



**Investor Presentation**

*19 August 2024*

# **Green Rare Earths**

## **Mine of the Future Now**

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## **Competent person statement**

The information in this report that relates to exploration results is based on information compiled by Mr. Antonio de Castro, BSc (Hons), MAusIMM, CREA, who acts as BCM's Senior Consulting Geologist through the consultancy firm, ADC Geologia Ltda. Mr. de Castro has sufficient experience which is relevant to the type of deposit under consideration and to the reporting of exploration results and analytical and metallurgical test work 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". Mr. Castro consents to the report being issued in the form and context in which it appears.

The information in this report that relates to exploration results released by the Company to the ASX on 2 April, 22 April, 3 May and 7 May 2024 is based on information compiled by Mr. Antonio de Castro, BSc (Hons), MAusIMM, CREA, who acts as BCM's Senior Consulting Geologist through the consultancy firm, ADC Geologia Ltda. Mr. de Castro has sufficient experience which is relevant to the type of deposit under consideration and to the reporting of exploration results and analytical and metallurgical test work 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". Mr. Castro consents to the report being issued in the form and context in which it appears.

The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant market announcement and, in the case of mineral resource estimate, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. Refer to ASX announcement dated 22 April 2024.

## **Exploration results and mineral resources**

The information in this Presentation that relates to Exploration Results and Mineral Resources is based upon and fairly represents information previously released to the ASX on 22 May 2023, 6 June 2023, 17 July 2023, 31 July 2023, 13 September 2023, 3 October 2023, 19 October 2023, 7 December 2023, 29 January 2024, 6 February 2024, 22 February 2024, 13 March 2024, 3 April 2024, 22 April 2024, 3 May 2024, 20 May 2024, 8 July 2024, 2 August 2024 and 6 August 2024.

This presentation has been approved for release by the Board of Directors.

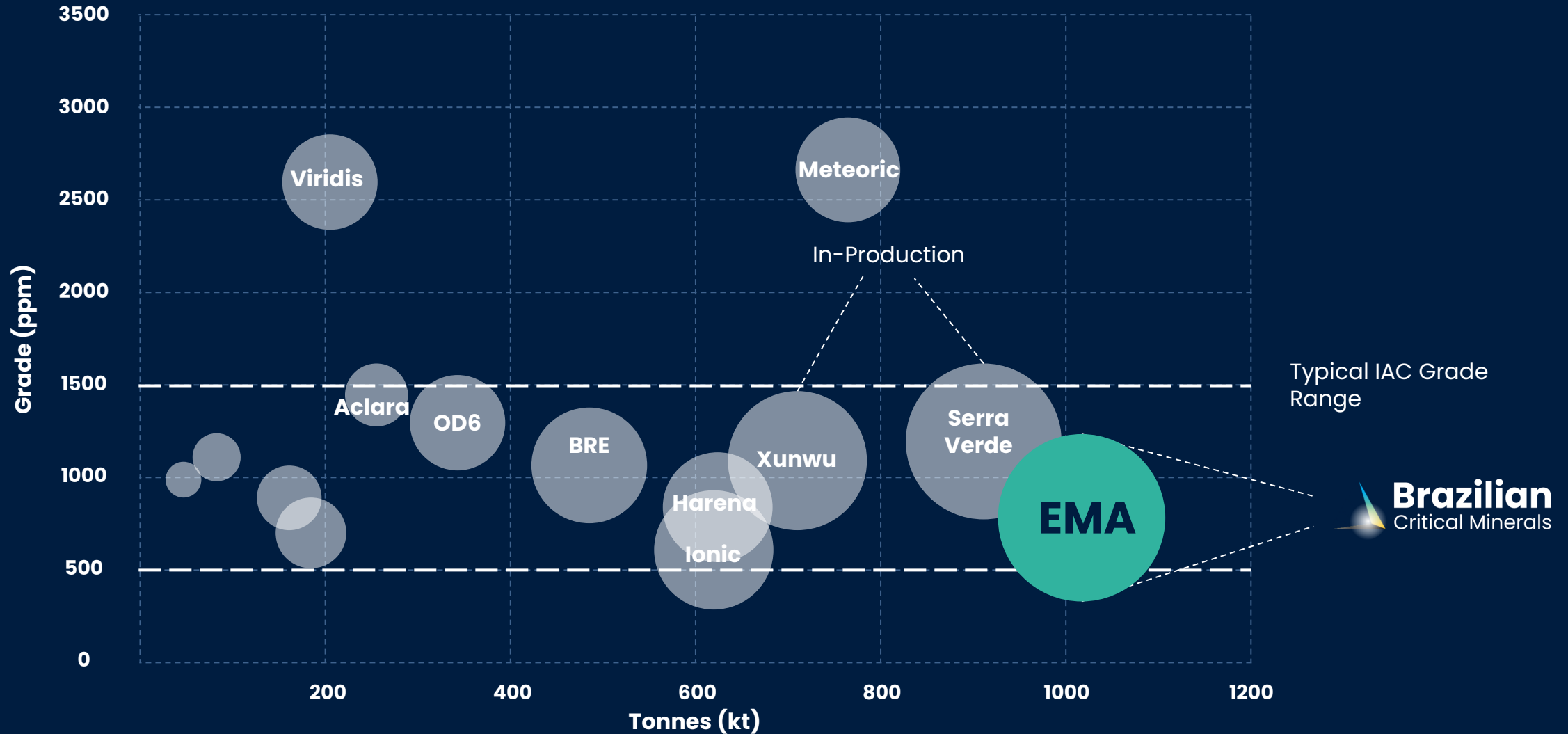
# Brazilian REE Landscape

**EMA Rare Earths – >1Bt MRE  
Apuí Rare Earths**

30 km south from Apuí



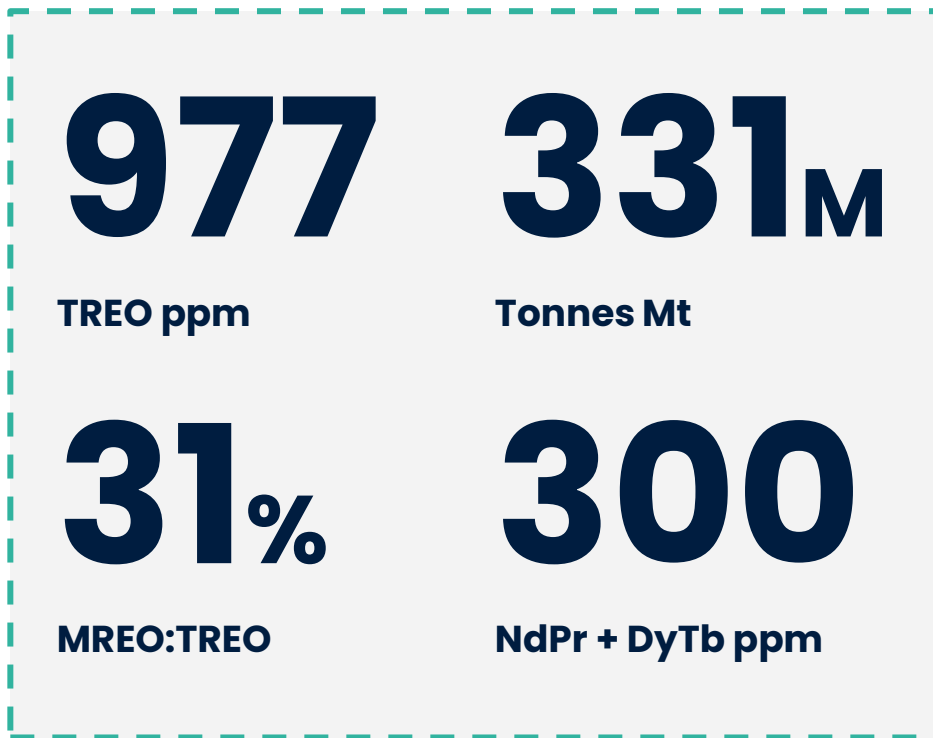
# Rare Earth Clay Deposits



# Large Resource Base



## Ema REE Project 2024 Mineral Resource Estimate



Ema REE Project 2024 Mineral Resource Estimate – by cut-off grade

JORC Category	cut-off ppm TREO	Tonnes Mt	TREO ppm	NdPr ppm	DyTb ppm	MREO ppm	MREO:TREO %
Inferred	0	1,340	694	163	15	178	26
Inferred	500	1,017	793	199	17	216	27
Inferred	600	863	836	218	18	236	28
Inferred	700	685	885	237	20	257	29
Inferred	800	494	936	259	21	280	30
Inferred	900	331	977	278	22	300	31

# World's first fully green REE mine



## Large Resource Base

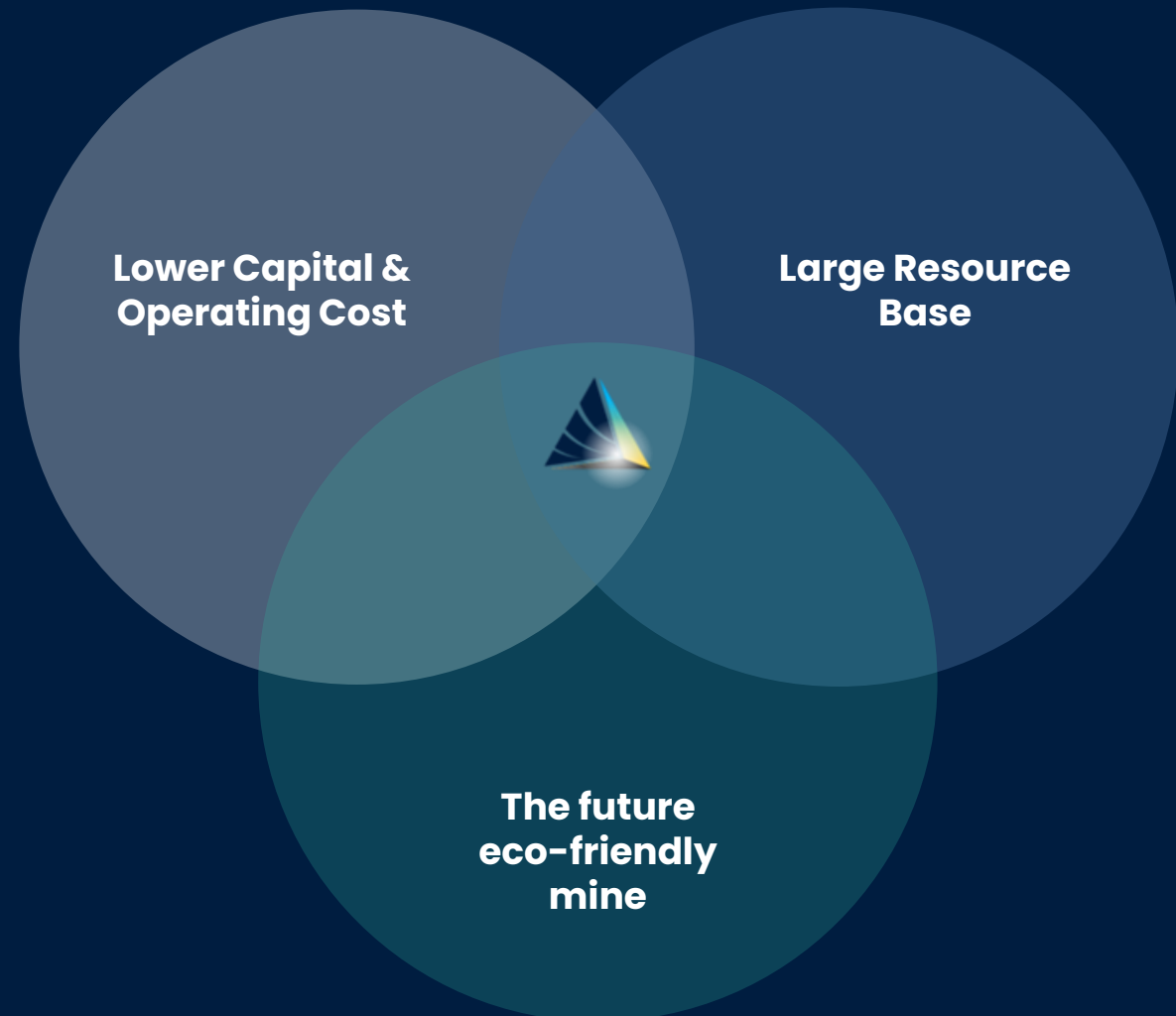
Lower Capex and Opex , Lower Cut-off Grade utilised, More material can be mined

## Lower Capital

ISR offers a lower capital expenditure to first cash flow with no mining costs and fewer processing steps involved to final product.

## Lower Impact Mining

No mining No blasting No waste rock, No noise, No dust and No large tailings dams or large open pits. Eco-friendly chemicals.



# Most cost effective Environmentally friendly method of Mining



**RIGHT**  
Geology

Weathering less  
than 20m deep



**RIGHT**  
Style of Mineralisation

Ore grades directly  
above bedrock



**RIGHT**  
Confining Layer

Non-fractured  
bedrock at shallow  
depths



**RIGHT**  
Chemistry

High recoveries and  
Ionic leaching



**RIGHT**  
Reagents

Reagents with no detrimental  
effects on the environment



**RIGHT**  
Product

MREC with 99% purity



**Brazilian**  
Critical Minerals



**NO**  
Land Clearing



**NO**  
Open Pit Mining



**NO**  
Dirty Mining  
Equipment



**NO**  
Noisy Dusty Tuck  
Haulage



**NO**  
Large Processing  
Facility



**NO**  
Need for  
Reclamation

# In-Situ Leach potential



Evaluation work to date says we can

Deposit Required Conditions			Ema Applicability Evaluation	Remarks
Deposit Conditions	Parent Rock	Shallow crustal weathering	Excellent	Bedrock at 15-20m depth
	Deposit Permeability	Fine (1-3m / day)	Excellent	Initial testing confirms within range. More test work required to confirm
Hydrogeological conditions		The groundwater level coincides with the bedrock	Excellent	Water is free draining
Engineering Conditions	Occurrence of Bedrock	Full confining layer	Good	
	Dip angle of Ore	Gentle tilt	Excellent	
	Thickness of Ore	Thick	Excellent	5-10m orezones



# In-Situ Mining



**1** Magnesium Sulfate Solution is injected at top of orebody

**2** Solution **extracts** REE's from orezone and runs along top of basement

**3** Solution carrying REE's is **extracted** via pumps

**4** The **solution is removed of impurities** and precipitated to form **MREC**.

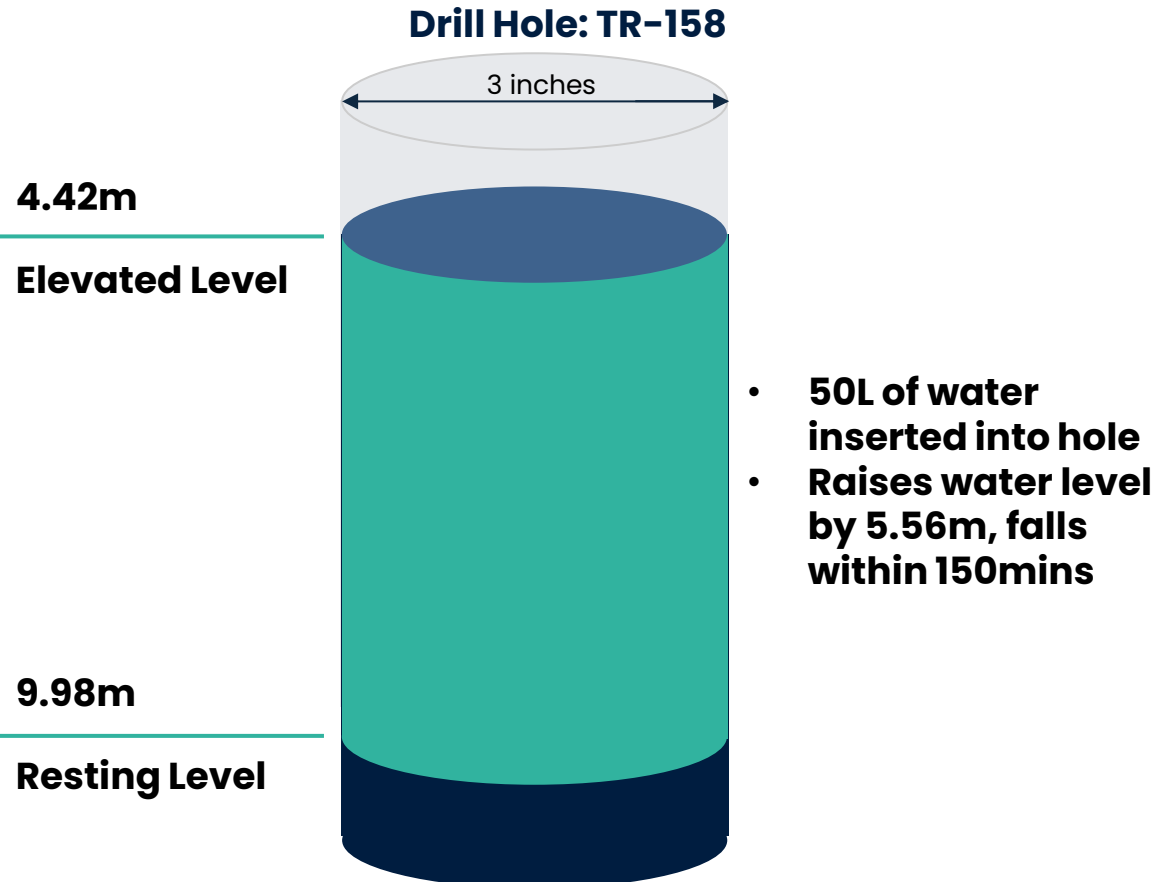


Solution rich in REE flows to extraction holes

# Field Permeability Testing



Evaluation of clayzone hydraulic conductivity elicits strong rapid response with very good percolation rates



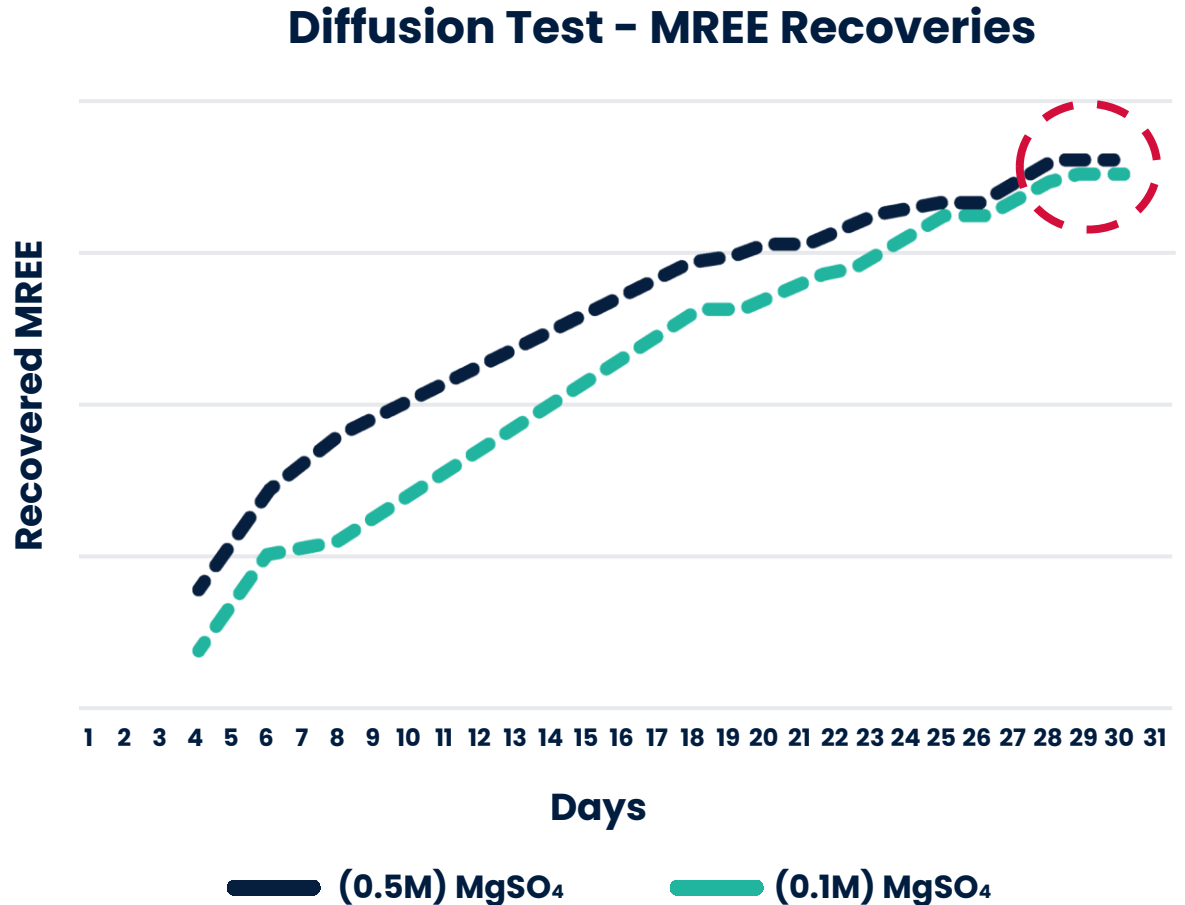
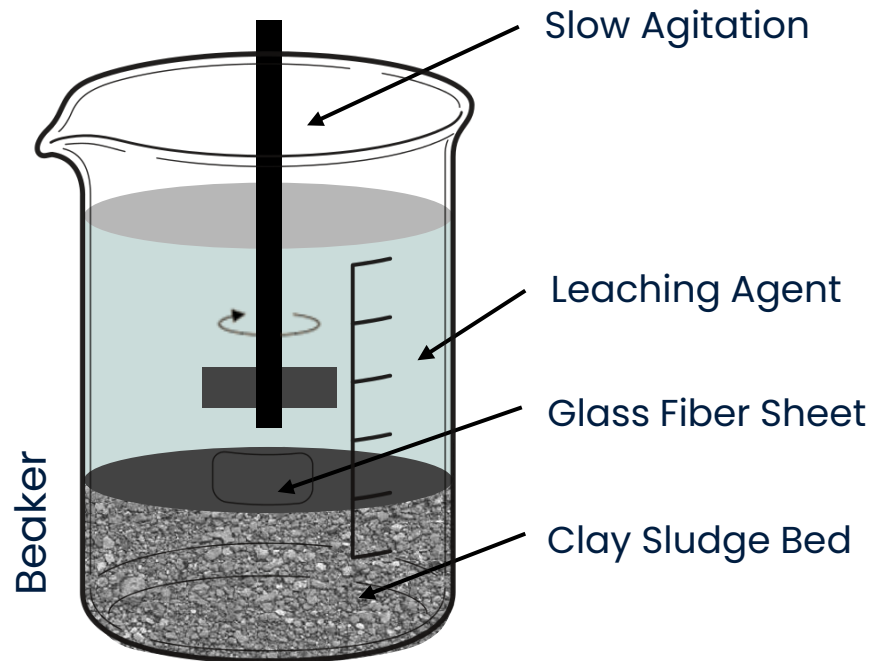
50L of Water Inserted Into Hole		
	Level (m)	Time (mins)
Elevated Water Level	4.42	0
Resting Water Level	9.98	150
Results	After 150 mins water level drops by 5.56m	
Percolation Rate	2.22m/hr	

9 Holes completed to date with similar results

Pumping field trials to be conducted during Q3 & Q4

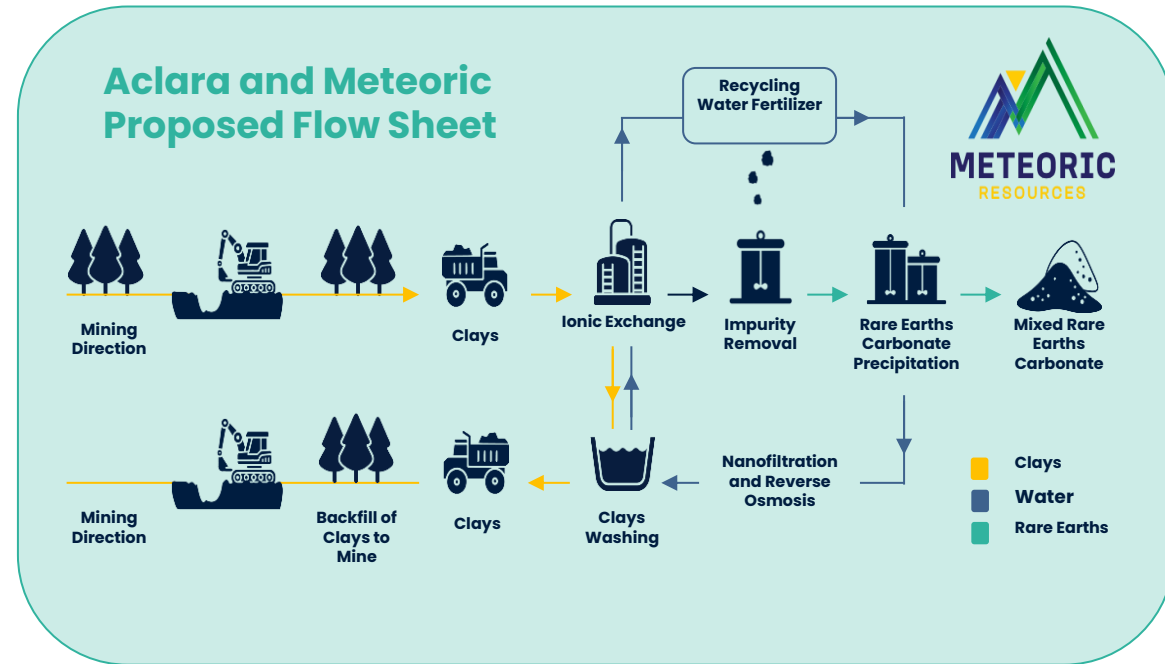
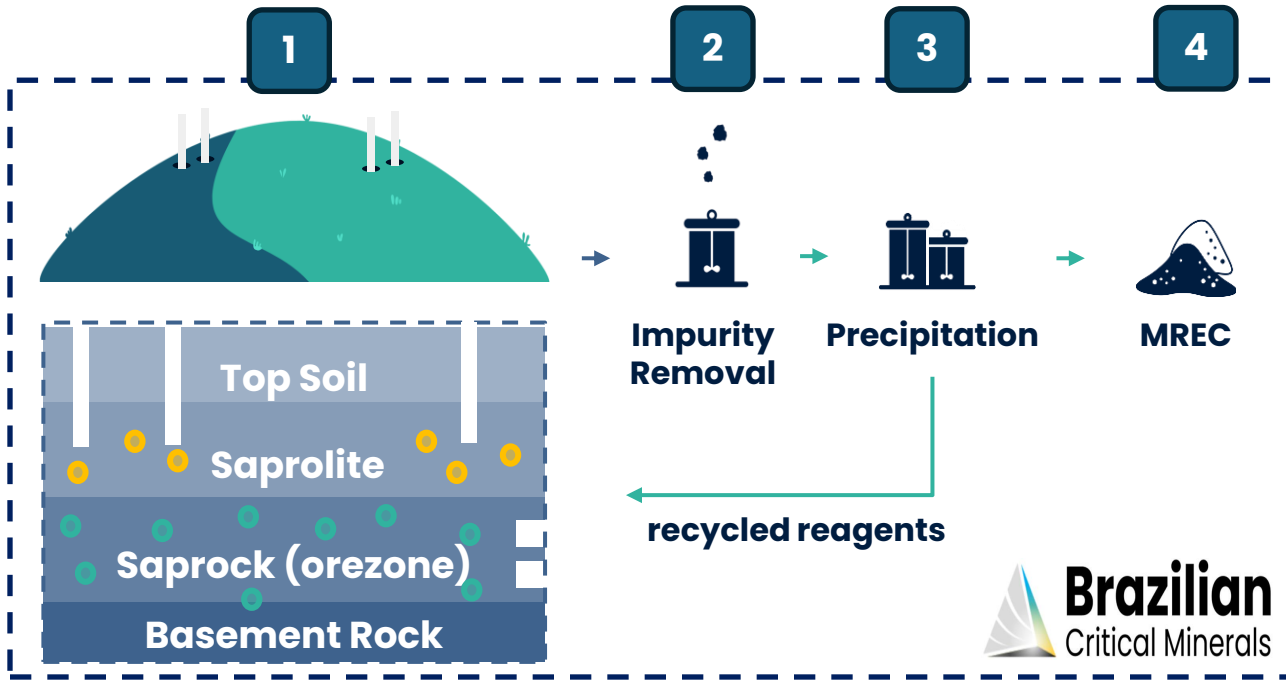
# Lab Diffusion Testing

Test mimicks ISR (leaching in the ground)



- Test shows REE's flow through clay easily
- Results using different strength MgSO<sub>4</sub> reach same value after 30 days

# Substantially Reduced Flow Sheet



**Insitu leach**  
**4 Step process flow sheet**  
**Opportunities to substantially reduce**  
**CAPEX and OPEX**

**Tank (VAT) leach**  
**10 Step process flow sheet**

# Commercial ISR Projects Malaysia



ISR Mining Rare Earths in Malaysia

## ISR construction and setup

- **I – inground leaching**
- **S – simple (tanks and pipes)**
- **R – rapid leaching kinetics enhance the viability**
- **Cost effective**
- **Quick establishment**
- **Low opex**



## reagent storage

- 2** Impurity removal
- 3** Precipitation of REE's
- 4** Production of MREC

# Magnesium Sulfate

## Eco friendly reagent



Evaluation of  $MgSO_4$  shows strong recoveries for

- **heap leaching – 63% MREE<sup>1</sup>**
- **Diffusion testing – similar to Chinese deposits<sup>2</sup>**

Magnesium Sulfate	Amonium Sulfate
Fully water-soluble, and therefore immediately plant-available	Can be harmful to aquatic organisms upon long-term exposure
Magnesium is a metal which has a strong ionic bond compared to ammonium and aids leaching	losses of Ca, Mg and Al in the leaching process make it difficult for plants to grow
reduces production of ammonia nitrogen wastewater	can be harmful if used in excess
supply the Mg needed by soils	century-old industrial process that produces a lot of greenhouse gas
	impact of nitrogen accumulation on plant species diversity and composition

1. (ASX: BCM) Excellent Heap Leach Recoveries Ema Project 06.08.24

2. (ASX: BCM) Excellent Heap Leach Recoveries Ema Project 06.08.24

# Leach Recoveries to Date



Test	Reagent	Target pH	Temp °C	Leach Duration	MREE (%)	Leaching Type
1	0.5 (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	4.5	ambient	2 hrs	68	VAT (tank) leaching
2	0.5M MgSO <sub>4</sub>	4.5	ambient	18 days	63	Heap Leaching
3	MgSO <sub>4</sub>	<b>Field pumping trials to commence in Q4 2024</b>				In-Situ Leaching

- In-situ leaching trials to commence in the coming months
- Leaching with Magnesium Sulfate is the most environmentally friendly reagent as it contains no nitrogen

1. (ASX:BCM) World Leading Recoveries Confirmed at Ema Project 07.05.24

2. (ASX: BCM) Excellent Heap Leach Recoveries Ema Project 06.08.24

# Leach Impurities to Date



	REE Mining	REE Leaching	Impurity Removal	REE Precipitation	MREC Production	
	Uranium (U)	Thorium (Th)	Aluminium (Al)	Iron (Fe)	Calcium (Ca)	Silica (Si)
mg/l	0.2	0.02	73	< 1	11	6

- Very low uranium and thorium values<sup>1</sup>
- Impurities can be removed through simple pH adjustment in REE precipitation
- Final MREC product needs to meet European, North American and Asian offtake partner specification testing to advance discussions regarding commercial offtake.

1. (ASX: BCM) Ema Project Achieves Low Impurities 02.08.24



# Capex – Hard Rock vs Soft Rock Capex





Lower capital and operating costs

## Cost efficiency



Minimal noise, dust, greenhouse gas impact

## Responsible mining



Minimal visual disturbance

## Minimal disruption



The most environmentally friendly way to mine

## Green mining



Safer for mine workers and surrounding communities

## Enhanced protection



No creation of open holes, waste dumps, leach pads or tailings

## Waste-free operations



# The Value of In-Situ Recovery

- Ionic REE are highly leachable
- Rapid leaching kinetics enhance the viability of lower cost ISR mining

# Work fronts



## Rare Earths

- Large auger drilling program underway – 240 holes
- Increase MRE from Inferred to Indicated
- Looking for 20 yr minelife as a minimum for scoping study
- MRE update Q4 2024

## Rare Earths

- Environmental baseline study awarded
- ANSTO test work on impurity removal and final product precipitation has commenced
- Scoping Study to define economics awarded
- In-Situ leach lab and field trials testwork planning underway

# Tax Incentive – Sudam



**A hub for industrial activity in Brazil. Established in 1967**

Incentive	Description	Requirements
Investments in Amazon Development Superintendence (SUDAM)	Reduces corporate income tax by 55% for a 10 year period	Approval by SUDAM (responsible regulatory agency)

**“Corporate Income tax reduction from 34% to 15.25%.”**

# Corporate Overview



**830<sub>M</sub>**

Shares on Issue

**8<sub>M</sub>**

Performance Rights

**1.4<sub>c</sub>**

Share Price (13/8/2024)

**11.6<sub>M</sub>**

Market Cap

Board of Directors



**Jeremy Robinson**

Non-Executive Chairman



**Andrew Reid**

Managing Director



**Abby Smith**

Non-Executive Director



### Brazil

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– Rio de Janeiro – RJ – Brasil

### Australia

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# Thank You.

# Appendix 1 – Mineral Resources



Company	Tonnes (Mt)	Grade (ppm)	Measured: Indicated: Inferred ratio (Mt)	Reference
BCM	1017	793	0 : 0 : 1017	Brazilian Critical Minerals (ASX:BCM) Massive Maiden Mineral Resource for Ema Project 22.04.24
Aclara	258	1,452	0 : 0 : 258	Aclara (TSX:ARA) Aclara announces 77% increase in inferred mineral resources at Carina Module In Goias, Brazil 09.08.24
Australian Rare Earths	186	712	0 : 0 : 186	Australian Rare EARTHS (ASX:AR3) 84% Increase in Resource for Koppamurra REE Project 19.03.24
Brazilian Rare Earths	485	1071	0 : 0 : 485	Brazilian Rare Earths (ASX:BRE) Prospectus - Part 1 19.12.23
Ionic Rare Earths	617	630	0 : 517 : 99	Ionic Rare Earths (ASX:IXR) Major Increase to Globally Significant Rare Earth Resource 23.06.20
Longnan	48	1,000	0 : 0 : 48	Research Reports
Meteoric	740	2,572	11 : 297 : 431	Meteoric Resources (ASX:MEI) Updated Figueira Mineral Resource Estimate 05.08.24
OD6 Metals	628	1,338	0 : 0 : 628	OD6 (ASX:OD6) Mineral Resource Estimate Upgrade Investor Presentation 29.05.24
Serra Verde	911	1,200	n/a	Research Reports
Harena Resources	628	895	0 : 0 : 628	<a href="https://harenaresources.com.au/ampasindava-rare-earth-projects/">https://harenaresources.com.au/ampasindava-rare-earth-projects/</a>
VMM	201	2,590	0 : 62 : 139	Viridis Mining and Minerals (ASX:VMM) Globally Significant Colossus Rare Earth Ionic Adsorption Clay Project Maiden Mineral Resource Estimate 04.06.20
West Cobar Metals	83	1,117	0 : 39 : 151	West Cobar Metals (ASX:WC1) Salazar Clay - REE Resource Quadruples 09.08.23
Xinfeng	162	900	n/a	Research Reports
Xunwu	710	1,100	n/a	Research Reports

# Appendix 2 – Capex Requirements **Brazilian** Critical Minerals

Company	Capital AUD\$M	Level of Assessment	Deposit Type	Final Product	Reference
Arafura	1,590	DFS	Hard Rock	oxides	Arafura Rare Earths Ltd (ASX:ARU) Nolans Project Update 11.11.22
Aclara	822	Scoping study	Ionic Clay	MREC	Aclara (TSX:ARA) Aclara delivers a positive PEA for its Carina project in Goias, Brazil 23.01.24
Hastings	948	DFS	Hard Rock	MREC	Hastings (ASX:HAS) YANGIBANA PROJECT UPDATE Staged development to reduce project delivery risk and enable faster pathway to cash flow 31.05.23
Ionic Rare Earths	173	DFS	Clay	MREC	Ionic Rare Earths (ASX:IXR) MAKUUTU STAGE 1 DFS CONFIRMS TECHNICAL AND FINANCIAL VIABILITY FOR SUSTAINABLE, LONG-LIFE OF MAGNET AND HEAVY RARE EARTHS, MAIDEN ORE RESERVE ESTIMATE 20.03.23
Meteoric Resources	600	Scoping study	Ionic Clay	MREC	Meteoric Resources (ASX:MEI) Caldeira Project Scoping Study confirms potential for the world's lowest cost source of rare earths with outstanding financial metrics 08.07.24