or significant project. Mining method: OC – opencut, UG – underground
[2] Figures are reported at 100% irrespective of percentage attributable to Exxaro and refer to 2018 only
[3] Locality maps are for illustrative purposes only. Detailed maps are provided in the ancillary section
[4]The + symbol is used in instances where the scheduled LoMP extends beyond the expiry of the mining right. In each instance, Exxaro has a reasonable expectation that the mining right will be renewed
[5]Export refers to export thermal coal except at Grootegeluk mine where it refers to semi-soft coking coal, suitable for both the export and inland market
[6]The percentage difference between 2018 reported ROM and 2017 reported ROM and the percentage difference between 2018 reported total saleable tonnes and 2017 reported total saleable tonnes. Brackets signify a negative
[7]LoMP exceeds the mining right, expiring in 2025. The total decrease and movement within categories are the result of a change in the resource base (~6%) and reduction in pillar extraction recovery after reviewing the extraction process to enhance safety and ventilation and considering actual extraction figures in the reporting period
[8]Estimates are received from Anglo American Coal Proprietary Limited and not audited by Exxaro
[9]Exxaro divested from the operation
[10]The increase reflects incorporation of the 2017 geological model in the updated LoM and coal reserve classification for both Dorstfontein West and Dorstfontein East operations. This resulted in including a material amount of seams 2 and 4 lower in the underground reserve at the Dorstfontein operation

Table 6: Coal Reserve qualities 2018

		Thermal saleable (proved + probable)						Metallurgical saleable (proved + probable)						Coking saleable (proved + probable)					
Operation[1]	Seam/layer	Tonnes (Mt)[1]	CV MJ/ kg	% VM	% Ash	% S	Yield %	Tonnes (Mt)[1]	CV MJ/ kg	% VM	% Ash	% S	Yield %	Tonnes (Mt)[1]	CV MJ/ kg	% VM	% Ash	% S	Yield %
Matla mine	Seam 2	61.0	22.4	23.7	21.7	0.8	100												
	Seam 4	126.9	19.3	21.4	26.7	1.0	100												
Leeuwpan mine	TC[2]	16.0	22.9	19.4	25.3	0.9	57												
	BC[2]	25.0	23.7	22.7	22.6	1.0	80	0.4	28.0	8.2	15.0	0.9	58						
Mafube Mine	Middlings	13.9	22.0	21.7	25.0	0.6	22												
	Export	26.5	26.5	26.3	13.6	0.4	43												
NBC	All seams			Disinvested															
Belfast project	Thermal	8.1	21.9	22.4	26.6	1.8	53												
	Export	35.3	26.9	24.1	13.7	0.5	76												
Dorstfontein complex	All seams	54.0	24.6	21.9	19.1	0.6	57												
Forzando mines	All seams	29.2	24.4	23.7	17.6	0.9	54												
Grootegeluk mine	All seams	1 437	21.0	23.8	33.1	1.5	42	98	29.0	23.9	13.7	0.6	60	209	29.1	35.1	11.7	1.2	13
Thabametsi project[3]	T1	64.0	12.7	20.0	53.9	1.1	98												
	T2	63.0	11.3	19.0	55.7	1.0	98												

•VM – volatile matter, S – sulphur, CV – gross calorific value
•Rounding figures may cause computational discrepancies
•Saleable reserve tonnage represents the product tonnes of coal available for sale on an applicable moisture and air-dried quality basis
[1] Saleable product tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt
[2] TC: Top coal BC: bottom coal
[3] Based on Thabametsi bench configuration as defined in phase 1 feasibility study

GROUP SUMMARY OF RESOURCE AND RESERVE ESTIMATES (CONTINUED)

Mineral Sands

Mineral Sands Resources as on 31 December 2018

Table 7: Mineral Sands Resources reported for 2018

		2018 – tonnes and grade			2017 – tonnes and grade			
Operation[1]	Category	Tonnes (Mt)	% Ilmenite	% Zircon	Tonnes (Mt)	% Ilmenite	% Zircon	Change in tonnes %
Hillendale mine	Measured	12.2	2.9		12.2	2.9		0
KwaZulu-Natal	Indicated							
(OC) (in closure)	Inferred							
43.3% attributable to Exxaro[2]	**Total**	12.2			12.2	2.9		0
Fairbreeze mine[3]	Measured	287.5	3.5		149.7	4.1		92
KwaZulu-Natal	Indicated	9.1	2.1		55.7	2.6		(84)
(OC) (mining right)	Inferred	53.7	1.8		9.0	1.9		497
43.3% attributable to Exxaro[2]	**Total**	350.3	3.2		214.4	3.6		63
Block P	Measured							
KwaZulu-Natal	Indicated	40.6	3.1		40.6	3.1		0
(OC) (mining right)	Inferred							
43.3% attributable to Exxaro[2]	**Total**	40.6	3.1		40.6	3.1		0
Port Durnford project	Measured	143	3.0		143	3.0		0
KwaZulu-Natal	Indicated	340	2.8		340	2.8		0
(OC) (prospecting)	Inferred	466	2.5		466	2.5		0
43.3% attributable to Exxaro[2]	**Total**	949	2.7		949	2.7		0
Namakwa sands mine	Measured	630	2.7	0.6	648	2.7	0.6	(3)
Western Cape	Indicated	365	2.3	0.5	369	2.3	0.5	(1)
(OC) (mining right)	Inferred	580	1.5	0.3	581	1.5	0.3	0
43.3% attributable to Exxaro[2]	**Total**	1 575	2.2	0.5	1 598	2.2	0.5	(1)

Table 7: Mineral Sands Resources reported for 2018 (continued)

Operation[1]	Category	2018 – tonnes and grade Tonnes (Mt)	2018 – tonnes and grade % total heavy minerals (THM)	2017 – tonnes and grade Tonnes (Mt)	2017 – tonnes and grade % total heavy minerals (THM)	Change in tonnes %
Cooljarloo mine	Measured	272	1.8	296	1.8	(8)
Western Australia	Indicated	204	1.7	204	1.7	0
(OC)	Inferred					
23.35% attributable to Exxaro[2]	**Total**	477	1.8	501	1.8	(5)
Cooljarloo West project[4]	Measured					
Western Australia	Indicated	211	1.7	177	1.8	19
(OC) (mining right)	Inferred					
23.35% attributable to Exxaro[2]	**Total**	211	1.7	177	1.8	19
Cooljarloo North West project	Measured					
Western Australia	Indicated					
(OC) (prospecting)	Inferred	142	2.1	142	2.1	0
23.35% attributable to Exxaro[2]	**Total**	142	2.1	142	2.1	0
Jurien project	Measured	36	5.8	36	5.8	0
Western Australia	Indicated	6	3.3	6	3.3	0
(OC) (mining right)	Inferred	1		1		0
23.35% attributable to Exxaro[2]	**Total**	43	5.4	43	5.4	0
Dongara project	Measured	107	3.9	107	3.9	0
Western Australia	Indicated	31	3.5	18	4.5	73
(OC) (mining right)	Inferred	38	2.7	39	2.7	(4)
23.35% attributable to Exxaro[2]	**Total**	175	3.6	164	3.7	7

•Mineral Resources are quoted inclusive of Mineral Resources that have been modified to Mineral Reserves unless otherwise stated
•Estimates as received from Tronox at 31 December 2018 and not audited by Exxaro
•Rounding figures may cause computational discrepancies
•Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt
•All changes over 10% are explained
[1] Operation refers to operating mine or significant project. Mining method: OC – opencut, UG – underground
[2] Figures are reported at 100% irrespective of percentage attributable to Exxaro and refer to 2018 only
[3] The increase (~136Mt) is the result of new drilling information
[4] The increase is primarily the result of new drilling information

GROUP SUMMARY OF RESOURCE AND RESERVE ESTIMATES (CONTINUED)

Mineral Sands Mineral Reserves as on 31 December 2018

Table 8: Mineral Sands Reserves reported for 2018

			2018 – ROM and grade						2017 – ROM and grade		
			Total heavy mineral (THM) composition								
Operation[1]	Life of mine (years)[3]	Category	ROM (Mt)	% THM	% Ilmenite	% Rutile	% Zircon	% Leucoxene	ROM (Mt)	% THM	Change in ROM %
Fairbreeze mine[4]	**17+**	Proved	231	5.9	3.7	0.3	0.5	0.1	131	6.7	76
KwaZulu-Natal		Probable	11	3.7	1.9	0.1	0.3	0.1	45	4.6	(76)
(OC) (mining right)		**Total**	242	5.8	3.6	0.3	0.5	0.1	177	6.2	37
43.3% attributable to Exxaro[2]		Inferred resources inside LoMP									
Namakwa sands mine	**26+**	Proved	172	8.3	3.0	0.2	0.8	0.5	195	8.6	(12)
Western Cape		Probable	485	5.5	2.8	0.2	0.6	0.4	492	5.5	(1)
(OC) (mining right)		**Total**	657	6.2	2.8	0.2	0.7	0.4	687	6.4	(4)
43.3% attributable to Exxaro[2]		Inferred resources inside LoMP									
Cooljarloo mine	**13+**	Proved	270	1.8	61.0	5.4	10.2	2.3	294	1.8	(8)
Western Australia		Probable	20	2.1	61.8	5.2	9.4	2.6	20	2.1	0
(OC)		**Total**	289	1.9	61.1	5.4	10.2	2.3	314	1.9	(8)
23.35% attributable to Exxaro[2]		Inferred resources inside LoMP									
Cooljarloo West project[5]	**9**	Proved									
Western Australia		Probable	130	2.0	60.5	5.4	12.2	2.9	105	2.0	24
(OC) (mining right)		**Total**	130	2.0	60.5	5.4	12.2	2.9	105	2.0	24
23.35% attributable to Exxaro[2]		Inferred resources inside LoMP									
Dongara project	**12+**	Proved	62	5.2	48.7	6.1	10.9	2.8	62	5.2	0
Western Australia		Probable									
(OC) (mining right)		**Total**	62	5.2	48.7	6.1	10.9	2.8	62	5.2	0
23.35% attributable to Exxaro[2]		Inferred resources inside LoMP									

•% THM – percent total heavy minerals
•Rounding figures may cause computational discrepancies
•Figures are reported at 100% irrespective of percentage attributable to other shareholders
•Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt
•Reserves are quoted on a run-of-mine (ROM) reserve tonnage basis which represents tonnages delivered to the plant at applicable moisture and quality
•Inferred resources in life-of-mine plan (LoMP) refer to Inferred resources considered for LoMP
•Estimates as received from Tronox at 31 December 2018 and not audited by Exxaro
•All changes more than 10% are explained
[1] Operation refers to operating mine or significant project. Mining method: OC – opencut, UG – underground
[2] Figures are reported at 100% irrespective of percentage attributable to Exxaro and refer to 2018 only
[3] The + symbol is used where the scheduled LoMP extends beyond the expiry of the mining right
[4] The increase is primarily the result of a change in the resource base
[5] The increase is primarily the result of a change in the resource base as well as remodelling and optimisation of the Woolka Road, Harrier and Kestrel reserve areas

Base Metals

Base Metal Resources – exclusive – as at 31 March 2018

Table 9: Base Metal Resources (exclusive) reported for 2018

		2018 – tonnes and grade					2017 – tonnes and grade					
Operation[1]	Category	Tonnes (Mt)	% Zn	% Pb	% Cu	Ag g/t	Tonnes (Mt)	% Zn	% Pb	% Cu	Ag g/t	% change in tonnes
Deeps mine[3]	Measured	4.0	3.1	3.4	0.3	38.1	2.9	3.6	3.9	0.4	41.5	37
Northern Cape	Indicated	6.6	2.8	2.7	0.5	32.7	4.1	3.0	3.0	0.5	33.9	62
(UG) (zinc, lead, copper and silver)	Inferred											
26% attributable to Exxaro[2]	**Total**	10.6	2.9	3.0	0.4	34.7	7.0	3.3	3.4	0.5	37.0	52
Swartberg mine[4]	Measured											
Northern Cape	Indicated	35.7	0.8	3.7	0.3	57.0	45.4	0.5	3.2	0.5	30.7	(21)
(UG) (zinc, lead, copper and silver)	Inferred	26.5	2.2	3.0	0.2	50.2	4.7	0.8	2.8	0.2	52.2	459
26% attributable to Exxaro[2]	**Total**	62.2	1.4	3.4	0.3	54.1	50.1	0.6	3.2	0.5	32.8	24
Gamsberg North mine	Measured	43.3	6.6	0.6			43.3	6.6	0.6			0
Northern Cape	Indicated	54.6	5.9	0.5			54.6	5.9	0.5			0
(OC) (zinc)	Inferred	32.1	5.8	0.5			32.1	5.8	0.5			0
26% attributable to Exxaro[2]	**Total**	130.0	6.1	0.5			130.0	5.8	0.5			0
Gamsberg East	Measured											
Northern Cape	Indicated											
(project) (zinc)	Inferred	32.3	9.8	0.6			32.3	9.8	0.6			0
26% attributable to Exxaro[2]	**Total**	32.3	9.8	0.6			32.3	9.8	0.6			0

•% Zn – percent zinc, % Cu – percent copper, % Pb – percent lead, Ag g/t – grams per tonne silver, % Mn – percent manganese, % S – percent sulphur
•Rounding figures may cause computational discrepancies
•Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt
•Estimates as received from Vedanta Resources plc at 31 December 2018 and not audited by Exxaro
•All changes more than 10% are explained
•Tonnages are reported on a dry basis
[1] Operation refers to Black Mountain Mining operating mine or significant project. Mining method: OC – opencut, UG – underground
[2] Figures are reported at 100% irrespective of percentage attributable to Exxaro
[3] The increase is mainly the result of updating the geological model with new mapping and drilling information as well as the use of higher input metal prices which allowed for a greater increase in economical tonnes
[4] The increase is mainly the result of updating the geological model with new drillhole information and model refinement

GROUP SUMMARY OF RESOURCE AND RESERVE ESTIMATES (CONTINUED)

Base Metal Reserves – exclusive – as at 31 March 2018

Table 10: Base Metal Reserves (exclusive) reported for 2018

			2018 – ROM, grade and contained metals					2017 – ROM, grade and contained metals					
Operation[1]	Life of mine (years)	Category	ROM (Mt)[3]	% Zn	% Pb	% Cu	Ag g/t	ROM (Mt)[3]	% Zn	% Pb	% Cu	Ag g/t	% change in ROM
BMM Deeps mine	**6**	Proved	1.3	3.0	4.0	0.3	43.3	1.7	2.9	3.5	0.4	42.8	(27)
Northern Cape		Probable	4.3	3.0	1.7	0.7	23.8	4.3	2.8	2.1	0.7	25.9	0
(UG) (zinc, lead, copper and silver)		**Total**	5.6	3.0	2.2	0.6	28.2	6.1	2.9	2.5	0.6	30.8	(8)
26% attributable to Exxaro[2] (LoMP)	Inferred resources inside life-of-mine plan												
BMM Swartberg mine[3]	**6**	Proved											
Northern Cape		Probable	2.3	0.6	3.3	0.5	30.8	2.1	0.6	3.7	0.5	31.6	13
(UG) (zinc, lead, copper and silver)		**Total**	2.3	0.6	3.3	0.5	30.8	2.1	0.6	3.7	0.5	31.6	13
26% attributable to Exxaro[2]	Inferred resources inside LoMP												
Gamsberg North mine	**13**	Proved	44.5	6.8	0.5			44.5	6.8	0.5			0
Northern Cape		Probable	8.7	6.0	0.5			8.7	6.0	0.5			0
(OC) (zinc)		**Total**	53.2	6.6	0.5			53.2	6.6	0.5			0
26% attributable to Exxaro[2]	Inferred resources inside LoMP							0.4					

•% Zn – percent zinc, % Cu – percent copper, % Pb – percent lead, Ag g/t – grams per tonne silver, % Mn – percent manganese, % S – percent sulphur
•Rounding figures may cause computational discrepancies
•Figures are reported at 100% irrespective of percentage attributable to Exxaro and refer to March 2018 only
•Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt
•Reserves are quoted on a run-of-mine (ROM) reserve tonnage basis which represents tonnages delivered to the plant at applicable moisture and quality
•Inferred resources in life-of-mine plan (LoMP) refer to inferred resources considered for LoMP
•Estimates as received from Vedanta Resources plc at 31 December 2018 and not audited by Exxaro
•All changes more than 10% are explained
[1] Operation refers to Black Mountain Mining operating mine or significant project. Mining method: OC – opencut, UG – underground
[2] Figures are reported at 100% irrespective of percentage attributable to Exxaro
[3] The increase is primarily due to design changes of longhole stopping as well as implementation of additional stopes and declines

ESTIMATION METHODOLOGY SUMMARY

Coal Resources

The estimation process is summarised below and applies to all coal operations and projects under Exxaro's management control. The resource competent person (CP) is actively involved throughout the process and no data is included/ excluded without their consent.

The resource estimation process for Coal Resources under Exxaro's control is governed by the group's resource estimation procedure and aligned to the SAMREC Code 2016 and SANS 10320:2004 standard. The data used for resource estimation is managed by separate commodity-specific procedures through which core recovery and logging, sampling, quality assurance and control, relative density determination and wireline logging standards are enforced. These standards were updated in 2017 to comply with SAMREC 2016 and SANS 10320:2004 but aspects aligning with the SANS 10320:2017 draft standard are considered where applicable.

The core recovery standard (>95% in coal seams for valid points of observation) as stipulated in SAMREC 2016 and SANS 10320 standard is not always empirically enforced due to unavailability of digital core recovery data for pre-2017 boreholes. However, Exxaro competent persons confirm that there is high confidence in core and sample recovery for all boreholes used for resource estimation purposes and any deviation is managed by increased geological losses within geological loss domains, downgrading resource classification, and/or redrilling boreholes. Core recovery is continuously reviewed, and any shortcomings are actively addressed through downhole geophysical surveys, seam validations and redrilling.

For Coal Resources, relative density (air-dried) is determined by accredited laboratories using the Archimedes method in all instances, except for Grootegeluk mine and the Thabametsi project, where relative density is determined using an on-site mine laboratory application of the Archimedes method and results are continuously used to validate core recovery. A comparative study between the field and laboratory methods was undertaken in 2015, and results Indicated no significant difference.

A formal, annually compiled, integrated and signed-off exploration strategy outlines planned activities to investigate areas of low confidence and/or geological or structural complexities to ensure resources with a high level of geological confidence are considered for mine planning.

Exploration plans are available as supplementary information to the competent person's report (CPR).

The resource estimation process is summarised below and applies to all coal operations and projects under Exxaro's management control. The resource competent person (CP) is actively involved throughout the process and no data is included/excluded without their consent.

ESTIMATION METHODOLOGY SUMMARY (CONTINUED)

Table 11: Summary of estimation considerations

Item	Description
Resource fact pack	Lists new information since last estimation, together with a reconciliation between predicted MTIS and actual MTIS. Recommendations from internal/external audits are included.
Technical data validation	Technical validation of data to be used for resource estimation, including collar validation, gaps and overlaps checks, data distribution, etc.
Data analysis	Entails a review and analysis of the geological integrity and continuity of data in a spatial and geostatistical sense. Includes domaining and structural interpretations.
Data modelling	Geovia Minex is used for coal modelling and the Minex growth algorithm is the preferred interpolation technique. ESRI ArcGIS is used for modelling structural features. Sable Data Warehouse (SDWh) or Minex is used for coal compositing and, in both instances, representative substitute values are used for unsampled non-coal material. The geological model and structural interpretation are presented by the resource CP, aided by relevant technical specialists, to a panel comprising Exxaro lead CP and domain experts for sign-off and approval. Concept-level geological models, where applicable, are compiled for alternative interpretations and these risks are evaluated during sign-off. Feasibility-level and/or LoMP-level geological models are based on reviewed and signed-off interpretations.
Resource classification	Resource classification follows the Exxaro estimation procedure and is aligned with SANS 10320:2004 and the consideration of RODA. Anomalous borehole data and structurally complex areas are accounted for and resource classification is used to control the adequacy of borehole data. Separate confidence zones are determined for structural features based on a matrix approach. The effect of extrapolation is controlled by resource classification in which classification domains are not extrapolated beyond half the average borehole spacing for the classification category. Only points of observation with applicable quality data are used for classification.
Estimation and reporting	Resource reporting uses approved cut-offs and geological loss domains, followed by completing all necessary reports and audit trails. Exxaro currently uses a systematic and integrated review process that measures the level of maturity of exploration work done, the extent of geological potential, licence-to-operate and associated geological risks to establish an eventual extraction (EE). The criteria for assessing reasonable prospects for eventual economic extraction (RPEEE) are shown in table 12. Reporting includes technical information that requires subsequent calculations to derive subtotals, totals and weighted averages. Such calculations may involve a degree of rounding and consequently introduce an error. Where such errors occur, Exxaro does not consider them material.
Review and consolidation	Individual reports are reviewed, and corrections effected if necessary. Reports are endorsed by management and used to compile the consolidated Coal Resources and Coal Reserves report.

Table 12: Exxaro considerations for reasonable prospects for eventual economic extraction (RPEEE)

Item	Criteria	Considerations
Geological data	Data has been validated and signed off by competent person	Seam depth and extent, seam thickness, structure and seam quality (cut-off)
Geological model	Geological model has been considered and signed off	
Structural model	Structure model was considered and signed off	
Mining	Mining assumptions considered and defined	Mining method, inputs from metallurgist, rock engineer and hydrogeologist
Assurance	Minimum tier 1 assurance as per Exxaro governance and assurance framework	As per tier 1 requirement
Economic evaluation	A concept-level exploitation and economic evaluation that quantifies economic potential based on economic and mining assumptions, including geotechnical and geohydrological assumptions	Preliminary appraisal of layout, cost and profit
Environmental	An assessment of potential impediments is done and, if any exist, there should be a reasonable expectation that these will be resolved. Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national legislation	
Tenure	Formal tenure must be demonstrated. If any potential impediments exist, there must be a reasonable expectation that these will be resolved. If a prospecting right, there should be reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national legislation	
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence. Any potential impediments should have a reasonable expectation that they will be resolved. Power, water and transport considered	
Market	A potential market for the product that is planned to be extracted from the resource with a reasonable assumption that this market is sustainable	

"Reasonable prospects for eventual economic extraction should be demonstrated through the application of an appropriate level of consideration of the potential viability of Coal Resources. Such a consideration should include a reasoned assessment of the geological, mining engineering, processing, metallurgical, legal, infrastructural, environmental, marketing, socio-political and economic assumptions which, in the opinion of the competent person, are likely to influence the prospect of economic extraction. All of the issues listed in table 1, under reasonable prospects for eventual economic extraction, should be discussed to the level appropriate for the specific investigation." SAMREC, 2016 edition

We have enhanced our current process to consider all aspects as per SAMREC 2016 (table 1, 4.3) to establish reasonable prospects for our operations and projects. Each operation/project's RPEEE is presented in the ancillary section. We continuously examine our criteria to review the probability of extraction and to identify any areas where potential risk may exist.

ESTIMATION METHODOLOGY SUMMARY (CONTINUED)

Coal reserves

Coal reserves are estimated using the relevant modifying factors at the time of reporting (mining, metallurgical, economic, marketing, legal environmental, social and regulatory requirements). Modifying factors are signed off before and after reserve estimation by the persons responsible for ensuring that all factors are timeously and appropriately considered. Comprehensive modifying factor sign-off and reserve fact packs that record losses, recoveries/yields and other factors applied are documented in each independent CP's report.

Exxaro is keenly aware of the importance of its mineral assets, both for the short-term profitability of its operations and the sustainability of the company. The optimisation of mineral assets beyond what is generally referred to as Mineral Resource management is being driven as a priority. Changes in the resources market, increased awareness of protecting the natural environment and changing legislation and statutory requirements demand a change in the utilisation strategy and execution of mining operations. Exxaro continuously assesses the various life-of-mine strategic plans to consider the best way of addressing these challenges.

For Coal Reserve estimates to comply with life-of-mine policy, the following supporting inputs are required for all reserve estimates: survey, rock engineering, infrastructure, legal, processing, social, political and environmental as well as a reserve estimation scoping report.

The following outputs are generated after successfully completing the procedure: validation and verification report, mining block model, exploitation strategy report, mining schedule and equipment strategy report, and reserve estimation report.

At the start of the estimation process, the applicable reserve CP must compile, for every operation, a reserve fact pack report outlining the standards and norms of that operation as well as all relevant planning standards. Also considered are all standards and norms and planning parameters, the geological model, infrastructure and environmental plans together with the structural plan, geotechnical review report, and others. The market strategy, supply contracts and planned volumes drive the schedule. All operations standards must be signed off by the applicable mine management and reserve CP. A similar procedure is followed for projects, with the project steering committee fulfilling the role of mine management.

Reserve estimation may be conducted either as required, eg for a project-stage evaluation, or as part of the annual Mineral Resource and Mineral Reserve estimation process. The data conversion, validation and verification report are the first outputs of this procedure.

On receipt of the geological model, the validation procedure is run, and the model is converted into a mining model, after which a report is compiled with possible geological model anomalies, and a comparison of volumes in the geological model and mining model to confirm data conversion has been carried out correctly. This information is signed off as acceptable by the resource CP and manager: strategic mine planning and design.

The following components are included in the LoMP and reserve estimation: exploitation strategy, operational methodology and pit shell.

The exploitation strategy needs to broadly demonstrate the pit/mining economics, in terms of resource boundaries, legal and other, ie servitudes. For example, when converting the resource to reserve, explain the economics, in terms of stripping ratio, underground versus open-pit, etc. Lastly, the extraction sequence of mining different areas in terms of access, economics or other criteria deemed most appropriate.

Operational methodology considers:

- *Material flow explains the flow of material over time, ie open-pit – ex-pit; distances horizontal and vertical; underground – geographical expansion versus stooping; and deep pit – push-back strategy, minimum and maximum stripping curves*
- *Equipment explains the size and type of equipment for the design, including life of equipment, major interventions and/or major changes (ie open-pit to underground) over the life of the resource*
- *Waste dumps (size and position), rehabilitation (main issues and interventions) together with legal and other – indicates licences obtained and required*
- *Pit shell is the final delineation or envelope of the resource that will be converted to a reserve. The LoMP pit shell is the foundation of the business case and, as such, is based on the most accurate information available*
- *Measured and Indicated Resources are used as basis for conversion. The first five years of the LoMP must be covered by at least 80% Measured Resources.*

Resource volumes/tonnages are converted to reserve tonnages by applying the following mining modifying factors:

- Mining efficiency losses – *as per average cut thickness. This factor is applied to account for net losses of reserves due to mining equipment selection and mining method. The efficiency factor also accounts for the thickness of the selected ROM and waste horizons relative to selected mining equipment*
- *Layout losses account for the loss of reserves due to actual mining activities not reaching the defined reserve boundary or due to the geometry of the reserve block*
- *ROM extraction accounts for losses incurred using the selected mining method*
- *Contamination accounts for waste or inter-burden material unintentionally added to the mining horizon as a result of mining operations and equipment used*
- *Free moisture accounts for the change in the reserve tonnage due to the addition of moisture from bench-mining operations.*

The reserve classification methodology for Coal Reserves under Exxaro's control is governed by the Exxaro Coal Reserve estimation procedure, as described in the LoMP policy, and aligned to the SAMREC 2016 and SANS 10320:2004 standard. In general, Measured Resources are converted to Proved Reserves and Indicated Resources are converted to Probable Reserves. If an operation or project has additional constraints, ie a supply agreement that has not been finalised or a sales/ marketing strategy that limits the profitability of the mine, the Measured Resources can be downgraded to Probable Reserves. In situations where this has been applied, it is clearly stated in the footnotes for the reserve's tables.

Where Inferred Resources were considered for life-of-mine plans, the amount (Mt) and effect is always clearly stated. When Inferred Resources are included in the LoMP, these tonnages are never scheduled in the first five years of mine life. The rationale for considering Inferred Resources inclusion is explained and actions to address this issue are stated and Exxaro generally attempts to limit Inferred Resources to less than 15% of total resources to be considered for LoMPs. Any inclusion of Inferred Resources must be tested, reported and modifying factors and assumptions that were applied to the Indicated and Measured Resources to determine the Coal Reserves must be equally applied to the Inferred Resources. However, Inferred Resources are not converted to Coal Reserves and are not stated as part of the Mineral Reserve. The amount of Inferred Resources considered for the reported LoMP is included in the reserve statement.

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION

Supplementary descriptions are provided for projects and operations directly under Exxaro's management control. For projects and operations included in the Exxaro Mineral Resource and Mineral Reserve statement but in which Exxaro does not have management control, the reader is referred to that company's website for supplementary information (refer to foreword).

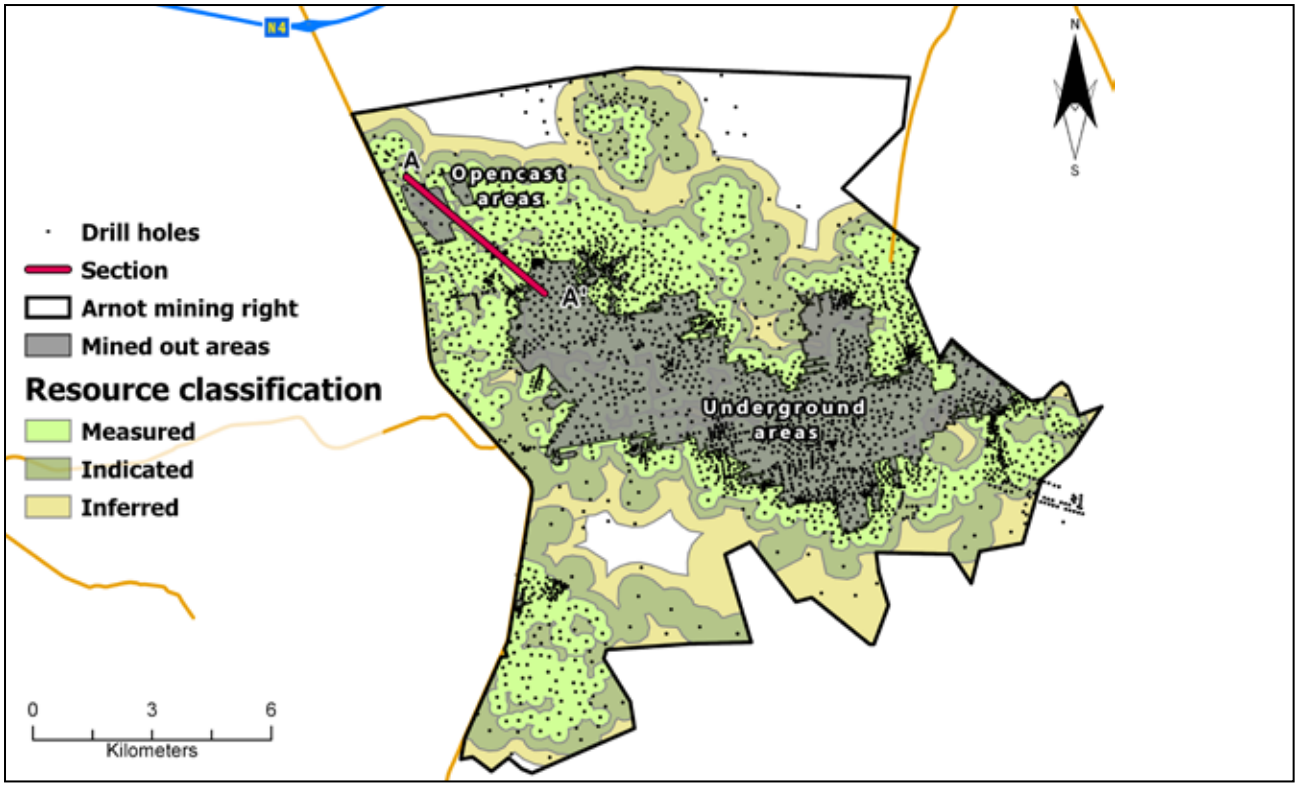
ARNOT MINE

Operation overview

Arnot mine is situated roughly midway between the towns of Middelburg and Carolina in Mpumalanga province, South Africa. Arnot was acquired from Eyesizwe Coal with the creation of Exxaro Resources in 2006. The mine is 43km by road from Middelburg, 65km by road from Carolina and 25km from Hendrina, and is surrounded by a number of projects and active operations. Tenure from Umsimbithi Mining and the Wonderfontein coal operation as well as Mafube coal mine, a joint venture between Anglo American and Exxaro, is situated towards the north of Arnot. Universal Coal's large Arnot South project is to the south of Arnot and the in-closure Exxaro operation of Strathrae is adjacent to the east.

Arnot was contracted to supply coal to the nearby Eskom Arnot power station until 31 December 2015. This was achieved by extracting no 2 seam lower (S2L) from two underground shafts, 8 and 10, using mechanised mining equipment (bord-and-pillar extraction) while Mooifontein opencast used conventional truck-and-shovel, roll-over mining method to extract S2L and no 1 seam (S1). One beneficiation plant handles around 14% of the run-of-mine and the mine is served by several good access roads, both gravel and paved. The mineral area is 15 021.21 hectares and annual production in 2014 and 2015 was 1.44Mt and 1.40Mt respectively. Arnot has a mining right (MP30/5/1/1/2/1/325MR) that is executed and lapses on 6 December 2039. The operation is in closure after the coal-supply agreement lapsed.

Figure 10: Arnot mine



ARNOT MINE (CONTINUED)

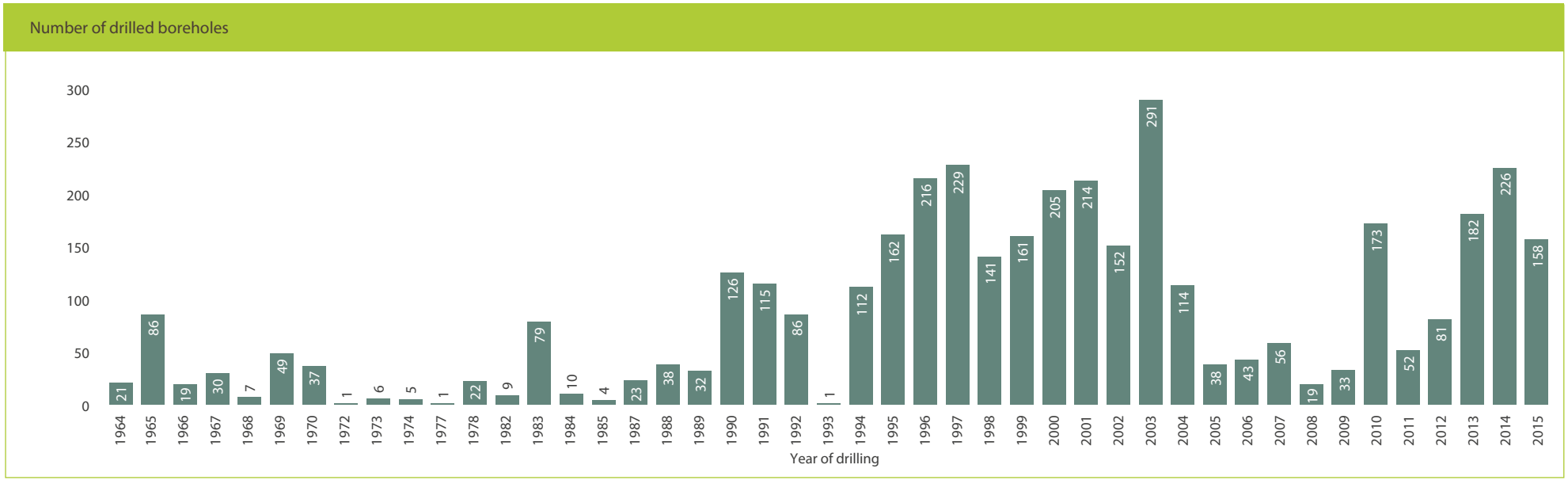
Operation history

Arnot mine produced thermal coal for over 40 years, using various mining methods, predominantly bord-and-pillar (currently mechanical), open-casting and short-walling between 1995 and 2005. Arnot had a 40-year coal-supply agreement (CSA) with Eskom, supplying the adjacent Arnot power station, which ended on 31 December 2015. A prefeasibility study on the commercial viability of Arnot in 2016 found several areas that can be profitably mined for the thermal coal market. However, due to the absence of a confirmed CSA, no reserves have been declared.

Arnot's Coal Resource has been extensively drilled using a combination of open hole, wireline logged and cored methods as well as various other prospecting techniques. Diamond coring was predominantly done using a smaller diameter drill bit (TNW), but large (HQ3) diameter size was also employed specifically for specialised coal quality, geotechnical, geohydrological and gas-sampling investigative work. Open-hole (percussion) wire-line logged drilling was used for in-fill grade-control purposes to investigate the outline of geological structures and test coal-seam structure continuity within areas already classified as Measured Resources.

Drilling was first recorded in 1964, and at least 6 072 vertical exploration drillholes have been drilled to date. A significant amount of historical drillholes have no known drilling information as no hardcopy or database information could be traced and were therefore excluded from any estimation processes.

Figure 11: Arnot drilling history



ARNOT MINE (CONTINUED)

Operation geology

The Arnot operation lies close to the eastern edge of the Witbank coalfield, close to the margin of the Main Karoo Basin in which the stratigraphic column is reduced to 80m but still contains coal seams correlating to the five classical (#1-5) Witbank coalfield seams. The pre-Karoo basement topography consists of both felsites and diabase intrusives associated with the Transvaal Supergroup and Bushveld Igneous Complex respectively. The Vryheid Formation is conformably deposited on top of the reworked glacio-fluvial tillite of the Dwyka Group.

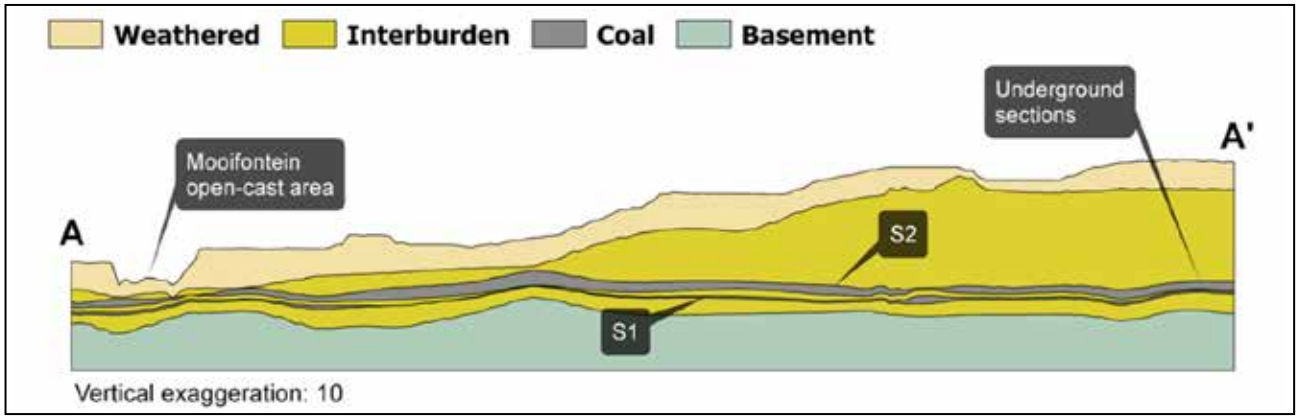
Seam 1 and S2L are the only coal seams of economic interest in the Arnot mining right area, and these correlate with the typical Witbank coalfield seams. The no 1 seam is well-developed across the entire underground and opencast resource areas. It is intersected at an average depth of over 50m in the underground areas, and the depth and undulation render it unfeasible for exploitation. It does, however, occur at shallower depths of at least 23m in opencast areas and remains a good prospect in these areas.

The no 2 Seam is the main, well-developed coal seam of economic importance at Arnot. The depth to the top of no 2 seam depends largely on local surface topography and reaches a maximum depth of 80m along the eastern boundary of the mine lease area, and pinches and thins out in the eastern parts of the mining section due to local, pre-Karoo basement palaeo highs. This seam is generally intersected at an average depth of 44m in underground resource areas; and at average depths of 20m in opencast resource areas. It is continuous across the Arnot mine lease area and varies from <1m to 4.5m in thickness, with an average of 3.1m. The no 2 seam is site-specifically subdivided into the seam 2 lower (S2L); seam 2 upper (S2U) and seam 2A (S2A) marked by two in-seam partings, namely P2 and P3 respectively. The S2L is the only coal seam being mined in the underground resource areas and consists of dull to lustrous coal with several bright coal bands and occasional stone partings. It has an average of 23.28MJ/kg (adb) calorific value in the underground resource area and a 24.22MJ/kg (adb) in the opencast area and constitutes about two-thirds of the mineable in-situ Coal Resource in the Arnot mining area.

The no 4 seam occurs erratically across the mining area with an average thickness of 0.5m. The seam is often spilt by internal clastic partings into S4L and S4U. The seam is overlain by interlaminated units of siltstone and shale with the no 5 seam sporadically developed in small areas.

A number of faults trending roughly north-east south-west with displacement of 1 to 3m are present in the Arnot mining right. However, one large pertinent trust fault (L9) separates the southern coal resource area from the main resource and accessibility through this fault is problematic and will require specialist mining intervention. A limited number of dolerite dykes are known to have intruded the Karoo sediments in the area. Dykes in general lack magnetic signature and are not responsive to geophysical method of detection. The presence of dolerite dykes and sills has a devolatising effect on the S2L coal seam. The intersected dykes are generally thin (0.3 to 1.5m), discontinuous and sub-parallel to a sill in an east-west direction. This sill is well-developed (about 5 to 40m thick) and overlies the S2L coal seam along the south-eastern resource boundary.

Figure 12: Typical north-south (A-A') section through Arnot geological model



ARNOT MINE (CONTINUED)

Operation resource evaluation

The reported estimation is based on the 2015 geological model, which was the last updated model when operations stopped. Some 2 458 boreholes with applicable analysis were used for resource estimation, using the Minex growth algorithm. Coal-quality compositing was conducted in Minex on a weighted average basis and signed-off substitute values were used for unsampled in-seam material. The average estimated raw relative density was used for tonnage estimation. In general, a 10% geological loss was applied but the loss factor may vary depending on the consideration of structural complexity, intrusions and level of weathering (application of RODA).

All data collection (geological logging, description, interpretation, sampling, validation and capturing of drillhole cores information) is undertaken by qualified, trained and competent geologists on-site and aligned with Exxaro standards. A well-trained grade-control and geological mapping team undertake mapping and reconciliation. Mapping captures intrusions, devolatilised coal, channel sandstones/ in-seam partings, slumping structures, faults, joints, guttering, slabbing and floor rolls as well as measurements of mined heights, contamination and dilution. Dips and dip directions of all geological features and structures are Measured, recorded and digitalised into Bentley MicroStation v8i. Surface mapping was only conducted where outcrops were observed.

Core loss for coal-seam intersections is recorded and a recovery of <95% through coal (by volume) is deemed unsatisfactory. Anomalies were investigated and redrilled if required. Wire-line logging results are only available for more recent boreholes. Underground drillholes at Arnot are bull-nose drillholes; a diamond drill-bit is used to produce chips instead of core and changes in lithology are easily detected by changes in penetration rates. In addition, 1.5m core samples are taken every 20m to confirm the lithology in this regard.

Logging is conducted by recording lithology down to centimetre according to the classification of the various coal 'lithofacies'/coal type zones or ply (shale-coaly; coal-shaly; coal dull; coal mixed, mainly dull; coal mixed; coal mixed, mainly bright; coal bright) – based on the discernible visible lithofacies change and identified marker horizons – particularly through coal zones. All holes were captured in Micromine Geobank© SQL geological database information system, but migrated in 2017 to acQuire Technology Solutions Proprietary Limited.

All core sampling is done at the drill sites. The samples are selected according to their respective coal seam boundaries after a thorough correlation. In-seam partings made seam and sample correlation challenging and the geologist must apply discretion to ensure best correlation and sampling fit. A general rule of >0.5m seam sample thickness cut-off is applied but evaluated in-field where necessary. In addition, the proposed mining method, mining equipment and sample mass (chemical and physical analysis required) are also considered. In-seam partings are sampled together with the coal zone samples, especially the PL parting (after considering thickness) in the no 2 seam lower zone.

Two distinct horizons are sampled in the no 2 seam lower, and these are often distinguished by the variable and discernible vitrinite content and/or the PL parting. Each sample is assigned a unique sample number, bagged and tagged separately for each seam interval to minimise contamination or errors. The samples are dispatched to the coal assay laboratory within three days to minimise moisture loss and variation and another possible coal-property deterioration.

All bore samples (up to 2015) are sent to Siza Coal Services Laboratory (SCS), a Middelburg-based SANAS-accredited testing laboratory with a full ISO/IEC 17025:2005 certification (last samples submitted in 2014). Arnot and the applicable laboratory reviewed the Yanka round-robin system (to ensure that the laboratory's proficiency testing schemes are still in line with other independent laboratories on reproducibility and repeatability of results.

Drill core samples are dried in an oven before being crushed and screened at -13mm, +0.5/-0.5mm size fractions for physical analysis, and down to -212↔m for chemical analysis. The collected sample is divided into two: one half is for physical analysis (eg ad hoc abrasive index testing) and the other half is for chemical analysis (ie proximate analysis and calorific value). Float and sink analyses (washabilities) of the screened -13mm and +0.5mm particle size distributions are then performed at five relative densities (RDs), namely 1.40, 1.50, 1.60, 1.70 and 1.80 g/cm^3. Full proximate, calorific value and total sulphur analyses are performed at each RD fraction. Reference samples are stored for at least three months before they are disposed of.

Table 13: Arnot Coal Resource reporting criteria

Thickness cut-off (reporting and extraction height considerations)	Quality cut-offs (adb)	Geological loss
OC <1.0m	Ash >35%	Applied per domains ~10% (RODA)
UG <1.8m	Ash >35%	

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

ARNOT MINE (CONTINUED)

Table 14: Arnot Coal Resource estimation criteria

	Item	Description
Database	**Drillhole database**	acQuire
	Data datum	Cape LO29
	No drillholes used for resource estimation	2 458
	Validation	Range of standard queries to test seam structure and quality
	Data compositing and weighting	Minex
Model	**Previous model date**	2014
	Last model update	2015 (ARN 2015)
	Geological modelling software	Geovia Minex
	Last peer review	2015
	Estimation technique	Growth algorithm
	Grid mesh size	25m x 25m
	Scan distance	2 000m
	Data boundary	200m
	Model build limits	Upper: limit of weathering and topography/collar Lower: basement/Dwyka
	Model outputs	Roof, floor and thickness grids generated for structure. Raw quality grids
	Changes to modelling process	None

Table 15: Arnot Coal Resource classification criteria

Category	Type of boreholes	Borehole spacing	Structurally complex areas
Measured	Cored boreholes with applicable coal qualities	0 – 350m	May vary, after consideration of RODA
Indicated	Cored boreholes with applicable coal qualities	350 – 500m	May vary, after consideration of RODA
Inferred	Cored boreholes with applicable coal qualities	500 – 1 000m	May vary, after consideration of RODA

Table 16: Arnot Resource and Reserve statement

Category	2018 (Mt) (OC)	2018 (Mt) (UG)	2017 (Mt) (OC)	2017 (Mt) (UG)	Difference (%)
Measured	20.2	118.3	20.2	118.3	0
Indicated	18.9	45.4	18.9	45.4	0
Inferred	8.8	12.5	8.8	12.5	0
Total resources	47.9	176.2	47.9	176.2	0

Rounding figures may cause computational discrepancies
All changes more than 10% are explained
Mining method: OC – opencast, UG – underground
Figures are reported at 100% irrespective of percentage attributable to Exxaro
The tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt. Coal resources are quoted as minable tonnes in-situ and refer to remaining resources after 31 December 2018 and 31 December 2017
Coal Resources are reported on a minable in-situ (MTIS) basis
Coal Resources are quoted inclusive of Coal Reserves

ARNOT MINE (CONTINUED)

Table 17: Arnot RPEEE considerations

Item	Criteria	Considered	Arnot-specific comment
Geological data	Data has been validated and signed off by competent person	Yes	2015 version
Geological model	Geological model was considered and signed off	Yes	Geological structure and depositional extent, seam thickness >1.80m (UG) and >1.0m (OC), <50% ash content. Coal qualities reported on an air-dry basis
Structural model	Structure model was considered and signed off	Yes	2015 version
Mining	Mining assumptions considered and defined	Yes	Underground and opencast
Assurance	Minimum tier 1 assurance (Exxaro governance)	Yes	2015
Economic evaluation	A concept-level exploitation with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	Prefeasibility study done for mineral rights area
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Done	A dispute on the Exxaro/Eskom coal-supply agreement for the shortfall on the rehabilitation financial provision was in arbitration but declared in favour of Exxaro. Approval of the consolidated environmental management plan (EMP) is pending. Land acquisition and environmental approval in the potential opencast and underground resource areas have a reasonable expectation to be concluded if a favourable market agreement is in place
Tenure	Formal tenure must be demonstrated. Reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national governmental legislation	Yes	Compliant mining right. Mine is in closure
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence	Done	Current infrastructure
Market	A potential market for the product with a reasonable assumption that this market is sustainable	Done	Good quality Coal Resource. We believe a reasonable understanding between a mining operator and Eskom will unlock any potential challenges and will lead to coal extraction

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

ARNOT MINE (CONTINUED)

Known risks

No reserves are declared because of the absence of a CSA. Known occurrence of dykes, geological faults, weathering and seam thickness and quality variability are known. The occurrence and thickness of in-seam partings are highly variable and create significant challenges in underground mining sections. Continuous and focused infill open-hole wire-logged drilling in panels is employed to address these risks.

The mining right has been executed but registration is pending, and the mine is in closure.

BELFAST MINE

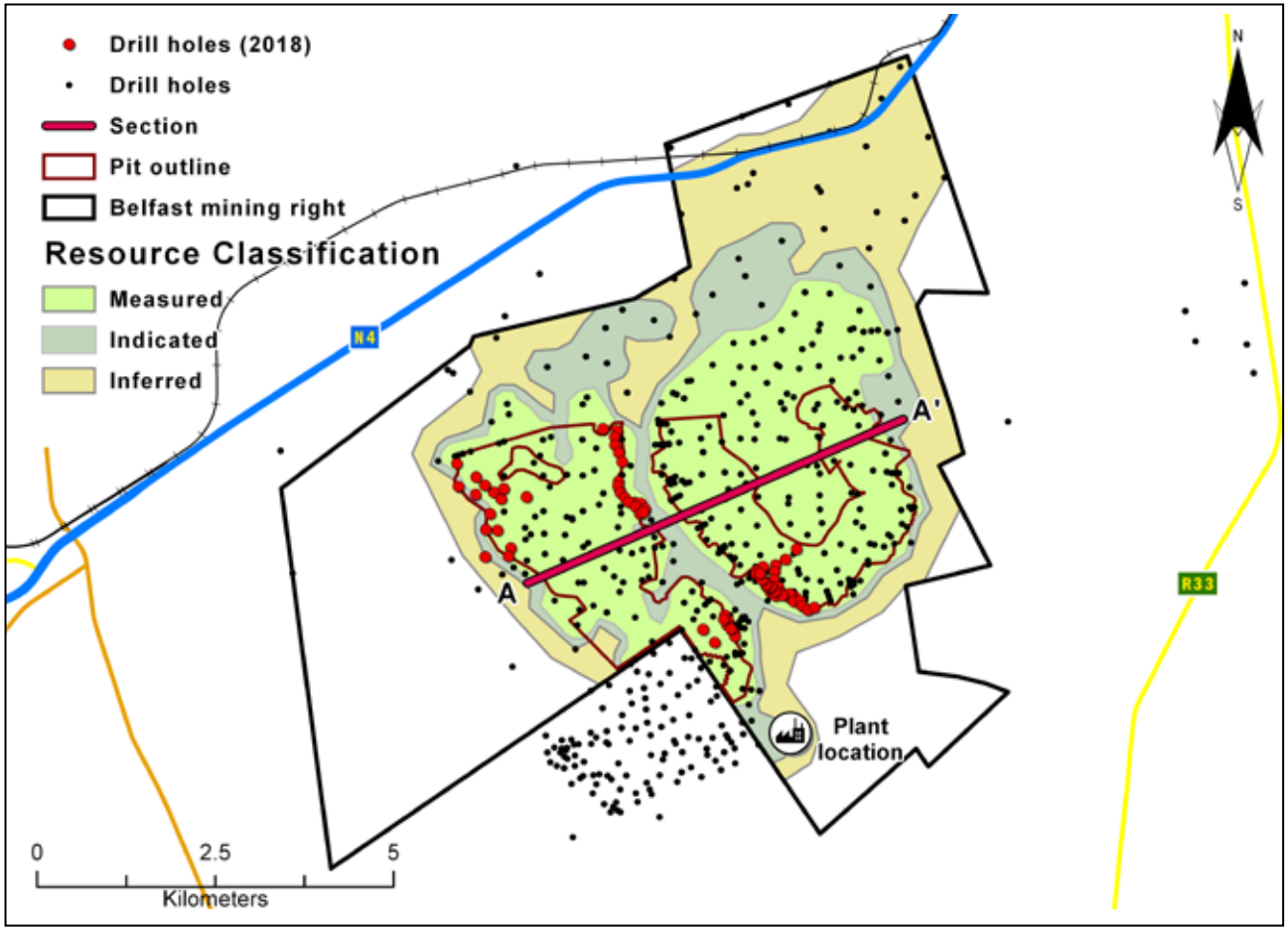
Operation overview

The Belfast mine is located some 10km south-west of the town of Belfast in Mpumalanga, South Africa, on the far eastern edge of the Witbank coalfield. The coalfield extends about 190km east-west between the towns of Springs and Belfast, and about 60km in a north-south direction between the towns of Middelburg and Ermelo. The mineral tenure areas of Umsimbithi Mining and Universal Coal (Paardeplaats) are to the north of Belfast, with the Umsimbithi Mining, Wonderfontein coal mine to the far west.

The Belfast mine is adjacent to the N4 highway connecting Pretoria and Maputo and can be accessed from the N4 via two district roads, namely D1110 and D1770. The mine is also adjacent to the railway line to Maputo. There are nearby loading facilities that link to the railway line to Richards Bay. Once fully developed, the mine will have seven opencast pits. There are prospects for additional opencast pits and an underground mining section.

Thermal coal will be beneficiated in a two-stage dense medium separation plant (currently under construction that will handle ROM at 500t/hr) to produce a primary product of 6 000kcal/kg net as received (NAR) and a secondary product of 21.6Mj/kg. Both products are suitable for the export market, but the secondary product can also be sold in the domestic market. Mobile crush-and-screen plants may be brought on site as needed. There are existing Eskom power lines on the property for electricity supply. The mining right has been approved and all environmental appeals have been favourably addressed. Mining operations will start in Q1, 2019.

Figure 13: Belfast mine



BELFAST MINE (CONTINUED)

Operation history

Belfast Coal has an approved mining right that covers 7 198 hectares. The geological model incorporates 387 drillholes.

Table 18: Belfast operation history

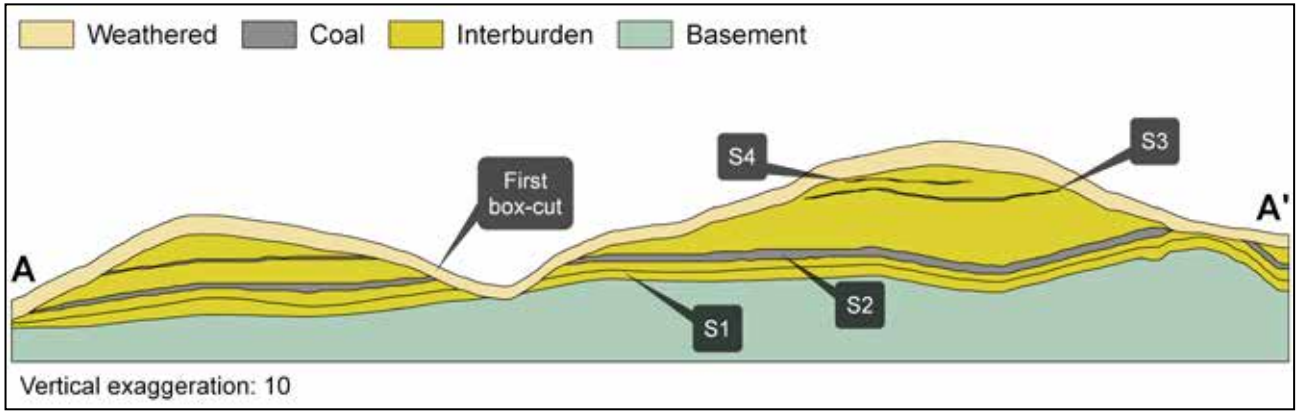
Date range	Company	Material notes
1967	Fuel Research Institute of South Africa (FRI)	25 drillholes
1969	Trans-Natal Steenkoolkorporasie Beperk (TNS)	10 drillholes
1975 – 1983	Gold Fields Mining and Development (GFM&D)	43 drillholes
2001 – 2003	Eyesizwe	155 drillholes
2008 – 2009	Exxaro	153 drillholes, to refine classification and potential box-cut positions

Operation geology

The Witbank coalfield, which has up to five coal seams contained in the middle Ecca group sediments of the Karoo supergroup. The Karoo sequence in the area is represented by the Dwyka formation and the middle Ecca, with little or no lower Ecca development. The middle Ecca sequence of coal horizons interbedded with sediments is highly truncated due to erosion, with only very minor areas where the full sequence is developed. The no 2 seam dips gently to the south. Locally, there are mainly three seams, seams 2, 3 and 4. Seam 5 was intersected in only two drillholes in the northern part of the project area. The target seams, with seam 2 being most prevalent, make up 86% of the Coal Resource. The seam is consistently developed, except in areas where it has been eroded, and has an average thickness of 2.8m. Seam 3 is also sporadically developed due to erosion and has an average thickness of 0.6m at an average depth of 60m. Due to the proximity of the northern edge of the Witbank Basin, the primary control of the coal development is the current weathering surface. The deposit is therefore divided by a perennial stream into two resource blocks under two distinct spurs in the surface topography. There is no indication of pertinent faulting from the borehole information, but potential intrusions of dolerite dykes are outlined by regional airborne magnetics, indicating the possible occurrence of regional north-south trending dykes.

There are no known geological structures that may affect the geology or coal seam continuity.

Figure 14: Belfast west-east cross section



BELFAST MINE (CONTINUED)

Operation resource evaluation

The geologist in charge supervises all borehole drilling and is responsible for logging and sampling, aligned and in compliance to logging and sampling standards and standard operating procedures (SOPs). Sampling of boreholes is only conducted after the stratigraphy has been correlated. All samples collected and bagged are registered in a sample sheet which is also used as a dispatch sheet. The dispatch sheet is signed by the receiving laboratory personnel after ensuring that the number and sample ID on the dispatch sheet matches that of the actual samples to be analysed. The analysis required is clearly explained in the sample dispatch sheet. The turnaround time is calculated as the time from which the laboratory receives the samples to the time when the last batch of analysis is reported. Once the laboratory receives and signed the dispatch sheet, the safekeeping and storage of that batch of samples lies with the laboratory.

All coal analysis was conducted at Bureau Veritas and is ISO/IEC 17025:2005 accredited. Due to the nature of coal, quality assurance and control procedures are limited as matrix-matched blanks and coal material standards are not commonly available or used. Great emphasis is, however, placed on ensuring data integrity though rigorous procedures and supervision during processing. As part of the assurance and control process, audits are performed internally and externally. Internal audits are periodically done by the laboratory accreditation department using SANAS F48 and F49, which cover management and technical requirements as per ISO 17025. Customer audits are performed by clients to ensure they receive quality service.

No changes in the Coal Resources or Coal Reserves are reported.

Table 19: Belfast Coal Resource reporting criteria

Thickness cut-off (thickness and extraction height considerations)	Quality cut-offs (adb)	Geological loss
<1.0m	Ash >50%	5%

Table 20: Belfast Coal Resource estimation criteria

	Item	Description
Database	**Drillhole database**	acQuire
	Data datum	Cape LO29
	No drillholes used for resource estimation	387
	Validation	Conducted using queries in acQuire Excel
	Data compositing and weighting	Minex
Model	**Previous model date**	2012
	Last model update	2009
	Geological modelling software	Geovia Minex
	Estimation technique	Growth algorithm
	Grid mesh size	25m x 25m
	Scan distance	2 000m
	Data boundary	200m
	Model build limits	Upper: limit of weathering and topography/collar Lower: basement/Dwyka
	Model outputs	Roof, floor and thickness grids generated for structure. Raw quality grids
	Changes to modelling process	None

Table 21: Belfast Coal Resource classification criteria

Category	Type of boreholes	Borehole spacing	Structurally complex areas	BH/ha
Measured	Cored boreholes with applicable coal qualities	0 – 350m	RODA	0.08
Indicated	Cored boreholes with applicable coal qualities	350 – 500m	RODA	0.04
Inferred	Cored boreholes with applicable coal qualities	500 – 1 000m	RODA	0.01

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

BELFAST MINE (CONTINUED)

Table 22: Belfast Resource and Reserve statement

Category	2018 (Mt) (OC)	2017 (Mt) (OC)	Difference (%)
Measured	81.1	81.1	–
Indicated	22.4	22.4	–
Inferred	34.4	34.4	–
Total Resources	137.8	137.8	–
Proved	45.7	45.7	–
Probable			–
Total Reserves	45.7	45.7	–

Rounding of figures may cause computational discrepancies
All changes more than 10% are explained
Mining method: OC – opencast
Figures are reported at 100% irrespective of percentage attributable to Exxaro
The tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt. Coal Resources are quoted as minable tonnes in-situ and refer to remaining resources after 31 December 2018 and 31 December 2017
Coal Resources are reported on a mineable in-situ (MTIS) basis
Coal Resources are quoted inclusive of Coal Reserves

Table 23: Belfast RPEEE considerations

Item	Criteria	Criteria met (Y/N)	Comment
Geological data	Data has been validated and signed-off by competent person	Yes	Geological structures and depositional extent, seam thickness <1.0m (OC), >50% ash content. Coal qualities reported on an air-dry basis
Geological model	Geological model has been considered and signed off	Yes	
Structural model	Structural model was considered and signed off	Yes	2017
Mining	Mining assumptions considered and defined	Yes	Opencast
Assurance	Exxaro internal audits and external audit conducted	Yes	External audit conducted in 2015
Economic Evaluation	Exploitation study with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	Belfast exploitation strategy over mining right
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Yes	EMP, IWUL and NEMA licences in place and compliant

Operation reserve estimation

Scheduling of the reserve is determined using mining scheduling applications from XPAC. This is the same software used to develop the LoMP schedule. The geological 3D model used for the resource statement is referred to as the reserve geological 3D model. This reserve model differs from the resource model. The resource model uses the full coal seam while the reserve model uses a select mining height from the drillhole profile.

The geological model has been created by Exxaro geosciences, using Minex software, and this is then supplied to mining processes in the form of Minex grids. The grids and DXF files were converted by mining processes to Surpac files. The methodology used by mining processes is to initially validate the geological information received, check the integrity of the structure, and that quality and wash-table values are consistent.

Indicated Resources are generally converted to Probable Reserves and Measured Resources to Proved Reserves except if one of the modifying factors have not been fulfilled, where the Measured Resource is either not converted or the Measured Resource is converted but downgraded to Probable and the risk is clearly stated. Inferred Resources are not converted to Coal Reserves.

Some 0.5Mt of Inferred Resources are included in the life-of-mine plan and are not considered material. The area with Inferred Resources, on the western edge of the pit will only be reached towards the end of life-of-mine. This is a new mine, yet to be exploited, and there are thus no production figures.

BELFAST MINE (CONTINUED)

Table 23: Belfast RPEEE considerations (continued)

Item	Criteria	Criteria met (Y/N)	Comment
Tenure	Formal tenure must be demonstrated. Reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national governmental legislation	Yes	Mining right in place Land acquisitions will be done with expansions
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence	Yes	Existing infrastructure adequate or can be upgraded. New required infrastructure under construction
Market	A potential market for the product with a reasonable assumption that this market is sustainable	Yes	Primary product qualities suitable for A-grade export market and middlings suitable for domestic power generation

Table 24: Belfast modifying factors in the conversion of Coal Resources to Coal Reserves

Modifying factors	Value
Geological loss	5%
Average thickness cut-off	1.0m
Quality cut-offs	No quality cut-offs, economic cut-offs
Mining loss	5%
Boundary pillar	–
Dilution	0%
Contamination	0.1m (8.94%)
Mining recovery efficiency	100% (already accounted in mining loss)
Planned average slope angles	–
Practical plant yield	88.11%
Strip ratio cut-off	–
Environmentally sensitive areas	Environmentally sensitive areas excluded, or applications made
Legal	Applicable mining right considered
Social	Applicable communities considered
Geohydrological	Applicable surface and groundwater models considered

Known risks

Modifying factors are currently theoretical and will be reviewed after actual mining has started and reconciliation data is available. Risk of weathered material in the proposed box-cuts has been investigated through drilling and box-cut outlines adjusted. We do not know of any pertinent risks or other material conditions that may impact on the company's ability to mine or explore, including technical, environmental, social, economic, political and other key risks.

Operational excellence

Early cash-generating mining activities have started, which will see mining operations begin in 2019. Further expansion for both opencast and underground potential towards the north of the current LoMP area is under investigation.

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

GROOTEGELUK MINE

Operation overview

Grootegeluk Mine is on the southern margin of the Waterberg coalfield, south of the Daarby fault on the shallow open-castable portion of the coalfield. The mine is 25km west of the town of Lephalale, in the Lephalale magisterial district of Limpopo, South Africa. Grootegeluk can be reached from Lephalale via the hard-topped Nelson Mandela Drive, which is linked to the R510 road linking Lephalale to the town of Vaalwater to the south and the Stockpoort border post between South Africa and Botswana to the north.

Grootegeluk comprises one openpit mine comprising two overburden benches, nine ROM benches and three interburden benches. ROM is transported to the Grootegeluk beneficiation complex via hauling trucks and conveyor belts. The beneficiation complex consists of eight plants producing several different coal products to client specifications. Beneficiation plant discard is backfilled into the mined-out portion of the openpit while slimes are pumped to a specially designed cyclic pond system from where it is reclaimed later and blended in low quantities with the power station coal produced.

The mine is linked with the suburb of Onverwacht, town of Lephalale and neighbouring towns, as well as nearby border posts with Botswana via the R510 road.

Power supply to the mine is obtained directly from the power station, via two 133kV lines that supply power to the mine's 40MVA transformers, in turn distributing 33MV through two measuring points to the plant and mining operations.
A portion of the mine's product is railed from site to a range of customers by a single-gauge railway line that extends southward to Thabazimbi, where it links into the main railway network. Most coal exports are shipped via Richards Bay Coal Terminal (710km south-east of Grootegeluk) and the rest from Durban harbour (760km south-east of Grootegeluk). Raw water is delivered to the mine, as well as to a water refinement plant on the farm Zeeland, by the 700mm diameter Hans Strijdom pipeline. The pipeline originates at Mokolo Dam, in the Waterberg Mountains, 39km south-east of Grootegeluk.

Potable water from the Zeeland water refinement plant (11km south-south-east of Grootegeluk) is in turn routed to the mine and local communities.

Coal is beneficiated via eight different plants that produce power station coal (thermal coal) at 35% ash, various-sized metallurgical coal products at different quality specifications and semi-soft coking coal. Thermal coal is sold to Eskom on long-term coal-supply agreements to supply feed coal to the Matimba and Medupi power stations via conveyor belts. Different-sized metallurgical coal products at 15% ash content are sold to domestic customers via rail and road transport. Low-ash semi-soft coking coal at 10.3% ash content is sold to ArcelorMittal while the 15% ash content semi-soft coking coal is sold in the export market via rail transport.

Figure 15: Grootegeluk mine

GROOTEGELUK MINE (CONTINUED)

Operation history

Since beginning exploration activities at Grootegeluk, the company changed its name and/or unbundled several times without selling the asset to new owners. Through all these changes, exploration drilling continued in the same way.

Table 25: Grootegeluk operation history

Date range	Company	Material notes
1960s – 1980	Yskor – Iscor – Iscor Mining – Kumba Resources	Drilling exploration holes before mine commissioning took place
1980 – 2018	Kumba Resources – Kumba Coal – Exxaro Resources	Continued exploration drilling post mine commissioning

Small diameter boreholes (HQ/TNW size core) were drilled on a 500m x 500m grid when the initial exploration project at Grootegeluk started. The suite of analyses performed at that time was analysed only per coal sample and the amount of core obtained from the boreholes was adequate for all the required analysis. Over time, gradual subdivision of coal zones into smaller units or 'samples', as well as added relative density fractions to the suite of analysis, resulted in insufficient sample material being available in some samples and some relative density fractions for the required suite of analysis.

To accommodate the new sample subdivision and have sufficient material available from each sample for the required suite of analyses to relative densities of 2.20g/cc, it was decided to change the size of exploration boreholes from small to large diameter (123mm diameter drill core). The large diameter boreholes were drilled in between the existing 500m x 500m grid of small diameter boreholes, resulting in a 250m x 250m exploration borehole grid. The reason for this placement of large diameter boreholes was that analysis of samples from the large diameter boreholes could be used to supplement analysis of existing small diameter boreholes where samples and density fractions were absent.

Grootegeluk executes its exploration strategy across the Coal Resource. Boreholes furthest from the openpit are spaced 3 000m x 3 000m and, closer to the pit, infill holes are drilled to reduce borehole spacing to 1 000m x 1 000m. For the area in front of the openpit (10 years ahead of planned pit-advance direction), boreholes drilled form a grid of 500m x 500m. In addition, infill holes are also drilled on a 350m x 350m spacing to cover the area that will be mined in the next five years and percussion boreholes are drilled in geologically complex areas to complement the structure interpretation.

Operation geology

Regionally, Grootegeluk is in the southern portion of the Limpopo depression, a relatively small corridor between the Limpopo River in the west and the Palala-Pietersburg plateau in the east. Fundamentally, however, it is a re-exposed post-Waterberg topographical feature, on which Karoo sediments were deposited, followed by tectonic activity, which was the primary element responsible for the development of the depression.

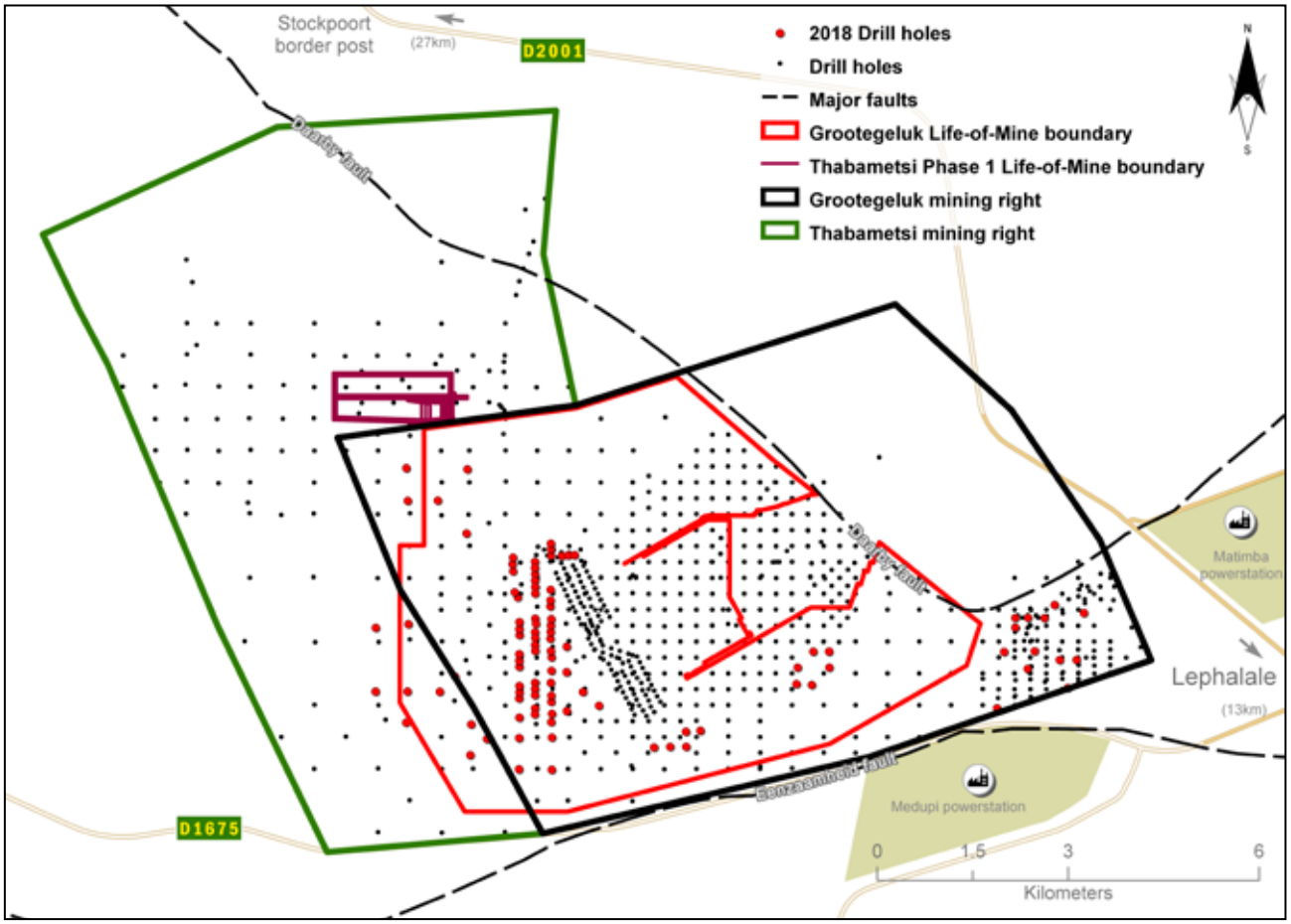
The Zoetfontein fault forms the boundary of the Waterberg coalfield in the north, while the Eenzaamheid fault forms the boundary in the south. The Daarby fault, with a throw of some 350m, divides the coalfield into a deep north-eastern portion and a shallow south-western portion. The first fresh coal in the shallow south-western portion is on average 20m below surface. The lowermost coal seam (zone 1) occurs at a depth of about 130m in the shallow portion of the coalfield, but this may vary depending on the local structure (figure 17). The predominantly horizontal coal-bearing formations have a very gentle dip to the south-east near Grootegeluk. Only a few dolerite dykes outcrop in the south-eastern portion of the Waterberg coalfield and no sills have been encountered in any exploration boreholes drilled in the mine right area to date.

The upper part of the coal deposit, the Volksrust formation (±60m thick), comprises intercalated mudstone or carbonaceous shale and bright coal layers. It displays such a well-developed repetition of coal-shale assemblages that it can be subdivided into seven discrete sedimentary cycles or zones (zone 11 – zone 5). Smaller sub-cycles (samples) were chosen within these zones and sampled individually in the exploration phase. This subdivision of coal seams into smaller lithological units is necessary to cater for numerous mining bench definitions and/or product specifications. The terms 'zone' and 'sample' are used at Grootegeluk instead of 'seam' and 'ply' due to the site-specific intercalated nature of the coal and shale. The Volksrust formation is classified as a thick interbedded seam deposit type.

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

GROOTEGELUK MINE (CONTINUED)

Figure 16: Grootegeluk mine and the adjacent Thabametsi project area



The Volksrust formation zones typically start with bright coal at the base, with the ratio of coal to shale decreasing from the base of each zone upwards. The basal zone (zone 5) is an exception because of a more homogeneous distribution of coal and shale throughout this zone. The Volksrust formation shale shows an increase in carbon content with depth and varies from a massive bluish-grey mudstone to carbonaceous shale towards the base. Although the thickness and coal quality of the Volksrust formation are reasonably constant across the coalfield, a large variation in the yield of semi-soft coking coal and total sulphur content occurs vertically in the coal succession.

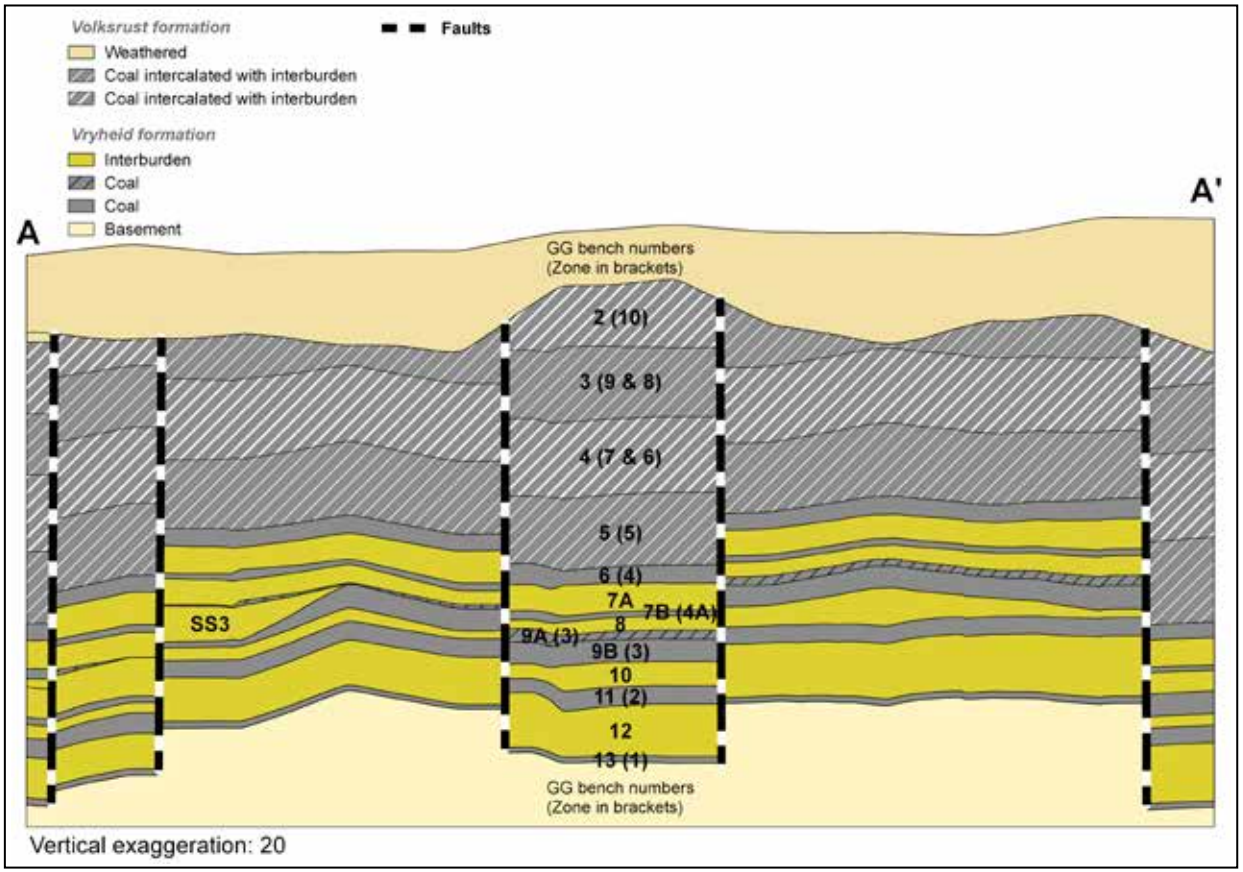
The Vryheid formation (±55m thick) forms the lower part of the coal deposit and comprises carbonaceous shale and sandstone with interbedded dull coal seams varying in thickness from 1.5 to 9m. It is therefore classified as a multiple seam deposit type.

There are five coal zones that consist of predominantly dull coal, with some bright coal developed at the base of zones 2, 3 and 4 in the Vryheid formation. Due to lateral facies changes and variations in the depositional environment, these zones are characterised by a large variation in thickness and quality. It is noted in the mine lease area that these zones depreciate in development and coal quality in a westward direction due to sedimentological facies changes.

Zone 3 is the best-developed dull coal zone in the mine lease area and reaches a maximum thickness of 8.9m. The basal portion of this zone yields some semi-soft coking coal. Zone 2, on average 4m thick, reaches a maximum thickness of 6m in the mine lease area. The basal portion of this zone also exhibits semi-soft coking coal properties. Zone 2 exhibits the most consistent thickness of all the Vryheid coal zones across the entire Waterberg coalfield. Zone 1, the basal Vryheid coal zone, has an average thickness of 1.38m. Zone 1 contains the best-quality metallurgical coal at Grootegeluk and is suitable to produce char but is not included in the mine plan due to the high stripping ratio given a 12m thick overlying interburden sandstone seam. With plans to expand the on-site semi-coke plant by eight additional retorts, much attention is currently given to re-evaluating the economic viability of Zone 1 in the current mine plan. Because of previous mining activity, over 5Mt of high-quality low-phosphorous content metallurgical coal from zone 1 has been sterilised to date by the pit backfill operation.

GROOTEGELUK MINE (CONTINUED)

Figure 17: Typical west-east section through Grootegeluk geological model showing the various benches and zones



Operation resource evaluation

All exploration boreholes are logged and sampled by experienced on-site geologists, aligned and in compliance to logging and sampling standards and SOPs. Samples are selected according to seam coal and shale contacts, visual variation in the vitrinite content, assisted by a suite of downhole geophysical logs, and non-coal material present in the seam boundaries. Large diameter core (123mm) drillholes are drilled for Coal Resource purposes.

Core loss for coal seam intersections is recorded and a recovery of <95% through coal (by volume) is deemed unsatisfactory. Anomalies were investigated and redrilled if required. Wire-line logging results are available for all boreholes. Logging is conducted by recording lithology down to centimetre according to the classification of the various coal 'lithofacies'/coal type zones or ply (shale-coaly; coal-shaly; coal dull; coal mixed, mainly dull; coal mixed; coal mixed, mainly bright; coal bright) – based on the discernible lithofacies change and identified marker horizons – particularly through coal zones.

Sampling of boreholes is only conducted after the stratigraphy has been correlated and the geologist in charge supervises all borehole drilling and is responsible for logging and sampling. Each sample submitted to the laboratories is accompanied by a unique sample number for validation and tracking as well as a submission list that serves as a sample advice sheet with instructions for analysis. The delivery or turnaround time is calculated as the time from which the laboratory receives the samples to the time when the last batch of analysis is reported. Once the laboratory has received and signed the dispatch sheet, the safekeeping and storage of that batch of samples lies with the laboratory.

Grootegeluk uses Bureau Veritas laboratory for its exploration borehole sample analyses. Bureau Veritas took over Advanced Coal Technology (ACT) in 2013 which had performed Grootegeluk's analysis of exploration borehole samples since the early 1960s. ACT was an outsourced company formed from the old Iscor pilot plant laboratories and has been a continuation of services previously provided by Iscor.

The only form of subsampling done at Grootegeluk is the separate sampling of coal and shale layers of the Volksrust formation sample units for analyses. The composited coal and shale samples per sample interval are weighed to determine the samples' relative densities and percentages core recovery. Relative density (RD) measurements are carried out at Grootegeluk using the 'mass in air vs mass in water' method.

Current sample intervals as per exploration borehole are, in certain cases, sub-intervals of historical sample intervals, for instance samples 22A, 22B, 22C, 22D and 22E are subdivisions of sample 22 as it was sampled in historical boreholes, hence the nomenclature. When compositing these relevant subintervals, it is fully representative and can be used in conjunction with historical boreholes to describe the same geological unit.

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

GROOTEGELUK MINE (CONTINUED)

The laboratory follows one of four standard suites of analysis for each sample from Grootegeluk, namely: 1) Volksrust formation coal; 2) Volksrust formation shale; 3) Vryheid formation coal; and 4) Vryheid formation shale. Coal samples are analysed before shale samples because of potential changes that could take place in the characteristics of the coal due to exposure to the atmosphere.

The analyses performed on the borehole core samples include proximate analysis, ash composition analysis, ash fusion temperature analysis and petrography. Analyses are performed separately on the coal and shale samples after float-and-sink analyses have been performed to obtain fractional samples for the range of densities. All data received from Bureau Veritas is in digital format and checked against the original request list to ensure the required analyses were conducted and results were recorded appropriately. The digital data is then imported into the same database in which the core log data has been captured (Sable Data Warehouse) and subsequent validation procedures are conducted. This serves to verify laboratory accuracy and is performed during the data-importation stage.

The Coal Resource classification methodology is fundamentally based on SANS 10320 and considers drillhole spacing, type of drillholes and structural complexity of the resource. Additional efforts are used to provide for areas with perceived geological risk.

Table 26: Grootegeluk Coal Resource reporting criteria

Thickness cut-off (thickness and extraction height considerations)	Quality cut-offs (adb)	Geological loss (%)
<0.5m	Ash content of >65%	Variable per bench, calculated each year considering geological model estimation error and physical geological loss

GROOTEGELUK MINE (CONTINUED)

Table 27: Grootegeluk Coal Resource estimation criteria

	Item	Description
Database	**Drillhole database**	Sable Data Warehouse
	Data datum	LO27 WGS 84
	No drillholes used for resource estimation	801
	Validation	Conducted using queries in Sable and Excel
	Data compositing and weighting	Sable Data Warehouse
Model	**Previous model date**	2013
	Last model update	2016
	Geological modelling software	Geovia Minex
	Estimation technique	Growth algorithm
	Grid mesh size	20m x 20m
	Scan distance	2 000m
	Data boundary	200m
	Model build limits	Upper: limit of weathering Lower: zone 1 floor
	Model outputs	Roof, floor and thickness grids generated for structure. Coal-washability quality grids
	Changes to modelling process	None

Table 28: Grootegeluk Coal Resource classification criteria

Resource category	Type of boreholes	Borehole spacing (Volksrust Formation and Vryheid Formation)	Structurally complex areas	BH/ha
Measured	Cored boreholes with applicable coal qualities	≤500m	Matrix (additional geophysically logged boreholes needed)	0.04
Indicated	Cored boreholes with applicable coal qualities	>500m and ≤1 000m	Matrix (additional geophysically logged boreholes needed)	0.01
Inferred	Cored boreholes with applicable coal qualities	>1 000M and ≤3 000m	Matrix (additional geophysically logged boreholes needed)	0.001

The classification method is the same for the overlying Volksrust and underlying Vryheid formation Coal Resources for practical considerations. The classification methodology is reviewed each year and reconciliation for that year is used to test the classification criteria. The review addresses specific geological risks expected in the resource, including increased variability in certain coal qualities, thinning of certain benches by weathering in the Volksrust formation, deterioration of coal formation in certain benches and a gradual increase in the average total sulphur content in general. Only cored boreholes with applicable coal quality data are used and structurally complex areas must be complemented by additional geophysically logged open (percussion drilled) boreholes.

Table 29: Grootegeluk Resource and Reserve statement

Category	2018 (Mt)	2017 (Mt)	Difference in tonnes (Mt)	Difference (%)	Reason for changes
Measured	2 844	2 902	58.0	(2)	
Indicated	1 017	1 017			
Inferred	653	653			Mining depletion
Total Resources	4 514	4 572	58.0	(1.3)	
Proved	2 576	2 633	57.0	(2)	
Probable	645	645			Mining depletion
Total Reserves	3 221	3 278		(2)	

Rounding figures may cause computational discrepancies
All changes more than 10% are explained
Mining method: OC – opencast
Figures are reported at 100% irrespective of percentage attributable to Exxaro
Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt. Coal resources are quoted as mineable tonnes in-situ and refer to remaining resources after 31 December 2018 and 31 December 2017
Coal Resources are reported on a mineable in-situ (MTIS) basis
Coal Resources are quoted inclusive of Coal Reserves

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

GROOTEGELUK MINE (CONTINUED)

Table 30: Grootegeluk RPEEE considerations

Item	Criteria	Considered	Comment
Geological data	Data has been validated and signed off by competent person	Yes	
Geological model	Geological model was considered and signed off	Yes	Seam depth, seam thickness >0.5m, ash content <65%. Coal qualities reported on an air-dry basis
Structural model	Structural model was considered and signed off	Yes	2017 review
Mining	Mining assumptions considered and defined	Yes	Opencast
Assurance	Minimum tier 1 assurance (Exxaro governance)	Yes	Resource and LoM done in 2018
Economic evaluation	A concept-level exploitation with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	Consolidated exploitation plan
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Yes	Current required approvals in place
Tenure	Formal tenure must be demonstrated. Reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national governmental legislation	Yes	Mining right (23 years). Reasonable expectation that right will be renewed
Infrastructure	Assumptions used should be reasonable and within known/ assumed tolerances or have examples of precedence	Yes	Current mine infrastructure
Market	A potential market for the product with a reasonable assumption that this market is sustainable	Yes	Current coal-supply agreements for local and export markets

GROOTEGELUK MINE (CONTINUED)

Operation reserve estimation

No amendments were made to the life-of-mine plan for Grootegeluk in 2018 and the change is only the result of annual mining depletion. All modifying factors were considered, and no downgrade were made to any Coal Reserves in the various categories. The amount of Inferred Resources in the LoMP is 510Mt, representing 15.8% of the LoMP. The impact of Inferred Resources on the LoMP was tested and is well understood. The Inferred Resources are located at the latter end of the LoMP and are addressed through continuous exploration.

XPAC mine-scheduling software is used to derive the remaining saleable reserves from run-of-mine (ROM reserves in the approved pit layout. After converting the geological model's grids to the appropriate format, the floor, roof and thickness data as well as quality data for each bench is imported into the XPAC model. In this model, validations are performed to evaluate the data for possible discrepancies, such as incremental yields for each bench rising with increases in the relative float densities. The resource category areas are also loaded into the XPAC model for reserve categorisation purposes.

The 2017 XPAC model integrates new geometallurgical principles into the LoM planning process and scheduling model to better predict as-mined plant performance. This is an all-inclusive model that can simulate all the plants in the Grootegeluk complex from one integrated flowsheet. The key improvement is that the model provides:

- Combined washability data for all material fed to a specific plant
- The data is combined for each relative density (RD)
- The impact on plant yield performance, due to ROM for various benches, is modelled.

A number of audits have been conducted, in conjunction with the mine, to ensure the process applied is well understood, documented and that predicted product volumes are realistic and transparent.

The washability tables for each blast block are imported into the geometallurgical model (XPAC). The geometallurgical schedule imitates reality at Grootegeluk as portions of a single blast block can be allocated to several beneficiation plants in a particular scheduling period. Once the production schedule has run, a blend of blast blocks from different benches is allocated to each plant for each scheduling period. A new composite wash table is then derived for each plant for each scheduling period, which represents the blend of material fed from the mine to that plant. This composite wash table is then used to derive the specific products required to be produced by that plant for that period. A set of calibrated plant factors is applied per plant to adjust theoretical product yields to practical expected levels. It is thus not assumed that a block in its entirety is allocated to one plant only, as this does not represent reality at Grootegeluk. The scheduled mining blocks are of the same size as current actual blast blocks in the mine. The fact that material from different benches is combined and beneficiated simultaneously creates difficulty in reporting saleable product tonnages per bench. The preferred reporting is therefore ROM tonnes per bench and saleable product tonnes per beneficiation plant.

Table 31: Grootegeluk production figures

Category	Actual 2017	FC 2018	Actual 2018	FC 2019	FC 2020
ROM (Mt)	51.4	55.5	57.2	57.0	62.4

Table 32: Grootegeluk modifying factors considered in converting Coal Resources to Coal Reserves

Modifying factors	Value
Geological loss (varies per bench)	0 – 0.75% for Proved Reserves 0 – 1.5% for Probable Reserves
Thickness cut-off	< 0.5m
Quality cut-offs	>65% ash content (raw in-situ coal)
Mining loss	0% due to the fact that all mining boundaries are reached, no pillars are left
Boundary pillar	N/A
Dilution	Applied to in-situ mineable reserves due to the inter-layered composition of the deposit
Contamination (varies per bench)	0.0 – 0.75 metres – applied to interburden seams
Mining recovery efficiency (varies per bench)	0.0 – 0.75 metres depending on bench height
Planned average slope angles	<61.7 degrees
Practical plant yield	Considered in the reserving process, as per wash table information per combination of blocks per planning increment and the empirically determined practical yield adjustment factor
Strip ratio cut-off	Energy strip ratio >7 GJ/ex-pit tonne
Environmentally sensitive areas	Areas underlying wetlands and other eco-sensitive areas are excluded from the reserves, with a 100m or 100-year floodline cut-off applied
Legal	The layout is within the mining right boundary, not closer than 15m
Social	There are no known socially sensitive areas in the pit layout (eg graveyards, dwellings)
Geohydrological	Areas identified are flagged and excluded or reclassified in the reserving process

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

GROOTEGELUK MINE (CONTINUED)

Known risks

We do not know of any pertinent risks or other material conditions that may impact on the company's ability to mine or explore, including technical, environmental, social, economic, political and other key risks.

There are a number of low risks addressed by continuous actions at the operation:

Geological structure accuracy: The structure interpretation (fault positions) is based on current points of observation. Additional percussion boreholes are required in structurally complex areas to finalise the position and characteristics of faults.

Inferred Resources: Some 22% of the total Coal Resource (~16% in LoMP) is in the Inferred category due to the revised mining pit introduced in 2017. The Inferred Resources are on the tail-end of the LoMP and are addressed by an integrated exploration plan that is reviewed each year.

Thinning of upper benches: Bench 2 and bench 3 are thinning and disappearing in certain areas of the Coal Resource due to weathering, with only a small portion of bench 2 remaining in the next few years. This information is incorporated in the mine's production schedules. Large portions of bench 2 and bench 3 are still available in the planned pit layout further away from the current production face.

Increasing total sulphur content in semi-soft coking coal: A trend of increasing sulphur content in the benches used to produce semi-soft coking coal (benches 2, 3 and 4) is observed in the geological model. Coal sulphur content is known to be highly variable, which makes it difficult to estimate accurately. The variability was considered during the revision of the 2017 pit and LoMP.

Phosphorus content in semi-coke feed coal: The phosphorous content of bench 11 poses a risk to the production of semi-coke. Bench 11 and zone 1 are the sources of relatively low phosphorus content coal but bench 11 shows a continual increase in phosphorus content. Studies conducted show that most of the phosphorous content of bench 11 is in the uppermost portion of the bench and can be removed separately to mitigate the risk. In addition, zone 1 (bench 13) is currently omitted from the mine plan due to its high stripping ratio but can be used as a sweetener if it is blended with bench 11.

Operational excellence

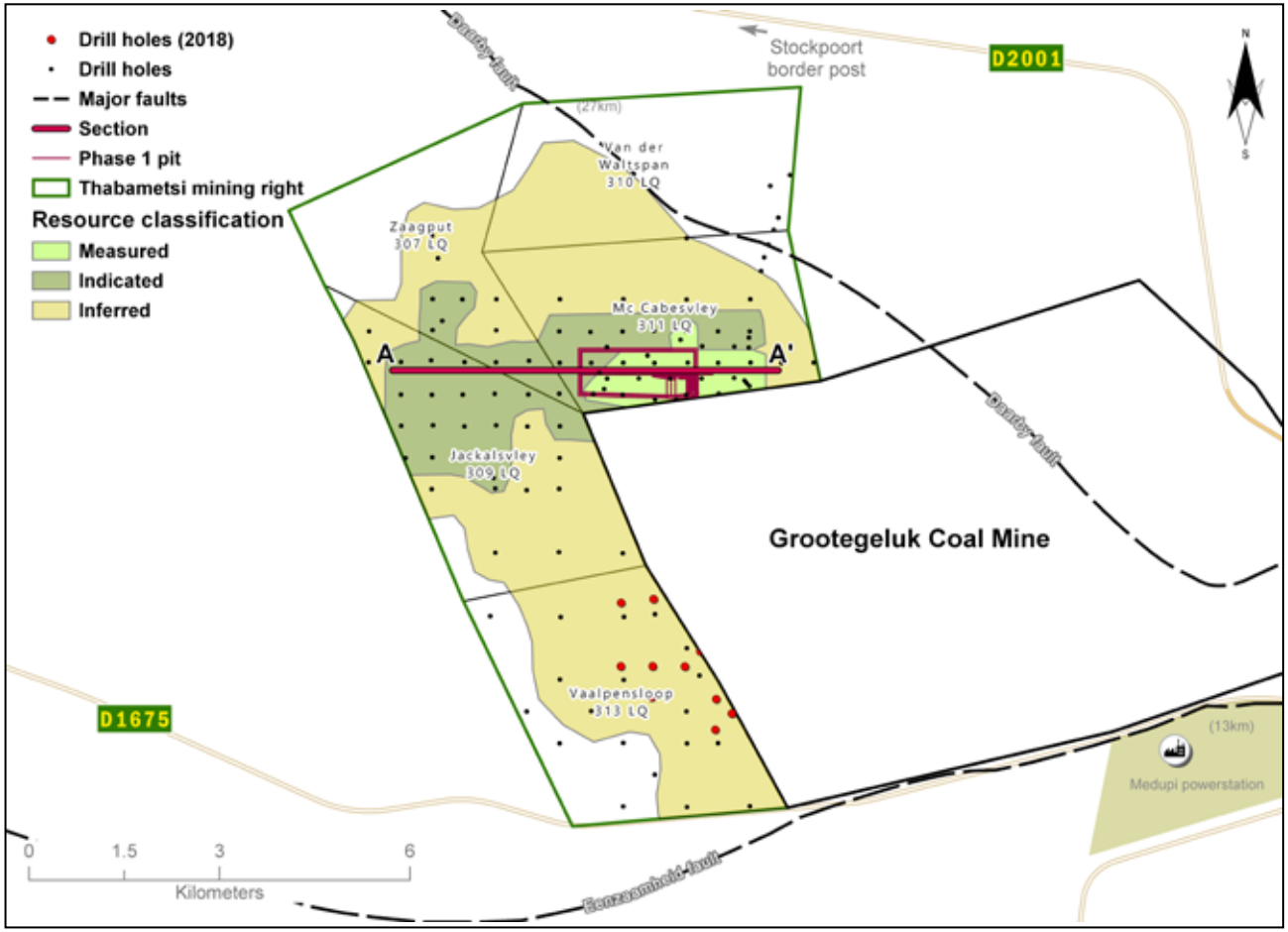
The implementation of a short-term geological model that incorporates exploration, infill and production drilling as well as pit mapping will enhance short-term estimation and mine planning significantly. The implementation of the GG6 beneficiation plant will unlock exceptional value in the semi-soft coking coal market.

THABAMETSI PROJECT

Project overview

The Thabametsi project is 22km west of the town of Lephalale and adjacent to Exxaro's Grootegeluk mine. The project area is divided into a northern opencastable portion, and a southern underground area. The northern portion aims to produce power station coal for an on-site independent power producer (IPP) as part of phase 1. A feasibility study on phase 1 was successfully concluded in 2016 and studies on extending the phase and the southern project area are ongoing. In October 2016, the South African Minister of Energy announced that the Thabametsi power project, for which Thabametsi project has a 30-year coal-supply agreement, had been selected as a preferred bidder in the first bid window of South Africa's coal-baseload IPP procurement programme. A mining right (10013MR) for a period of 30 years was granted and executed in June 2016. A section 102 of the MPRDA submitted to include several additional minerals to coal, to correct an administrative error, was granted in July 2017 and executed in November 2017.

Figure 18: Thabametsi project



THABAMETSI PROJECT (CONTINUED)

Project history

Drilling on the Thabametsi project area began in 1979 during Iscor's regional exploration of the Waterberg. This investigation was prompted by positive results on adjacent farms where Grootegeluk mine began production in 1980.

As part of this exploration, one borehole was drilled on all farms of interest. On farms where results were promising, follow-up drilling was conducted in 1980/81. During this time, eight boreholes were drilled on four of the five Thabametsi farms: McCabesvley, Jackalsvley, Zaagput and Vaalpensloop. Two boreholes were drilled in 1988 on the remaining farm, Van der Waltspan, to complete regional exploration of the Thabametsi project area. All regional exploration during this time, except the boreholes on Van der Waltspan, was conducted through rotary core diamond drilling using an NQ-sized (47.6mm) core barrel. The boreholes on Van der Waltspan used a T6-146-sized (123mm) core barrel.

Exploration activities began in earnest on the project area in 2008. Since the start of the latest drilling programme, 61 boreholes have been drilled on Thabametsi at a cost of around R50 million. All boreholes completed on the project site since 2008 were undertaken using a T6-146-sized core barrel to produce a 123mm diameter core.

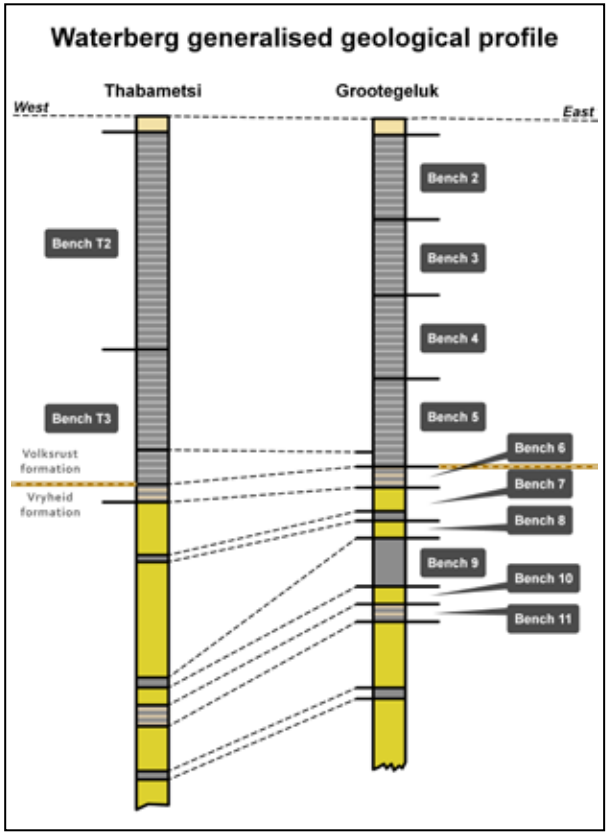
Table 33: Thabametsi project history

Date range	Company	Material notes
1979 – 1988	Iscor – Iscor Mining – Kumba Resources	Exploration drilling commenced
2007 – 2012	Exxaro Resources	Prospecting right, exploration activities specifically on the project area
2016 – current	Exxaro Resources	Mining right registered in 2016, valid for 30 years

Project geology

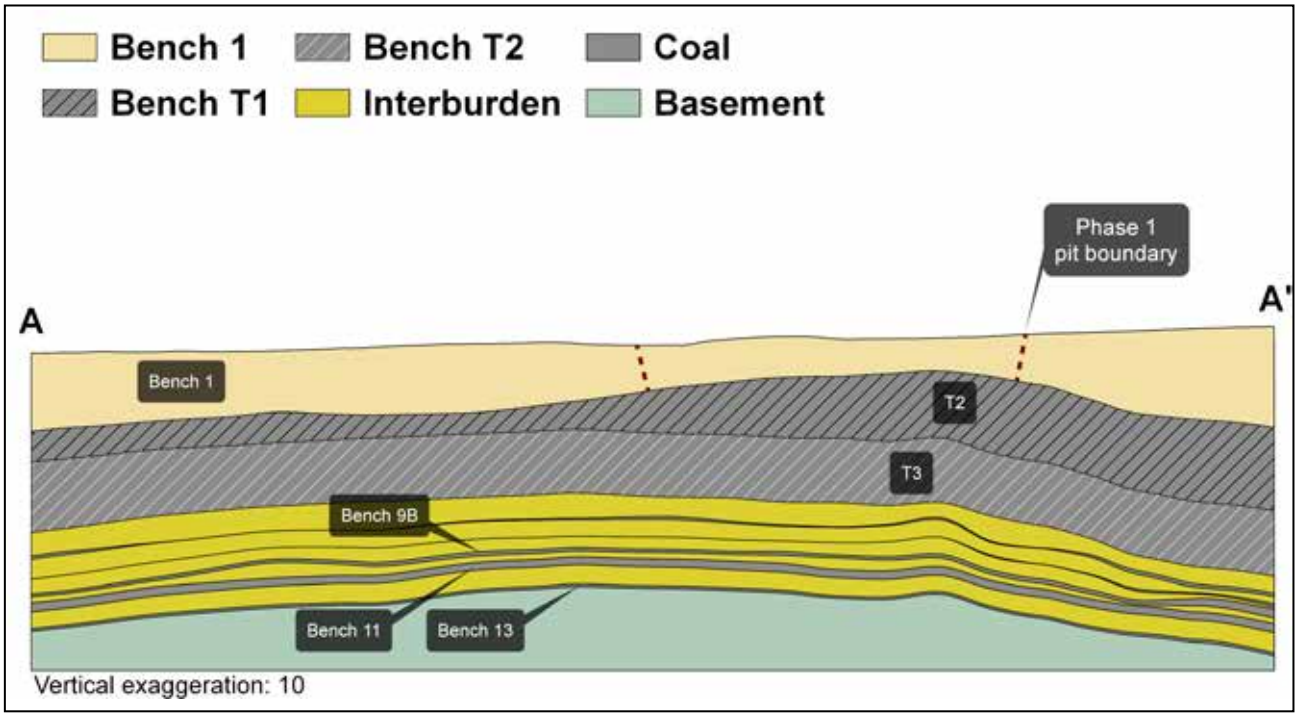
The geology is similar to Grootegeluk's geology, but increased weathering and deteriorating coal qualities required a different bench configuration. In the north, the full succession of the Volksrust and Vryheid formations is present. Further south, however, the Volksrust formation thins out and eventually disappears. A pertinent channel sandstone in the northern portion of the project area affects benches 9A and 9B. A cross-section through the geological model is presented in figure 19.

Figure 19: A generalised profile of the Grootegeluk and Thabametsi geological profile



THABAMETSI PROJECT (CONTINUED)

Figure 20: Cross-section through 2015 Thabametsi geological model



Project resource evaluation

Logging and sampling follow the same protocols as at Grootegeluk mine. Controls in the work procedure ensure that mistakes are omitted from the process, initially from the placement of borehole survey data in the field to the point of delivery of samples to the laboratory, and after that from receiving analyses back from the lab to the point where data is used for geological modelling. These procedures include controls to ensure the drill core is correctly correlated, sampled, relative densities determined, and material recoveries validated to stipulated standards.

Prior to dispatching, coal and shale samples are reweighed in air to check that they have been correctly labelled and that the initial weights recorded are correct (for subsequent relative density (RD) calculation). When samples arrive at the Bureau Veritas laboratory in Pretoria, they are reweighed and checked against the recorded RDs on the sample list supplied with the samples by the geology department. The geology personnel are notified of any discrepancy, which is rectified without delay.

The senior geologist in the geodata subsection at Grootegeluk mine is responsible for maintaining a system to ensure that all exploration borehole data is verified, and all geological information is correctly entered into the borehole database (Sable Data Warehouse). The individual is also responsible for tracking borehole samples in the analytical process, accepting analytical data from Bureau Veritas, electronic transfer of analytical data to the borehole database and validation of the data.

Table 34: Thabametsi Coal Resource reporting criteria

Thickness cut-off (thickness and extraction height considerations)	Quality cut-offs (adb)	Geological loss (%)
<0.5m	Ash content of >65%	5%

THABAMETSI PROJECT (CONTINUED)

Table 35: Thabametsi Coal Resource estimation criteria

	Item	Description
Database	**Drillhole database**	Sable Data Warehouse
	Data datum	LO27 WGS 84
	No drillholes used for resource estimation	116
	Validation	Conducted using queries in Sable and Excel
	Data compositing and weighting	Sable Data Warehouse
Model	**Previous model date**	2014
	Last model update	2015
	Geological modelling software	Geovia Minex
	Estimation technique	Growth algorithm
	Grid mesh size	45m x 45m
	Scan distance	1 000m
	Data boundary	300m
	Model build limits	Limit of weathering
	Model outputs	Roof, floor and thickness grids generated for structure. Coal washability quality grids
	Changes to modelling process	None

Resource estimation and data-compositing methods are aligned to the methodology applied at Grootegeluk. In recent years, five geological models have been built for the Thabametsi project area, accounting for alternate interpretations and compositing scenarios.

Resource classification, throughout the Volksrust and Vryheid formations, is fundamentally based on SANS 10320:2004 guidelines for multiseam deposits. The approach is recognised as more conservative than applying guidelines for thick interbedded-type deposits and was chosen to remain conservative during current studies. The classification methodology will be reviewed (as with Grootegeluk) in 2019. Some 112 boreholes were used for resource estimation, all of which contain coal-washability data.

The resource classification methodology although fundamentally based on SANS 10320 is based on a matrix approach that incorporates drillhole spacing, type of drillholes and structural complexity in the resource.

THABAMETSI PROJECT (CONTINUED)

Table 36: Thabametsi Coal Resource classification criteria

Resource category	Type of boreholes	Borehole spacing (Volksrust Formation and Vryheid Formation)	Structurally complex areas
Measured	Cored boreholes with applicable coal qualities	0 – 350m	(Matrix) Additional geophysically logged boreholes needed
Indicated	Cored boreholes with applicable coal qualities	350m – 500m	(Matrix) Additional geophysically logged boreholes needed
Inferred	Cored boreholes with applicable coal qualities	500m – 1 000m	(Matrix) Additional geophysically logged boreholes needed

Table 37: Thabametsi Resource and Reserve statement

Category	2018 (Mt)	2017 (Mt)	Difference in tonnes (Mt)	Difference (%)
Measured	**270**	270		
Indicated	**749**	749		
Inferred	**2 916**	2 916		
Total resource	**3 935**	3 935	0	0
Proved	**109**	109		
Probable	**21**	21		
Total reserves	**130**	130	0	0

Rounding of figures may cause computational discrepancies
All changes more than 10% are explained
Mining method: OC – opencast
Figures are reported at 100% irrespective of percentage attributable to Exxaro
Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt. Coal resources are quoted as mineable tonnes in-situ and refer to remaining resources after 31 December 2018 and 31 December 2017
Coal Resources are reported on a mineable in-situ (MTIS) basis
Coal Resources are quoted inclusive of Coal Reserves

Table 38: Thabametsi RPEEE considerations

Item	Criteria	Considered	Comment
Geological data	Data has been validated and signed off by competent person	Yes	
Geological model	Geological model was considered and signed off	Yes	Geological structure and depositional extent, seam thickness >0.5m, <65% Ash
Structural model	Structure model was considered and signed off	Yes	
Mining	Mining assumptions considered and defined	Yes	opencast and underground
Assurance	Minimum tier 1 assurance (Exxaro governance)	Yes	2015
Economic evaluation	A concept-level exploitation with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	Studies that underpin the IPP study and mining right mine works programme
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Yes	Approvals and land ownership in place
Tenure	Formal tenure must be demonstrated. Reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national governmental legislation	Yes	Mining right (30 years)
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence	Yes	Current infrastructure
Market	A potential market for the product with a reasonable assumption that this market is sustainable	Yes	IPP and current Grootegeluk steam coal market

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

THABAMETSI PROJECT (CONTINUED)

Project reserve estimation

For the phase 1 feasibility study (IPCC Pit), XPAC mine-scheduling software is used to derive remaining saleable reserves from run-of-mine reserves in the approved pit layout. After converting the geological model's grids to the appropriate format, the floor, roof and thickness data as well as the quality data for each bench is imported into the XPAC model. With this model, validations are performed to evaluate the data for possible mistakes, such as incremental yields for each bench rising with increases in relative float densities.

The resource category areas are also loaded into the XPAC model for reserve categorisation. Indicated Resources are converted to Probable Reserves and Measured Resources converted to Proved Reserves. The Coal Reserve is based on a bankable feasibility project level of investigation.

Known risks

Some assumptions regarding the highwall mining method need to be confirmed at the start of the operation.

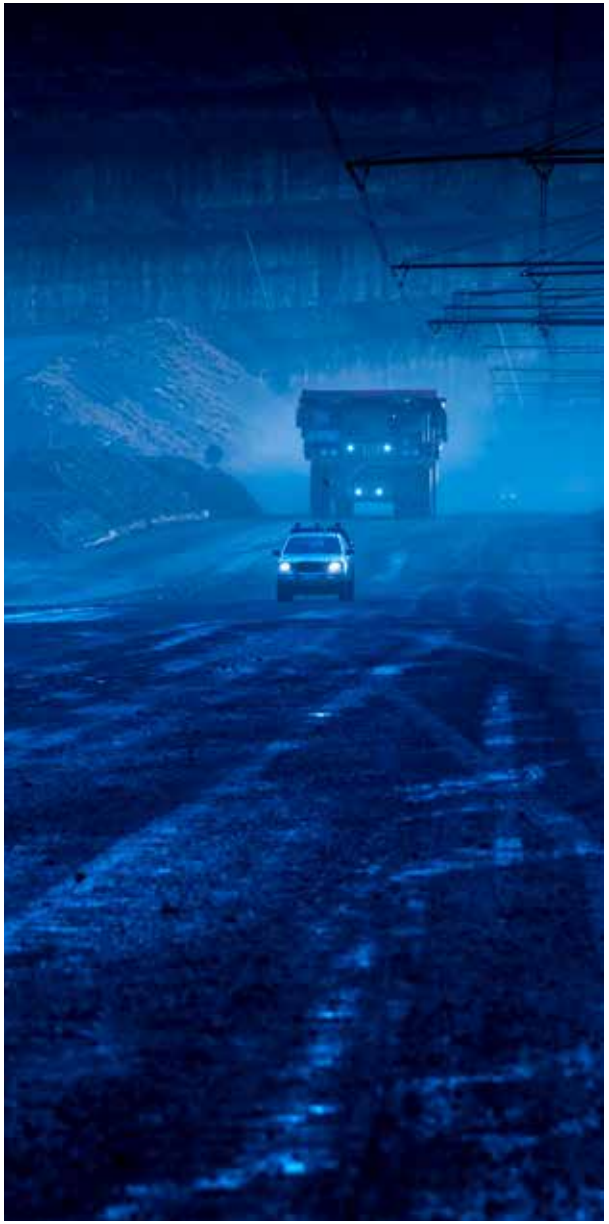


Table 39: Thabametsi modifying factors considered in converting Coal Resources to Coal Reserves

Modifying factors	Value
Geological loss	5%
Average thickness cut-off	<1m
Quality cut-offs (adb)	Raw CV >11Mj/kg
Mining loss	*T1 – 0.5m losses to overburden *T2 – 0.25% of coal left in pit bottom
Boundary pillar	N/A
Dilution	Applied to in-situ mineable reserves due to inter-layered composition of deposit
Contamination	T2 – 0.3m
Mining recovery efficiency	No additional losses due to proposed mining method. Coal transfer between benches T1 and T2 will balance out over time as both go to same plant
Planned average slope angles	35 degrees
Practical plant yield	Crushing and screening process 98%
Strip ratio cut-off	Energy strip ratio >7Gj/ex-pit tonnes Strip ratio < 0.3m^3/tonne
Environmentally sensitive areas	No sensitive areas in pit layout
Legal	The layout is within the mining right boundary
Social	There are no socially sensitive areas in the pit layout (eg graveyards, dwellings)
Geohydrological	No areas identified in the mining area

**T1, T2 – Mining Benches (figure 19)*

DORSTFONTEIN COMPLEX

Operation overview

Dorstfontein (DCM) complex forms part of Exxaro Coal Central (ECC) and is on the northern margin of the Highveld coalfield along the boundary of the Smithfield Ridge, the boundary between the Highveld and Witbank coalfields.

DCM complex is 36km south of the town of eMalahleni and, to the south-west, the property borders the town of Kriel. It is in the Highveld magisterial district, under the jurisdiction of the eMalahleni local council, Mpumalanga, South Africa. DCM operations can be reached via the hard-topped R544/R547 roads linking the towns of Witbank and Kriel. DCM is surrounded by mineral right tenure owned by Kusile Mining to the west, the Universal Coal NCC operation to the north, the Kriel-East operation to the south and Mbuyelo Coal to the east.

The complex covers a total rights area of 7 892 hectares comprising the underground Dorstfontein West Mine (DCMW) and opencast Dorstfontein East Mine (DCME). DCMW is currently exploiting the no S2 through underground bord-and-pillar method. The operation is supported by four continuous miner (CM) sections and one drill-and-blast section. With the S2 reserves coming to an end, the operation is moving upwards to exploit the S4L through an incline development from the current S2 working. DCME is the only opencast mine in the ECC stable. Seams being exploited are mainly no S4 (S4U and S4L) and no S2 (S2U and S2L). However, where thicker than 1.0m, the no S5, S3 and S1 are also extracted. Mining activities use a truck-and-shovel method to expose and extract coal. The LoMP entails the introduction of underground extraction of S4L via an adit from one of its pits' highwalls.

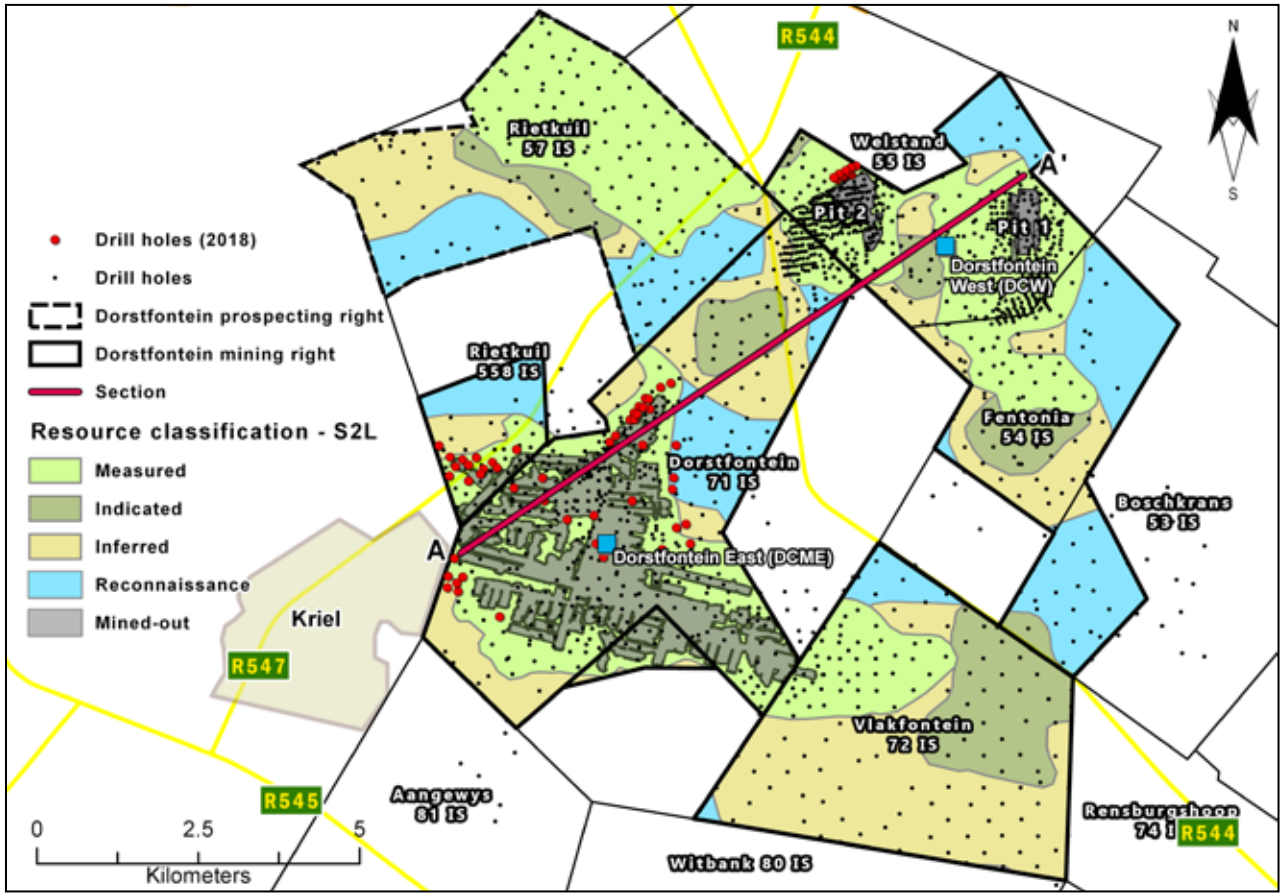
A major high-tension power line from the Komati power station crosses the property, in a south-westerly direction, over the northern part of the farm Fentonia 54IS and then swings westward over portions 1, 2 and 9 of the farm Dorstfontein 71IS. A secondary high-tension power line runs along the southern boundary of the farm Welstand 55 IS and continues over portions 2 and 3 of the farm Fentonia 54IS.

DCMW mining infrastructure extends over a portion of the farm Rietkuil 558 IS and portion RE 3 of the farm Dorstfontein 71IS, while DCME mining infrastructure lies on portion 11 of the farm Welstand 55 IS. Surface infrastructure consists of mine buildings (offices, workshops and change houses), a box-cut to access the coal seams, conveyor belt systems, coal-washing plant, pollution-control dams, coal stockpile areas, truck-loading facilities with weighbridges, discard dumps and a rapid coal-loading facility (rapid loading terminal) linked to the main Richards Bay coal terminal. DCMW mainly supports the inland market (ferrochrome and charring plants). However, screened product from DCMW is trucked to DCME, forming part of its export product. Historically, DCME has always catered only for the export market but, in 2019, it will support both the domestic Eskom and export markets. DCMW run-of-mine (ROM) is beneficiated in a heavy medium coal-washing plant for various sizes. Final plant product is screened and classified into large nuts, small nuts, jumbo peas, peas and duff. ROM from DCME is also beneficiated in a heavy medium coal-washing plant to produce a product that depends on the coal characteristics and contractual requirements.

Operation history

DCM complex mining and prospecting rights cover some 7 892 hectares which have been explored from the 1950s. To date, 1 692 boreholes have been drilled. However, the 2017 geological model was built using 1 282 boreholes with wash-quality information and excluding the remaining boreholes based on a rigorous data-validation process.

Figure 21: Dorstfontein complex



DORSTFONTEIN COMPLEX (CONTINUED)

Table 40: Dorstfontein operation history

Date range	Company	Material notes
1956	Natal Navigation Collieries Proprietary Limited jointly with Estate Company Proprietary Limited	Widespread drilling of 13 boreholes on the farms Dorstfontein 71IS, Welstand 55IS and Rietfontein 43IS
1970	Anglo American Proprietary Limited	Drilling of 37 boreholes for more detailed cover
1974 – 1975	South Cape Exploration Proprietary Limited	86 boreholes drilled, 340 samples analysed
1976 – 1978	Sun Mining and Prospecting Proprietary Limited, an Anglovaal exploration company	82 boreholes drilled, 328 coal samples analysed for washing characteristics
1980 – 1982	Anglovaal Proprietary Limited	100 boreholes drilled on the farm Dorstfontein 71IS
1996 – 1998	Anglovaal Proprietary Limited	Drilling of 105 boreholes on the southern portion of the farm Dorstfontein 71 to support a feasibility study of the S2 mining operation at DCMW. First coal in 1997
1999 – 2004	Total Exploration South Africa (TESA)	TESA took over the DCMW operation
2004 – 2007	Dorstfontein Coal Mines Proprietary Limited	Total Coal South Africa (TCSA) emerged from TESA. Continuous drilling for additional exploration and mine planning. In 2007, 140 boreholes drilled for the feasibility study of the proposed S4 mining operation at DCMW. An additional 25 boreholes drilled for specialised analyses
2008 – 2015	Dorstfontein Coal Mines Proprietary Limited	Since 2008, a total 1 022 boreholes drilled in both areas where ECC holds prospecting and mining rights. First coal recorded at DCME in 2011
2015 – 2018	Dorstfontein Coal Mines Proprietary Limited	Exxaro acquired TCSA in 2015. Feasibility study for DCMW S4L project approved as a replacement for current DCMW S2L operations

Operation geology

Coal measures of the Highveld and Witbank coalfields are hosted in the Ecca group, which includes the Vryheid and Volksrust coal-bearing formations. All coal seams in the ECC area are hosted in the Vryheid formation which ranges in thickness from 80m to 300m. There are five major coal seams present in the area, named from the base upwards as no 1 seam (S1), no 2 seam (S2), no 3 seam (S3), no 4 seam (S4) and no 5 seam (S5).

A granitic basement high, which forms part of the Smithfield Ridge and is referred to below as the Central plateau, divides the DCM complex into two separate geological domains and the Western and Eastern Limbs can be found on either side of this plateau. S1 is only developed in the central portions of the paleo-valleys, ranging in thickness from 0.1 to 2.5m. Underground extraction of this seam is considered uneconomic due to its highly variable thickness, inferior quality, isolated occurrence and coal devolatilisation. In the DCM complex, seam splitting is generally a provenance of detrital material resulting largely from the proximity of the seam to the Smithfield Ridge and, as a result, the S2 and S4 are further subdivided into S2L, S2U and S4L and S4U, respectively.

S2L is thinnest over palaeo-highs and thickest over troughs of palaeo-valleys. Two S2L thickness domains exist in the complex: in the west (DCMW), seam thickness ranges from 0.1m to 5m and, in the east (DCME), from 0.2m to 6.0m. In the north of DCMW, the S2L exists as a single coal horizon, generally devoid of stone partings. To the south of this block, an arenaceous parting splits the seam into an upper and lower subseam. The parting separating S2U and S2L in both the west and east attains a maximum thickness of 4.5m and, in the northern portion, a minimum of 0.2m with an average of 1.5m. S2U is considered uneconomic to mine separately by underground methods but is included for the opencastable blocks. Generally, S2L is the thicker of the two subseams and has better-quality coal. As such, S2L is theoretically the mining target. However, practical mining of S2L is often problematic due to parting between two subseams S2L and S2U.

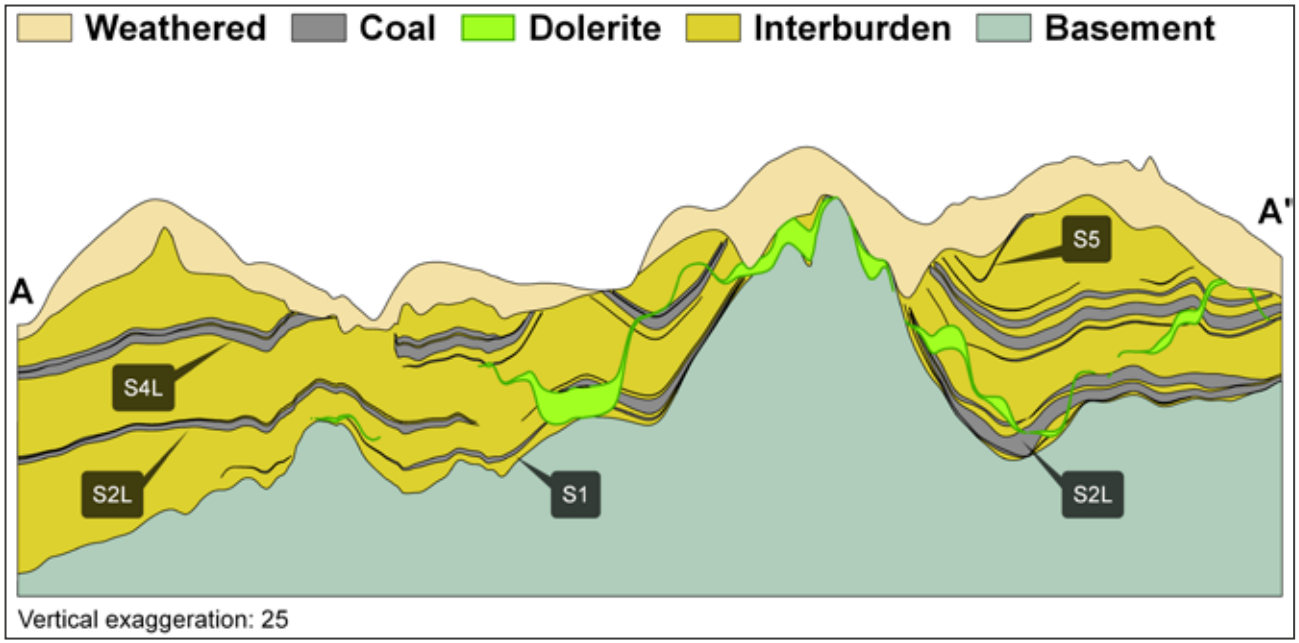
DORSTFONTEIN COMPLEX (CONTINUED)

On the basis of seam thickness and coal quality, S4L is the main underground exploitation target in seam 4. Seam 4 comprises coal and minor in-seam partings and is characteristically banded with alternating dull and bright coal. The seam contains one in-seam parting of significant thickness and lateral extent with a thickness average of 0.2m but can reach 0.5m. Generally, the average thickness of S4L is 3.0m. S4U has an average thickness of 1.7m in the west and, in the east, the thickness is generally more than 1.0m, reaching 3.0m in the centre of the palaeo-valley. Seam S4U has a higher ash content and thus lower CV compared to S4L. Thickness of the S5 is generally over 1.5m. Due to a significant parting, the seam is considered uneconomic for underground extraction but can be considered for selective extraction in opencast.

Numerous Jurassic dolerites (dykes and sills) intrude the Vryheid formation at various stratigraphic levels in the area. These intrusions negatively influence the stratigraphy and coal qualities, in places. The distribution of the lower coal seams is strongly influenced by basement topography while distribution of the upper seams is controlled by present-day topography. Most affected by basement topography are S1 and S2. Seams often thin and sometimes pinch out over and against palaeo-highs. Strata (including coal) are often faulted, although displacements are rarely more than 1m. Structural displacements, resulting from intrusions of dolerite sills through seams, often complicate mining seams.

The DCM complex geology and grade continuity are largely influenced by palaeo-topography, present-day topography, surface weathering, seam thickness variation (mainly between DCMW and DCME), in-seam parting, in-seam washouts, dolerite intrusions in the form of sills and dykes, resulting in minimal to extensive zones of devolatilisation. These geological risks are well managed through extensive drilling in areas of concern, using downhole wireline logging for better definition, underground channel sampling incorporated as points as observation in the short-term model, underground face mapping generally used to track both vertical and lateral variations in the lithology to assist with reconciliations as well as structural interpretation and surface mapping, particularly of basement outcrops. The information collated from the various approaches is incorporated in the structural model, together with additional potential risks from other disciplines and represented in a GIS-based risk and opportunity domain analysis (RODA), allowing for a more integrated approach to risk management.

Figure 22: Typical SW-NE section through Dorstfontein geological model



DORSTFONTEIN COMPLEX (CONTINUED)

Operation resource evaluation

All exploration boreholes are logged and sampled by experienced on-site geologists aligned and complying to logging and sampling standards and SOPs. Samples are selected according to seam boundaries, visual variation in the vitrinite content, assisted by density logs, and non-coal material present in the seam boundaries. Each sample submitted to the laboratories is accompanied by a unique sample number for validation and tracking as well as a submission list that serves as a sample advice sheet with instructions for analysis. Three major laboratories have been used over the past ten years: Australian Laboratory Services (ALS), Societe Generale de Surveillance (SGS) and CoalLab (Cotecna), all with SANAS accreditation (T0611, T0815 and T0612 respectively). All three laboratories have committed to assuring the quality of results provided to the customer by ensuring quality assurance, quality control, data validation and proficiency testing procedures are observed.

Table 41: Dorstfontein Coal Resource reporting criteria

Thickness cut-off (thickness and extraction height considerations)	Quality cut-offs (adb)	Geological loss*
Opencast ≤0.5m Underground ≤1.2m	Dry Ash Free Volatiles (DAFV) ≤26% Raw ash ≥50%	10% – 50% (domains)

**A 10% standard geological loss is applied but may vary based on the consideration of structural complexity (dolerite sill breakthrough – 50% loss within determined spatial extent), seam gradient (>4 degrees – 50% loss), dolerite sill proximity to seam (25% loss).*

Table 42: Dorstfontein Coal Resource estimation criteria

	Item	Description
Database	**Drillhole database**	Sable Data Warehouse
	Data datum	Cape LO29
	No. of drillholes used for resource estimation	1 282 of 1 580 boreholes in the database with washability data
	Validation	The laboratory conducts data validation and proficiency testing on samples submitted. In the Sable Database Warehouse, additional validations are conducted on points of observation where missing data and/or duplicate data are identified and corrected. Data is exported from Sable into csv files where it is subjected to 'coal sense' checks
	Data compositing and weighting	Data compositing is conducted per seam using a weighted value from the individual samples that make up the seam along with the RD and length of each individual sample. This is done in Geovia Minex
Model	**Previous model date**	2016
	Last model update	2017 (peer review in 2017)
	Geological modelling software	Geovia Minex 6.3.2
	Estimation technique	Growth algorithm – general purpose gridding
	Grid mesh size	25m x 25m
	Scan distance	2 000m
	Data boundary	200m
	Model build limits	Upper: limit of weathering and topography/collar Lower: basement/Dwyka
	Model outputs	Roof, floor and thickness grids generated for structure. Raw quality and washability grids
	Changes to modelling process	None

DORSTFONTEIN COMPLEX (CONTINUED)

Table 43: Dorstfontein Coal Resource classification criteria

Category	Type of boreholes	Borehole spacing	Structurally complex areas	Borehole/ha
Measured	Cored boreholes with applicable coal qualities	0 – 350m	Structural complexity and coal variability (RODA) additional infill drilling	0.49
Indicated	Cored boreholes with applicable coal qualities	350 – 500m	Structural complexity and coal variability (RODA) additional infill drilling	0.10
Inferred	Cored boreholes with applicable coal qualities	500 – 1 000m	Structural complexity and coal variability (RODA) additional infill drilling	0.06

Table 44: Dorstfontein Resource and Reserve statement

Category	2018 (Mt)	2017 (Mt)	Difference in tonnes (Mt)	Difference (%)	Reason for changes
Measured	156.4	158.1	(1.7)	(1)	0.9Mt and -1.7Mt depletion for DCMW and DCME respectively, 0.5Mt and 0.8Mt from DCMW and DCME respectively due to better constrained geo-loss domains applied in 2018
Indicated	137.5	142.4	(4.9)	(3)	
Inferred	52.8	47.4	5.4	11	
Total Resources (UG and OC)	346.6	347.9	(1.3)	0	
Proved	54.3	36.5	17.3	49	Inclusion of additional reserves Depletion, 1.0Mt and 1.8Mt from DCMW and DCME respectively as well as 22.4Mt inclusion of S4L UG reserves at DCMW and 31Mt inclusion of S4L and S2L UG reserves at DCME (Fentonia area)
Probable	40.5	7.7	32.8	426	
Total Reserves (UG and OC)	94.8	44.2	50.8	115	

Rounding of figures may cause computational discrepancies
All changes more than 10% are explained
Mining method: OC – opencast, UG – underground
Figures are reported at 100% irrespective of percentage attributable to Exxaro
Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt. Coal resources are quoted as mineable tonnes in-situ and refer to remaining resources after 31 December 2018 and 31 December 2017
Coal Resources are reported on a mineable in-situ (MTIS) basis
Coal Resources are quoted inclusive of Coal Reserves

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

DORSTFONTEIN COMPLEX (CONTINUED)

Table 45: Dorstfontein RPEEE considerations

Item	Criteria	Considered	Comment
Geological data	Data has been validated and signed off by competent person	Yes	Geological structure and depositional extent, seam thickness >1.2m (UG) and >0.5m (OC), <50% ash content, >24% DAFV. Coal qualities reported on an air-dry basis
Geological model	Geological model was considered and signed off	Yes	
Structural model	Structural model was considered and signed-off	Yes	
Mining	Mining assumptions considered and defined	Yes	OC and UG areas defined, aligned with exploitation strategy
Assurance	Minimum tier 1 assurance (Exxaro governance)	Yes	Compliant – update 2018
Economic evaluation	Concept-level exploitation with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	Only approved economic assumptions and parameters are applied
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Yes	Environmental and social concept assessment is done, applications and approvals are considered
Tenure	Formal tenure must be demonstrated. Reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national governmental legislation	Yes	Mining and prospecting rights licences are valid. Extensions or annexations will be lodged when necessary with reasonable expectations that the applications will be granted
Infrastructure	Assumptions used should be reasonable and within known/ assumed tolerances or have examples of precedence	Yes	Current infrastructure is considered
Market	Market/s identified – form part of an existing operation market strategy or potential market for which a conceptual market study exists	Yes	Operational strategies are aligned with existing markets

Operation reserve estimation

Scheduling of the reserve is determined using mining scheduling applications from XPAC. This is the same software used to develop the LoMP schedule.

The geological 3D model used for the reserve statement is referred to as the reserve geological 3D model. This reserve model differs from the resource model as the latter uses the full coal seam (with specific reporting assumptions) while the reserve model uses a select mining height based on practical mining heights and other modifying factors. The process ensures that the model represents practical aspects of the capabilities of production sections and their equipment.

A total of 5.7Mt of Inferred Resource is included in the LoMP, around 6% of total Coal Reserves. The majority is located along main developments that serve as access future reserve blocks well beyond the first five years of life of mine (LoM). The impact of including these Coal Resources is well understood and tested, and exploration activities are planned to upgrade these categories to a higher level.

DORSTFONTEIN COMPLEX (CONTINUED)

Table 46: Dorstfontein production figures

	Actual 2017	FC 2018	Actual 2018	FC 2019	FC 2020
DCME ROM (Mt)	1.94	2.20	1.85	2.44	2.48
DCMW ROM (Mt)	1.08	1.04	1.04	1.11	1.97
DCM COMPLEX ROM (Mt)	3.02	3.24	2.89	3.56	4.45

Table 47: Dorstfontein modifying factors considered in converting Coal Resources to Coal Reserves

Considerations	Underground	Opencast
Geological loss	10 – 25%	10 – 25%
Average thickness cut-off	1.4m	1.0m
Quality specification	5 200kcal/kg	5 200kcal/kg
Mining loss	0.05m	0.1m
Depth to roof	15m	–
Safety factor	1.6 – 2.0	–
Board width	6.5m	–
Barrier pillar	At least equal to the panel pillar width	–
Boundary pillar	15m	15m
Pillar centres	14m x 14m	–
Mining height	1.4m	–
Extraction factor	65%	–
Dilution	Already included in model	Already included in model
Contamination	0.05m	0.10m
Practical plant yield	Considered in reserving process	Considered in reserving process
Environmentally sensitive areas	Areas underlying wetlands and other eco-sensitive areas are excluded from reserves. A higher safety factor is used underneath rivers and surface structures	50m cut-off away from opencast mining activities
Legal	Mining right boundary	
Social	Considered in reserving process	
Geohydrological		

Known risks

DCME pits 1, 2 and 3 and Vlakfontein areas are affected by dolerite activity. Risk in these areas has been accommodated in mine planning by assigning higher geological loss values to areas reasonably expected to incur losses caused by dolerite activity.

The move at DCMW from S2 to S4L will result in changes to coal quality characteristics. These changes were accommodated in mine planning and DCM product and market strategy.

DCM was informed of prospecting rights being granted at Vlakfontein and Rietkuil Vhakoni which overlap with our existing mineral rights. Appeals were timeously submitted, and DCM has reasonable expectations that the conflicts will be favourably resolved.

We do not know of any pertinent risks or other material conditions that may impact on the company's ability to mine or explore, including technical, environmental, social, economic, political and other key risks.

Operational excellence

The implementation of the incline at DCMW to access the thicker, although somewhat lower quality, S4L is progressing well. The new development will accommodate three sections and plans to add a fourth section are under review. Expansion studies at DCME to access underground Coal Reserves through the highwall at pit 2 were concluded. The significant change in Coal Reserves reflects this development.

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

FORZANDO MINE

Operation overview

Forzando (FZO) complex, consisting of the Forzando North (FZON) and Forzando South (FZOS) operations and contiguous prospecting rights, is in the north-eastern corner of the Highveld coalfield, separated from the Witbank coalfield by the pre-Karoo Smithfield Ridge.

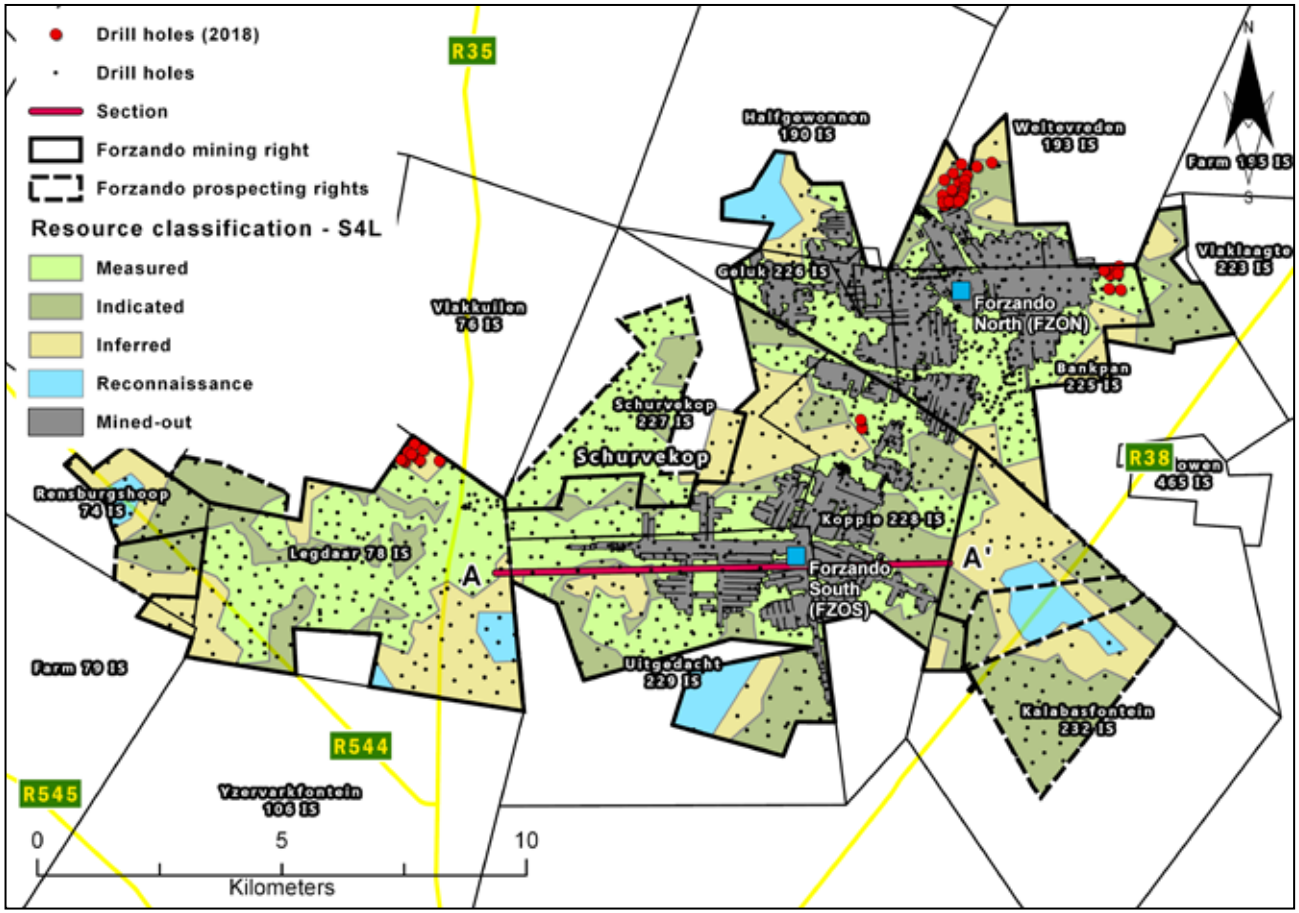
FZO complex is in Mpumalanga province, some 10km north of the town of Bethal. The complex is also some 55km and 77km from two major urban cities, eMalahleni and Middelburg, respectively. Major forms of transport include road and railway networks that operate throughout the year. Major roads servicing the area are R35 and R542. The complex is adjacent to several other mineral tenures, including the Anglo-American Coal project of Elders to the north and prospects of Canyon and Continental Coal to the south. Two provincial roads run through the property: Bethal-Middelburg tarred road lies just west of the area; and Bethal-Hendrina tarred road passes along the extreme eastern edge. Three secondary, all-weather dirt roads traverse the area. All other infrastructure such as houses, small power lines and irrigation systems are associated with agricultural activities.

The complex covers 12 113 hectares and comprises two underground operations, namely Forzando North Colliery (FZON) and Forzando South Colliery (FZOS). FZOS is characterised by mechanised bord-and-pillar mining using a suite of continuous mining (CM) equipment. The operation is currently exploiting the S4L with five CM sections and is supported by a fleet of primary and secondary mining equipment. FZOS is in its 14th year of operation. FZON also uses mechanised bord-and-pillar mining using a suite of CM equipment to exploit primarily the S4L, although S2L was also previously exploited. After operating for 20 years, FZON was placed under care and maintenance in February 2014. It was recommissioned in October 2018 with one CM section targeting the S4L and plans to introduce additional sections.

Surface infrastructure still in use includes: mine buildings (offices, workshops and change houses), box-cuts to access the coal seam, conveyor belt systems, two coal-washing plants and a rapid coal-loading facility (rapid loading terminal) linked to the main Richards Bay Coal Terminal via a privately-owned railway loop.

ROM from FZOS is conveyed by surface to the beneficiation plant at FZON. Both operations support the export market. Discard from FZON is rewashed to add to the coal product mix.

Figure 23: Forzando complex



FORZANDO MINE (CONTINUED)

Operation history

The complex has been exploited since the late 1960s, with several companies undertaking drilling campaigns.

Table 48: Forzando operation history

Date range	Company	Material notes
1966 – 1969	Anglo American Corporation	The first company to conduct an exploration programme
1995 – 1998	Anglovaal Minerals	FZO complex acquired by Anglovaal Minerals in 1980s. Exploitation of S4L started in 1995 at FZON
1999 – 2004	Total Exploration South Africa (TESA)	TESA took over the operations, exploitation of S4L continued at FZON
2005 – 2015	Total Coal South Africa (TCSA)	Further exploration work by TCSA. Exploitation of S4L started in 2006 at FZOS. FZON placed under care and maintenance in February 2014
2015 – 2018	Exxaro Coal Central (ECC)	TCSA became ECC after being taken over by Exxaro in August 2015. FZON reopened in October 2018 after being on care and maintenance for five years

FZO complex mining and prospecting rights cover 12 113 hectares. To date, 2 573 boreholes have been drilled, with only 1 937 falling in the respective FZO rights. The 2017 geological model was built using 1 386 boreholes with wash-quality information. In general, FZO complex has a borehole distribution of 0.11bh/ha, as per classification criteria in the table below. Exploration has been conducted through diamond core and open wire-lined (percussion) drilling as well as surface geophysical magnetic surveys.

Operation geology

Highveld coalfield hosts up to five coal seams in the middle ECCA Group sediments of the Karoo Supergroup. The stratigraphic sequence in the mine area includes five coal seams that can be correlated with seams found in the Witbank coalfield. The entire suite of five seams exists, with the thickest and most ubiquitous being the S2, S4 and S5 seams. S1 is restricted to palaeo-lows while S3 only occurs on the western side of the complex. Seam splitting is a common feature. Local Forzando nomenclature recognises the following seams, from the base upwards: S1, S1 lower, S2, S2 leader, S3, S4 and S5. The principal economic seams currently exploited are S2L and S4L, with the remaining seams being either too thin, laterally discontinuous, poor quality or impractical/uneconomical to mine.

FZO complex is characterised by two adjoining palaeo-valleys, one in FZON and the other in FZOS. The valley in FZON has higher-quality coal while FZOS is characterised by lower-quality coal. The different coal qualities are indicative of different depositional environments and thus the different geological domains. Remnants of the Smithfield Ridge exist in the north-western edge of FZON and northern extremity of Schurvekop.

S2 seam occurs over most of the Forzando area, except for areas of extreme palaeo-highs along the Smithfield Ridge, along the central portion and in an isolated palaeo-hill in the north-east of the complex. The seam varies in thickness from under 1.0m to over 6.0m, with siltstone and sandstone parting typically found in areas where the seam thickness exceeds 3.5m. The seam has been extensively devolatilised, leaving disconnected pockets of unaffected coal. Within these pockets, coal quality is extremely variable with high ash content resulting from the prevalence of thin shaly partings. The lack of continuity of unburnt coal renders it of no economic value.

Throughout the area the S4 consists, from top down, of S4A (a gritstone parting), S4U (siltstone and coarse-grained sandstone parting) and the S4L. In the east, the siltstone and coarse-grained sandstone below have been eroded, leaving only the overlying grit. Both S4A and S4U are rarely thick enough and too poor in quality to be considered economic. S4L is the only seam that is thick enough, of sufficient quality and developed throughout the area to warrant economic extraction in prevailing economics. In the FZO complex area, the thickness of the seam ranges from 0.5 to 4.0m with an average of 2.1m.

The total FZO area has been intruded by Karoo dolerites even though the impact on S4 is comparatively small and confined to those areas where they come close to or intersect the seams. Transgressive sills with a thickness of 5 to 30m have been noted, resulting in extensive burning of coal in areas, particularly where the sill either closely underlies or overlies the seam. Seams are also burnt and devolatilised near the sill transgression zones, with burnt zones ranging from a few metres to 20m.

Dolerite dykes and stringers with a thickness ranging from 0.5m to 5.0m are commonly encountered in the FZO complex. Dolerite structures have a tendency to pinch and swell, even over very short distances. Dolerite stringers are thought to be offshoots from the dykes which in turn feed from the dolerite sills below. Dykes in the area are noted as having a general preferred orientation of north-west to south-east and north-east to south-west. Burnt coal zones associated with dykes/stringers vary considerably from zero to ±10m with the width of the burnt zone not necessarily relating to the thickness of the dyke/stringer. These geological risks are well managed through extensive surface vertical and underground horizontal drilling in areas of concern, use of downhole wireline logging for better correlation, underground channel sampling incorporated in the short-term planning model, underground face mapping to track both vertical and lateral variations in the lithology (which assists with reconciliations and structural interpretation), and surface mapping, particularly of basement outcrops.

FORZANDO MINE (CONTINUED)

The information collated from the various approaches is incorporated in the structural model, together with additional potential risks from other disciplines and represented in a GIS based risk and opportunity domain analysis (RODA), allowing for a more integrated approach to risk management.

Operation resource evaluation

All exploration boreholes are logged and sampled by on-site experienced geologists, aligned and complying to Exxaro standards and SOPs. Samples are selected according to seam boundaries, visual variation in the vitrinite content (assisted by density logs) and non-coal material present in the seam boundaries. Each sample to be submitted to the laboratories is accompanied by a unique sample number for tracking and a submission list that also serves as a sample advice sheet with instructions for analysis.

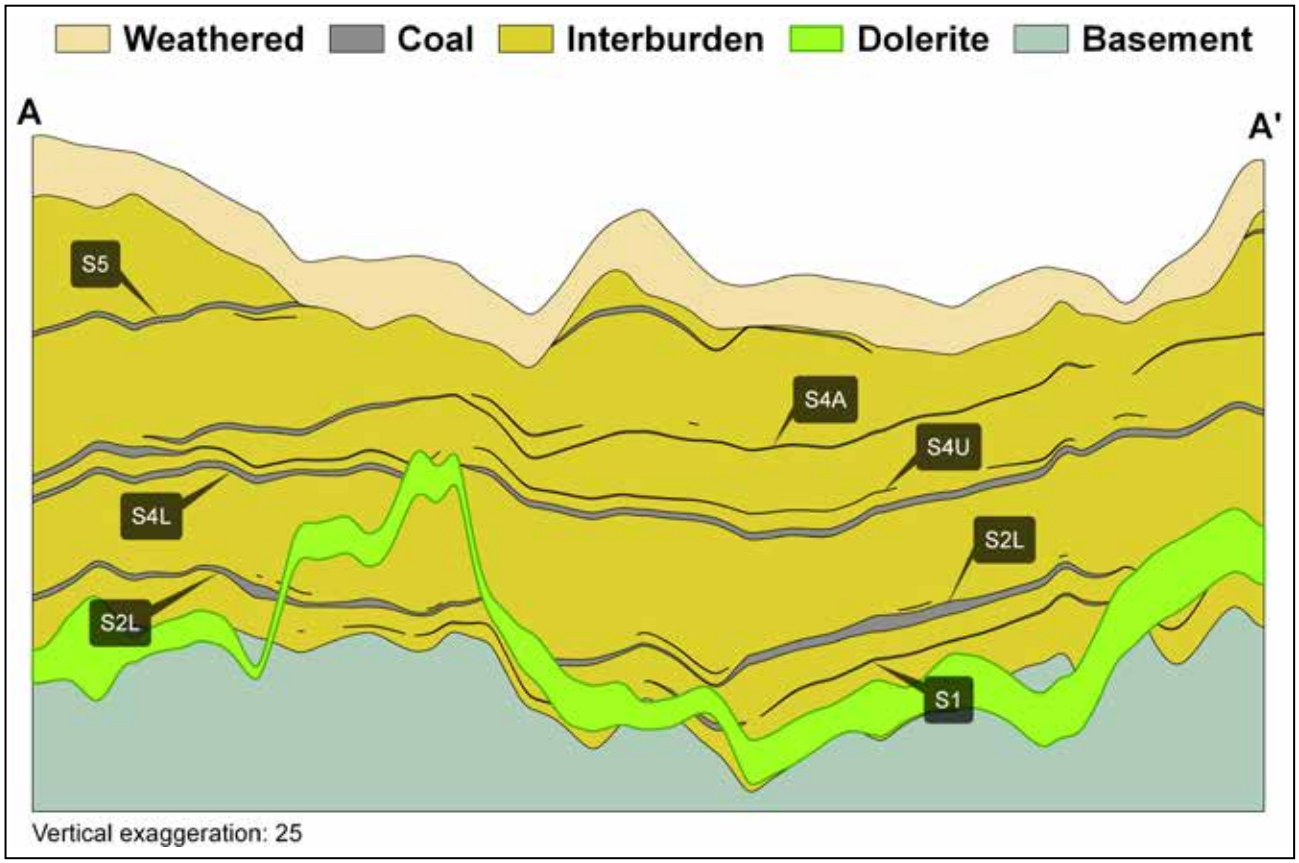
Three major laboratories have been used over the past ten years: Australian Laboratory Services (ALS), Societe Generale de Surveillance (SGS) and Bureau Veritas (BV), all with SANAS accreditation (T0611, T0815 and T0313, respectively). ISO and South African National Standards (SANS) have a standard set of tests and methods used for coal analysis by South African laboratories. The noted laboratories have committed to assuring the quality of results provided to the customer by ensuring quality assurance, quality control, data validation and proficiency testing procedures are observed.

Table 49: Forzando Coal Resource reporting criteria

Thickness cut-off (reporting and extraction height considerations)	Quality cut-offs (adb)	Geological loss[1]
Opencast ≤0.5m Underground ≤1.2m	DAFV ≤26% Raw ash ≥50%	10% – 50%

[1]A 10% standard geological loss is applied but may vary based on the consideration of structural complexity (dolerite sill breakthrough – 50% loss within determined spatial extent), seam gradient (>4 degrees – 50% loss), dolerite sill proximity to seam (25% loss). A 15% geological loss is applied (weighted average of the various risk domains)

Figure 24: Typical W-E section through Forzando geological model



FORZANDO MINE (CONTINUED)

Table 50: Forzando Coal Resource estimation criteria

	Item	Description
Database	Drillhole database	Sable Data Warehouse
	Data datum	Cape LO29
	Number of drillholes used for resource estimation	1 386 of 1 937 boreholes in the database with washability data
	Validation	The laboratory conducts data validation and proficiency testing on samples submitted. In the Sable Database Warehouse, additional validations are conducted on points of observation where missing data and or duplicate data are identified and corrected. Data is exported from Sable into csv files where it is subjected to 'coal sense' checks
	Data compositing and weighting	Data compositing is conducted per seam using a weighted value from individual samples that make up the seam, along with the RD and length of each individual sample. This is done in Geovia Minex
Model	Previous model date	2016
	Last model update	January 2017
	Geological modelling software	Geovia Minex 6.3.2
	Estimation technique	Growth algorithm – general purpose gridding
	Grid mesh size	25m x 25m
	Scan distance	2 000m
	Data boundary	200m
	Model build limits	Upper: limit of weathering and topography/collar Lower: basement/Dwyka
	Model outputs	Roof, floor and thickness grids generated for structure Raw quality and washability grids
	Changes to modelling process	None

FORZANDO MINE (CONTINUED)

Table 51: Forzando Coal Resource classification criteria

Category	Type of boreholes	Borehole spacing	Structurally complex areas	Borehole/ha
Measured	Cored boreholes with applicable coal qualities	0 – 350m	Structural complexity and coal variability (RODA)	0.15
Indicated	Cored boreholes with applicable coal qualities	350 – 500m	Structural complexity and coal variability (RODA)	0.07
Inferred	Cored boreholes with applicable coal qualities	500 – 1 000m	Structural complexity and coal variability (RODA)	0.02

Table 52: Forzando RPEEE considerations

Item	Criteria	Considered	FZO applicable comments
Geological data	Data validated and signed off by competent person	Yes	Geological structure and depositional extent, seam thickness >1.2m (UG) and >0.5m (OC), <50% ash content, >24% DAFV. Coal qualities reported on an air-dry basis
Geological model	2017 geological model was considered and signed off	Yes	
Structural model	Structural model was considered and signed off	Yes	2018
Mining	Mining assumptions considered and defined	Yes	Opencast and underground aligned with exploitation strategy
Assurance	Policy-driven governance, internal and external audits	Yes	External audit in 2018
Economic evaluation	Concept-level exploitation with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	Only approved economic assumptions and parameters are applied within current prefeasibility and feasibility studies
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Done	Environmental and social concept assessments were considered
Tenure	Only areas within acceptable prospecting and mining rights. In areas adjacent to existing rights where legal section application is pending with reasonable expectation of approval	Yes	Mining and prospecting rights are valid
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence	Yes	Current infrastructure
Market	Market/s identified – form part of an existing operation market strategy or potential market for which a conceptual market study exists	Yes	Operational strategies are aligned with existing markets

FORZANDO MINE (CONTINUED)

Table 53: Forzando Resource and Reserve statement

Category	2018 (Mt)	2017 (Mt)	Difference in tonnes (Mt)	Difference (%)	Reason for changes
Measured	81.5	83.1	(1.6)	(2)	Depletion, transfer and reconciliation
Indicated	35.9	35.2	0.7	2	Depletion, transfer and reconciliation
Inferred	25.8	26.1	(0.3)	(1)	Transfer and reconciliation
Total Resources	143.2	144.4	(1.2)	(1)	FZO complex depletion, FZON = -0.1Mt and FZOS = 2.1Mt, 1Mt disposal, 0.1Mt due to a change in estimation polygon outlines
Proved	38.6	37.8	0.8	2	Depletion and change in scheduling methodology
Probable	15.9	16.3	(0.4)	(2)	Depletion and change in scheduling methodology
Total Reserve	54.6	54.1	0.5	1	Depletion, FZON = -0.1Mt and FZOS = -1.7Mt., 2.3Mt due to a change in scheduling methodology

Rounding of figures may cause computational discrepancies
All changes more than 10% are explained
Mining method: UG – underground
Figures are reported at 100% irrespective of percentage attributable to Exxaro
Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt. Coal resources are quoted as mineable tonnes in-situ and refer to remaining resources after 31 December 2018 and 31 December 2017
Coal Resources are reported on a mineable in-situ (MTIS) basis
Coal Resources are quoted inclusive of Coal Reserves

Operation reserve estimation

Scheduling of the reserve is determined using mining scheduling applications from XPAC. This is the same software used to develop the LoMP schedule.

The geological 3D model used for the reserve statement is referred to as the reserve geological 3D model. This reserve model differs from the resource model in that the latter uses the full coal seam (including specific reporting criteria) while the reserve model uses a select mining height based on practical mining height considerations. The process ensures the model represents the practical aspects of the capabilities of current production sections and their available equipment.

A total of 7.5Mt of Inferred Resource is included in the LoMP, representing 12% of LoMP reserves. The majority is located along the boundaries of the life-of-mine (LoM) layout, well beyond the first five years of LoM. The impact of including these Coal Resources is well understood and tested, and exploration activities are planned to upgrade these categories to a higher level.

Table 54: Forzando production figures

	Actual 2017	FC 2018	Actual 2018	FC 2019	FC 2020
FZOS ROM (Mt)	2.38	2.25	2.02	2.13	2.17
FZON ROM (Mt)	–	–	0.05	0.81	0.09
FZO COMPLEX ROM (Mt)	2.38	2.25	2.07	2.93	3.06

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

FORZANDO MINE (CONTINUED)

Table 55: Forzando modifying factors considered with the conversion of Coal Resources to Coal Reserves

	Underground	Opencast
Geological loss	10 to 25%	10 to 25%
Average thickness cut-off	1.65m	1.0m
Quality specification	5 200kcal/kg	5 200kcal/kg
Mining loss	0.1m	0.1m
Depth to roof	30m, unless rock strength allows otherwise	-
Safety factor	1.6 to 2.0	-
Bord width	7.2m	-
Barrier pillar	At least equal to pillar width	-
Boundary pillar	15m	-
Pillar centres	14m x 14m	-
Mining height	2.1m	-
Extraction factor	65%	-
Dilution	Already included in model	
Contamination	0.1m	0.1m
Practical plant yield	Considered in the reserving process, as per wash-table information per block and empirically determined practical yield adjustment factor	
Environmentally sensitive areas	A higher safety factor is used underneath rivers and surface structures, together with weathering depth consideration	Coal blocks underlying wetlands and other eco-sensitive areas are excluded from reserves. 50m cut-off away from opencast mining activities
Legal	Mining right boundary	
Social	Socially sensitive areas in the mining right (eg graveyards) are excluded from reserves in the reserving process	
Geohydrological	Areas identified are flagged and excluded or reclassified in the reserving process	

Known risks

There is a high occurrence of dolerite dykes at the various Forzando operations. Applicable surface geophysical surveys, wire-logged vertical open holes and horizontal drilling are used to provide adequate cover ahead of mining panels.

We do not know of any pertinent risks or other material conditions that may impact on the company's ability to mine or explore, including technical, environmental, social, economic, political and other key risks.

Operational excellence

Forzando North was reopened in October 2018, accessing high quality Coal Reserves. Studies are under way to add production sections to current employed equipment.
A number of synergies with adjacent mineral right holders exist that might enhance the exploitation of boundary Coal Resources for both parties.

MATLA COAL MINE

Operation overview

Matla Coal is in the Highveld coalfield, immediately south of the Witbank coalfield. Matla is in Mpumalanga province, South Africa, some 15km west of Kriel and 63km south of eMalahleni. Two power stations, Kriel and Matla, are some 10km from the mine and it is contracted to supply bituminous coal to Eskom's Matla power station. Matla is on the P53-1 and R547 secondary roads branching off the R580 and R545. The well-known Kriel coal mine neighbours Matla mine to the east and the operations of Kuthala (South32) and Zondagsfontein (Anglo-American) to the north.

Matla comprises three underground production facilities: mine 1, mine 2 and mine 3. All three are long-life assets, each with a specific operating capacity comprising conventional coal circuits to produce bituminous coal. Work at mine 1 was stopped in 2015 due to pillar instability but an Eskom-approved project to relocate mine 1 access is currently under final review before implementation. Mine 2 and mine 3 use both bord-and-pillar and shortwall methods to mine S2 and S4 coal seams. In 2018, Matla implemented pillar extraction (stooping) as a mining method to maximise resource extraction. At mine 2, there are four CM sections (two currently stooping) and a shortwall section mining S2. At mine 3, there are three CM sections (one currently stooping) and a shortwall section mining S4 and three CM sections mining S2.

Existing infrastructure of the three shaft complexes includes three ventilation shafts, a network of conveyor belts, coal silos and stockpiles, a crushing-and-screening plant, four pollution-control dams, hospital, accommodation facilities, offices and workshops, and a water-treatment plant. Potable water is received from Eskom and no potable water plant exists on the mine property. Electricity is sourced from Eskom (Matla power station) and transporting coal from the mine to Matla power station is via a network of conveyor belts.

Matla mine produces thermal coal exclusively to Eskom. The Eskom contract renewal is in 2023 but Exxaro has reasonable expectations that the contract will be renewed. The Matla resource base is sufficient to sustain mining beyond the 2023 contract-review date, where resource thickness and quality permit mining according to existing operational standards.

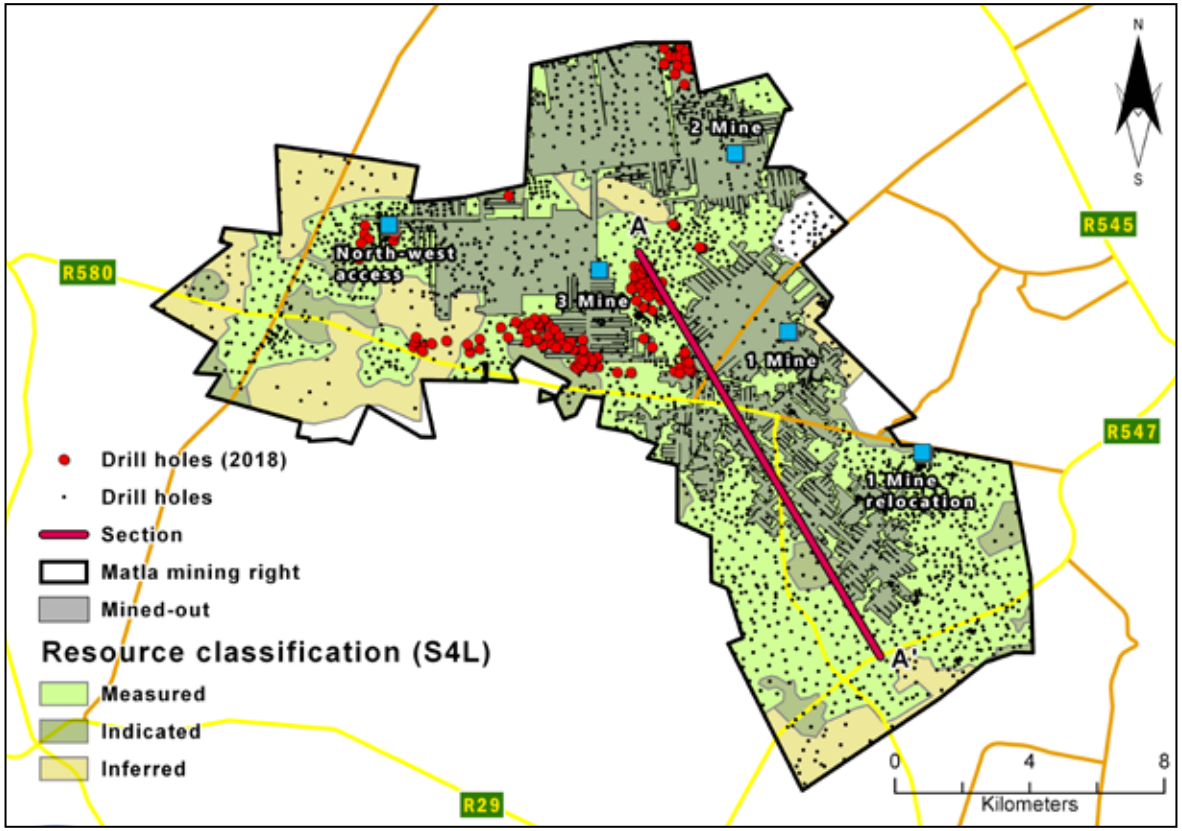
Operation history

Matla has been exploited from the mid-1970s and a significant amount of exploration and extraction activities has been conducted over the large tenure area of some 22 000 hectares. The 2018 geological model update includes 2 293 boreholes with applicable coal qualities.

Table 56: Matla mine history

Date range	Company	Material notes
1976 – 1990	Trans Natal Mines	Construction begun in 1976, with full production in 1983. 465 boreholes drilled in this period
1990 – 2018	Eyesizwe – Exxaro	Eyesizwe (now Exxaro) took over ownership from Trans Natal Mines. >1 950 boreholes drilled in this period

Figure 25: Matla mine



MATLA COAL MINE (CONTINUED)

Operation geology

The coal deposit at Matla Mine forms part of the Highveld coalfield. The coal seams are found in the Vryheid formation of the Karoo Supergroup. The stratigraphy sequence in the Matla area includes five coal seams that can be easily correlated with seams found in the Witbank coalfield. Coal seams in the area are generally flat and continuous, with subsequent igneous activity resulting in displacements and devolatilisation of coal seams at places.

The principal economic seams currently exploited are S2 and S4L, with mining of S5 terminated in 1998 due to high levels of contamination and subsequent increase in abrasive index. The Matla mining area is characterised by two distinct dolerite types, the B8 (porphyritic) and B4 (olive-rich) types which have varying effects on seam displacements and coal burning and devolatilisation. A dolerite sill with an average thickness of 10m is generally found above S5 in mine 2 and 3 but intersects the coal seams and underlies S2 in mine 1 and S4 on the south-western part of the reserves. This sill has burned and devolatilised S2 on the southern part of the mining area in mine 1. Floor rolls have been encountered in S2 workings and created some challenges in some mining sections. The floor rolls strike NE-SW vary in width between 50m and 200m and have amplitudes up to 1.5m. The floor rolls are more prominent if the seam floor is close to the basement contact. Sandstone lenses encountered are generally less than 0.5m in width but can reach up to 1.5m in thickness.

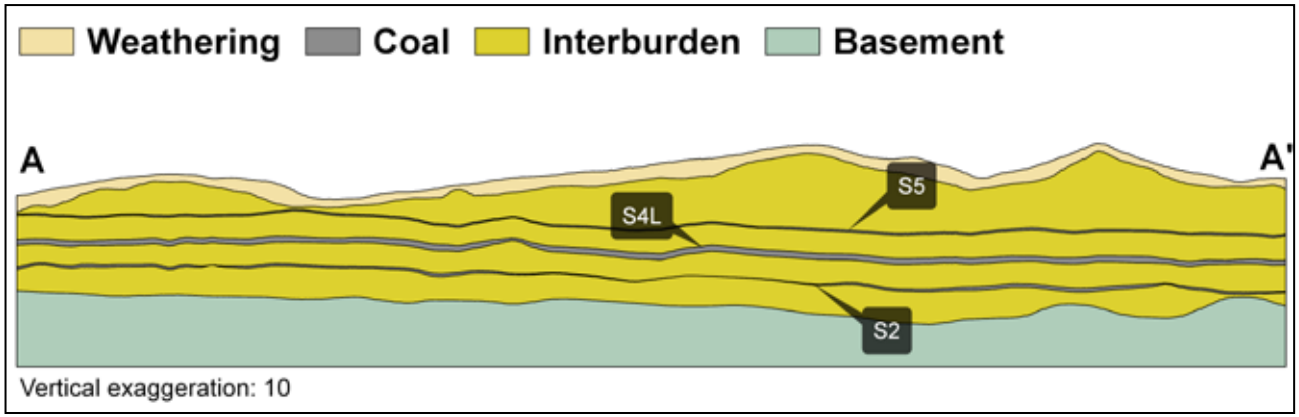
S5 was historically mined for a limited period but is currently not extracted. The seam is most prominent in the number 2 and 3 mining areas and, to a limited extent, in the Western Limb of the southern part of the mining rights area. The roof comprises ~0.5m of thick sandy micaceous shale at mine 2 that thickens up to ~1.6m in mine 3. Above this is a competent sandstone, usually saturated with water, resulting in a weathered parting between the two sequences. This presents challenges in supporting the shale during coal extraction and must, in most cases, be removed. The seam consists of mix-coal and torbanitic material with an average thickness of 1.5m.

Seam 2 at Matla is well developed in the NW part of the mining area, in the mines 2 and 3 resource areas. It thins out to the south, where thickness averages 1.2 to 2.5m. Coal qualities are also generally poor in this area, thus S2 is not generally mined in the southern portion of the mine area. Seam 4 is generally well distributed throughout mine 1, 2 and, to a limited extent, mine 3. Seam thickness various between 1.0 to 5.5m and consists of homogenous, dull lustrous coal interspersed with bright coal bands. S4 splits in two thin and poor-quality horizons impacting on the economic viability in mine 3. The best S4 qualities are on the southern part of the lease area (mine 1 area). However, S4 is heavily intruded by dykes in this area, creating significant challenges for coal extraction.

Table 57: Matla Coal Resource reporting criteria

Thickness cut-off (thickness and extraction height considerations)	Quality cut-offs (adb)	Geological loss
<1.8m	DAFV ≤26% CV <15MJ/kg	10% (may vary considering RODA)

Figure 26: Typical north-south section through Matla geological model



MATLA COAL MINE (CONTINUED)

Operation resource evaluation

Geological and structural models were updated in 2018, incorporating significant new information from drilling and results of reviewing previously excluded historical borehole information. The new information was used to review Coal Resource classification categories and enhanced specifically the outlines of the Indicated and Measured Resource categories.

All data collection (geological logging, description, interpretation, sampling, validation and capturing of drillhole cores information) is undertaken by qualified, trained and competent geologists on-site and aligned with Exxaro standards. A well-trained grade-control and geological mapping team undertakes mapping and reconciliation. Mapping captures intrusions, devolatilised coal, channel sandstones/in-seam partings, slumping structures, faults, joints, guttering, slabbing and floor rolls as well as measurements of mined heights, contamination and dilution. Dips and dip directions of all geological features and structures are measured and recorded. Surface mapping was only conducted where outcrops were observed.

Core loss for coal-seam intersections is recorded and a recovery of <95% through coal (by volume) is deemed unsatisfactory. Anomalies are investigated and redrilled if required. Wire-line logging is conducted on all vertical holes to enhance the definition of contacts and improve seam correlation.

All geological logging and sampling are undertaken by a team of on-site qualified, trained and competent geologists. Logging is conducted by recording of lithology down to centimetre according to the classification of the various coal 'lithofacies'/coal type zones or ply (shale-coaly; coal-shaly; coal dull; coal mixed, mainly dull; coal mixed; coal mixed, mainly bright; coal bright), based on discernible lithofacies change and identified marker horizons, particularly through coal zones. All holes are captured in the acQuire Technology Solutions geological database.

All core sampling is done at the drill sites. Samples are selected according to their respective coal-seam boundaries after thorough correlation. A general rule of >0.5m seam sample thickness cut-off is applied but is evaluated in-field where necessary. In addition, the proposed mining method, mining equipment and sample mass (chemical and physical analysis required) are also considered. In-seam partings are sampled together with coal zone samples, especially the PL parting (after considering thickness) within the seam.

All geological coal core samples are sent biweekly to Siza Coal laboratory (SANAS accreditation no T0447) in Kinross. ISO and South African National Standard (SANS) have a standard set of tests and methods used for coal analyses by South African laboratories.

Table 58: Matla Coal Resource estimation criteria

	Item	Description
Database	**Drillhole database**	acQuire
	Data datum	Cape LO29
	No drillholes used for resource estimation	2 293 of 2 500 in the database
	Validation	Conducted using queries in acQuire and Excel
	Data compositing and weighting	Conducted in Geovia Minex
Model	**Previous model date**	2017
	Last model update	May 2018
	Geological modelling software	Geovia Minex
	Estimation technique	Growth algorithm
	Grid mesh size	25m x 25m
	Scan distance	2 000m
	Data boundary	200m
	Model build limits	Upper: limit of weathering and topography/collar Lower: basement/Dwyka
	Model outputs	Roof, floor and thickness grids generated for structure Raw quality grids
	Changes to modelling process	None

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

MATLA COAL MINE (CONTINUED)

Resource classification was guided by SANS 10320 minimum guidelines (~350m spacing between boreholes, with quality and structural information). Additional closer-spaced drilling was conducted in areas of structural complexity to ensure timely geotechnical accessibility and mineability (fall-of-ground considerations) of Coal Resources/Reserves.

Table 59: Matla Coal Resource classification criteria

Category	Type of boreholes	Borehole spacing	Structurally complex areas	BH/ha
Measured	Cored boreholes with applicable coal qualities	0 – 350m	Closer-spaced boreholes and geotechnically logged holes are required to evaluate mineability	~0.136 (avg 2 and 4 seam)
Indicated	Cored boreholes with applicable coal qualities	350 – 500m		~0.06 (avg 2 and 4 seam)
Inferred	Cored boreholes with applicable coal qualities	500 – 1 000m		~0.05 (avg 2 and 4 seam)

Table 60: Matla Coal Resource and Reserve statement

Category	2018 (Mt)	2017 (Mt)	Difference in tonnes (Mt)	Difference (%)	Reason for changes
Measured	713	641	72	11	Increased confidence due to new drilling
Indicated	97	204	(107)	(52)	Increased confidence due to new drilling. Change in LoMP area. Refine classification criteria in Indicated and Inferred zones. Decrease in tonnes due to new drilling in structurally complex areas
Inferred	240	251	(11)	(4)	
Total Resources	1 050	1 096	(46)	(4)	
Proved	172	195	(23)	(12)	Coal extraction from stooping pillars reduced. Pillar extraction at mine 1 reduced because of inaccessibility of older areas
Probable	16	37	(20)	(56)	
Total Reserves	188	232	(44)	(19)	

Rounding of figures may cause computational discrepancies
All changes more than 10% are explained
Mining method: UG – underground
Figures reported at 100% irrespective of percentage attributable to Exxaro
Tonnages quoted in metric tonnes and million tonnes is abbreviated as Mt. Coal resources quoted as mineable tonnes in-situ and refer to remaining resources after 31 December 2018 and 31 December 2017
Coal Resources reported on a mineable in-situ (MTIS) basis
Coal Resources quoted inclusive of Coal Reserves

Table 61: Matla RPEEE considerations

Item	Criteria	Considered	Comment
Geological data	Data validated and signed off by competent person	Yes	Tested in 2018
Geological model	Geological model considered and signed off	Yes	Seam depth, seam thickness >1.8m, dry ash-free volatiles >26% air-dried CV >15MJ/kg, ash <50%. Coal qualities reported on an air-dry basis
Structural model	Structural model considered and signed off	Yes	Updated in 2018
Mining	Mining assumptions considered and defined	Yes	Underground
Assurance	Minimum tier 1 assurance (Exxaro governance)	Yes	2018 (model and chain of custody)
Economic evaluation	Concept-level exploitation with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	Life-of-mine exploitation study
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Yes	All required approvals in place. Additional requirements can be demonstrated in the context of local, regional and national legislation. Land acquisitions for future stooping can be achieved based on current acquisition strategy
Tenure	Formal tenure must be demonstrated. Reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national governmental legislation	Yes	Mining right (10 years)
Infrastructure	Assumptions used should be reasonable and within known/ assumed tolerances or have examples of precedence	Yes	Current infrastructure
Market	A potential market for the product with a reasonable assumption that this market is sustainable	Yes	Current coal-supply agreement

MATLA COAL MINE (CONTINUED)

Operation reserve estimation

Scheduling of the Coal Reserve is determined using mining scheduling applications from XPAC and ProgCad. The geological 3D model used for the Coal Reserve estimation is referred to as the reserve 3D model. The Coal Resource model uses the full coal seam while the reserve model only defines a select mining height. The process ensures the model represents reality for the technical capability of current production equipment.

At Matla, Indicated Resources are generally converted to Probable Reserves and Measured Resources to the Proved Reserve category, except if any modifying factors have not been (partly) fulfilled, where the resource is either not converted or downgraded to the Probable Reserve category, clearly stating the outstanding requirement and risk. The LoM was updated in the reporting year to incorporate new information used in the geological model update. All applicable modifying factors have been considered, specifically focusing on geotechnical as Matla faces several geological structural challenges.

A number of changes were made to the LoMP between 2016 and 2018 to accommodate the 2015 mine 1 closure, due to pillar instability. All mining sections of mine 1 had to be placed in mine 2 and 3 to ensure that planned tonnages and qualities complied to contractual agreements. These forced changes accelerated the need for high-resolution geological information in reserve areas only planned for later in the prior LoMP. Infill vertical drilling, supplemented by horizontal drilling and geophysical surveys, has therefore increased dramatically in the last three years and the Matla team has done exceptionally well in the absence of mine 1 to keep coal production stable. However, the number of reserve areas and associated mining flexibility will increase after the mine 1 relocation project was approved in the reporting year. Some 25Mt of Inferred Resource in the LoMP translate to 12% of total LoMP. However, only 1.25% of Inferred Resources are within the five-year production plan, again illustrating the exceptional work of the mining team to minimise the mine 1 closure impact on Matla.

Table 62: Matla production figures

	Actual 2017	FC 2018	Actual 2018	FC 2019	FC 2020
ROM (Mt)	7.90	7.09	6.70	6.31	7.54

Table 63: Matla modifying factors in the conversion of Coal Resources to Coal Reserves

Modifying factors	Value
Geological loss	10% (already included in model)
Average thickness cut-off	>1.8m and <4.8m
Quality cut-offs (adb)	DAFV >26% and CV >15MJ/kg
Mining loss	Already included in model, based on specific geological conditions and mining restrictions
Depth to roof	40m, unless rock strength allows otherwise
Safety factor	Tertiary panels 1.6, main development 2.0
Bord width	7.2m
Barrier pillar	At least equal to pillar width
Boundary pillar	15m
Pillar centres	19m x 19m or depending on depth and safety factor
Mining height	>1.8m and <4.8m
Extraction factor	Already included in model
Dilution	Already included in model
Contamination	Use select seam
Practical plant yield	N/A
Environmentally sensitive areas	Areas underlying wetlands and other eco-sensitive areas are excluded from reserves. A higher safety factor is used underneath rivers and surface structures
Legal	Mining right boundary
Social	None
Geohydrological	None

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

MATLA COAL MINE (CONTINUED)

Known risks

Dolerite sills and dykes pose a risk for operations at Matla. Dykes have been identified through both geophysical surveys and mining observations and are known to affect S4 at mines 1 and 2 as well as S2 at mine 3. Dykes impact on production rate and roof stability, where sill activity causes burnt coal, devolatilisation and considerable stability and mine-panel accessibility challenges. The challenges are addressed through a suite of exploration activities and are generally proactively accommodated in mine planning. Continuous surface exploration drilling aims to improve sill characterisation in mine 2, while underground horizontal drilling is used to pinpoint dykes in operating sections at mines 2 and 3. Unforeseen geological structural complexity (faulting and intrusives) poses risk for specifically the low seam reserves at mines 2 and 3. Geological faults with a significant offset have been encountered and they have considerable impacts on mining sections.

Sizeable pillars of generally good qualities with the potential to be mined by the stooping method, are left behind due to current mining equipment limitations. Stooping was introduced in 2018, but timely environmental approvals and surface-right acquisitions are vital for continuous extraction.

Operational excellence

The approvals of both mine 1 relocation and the two (Mine 2, 3) expansion projects (called the NW access projects) are significant achievements. Both projects will unlock considerable value for the operation and provide vital mining flexibility for mine planning and operational teams.

The Matla mine 3 S4 turnaround strategy was implemented to embed lean performance management to drive accountability and improve culture. In addition, implementation of the Masakhane project and its top five initiatives is seen as an exceptional achievement:

- Reduction in conveyor downtimes/delays by improving section and trunk conveyor availability
- Improved plant throughput by reducing plant downtimes
- In-bye downtime reduction from primary in-bye equipment
- Improved geological information through an integrated exploration strategy
- Cost saving on capital projects by 10% by implementing value engineering.

Matla has progressed exceptionally with digitalising its critical management key performance areas. The management dashboard enables the operation to observe and track operational activities from RoM to plant to product.

LEEUWPAN COAL MINE

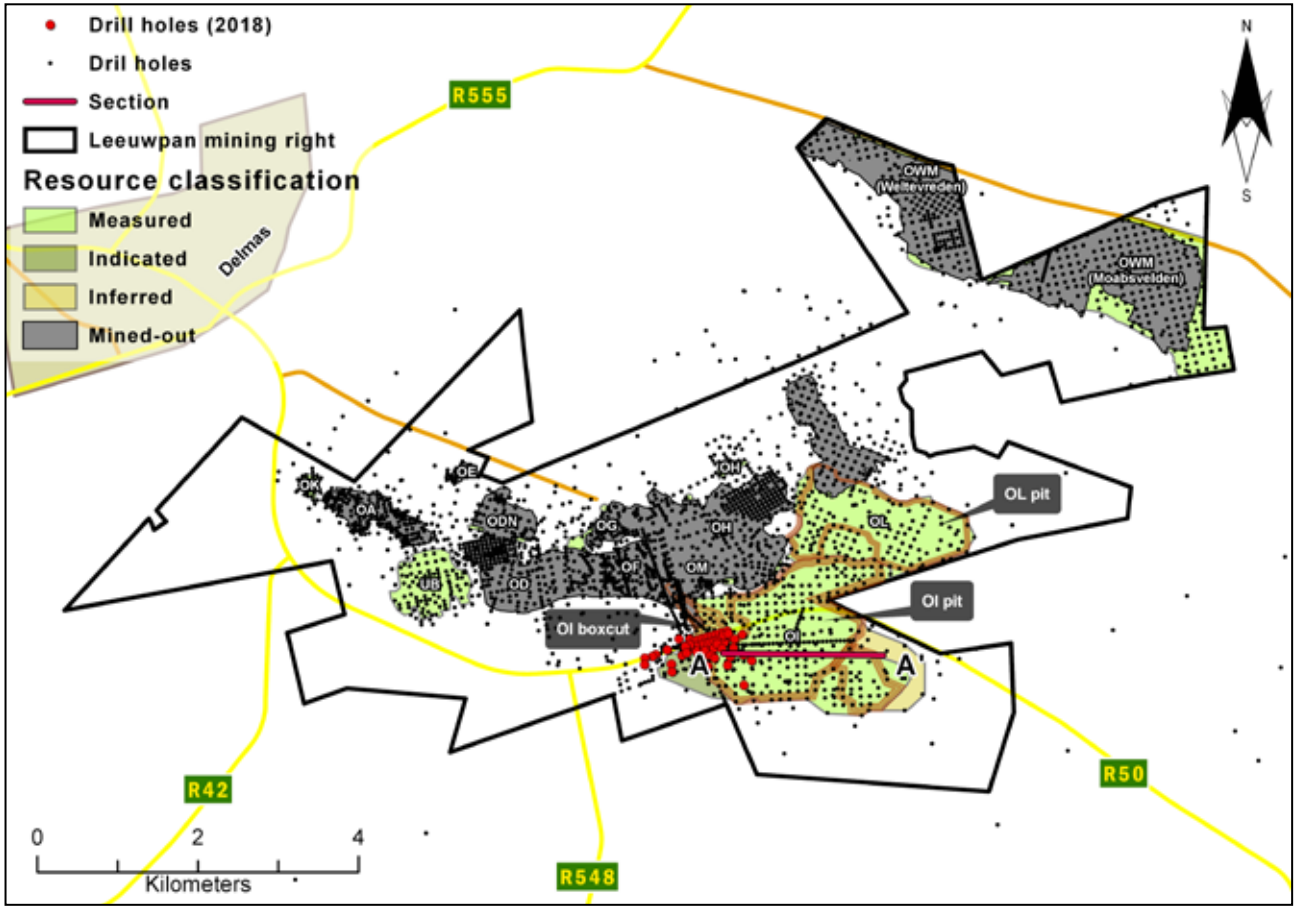
Operation overview

Leeuwpan coal mine is in the Delmas coalfield, on the western border of the Witbank coalfield. Leeuwpan, in the Victor Khanye local municipality in Mpumalanga province, is 10km south-east of the town of Delmas, 80km east of Johannesburg and 70km south-east of Pretoria. It lies alongside the R50 hard-topped secondary road and is serviced by a rail track that includes a rapid load-out station.

Leeuwpan is an opencast operation with various reserves, in various pits, mined simultaneously. Current mining operations are on the OJ, OL and OWM reserves with the introduction of OI reserves. OJ was depleted in 2018. The OI box-cut was completed in September 2018, with first coal expected in Q1 2019. The mine uses trucks and shovels for mining-related operations. We estimate that the mine will be in production until 2031, with the mining right lapsing in 2040. Leeuwpan supplies both domestic and export markets. The mine is equipped with a rapid rail load-out station, which is the preferred means of coal offtake, although road transport is accommodated.

Leeuwpan has two dense medium separator (DMS) plants that beneficiate export thermal coal and a crush-and-stack (CS) plant that handles selectively mined thermal coal, mainly for the local market. The second DMS plant, commissioned in 2016, is operated by Fraser Alexander (FA DMS). The original DMS plant produced a 5 700kcal/kg product whose market ended in Q4 2018, necessitating the change to a 5 200kcal/kg product. The FA DMS, on the other hand, was geared to produce a 5 200kcal/kg product. The CS produced a 4 200kcal/kg product. All three plants produce mainly thermal coal.

Figure 27: Leeuwpan coal mine



LEEUWPAN COAL MINE (CONTINUED)

Operation history

Leeuwpan has 4 152 boreholes in the mining right covering 4 269 hectares, but only 2 215 falls in the resource blocks. These boreholes were drilled in various campaigns and not all boreholes are reliable, so only 871 have been used in geological modelling. All Measured Resources at Leeuwpan are currently at 100m x 100m drill spacing.

Table 64: Leeuwpan operation history

Date range	Company	Material notes
Up to 1988	Southern Sphere	262 borehole records exist for this period. Leeuwpan was sold to Kumba in 1988
1988 – 2006	Kumba Resources	Exploration began in 1990. Box-cut commissioned in 1992. Ceded rights to Exxaro Resources in 2006
2006 – 2018	Exxaro Resources	Ongoing exploration campaigns focused mainly on operational de-risking drilling programmes

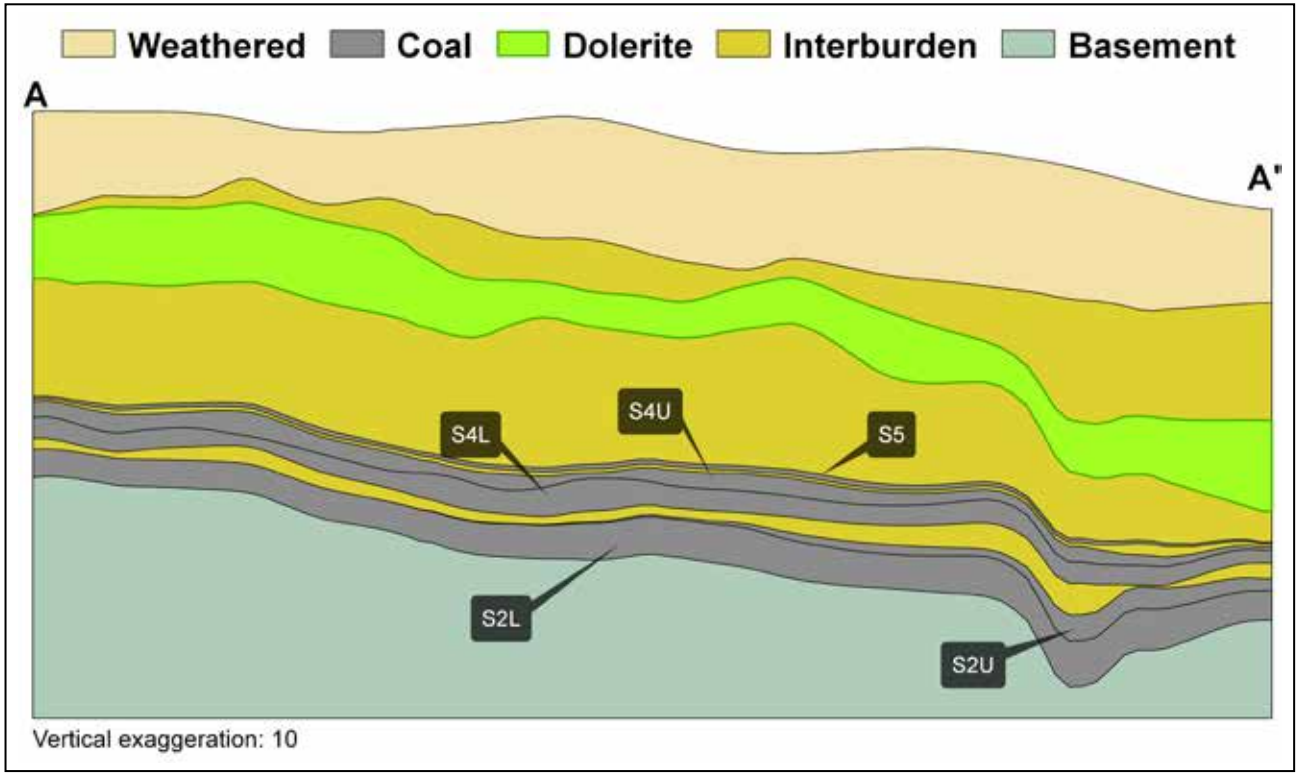
Operation geology

Two coal seams have been identified at Leeuwpan: top coal seam (TC) and bottom coal seam (BC). BC correlates with the number 2 seam of the Witbank and Highveld coalfields and TC correlates to the number 4 and 5 seams. BC qualities are generally higher than TC qualities.

The coal seams at Leeuwpan are primarily interbedded with sandstone, shale and carbonaceous shale. The coal was deposited on glacial sediments of Dwyka tillite which, in turn, were deposited on dolomite of the Transvaal Supergroup. A significant amount of magma intruded as concordant sills of dolerite in the Karoo strata in the Delmas area. Associated with the dolerite intrusion are numerous thin dolerite dyke structures that transgress the stratigraphy. Factors controlling geological and quality continuity are mainly surface weathering, significant variation in seam thickness due to an undulating tillite floor, faulting associated dolerite activity and dolomitic basement, and devolatilisation and weathering due to dolerite intrusions (sills and dykes).

The average total seam thickness at Leeuwpan is 10.9m, with an average raw calorific value of 20.1MJ/kg, raw volatile matter of 18.7% and raw ash content of 31.4% (adb). These qualities require beneficiation for export-quality products.

Figure 28: Typical cross-section through Leeuwpan geological model (Moabsvelden)



LEEUWPAN COAL MINE (CONTINUED)

Operation resource evaluation

Samples are named and numbered as per the standard task procedure at Leeuwpan (STP-LP-PO.003) which states that: samples should be numbered on the BH core using a wax marker in a different colour to that of the lithology code. The number of samples is recorded on the log sheet as per STP-LP-PO.002. Numbering of the sample tag is written in the order of reserve BHID/sample number, example, MN971/2.

Samples are split on the lithological contact, if needed, use a chisel and hammer to ensure a clean break. Each sample is put in an individual bag with all contents represented in that interval, ensuring no contamination occurs between materials to be sampled. Should there be any unwanted material in the bag, a comment is made on the sample sheet. Once the sample is in the bag, a tag is attached. Two sample tags are written on plastic sample tags using a permanent marker. One sample tag is placed inside the bag and the second on the outside of the bag when sealed with a cable tie.

In 2014, Bureau Veritas was awarded the coal quality analyses contract for sample preparation and analyses. Raw RD is firstly determined, the sample is then crushed to -12.5mm and the 0.5mm fraction is screened out. Raw analysis is done on the +0.5mm -12.5mm material and float-sink analyses performed at float RD: 1.4, 1.5, 1.6, 1.7 and 1.8. Proximate analysis, CV and Sulphur are performed on each fraction. All sample preparation is done in accordance with ISO 3909 parts 1 to 5.

Bureau Veritas is SANAS-accredited for analytical work and participates in monthly local and international round-robins.

Table 65: Leeuwpan Coal Resource reporting criteria

Thickness cut-off (thickness and extraction height considerations)	Quality cut-offs (adb)	Geological loss
<2m (2014 model) <1m (2015 model and onwards)	Ash >50%	5%

Table 66: Leeuwpan resource estimation criteria

	Item	Description
Database	**Drillhole database**	acQuire
	Data datum	Cape LO29
	No drillholes used for resource estimation	2 293 of 4 152 in the database
	Validation	Conducted using queries in acQuire and Excel
	Data compositing and weighting	Minex
Model	**Previous model date**	2016
	Last model update	2018
	Geological modelling software	Geovia Minex
	Estimation technique	Growth algorithm
	Grid mesh size	20m x 20m
	Scan distance	2 000m
	Data boundary	200m
	Model build limits	Upper: limit of weathering and topography/collar Lower: basement/Dwyka
	Model outputs	Roof, floor and thickness grids generated for structure. Raw quality grids Wash quality grids
	Changes to modelling process	None

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

LEEUWPAN COAL MINE (CONTINUED)

Table 67: Leeuwpan Coal Resource classification criteria

Category	Type of boreholes	Borehole spacing	Structurally complex areas	BH/ha
Measured	Cored boreholes with applicable coal qualities	0 – 100m	Resource blocks limited by faults, dolerite sill breakthrough and devolatisation. Geotechnical risks associated with faulting, dykes, sill and weathering – infill drilling	1.1
Indicated	Cored boreholes with applicable coal qualities	100 – 200m	Resource block limited by devolatisation and coal depth – infill drilling	0.6
Inferred	Cored boreholes with applicable coal qualities	200 – 1 000m	Resource block limited by devolatisation – infill drilling	0.2

Table 68: Leeuwpan Resource and Reserve statement

Category	2018 (Mt)	2017 (Mt)	Difference in tonnes (Mt)	Difference (%)	Reason for changes
Measured	101.07	118.19	(17.12)	(14.49)	Mining depletion, disposals based on RPEEE and movement of resources from inside to outside LoM
Indicated	2.59	0.00	2.59		New information at OI West
Inferred	3.60	3.69	(0.09)	(2.44)	Reporting methodology due to re-digitalisation of reporting strings
Total Resource	107.26	121.88	(14.63)	(12.00)	
Proved	53.65	61.87	(8.22)	(13.29)	Mining depletion
Probable	6.19	3.25	2.94	90.46	New information for OI West
Total Reserves	59.84	65.12	(5.28)	(8.11)	

Rounding of figures may cause computational discrepancies
All changes more than 10% are explained
Mining method: OC – opencast
Figures reported at 100% irrespective of percentage attributable to Exxaro
Tonnages quoted in metric tonnes and million tonnes abbreviated as Mt. Coal resources quoted as mineable tonnes in-situ and refer to remaining resources after 31 December 2018 and 31 December 2017
Coal Resources reported on a mineable in-situ (MTIS) basis
Coal Resources quoted inclusive of Coal Reserves

Minex is used to model the coal seams and estimate in-situ Coal Resources at Leeuwpan. Coal resource block sizes vary, and boundaries are determined by farm boundaries, coal qualities, coal thicknesses, infrastructure and geological structures. The model generates grid surfaces for the upper and lower boundaries of the coal seams from borehole intersection points. The grid surfaces of the top of a seam and bottom of the seam are then subtracted from each other to estimate the thickness of the seam. The washability qualities associated with each sample are also converted from point to grid data using the same Minex growth technique. The method gives smooth surfaces which replicate the regional trends of geology, while reflecting local anomalies.

LEEUWPAN COAL MINE (CONTINUED)

Table 69: Leeuwpan RPEEE considerations

Item	Criteria	Considered	Comment
Geological data	Data validated and signed off by competent person	Yes	
Geological model	Geological model considered and signed off	Yes	Seam depth, seam thickness >2m (2014 model), seam thickness >1m (from 2015 model). Coal qualities reported on an air-dry basis
Structural model	Structural model considered and signed off	Yes	
Mining	Mining assumptions considered and defined	Yes	OC
Assurance	Minimum tier 1 assurance (Exxaro governance)	Yes	2018
Economic evaluation	Concept-level exploitation with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	Life-of-mine exploitation study
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Yes	Current required approvals in place, except for OI West where IWUL had been granted for infrastructure. Approval for mining is pending
Tenure	Formal tenure must be demonstrated. Reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national governmental legislation	Yes	Mining right valid to 2040
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence	Yes	Current infrastructure
Market	A potential market for the product with a reasonable assumption that this market is sustainable	Yes	Current coal supply agreement

Operation reserve estimation

Scheduling of reserve is determined using mine scheduling applications from XPAC, the same software used to develop the LoMP schedule.

There is no difference between resource grids and reserve grids. Grid validation for Leeuwpan is conducted by checking for negative thicknesses, ensuring contact integrity and checking energy ratios to ensure progressive increase down the wash tables.

At Leeuwpan, the Measured Resources are all converted to Proved Reserves, except for UB, where it is a Probable Reserve because of low volatiles and absence of a market for this quality of coal. Indicated Resources are converted to Probable Reserves as is the case for OI West.

Table 70: Leeuwpan production figures

	Actual 2017	Actual 2018	FC 2019	FC 2020	FC 2021
ROM (Mt)	5.60	6.65	6.87	6.91	6.89

LEEUWPAN COAL MINE (CONTINUED)

Table 71: Leeuwpan modifying factors in the conversion of Coal Resources to Coal Reserves

Modifying factors	Value
Geological loss	5%
Average thickness cut-off	0.5m on all seams except S5, which is 1m
Quality cut-offs	N/A
Mining loss	25% for S5; 5% for all other seams
Boundary pillar	100m
Dilution	–
Contamination	5% on DMS plants and 1% on CS plant
Mining recovery efficiency	5% (CS); 5% (DMS bypass)
Planned average slope angles	45 degrees. For highwall stability, soft material is mined at least one strip ahead of hard material and coal-mining activities
Practical plant yield	90% DMS; 90% FA DMS, slimes loss on DMS of 9% and on FA DMS of 15%
Strip ratio cut-off	N/A
Environmentally sensitive areas	OJ (environmentally sensitive areas such as wetlands)
Legal	OWM; OJ
Social	Socially sensitive areas in the mining right (eg graveyards) are excluded from reserves in the reserving process
Geohydrological	Pit floor was taken into consideration to minimise water handling in the pit face

Known risks

The OI west portion of the Coal Reserve is still classified as Probable as Leeuwpan is still awaiting approval of the integrated water use licence (IWUL). Geological challenges (eg seam floor undulation and presence of sill and dykes) are addressed through proactive infill drilling and mine planning.

Operational excellence

DMS bypass project to improve plant throughput on RoM with in-spec raw qualities. Leeuwpan is running a number of operational excellence initiatives to improve productivity, including:

- Overburden optimisation
- Improve DMS throughput
- Frazer Alexander plant RoM circuit improvement (upgrade)
- Cost reduction
- Mining fleet improvement
- Improve equipment availability and reliability.

The Leeuwpan integrated operations centre is intended to increase operational throughput by optimising the value chain. Having an across-the-board view of operations, it will be possible to make timely decisions for better control of interruptions across the value chain.

TUMELO COAL MINE

Project overview

Tumelo Coal Mine forms part of Exxaro Coal Central (ECC), and is in Mpumalanga, 15km north-west of the town of Hendrina and 5km south-east of Hendrina power station. The Hendrina-Middelburg tarred road passes 6km east of the property. An all-weather dirt road linking the town of Hendrina and the power station runs 500m to the west of the property, while the Wonderfontein-Broodsnyersplaas railway line lies 2km west, with the closest siding being Pullenshope, 3.5km away.

Tumelo's mining right (116 MR) covers 462.9ha on the farm Boschmanskop 154 IS. Following the purchase of Total Coal South Africa (TCSA) assets by Exxaro in August 2015, the current Tumelo shareholding is 51% Mmakau Mining and 49% ECC.

Surface infrastructure still in use includes: mine buildings (offices, workshops and change houses), box-cuts to access the coal seam, conveyor belt systems and a ROM stockpile facility. After operating for six years, Tumelo ceased production in January 2014 after its mining contract expired, and it was placed on care and maintenance.

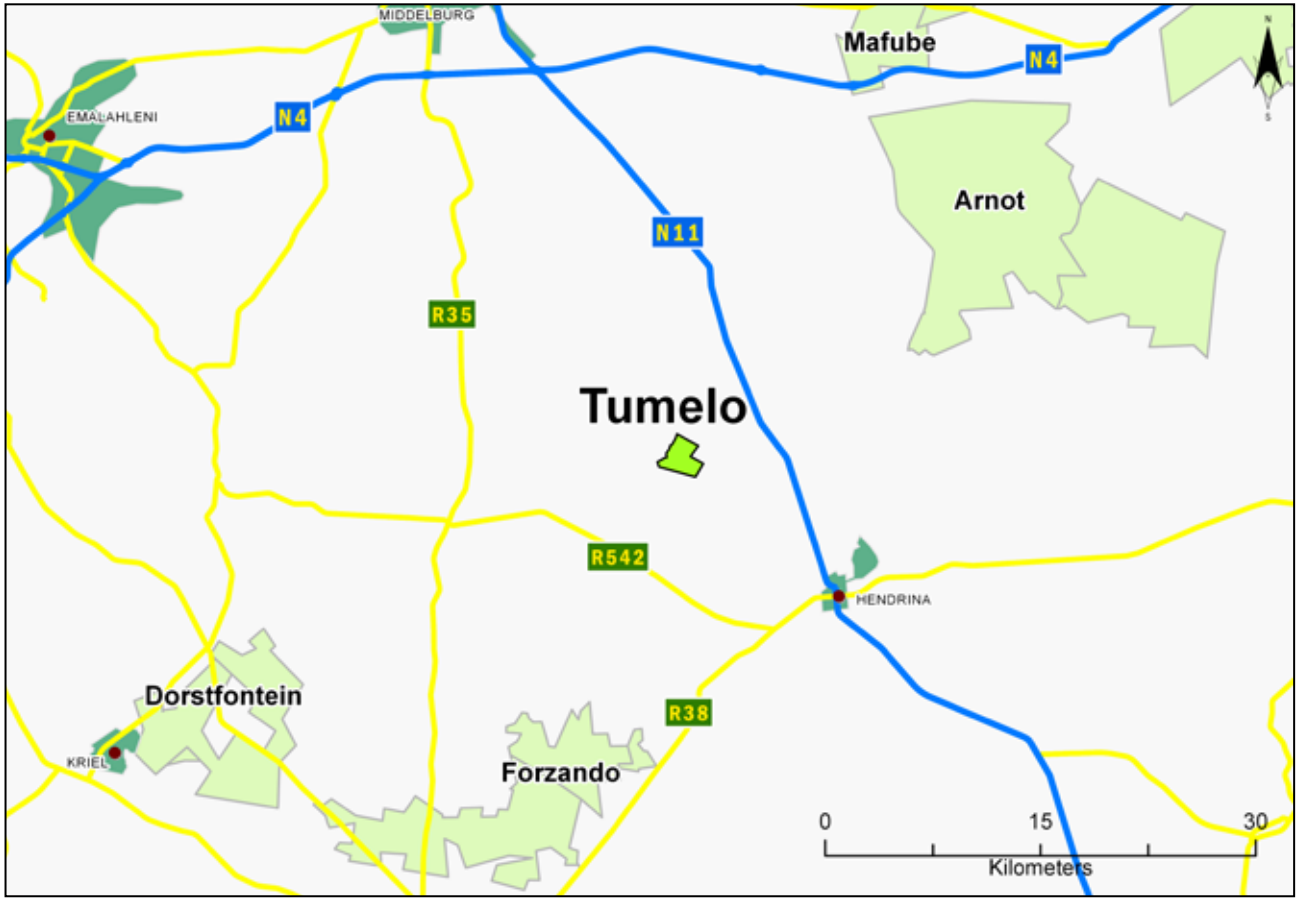
Since then, a series of technical and economic evaluations were conducted by both TCSA and Mmakau Mining, reviewing the potential of the remaining mineable reserves, mining method and production rate. Mmakau Mining is currently reviewing the option to recommission the operation in Q2 2019.

Tumelo exploits seam 2 on the edge of the Springs-Witbank coalfield and RoM was trucked using existing roadways to Forzando North (FZON) where it was beneficiated for a 5 800kcal/kg export product.

Project history

Exploration activities started in the early 1990s, with a mining right submitted in 2006 and first coal production in 2009. To date, there are 132 boreholes (103 with coal wash data) in Tumelo's mining right area. The 2017 geological model update incorporated all existing boreholes with wash quality information. In general, Tumelo has a borehole distribution of 0.22bh/ha.

Figure 29: Tumelo locality map

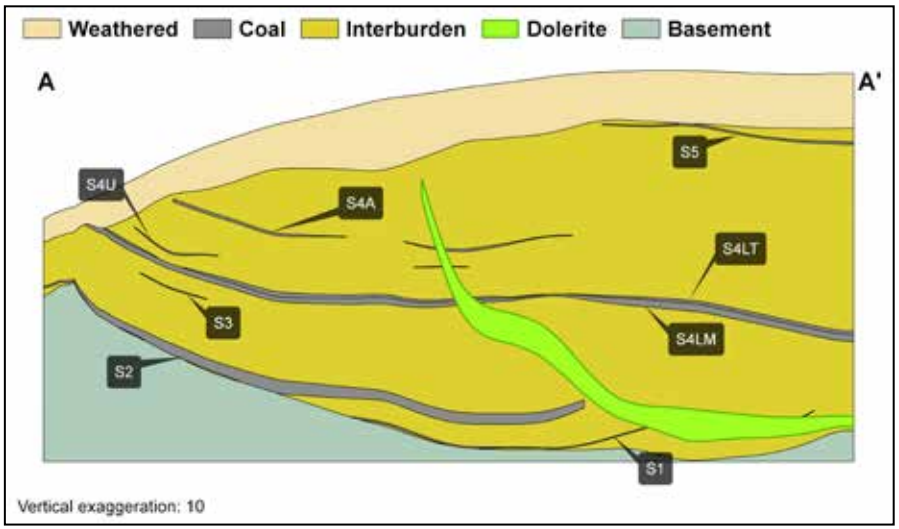


TUMELO COAL MINE (CONTINUED)

Table 72: Tumelo project history

Date range	Company	Material notes
1990	Senekal Mine	The first company to conduct exploration programme, drilling 26 boreholes
1991	Hanover Mining	Further exploration work, 34 boreholes drilled
2002	Total Exploration South Africa (TESA)	TESA acquired the project, with 18 boreholes drilled during its tenure. A feasibility study in 2002 confirmed the presence of economic Coal Reserves. The Boschmanskop project would later become known as Tumelo
2004 – 2013	Total Coal South Africa (TCSA)	Further exploration work undertaken by TCSA. Mining right applied for in 2006 in the name of Tumelo Coal Mine. First coal recorded in 2009, exploiting S2 via bord-and-pillar method. Mining outsourced to SBS Mining Proprietary Limited, a mining contractor. Initially ROM coal was custom washed for an export product at the Shanduka (Glencore)-owned Koornfontein Colliery washing plant but would later be trucked to TCSA's FZON and washed for a 5 800kcal/kg export product
2014 – 2015	Total Coal South Africa (TCSA)	Production ceased in January 2014 when the mining contract expired. Failure to agree on a possible extension with the contractor led to the operation being placed under care and maintenance in February 2014
2015 – 2018	Exxaro Coal Central (ECC)	TCSA became ECC after being taken over by Exxaro in August 2015. Tumelo remained under care and maintenance

Figure 30: Tumelo cross section



Project geology

Tumelo is to the north of the Smithfield Ridge on the north-eastern edge of the Springs-Witbank coalfield. The area is part of the Karoo basin whose stratigraphy is similar to that of other ECC operations, Dorstfontein and Forzando, with subtle location-induced differences.

Six coal seams are developed in the area, named from the base up as S1, S2, S4L, S4U, S4A and S5. S1 is very thin, being only developed in the deepest part of the palaeo-valley. The thickest average seam is the S2 (0.5m to 5.3m), developed mainly in a palaeo-valley where it is either thin or absent over the adjacent palaeo-ridges. Seam 2 has been exploited since Tumelo production started in 2009. S4L is the most continuous and second-thickest seam while S4U is thin and has mostly been eroded. S4A is thin and patchily developed, and S5 is only present in a topographically high area in the south east. The only economically exploitable seam is S2.

Late Jurassic dolerite sills and dykes occur in the Tumelo area. The intrusions resulted in displacement of the various seams and devolatilisation of extensive areas of coal. The geological complexity and associated challenges are proactively managed by extensive infill drilling, downhole wireline logging for better contact definition and seam correlation as well as surface mapping, particularly of basement outcrops. This information is captured in a structural model, together with potential captured in a GIS based risk and opportunity domain analysis (RODA), allowing for a more integrated approach to risk management.

Project resource evaluation

All exploration boreholes are logged and sampled by qualified geologists, aligned with Exxaro logging and sampling standards and COPs. Samples are selected according to seam boundaries, visual variation in the vitrinite content, assisted by density logs, and non-coal material present in the seam boundaries. The geologist takes cognisance of the borehole purpose and drilling conforms to ECC standards.

TUMELO COAL MINE (CONTINUED)

ECC's sampling governance and chain of custody requires that each sample to be submitted to the laboratories is accompanied by a sample submission list that also serves as a sample advice sheet with instructions for analysis. The laboratory is notified of samples that are ready for collection. On collection, the laboratory representative cross-checks all samples against the submission list to confirm the names and number of samples they are receiving. All submission lists are managed in duplicates with signed copies scanned and saved electronically in the geology server.

All geological core sample are sent to the laboratory for coal quality analysis. Two major laboratories have been used at Tumelo: Australian Laboratory Services (ALS) and Societe Generale de Surveillance (SGS) with SANAS accreditation (T0611 and T0815, respectively). ISO and South African National Standards (SANS) have a standard set of tests and methods used for coal analysis by South African laboratories. These laboratories have committed to assuring the quality of results provided to the customer by ensuring quality assurance, quality control, data validation and proficiency testing procedures are observed.

Table 73: Tumelo Coal Resource reporting criteria

Thickness cut-off (reporting and extraction considerations)	Quality cut-offs (adb)	Geological loss*
Underground ≤1.2M	DAFV ≤26% Raw ash ≥50%	10 – 50%

**A 10% standard geological loss is applied but may vary based on consideration of structural complexity (dolerite sill) breakthrough – 50% loss within determined spatial extent), seam gradient (>4 degrees – 50% loss), dolerite sill proximity to seam (25% loss). A 15% geological loss is applied (weighted average of the various risk domains).*

Table 74: Tumelo Coal Resource estimation criteria

	Item	Description
Database	**Drillhole database**	Sable Data Warehouse
	Data datum	Cape LO29
	Number of drillholes used for resource estimation	103 of 132 boreholes in the database with washability data
	Validation	The laboratory conducts data validation and proficiency testing on samples submitted. In the Sable Database Warehouse, additional validations are conducted on points of observation where missing data and/or duplicate data are identified and corrected. Data is exported from Sable into csv files where it is subjected to 'coal sense' checks
	Data compositing and weighting	Data compositing is conducted per seam using a weighted value from individual samples that make up the seam, along with the RD and length of each sample. This is done in Geovia Minex
Model	**Previous model date**	January 2010 in Stratmodel
	Last model update	January 2017
	Geological modelling software	Geovia Minex 6.3.2
	Estimation technique	Growth algorithm – general purpose gridding
	Grid mesh size	25m x 25m
	Scan distance	2 000m
	Data boundary	200m
	Model build limits	Upper: limit of weathering and topography/collar Lower: basement/Dwyka
	Model outputs	Roof, floor and thickness grids generated for structure. Raw quality and washability grids
	Changes to modelling process	Change in modelling package from Stratmodel to Geovia Minex

Table 75: Tumelo Coal Resource classification criteria

Category	Type of boreholes	Borehole spacing	Structurally complex areas	BH/ha
Measured	Cored boreholes with applicable coal qualities	0 – 350m	Structural complexity and coal variability – additional infill drilling	0.30
Indicated	Cored boreholes with applicable coal qualities	350 – 500m	Structural complexity and coal variability – additional infill drilling	0.20
Inferred	Cored boreholes with applicable coal qualities	500 – 1000m	Structural complexity and coal variability – additional infill drilling	0.11

ANCILLARY RESOURCE AND RESERVE INFORMATION BY OPERATION (CONTINUED)

TUMELO COAL MINE (CONTINUED)

Table 76: Tumelo Resource and Reserve statement

Category	2018 (Mt)	2017 (Mt)	Difference (%)
Measured	8.7	8.7	0
Indicated	0.2	0.2	0
Inferred	1.8	1.8	0
Total Resources	10.7	10.7	0
Proved	0.7	0.7	0
Probable	0.0	0.0	0
Total Reserves	0.7	0.7	0

Rounding of figures may cause computational discrepancies
All changes more than 10% are explained
Mining method: UG – underground
Figures reported at 100% irrespective of percentage attributable to Exxaro
Tonnages quoted in metric tonnes and million tonnes abbreviated as Mt. Coal resources quoted as mineable tonnes in-situ and refer to remaining resources after 31 December 2018 and 31 December 2017
Coal Resources reported on a mineable in-situ (MTIS) basis
Coal Resources quoted inclusive of Coal Reserves

Table 77: Tumelo RPEEE considerations

Item	Criteria	Considered	Comment
Geological data	Data validated and signed off by competent person	Yes	Geological structure and depositional extent, seam thickness >1.2m (UG), <50% ash content, >24% DAFV. Coal qualities reported on an air-dry basis
Geological model	2017 geological model considered and signed off	Yes	
Structural model	Structural model considered and signed off	Yes	
Mining	Mining assumptions considered and defined	Yes	UG areas defined, aligned with exploitation strategy
Assurance	Policy-driven governance, internal and external audits	Yes	In place, internal review 2012
Economic evaluation	Concept-level exploitation with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	Only approved economic assumptions and parameters applied
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Done	Areas where there is reasonable expectation that mining will not be permitted are considered, ie wildlife sanctuary, river and streams, historical sites, monuments. Environmental and social concept assessment is done
Tenure	Only areas in acceptable prospecting and mining rights. In areas adjacent to existing rights where legal section application is pending with reasonable expectation of approval	Yes	MR/PR licences are valid. Extensions or annexations will be lodged as necessary
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence	Done	Current infrastructure
Market	Market/s identified – form part of an existing operation market strategy or potential market for which a conceptual market study exists	Done	Operational strategies aligned with existing markets

TUMELO COAL MINE (CONTINUED)

Project reserve estimation

The 2010 geological model was used for coal reserving purposes. On receipt of the geological model, a Coal Reserve evaluation was conducted to determine areas that can be converted to reserves. The process ensures that only economically viable areas are reserved. The approach considers all applicable modifying factors: mining, beneficiation, material handling and transport costs, etc.

Table 78: Tumelo production figures

	Actual 2017	FC 2018	Actual 2018	FC 2019	FC 2020
ROM (Mt)	–	–	–	0.29	0.41

Note: With the operation on care and maintenance from February 2014, no production has taken place.

Known risks

The Tumelo mining right expired on 10 December 2015 and a renewal application was lodged with the DMR on 29 July 2015. ECC has a reasonable expectation that the application will be approved.

Deteriorating ground conditions to access coal, due to care-and-maintenance status, poses a risk. However, reassessment of current conditions will take place prior to beginning planned operations. Boreholes received from third parties and drilled between 1990 and 1991 lack wash information for specific fractions. A limited amount of drilling is required to address this data gap. We do not know of any further pertinent risks or other material conditions that may impact on the company's ability to mine or explore, including technical, environmental, social, economic, political and other key risks.

Operational excellence

Planning is under way to recommission Tumelo to realise the potential of the remaining S2L reserves.

Table 79: Tumelo modifying factor considerations in the conversion of Coal Resources to Coal Reserves

Modifying factors	Value
Geological loss	10 – 25% (already included in model)
Average thickness cut-off	≥1.60m (UG)
Quality specification	5 800kcal/kg
Mining loss	2%
Depth to roof	20m, unless rock strength allows otherwise
Safety factor	Tertiary panels 1.6, main development 2.0
Bord width	6.5m
Barrier pillar	At least equal to pillar width
Boundary pillar	15m
Pillar centres	14m x 14m
Mining height	1.6m
Extraction factor	65%
Dilution	Already included in model
Contamination	0.1m
Practical plant yield	N/A
Environmentally sensitive areas	None
Legal	All applicable mining and prospecting rights
Social	Applicable communities and stakeholders
Geohydrological	Applicable surface and groundwater models and compliance

EXPLORATION

Exploration in existing operations of our coal business consisted of drilling (diamond core and reverse circulation) with surface geophysical surveys, when required, and downhole geophysical logging.

Exploration was primarily conducted on mining right and associated adjacent prospecting right areas and new information incorporated into updated geological models and included in the Mineral Resource statement. Drilling was carried out for production purposes and to improve geological confidence to enhance geological modelling and estimation. These boreholes are depicted in the relevant locality maps in the ancillary section. A limited amount of geotechnical and hydrogeological drilling was conducted to improve mine-planning parameters and is included in exploration results (table 80).

No exploration was conducted on areas not included in the Coal Resource statement. The resource in the various operations were reviewed in 2018 to identify and outline geological challenges/complexities. Based on this review, an integrated exploration plan was compiled that includes activities required to address Coal Resource-and-metallurgical characterisation, overburden characterisation, geological structure as well as rock engineering and hydrogeological data requirements.

Grootegeluk Mine drilled a number of large-diameter cored exploration boreholes to advance Inferred and Indicated to Measured Resources to mitigate geological risk and enable detail mine planning. Positions were carefully selected to fill Coal Resource information gaps and to increase our confidence on rock engineering and hydrogeological information to fulfil applicable Coal Resource to Reserve modifying factor requirements. Additional core drilling, surface geophysical surveys and percussion drilling were applied to better define geological faulting that poses challenges for future mining. Resource drilling will proceed in 2019 but there will be a substantial increase in percussion drilling in front of the advancing pit. This will improve the definition of geological faulting as well as the characterisation of the overburden to enhance the study progress of the in-pit crushing and conveying overburden (IPCC OVB) project and backfill strategy.

At Matla mine exploration activities in recent years have aimed to address the considerable information gap created by several changes to LoM layouts to accommodate delayed Eskom approvals of the Matla expansion projects. Vital progress has been made and drilling in 2019 will proceed to mitigate geological risk in the short and medium term, derisking accessibility and mineability (roof stability) within the LoMP. Geological faulting, impact of sill and dykes as well as seam variability are the mayor challenges addressed through the integrated and focused exploration activities.

Cored and openhole (percussion) drilling at the Belfast operation was primarily focused on derisking the two box-cut areas where mining will start. The objectives were to clearly define coal seam thickness, outline areas of weathering (minimise losses) and enhance overburden characterisation (to improve slope design and mining recommendations). Drilling in 2019 will focus on further derisking the two- to five-year plan through selective infill drilling.

Drilling at Leeuwpan mine was executed to confirm and improve the confidence of coal seam structure and coal qualities in the OI west resource expansion area. In addition percussion drilling was conducted in the OI reserve to improve the understanding of the geological contacts for slope design and safety considerations. The OI expansion project presents significantly higher striping ratios and lower yields, and slope design recommendations are vital to ensure an optimal extraction design.

Exploration activities at ECC focused on increasing the level of geological confidence and around a third were specifically drilled for geotechnical purposes. A number of holes will be drilled in 2019 at Dorstfontein West to better define geological faulting and seam variability in the new seam 4 underground expansion project. Selective cored holes are planned adjacent to the two open pits at Dorstfontein East to confirm seam continuity and, specifically at pit 2, for improved definition of geological structure (faulting, sills and dykes) in the area earmarked for underground mining. Drilling at Forzando is primarily planned to upgrade Inferred and Indicated Resources to the Measured Resource category.

Table 80: Summary of exploration expenditure for coal

	2017 actual		2018 actual				2019 planning*	
Project or mining operation	Number of boreholes	Total cost (Rm)	Number of boreholes	Drilling cost (Rm)	Analyses and other costs (Rm)	Total costs (Rm)	Number of boreholes	Total cost (Rm)**
Grootegeluk	133	20.9	98	5.5	11.1	16.6	182	29.1
Arnot	–	–	–	–	–	–	–	–
Matla	87	10.5	124	8.6	2.5	11.1	80	8.1
Belfast	–	–	74	1	0.5	1.4	24	1.9
Leeuwpan	24	4.2	33	1.7	0.4	2.1	28	1.8
Thabametsi project (mining right)	–	–	–	–	–	0.4	10	0.67
Dorstfontein and adjacent projects	23	2.5	68	2.0	1.5	3.5	49	6.7
Forzando and adjacent projects	25	2.9	30	1.5	0.9	2.4	75	4.6
Tumelo	–	–	–	–	–	–		
Others (projects not reported on)								
Total	304	41.1	427	20.2	16.0	37.5	448	53.7

**Non-committed*
***Includes all associated exploration cost, eg drilling, geophysics surveys and geotechnical, hydrogeological and metallurgical testwork, excluding personnel*

ENDORSEMENT

The Exxaro lead competent persons are appointed by the Exxaro executive management team.

The Exxaro lead Mineral Resource competent person is Henk Lingenfelder, a member of the Geological Society of South Africa and registered (400038/11) with the South African Council for Natural Scientific Professions. He has a BSc (hons) in geology and 22 years of experience as geologist in coal, iron ore and industrial minerals.

The person in Exxaro designated to take corporate responsibility for Coal Resources, Henk Lingenfelder, the undersigned, has reviewed and endorsed the reported estimates.

JH Lingenfelder
BSc geology (hons)
Pr Sci Nat (400038/11)
Group manager geoscience
Roger Dyason Road
Pretoria West
0183

The address for South African Council for Natural Scientific Professions:
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Silverton
0127
Gauteng
South Africa

The Exxaro lead Mineral Reserve competent person is Chris Ballot, a mining engineer registered (20060040) with the Engineering Council of South Africa. He has 21 years of experience in iron ore, mineral sands and coal in various technical and management roles.

The person in Exxaro designated to take corporate responsibility for Mineral Reserves, C Ballot, the undersigned, has reviewed and endorsed the reported estimates.

CC Ballot
BEng mining
ECSA 20060040
Manager mining processes
Roger Dyason Road
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ABBREVIATIONS

AMT	audio magnetic telluric
adb	air dried basis
arb	as received basis
CM	continuous miner
CMRR	Consolidated Mineral Resource and Reserve Report
CP	competent person
CPR	competent person's report
CSA	coal-supply agreement
CV	calorific value
DAF	dry ash free volatiles
DCM	Dorstfontein complex
DCME	Dorstfontein East complex
DCMW	Dorstfontein West complex
FZO	Forzando
GBIS	global borehole information system
GTIS	gross tonnes in-situ
Ha	hectare
IM	inherent moisture
JSE	JSE Securities Exchange Limited
kcal/kg	kilocalories per kilogram
LoM	life-of-mine
LoMP	Life-of-mine plan
MJ/kg	megajoules per kilogram
MPRDA	Minerals and Petroleum Resources Development Act
Mt/Mtpa	million tonnes/per annum
NAR	nett as received
RD	relative density
RODA	risk and opportunity domain analysis
ROM	run-of-mine
SAMREC	South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves
SANS	South African National Standard

APPENDIX A

Table 81: Shareholding and tenure of reported Mineral Resources and Mineral Reserves

Complex		Name of right	Type	Status	% attributable to Exxaro	Expiry date	Remainder attributable to
Arnot	Arnot (UG and OC)	Arnot (325MR)	mining right	executed	100	05 Dec 2039	
Matla	Matla (UG)	Matla (327MR)	mining right	executed	100	05 Dec 2025	
Leeuwpan	Leeuwpan (OC)	Leeuwpan (157MR)	mining right	registered	100	23 Mar 2040	
		Leeuwpan Ext (171MR)	mining right	registered	100	23 Mar 2040	
Mafube	Mafube (OC)	Mafube (172MR)	mining right	registered	50	30 Jul 2030	Anglo American Coal Proprietary Limited
		Nooitgedacht (10026MR)	mining right	registered	50	13 Nov 2043	Anglo American Coal Proprietary Limited
	Strathrae (OC)	Strathrae (328MR)	mining right	granted	100	–	
Belfast	Belfast (OC)	Belfast (431MR)	mining right	registered	100	08 Oct 2043	
Grootegeluk	Grootegeluk (OC)	Grootegeluk (46MR)	mining right	registered	100	29 Mar 2041	
Thabametsi	Thabametsi (UG and OC)	Thabametsi (10013MR)	mining right	registered	100	29 Jun 2046	
Waterberg prospecting	Waterberg North (OC)	Pentonville (10719PR)	prospecting right	executed	100	28 Feb 2020	
		Dartmoore (10720PR)	prospecting right	executed	100	28 Feb 2020	
		Carolina (10718PR)	prospecting right	granted	100	19 July 2021	
	Waterberg South (OC)	Swelpan (10721PR)	prospecting right	granted	100	19 July 2021	
Tshikondeni	Tshikondeni (OC and UG)	Tshikondeni (54MR)	mining right	granted	100	–	
		Goni (34MR)	mining right	registered	100	31 Mar 2039	
Australian region	Moranbah South (OC and UG)	MDL277 and 377	Mineral development licences	renewal	50	–	Anglo American Coal Proprietary Limited
		EPC 548 and 602	exploration permits	executed	50	22 Feb 2017 and 31 Dec 2018	Anglo American Coal Proprietary Limited

Complex		Name of right	Type	Status	% attributable to Exxaro	Expiry date	Remainder attributable to
Exxaro Coal Central (ECC)	Dorstfontein (OC and UG)	Dorstfontein West + Vlakfontein (119MR)	mining right	registered	74	06 Dec 2042	Mmakau Mining Proprietary Limited
		Dorstfontein West (123MR)	mining right	registered	74	06 Dec 2042	Mmakau Mining Proprietary Limited
		Dorstfontein East (51MR)	mining right	registered	74	12 May 2036	Mmakau Mining Proprietary Limited
		Rietkuil Vhakoni (1916PR)	prospecting right	registered	74	07 Oct 2015	Mmakau Mining Proprietary Limited
			section 102	new application	74	09 Jul 2015	
Exxaro Coal Central (ECC)	Forzando (OC and UG) ECC has an additional indirect 12.75% shareholding through Mmakau Coal – therefore a total interest of 86.75%	Forzando South (380MR)	mining right	executed	86.75	27 Jun 2029	Mmakau Mining Proprietary Limited
		Forzando North (381MR)	mining right	registered	86.75	27 Jun 2029	Mmakau Mining Proprietary Limited
		Legdaar (1864PR)	prospecting right	renewal submitted	86.75	05 April 2015	Mmakau Mining Proprietary Limited
		Kalabasfontein (1035PR)	prospecting right	section 102 submitted	86.75	31 Jun 2018	Mmakau Mining Proprietary Limited
		Kalabasfontein (1170PR)	prospecting right	section 102 submitted	86.75	31 Jun 2018	Mmakau Mining Proprietary Limited
		Schurvekop ptn 24 (4627PR)	prospecting right	granted	86.75	31 Sept 2020	Mmakau Mining Proprietary Limited
		Schurvekop (1063PR) Mmakau Coal	prospecting right	registered	49	27 Nov 2016	Mmakau Mining Proprietary Limited
		Schurvekop (1063PR) Mmakau Coal	mining right	new application	49	21 Nov 2016	Mmakau Mining Proprietary Limited
Exxaro Coal Central (ECC)	Tumelo (UG)	Boschmanskop (116MR)	mining right	renewal submitted	49	12 Nov 2015	

PR – Prospecting rights
MR – Mining rights

APPENDIX A (CONTINUED)

Table 82: Shareholding and tenure of reported mineral sands and base metals resources and reserves

Commodity	Name of right	Type	Status	% attributable to Exxaro	Expiry date	Remainder attributable to
Mineral sands	Hillendale Mine + Braeburn + Braeburn Extension	converted right	executed	43.3	closed	Tronox
	Block P	converted right	executed	43.3	24 Mar 2035	Tronox
	Fairbreeze A+B+C+D	converted right	executed	43.3	24 Mar 2035	Tronox
	Fairbreeze C ext	converted right	executed	43.3	04 Aug 2039	Tronox
	Port Durnford project	converted right	executed	43.3	06 Mar 2018	Tronox
	Namakwa Sands mine	converted right	executed	43.3	17 Aug 2038	Tronox
	Namakwa satellite deposits (Houtkraal and Rietfontein)	prospecting right	MR application submitted	43.3	29 Mar 2046	Tronox
	Cooljarloo	mining licence	executed	23.35	31 Jan 2020	Tronox
	Jurien	mining licence	executed	23.35	12 Nov 2031	Tronox
	Dongara	mining licence	executed	23.35	30 Mar 2029	Tronox
	Cooljarloo west	mining licence	executed	23.35	17 Mar 2036	Tronox
	Cooljarloo north-west project	retention licence	executed	23.35	07 Jul 2019	Tronox
Base metals	Deeps and Swartberg (zinc, lead, copper and silver)	converted right	executed	26	30 Sept 2038	Vedanta Resources plc
	Gamsberg North and Gamsberg East prospecting (zinc)	converted right	executed	26	18 Aug 2038	Vedanta Resources plc

Table 83: 2018 competent persons' register

	Mineral Resources				Mineral Reserves			
Operation/project	Name	Relevant experience (years)	Job title	Registration*	Name	Relevant experience (years)	Job title	Registration
Lead CP, Exxaro	JH Lingenfelder	23	Group manager geosciences	SACNASP (400038/11)	C Ballot	22	Group manager mining	ECSA (20060040)
Arnot Mine	MV Sambo	11	Senior geologist, ECC	SACNASP (400369/12)	N/A			
Belfast Mine	G Gcayi	11	Resident geologist, Belfast	SACNASP (400299/11)	PDM Lourens	13	Principal mining engineer	SAIMM (702550)
Grootegeluk Mine	CW van Heerden	16	Resident geologist, Grootegeluk	SACNASP (400069/04)	R van Staden	15	Manager mining operations	ECSA (20050123)
Leeuwpan Mine	P Themba	16	Resident geologist, Leeuwpan	SACNASP (400031/09)	M Sethethi	11	Mine manager, Leeuwpan	ECSA (20095030)
Matla Mine	TF Moabi	13	Resident geologist, Matla	SACNASP (400067/08)	B Young	22	MRM Manager, Matla	PLATO, PMS (0182)
Thabametsi project	CW van Heerden	16	Resident geologist, Grootegeluk	SACNASP (400069/04)	C Ballot	22	Group manager mining	ECSA (20060040)
Dorstfontein, Forzando, Tumelo	G Bittah	11	Manager geologist, ECC	SACNASP (400217/12)	G Ndebele	35	MRM manager, ECC	SACNASP (400107/10)
Waterberg North project	JH Lingenfelder	23	Group manager geosciences	SACNASP (400038/11)	N/A			
Waterberg South project	JH Lingenfelder	23	Group manager geosciences	SACNASP (400038/11)	N/A			
Mafube (Nooitgedacht and Wildfontein)	D Xaba	19	Geology manager, Anglo Coal	SACNASP (400019/05)	D Xaba	19	Geology manager, Anglo Coal	SACNASP (400019/05)
Mafube Mine (Springbok-laagte)	D Xaba	19	Geology manager, Anglo Coal	SACNASP (400019/05)	D Xaba	19	Geology manager, Anglo Coal	SACNASP (400019/05)
Moranbah South, Australia	AJ Laws	23	Specialist resource geologist, Anglo American Coal	AusIMM (209913)	N/A			
Hillendale mine, Extension	D Sibiya	23	Geologist, Tronox	SACNASP (400294/06)	C Philander	22	Manager, Tronox	SACNASP (400181/15)
Fairbreeze A+B+C+C Ext	D Sibiya	23	Geologist, Tronox	SACNASP (400294/06)	C Philander	22	Manager, Tronox	SACNASP (400181/15)
Block P and Block extension	D Sibiya	23	Geologist, Tronox	SACNASP (400294/06)	C Philander	22	Manager, Tronox	SACNASP (400181/15)

APPENDIX A (CONTINUED)

	Mineral Resources				Mineral Reserves			
Operation/project	Name	Relevant experience (years)	Job title	Registration*	Name	Relevant experience (years)	Job title	Registration
Port Durnford	D Sibiya	23	Geologist, Tronox	SACNASP (400294/06)	C Philander	22	Manager, Tronox	SACNASP (400181/15)
Fairbreeze D	D Sibiya	23	Geologist, Tronox	SACNASP (400294/06)	C Philander	22	Manager, Tronox	SACNASP (400181/15)
Namakwa Sands	C van Vuuren	16	Geologist, Tronox	SACNASP (400111/96)	C Philander	22	Manager, Tronox	SACNASP (400181/15)
Cooljarloo, Australia	P Stevenson	33	Manager resource development, Tronox	AusIMM (107759)	P Stevenson	33	Manager resource development, Tronox	AusIMM (107759)
Jurien, Australia	P Stevenson	33	Manager resource development, Tronox	AusIMM (107759)	P Stevenson	33	Manager resource development, Tronox	AusIMM (107759)
Dongara, Australia	P Stevenson	33	Manager resource development, Tronox	AusIMM (107759)	P Stevenson	33	Manager resource development, Tronox	AusIMM (107759)
Black Mountain	S Jenniker	19	Mineral resources manager, Vedanta	SACNASP (400129/08)	S Jenniker	19	Mineral resources manager, Vedanta	SACNASP (400129/08)
Gamsberg	S Jenniker	19	Mineral resources manager, Vedanta	SACNASP (400129/08)	S Jenniker	19	Mineral resources manager, Vedanta	SACNASP (400129/08)

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**Address for Engineering Council of South Africa: Private bag x691, Bruma, 2026, Gauteng, South Africa*
**Address for Australasian Institute of Mining and Metallurgy: 204 Lygon Street, Carlton VIC 3053, Australia*
**All competent persons are Exxaro employees except where otherwise stated*

Table 84: Coal production figures (kilotonnes)

Operation	Product	2017	2018	FC 2019*	FC 2020*
Grootegeluk	Thermal coal	23 405	27 375	27 540	27 213
Grootegeluk	Metallurgical coal	2 132	2 323	2 457	4 042
Matla	Thermal coal	7 400	6 609	6 311	7 379
ECC	Thermal coal	4 060	3 797	4 642	5 371
Leeuwpan	Thermal coal	3 355	4 220	4 674	5 118
NBC	Thermal coal	2 963	1 425		
Mafube (buy-ins from JV)	Thermal coal	1 660	991	1 616	1 923
Belfast				1 082	2 947

** Forecast*

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