

### MAHENGE GRAPHITE PROJECT BEST OF CLASS GRAPHITE PROJECT

Naturally Better Graphite

**August 2018 Investor Update** 





### **Important Information**

The release, publication or distribution of this presentation in certain jurisdictions may be restricted by law and therefore persons in such jurisdictions into which this presentation is released, published or distributed should inform themselves about and observe such restrictions.

#### **DISCLAIMER**

This presentation is for informational purposes only and does not constitute an offer to sell, or solicitation to purchase, any securities. Such Offer can be made only through proper subscription documentation and only to investors meeting strict suitability requirements. Any failure to comply with these restrictions may constitute a violation of applicable securities laws. In providing this presentation Black Rock Mining Limited ACN 094 551 336 ("Black Rock") has not considered the financial position or needs of the recipient. Persons needing advice should consult their stockbroker, bank manager, solicitor, attorney, accountant or other independent financial and legal advisors.

#### FORWARD LOOKING STATEMENTS

Various statements in this presentation constitute statements relating to intentions, future acts and events. Such statements are generally classified as "forward looking statements" and involve known and unknown risks, uncertainties and other important factors that could cause those future acts, events and circumstances to differ materially from what is presented or implicitly portrayed herein. Words such as "anticipates", "expects", "intends", "plans", "believes", "seeks", "estimates" and similar expressions are intended to identify forward-looking statements. Black Rock caution shareholders and prospective shareholders not to place undue reliance on these forward-looking statements, which reflect the view of Black Rock only as of the date of this presentation. The forward-looking statements made in this presentation relate only to events as of the date on which the statements are made.

#### **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".



#### **Table of Contents**

- 1. Summary
- 2. Black Rock Overview Corporate
- 3. Execution Focused on Delivery
  - On track for first product in late CY2019
- 4. Overview Mahenge Graphite Project (Location + PFS metrics)
- 5. DFS Pilot Plant Confirms Unique Ore and Product Quality
  - DFS Executing to plan
  - DFS DFS Simple reliable flexible mill
  - DFS Opex infrastructure leverage
- 6. Execution Financing discussions progressing in parallel with DFS completion
  - Execution Customer acceptance and product quality
  - Execution Permitting process nearing completion
- 7. Graphite Market more than just batteries
  - Volume to double over next decade
  - Supply constraints leading to higher prices
- 8. Why Black Rock?



## 1. Summary

- 100% Project Ownership Black Rock Mining (ASX:BKT) has a 100% interest in the Mahenge Graphite Project located in Tanzania
- Exceptional PFS Optimised PFS completed in Aug 2017 with the following key metrics
  - Long life and meaningful scale Three stage construction to deliver 250k tonnes per annum for 31 years
  - **Low capex** Pre production capex only US\$90m for 83k tonnes per annum
  - Cash flow funding Stages two and three funded from cash flow
  - **Low opex** Steady state opex of US\$378 per tonne (likely to be lower with train)
  - Brilliant financial metrics Post tax unlevered NPV<sub>10</sub> of US\$905m with IRR of 45.1% inclusive of 16% Government free carry
- Industry leading graphite Industry leading product attributes (concentrate grade and flake size distribution) confirmed by pilot plant
- Simple processing Arguably the most simple process flow sheet in the industry
- Strong management capability Proven management team focused on project execution
- Path to market established Real partners in place
- Graphite market improving Graphite market dynamics becoming increasingly positive



### 2. Black Rock Overview - Corporate

ASX Ticker	ВКТ
Share Price	A\$0.044
Shares on Issue	443.7m
Options	64m
Performance Rights	3.4m
Fully Diluted Market Capitalisation	A\$22.5m
Cash on hand as at 30 June 2018	\$1.79m
Top 20 Shareholders	c.50%
Major shareholders	
Copulos Group	21.58%



#### **Key Management**



#### **JOHN DE VRIES**

#### **CEO and Managing Director**

Mining Engineer with over 35 years-experience 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.



## 3. Execution – Focused on Delivery

### **Consistent delivery on promises**

Q1



Q2



Q3



Q4

**Complete PFS** 

<u>& Leadership</u>

**Start DFS** 

Validate Design & Assumptions

**Q1 FY18** 

- Delivered Optimised PFS
- Reserve declared of 69.6 Mt at 8.5% TGC

**Q2 FY18** 

**Balance Sheet** 

- New Chairman appointed
- \$4.75m raised to progress DFS
- 300 cycle battery test work completed
- DFS Engineer appointed

**Q3 FY18** 

- Metallurgical testing and drilling program completed
- TIC registration successful
- ESIA submitted
- Pilot plant commenced

Q4 FY18

- Rail confirmed
- Pilot plant testing confirms industry leading graphite concentrate
- ESIA Response
- Customer concentrate placement



# 3. Execution – Timeline on track for first product in late CY2019\*

### Focus on construction ready / FY 19 Targets









**2H** 

#### **Study Completion**

- ESIA approval
- Resettlement framework approved
- DFS Completed
- Continued offtake conversations
- Commence commercials Rail, Power, Ports
- Commence financing

#### **Permitting & Contracts**

- Mining Licence submitted
- China procurement resolved
- BOT contracts tendered and awarded
- Pilot Plant II completed
- Design Optimization completed

#### **Finance & Construction**

- Mining Licence in place
- Offtake in place
- Finance in place
- Construction commenced with commissioning targeted for late CY19

<sup>\*</sup> Timeline is subject to relevant Tanzanian regulatory approval and financing



- Crawl, Walk, Run Strategy
- 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 of 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 NPV<sub>10</sub> of US\$905m
- Post-tax, unlevered IRR of 45.1%
- EBITDA in first full year of production US\$220 million (EBITDA margin of 66%)





Basket Price Assumption (US\$ per tonne)	Price Assumption (US\$ per tonne)	NPV <sub>10</sub> (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

Sensitivity Table showing how changes in basket price effect NPV<sub>10</sub> and IRR

<sup>\*</sup> All material assumptions used in PFS announcement of 8 August 2017included in this presentation have not materially changed and that the material assumptions continue to apply per that PFS announcement



# 5. DFS – Pilot Plant Confirms Unique Ore and Product Quality

#### **Purity and size matter**

- Approximately 70% of the primary cleaning circuit for the Ulanzi ore product contained flake sizes over 80 mesh (180 microns)
- Primary cleaning delivered a 95% concentrate and a secondary cleaning circuit increased this to 97.5%
- Repolishing delivered world first Ultra +99% concentrate from flotation

97.5% Premium run						
Size		% Retained	Grade			
Mesh	um	Individual	C (t) %			
32	500	1.6	97.3			
48	300	25.9	97.5			
65	212	32.1	98.2			
80	180	16.3	97.3			
100	150	9.3	97.5			
150	106	7.3	96.9			
200	75	3.0	97.6			
-200	-75	4.5	96.4			
Total (calc)		100				
Total (direct)						
K <sub>80</sub>		354				

99% Ultra Run						
Size		% Retained	Grade			
Mesh	um	Individual	C (t) %			
32	500	0.2	99.1			
48	300	12.9	99.8			
65	212	25.3	99.7			
80	180	16.6	98.4			
100	150	16.4	99.6			
150	106	11.1	99.1			
200	75	7.1	99.3			
-200	-75	10.4	99			
Total (calc)		100				
Total (direct)						
K <sub>80</sub>		276				

Tables showing results from initial pilot plant run on Ulanzi ore



### 5. DFS – Study Executing to Plan

#### DFS remains on budget and on schedule

- On track for release in September 2018
- High quality study supported by rigorous test work

#### **Engineering**

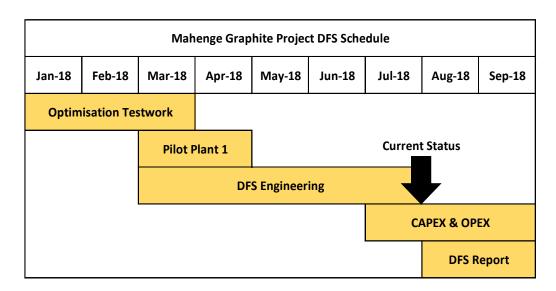
- Flowsheet complete
- Vendor testwork and, mechanical selection complete, material off takes commenced

#### Capex & Opex

- Opex leverage to early grid power & rail
- Capex leverage to global procurement and single sourcing

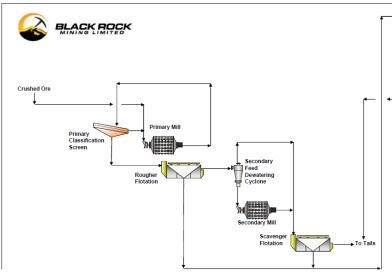
#### Reporting

- Engineering complete by Sept
- Reporting will continue into Oct
- Many common sections with Mining Licence





## 5. DFS – Simple Reliable Flexible mill



#### **Single Circuit**

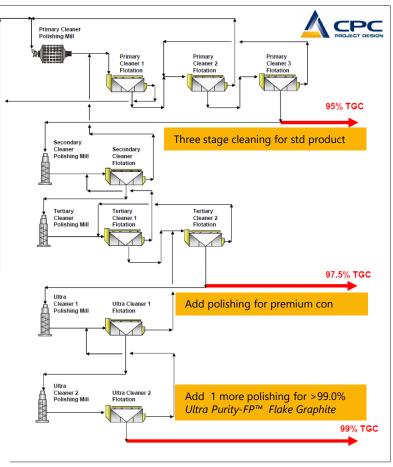
- Flexible Regular, Premium and *Ultra Purity-FP*™ *Flake Graphite* delivered from the same circuit
- Straight forward product flow no mid mill screens

#### **Dry Stacking**

- Derisks and simplifies water management
- Frees up space and reduces residue footprint

#### Strong recovery rates and grades

Base case 93% recovering delivering 97.5% TGC (graphite)





### 5. DFS – Opex Infrastructure Leverage

# Rail haulage demonstrates superior logistics solution

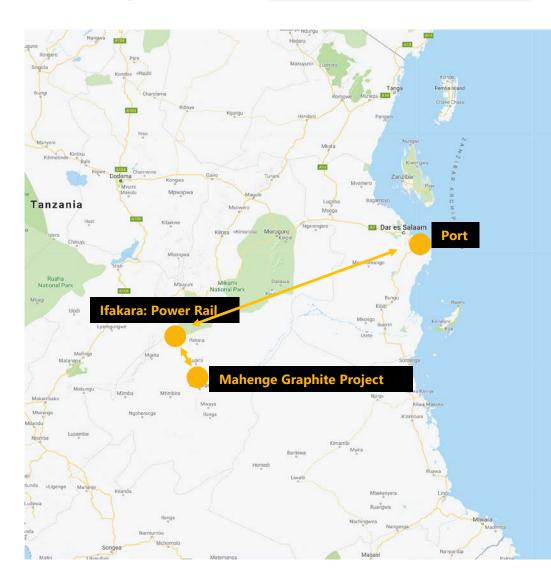
- Second bulk sample rail hauled to Port of Dar es Salaam validates logistical viability for Mahenge production
- Rail haulage simplifies logistics and materially lowers cost by an estimated USD\$40/tonne

#### **Reliable Grid Power**

- Tanesco provides reliable power across Tanzania and to the Mahenge project
- Significant cost advantage relative to diesel

#### Port of Dar es Salaam

- 4<sup>th</sup> largest port Indian Ocean port in Africa, 12 million tonnes shipped annually
- Provides a pool of empty containers for back hauls to Asia





# 6. Execution – Financing discussions progressing in parallel with DFS completion

#### **Continued engagement with China**

 Serious discussions with Chinese engineering, procurement, construction and management (EPCM) firm

#### **Potential reduction in CAPEX**

 A single-source mining infrastructure procurement process would be expected to lower capital expenditure requirements and be consistent with local content obligations

#### **Funding pathway**

 Successful negotiations with ECPM firm may enable Black Rock to secure future funding

#### **Tanzania Banking**

 Encouraging conversations indicate capacity for meaningful contribution to overall project financing





# 6. Execution – Customer acceptance and product quality

#### Large flake is key point of differentiation

Industry leading large, pure flake graphite distinguishes Mahenge

# Strong demand for ultra-high grade graphite

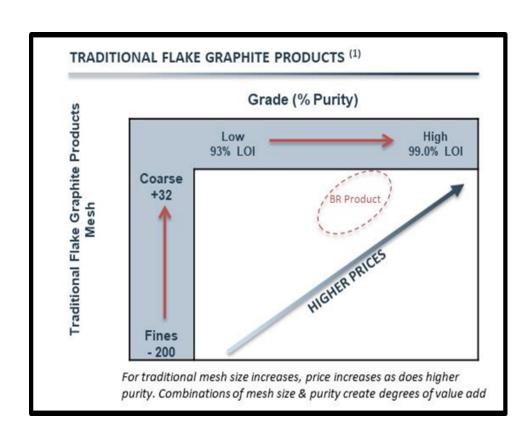
- *Ultra Purity-FP™ Flake Graphite* is a superior product with impressive demand
- Applications including batteries, fire retardants and graphene products

# Positive feedback from potential Mahenge customers

- *Ultra Purity-FP™ Flake Graphite* was well received by potential customers
- Sample delivery has generated a lot of interest in Mahenge graphite products

#### **USA Vs China Tariffs**

 Likely to be advantageous for both African sourced as well as higher specification products





# 6. Execution – Permitting process near completion

#### **Environmental and Social Impact Assessment**

- Final submitted in May expect advice near term
- Resettlement Policy Framework complete and well supported within community

# **DFS provides a number of important documents required for Mining Licence**

- Environmental and Social Impact Assessment (ESIA) – submitted
- Feasibility report DFS summary
- Environmental Management Plan
- Employment and training program
- Resettlement Action Plan partially completed as Resettlement strategy completed
- Program of mining operations
- Infrastructure requirements plan
- Local content plan



# 7. Graphite Market – More than just batteries!













## THERMAL MANAGEMENT

Geothermal
Refractories
Crucibles
Hot Metal Toppings
Foundry
HMF- Dispersions
Glass

## ENGINEERED PRODUCTS

Friction

Powder Metallurgy

\*Graphite Foils

Agriculture

Ceramics

SiC Optics

MIL-SPEC

Carbon Brush

Pencil

#### LUBRICANTS

\*Grease
Dry Powders
Seed Lubes
Rail Lubes
Dispersions
MIL-SPEC
\*Drilling Fluids

#### **ENERGY STORAGE**

Alkaline Batteries
Lead Acid Batteries
\*Li-lon Batteries
Primary Lithium
Super-Caps
Fuel Cells
DOD & DOE

E-Bikes

#### PLASTIC, POLYMERS, RUBBER

Conductive Plastics Conductive Coatings & Paints

#### \*Fire Retardants

Antistatic Flooring
PEEK
PTFE
Rubber
Electronics Packaging

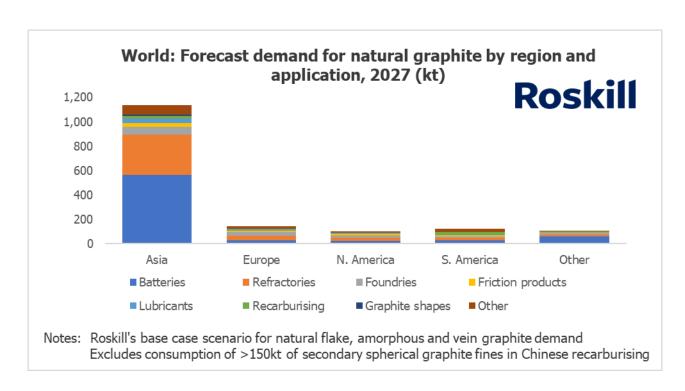
\* Applications that are initial targets, are testing, or qualifying lab samples; next step commercial bulk samples (customer paid).

Having products that are desirable in diverse markets is a critical risk mitigator



# 7. Graphite Market – Volume to double over next decade

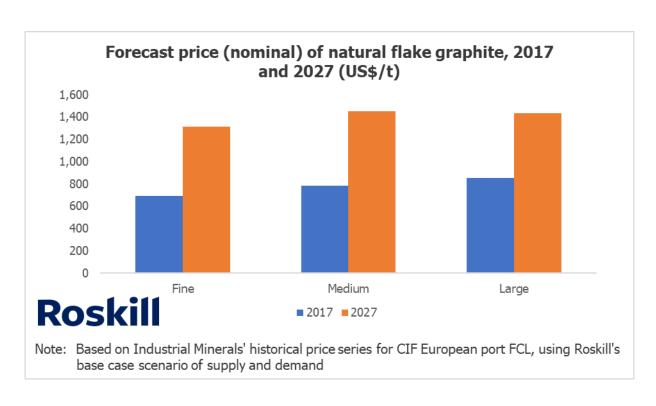
- Demand doubles over next decade driven by batteries
- Increased demand in speciality applications
- Expanded demand drives large flake and purity demand
- Increased volumes needs to replace mines closing due to environmental compliance and declining grades





# 7. Graphite Market – Supply constraints leading to higher prices

- Chinese supply constraints (environmental and reserve depletion)
- Global shift from China to Africa to drive supply side
- Growth in expanded application drives large flake and purity demand





### 8. Why Black Rock?

#### Track record of delivering to promise

Demonstrated engagement with government and community derisks project

#### Pilot plant critically de-risks the project

 Pilot plant proves that at significant scale the project can deliver premium size high grade concentrate

#### **Definitive Feasibility Study**

 High quality detailed study supported by real pilot plant data de-risks capex, and opex estimates, and increases deliverability – "measure twice cut once"

#### **Infrastructure Advantage**

Power, Rail and Port – long term competative advantage

#### **Products and Partners**

Real product, in credible volumes, in the hands of customers = real market engagement



John de Vries

CEO & Managing Director

Black Rock Mining

+61 438 356 590

jdv@blackrockmining.com.au





