

BLACK ROCK

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Naturally Better Graphite



BLACK ROCK MINING (ASX: BKT)

BLACKROCKMINING.COM.AU



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COMPETENT PERSONS

The information in this report that relates to Exploration Results and Mineral Resource Statements is based on information compiled by John de Vries, who is a member of the AusIMM. He is an employee of Black Rock. John de Vries has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2004 and 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'.

The information that relates to Mineral Resources is based on and fairly represents information compiled by Mr Lauritz Barnes, (Consultant with Trepanier Pty Ltd) and Mr Aidan Patel (Consultant with Patel Consulting Pty Ltd). Mr Barnes and Mr Patel are members of the Australian Institute of Mining and Metallurgy and have sufficient experience of relevance to the styles of mineralisation and types of deposits under consideration, and to the activities undertaken to qualify as Competent Persons as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Barnes, Mr Patel and Mr de Vries consent to the inclusion in this report of the matters based on their information in the form and context in which they appear.

The Ore Reserves have been compiled by Oreology Consulting Pty Ltd, under the direction of Mr John de Vries, who is a Member and Chartered Professional of the Australasian Institute of Mining and Metallurgy. Mr de Vries is a full-time employee of Black Rock Mining and holds performance rights in the company as part of his total remuneration package. Mr de Vries has sufficient experience in Ore Reserve estimation relevant to the style of mineralisation and type of deposit under consideration to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Mineral Resources and Ore Reserves".



Corporate Structure

ASX Ticker	ВКТ
Share Price	\$0.069
Shares on Issue ¹	443.7m
Options	67.2m
Performance Rights	3.4m
Market Capitalisation	\$30.6m
Cash on hand as at 31 December 2017*	\$4.12m
Top 20 Shareholders	46.67%
Major shareholders	
Copulos Group	24.63%



*\$540k received in placement post 31-Dec

Resources: 212 mt @7.8% for 16.5 mt graphite Reserves: 69.6mt @8.5% for 5.9 mt of graphite

Quality Board & advisors – here to build a mine Cashed for DFS DFS contractor – CPC engineering – track record in sector PFS: Aug 2017 "crawl walk run" 3 stage self funded bootstrap

- \$90m USD capex
- \$378/t USD steady stage opex
- \$1,241 FOB basket
- Steady state EBITDA \$220m USD
- 240 ktpa prodn ~ 98.5%-99.5%

Modest market capitalisation for a well funded advanced world class project

Peak capital intensity & Opex are first order issues





Staged bootstrap model, and access to large high grade deposits are fundamental to delivering low peak capital intensity with meaningful scale





Size and grade do matter



RESOURCE - CONTAINED GRAPHITE VS GRADE

Resource is relatively easy to add tonnage to...

However grade and strip ratio <u>define</u> opex and capex

RESERVE - CONTAINED GRAPHITE VS GRADE



Reserve should have >\$100/t contained value for a credible investment

BKT has large high grade deposit capable of supporting a high grade, long life mine with meaningful scale



Opex sustainability



Absolute strip ratio and head grade determine opex sustainability



Selling price is a function of concentrate grade and flake size. BKT has the highest con grade of the peer group, and sizing is supported by two independent labs



The best guide to opex is absolute strip - *Strip ratio* * *grade* **recovery*



BKT is well positioned within the peer group and has a credible opex estimate

Normalising the peer group for concentrate grade and basket size levels the field



Market prices are available from a number of sources – Benchmark Mineral Intelligence, Bainfo and Industrial Minerals Research. Applying market prices for flake size and concentrate purity significantly tightens distribution of income assumptions



High margin



After normalising for concentrate grade and flake size, BKT has the highest margin of any mine with meaningful scale



Capital intensity \$USD/ annual tonne



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Black Rock – Mahenge Graphite Project







- 1. Black Rock Mining
- 2. Corporate Overview
- 3. 2017 From explorer to developer
- 4. 2018 Construction ready
- 5. The Mahenge Graphite Mine
- 6. Graphite Market
- 7. Summary



1. Black Rock Mining

DEVELOPER OF THE MAHENGE GRAPHITE MINE





Mahenge Graphite Project – truly a world-class deposit

- Lowest quartile FOB costs of US\$378 per tonne steady state
- Upper quartile margins of US\$863 per tonne *based on credible price deck*
- Best in class peak capex at US\$90m against 250k tonnes per annum of steady state production
- Scalable and option rich

Successfully delivered optimised PFS with disciplined "crawl walk run" strategy

- Increased NPV₁₀ to US\$905m after tax, inclusive of 16% free carried interest, inspection fee and royalty increases (announced in July 2017)
- Ore Reserves increased to 69.6 million tonnes at 8.5% TGC
- Production rate increased to a maximum of 250k tonnes per annum
- Steady state EBITDA increased to over US\$220m per annum



Simple concentrate only business model

- Investable & fundable
- Avoids over stressing balance sheet
- Avoids corporate distraction
- Simplifies marketing and avoids competing with customers





SENIOR MANAGEMENT TEAM IN PLACE TRANSITION FROM **EXPLORER TO DEVELOPER**



JOHN DE VRIES CEO and Managing Director

Mining Engineer with over 35 yearsexperience in mine development and operations. Previously, General Manager Technical Services with St Barbara and integral in the 2014 turnaround. John has held positions at BHP Ni West, and was Global Business Manager, Advanced Mining Solutions with Orica Mining Services. John's geographic experience includes Africa, the Pacific, the FSU, North America and South America.



RICHARD CROOKES Non-Executive Chairman

A geologist with over 28 years executive experience in the resources and investments industry. He is currently an Investment Director of EMR Capital and was formerly a Director of Macquarie Bank's Metals Energy Capital Division and was Chief Geologist with Ernest Henry Mining.



STEVE COPULOS Non-Executive Director

Businessman and investor with over 30 years experience in a wide range of industries. Experienced Director for both listed and private companies. Largest BKT shareholder. Committed to increasing value per share.



GABRIEL CHIAPPINI Non-Executive Director and Company Secretary

A Chartered Accountant and member of the AICD Has over 20 years-experience including positions of Director, Company Secretary and Chief Financial Officer in listed and private companies operating in Australia, the UK and the USA. Gabriel is a Non-Exec Director of Fast Brick Robotics.



ANTHONY HALL Head of Strategy

A qualified lawyer with 20 years' commercial experience. Previously Managing Director of ASX listed Highfield Resources Ltd from 2011 to 2016. During his tenure the company's market cap grew from \$10m to \$500m & over \$140m was raised to progress potash projects in Spain. Anthony is also an Executive Director of borate and lithium developer APBL (ABR.ASX).

2. Corporate Overview





TANZANIAN CENTRIC OPERATING MODEL

BUILDING SYSTEMS AND PROCESSES TO UPLIFT LOCAL SKILLS TO A POINT WHERE ASSET CAN BE RUN FROM WITHIN COUNTRY:

- Bolt on/off
- Lower long term cost base
- Increased premium (bolt on/off)
- Consistent with legislative reset and credible risk management strategy

TANZANIA

- Operations & asset management
- P&L and Balance Sheet for asset accountability in country
- Build up systems and processes to support independent operations

PERTH

- Governance
- CFO, treasury
- Marketing
- HR & policy



3. 2017 – From Explorer to Developer

TRANSITIONAL YEAR THAT ESTABLISHED THE MAHENGE GRAPHITE MINE AS A WORLD CLASS PROJECT





4. 2018 – Construction Ready CLEAR FOCUS







Image showing project location in Tanzania

Image showing Ulanzi and Cascades localities. Grid spacing is 500m.

HIGH-GRADE RESOURCE CAPABLE OF DELIVERING A MULTI-GENERATIONAL MINE WITH SIGNIFICANT SCALE

Feed profile is derisked with 69.6 million tonnes ore reserve delivering 80% of plant feed* Three staged bootstrap development model gives magnitude without overreach Good infrastructure with 220 kv power, and rail 60 km away at Ifkara, and new bridge over Kilombero River

Total Resource contains over 16 million tonnes of graphite

5. Mahenge Graphite Mine

OUTSTANDING FINANCIAL METRICS

KEY PFS INVESTMENT METRICS

- NPV₁₀ of **US\$905m*** (\$1.1 bn AUD)
- IRR of **45.1%**
- EBITDA in first full year of production of US\$220m (EBITDA margin of 66%)

*Post 16% free carry and new royalty regime



PEAK CAPITAL INTENSITY VS FINAL RUN RATE

SENSITIVITY ANALYST ON BASKET PRICE ASSUMPTION

Basket Price Assumption (US\$ per tonne)	Price Assumption (US\$ per tonne)	NPV ₁₀ (nominal) US\$ m	IRR %
+400	1,641	1,421	62.8
+200	1,441	1,163	54.0
BASE	1,241	905	45.1
-200	1,041	648	36.0
-400	841	390	26.6



INDUSTRY LEADING PRE-PRODUCTION CAPEX, MARGIN, CONCENTRATE GRADE WITH A MULTI-GENERATIONAL MINE LIFE

- Three stage construction to deliver a maximum of 250k tonnes per annum of 98.5% graphite concentrate for 31 years. Stages two and three to be funded from free cash flow
- Pre-production capex of US\$90.1m*
- Steady state opex reduced to US\$378 per tonne
- Realistic basket price assumption of US\$1,241 per tonne delivering an operating margin of US\$863 per tonne
- Assumed feed grade of 8.5% TGC
- Life of mine strip ratio of 0.8:1 (early years are 0.5:1)
- Post-tax unlevered project NPV₁₀ of US\$905m
- Post-tax, unlevered IRR of 45.1%
- EBITDA in first full year of production US\$220 million (EBITDA margin of 66%)

KEY FINANCIAL PARAMETERS	Unit	Single Module	Two Module	Three Module	LOM			
Commencement	(Year)	1&2	3+	5	31			
Capital Cost	(USD M, real)	90.7	72.2	81.7	243.7			
IRR - after tax	(%, nom)	35.3%	43.8%	45.6%	45.6%			
NPV @ 10%	(USD nom)	202	506	905	905			
Total Sales	('000 t)	3,265	5,142	6,738	6,738			
FOB Cash Costs	(USD/t, real)	513	382	378	378			

Key parameters of the Mahenge Graphite Project









- Disciplined focus on realistic low pre production capex, ensures financing is achievable.
- Staged ramp up profile properly matches likely increases in market demand
- Meaningful scale supported by large multi-generational Resource
- Long-term product development and partner strategy supported by superior graphite product



ENGINEERING STUDIES



- Modular approach results in higher level of final engineering before execution decision is made
- Modular approach minimises in-field risk via completion testing and fixed price deliver at factory gate
- Assembly vs construction minimises in-field complexity



ORGANISATION DEVELOPMENT

- Develop systems and processes to support business in-country
- Invest in skills as part of DFS to facilitate smooth start-up and running of module 1
- Boot strap approach results in orderly scale up of workforce as successive modules are added to the business



MARKET DEVELOPMENT

- Pilot plant and bulk sample early gives customers concentrate at least two years before commercial operation
- Extended battery test program gives consumers a "cookbook" to start with
- Funded and resourced component of study



MOU'S SIGNED WITH REAL INDUSTRY PARTICIPICANTS

🔀 MEIWA CORPORATION

MEIWA

- Part of Mitsubishi group of companies
- Existing major player in battery space



BOTIAN

- Existing spheroniser in Chinese market
- Creates capacity to deliver final product without investing capital, organisational development and management bandwidth



BATTERY TESTING

• Long cycle data available to customers to facilitate acceptance testing



300 CYCLE TESTING – INDUSTRY STANDARD FOR CONSUMER APPLIANCE



- The evidence from Mahenge graphite's performance at 300cycles indicates it strongly outperforms commercially available products, potentially establishing new performance benchmarks of natural graphite in the battery market.
- Establishing new industry performance benchmarks is an important step in the Company's commercialisation strategy





Black Rock Management believes the Mahenge Graphite Project works under the announced new mining framework In the absence of a formal State Agreement, Black Rock Mining will be assuming the announced mining framework applies and it will use the framework subject to renegotiation of a few critical elements associated with financial stability

Black Rock Mining is in the process of submitting an EIS and is preparing for the new mining code via completing of an application for a Mining Licence under the existing legislation

Any State Agreement that is likely to be achieved in the medium term and will only enhance Black Rock Mining's position

ONCE THE MINING CODE IS COMPLETED:

 Recommence some work as a sign of goodwill once mining is signed
(Pilot Plant 1 – provides concentrate for marketing)

- Resume DFS once mining licence is granted
- Complete drill out and Pilot Plant 2
- Commence engineering, organisational development and increase marketing

6. Graphite Market



DEMAND INCREASING DRIVEN BY ENERGY EFFICIENCY AND STORAGE BUILDING CLADDING LI-ION BATTERIES



Increased regulation to drive move from polystyrene to expandable flake graphite resulting from unfortunate incidents at:

- Grenfell Tower London
- Torch Tower Dubai •
- Lacrosse Building Melbourne •

Volume estimates vary from 250k tonnes pa to over 1m tonnes pa of flake graphite within five years



ProGraphite forecasts ~ 60% growth in flake graphite demand between 2016 and 2025, with LIB growth dominating at 15.7% CAGR

Roskill forecasts ~10% CAGR in total graphite demand from LIB between 2016 and 2026 – overall increase ~700,000 tons

Source:, Yuan Gao, Ph. D. President & CEO Pulead Technology Industry Co. Ltd. "Chinese EV Market & Cathode Materials Used for Automotive LIBs" 2017 International Lithium & Graphite & Cobalt Conference





EXISTING SUPPLY UNDER PRESSURE DUE TO ENVIRONMENTAL REGULATION AND REDUCTION IN SYNTHETIC SUBSTITUTES

Natural

Majority of current global supply comes from China.

China has moved to increase anti pollution emphasis, crack downs on undocumented and unlicensed operations, and reduced access to explosives have constrained mine supply.

Anecdotal evidence suggests this has resulted in 40% permanent closures of graphite mines.

Synthetic

Within China, coal tar price increased during 2016 from RMB1,400/t to RMB2,200/t and is currently (September 2017) between RMB2,500/t and RMB3,000/t with resulting anode grade coke from India moving from US\$230/t in late 2016 to over US\$500/t, spot pricing has recently exceeded US\$1,000/t.

Closure of facilities during last electrode arc furnace (EAF) downturn, consolidation of suppliers, and shortage of needle coke has pushed prices up from ~US\$4/lb in May to US\$10 lb Nov.



6. Graphite Market

PRICES INCREASING DUE TO DEMAND INCREASING AND SUPPLY DECREASING



7. Black Rock Mining Summary



DEVELOPING THE MAHENGE GRAPHITE MINE

The Mahenge Graphite Project has a JORC Compliant Mineral Resource Estimate of 211.9 million tonnes at 7.8% Total Graphitic Carbon ("TGC") for **over 16 million tonnes of contained graphite.**

INDUSTRY LEADING LOW CAPEX

The Company's optimised PFS released in August 2017 estimates capex at US\$90.1m for phase one production of 83,000 tonnes per annum.

Phases two and three are self funded and adds a further 83,000 tonnes per annum each, taking total production to 250,000 tonnes per annum.

INDUSTRY LEADING MARGIN

Cash costs to port in full production estimated at US\$378 per tonne, significantly lower than most African peers.

With industry leading product concentrate grade and atributes, selling price is likely to be higher than other developers.

COMPELLING FINANCIAL METRICS

Post-tax unlevered project NPV₁₀ of USD \$905m after tax, inclusive of 16% free carried, inspection fee and royalty increase

EBITDA in first full year of production US\$220 million (EBITDA margin of 66%).

SIGNIFICANT SCALE OPPORTUNITIES

Ability to add scale or life given initial 32 year mine life uses around 30% of the Resource's contained graphite.

INCREASING DEMAND AND CHALLENGING SUPPLY DYNAMIC

Building cladding and lithium-ion batteries driving demand at very significant annual growth rates with production of natural flake graphite and synthetic substitutes decreasing. Pricing data proving out positive supply demand dynamic







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