Brazilian Rare Earths Limited: Successful Metallurgical Results from the Monte Alto Project

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Sydney, Australia - Brazilian Rare Earths Ltd. (ASX:BRE) (OTCMKTS:BRELY) (OTCMKTS:BRETF) is pleased to announce successful initial metallurgical results from the ultra-high grade REE-Nb-Sc-Ta-U mineralisation at the Monte Alto Rare Earth Project (Monte Alto), located in Bahia, Brazil.

The Monte Alto Rare Earth Project in Bahia, Brazil, has delivered successful results from initial metallurgical leaching studies of the ultra-high grade REE-Nb-Sc-Ta-U mineralisation. The successful test work on non-beneficiated mineralisation confirmed highly efficient rare earth extractions of up to 94% TREO into a stable solution, at atmospheric pressure and low sulfuric acid concentrations.

The ultra-high grade mineralisation was assessed for direct metallurgical leaching of crushed and milled REENb-Sc-Ta-U hard rock mineralisation, without prior-beneficiation (target run-of-mine material with ore-sorting).

This processing pathway has the potential to deliver higher total product yields, at lower capital and operating costs.

The exceptional grades of Monte Alto's mineralisation underpin the flexibility to pursue either direct metallurgical leaching or the potential export of high-grade Direct Ship Mineral (DSM). The REE-Nb-Sc-Ta-U hard rock mineralisation has reported weighted average rare earth grades of 16.4% TREO from drilling to date, including grades of 27,063ppm NdPr and 1,327ppm of heavy rare earths DyTb.

These exceptional grades are primarily within the 'chevkinite' mineral phase, comprising 63%-78% of the REE mineral assemblage and hosting ~80% of total rare earth elements, along with high co-product grades of niobium, scandium, tantalum and uranium.

To assess the potential for a high-grade DSM product, an initial metallurgical test work program by ANSTO Minerals has evaluated the direct leaching performance of Monte Alto's non-beneficiated REE-Nb-Sc-Ta-U mineralisation.

Mineralogical Characterisation

Comprehensive mineralogical studies by SGS Laboratories and ANSTO Minerals have provided detailed insights into Monte Alto's ultra-high grade REE-Nb-Sc-Ta-U mineralisation:

- 'Chevkinite' is the dominant mineral in the ultra-high grade REE-Nb-Sc-Ta-U mineralisation

- Chevkinite is monoclinic REE-Ti-Fe sorosilicate mineral, containing very high concentrations of rare earth elements, niobium, tantalum, scandium and uranium

- Chevkinite has been found as a minor accessory mineral in REE-rich deposits in Russia, China, Greenland and the U.S.A. Chevkinite has also been identified in meteorites and in lunar rocks brought back by the Apollo space missions. Until the discovery of Monte Alto, less abundant chevkinite was typically overshadowed by typically more refractory rare earth minerals such as monazite and xenotime

- The chevkinite mineralisation at Monte Alto stands out for its remarkable scale, with the deposit currently mapped over a strike length of 1 km and true drilling intercepts reaching up to 28 meters in width

- The chevkinite is coarse-grained with over 80% of the chevkinite grains 'sand-sized', and only a negligible amount in the sub-38 um 'slimes' size fraction

- The high-grade monazite sands delineated from surface at Monte Alto, and extensively across the Rocha da Rocha province, are posited to be the weathered expression of the underlying ultra-high grade REENb-Sc-Ta-U 'source rock' Direct Metallurgical Leaching

Initial metallurgical testing by ANSTO Minerals has delivered highly promising results:

- Direct metallurgical leaching of the REE-Nb-Sc-Ta-U mineralisation successfully confirmed efficient rare earth extractions of up to 94% TREO into a stable solution, including up to 94% for NdPr and over 92% for DyTb

- High TREE liquor tenors of over 23 g/L were achieved

- Rapid-leaching kinetics with over 90% extraction within 2 hours

- Efficient leaching achieved at atmospheric pressure with sulfuric acid concentrations at or below 75 g/L

- The primary amphibole gangue-mineral did not consume acid during leaching and reported to solid residue

- Pregnant leach solutions exhibited fast filtration rates, supporting downstream impurity removal

Monte Alto Scoping Study - Stage I

The Monte Alto Stage I Scoping Study, scheduled for completion in Q2 2025, will evaluate an initial operation targeting two saleable export products:

1) High-grade rare earth monazite concentrate: Extracted from the shallow, free-dig, high-grade monazite sand deposit, and processed using industry-standard gravity, magnetic, and flotation methods

2) Direct Ship Mineral (DSM): Run-of-mine, crushed, and ore-sorted hard rock REE-Nb-Sc-Ta-U mineralisation

Future Stage II Scoping Studies will assess the technical and economic feasibility for downstream leaching and separation operations for both high-grade monazite concentrates and REE-Nb-Sc-Ta-U feedstocks

Brazilian Rare Earths' CEO and Managing Director, Bernardo da Veiga, commented:

"We are thrilled with the results of the metallurgical studies from Monte Alto. The results highlight the remarkable efficiency of processing chevkinite-dominant mineralisation under atmospheric leaching conditions.

Our scoping level technical studies remain on schedule, and we look forward to providing further updates as we move closer to defining the economic potential of Monte Alto."

Monte Alto is BRE's most advanced project in the extensive Rocha da Rocha rare earths and critical minerals province. Discovered less than two years ago, the project has been systematically explored and delineated through multiple exploration programs. The current mineralised strike length is over 1 km with a width of 0.5 km.

Drilling has intersected wide zones of ultra-high-grade REE-Nb-Sc-Ta-U hard rock mineralisation from surface to depths of up to 200 metres. The ultra-high grade hard rock mineralisation is overlain by a free-dig, high-grade monazite-sand deposit that extends from surface to depths of around 75 metres.

The Monte Alto deposit is hosted within the Volta do Rio Plutonic Suite (VRPS), a provincial-scale magmatic system that has already yielded multiple discoveries of ultra-high-grade REE-Nb-Sc-Ta-U mineralisation, including at the Sulista and Pele Projects. The hard rock REE-Nb-Sc-Ta-U mineralisation is coeval with the granites of the VPRS and repeats along the prominent geophysical trendline that runs down the extensive spine of the Rocha da Rocha Province.

Comprehensive mineralogical studies on the ultra-high-grade REE-Nb-Sc-Ta-U mineralisation have confirmed the dominant high-grade rare earth mineral is 'chevkinite' (up to 61% by weight).

Chevkinite is a readily leachable rare earth mineral, hosting the majority (~80%) of rare earth elements (REE) and critical co-product elements within the REE-Nb-Sc-Ta-U mineralisation. The accessory mineral apatitebritholite hosts ~10% of the REEs, with the balance hosted by minor REE minerals.

The first phase of metallurgical test work by ANSTO successfully confirmed that rare earths in the REE-Nb-ScTa-U mineralisation can be efficiently extracted into stable solution, using mild leaching conditions and at atmospheric pressures (Figure 1*).

Future Testing Pipeline

The ANSTO testing program is advancing on schedule, with completion anticipated in early 2025. The

second phase of the test work program will focus on impurity removal, including the recovery of uranium, prior to producing a mixed rare earth carbonate (MREC).

The key objectives of the future test work program include:

Co-product recovery and impurity management:

- Progress and enhance recovery of the co-products including uranium, niobium tantalum and scandium

- Impurity removal and immobilisation Comprehensive beneficiation studies:

- Hard-rock beneficiation: Ore sorting, gravity concentration, flotation, and magnetic separation

- Monazite sands: Refine and enhance beneficiation process (gravity concentration, flotation, and magnetic separation) and optimise the cracking process for the high-grade monazite sand concentrates

The test work programs are being conducted in both Brazil and Australia to ensure a full evaluation of the process. Mineral concentrates produced from the beneficiation activities may undergo further extractive metallurgical testing in both regions to assess and maximise the economic value of the processes.

*To view the full release including tables and figures, please visit:
https://abnnewswire.net/lnk/9T9O7489

About Brazilian Rare Earths Limited:

Brazilian Rare Earths Limited (ASX:BRE) is an Australian company, rapidly advancing its Tier 1 rare earth project in Northeast Brazil.

Company exploration to date has discovered and delineated a globally significant, district-scale mineral province containing large volumes of both heavy and light rare earths critical to advanced industries and applications that will deliver a green energy transition.

The Company is led by a team of experienced mining executives and geologists with hundreds of years of cumulative experience in finding, developing, and operating mineral assets to generate value across a wide variety of jurisdictions, and commodities throughout the globe.

Source:
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