

## Company Presentation

In accordance with the requirements of Listing Rule 3.1 we submit the attached material being presented to investors and brokers.

Mark Cooksey, Managing Director, and CEO is making the presentation.

ASX Release authorised by Mark Cooksey, Managing Director, and CEO.

### **For further information please contact:**

Dr Mark Cooksey

CEO

ABx Group

Mobile: +61 447 201 536

Email: [mcooksey@abxgroup.com.au](mailto:mcooksey@abxgroup.com.au)

Website: [abxgroup.com.au](http://abxgroup.com.au)



(ASX:ABX)

# Company Presentation

6 June 2023

# Disclaimer

This presentation has been prepared by ABx Group Limited ACN 139 494 885 ("ABx" or the "Company"). It should not be considered as an offer or invitation to subscribe for or purchase any securities in the Company or as an inducement to make an offer or invitation with respect to those securities. No agreement to subscribe for securities in the Company will be entered into on the basis of this presentation.

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You should not act or refrain from acting in reliance on this presentation material. This overview of ABx does not purport to be all inclusive or to contain all information which its recipients may require in order to make an informed assessment of the Company's prospects. You should conduct your own investigation and perform your own analysis in order to make an informed assessment of the company's prospects. You should also conduct your own investigation and perform your own analysis in order to satisfy yourself as to the accuracy and completeness of the information, statements and opinions contained in this presentation and making any investment decision.

Prices for aluminium fluoride (AlF<sub>3</sub>) were sourced from Asian Metals, China Customs and verified by comparison with prices from Bloomberg. The price actually achieved will depend upon market conditions at the time of sale.

## Competent Person Statement

The information in this report that relate to Exploration Information and Mineral Resources are based on information compiled by Ian Levy who is a member of The Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists. Mr Levy is a qualified geologist and a director of ABx Group Limited.

Mr Levy has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration and to the activity, which they are undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of exploration Results, Mineral Resources and Ore Reserves. Mr Levy has consented in writing to the inclusion in this report of the Exploration Information in the form and context in which it appears.

# Board of Directors

## Hon Paul Lennon AO (Chair)



- Premier of Tasmania 2004-2008
- Deputy Premier and Minister for Infrastructure, Energy & Resources 1998-2004
- Principal Paramul Pty Ltd 2009-

## Dr Mark Cooksey (Managing Director and CEO)



- More than 20 years with Rio Tinto and CSIRO
- Worked closely with aluminium and other metal industries
- Significant experience in commercialising new technologies and processes
- PhD in Chemical & Materials Engineering

## Ian Levy (Director)



- Previous CEO of ABx
- 30 years of senior management experience across multiple commodities, including WMC and Pancontinental Mining
- Previously CEO of Allegiance Mining, Chair of Dynasty Metals Australia, and Director of Gloucester Coal
- Member of JORC for 11 years (4 years as Vice Chairman) and Federal President, Australian Institute of Geoscientists

## Ken Boundy (Non-Executive Director)



- 20 years leading companies and divisions in wine, food, building materials and tourism industries
- Chair and Non-Executive on 21 private and public boards
- Executive experience in corporate development, M&A and marketing

# Corporate Overview

ASX code: **ABX**

Listed	Issued shares	Options	52-week range	Average daily volume (3 months)	Market cap (@\$0.10)	Cash @ 1 June 2023	Shareholders
24 Dec 2009 @ \$0.20	223.6m	-	\$0.10- \$0.18	190,000	\$23m	\$3.3m	2,546

Major Shareholders	Shares	%
Shareholders Mutual Alliance	6.0 m	2.7
HSBC Custody Nominees	5.9 m	2.6
Justevian Pty Ltd	5.8 m	2.6
Yarraandoo Pty Ltd	5.6 m	2.5
Aftron Pty Ltd	5.6 m	2.5
Top 20 shareholders	63.3 m	28.3
Remainder	160.3 m	71.7

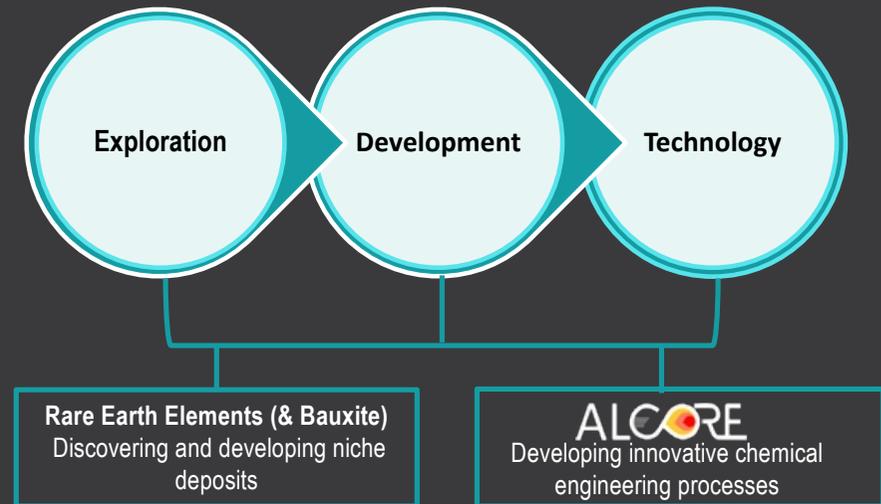


Resources: **21 million tonnes rare earths and 130 million tonnes bauxite**



## Delivering materials for a cleaner future

1. Discovering and developing an ionic adsorption clay rare earth project in northern Tasmania
2. Establishing a plant to produce hydrogen fluoride and aluminium fluoride from recycled industrial waste, to replace imports (ALCORE)
3. Mining and enhancing bauxite resources for the cement, aluminium and fertiliser industries



# Segments



Rare earth discoveries in northern Tasmania



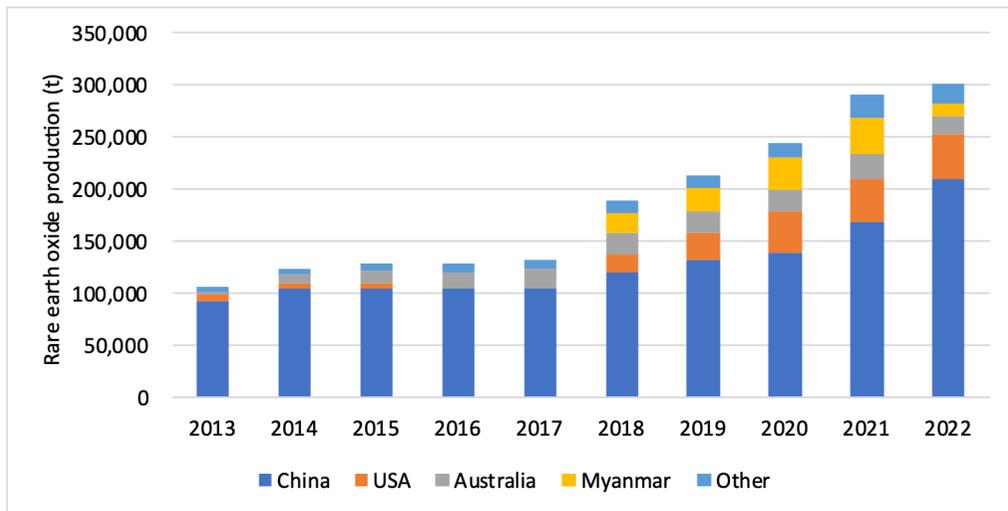
ALCORE Aluminium fluoride production technology



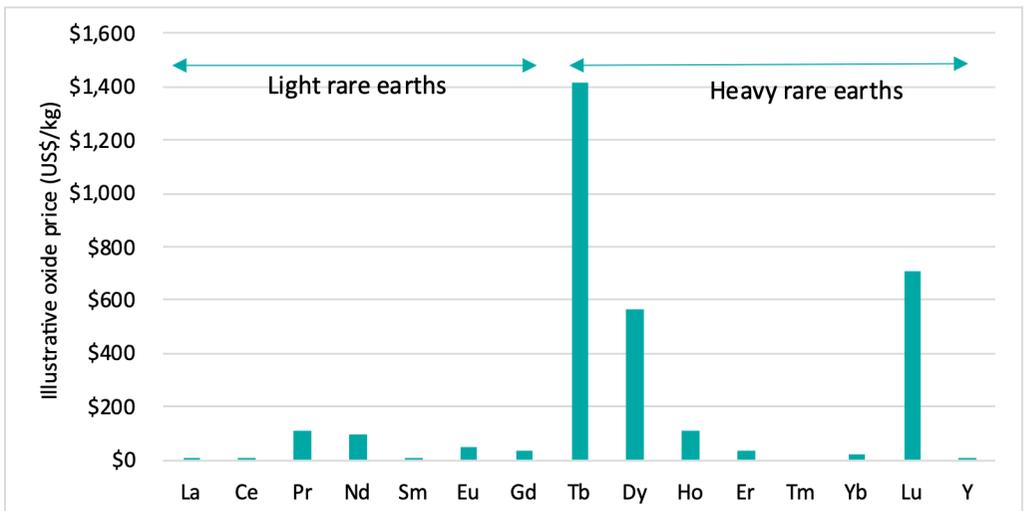
Bauxite operations in Queensland and Tasmania

# Rare earth elements market

- 15+ rare earth elements (REEs) used in wide variety of applications, with demand growing rapidly
- China dominates rare earths markets
- Prices of different rare earths vary significantly because:
  - Proportions of supply do not match proportions of demand
  - Rare earths difficult to substitute



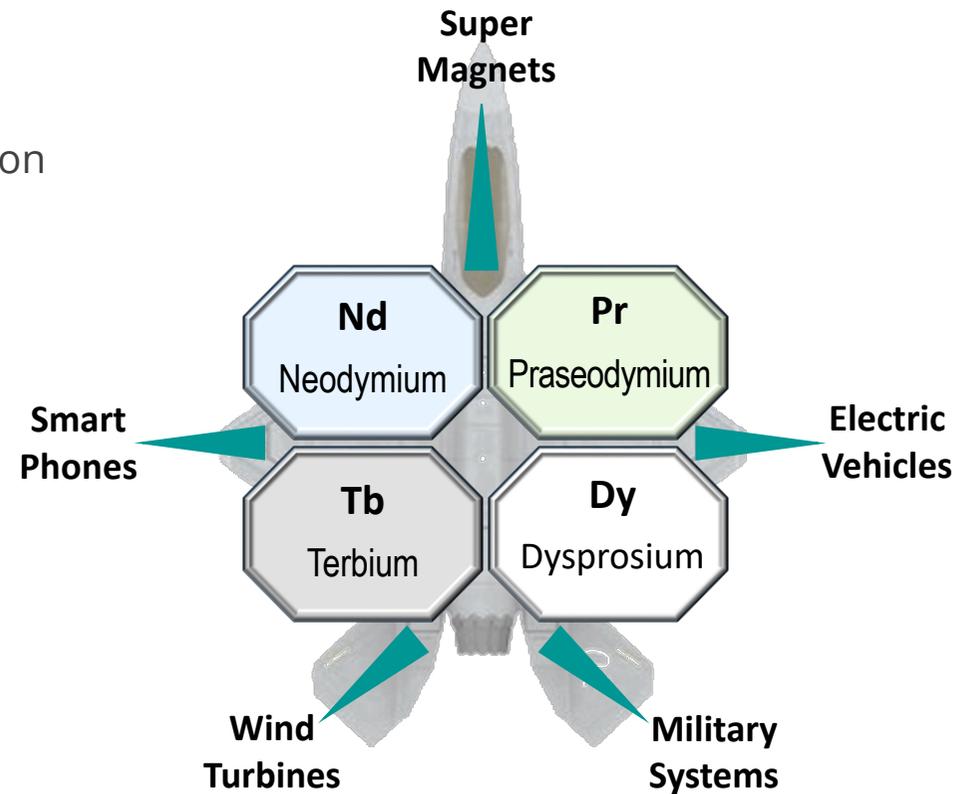
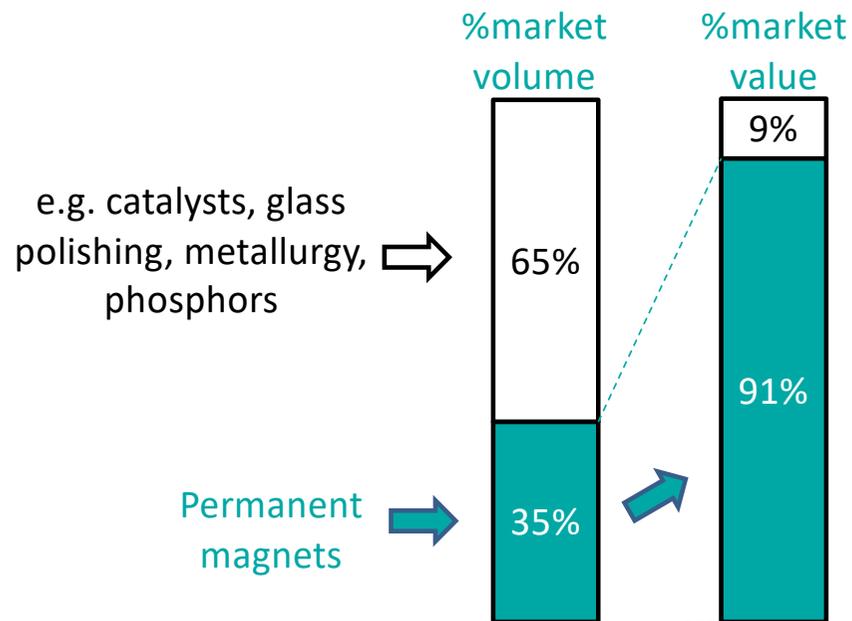
Source: USGS (excludes unregulated production in China)



Source: NI 43-101 Technical Report: Preliminary Economic Assessment for Penco Module Project, 2021

# Permanent magnets

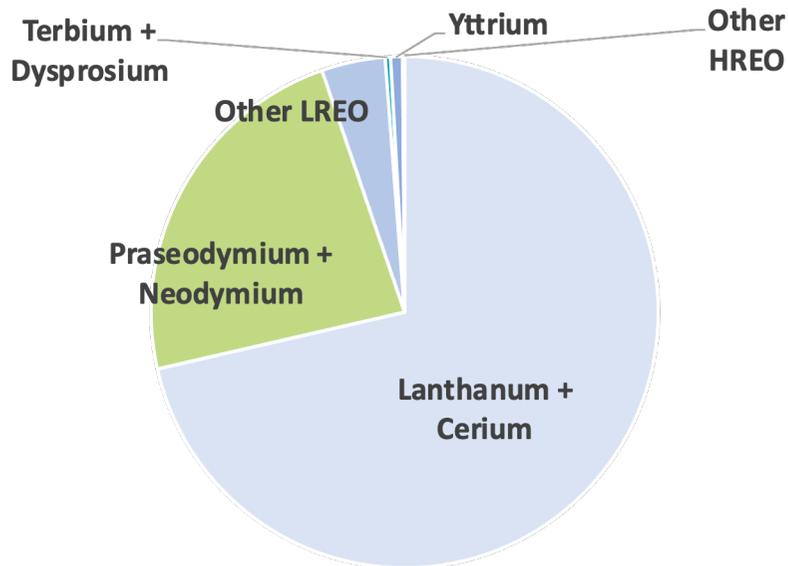
- Essential for electric vehicles and wind turbines
- Represent over 90% of value of rare earths consumption
- Forecast to grow at 7% per year to 2040



Source: Rare Earth Industry Association (<https://www.global-reia.org/about-rare-earth/>)

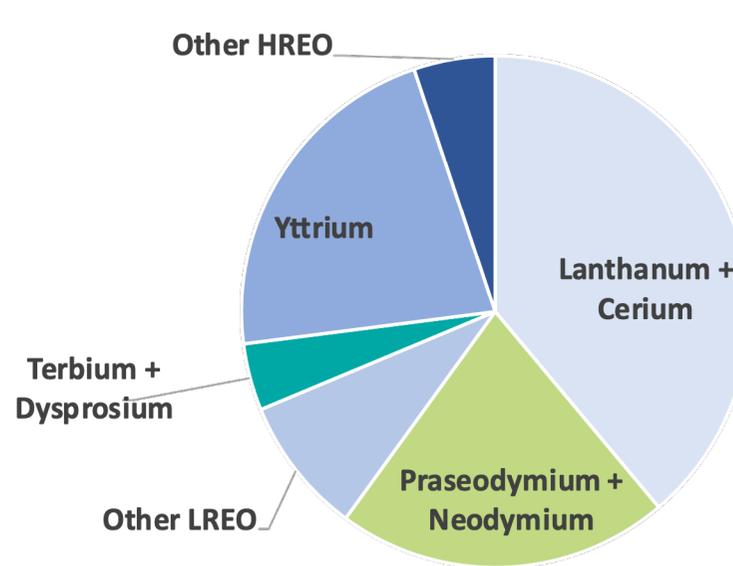
# Ionic adsorption clay (IAC) rare earth deposits

- Currently only mined in southern China
- Less complex processing: lower costs and shorter time to production
- Contain much higher proportion of higher value, heavy rare earths



Hard rock: Mount Weld (Lynas)

Source: D.J. Packey and D. Kingsnorth, Resources Policy, 48(2016) 112-116.



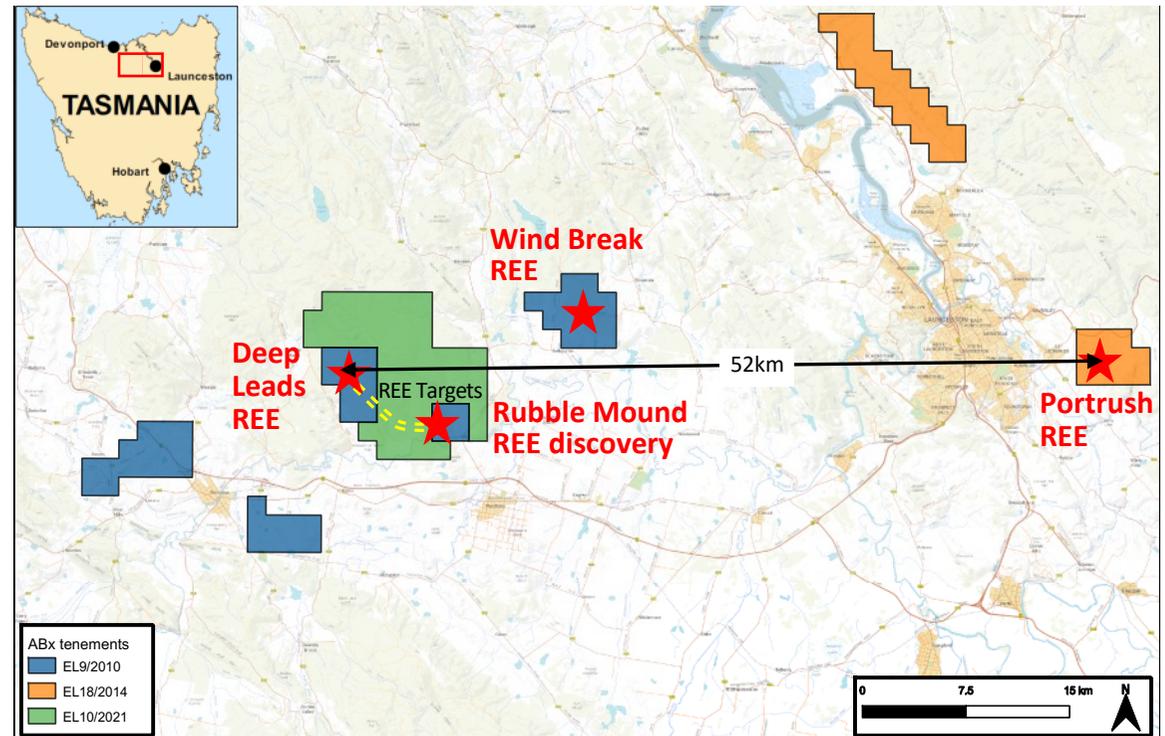
Ionic clay: Deep Leads<sup>1</sup>

ABx Group

# ABx rare earth discoveries in Tasmania

- ABx is the first company to discover rare earths in Tasmania
- Deep Leads and Rubble Mound have **highest reported extractions from any clay-hosted REE prospect in Australia:** they are ionic adsorption clays<sup>2</sup>

- Four discoveries spanning 52 km <sup>(3)</sup>
- Very low levels of radioactive elements (thorium and uranium)



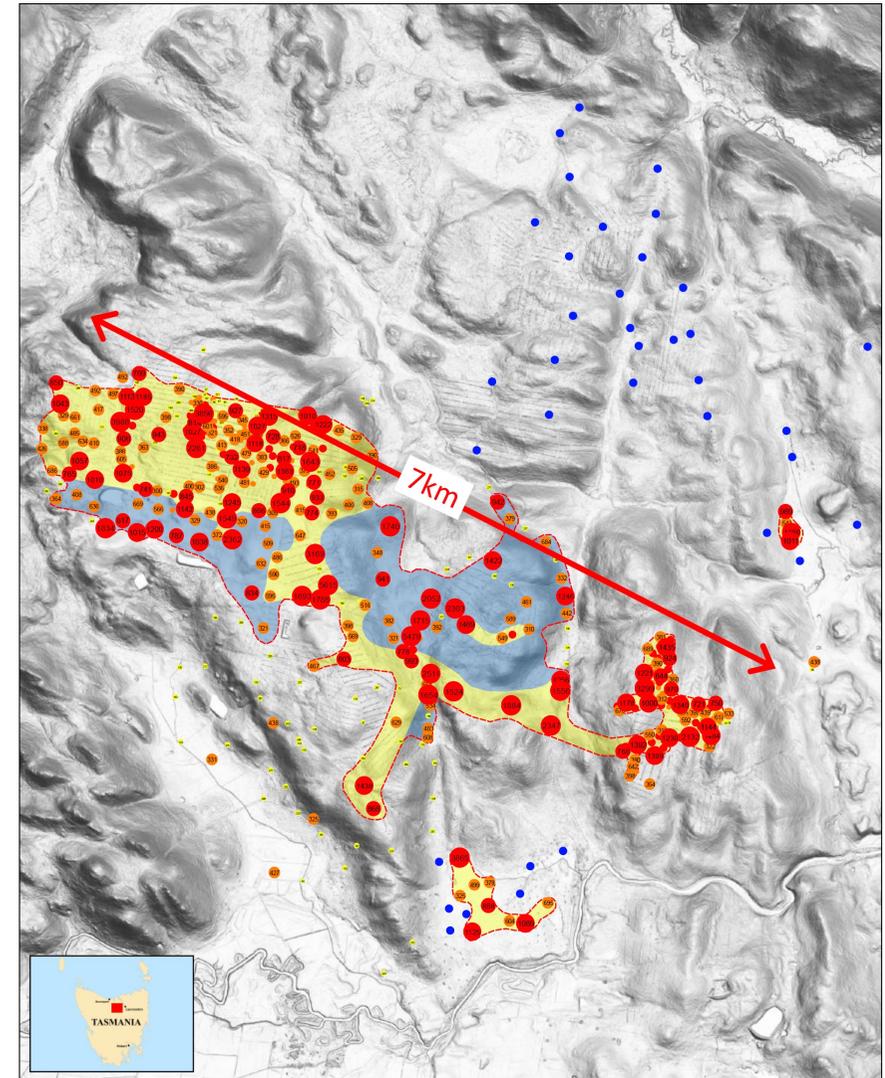
# Rare Earths Resource Estimate

- Announced 8 May 2023<sup>1</sup>
- Five-fold increase since maiden estimate in November 2022<sup>4</sup>

Size	Cut-off (ppm TREO-CeO <sub>2</sub> )	Mean TREO (ppm)	Mean TREO-CeO <sub>2</sub> (ppm)
21 Mt	250	770	585

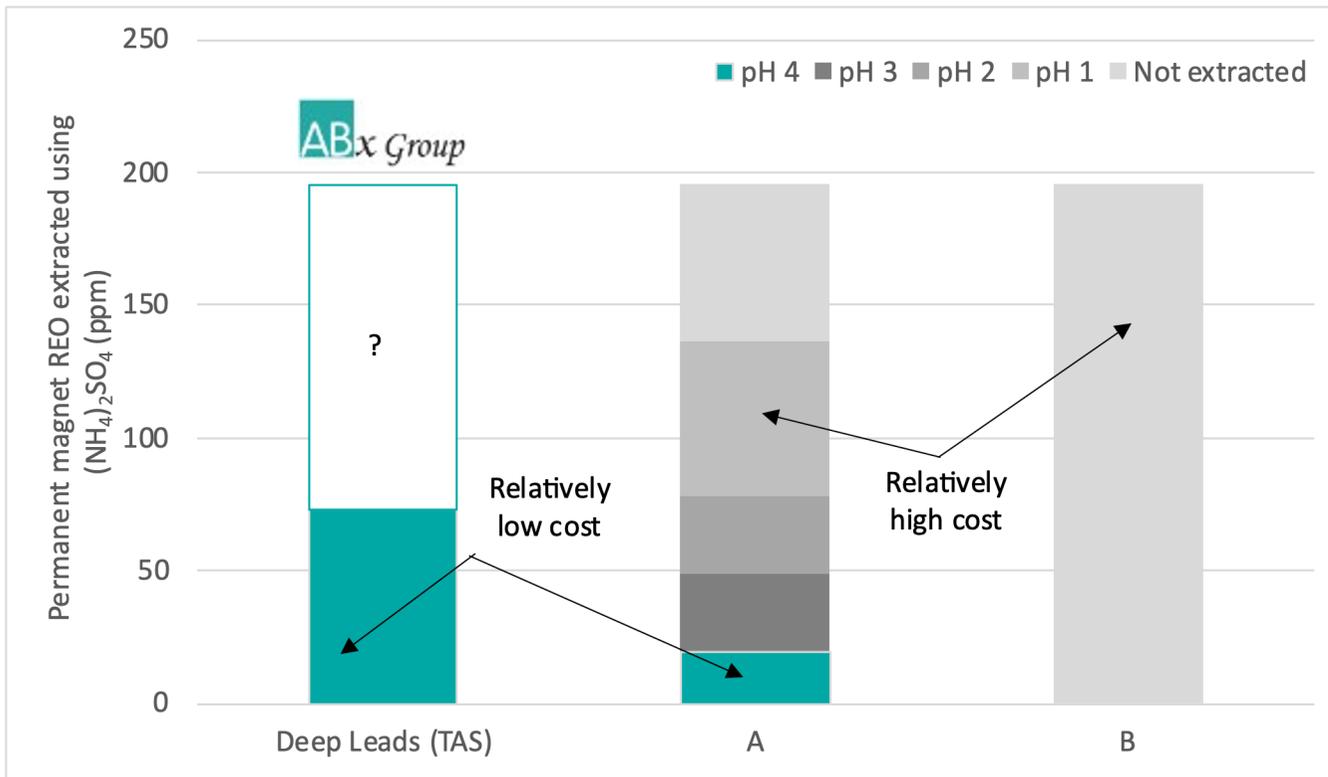
Holes drilled	Metres drilled (m)	Metres assayed (m)	Thickness (m)
635	6,224	2,893	7.7

• Resource represented covers only 18% of total prospective area

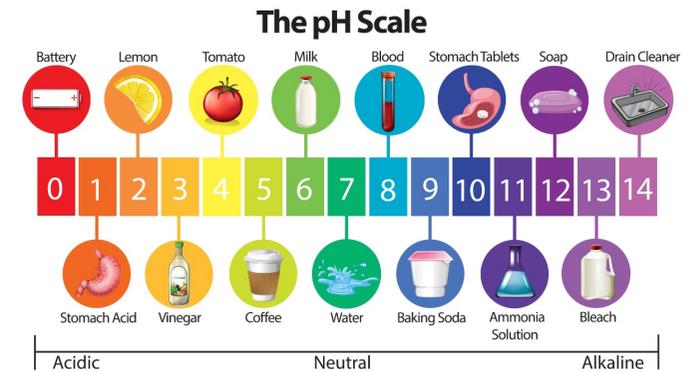


# Not all clays are created equal

## pH is king



- Deposits A and B are hypothetical (same grade)
- Processing cost increases significantly as pH decreases
  - Acid consumption
  - Impurity removal



Permanent magnet REO = Pr<sub>6</sub>O<sub>11</sub> + Nd<sub>2</sub>O<sub>3</sub> + Tb<sub>4</sub>O<sub>7</sub> + Dy<sub>2</sub>O<sub>3</sub>

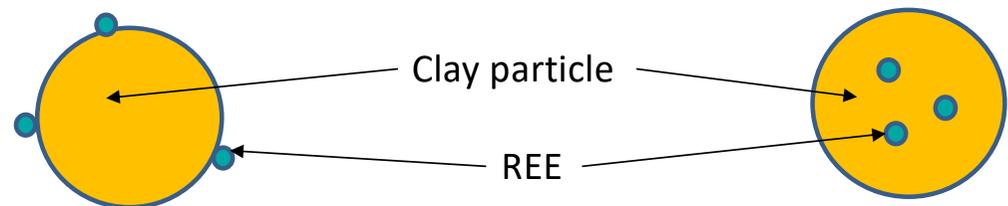
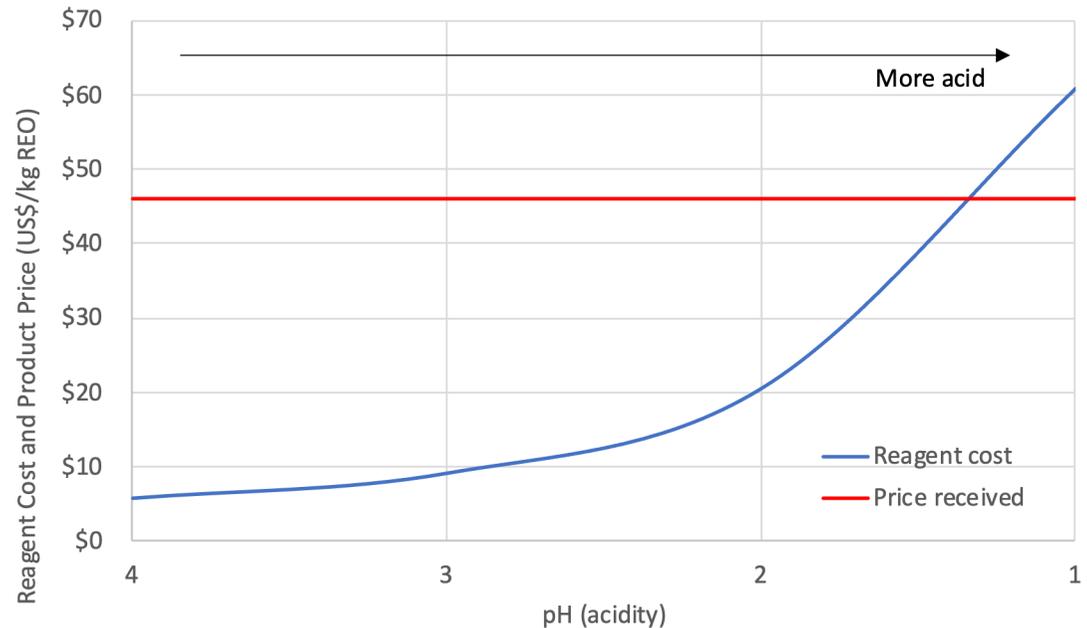
Source: ABX ASX release, 2 February 2023

# Not all clays are created equal

## pH is king

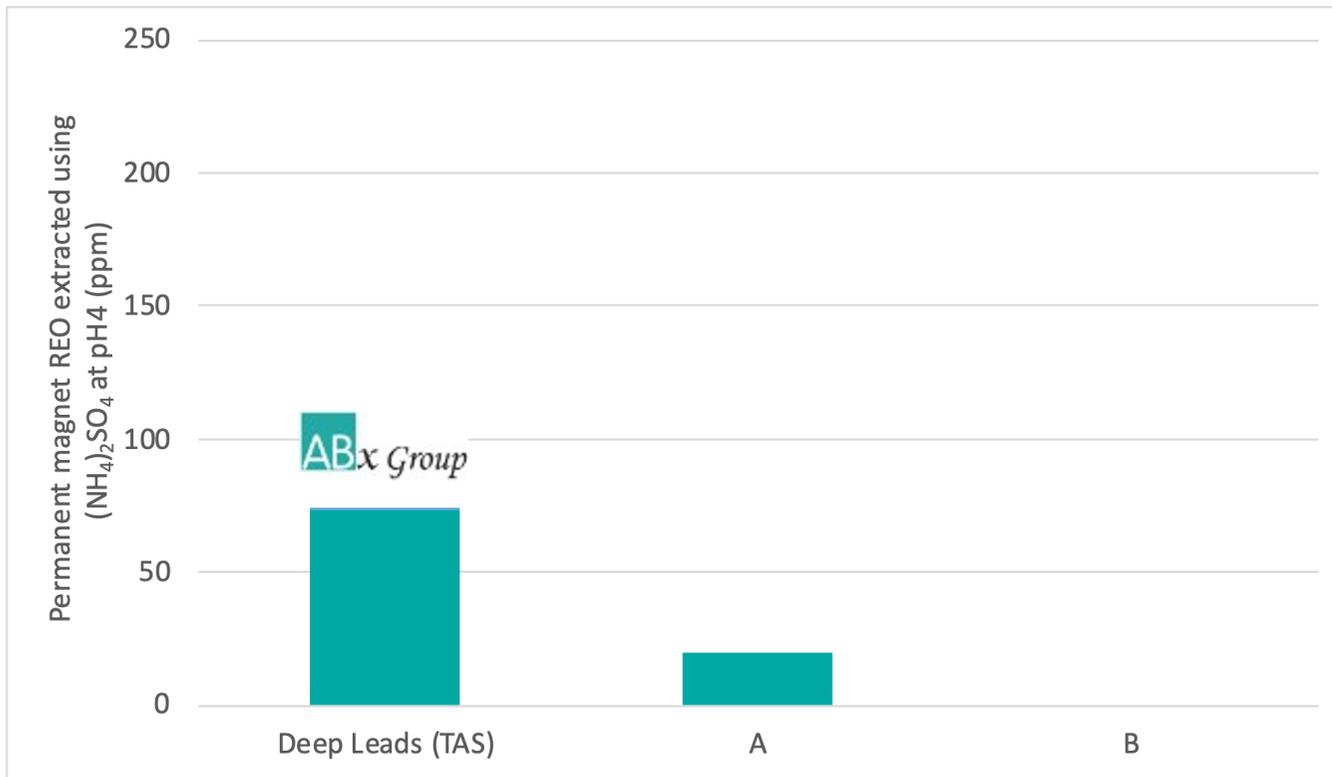
- Charts shows indicative reagent cost and product prices, based on published data
- As pH decreases, reagent cost alone can be higher than product price

- Position on cost curve heavily dependent on pH required to achieve significant extraction
- There is a threshold pH below which the production cost is likely to be higher than revenue



## Not all clays are created equal

'Desorbable grade' varies enormously



Permanent magnet REO =  $\text{Pr}_6\text{O}_{11} + \text{Nd}_2\text{O}_3 + \text{Tb}_4\text{O}_7 + \text{Dy}_2\text{O}_3$

- If only consider extraction at pH 4 ('desorbable grade'), then deposits are very different

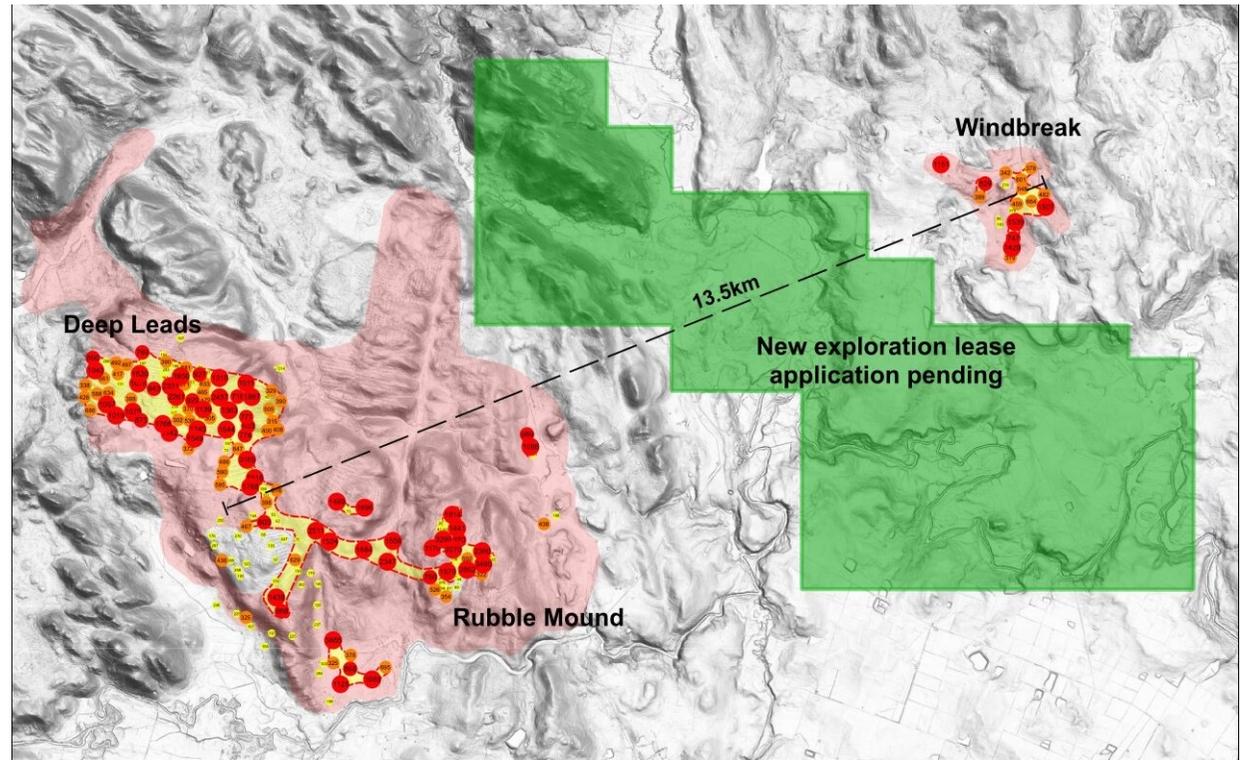
# ABx rare earths strategy

## Strategy

- Rapidly develop low-cost production of mixed rare earth carbonate
- We operate only where welcomed

## 2023 Plan

- Further investigations of metallurgical processing steps and conditions
- Estimate CAPEX and OPEX
- Deepen engagement with potential customers
- Enhance ABx's exploration technology to find more rare earths
- Further drilling campaigns



# Segments



Rare earth discoveries in northern Tasmania



ALCORE Aluminium fluoride production technology



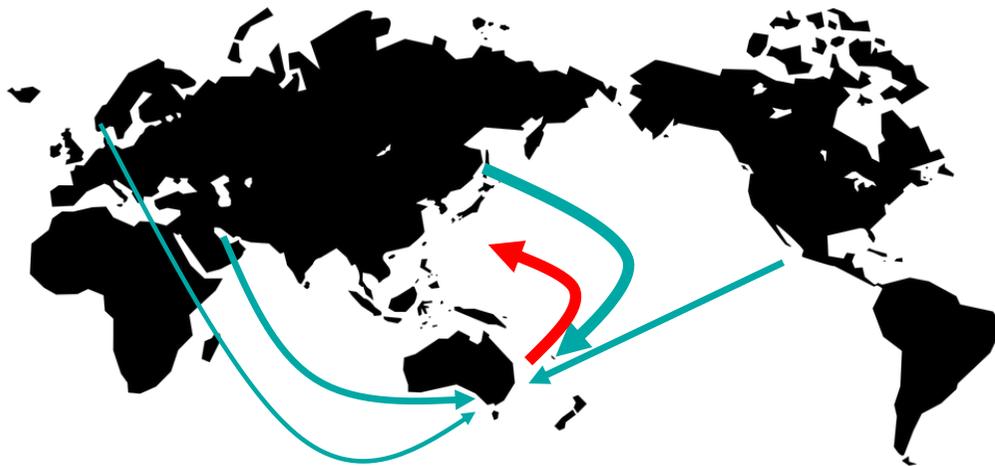
Bauxite operations in Queensland and Tasmania

# Aluminium fluoride from aluminium smelter waste

Aluminium fluoride ( $\text{AlF}_3$ ): essential for aluminium smelting

- 1.2 million tonnes produced globally per year worth US\$1.5 billion (US\$1,000-1,800 per tonne)
- 50% produced in China, mainly for Chinese smelters
- Australia imports 100% of requirements, mostly from China

- Traditionally produced from high-cost aluminium hydroxide and fluorspar
- Achievable specification – product purity risk is low
- Mature market – dozens of customers globally



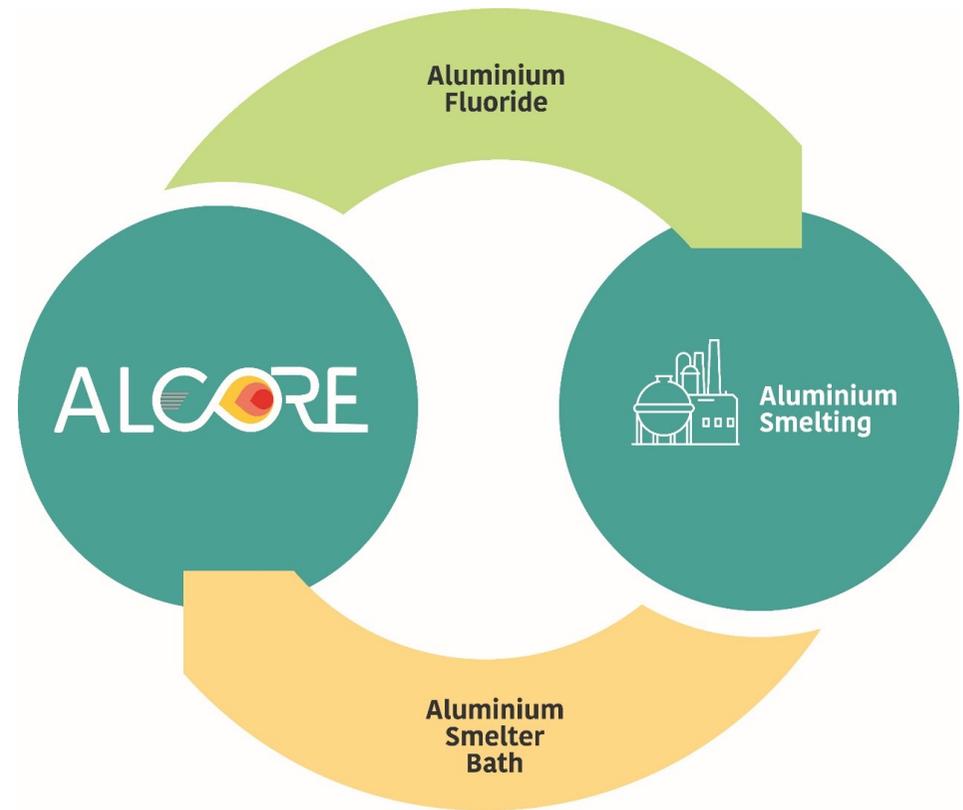
→ Aluminium fluoride      → Tapped bath

Current imports/exports

# ALCORE Process to produce aluminium fluoride

- Exemplary illustration of circular economy

- ABx's 83%-owned refining technology subsidiary
- Developing processes to produce aluminium fluoride using:
  - Fluorine from tapped bath (an aluminium smelter waste)
  - Aluminium from dross (an aluminium smelter waste) or bauxite



## ALCORE Process economics

- Based on long term aluminium fluoride prices and exchange rates, and estimated costs
- For 20,000 t/y aluminium fluoride (80% of Australian demand)
- Attractive margins under all scenarios

Aluminium source	Scenario	AlF <sub>3</sub> price (US\$/t)	FX rate USD:AUD	AlF <sub>3</sub> price (A\$/t)	Estimated operating cost (A\$/t AlF <sub>3</sub> )	Estimated operating margin* (A\$/t AlF <sub>3</sub> )	Estimated EBITDA* (A\$m)
Aluminium hydroxide	Baseline	\$1,220	0.75	\$1,630	\$1,250	\$730	\$15m
Dross	Baseline	\$1,220	0.75	\$1,630	\$1,050	\$930	\$19m
Aluminium hydroxide	Optimistic	\$1,400	0.70	\$2,000	\$930	\$1,450	\$29m
Dross	Optimistic	\$1,400	0.70	\$2,000	\$770	\$1,600	\$32m

\*Includes revenue from co-products

## ALCORE Technical progress

- Critical processing steps have been demonstrated in laboratory
- Initial operating conditions for the pilot plant reactor have been selected<sup>5</sup>
- Basic engineering design for pilot plant reactor completed, and detailed design being finalised



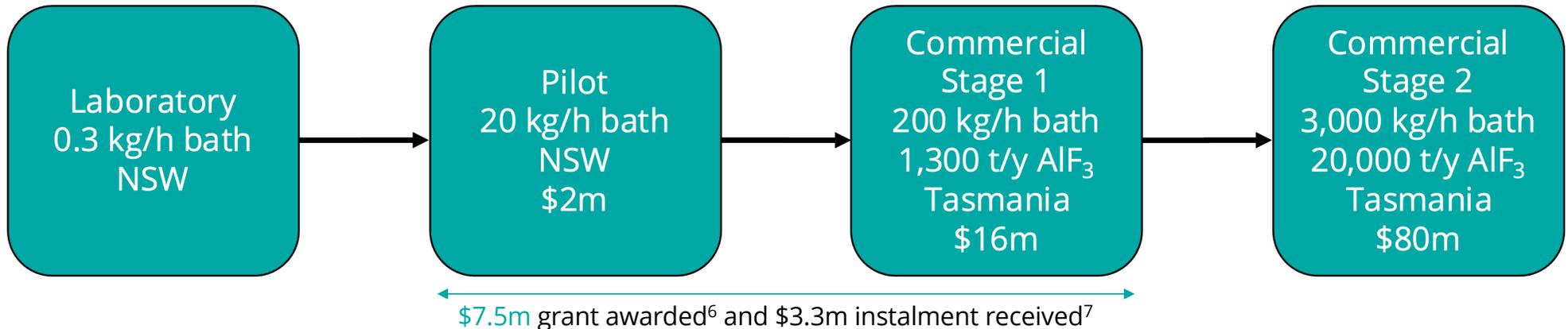
Rotary kiln for recovery  
of fluorine from  
aluminium smelter bath

Oleum production plant



# ALCORE Process scale-up

- Rigorous scale-up to reduce technical risk
- First aluminium fluoride plant planned for Bell Bay, Tasmania, near existing hydro-powered aluminium smelter. Planned production 20,000 t/y
- High potential for plants in other major aluminium smelting regions
- Potential expansion into other markets, including fluorine chemicals



# ALCORE Technical plan

Reactor	Purpose	Commissioning
Bath lab reactor MkII	<ul style="list-style-type: none"> <li>• Confirm preferred reactor design</li> <li>• Demonstrate that can achieve high fluorine yield from bath</li> <li>• Produce metal sulfate residue suitable for further process development</li> </ul>	August 2023
Bath pilot plant reactor	<ul style="list-style-type: none"> <li>• Demonstrate quality of hydrogen fluoride produced at pilot scale</li> <li>• Determine design and operating parameters for commercial plant</li> </ul>	Early 2024



Illustrative images

# Segments



Rare earth discoveries in northern Tasmania



ALCORE Aluminium fluoride production technology

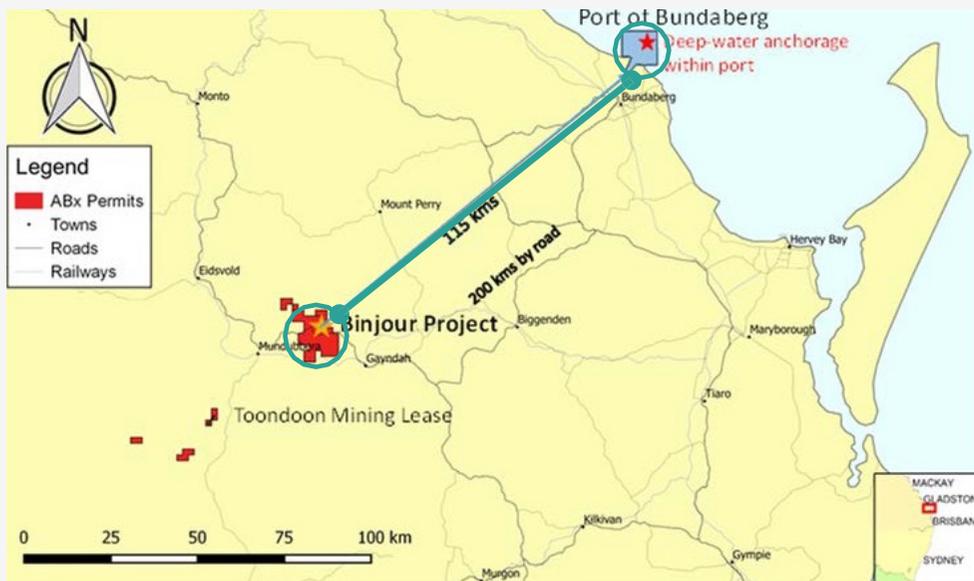


Bauxite operations in Queensland and Tasmania

# ABx bauxite operations

## Sunrise Bauxite project

Queensland

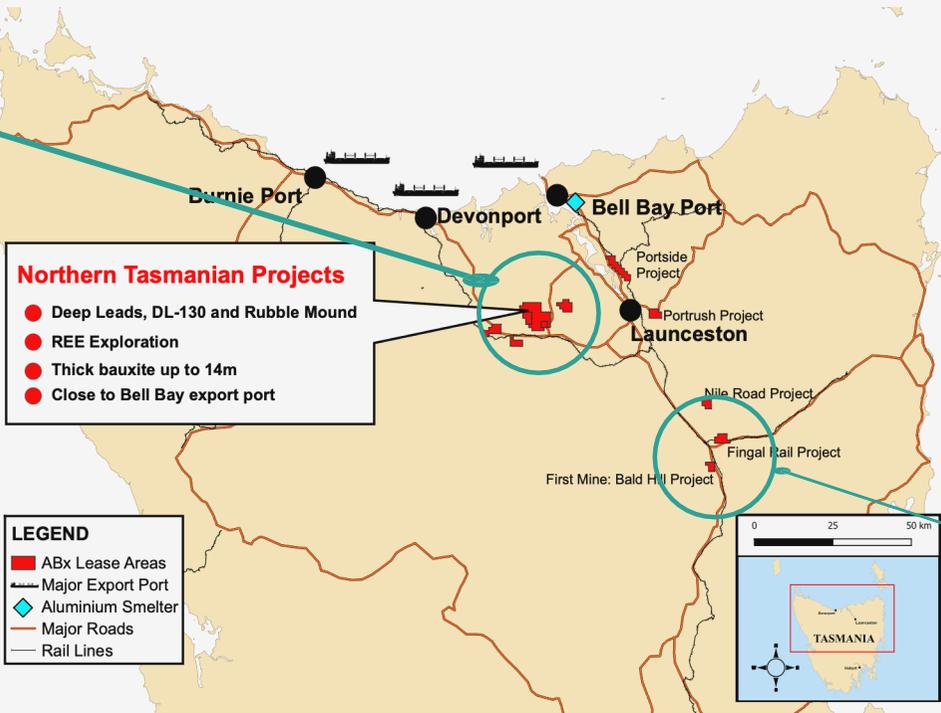


- 50:50 joint venture with Alumin Pty Ltd, an Australian special purpose vehicle company associated with our strategic marketing partner, Rawmin India<sup>8</sup>. ABx is operator
- Mining lease application on the Binjour deposit (37 million tonnes resource), 115km west of Bundaberg Port.
- Alumin will contribute up to \$18m (for 49.9% equity), which is anticipated to fund mine and port development
- Engineering studies complete and environmental studies in progress<sup>9</sup>
- Production planned to commence H1 2025
- Full production anticipate to be 1.5 mt/y

# ABx bauxite operations

## Northern Tasmania

✓ Notice of Intent accepted for DL130<sup>5</sup>



- Several Tasmanian bauxite deposits that can supply cement and fertiliser grade bauxite for many years.
- Mining planned to commence at DL130 in Q3 2023<sup>9</sup>
- Bauxite mining at DL130 may accelerate development of the Deep Leads REE discovery

✓ First mine at Bald Hill fully rehabilitated



**ABx Group Limited**

L5 52 Phillip Street  
Sydney 2000  
Australia

Phone: +61 2 9251 7177

E: [corporate@abxgroup.com.au](mailto:corporate@abxgroup.com.au)

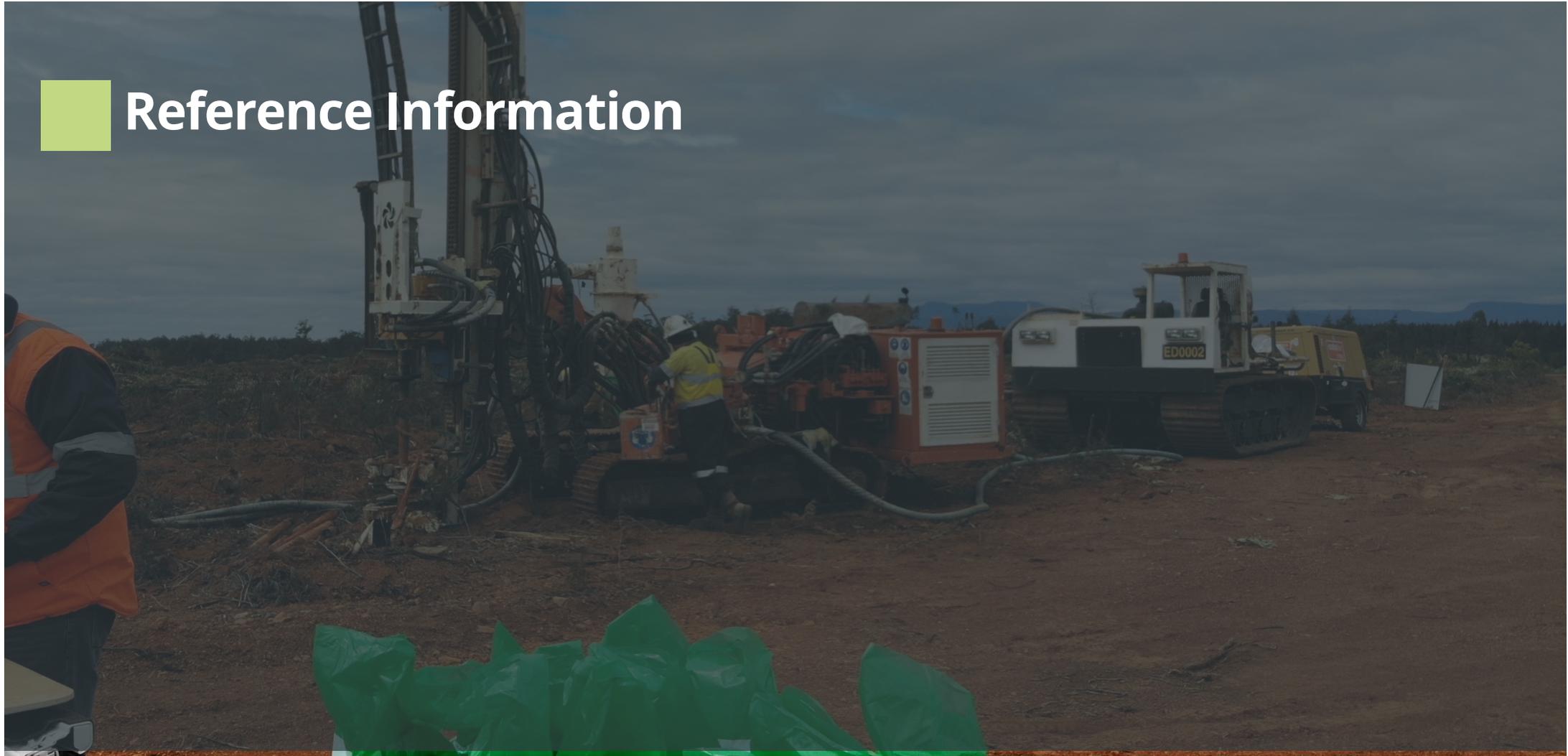
**Mark Cooksey**

Managing Director and CEO

E: [mcooksey@abxgroup.com.au](mailto:mcooksey@abxgroup.com.au)



# Reference Information





## References

<sup>1</sup>ASX release 8 May 2023

<sup>2</sup>ASX release 2 Feb 2023

<sup>3</sup>ASX release 16 March 2022

<sup>4</sup>ASX release 23 November 2022

<sup>5</sup>ASX release 24 October 2022

<sup>6</sup>ASX release 29 April 2022

<sup>7</sup>ASX release 18 Jan 2023

<sup>8</sup>ASX release 28 February 2022

<sup>9</sup>ABx quarterly report to December 2022, 31 Jan 2023