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ASX Announcement

12 March 2024

Globe initiates production of concentrate for chlorination refinery pilot plant

Highlights

- Completion of successful flotation economic optimisation testwork to finalise choice of reagents.
- Production of concentrate feedstock initiated for Globe's chlorination refinery pilot plant.
- Construction of chlorination refinery pilot plant commences utilising technology with low environmental impact.

Globe Metals & Mining Limited (ASX: GBE) ("**Globe**" or "**Company**") is pleased to announce the results of its flotation economic optimisation testwork and the initiation of production of concentrate feedstock for its chlorination refinery pilot plant.

Flotation of Bulk Sample

In preparation for the pilot plant operation, Globe has completed a series of reagent optimisation tests to confirm that the most efficient and cost-effective reagents have been selected. The outcome of the testwork indicates that the collector/promoter (sourced from Mexico) in the historical testwork proved to be a better overall economic option (expressed as consumption times cost) to reagents sourced from South Africa.

Globe is now in the process of producing the required concentrate feedstock from the 10-tonne ore bulk sample taken from the Kanyika mine site[1] and is pleased to confirm that the production of niobium/tantalum concentrate via flotation follows the results of locked cycle tests carried out internally in 2022.

It must be noted that the niobium content of the ore at this location is lower than the overall resource grade and lower than that anticipated for the initial mining. The lower head grade reduces the amount of pyrochlore that can be recovered per tonne of ore, which results in a recovery versus grade optimisation.

Two scenarios were tested to show recovery optimisation versus concentrate grade optimisation. The results of the tests are set out in Table 1. The two results are effectively the two extremes that could be followed during flotation. The Locked Cycle Test (see Table 2) carried out on core material lies between

[1] Refer to ASX Announcement titled 'Globe extracts 10-tonne sample from Kanyika Niobium Project' made on 3 May 2023

these two extremes. It should be noted that with the carbochlorination refining route that is relatively insensitive to concentrate grade, Globe will be targeting high recovery at the expense of grade.

Item	Run 1: Nb_2O_5 recovery optimised	Run 2: Concentrate grade optimised
Head grade Nb_2O_5	0.254%	0.244%
Mass pull	1.09%	0.57%
Niobium recovery	75.3%	52.4%
Nb_2O_5 in concentrate	9.95%	22.3%

Table 1: Flotation results carried out on 10-tonne bulk sample

Locked Cycle Test Comparison

In October 2022 Auralia Metallurgy, a Perth based metallurgical testing laboratory, carried out locked cycle tests on various core samples. A master composite sample covering the life of mine core was collected, milled, and supplied by Globe to Auralia Metallurgy.

The results of the locked cycle tests are set out below.

Project	**GLOBE - KANYIKA**			10/02/2022
Composite	**Master Comp 1**		**WATER**	**DI Water**
Test No	AM95-94		**GRIND TIME**	
Grind Size	P100=150µm		**PULP DENSITY**	~34% solids
Cell Size	4.4L Cell	3.0 kg	**GRINDING MEDIA**	Stainless Steel

Product	Weight		Nb_2O_5		Fe_2O_3		ZrO		Ta_2O_5	
	Gram	%	%	%dist	%	%dist	%	%dist	%	%dist
Mag Con	110.5	1.3	0.17	0.5	68.65	20.7	0.08	0.6	0.01	0.5
Deslime O/F	358.4	4.1	0.41	4.3	4.33	4.2	0.10	2.4	0.02	3.5
Cln 4 Con	122.4	1.4	**17.76**	**64.7**	15.08	5.0	7.85	62.9	0.75	40.4
Ro/Scav Tail	8212.7	93.3	0.12	30.4	3.13	70.1	0.06	34.0	0.02	55.6
Calc'd Head	8804.0	100.0	**0.38**	100.0	4.17	100.0	0.17	100.0	0.03	100.0

Table 2: Locked cycle test results on a master composite of core

The concentrate grade in this test was 17.8% Nb_2O_5 while the overall recovery was 64.7% starting with an ore head grade of 0.38% Nb_2O_5. The locked cycle concentrate grade and recoveries are between the two bulk sample results as referred in Table 1. The bulk sample results are lower due to the lower ore head grade of only 0.24% Nb_2O_5.

When selecting the location for taking the bulk sample, the following criteria were used:

- Had to be an outcropping at surface.
- Had to be within the initial mining area.

The bulk sample head grade is not too dissimilar to the Datamine orebody model data for the location of the bulk sample (data given below or refer to Table 3). The quality of the bulk sample is sufficient for the purpose of producing concentrate for metallurgical testing purposes.

The Datamine specifications of the bulk sample location are as follows:

Nb_2O_5	2,836.3 ppm
Ta_2O_5	99.2 ppm
U_3O_8	56.0 ppm
$ZrSiO_4$	3,741.4 ppm
Density	2.25 tonnes/m^3

Table 3: Datamine data for outcropping

The JORC Table 1 (refer Annexure A) is reproduced from the ASX announcement dated 19 August 2021: "Kanyika Niobium Project – Project Feasibility and Economics". Additional information has been included where it pertains to the extraction of a 10-tonne bulk sample taken on 27 April 2023 at an outcropping located in the initial mining pit using an excavator. This sample was transported to a crushing plant in Lilongwe. After crushing, the sample was sent to Energy Densification Systems in Johannesburg, South Africa for further testing that is reported on in this announcement.

Image: *Flotation testwork being undertaken at Geolabs laboratory in Johannesburg, South Africa*

Grant Hudson, Globe's CEO commented:

"We are incredibly pleased with the progress made in the metallurgical testwork that is underway. The physical production of a high-quality niobium concentrate as feedstock for the refinery pilot plant is progressing well. The demonstrated recovery of high-quality niobium and tantalum oxides are fundamental steps towards the negotiation and finalisation of offtake agreements, as well as the opportunity to finalise the updated feasibility study. Globe is particularly pleased with the development of the overall Kanyika Project. We look forward to the further results of the chlorination extraction testwork and the development and operation of the refinery pilot plant, which will be reported on shortly."

Next Steps

The next steps in Globe's chlorination refinery pilot plant journey are:

- Niobium/tantalum will be extracted and separated using environmentally sustainable chlorination refining.
- Levels of radiation through the refining process in the niobium/tantalum will be confirmed.
- Construction of a pilot plant will be initiated to produce marketing samples for the finalisation of key offtake agreements.

Technical Partners

As previously announced[2], Globe is very proud to be working closely with its key technical service providers in the development of its concentrator and refinery development journey. These providers are as follows:

- Geolabs https://www.geolabsglobal.com/ in the flotation testwork and production of concentrate for feed to the refinery pilot plant operation;
- Solo Resources https://www.soloresources.co.za/ in the development of the engineering and design of the concentrator; and
- TCM Research and the Resonant Group https://www.resonant.co.za/ in the chloride refining metallurgical testwork and the design, construction, and operation of the chloride refinery pilot plant.

Sales and Marketing

Globe is focused on the production of high purity niobium oxides and will therefore not be competing in the mainstream ferro-niobium market. The high-purity niobium oxide products will be sold into the specialty metals markets, realising premium prices over the ferro-niobium market. 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.

[2] Refer to ASX Announcement titled 'Quarterly Activities/Appendix 5B Cash Flow Report' made on 31 July 2023

ESG

Niobium (Nb) is on the US and European critical mineral lists and has many applications in the new economy. In its ferroniobium form it is used to produce high strength, low alloy steels that are utilised for bridges, high-rise buildings, offshore platforms, oil and gas pipelines, automobiles, and many other functions and structures.

Standard niobium oxide is used in the anodes of fast charging batteries, allowing for a charge to 100% in less than 10 minutes. These batteries have utility in large vehicles that cannot afford an excessive charging time. These include haul trucks, trains, front-end loaders, and underground mining machinery. They are also used in batteries for handheld tools where fast charging is a notable advantage.

High purity niobium is an integral component of daily-use, energy-related, and specialty technologies such as superalloys (which are used in aircraft engines, rocket assemblies, and other technology), and superconducting magnets (which are used in medical imaging devices and nuclear power generation).

The Kanyika Project 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 are set to be the lowest in the world. Hydroelectric and solar power will comprise the majority of its power sources for both the mine site and the refinery. The particularly low carbon footprint is also supported by a unique closed-cycle chlorination refining process, which is transformative for the industry.

Project 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, (Nb_2O_5) and 136 tpa of tantalum pentoxide (Ta_2O_5) over the 27-year life of operations. The Nb_2O_5 and Ta_2O_5 products will be high-specification high-purity products with grades exceeding 99.5% and 99% respectively.

Following its optimisation study, Globe has initiated the construction of a chlorination refinery pilot plant. The chlorination technology has a low environmental impact and low carbon footprint – which is important to Globe's operating philosophy. The pilot plant will be constructed and operated over the next few months and will produce very high purity – 99.98% (optical grade) niobium pentoxide, which will be provided to Globe's key off-takers to assess. Once the oxide product is produced, Globe will be keenly positioned to finalise its discussions with key industry off-takers, a major step forward in the development of the Kanyika Project.

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 have 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.*	On 27 April 2023, a ~11t bulk sample was collected at an outcropping located in the initial mining pit using an excavator. The sample was loaded onto a tipper truck and transported to a crushing plant in Lilongwe. Here most of the sample was crushed to -40mm. The crushed ore was loaded into bulk bags. The taking and primary crushing of the bulk sample was witnessed and supervised by two geologists from the Malawi Geological Survey who took samples for their own use. This sample was sent to Energy Densification Systems in Johannesburg, South Africa for further testing.
	Include reference to measures taken to ensure sample representation and the appropriate calibration of any measurement tools or systems used.	The location selected was 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 location selected was at outcroppings of the orebody that had already been determined by drilling. The sample was a mixture of both weathered and fresh material.
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.).*	An excavator dug a pit at the selected location. Topsoil was removed and set aside before taking both surface rocks as well as ore down to a depth of approximately 2.5m.
Drill sample recovery	*Method of recording and assessing core and chip sample recoveries and results assessed.*	Not applicable – bulk sample taken.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	Not applicable – bulk 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 – bulk 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 bulk sample.

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.</td><td>See above.</td></tr>
<tr><td></td><td>The total length and percentage of the relevant intersections logged</td><td>Not applicable.</td></tr>
<tr><td rowspan="6">Sub-sampling techniques and sample preparation</td><td>If core, whether cut or sawn and whether quarter, half or all core taken.</td><td>Not core.</td></tr>
<tr><td>If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.</td><td>Sample was loaded onto a tipper truck and transported to Lilongwe. The sample was then put through a conventional closed circuit crushing circuit. Prior to crushing, the crushing plant was brushed out and cleaned by operators to limit contamination. 9.5t of crushed material was put into 9 bulk bags and exported to South Africa. 8 of the bags had -40mm material while the 9th bag had the remaining +40mm that was cleaned out of the crusher.</td></tr>
<tr><td>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</td><td>One sample of the -40mm material was taken and a wet feed PSD conducted to find the particle size distribution. The material had a maximum size >26.5mm and <37.5mm (more than half of the feed size was within this size range) with an interpolated F80 of approximately 33.425mm. See report: TEST WORK REPORT, Globe Metals & Mining – Niobium Ore; Compiled By: Boaz Friedland, Technical Director at EDS, 26 June 2023. All 33 subsequent tests were also separated using a wet feed screening process to provide data for the appropriate sizing of the EDS multishaft mill.
3.6t of the -1mm crushed ore from EDS was transported to Light Deep Earth laboratories in Pretoria, South Africa.</td></tr>
<tr><td>Quality control procedures adopted for all sub-sampling stages to maximise representation of samples.</td><td>The first time that the bulk sample was assayed was at Light Deep Earth. The head grade of Nb_2O_5 was lower than the Mineral Resource block model estimated Nb_2O_5 grade of 0.2836% at the bulk sample location.
A 24 kg representative sample was extracted from the 3.6t ROM material using a bulk rotary splitter. The sample was split into various fractions including one that was analysed with QEMSCAN – PMA (for characterisation), XRD (for QEMSCAN calibration) and XRF (for chemical balance with the QEMSCAN).
<table>
<tr><th>Stream</th><th>Nb_2O_5 %</th><th>ZrO_2 %</th><th>Al_2O_3 %</th><th>SiO_2 %</th><th>CaO %</th><th>Fe_2O_3 %</th><th>Na_2O %</th></tr>
<tr><td>Head</td><td>0.24</td><td>0.31</td><td>21.5</td><td>60.4</td><td>0.88</td><td>0.8</td><td>9.95</td></tr>
</table>
</td></tr>
<tr><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 outcropping was overlaid on the orebody model to confirm that it was an outcropping of the orebody. The sample is a mix of weathered and fresh material.</td></tr>
<tr><td>Whether sample sizes are appropriate to the grain size of the material being sampled.</td><td>Not applicable as an 11t 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><u>Solo Resources – Gravity Separation Test Work</u>
3.6 tons of the -1mm milled material was delivered in bags to Light Deep Earth (LDE) in Pretoria, South Africa. LDE has ton scale and smaller splitter units. The entire batch was split and a 24kg sample was taken for characterization and gravity evaluation. The sample was split into various fractions including one that was analysed with QEMSCAN – PMA (for characterisation), XRD (for QEMSCAN calibration) and XRF (for chemical balance with the QEMSCAN).

The aim of the LDE test work was to provide Solo Resources (Concentrator plant designer) with options to consider for the gravity pre-concentration of the ore. The bulk of the test work showed that gravity separation using spirals would not be economically feasible. The full report is:
TEST WORK REPORT TO GLOBE METALS
SPIRAL AND SCRUBBING CHARACTERISATION
ISSUED BY : Solo Resources (Pty) Ltd
REPORT DATE : 12th October 2023
PROJECT NUMBER : SRF 306.1 Rev 0</td></tr>
</table>

Criteria	JORC Code explanation	Commentary
	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.	**Gravity test work samples were analysed by Light Deep Earth using QEMSCAN – PMA (for characterisation), XRD (for QEMSCAN calibration) and XRF (for chemical balance with the QEMSCAN).** **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. he analytical methods used were QEMSCAN – PMA (for characterisation), XRD (for QEMSCAN calibration) and XRF (for chemical balance with the QEMSCAN). The pertinent elements analysed were Nb, Ta, U and Zr.**
	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.	**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.** **No assay data was adjusted.**
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 outcropping was indeed part of the orebody.**
	The use of twinned holes.	**One pit was 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 and is stored in the Globe database.**
	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.*	**As the pit was of the order of metres in diameter, the pit was positioned using a GPS instrument.**
	Specification of the grid system used.	**Coordinate system - WGS84 UTM zone 36S.**
	Quality and adequacy of topographic control.	**GPS elevation formed part of the topographic control.**
Data spacing and distribution	*Data spacing for reporting of Exploration Results.*	**Not applicable as a pit was dug where the outcropping 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 a pit was dug where the outcropping occurred.**
	Whether sample compositing has been applied.	**No compositing was 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.*	**The bulk sample was excavated to approximate a cube of the mineralized material to mimic the anticipated mining method via open pit methods.**
	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 pit was dug at an outcropping located near the middle of the portion of orebody that will be mined initially.**
Sample security	*The measures taken to ensure sample security.*	**Individual samples were packaged into plastic containers, suitably marked, and delivered to UIS Analytical by a representative from TCM Research.**

Criteria	JORC Code explanation	Commentary
Audits or reviews	*The results of any audits or reviews of sampling techniques and data.*	None carried out.

Section 2 Reporting of Exploration/ Metallurgical Results

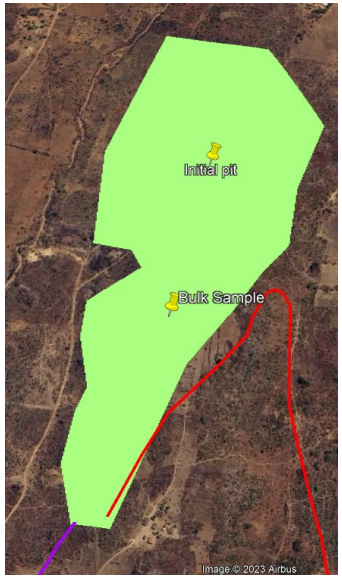
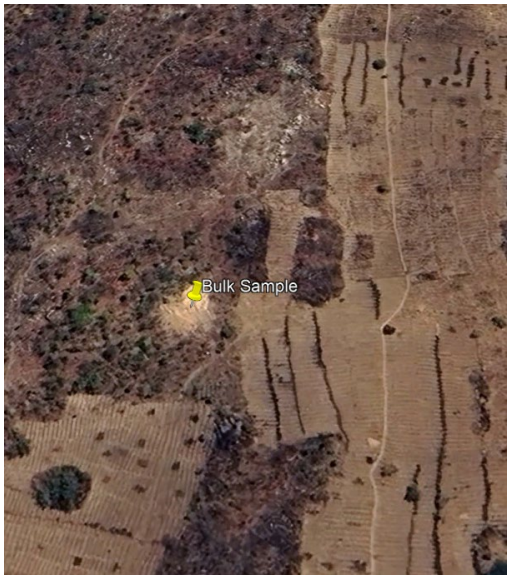
<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td>Mineral tenement and land tenure status</td><td>Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.</td><td>All of the Kanyika drilling is situated within LML0216/21, a Mining Licence, that was granted on 13 August 2021 by the Government of Malawi, acting through the Minister of Mining to Globe Metals and Mining (Africa) Limited. The Licence confers the Licensee the exclusive right to prospect for, mine and process, pyrochlore mineral concentrate containing niobium and tantalum and deleterious uranium over an area of 33.42 Km^2 for a period of 25 years. The Licence is defined by UTM Zone 36S coordinates as follows:
<table>
<tr><th>Point</th><th>Easting</th><th>Northing</th></tr>
<tr><td>A</td><td>507269</td><td>8599321</td></tr>
<tr><td>B</td><td>576784</td><td>8599281</td></tr>
<tr><td>C</td><td>577172</td><td>8594317</td></tr>
<tr><td>D</td><td>570269</td><td>8594321</td></tr>
</table></td></tr>
<tr><td></td><td>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.</td><td>The Mining Licence 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 years 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).</td></tr>
<tr><td>Exploration done by other parties</td><td>Acknowledgment and appraisal of exploration by other parties.</td><td>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.

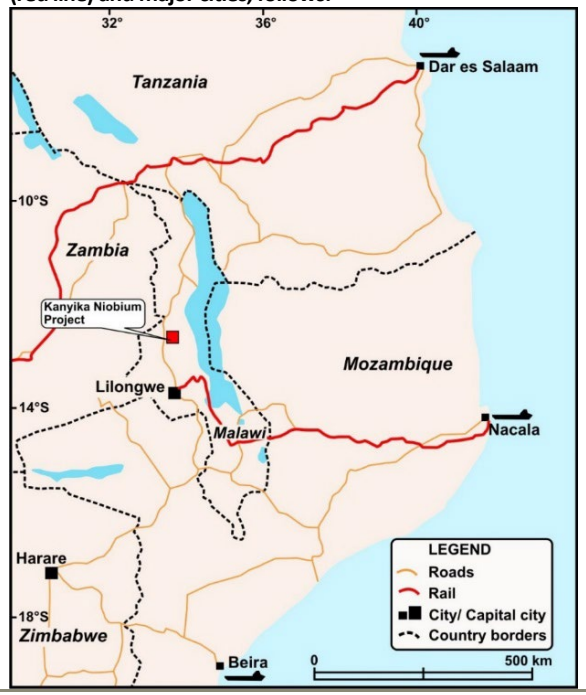
A field program to investigate the Kanyika airborne radiometric anomaly was conducted by the Malawi Geological Survey in 1986. A total-count ground radiometric survey was completed over an area of 2 by 0.7km. Areas of high radiometric response correlated to foliated nepheline syenite.

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.</td></tr>
</table>

Criteria	JORC Code explanation	Commentary
		The 11 July 2018 Kanyika Niobium Project – Updated JORC Resource Estimate announcement by Globe Metals and Mining Limited (ASX: GBE, Globe, or the Company) advised that it had completed an update of the Mineral Resources in accordance with the 2012 JORC guidelines. The Competent Persons of this Table 1 update were Messrs. A. Stephens and A. Bewsher and Dr. M. Steffens.
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 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.**

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td>Drill hole Information</td><td>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.</td><td>The pit location is given below:
<table><tr><th>Hole identification</th><th>Hole Type</th><th>Max depth (M)</th><th>Northing</th><th>Easting</th><th>Elevation</th><th>Grid type</th></tr><tr><td>10 ton bulk sample</td><td>PIT</td><td>2.6</td><td>8 595 603</td><td>572 336</td><td>1,088</td><td>UTM84-36L</td></tr></table>  
Bulk sample in relation to the initial pit and bulk sample excavation shown on Google Earth</td></tr>
<tr><td rowspan="3">Data aggregation methods</td><td>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.</td><td>There has been no exploration data included in this report. Only data relative to drilling and resource determination is stated.</td></tr>
<tr><td>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.</td><td>There has been no aggregation of data.</td></tr>
<tr><td>The assumptions used for any reporting of metal equivalent values should be clearly stated.</td><td>Metal equivalents are not used.</td></tr>
<tr><td>Relationship between mineralisation widths and intercept lengths</td><td>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’).</td><td>Not material as the purpose of the exercise was to collect a bulk sample for metallurgical testing only.</td></tr>
</table>

Criteria	JORC Code explanation	Commentary
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.*	The 2018 DFS included for two stages of flotation. In 2022, Globe carried out several internal laboratory flotation tests to determine if a single stage of flotation was possible without losing recoveries. The initial results were very encouraging. Globe then carried out a significant number of internal flotation tests designed to optimize the reagent suite. When the most promising suite was identified, tests were carried out on core samples that were composited to relate to different years of mining. The objective of these tests was to confirm that the reagent suite would work throughout the life of mine albeit with different addition rates. These tests showed that a suite of four reagents would be able to produce suitable quality concentrate while achieving acceptable recoveries. Once the reagent suite was locked in, Auralia Metallurgy was contracted to carry out three locked cycle tests on various core samples. Auralia is a Perth based metallurgical testing laboratory. Three different samples were prepared from drill core. The Master Composite was produced based on the amount of core pertaining to each year of the life of mine based on the mining plan. In addition, two additional samples were produced based on the first three years of mining to prepare the concentrator design team to deal with early mining concentrate. In October 2022 the Master Composite sample was milled and supplied by Globe to Auralia Metallurgy. The results of the flotation of the Master Composite are given below.

Criteria	JORC Code explanation	Commentary

Project	GLOBE - KANYIKA		10/02/2022
Composite	Master Comp 1	WATER	DI Water
Test No	AM95-94	GRIND TIME	
Grind Size	P100=150µm	PULP DENSITY	~34% solids
Cell Size	4.4L Cell, 3kg	GRINDING MEDIA	Stainless Steel
Test Details	Locked Cycle - Reduced SHMP and Oxalic Acid		

Cycle 4,5,6 Balance

Product	Weight		Nb2O5		Fe2O3		ZrO		Ta2O5	
	Gram	%	%	%dist	%	%dist	%	%dist	%	%dist
Mag Con	110.5	1.26	0.17	0.55	68.7	20.7	0.08	0.57	0.01	0.49
Deslime O/F	358.4	4.07	0.41	4.33	4.33	4.22	0.10	2.44	0.02	3.48
Cln 4 Con	122.4	1.39	17.8	64.7	15.1	5.03	7.85	62.9	0.75	40.4
Ro/Scav Tail	8212.7	93.3	0.12	30.4	3.13	70.1	0.06	34.0	0.02	55.6
Calc'd Head	8804.0	100.0	0.38	100.0	4.17	100.0	0.17	100.0	0.03	100.0

Bulk Sample Metallurgical Test Work

Energy Densification Systems – Tertiary Crushing Test Work

The initial test work carried out on the bulk sample was to crush the -40mm bulk sample material using an 8 shaft, horizontal multishaft impactor supplied by Energy Densification Systems (EDS). The purpose of the initial tests was to determine the optimum set up of the machine to achieve the lowest energy consumption kWh/tonne on a once through basis. Once this was established, the entire sample was processed simulating recycle to produce a final product of <1mm. Again, the objective was to establish the energy required to achieve this size parameter. In all 33 separate tests were carried out.

The main conclusions are that the optimal circulation screen size is around 2mm or larger though tests were only run on 1mm and 1.65mm apertures. Having a larger aperture reduces the recycle rate significantly though it also reduces the P150µm fraction produced in the -1mm recirculation load test. The P150µm fraction is screened out prior to milling thereby bypassing the ball mill altogether.

Overall, a power consumption of 2.1kWh/tonne was achieved.

The full report is contained in:
TEST WORK REPORT
Globe Metals & Mining – Niobium Ore
Compiled By: Boaz Friedland, Technical Director at EDS
26 June 2023

Criteria	JORC Code explanation	Commentary
		<u>Geolabs Global – Flotation Test Work</u> **Some 6 tons of the -1mm milled bulk sample was forwarded to Geolabs Global in Centurion, South Africa. The material was milled to P100 passing 150µm. The technique used was to fill the mill, run for a fixed period, drain the mill, screen off the -150 µm, return the oversize to the mill, add fresh material to the correct volume and repeat.** **The milled material was then sent to Multotec in Spartan, South Africa. Multotec used their proprietary desliming cyclones to deslime the sample with aim of removing the -10 µm fraction. The deslimed sample was then passed over a LIMS to remove the magnetic fraction in the material.** **Geolabs is currently using a 60 litre flotation cell to process the milled ore into concentrate. This concentrate will be delivered to TCM Research for refining into niobium oxide products.**
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.***	**A bulk sample has been recovered for metallurgical test work. The location of the pit is 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.***	**The niobium concentrate is to be forwarded to TCM research for carbochlorination test work to produce Nb_2O_5 product.**