



[Galileo Resources PLC](#) - GLR

# Rare Earths project- Update

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For immediate release

Dissemination of a Regulatory Announcement that contains inside information according to REGULATION (EU) No 596/2014 (MAR).

**12 June 2019**  
**Galileo Resources Plc**  
**("Galileo" or "the Company")**  
**Rare Earths project - Possibilities For Re-Activation**

Galileo draws its shareholders' attention to the recent trade dispute between US and China, and the latter's top economic planning body reportedly <sup>1</sup> studying proposals to establish export controls on rare earths (RE) to US, if the dispute between the two nations deepens. China supplies about 80% of US rare earths <sup>2</sup> and accounts for more than 70% of global output of RE.<sup>1</sup>

A US strategic minerals report released in December 2017 reportedly <sup>1</sup> stated "If China were to stop exports of critical minerals, including RE, for a prolonged longed period , similar to the China's RE embargo 2010, an extended supply disruption could cause significant shocks throughout the U.S. and foreign crucial mineral supply chains".

The Company's shareholders are reminded that it holds a 34% interest in the Glenover Rare Earth- Phosphate project (the Project").

Two advanced exploitation options for the Project have been studied, 1) preliminary economic assessment ("PEA") of primary RE production with phosphate as a by-product <sup>3</sup> and, 2) primary phosphate (P<sub>2</sub>O<sub>5</sub>) production <sup>4</sup> ,for which a proposed preliminary offtake agreement for the phosphate is in place <sup>5</sup> , and recovery of RE from the P<sub>2</sub>O<sub>5</sub> production tailings

The Board therefore considers that the project is well placed to benefit from potential upturn in the RE market and/or from third party major developers and they will be assessing the possibility of reactivating the project.

**Project Fundamentals as previously announced** (*note that should the Project proceed then these will need to be reconsidered and revised as appropriate*)

· **Project Current Resource Estimate** <sup>6</sup>

	SAMREC Code Resource category	Tonnes Million	Attributable <sup>b</sup> to Galileo Tonnes Million	Total RE Oxide %	P <sub>2</sub> O <sub>5</sub> %
Stockpiles <sup>a</sup>	Inferred <sup>a</sup>	2.685	1.188	1.94	22.21
In Situ o/pit	Indicated <sup>a</sup>	7.407	3.277	2.20	17.57
Total		10.092	4.465	2.13	18.80

### Rare Earth Development Option <sup>3</sup>

- **PEA (2015) net Present Value ("NPV") of US\$ 512 million using a rare earth oxide (REO) basket price <sup>c</sup> of US\$60.79 per kg <sup>d</sup> (of 99% REO )and a discount rate of 8%.**
- **Internal Rate of Return ("IRR") of 34.5 % for the Project**
- **REO production of 167,100 t (tonnes) in mixed high-grade REO chemical product over 24-year life of mine (LOM) on current resource estimate**
- **Ore production rate from 2.7 Mt stockpiles at 400,000 t per year 1 to 7**
- **Open pit mine ore production from 7.1 Mt at 400,000t per year from year 8**
- **Initial capital investment US\$233M, including a contingency of US\$34M but excluding**
  - \$57M for working and deferred capital

### Phosphate Development Option <sup>4</sup>

- **Major phosphate producer (MPP) undertakes expenditure of upwards of US\$300,000 pursuant to a proposed off-take agreement ("Agreement") on a pilot plant phosphate flotation study to produce phosphate concentrate for testing by MPP . Work continues by the MPP under this Agreement**
- **Extensive related testworks have taken place and negotiations to formalise the Agreement accepted by Galileo are on-going pending final phase pilot studies <sup>5</sup>**
- **The ultimate objective of this Option would be either to develop the Project or sell the Project in whole or part to MPP**
- **Grant of a Mining Right for Phosphate production is pending a decision from the Department of Mineral Resources; such process remains ongoing**
- **Rare-earths from the tailings of any future phosphate processing of the ore by MPP, would be available for further beneficiation and or recovery.**

Whilst the US has RE mine reserves, 93 times the nation's output last year <sup>2</sup>, 80% of US demand for REs is for the so called lighter lanthanum and cerium REs , both of which are oversupplied around the world. <sup>7</sup> However, export restrictions , which could cover relatively higher priced and less abundant light REs (Neodymium, Praseodymium) and heavy RE dysprosium, all widely used in permanent magnets in motors in industries from automobiles, to consumer goods (*and wind turbines*) would be a "devastating" blow to the US economy <sup>1</sup>. These less abundant and higher priced REs form nearly 30% of the suite of REs in the Project's deposit <sup>8</sup> .

Colin Bird, CEO of Galileo said, "In 2011, the west were much concerned with China's dominance of rare earth (RE) market against an increasing western requirement for REs including in military use. This concern prompted several western governments to take initiatives including the USA having a special senate committee and other steps to develop western RE production capability. This alternative source requirement did not dissipate but was overtaken by subsequent relative geo- political calm thereby negatively impacting on the RE price. This calm has now evaporated and the spectre again of a RE deficit, particularly, the heavy REs , is again emerging . The Glenover project , which has a good proportion of heavy REs, has had an independent preliminary economic assessment produced, which showed robust figures and good material processing characteristics. Galileo now intends with its project partner FerMinOre, to reappraise the market with the anticipation of improved RE prices, to restore value that temporarily left the project."

## Sources/References

- 1 Bloomberg News June 5 2019
- 2 US Geological Survey
- 3 Galileo RNS announcement 7 March 2013
- 4 Galileo RNS announcement 12 June 2017
- 5 Galileo RNS 12 February 2018
- 6 Galileo RNS 30 May 2013
- 7 [www.cnbc.com/markets/](http://www.cnbc.com/markets/) 3 June 2019
- 8 GBM Preliminary Economic Assessment - Executive Summary - 0468-RPT-027 Rev 1

## Notes

*a inferred resource The SAMREC CODE defines an Inferred Mineral Resource as " that part of a Mineral Resource for which volume or tonnage, grade and mineral content can be estimated with only a low level of confidence. It is inferred from geological evidence and sampling and assumed but not verified geologically or through analysis of grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that may be limited in scope or of uncertain quality and reliability. The stockpiles, which are inferred mineral resources, require rigorous SAMREC compliant sampling applied to them in order for them to be categorized as mineral reserves*

*indicated resource The SAMREC CODE defines an Indicated Mineral Resource' as " that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on information from exploration, sampling and testing of material gathered from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological or grade continuity but are spaced closely enough for continuity to be assumed.*

*b 4.24% attributable to Galileo after earn-in of the agreed 51%, with the balance of 5.76% attributable to Black Economic Empowerment shareholders*

*c The REO basket price is calculated as the weighted average of the individual REO prices based on estimated future (2015) prices at the relative proportions in which the REOs occur within the Glenover project deposit. No value was assigned for oxides of the five rare earth elements: Holmium, Erbium, Terbium, Ytterbium and Lutetium; these REOs have limited niche applications and would not form part of a standard off-take agreement. Based on preliminary assessment of market conditions, and a process of benchmarking other similar projects producing similar high-grade mixed REO product, a discount factor of 35 % has been applied to the basket price used in this PEA. This factor reflects the effective loss in value, to off-takers, of generally around 35% of the contained mixed REOs in further refining of the mixed product to produce oxides of the individual rare earth elements.*

*d estimated weighted average of individual REO prices 2019 without discount \$30/kg  
(prices <https://mineralprices.com/rare-earth-metals/>)*

You can also follow Galileo on Twitter: **@GalileoResource**

A copy of the announcement is available on the Company's website [www.galileoresources.com](http://www.galileoresources.com)

## Technical Sign-Off

Andrew Sarosi, Technical Director of Galileo, who holds a B.Sc. Metallurgy and M.Sc. Engineering, University of Witwatersrand and is a member of The Institute of Materials, Minerals and Mining, is a 'qualified person' as defined under the AIM Rules for Companies and a competent person under the reporting standards. The technical parts of this announcement have been prepared under Andrew Sarosi's supervision and he has approved the release of this announcement.

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#### Technical Glossary

Phosphate (P<sub>2</sub>O<sub>5</sub>):                      an oxide of phosphorus

Rare earths (RE):                      a set of fifteen chemical elements in the periodic table specifically  
the lanthanides (plus yttrium ad hoc and scandium) and by convention categorised as light  
REE (the first seven elements plus yttrium) and heavy REE (the other eight lanthanides)

REO (rare earth oxide):                      the oxide form of the rare earth elements

TREO:                      total rare earth oxides

The major rare earth elements in the Glenover deposit are:

Ce: Cerium                      Uses include cathode ray tube glass to prevent age discoloration, in auto catalytic  
converters, rich red colour pigments, low energy light bulbs, film studio carbon-arc lighting and minor use in self  
cleaning ovens

Eu: Europium                      Uses include bright red coloration in television tubes; industrial street lighting to give a  
more natural light, thin film superconductor alloys and in lasers

Gd: Gadolinium                      Uses include neutron capture capability and in compounds as a contrasting agent in  
radiography and magnetic resonance imaging in medical diagnostics

La: Lanthanum                      Uses include carbon-arc lighting, additive to glass for lenses and new treatment for bone  
disease (osteodysrophy). Potential use for hydrogen (H) storage for H-fuelled vehicles: being able to absorb  
hydrogen as much as 400 times its volume

Nd: Neodymium                      Uses include alloyed with iron and boron to make one the most powerful permanent  
magnets known (see also Samarium below) and found in modern vehicles using motorised devices; in welders  
protective glasses and power lasers

Pr: Praseodymium                      Uses include as an additive to give glass a pure yellow colour and brilliant pastel greens  
and yellows for glazes

Sm: Samarium                      Uses include alloyed with cobalt to produce permanent magnets ten thousand times  
more powerful than iron and has the highest resistance to demagnetization; in masers (microwave lasers) capable of  
cutting steel and bouncing off the surface of the moon

Y: Yttrium                      Uses include lasers, as host for europium in TV red phosphor, alloyed with boron and  
cobalt high temperature superconductors and microwave filters

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