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ASX Announcement

20 March 2024

Correction to ASX announcement: Further metallurgical results on chlorination test work

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The ASX announcement titled 'Further metallurgical results on chlorination test work' on 19 March 2024 has been amended as follows:

BODY OF TEXT

- An additional paragraph is included in the section titled 'Rare Earth Extraction' which references the JORC Table 1 from the ASX announcement dated 27 October 2023: 'Positive metallurgical test work results – correction' and provides further information on the bulk sample for this metallurgical test work.

- A competent person statement for the exploration results is included.

APPENDIX A

- A completed Table 1, Sections 1 and 2 of the JORC Code (including a location map for the test material) is included.

This announcement has been authorised for release by the Company's Chief Executive Officer, Grant Hudson.

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ASX Announcement

20 March 2024

Further metallurgical results on chlorination test work

Highlights

- Niobium/Tantalum successfully extracted and separated using environmentally sustainable chlorination refining.
- Confirmation that Niobium/Tantalum products contain no radiation as the radioactive materials are removed in the refining process.
- Successful extraction and separation of >94% of the key Rare Earth Elements (REE), as by-products of the niobium and tantalum refining process.
- Construction of Refinery Pilot Plant commenced for the production of marketing samples for the finalisation of key off-take agreements.

Globe Metals & Mining Limited (ASX: GBE) ("**Globe**" or "**Company**") is pleased to announce the second part of the metallurgical results on the chlorination test work.

As part of Globe's metallurgical test work on the use of chlorination as a refining process for the recovery of Niobium, Tantalum, and other key metals from the Kanyika concentrate, Globe is continuing to conduct test work on concentrate produced in 2014. The first part of the metallurgical results on the extraction results of >99% for Niobium and Tantalum was announced on 27 October 2023.[1]

The metallurgical test work is focused on two key steps – firstly, the extraction of metals from the Kanyika concentrate; and secondly, the separation of the metals (as chlorides) and subsequent purification and oxidation of the metals to high-purity saleable products.

Extraction Test Work

As announced on 27 October 2023 (results repeated below), Globe has conducted a baseline test followed by a series of kinetics and optimisation tests. This culminated in tests (OR12 & OR13) showing above 99% extraction for both Niobium and Tantalum. The tests further demonstrate high extraction yields for other potentially marketable products, namely Titanium and Zirconium, with extraction yields of above 99% and 96% respectively.

[1] Refer to ASX Announcement titled 'Positive metallurgical test work results – correction' made on 27 October 2023

Extraction %				
Test	**Nb_2O_5**	**Ta_2O_5**	**TiO_2**	**ZrO_2**
OR1	98,1%	89,7%	99,4%	53,2%
OR12	99,9%	99,8%	99,9%	92,7%
OR13	99,9%	99,8%	99,9%	95,9%

Fractional Cooling Separation

After the extraction of metals in the chlorination process, the metal chlorides leave the reactor as gases. The gases are systematically cooled down through controlled cooling causing elements to condense when they reach their respective boiling points. Initially uranium and thorium chlorides are condensed removing them from the gas stream. Subsequently iron and zirconium chlorides are condensed to a major extent. At a target condensation temperature of 250°C, a mixture of niobium, tantalum containing zircon and iron is condensed. Control over the target temperature is key to obtaining a high niobium chloride concentration in the condensate.

In the table below, the predicted analysis of condensate at three temperatures is given. The two actual results show that the actual condensation temperature achieved was between 265°C and 270°C rather than the target 250°C. Given the very small laboratory apparatus, accurate temperature control is difficult. The resulting separation of niobium chloride was demonstrated to be very good with a chloride purity over 84%. If the 250°C had been achieved, this would have been >90%.

KR01	**$NbCl_5$**	**$TaCl_5$**	**$FeCl_3$**	**$ZrCl_4$**
Analyzed #1	86,0%	3,5%	2,4%	8,1%
Analyzed #2	84,2%	4,7%	5,3%	9,1%
Calculated 250°C	90,2%	3,4%	1,6%	3,7%
Calculated 266°C	84,9%	3,2%	3,8%	8,1%
Calculated 270°C	83,1%	3,1%	4,6%	8,2%

Purification and Oxidation

The next step is to take the crude mixture of niobium and tantalum and purify it with distillation. The purified niobium chloride is expected to reach >99.9% during distillation. The very pure niobium chloride is then oxidised to produce a final niobium pentoxide product of >99.9% Nb_2O_5. Globe and TCM Research are currently working on this next phase of test work.

No Radioactivity in Intermediate Niobium/Tantalum Mixtures

The test work confirmed that "no radioactive contamination was found in the niobium pentachloride desublimation fraction". While this was expected, it has now been confirmed that the final niobium and tantalum products will not contain any radiation. All uranium and thorium were precipitated before the condensation of the niobium/tantalum mixture.

Rare Earth Extraction

While Rare Earths make up a minor fraction of the concentrate, they are still present and an important economic by-product for Globe.

During the chlorination process, the Rare Earths form chlorides in the form $RECl_3$. These chlorides remain in the reactor residue. Rare Earth chlorides are water soluble. They will be washed out of the residue and concentrated by fractional precipitation of impurities before being precipitated as a Rare Earth carbonate and sold as an important by-product.

The results below are for a particular sample of residue that was washed and analysed for extraction. Under the operating conditions, all the Rare Earths had a >94% extraction.

GMM-32	**Units**	**Ce**	**La**	**Nd**	**Pr**
Feed Material	mg/kg	3608,0	1266,7	1310,3	322,5
Feed Material	mg	288,6	101,3	104,8	25,8
Washed Residue	mg/kg	322,2	104,9	96,9	27,2
Washed Residue	mg	3,8	1,8	1,3	0,4
Extraction Solution	mg/l	504,3	167,3	153,0	42,0
Extraction Solution	mg	28,8	9,6	8,7	2,4
Extraction Yield	**%**	**94,8**	**95,2**	**95,7**	**95,1**

The JORC Table 1 (refer Annexure A) is reproduced from the ASX announcement dated 27 October 2023: 'Positive metallurgical test work results – correction'. Concentrate extracted from the 40-tonne bulk sample in 2013 has been used for the additional testing reported on in this announcement.

Upcoming Test Work

Marketing Samples

Based on these very encouraging results, Globe has already embarked on the production of small-scale (gram scale) marketing samples during March 2024. The mixed niobium/tantalum chloride mixtures will be generated using the equipment used for the TCM laboratory tests described above. These mixtures will then be purified with a target of producing Standard Grade (>99.9% Nb_2O_5) samples to be distributed for marketing purposes.

Pilot Plant Refinery

The larger pilot plant refinery which is currently under construction at Resonant Group (Johannesburg, South Africa) is expected to be commissioned and operational in April 2024. The pilot plant will be processing concentrate at a scale exceeding 10x that of the laboratory apparatus mentioned in this announcement. The aim of the pilot plant will be to produce very high purity 99.98% (optical grade) (kilogram scale) Niobium Pentoxide, which will be provided to Globe's key off-takers to assess. Once the oxide product is produced, Globe will be very well positioned to finalise its discussions with key industry off-takers, a major step forward in the development of Globe's Kanyika Project. The oxide market includes all oxide grades from Standard Grade up to optical grades of 99.98% niobium pentoxide, thus facilitating prices over US$50/kg.

Image: Distillation column for Globe's Pilot Plant under construction at Resonant Group's facility in Johannesburg, South Africa.

Grant Hudson, Globe's CEO commented:

"We are very pleased with the progress made in the metallurgical test work conducted so far. The successful floatation concentration of Kanyika ore, as announced recently, and the refinement of the concentrate through the environmentally conscious chlorination process, hold immense promise for Globe. Both the extraction and separation of all key metals have now been demonstrated as technically feasible, further bolstering our confidence in the process. We are very excited about the upcoming commissioning of the refinery pilot plant, and the production of high-purity marketing samples of niobium pentoxide, tantalum pentoxide, and rare earth element by-product for key industry off-take partners. This marks a major step forward in the development of our Kanyika project."

Project, ESG and Market Overview

Kanyika has the potential to become the first new globally significant niobium mine in 50 years, with an average nameplate production of 3,267 tonnes per annum (tpa) of niobium pentoxide, (Nb2O 5) and 136 tpa of tantalum pentoxide (Ta 2O 5) over the 27-year life of operations. The Nb2O 5 and Ta2O 5 products will be high-specification high-purity products with grades exceeding 99.5% and 99% respectively.

Standard Niobium oxide is being used in the anodes of fast charging batteries (charging to 100% in less than 10 minutes). These batteries have application in large vehicles that cannot afford excessive charging time. These include haul trucks, trains, front-end loaders, underground mining machinery, etc. They are also being used in batteries for handheld tools where fast charging is an advantage.

High purity Niobium is an integral component of daily-use, energy-related, and specialty technologies such as superalloys (for example, for aircraft engines, rocket assemblies, etc), and superconducting magnets (for example, for medical imaging devices, and nuclear power generation).

The Kanyika Project aims to be a pioneering and environmentally sustainable niobium venture, prioritising both innovation and adherence to ESG principals. It has been shown to be a bottom quartile cost project and is designed to ensure the production of "green niobium" in that its Scope 1 and Scope 2 carbon emissions will be of the lowest in the world, with hydroelectric and solar power dominating its power sources for both the mine site and the refinery. The very low carbon footprint is also supported by a unique closed-cycle chlorination refining process, which is transformative for the industry.

Authorisation for Release

This announcement has been authorised for release by the Company's Chief Executive Officer, Grant Hudson.

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Competent Person Statement

Kanyika Niobium Project – Process Metallurgy

The technical information in this report that relates to process metallurgy is based on work completed by TCM Research Ltd and information reviewed by Mr Rex Zietsman, who is the Chief Technology Officer and an employee of Globe Metals & Mining Ltd. Mr Zietsman is a registered professional engineer (Pr Eng) with the Engineering Council of South Africa, registration number 20140376, and has sufficient experience that is relevant to the type of processing under consideration and to the activity being undertaken to qualify as a Competent Person as defined by the JORC Code 2012. Mr Zietsman consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

About the Kanyika Niobium Project

The Kanyika Niobium Project is located in central Malawi, approximately 55km northeast of the regional centre of Kasangu and is secured by Large-Scale Mining Licence No. LML0216/21 which grants the Company security of tenure and the right to mine niobium, tantalum, and deleterious uranium.

Drilling programs totalling 33.8 kilometres of percussion and core drilling have defined the extent of mineralisation. Structured and progressive engineering studies have resulted in the current (JORC 2012) Mineral Resource Estimate (refer below) and given rise to significant improvements and simplifications in the process flowsheet.

In addition, Globe has undertaken substantial metallurgical optimisation work and commissioned the pilot plant design to demonstrate and further optimise metallurgical processes. Metallurgical optimisations studies have improved recoveries from 62% in 2012 to 75% presently, through novel patented metallurgical processes.

The Kanyika operations will produce a pyrochlore mineral concentrate that contains both niobium and tantalum in commercially valuable volumes to be shipped to a refinery for advanced processing into high purity materials.

A Mineral Resource Estimate for the Kanyika Niobium Project under the 2012 JORC guidelines was reported to ASX on 11 July 2018 as follows:

Table 1: MRE for KNP using a 1,500 ppm Nb_2O_5 lower cut

Category	Resource (Mt)	Nb_2O_5 (ppm)	Ta_2O_5 (ppm)
Measured	5.3	3,790	180
Indicated	47	2,860	135
Inferred	16	2,430	120
TOTAL	**68.3**	**2,830**	**135**

Table 2: MRE for KNP using a 3,000 ppm Nb_2O_5 lower cut

Category	Resource (Mt)	Nb_2O_5 (ppm)	Ta_2O_5 (ppm)
Measured	3.4	4,790	220
Indicated	16.6	4,120	160
Inferred	2.8	4,110	190
TOTAL	**22.8**	**4,220**	**190**

Mineral Resource Estimates

The information in this report that relates to Mineral Resources is extracted from the report titled "Kanyika Niobium Project – Updated JORC Resource Estimate" released to the Australian Securities Exchange (ASX) on 11 July 2018 and available to view at www.globemm.com and for which Competent Persons' consents were obtained. Each Competent Person's consent remains in place for subsequent releases by the Company of the same information in the same form and context, until the consent is withdrawn or replaced by a subsequent report and accompanying consent.

The Company confirms it is not aware of any new information or data that materially affects the information included in the original ASX announcement released on 11 July 2018 and, in the case of estimates of Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the original ASX announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Persons' findings are presented have not been materially modified from the original ASX announcement.

Full details are contained in the ASX announcement released on 11 July 2018 titled 'Kanyika Niobium Project – Updated JORC Resource Estimate' available to view at www.globemm.com.

ANNEXURE A

Section 1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	*Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.*	In 2013, a 40t bulk sample was collected in four locations using a TLB (tractor, loader, backactor). The sample was agglomerated and packed into drums. Assay samples of were taken from each drum. This sample was sent to Guangzhou Research Institute for on-Ferrous Metals (GZRINM) for metallurgical process optimization. After optimization, the remaining sample was processed through a pilot plant to produce concentrate. The results of this optimization were declared in the ASX release "Kanyika Demonstration Plant Completed with Outstanding Results" dated 21 October 2014.
	Include reference to measures taken to ensure sample representation and the appropriate calibration of any measurement tools or systems used.	The four locations selected were at outcroppings of the orebody that had already been determined by drilling.
	Aspects of the determination of mineralisation that are Material to the Public Report. *In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.*	The four locations selected were at outcroppings of the orebody that had already been determined by drilling.
Drilling techniques	*Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).*	A TLB dug trenches at each location.
Drill sample recovery	*Method of recording and assessing core and chip sample recoveries and results assessed.*	Not applicable – trench sample taken.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	Not applicable – trench sample taken.
	Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	Not applicable – trench sample taken.
Logging	*Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.*	No logging was carried out as this was a trench sample.

Criteria	JORC Code explanation	Commentary
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	See above.
	The total length and percentage of the relevant intersections logged	Not applicable.
Sub-sampling techniques and sample preparation	*If core, whether cut or sawn and whether quarter, half or all core taken.*	Not core.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	Sample was loaded into drums until a total of 40t of sample had been collected. This sample was then sent to Guangzhou Research Institute for Non-Ferrous Metals (GZRINM) where it was processed to produce a concentrate. The bulk sample optimization and concentrate production was covered in an ASX press release "Kanyika Demonstration Plant Completed with Outstanding Improvements" dated 21 October 2014.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	One sample per drum was taken. Surface and depth samples were taken from each of the locations and composited.
	Quality control procedures adopted for all sub-sampling stages to maximise representation of samples.	One sample per drum was taken. Assays from samples taken at surface and at depth:

Assays in %	Nb_2O_5	Ta_2O_5	ZrO_2	SiO_2	Fe_2O_3	Al_2O_3	P_2O_5	U_3O_8
Composite	0.42	0.027	0.39	52.42	1.19	21.3	0.081	0.0073
Surface	0.9	0.042	0.73	53.86	3.36	19.27	0.21	_
Deep	0.25	0.021	0.273	53.4	0.86	21.19	0.023	_

Bulk sample assay information				
Pit	Name of sample	Type/Interval	Analysis result in %	
			Nb_2O_5	ZrO_2
KPTN001	KPTN001—N1—02	Bulk Pit	0.3297	0.287
KPTN001	KPTN001—N1—08	Bulk Pit	0.3415	0.297
KPTN001	KPTN001—N1—14	Bulk Pit	1.2355	0.86
KPTN001	KPTN001—N1—21	Bulk Pit	1.0343	1.449
KPTN001	KPTN001—N1—29	Bulk Pit	1.366	0.685
KPTN002	KPTN002—N2—03	Bulk Pit	0.6909	0.822
KPTN002	KPTN002—N2—10	Bulk Pit	0.702	0.64
KPTN002	KPTN002—N2—13	Bulk Pit	0.6073	0.534
KPTC001	KPTC001—C—01	Bulk Pit	0.215	0.179

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>KPTC001</td><td>KPTC001—C—06</td><td>Bulk Pit</td><td>0.2411</td><td>0.2</td></tr>
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<tr><td>KPTS001</td><td>KPTS001—S1—44</td><td>Bulk Pit</td><td>0.25</td><td>0.368</td></tr>
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</td></tr>
<tr><td></td><td>Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.</td><td>The location of the four outcroppings were overlaid on the orebody model to confirm that they were outcroppings of the orebody. Subsequent assays showed this to be the case.</td></tr>
<tr><td></td><td>Whether sample sizes are appropriate to the grain size of the material being sampled.</td><td>No applicable as a 40t bulk sample was taken.</td></tr>
<tr><td>Quality of assay data and laboratory tests</td><td>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</td><td>Samples were prepared at Genalysis (Johannesburg) and analysed at the Genalysis Perth Laboratory. The analytical method used was ICP mass spectrometry following a sodium peroxide fusion. The pertinent elements analysed were Nb, Ta, U and Zr with each reported in elemental ppm.

Difficulty in analysing Nb and Ta was noted and is probably due to the concentration of hydrofluoric acid in the final digestion solution and the stability of metal complexes with time. Variable concentrations will affect the ability of the aliquot to retain Nb and Ta for an extended period for some sample matrices, which will result in variable degrees of Nb and Ta precipitation in different samples.</td></tr>
<tr><td></td><td>For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</td><td>Total count Scintillometer readings of the large RC bags were routinely taken and used as a field check for geological domains.

Samples were prepared and analysed at SANAS ISO/IEC 17025 accredited UIS Analytical (Pretoria, South Africa). The analytical method used was XRF spectroscopy following a lithium metaborate fusion. The pertinent elements analysed were Nb, Ta, Fe, Ti, U and Zr with each reported in oxide %. Loss on ignition (LOI) is determined gravimetrically at 1000˚C degrees.</td></tr>
</table>

Criteria	JORC Code explanation	Commentary
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Standards, blanks and field duplicates have been routinely submitted on a ratio of one standard, one blank and one duplicate for every 20 drilled samples. Reference material CAN-1 and CAN-2 were prepared by Ore Research & Exploration Pty Ltd of Melbourne from two 125 kg bulk samples of representative mineralised alkali granitoid from Kanyika. Both standards were certified in a program with ten laboratories, for Nb, Ta, U, and Zr. CAN-1 is certified at 2,237 ppm Nb and CAN2 as 7,144 ppm Nb. Checks (repeat analysis and duplicates samples) were completed as part of the determination of the chemical composition of the samples. Analysis of standards is included for every batch of samples.
Verification of sampling and assaying	*The verification of significant intersections by either independent or alternative company personnel.*	The onsite geologist, Mr Chris Ngwena, verified that the locations of the four outcroppings were indeed part of the orebody.
	The use of twinned holes.	Four different trenches were used to collect bulk sample.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	All sampling, geological logging and assay data has been captured digitally using standard file structure protocols and is stored in the Globe Access database, managed by BMGS in Perth. Copies of the database are held by Globe and various approved consultants.
	Discuss any adjustment to assay data.	No adjustments to assay data.
Location of data points	*Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*	All the trenches were accurately positioned using the prevailing industry standards.
	Specification of the grid system used.	Grid projection is WGS 84 (Zone 36S) as at 30 June 2018.
	Quality and adequacy of topographic control.	The surveying of trenches by Differential GPS formed part of the topographic control. Supporting this dataset were elevation spot heights determined from satellite remote sensing.
Data spacing and distribution	*Data spacing for reporting of Exploration Results.*	Not applicable as trenches were dug where the outcroppings occurred.
	Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.	Not applicable as trenches were dug where the outcroppings occurred.
	Whether sample compositing has been applied.	No compositing has been undertaken.
Orientation of data in relation to geological structure	*Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.*	Four mineralised zones have been identified. These strike 020° and dip to the WNW at ~40°-80°. Most of the drill holes defining the mineralisation are inclined -55° to the east. 18 scissor holes were drilled to the west to test downhole continuity. Consequently, the orientation of the sampling relative to the deposit geometry limits bias.
	If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	The bulk sample trenches were aligned with the outcroppings and in the direction of the orebody.
Sample security	*The measures taken to ensure sample security.*	Individual plastic bags containing samples were packed in large rice bags and sealed with cable ties. They were transported by four-wheel drive or 3-tonne hired trucks. Samples were delivered to Globe's Lilongwe office and then to the Department of Mines for inspection and export permits. After inspection the truck travelled to the airport where the samples were offloaded and weighed again at the secure premises of Manica Freight. The samples were then loaded onto the aircraft for transport to Johannesburg and collection by Genalysis. A Company representative was always on hand to

Criteria	JORC Code explanation	Commentary
		oversee the packing, transportation and delivery to Manica Freight. Genalysis (Johannesburg) handled the arrangements for pulps to be delivered to Genalysis Perth. Individual samples were packaged into plastic containers, suitably marked and delivered to UIS Analytical by a representative from TCM Research.
Audits or reviews	*The results of any audits or reviews of sampling techniques and data.*	None carried out.

Section 2 Reporting of Exploration Results

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	*Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.*	All of the Kanyika drilling is situated within EPL0421/15. The Company's Mining Licence Application was lodged with the Malawi Ministry of Natural Resources, Energy and Mining on 5 December 2014 and covers part of the areas by EPL0188 (expired). The coordinates of EPL 0421/15 (that are likely to change based on the Mines and Minerals Act 2018 for exploration tenement titles) are:

Point	Easting	Northing
A	507300	8603300
B	590500	8603300
C	590500	8595100
D	588500	8590000
E	588500	8581000
F	576900	8581000
G	576900	8599000
H	570300	8599000

The coordinates of the mining licence LML0216/21 are in ARC1950 grid reference:

Point	Easting	Northing
A	570269	8599321
B	576784	8599281
C	577172	8594317
D	570269	8594321

Criteria	JORC Code explanation	Commentary
	The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	The exploration license is in good standing with the Department of Mines Lilongwe as at the date of this publication. The Mining Licence has a mining lease term of 25 from 13 August 2021 under the Mines and Minerals Act (2018) gazetted on 1 September 2019 (and known or referred to as the Mines and Minerals Act (No8 of 2019).
Exploration done by other parties	*Acknowledgment and appraisal of exploration by other parties.*	From 1966 to 1967, the area was mapped at a scale of 1:250,000 by the Geological Survey of Malawi. Following mapping no work was completed in the area until the UNDP conducted a major airborne radiometric and magnetic survey over most of Malawi, at 1km line spacing, between 1984 and 1985. This survey led to the identification of a uranium and uranium-thorium anomaly, measuring approximately 3km by 1km at Kanyika. A field program to investigate the Kanyika airborne radiometric anomaly was conducted by the Malawi Geological Survey in 1986. A total-count ground radiometric survey was completed over an area of 2 by 0.7km. Areas of high radiometric response correlated to foliated nepheline syenite. A total of 91 soil samples and 21 rock chip samples were taken and analysed for Nb, Zn and Pb. Chemical analyses returned Zn and Pb results that were at or near background. Nb assays up to 1.20% in soils and 0.13% in rocks was detected, although there was a poor correlation with anomalous radiometric zones. The analytical suite did not include U, Zr, Ta or REEs due to limitations on available analytical equipment. Following acquisition of the project by Globe Metals and Mining (Africa) Limited, reconnaissance field programs were initiated in 2006. A total-count ground radiometric survey defined two distinct, 020° striking parallel zones, over 2.5km strike length. Soil and rock-chip sampling showed an associated +100ppm U_3O_8 soil anomaly (peak 482ppm U_3O_8) and coincident strong Ta and Nb. Rock-chip samples up to 0.29% U_3O_8, 7.33% Nb_2O_5 and 0.63% Ta_2O_5 were returned.
Geology	*Deposit type, geological setting and style of mineralisation.*	Kanyika is an intrusion-hosted Pyrochlore-Zircon mineralized deposit. It lies within the Malawi Province of the Mozambique Orogenic Belt. It is almost entirely underlain by Precambrian and Lower Palaeozoic Basement Complex, predominantly gneiss metamorphic rocks. Most of the rocks in the region are para-gneiss originating from variable protoliths including pelites, sandstones and limestones. Several granitoid bodies of variable size have intruded the gneiss basement and may have originated wholly or in part by anatexis. A few small concordant bodies of alkaline syenite rocks containing nepheline are also present, including the strike-extensive body which hosts the Kanyika Pyrochlore-Zircon mineralization. Airborne radiometric anomalies and follow-up geochemical sampling programs led to the discovery of the Kanyika deposit. With good surface exposure and abundant drill data, the local geology at Kanyika is well known. The deposit is hosted within a NNE striking, westerly dipping alkaline granitoid, which has broadly concordant contacts with enclosing biotite gneiss. The host unit outcrops over 3.5 km strike length, and averages 200m wide at surface in the south and 50m in the north. Niobium and tantalum mineralization occur as the mineral pyrochlore. The pyrochlore mineralization occurs only within the alkali granitoid, in disseminated form as well as in clustered aggregates forming centimeter wide bands. Within the resource area, four broad mineralisation zones are associated with 2 separate sheets of the alkali granitoid that contain disseminated, pale yellow pyrochlore grains. Each of the four broad mineralized zones appear to correlate broadly to footwall and hangingwall zones of the two granitoid sheets. Higher-grade shoots appear to occur generally at slightly more shallowly dipping orientations and thus have a broadly echelon distribution. Zircon mineralization is associated with

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		pegmatite zones spatially associated with these higher-grade shoots and is commonly, but not always, associated with pyrochlore mineralization in the disseminated and higher-grade forms.
Drill hole Information	*A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:* ▪ easting and northing of the drill hole collar ▪ elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar ▪ dip and azimuth of the hole ▪ down hole length and interception depth ▪ hole length. *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	The trench locations are given below: (see table below)
Data aggregation methods	*In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.*	There has been no exploration data included in this report. Only data relative to drilling and resource determination is stated.
	Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.	There has been no aggregation of data.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	Metal equivalents are not used.
Relationship between mineralisation widths and intercept lengths	*These relationships are particularly important in the reporting of Exploration Results.* *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').*	Not material as the purpose of the exercise was to collect a bulk sample for metallurgical testing only.

Hole identification	Hole Type	Max depth (M)	Northing	Easting	Elevation	Grid type
KAPT1	PIT	3.35	8,597,050.0	572,960.0	1,045.02	UTM84-36S
KAPT2	PIT	2.73	8,597,050.0	572,970.0	1,044.31	UTM84-36S
KAPT3	PIT	1.3	8,597,050.0	572,980.0	1,043.54	UTM84-36S
KAPT4	PIT	3.65	8,597,050.0	572,990.0	1,042.72	UTM84-36S

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Diagrams	*Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported. These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	Location of Kanyika niobium project annotated with country boundaries (dashed line) major roads (brown line) railways (red line) and major cities, follows. 
Balanced reporting	*Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	Data is presented in the same format as received from analytical laboratories.
Other substantive exploration data	*Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	Bulk samples have been recovered for metallurgical test work. The locations of these pits are recorded in "Drill hole Information" above.
Further work	*The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling). Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	Concentrate from the GZRINM test work was used for the current test work being reported upon. Representative sub-samples were extracted from the homogenized samples using industry standard subsampling and sample preparation techniques. The laboratory sample mass taken is appropriate for the fine particle size of the material and for the tests required.

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		Duplicate samples were extracted for comparative analysis. **Samples were prepared and analysed at SANAS ISO/IEC 17025 accredited UIS Analytical (Pretoria, South Africa). The analytical method used was XRF spectroscopy following a lithium metaborate fusion. The pertinent elements analysed were Nb, Ta, Fe, Ti, U and Zr with each reported in oxide %.** **Metallurgical testwork was conducted at TCM Research facility (Pretoria, South Africa) The procedures used in the metallurgical testwork studies involve laboratory-scale simulation of the processing methods which would be used in the proposed processing plant.** **Feed preparation** **The sample material has been pelletized with reductant/binder and dried at 60˚C for 12 hours prior to being submitted for extraction testwork.** **Extractive Chlorination** **The pelletized sample material has been subjected to chlorination according to TCM Research in-house standard operating procedures. The material has been weighed prior to and after extraction to determine the mass loss and submitted for chemical analyses to solve for the mass balance. A mass balance has been performed according to equation:** $\sum M_i = M_i^{residue\ after\ chlorination} + M_i^{volatalized}$