

ASX Release

17 April 2023

## Metallurgical test work initiated on REE-enriched clays at Neo prospect, Paddy's Well Project

### Highlights

#### Metallurgical test work to commence on recently drilled rare earth elements (REE)-enriched clays from the Neo prospect at Paddy's Well Project in Western Australia's Gascoyne Region.

- The program aims to characterise the REE species present within the large clay intervals (up to ~30m true width) identified from near surface<sup>1</sup> and determine:
  - What fraction of the REEs are "ionic" (recoverable by ionic desorption leach)?
  - What fraction of the REEs are in the more refractory colloidal & mineral phases?
  - How does temperature, acid concentration & pH influence recovery?
- Conducting test work at this early stage enables the Company to ascertain the preliminary viability of a clay-hosted REE venture and to discern whether it would be more efficient and economical to focus solely on primary (hard rock) REE targets at Paddys Well.
- Halloysite has been identified from scanning electron microscope (SEM) analysis – common kaolinitic clay mineral found in true REE ionic adsorption deposits (IADs)<sup>2</sup>

**Voltaic Strategic Resources Limited (ASX:VSR)** has initiated sighter metallurgical test work to characterise the REEs identified within clays at its Paddy's Well Project, in Western Australia's Gascoyne region, an emerging critical minerals hotspot (*Figure 1*).

The company has identified several both clay-hosted and primary hard rock REE targets at Paddys Well and this upcoming metallurgical work will enable the Company to make informed decisions on whether to continue targeting clay-hosted REEs or to shift focus solely to hard rock<sup>3</sup>.

The work involves undertaking industry-standard leach tests under different reagent schemes to:

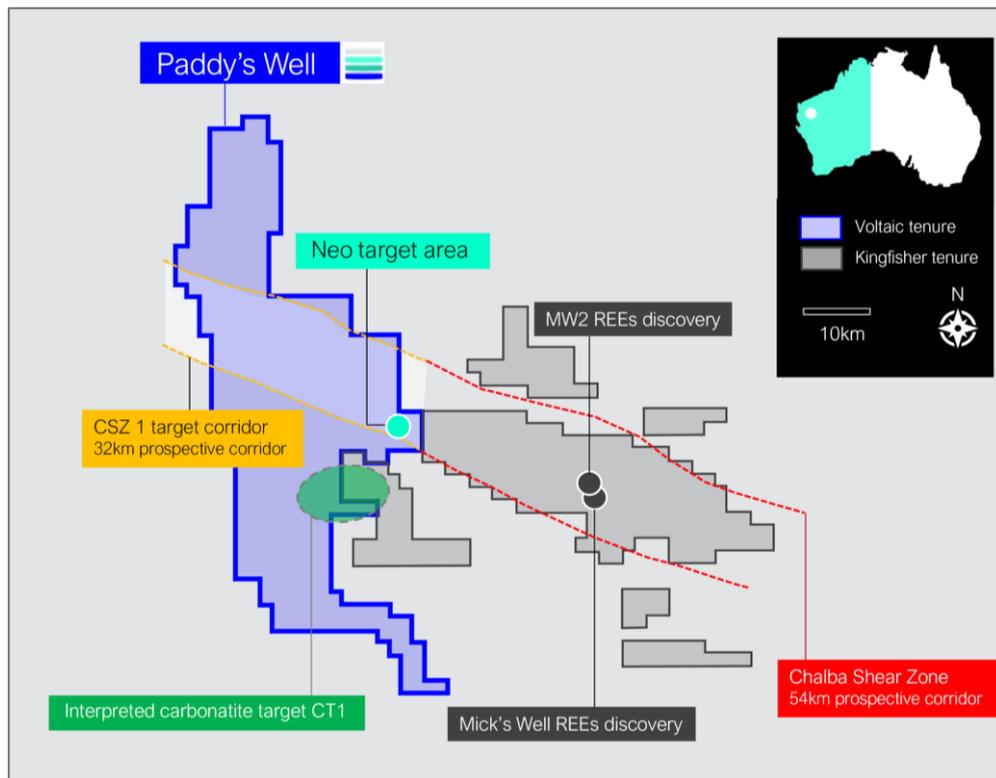
- I. Identify the REE distribution by particle size;
- II. Characterise the REEs by host phase (ion exchange, colloidal, or mineral);
- III. Determine the REE recoveries; and
- IV. Outline a preliminary process flowsheet if favourable results are obtained.

Testing will be carried out by Independent Metallurgical Operations who have extensive experience with REE metallurgy including clay characterisation test work for ASX-listed clients.

<sup>1</sup> Refer ASX release date 27 January 2023 'First REE Drill Results – Paddys Well'

<sup>2</sup> Qiu S, Yan H, Hong B, Long Q, Xiao J, Li F, Tong L, Zhou X, Qiu T 2022, 'Desorption of REEs from Halloysite and Illite: A Link to the Exploitation of Ion-Adsorption RE Ore Based on Clay Species', *Minerals*, vol. 12, no. 8, <https://doi.org/10.3390/min12081003>.

<sup>3</sup> Several Yangibana-style ferrocyanite hard rock targets have already been identified which are currently being followed up.



**Figure 1.** Paddy's Well Project showing CSZ1 Corridor and drilling target area at Neo prospect.

**Voltaic chief executive Mr Michael Walshe** said conducting metallurgical testing at such a nascent stage of the project's development displays the company's proactive approach towards the efficient deployment of capital.

"The key test will be to determine the ionic adsorption potential of the REE-enriched clays using ammonium sulphate as the ion-exchange medium under mildly acidic conditions (~pH 4). Most of the clay hosted REE discoveries made in Western Australia thus far, have not proven to be true IADs, with the majority requiring aggressive low pH, highly acidic conditions to leach, which limits their potential economic viability" Mr Walshe said.

"In less than 6 months, we have identified a large REE clay system at Neo<sup>4</sup>, along with several other primary hard rock targets, and metallurgical testing of the clay is the most logical next step. We have already identified the presence of halloysite within these clays (*Figure 2 – Appendix 1*) which is encouraging for IAD potential and look forward to commencing the work mid-April. In parallel, we will continue to pursue our several primary hard rock targets" he said.

**Release authorised by the Board of Voltaic Strategic Resources Ltd.**

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<sup>4</sup> Refer ASX release date 27 January 2023 'First REE Drill Results – Paddys Well'

### Upcoming News Flow from the Paddys Well Project

- April 2023: Regional pXRF wide space soils and exploration update
- May 2023: Paddys Well geophysical data (radiometric / magnetic) acquisition update
- May 2023: Further drill results from Neo RB drilling

### Planned and completed activities at Paddys Well: Q1-Q2 2023

	January	February	March	April	May	June
Field reconnaissance	●————●		●————●		●————●	
Auger vacuum & aircore/RC drilling	●————●		●————●		●————●	
Scanning electron microscope (SEM) characterisation	●————●		●————●		●————●	
Project data review and targeting	●————●					
UAV drone survey					●————●	
Sighter metallurgical testwork					●————●	
Aeromag, radiometric survey					●————●	
Results from Phase 3 rockchips					●————●	
Follow-up drill campaign					●————●	
Ranking of targets					●————●	

### Competent Person Statement

The information in this announcement related to Exploration Results is based on and fairly represents information compiled by Mr Claudio Sheriff-Zegers. Mr Sheriff-Zegers is employed as an Exploration Manager for Voltaic Strategic Resources Ltd and is a member of the Australasian Institute of Mining and Metallurgy. He has sufficient experience of relevance to the styles of mineralisation and types of deposits under consideration and to the activities undertaken to qualify as a Competent Person as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. He consents to the inclusion in this announcement of the matters based on information in the form and context in which they appear.

The information in this document that relates to metallurgical test work and flowsheet development is based on, and fairly represents, information and supporting documentation reviewed by Mr Peter Adamini, BSc (Mineral Science and Chemistry), who is a Member of The Australasian Institute of Mining and Metallurgy (AusIMM). Mr Adamini is a full-time employee of Independent Metallurgical Operations Pty Ltd, who has been engaged by Voltaic Strategic Resources Ltd to provide metallurgical consulting services. Mr Adamini has approved and consented to the inclusion in this document of the matters based on his information in the form and context in which it appears.

### Forward-Looking Statements

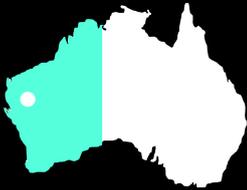
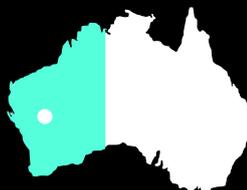
This announcement may contain forward-looking statements involving several risks and uncertainties. These forward-looking statements are expressed in good faith and believed to have a reasonable basis. These statements reflect current expectations, intentions or strategies regarding the future and assumptions based on currently available information. Should one or more of the risks or uncertainties materialise, or underlying assumptions prove incorrect, actual results may vary from the expectations, intentions and strategies described in this announcement. No obligation is assumed to update statements if these beliefs, opinions, and estimates should change or to reflect other future development.

## About Voltaic Strategic Resources

**Voltaic Strategic Resources Limited** explore for the next generation of mines that will produce the metals required for a cleaner, more sustainable future where transport is fully electrified, and renewable energy represents a greater share of the global energy mix.

The company has a strategically located critical metals portfolio led by lithium, rare earths, base metals, and gold across two of the world’s most established mining jurisdictions: Western Australia & Nevada, USA.

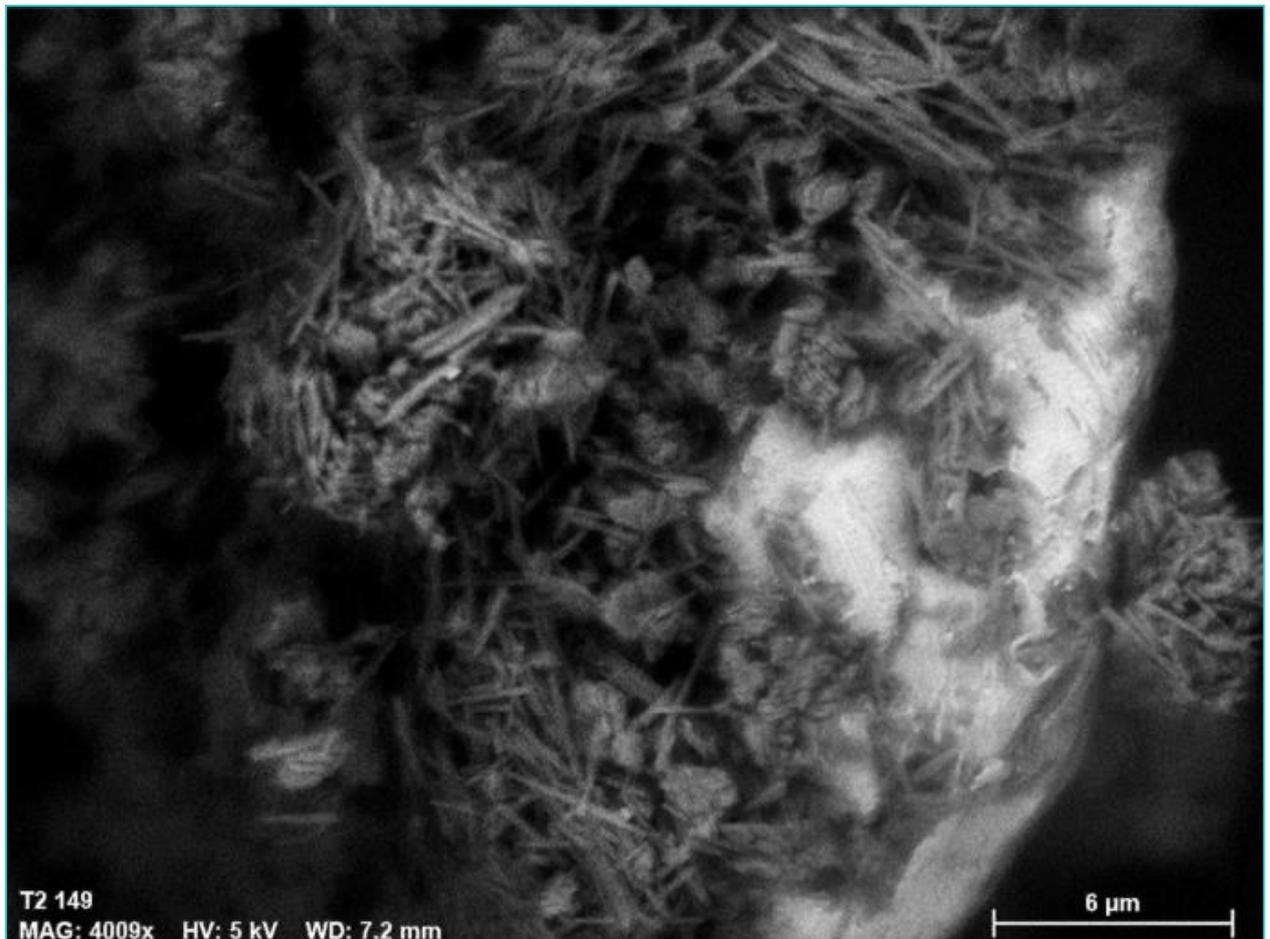
Voltaic is led by an accomplished corporate and technical team with extensive experience in REEs, lithium and other critical minerals, and a strong skillset in both geology and processing / metallurgy.

 <h3>Gascoyne Region Western Australia</h3> <ul style="list-style-type: none"> <li>Emerging critical minerals province (REE, Li, Ni-Cu-Co-PGE).</li> <li>Active neighbours in the region.</li> </ul> 	 <h3>Meekatharra Region Western Australia</h3> <ul style="list-style-type: none"> <li>Established gold district with two vanadium development projects.</li> <li>Active neighbours in the region.</li> </ul> 	 <h3>Stillwater Range Nevada, USA</h3> <ul style="list-style-type: none"> <li>Ni-Cu-Co project containing formerly producing Co mine.</li> <li>Global Energy Metals adjacent.</li> </ul> 
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## Appendix 1: Supplementary Data

### A1: Details of Scanning Electron Microscope (SEM) Analysis

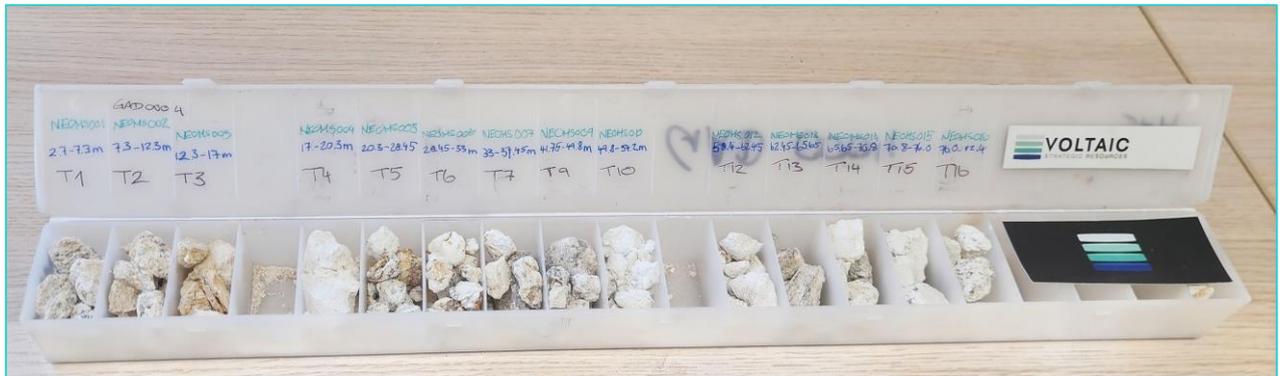
- SEM analysis was undertaken by RSC Consulting Limited at their West Perth office using a Hitachi SU-3900 instrument which is capable of delivering automated mineralogy using the Advanced Mineral Identification and Characterisation System (AMICS). The instrument has detectors for analysing energy dispersive spectrometry (EDS), backscatter electron (BSE), secondary electron (SE) and can run on ultra-variable pressure (UVD).
- RSC undertook an initial characterisation study of eleven (11) smear clay, three (3) epoxy resin embedded clay and two (2) basement rock samples of historical drillcore (GAD0004 hole<sup>5</sup>) (Figure 3) from the company's Paddys Well REE project, to investigate the mineralogical distribution of REE within the mineralised clay and vein horizons. RSC used their optical microscope and SEM for this work. Microcharacterisation of the samples provide an understanding of REE distribution and the potential implications for eventual metallurgical performance.



**Figure 2. Halloysite nanotubes** & associated kaolin identified from SEM analysis of REE-enriched clay samples from historical drillhole GAD0004<sup>6</sup>.

<sup>5</sup> Refer ASX release date 13 October 2022 REEs confirmed at Paddys Well

<sup>6</sup> Both halloysite (needles) and kaolinite (plates) are seen here intergrown with a REE-phosphate grain (bright phase on the right). The association between the minerals suggests that the REE phosphate formed contemporaneously with the clay minerals or after clay formation indicating that the REE phosphate is a secondary REE mineral and not a detrital REE phase.



**Figure 3.** Samples submitted for SEM analysis from historical drillhole GAD0004

**A2: Preliminary details of planned higher metallurgical test work on REE-enriched clays**

**Table 1.** Outline Test Work Program

Test	Purpose	Reagents (Lixiviant)	Reagents (Acid)	pH	Temp. (°C)	Time (h)
1	Any REE Ionically Exchangeable Phase present?	1.0M (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> + 1.0M NaCl	H <sub>2</sub> SO <sub>4</sub> to maintain pH at ~4	4	25 ambient	TBC
2	Does higher temp. & lower pH improve recoveries of the REE Ion Exchange Phase?	1.0M (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> + 1.0M NaCl	H <sub>2</sub> SO <sub>4</sub> to maintain pH at ~1	1	50	TBC
3	Are REEs within the Colloid phase (insoluble oxides or hydroxides) leachable?	1.0M NaCl	25g/L HCl	<1	50	TBC
4	Are REEs within the Mineral phase (insoluble oxides or hydroxides) leachable?	1.0M NaCl	100 g/L HCl	~0	50	TBC