

10 February 2016

# **Montepuez Concept Study Delivers Exceptional Results**

# Highlights

- Results from Concept Study at Montepuez Graphite Project are robust and will feed into Pre-Feasibility Study anticipated by Q3 2016
- Proposed 100,000t concentrate per year production
- Capital cost estimate of US\$166m (+20% contingency)
- Capital cost figure includes spherical graphite plant (US\$80m)
- 60 year life of mine (LOM), low 2.2:1 strip ratio
- Very low OPEX for both flake and spherical graphite products
- US\$300/t OPEX for large-jumbo flake graphite product
- US\$3500/t OPEX for coated spherical graphite product
- Significant cost improvement opportunities continuing to be assessed
- Favorable deposit characteristics position project for fast-track to mining
- Discussions and detailed test work with potential offtake parties progressing
- Project finance discussions underway

Metals of Africa Limited (ASX: MTA) (the Company) is pleased to announce highly positive results from a Conceptual Study (Concept Study) on its 100% owned Montepuez Graphite Project (the Project) in Mozambique which has confirmed support for the Project's potential development in order to proceed to a Pre-feasibility Study (PFS).

The Project is located in the world class Cabo Delgado graphite province of Mozambique, in East Africa. Based, on the strongly encouraging results of the Concept Study, MTA's Board has made the decision to move forward with the potential development of the Project.

The Concept Study including conceptual mine plan and preliminary economic analysis was completed by RungePincockMinarco. The Concept Study was completed to an accuracy of +/- 40%. The Company chose to adopt a conservative approach to input parameters, which provides the opportunity to significantly improve on Concept Study costs and recoveries during the proposed PFS.

# **Cautionary Statement**

The Company advises that a proportion of the production target referred to in this announcement is based on an inferred mineral resource. There is a low level of geological confidence associated with inferred mineral resources and there is no certainty that further exploration work will result in the determination of indicated mineral resources or that the production target itself will be realised.

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MTA Managing Director, Cherie Leeden said:

"We are delighted with the results of the Montepuez Concept Study, which provide the Company with the confidence required to complete our Pre-feasibility Study at the Project, followed by project development. The strong outcomes of the Concept Study along with the high quality of graphite at Montepuez combine to make what we believe is a compelling case to move forward with project permitting and financing, and to advance Company plans to make the Montepuez Project a significant graphite producing operation."

Parameter	Assumption					
Life of Mine (LOM)	Over 60 years					
Resource Category	Assessment includes Inferred Resources (55%) and					
	Indicated Resources (45%)					
Net carbon recovery to product	85%					
Product Moisture	10%					
Average Strip Ratio (LOM)	2:2:1					
Concentrate Production	100,000 tpa					
Processing Feed Rate	1.2Mtpa					
Overall Slope Angle	45 Degrees					
Mill feed grade	~10% TGC (first 30 years), ~8.5% TGC LOM					
Royalty Rate	3%					
Accuracy	+/- 40%					
OPEX for large-jumbo flake graphite product	Mining	\$59				
(US\$/t flake)	Processing	\$90				
	Transport <sup>(2)</sup>	\$105				
	Administration and Sustaining Capital	\$46				
	Total	\$300				
OPEX for coated spherical graphite product	Flake concentrate (as above)	\$300				
(US\$/t spherical graphite)	Spheriodization and coating \$3200					
	Total \$3500					
Capital Expenditure (US\$M) <sup>(3)</sup>	Processing Plant	\$35.0				
	Site Infrastructure <sup>(1)</sup>	\$25.7				
	Owners Costs	\$15.5				
	Power Facility	\$10.0				
	Spherical Graphite Plant	\$80.0				
	CAPEX Subtotal	\$166.2				
	Contingency (20%)	\$33.2				
	CAPEX Total	\$199.4				
Flake Size Distribution	Very Fine	15.5%				
	Fine	20.7%				
	Medium	7.5%				
	Large	23.5%				
	Jumbo	32.7%				

Table 1. Key Concept Study Parameters and Assumptions.

Notes 1. Inclusive of haul roads, ROM pad, camp and tailings storage facility.

- 2. Inclusive of trucking costs to the Port of Pemba
- 3. The Company has provided key inputs to the CAPEX

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A draft conventional mineral processing flow sheet has been designed employing crushing, grinding, floatation, regrinding and product dewatering and classification. A spheroidal graphite processing plant is proposed to treat the flake sizes below large flake size (180 microns) to produce 50% spheroidal graphite and 50% carburizer product. Therefore including the large, jumbo and super jumbo flake size, which accounts for over 50% of resource distribution, the final product proportion is estimated to be 25% spheroidal, 25% carburisation, 20% jumbo/super and 30% large flake. The proportion of flake sizes have some basis (from flake size analyses conducted for the resource estimation) however need to be confirmed with testwork. Whilst further detailed scheduling is required, based on a proposed production of 100kt concentrate per annum in a typical year, this would be the assumed total product output (Figure 1):

- 25kt per annum Coated Spheroidal graphite
- 25kt per annum Carburiser product
- 20kt per annum Jumbo-Super Jumbo Flake
- 30kt per annum Large Flake

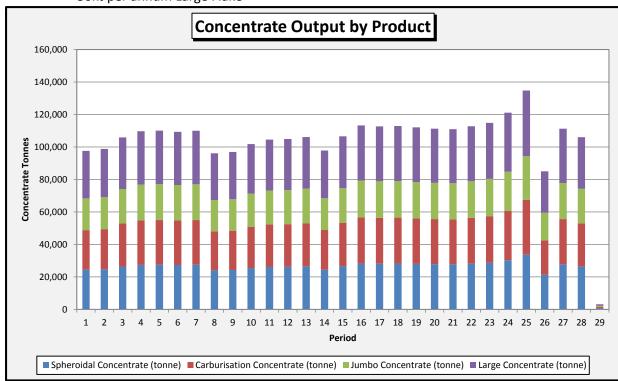


Figure 1: Proposed product split over the first 30 years of mining at the Montepuez Project

### **Product Mix**

The Project contains a very high proportion of large to super jumbo flake size. Graphite is priced according to flake size, the larger the flake, the more valuable the product. The Concept Study presumed that the medium, fine and very fine flake sizes will be used as inputs to the Spheroidal/Carburiser process. The highly sought after large, jumbo and super jumbo flake are presumed to be sold into the flake graphite market. As part of the PFS the Company is investigating supplying 100% of production into the spherical/recarburiser market which would be likely to significantly increase profitability. Based on a proposed production rate of 100,000t per annum the Montepuez Central Project would deliver the product mix as per Table 2.



### **Testwork commentary**

A testwork program is being conducted at ALS Metallurgy in Perth to establish a suitable processing flowsheet and the associated processing characteristics for the Buffalo ore from the Montepuez Central deposit. Four ore types representing two lithologies and two degrees of weathering (viz. weathered and primary) are being tested with a second round of testwork proposed for Lennox ores. The testwork program consists of head grade analysis, examining the potential for pre-concentration, grind size determination and flotation studies including kinetics and cleaning studies to produce suitable marketing products for the manufacture of Li-ion batteries. Comminution studies have been completed at JKTech for the four Buffalo ore types while determination of the comminution properties for the Lennox ores is underway. Metallurgical test work is a key project risk for the proposed PFS that the Company is currently addressing.

### **Grade and Recoveries**

The following concentrate Grades and Net Recovery to Product Assumptions were used in the Concept model. These assumptions made by the Company are based on its understanding of the processes involved and the quality of the Project's graphite. The Company's current test work is underway and the below Net Recovery to Product Assumptions in particular have used very conservative recovery percentages, due to the limited amount of test-work results currently available.

Concentrate Grades		
Spheroidal Concentrate Grade	%	99.95%
Carburisation product	%	90.00%
Jumbo Concentrate Grade	%	96.00%
Large Concentrate Grade	%	96.00%
Net Recovery to Product Assumptions		
Spheroidal	%	21%
Carburiser	%	21%
Jumbo	%	17%
Large	%	26%

Table 2. Concentrate Grade and recovery assumptions used in Study.

The target market for the Jumbo and Large Flake is the Asian region. The spherical graphite (coated) is proposed to be sold into the American market, for primary use in Lithium ion storage batteries.

Figure 2 represents the current general indicative market prices assumed for the various flake sizes and also the coated spherical graphite. These price assumptions that are used by the Company are not an outcome of any Study and are used solely for illustrative purposes.



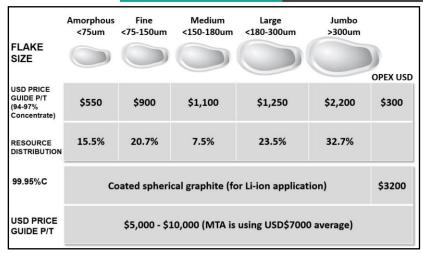


Figure 2: General Current Market Pricing (independent pricing source: Industrial Minerals 2015)

# **CONCEPT STUDY DETAILS**

### Key aims of the Concept Study:

- Analyse the geological characteristics of the deposit and implications for mining
- Identify the most appropriate mining method and development strategy
- Estimate capital and operating costs for the Project
- Characterise metallurgical properties including flake size, purity and nature of contaminants
- Select conceptual ore processing flowsheet and conceptual economic analysis

# Background - Lithium-ion Battery Market driving unprecedented spherical graphite demand

MTA is targeting the lithium-ion battery market as its main graphite market. Graphite is a critical component of Lithium (Li) ion batteries; the positive terminal (cathode) is composed of Lithium plus other metals and the negative terminal (anode) is composed of graphite. There is more graphite in a Li-ion battery than Lithium.

The Company is focused on developing flake graphite to anode-ready material (spherical graphite) tailored for the ever expanding battery market. Currently the only large scale spherical graphite facilities are located in China. An opportunity exists for the Company to create a spherical graphite facility located outside China, and MTA is proposing such a facility to be located in the United States of America where the demand for ethically mined and manufactured spherical graphite is significant and growing rapidly.

Green technologies such as Li-ion storage batteries that capture renewable energy and Li-ion powered electric vehicles are driving the surge in spherical graphite demand. This demand is expected to grow by approximately 40% per annum and is being assisted by global policies that encourage electric vehicles and green energy initiatives that rely on Lithium-ion battery storage units.



# **Key Concept Study Findings: Spherical Graphite Production**

- Conceptual mine plan and economic analysis completed to +/- 40% accuracy
- 2.2:1 strip ratio
- Production schedule completed at plant feed rate of 1.2Mtpa at average grade of 10% TGC for first 30 years
- Average 100,000tpa concentrate production
- Mine life over 60 years
- OPEX per weighted product tonne of approximately US\$1,150/t (four product stream)
- Estimated capital cost of US\$166M + contingency (assuming contractor operation)
- Sufficient Indicated Mineral Resources to progress toward PFS
- Favorable deposit characteristics to fast track mining
- 85% of throughput in the first 12 years uses mineral resources in the Indicated Category. This allows for fast track mine planning and potential project development.
- A spherical graphite processing plant is proposed to treat the flake sizes below large flake size (180 microns) to produce 50% spherical graphite and 50% recarburiser (from the spherical waste).

# **Key Concept Study Findings: Coarse Flake Production Option**

Favorable deposit characteristics to fast track coarse flake production only option for the Asian market:

- Lower CAPEX at US\$80M (doesn't include spherical graphite plant)
- OPEX US\$300/t first quartile production

Whilst the OPEX associated with producing Spherical Graphite is much higher than the production of coarse flake graphite, the potential sale value from this value added product warrants this option being investigated in detail in the proposed PFS.

The Capital Expenditure assumptions estimate includes development of a spherical graphite plant and coating facility. The purpose of a spherical graphite plant is to add value along the processing chain by creating anode ready battery material.

The operating costs estimate includes all costs from mining through to ship loading on a Free on Board status at the port of Pemba.

### Infrastructure

The proposed processing site is located 35km north west of Montepuez, the second largest city in the province. Some upgrading of existing road infrastructure is required to connect the project site to Montepuez. The highway between Montepuez and Pemba is all weather bitumen in good condition. Pemba is serviced by regular domestic and international flights. A power generator will be required onsite, and the Company's preference is to utilise solar energy combined with storage batteries.



Two well established port options exist for the project; the ports of Pemba and Nacala. Nacala is a larger port facility located approximately 580km from the project. The port of Pemba is approximately 260 kilometers from the Project and has sufficient capacity to facilitate the export of MTA's proposed 100,000tpa of product and has been selected as the preferred port due to its closer proximity to the Project (Figure 3). The existing port of Pemba can accommodate Handymax vessels. An allowance has been made to establish a storage and handling area for the product near the port of Pemba.

An upgraded port facility is currently under construction in Pemba, which is scheduled for completion in 2018 and may coincide with the Project's anticipated commencement of production. Sufficient allocation at the port will exist to accommodate the Project's product.



Figure 3: The existing port facility of Pemba MV Radiance (2015)

### The Montepuez Deposit

The basis of the Concept Study was the Mineral Resource estimate for the Montepuez Project (Buffalo, Lion and Elephant prospects), which contains 61.6Mt at 10.2% TGC for 6.3Mt of contained graphite at a cut-off of 6% TGC (refer ASX announcements 16 November 2015 and 8 December 2015 for more details in respect of the Mineral Resource at the Montepuez Project).

This Mineral Resource has been prepared by a competent person in accordance with the JORC Code and is used to underpin the production targets in the Concept Study. The Resource is comprised of three deposits located in close proximity to each other; Buffalo, Elephant and Lion. All three deposits are near-surface (with an average overburden of 2m of soil cover) and as such lend themselves to a potential open pit mining operation. Due to the minimal overburden, the deposits may be suitable for the commencement of ore mining quickly and efficiently, with minimal pre-strip capital investment. At Buffalo the mineralization is 60-80m wide, at Elephant width ranges from 40-120m and Lion's width ranges are 20-50m wide. Buffalo and Elephant boast higher grade and larger widths, and therefore these deposits have been scheduled first, beginning with Buffalo production as it has the highest Resource category.

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RungePincockMinarco Limited ("RPM") was engaged to prepare the Mineral Resource estimate in 2015. The Mineral Resource underpinning the production target, classified as Indicated and Inferred, was prepared under the supervision of a Competent Person and reported in November and December 2015 in accordance with the requirements in Appendix 5A (the JORC Code 2012 edition). Classification of the Mineral Resource was carried out taking into account the geological understanding of the deposit, quality of the sampling and density data, and drill hole spacing. Metallurgical considerations of flake size distribution, purity of product and petrographic analyses were also given due consideration.

Vast portions of the VTEM anomalism at the Project remain undrilled. There are opportunities to delineate further Mineral Resources parallel to existing trends at Elephant and Buffalo. All prospects are open along strike and down-dip.

Table 3 shows the Grade and Tonnage according to % TGC cut-off with incremental and cumulative resources tabulated.

### Montepuez Graphite Project November 2015 Mineral Resource Estimate

Grade Range	Incremental Resource				Cut-off	Cumulative Resource					
	Tonnes	TGC	V <sub>2</sub> O <sub>5</sub>	Contained	Contained	Grade	Tonnes	TGC	V <sub>2</sub> O <sub>5</sub>	Contained	Contained
TGC%	t	%	%	Graphite (t)	Vanadium (t)	TGC%	t	%	%	Graphite (t)	Vanadium (t)
1.0 - 2.0	80,302	1.97	0.05	1,582	44	1	83,527,774	8.81	0.23	7,357,009	190,620
2.0 - 3.0	1,396,495	2.55	0.06	35,639	887	2	83,447,472	8.81	0.23	7,355,427	190,576
3.0 - 4.0	2,653,909	3.69	0.09	97,805	2,466	3	82,050,977	8.92	0.23	7,319,788	189,689
4.0 - 5.0	7,529,132	4.53	0.12	340,970	9,296	4	79,397,068	9.10	0.24	7,221,983	187,223
5.0 - 6.0	10,245,400	5.50	0.14	563,119	14,849	5	71,867,936	9.57	0.25	6,881,012	177,927
6.0 - 7.0	7,146,042	6.51	0.17	465,033	12,497	6	61,622,536	10.25	0.26	6,317,894	163,079
7.0 - 8.0	7,505,020	7.54	0.20	566,217	14,861	7	54,476,494	10.74	0.28	5,852,861	150,582
8.0 - 9.0	8,431,197	8.52	0.22	718,663	18,307	8	46,971,474	11.26	0.29	5,286,644	135,721
9.0 - 10.0	10,464,986	9.53	0.23	997,611	24,367	9	38,540,277	11.85	0.30	4,567,981	117,415
10.0 - 11.0	9,586,488	10.47	0.26	1,003,564	25,024	10	28,075,291	12.72	0.33	3,570,370	93,048
11.0 - 12.0	5,790,582	11.51	0.29	666,225	16,595	11	18,488,803	13.88	0.37	2,566,806	68,024
12.0 - 13.0	3,523,078	12.38	0.31	436,144	10,973	12	12,698,221	14.97	0.41	1,900,581	51,428
13.0 - 14.0	2,104,757	13.44	0.36	282,811	7,583	13	9,175,143	15.96	0.44	1,464,437	40,455
14.0 - 15.0	2,488,293	14.81	0.46	368,471	11,403	14	7,070,386	16.71	0.46	1,181,626	32,872
15.0 - 20.0	4,101,168	17.47	0.47	716,360	19,148	15	4,582,093	17.75	0.47	813,155	21,469
> 20.0	480,925	20.13	0.48	96,796	2,321	20	480,925	20.13	0.48	96,796	2,321
Total	83,527,774	8.81	0.23	7,357,009	190,620					vdh.	125

Table 3: Grade and Tonnage tables according to % TGC cut-off with incremental and cumulative resources tabulated. The 6% TGC cut-off previously stated is highlighted in bold under cumulative resource. The 82 Mt @ 8.5% TGC figure used for the Concept Study utilised a TGC cut-off of 1%.



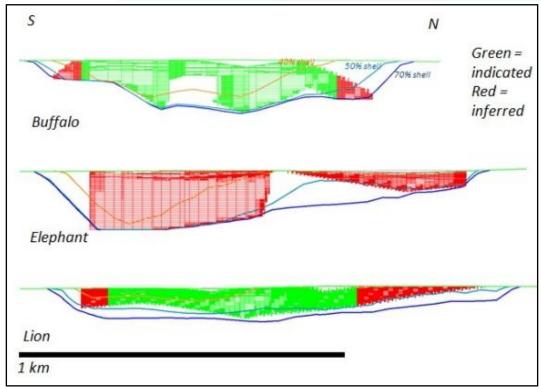


Figure 5: Deposit long sections, Buffalo and Elephant open along strike and at depth

-ENDS-

On behalf of Board of Directors Metals of Africa Ltd.

# For further information, please contact

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### **About Metals of Africa Limited**

Metals of Africa (ASX: MTA) is focused on the rapid development of its graphite assets located in Mozambique. MTA prides itself on environmental best practice and positive community relations.

Metals of Africa is conducting a series of research and development activities and trials in both Australia and Africa in establishing the best process methodology in mineral exploration, mining and processing. This activity is for the benefit of the company's holdings and in the licensing of intellectual property as a means of bringing these ideas to the market.

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# **Competent Persons Statement**

The information in this report that relates to a Concept Study is based on information compiled by Ms. Cherie Leeden, who is Managing Director of the Company. Ms Leeden is a Member of the Australian Institute of Geoscientists and has the relevant experience in the Technical Assessment and Valuation of Mineral Assets of this level of Pre Development study referred Concept Study. Ms. Cherie Leeden also has sufficient relevant experience in the style of mineralisation and the types of deposits under consideration, and to the activities undertaken, to qualify as a Competent Person 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. Ms Leeden consents to the inclusion in this report of the matters based on information in the form and context in which it appears.

The Maiden JORC Graphite Resource at Montepuez Central Project was announced by the Company 16 November 2015 and 8 December 2015 and should be referred with this report. The information pertaining to the Montepuez Central Mineral Resource is based on information compiled by Mr Robert Dennis who is a Member of Australian Institute of Geoscientists and a full time employee of RungePincockMinarco Limited. Mr Dennis 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 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Dennis consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The Montepuez Central Concept Study is based on a preliminary technical and economic assessment to test the potential economic viability of the Montepuez Central Mineral Resource with±40% accuracy to indicate if further work (i.e. PFS) should be undertaken. It includes appropriate assessment of realistically assumed mine development, processing and transport operational factors estimated with presently defined graphite product pricing which supports realistically justified progress to a Pre-Feasibility Study. The Concept Study is not a Pre-Feasibility or Feasibility Study as further comprehensive studies are required to achieve this level of economic confidence including Resource to Ore Reserve conversion and further product testwork.

### **Forward Looking Statement**

This release may include forward-looking statements, which may be identified by words such as "expects", "anticipates", "believes", "projects", "plans", "proposes" and similar expressions. These forward-looking statements are based on Metals of Africa's expectations and beliefs concerning future events. Forward looking statements are necessarily subject to risks, uncertainties and other factors, many of which are outside the control of Metals of Africa, which could cause actual results to differ materially from such statements. There can be no assurance that forward-looking statements will prove to be correct. Metals of Africa makes no undertaking to subsequently update or revise the forward-looking statements made in this release, to reflect the circumstances or events after the date of that release.