

## Quarterly report and activity statement, 3 months to 30 September 2022

### Highlights

#### Rare earth elements: major expansion of ionic adsorption clay prospects

ABx's confirmed REE IAC mineralisation is the main target at Deep Leads & Rubble Mound

Deep Leads & Rubble Mound amalgamated into a 6.5 x 7km REE mineralised zone

#### Alcore (Production of aluminium fluoride from aluminium smelter waste): positive results and pilot plant program continuing

Positive test results using the specialised laboratory reactor to investigate the reaction of bath with oleum to produce hydrogen fluoride. It is expected that the initial operating conditions for the pilot plant reactor will be determined early in the next quarter

The design and layout of the pilot plant was further developed, and it is anticipated that pilot plant construction will commence in the next quarter

#### Bauxite Operations: Planning to be mining in Queensland and Tasmania from Q3 2023

Queensland and Tasmanian mine lease applications progressing well, with surveys and studies well underway and on track for submissions

### Corporate

Appointment of Dr Mark Cooksey as Managing Director on 1 September 2022

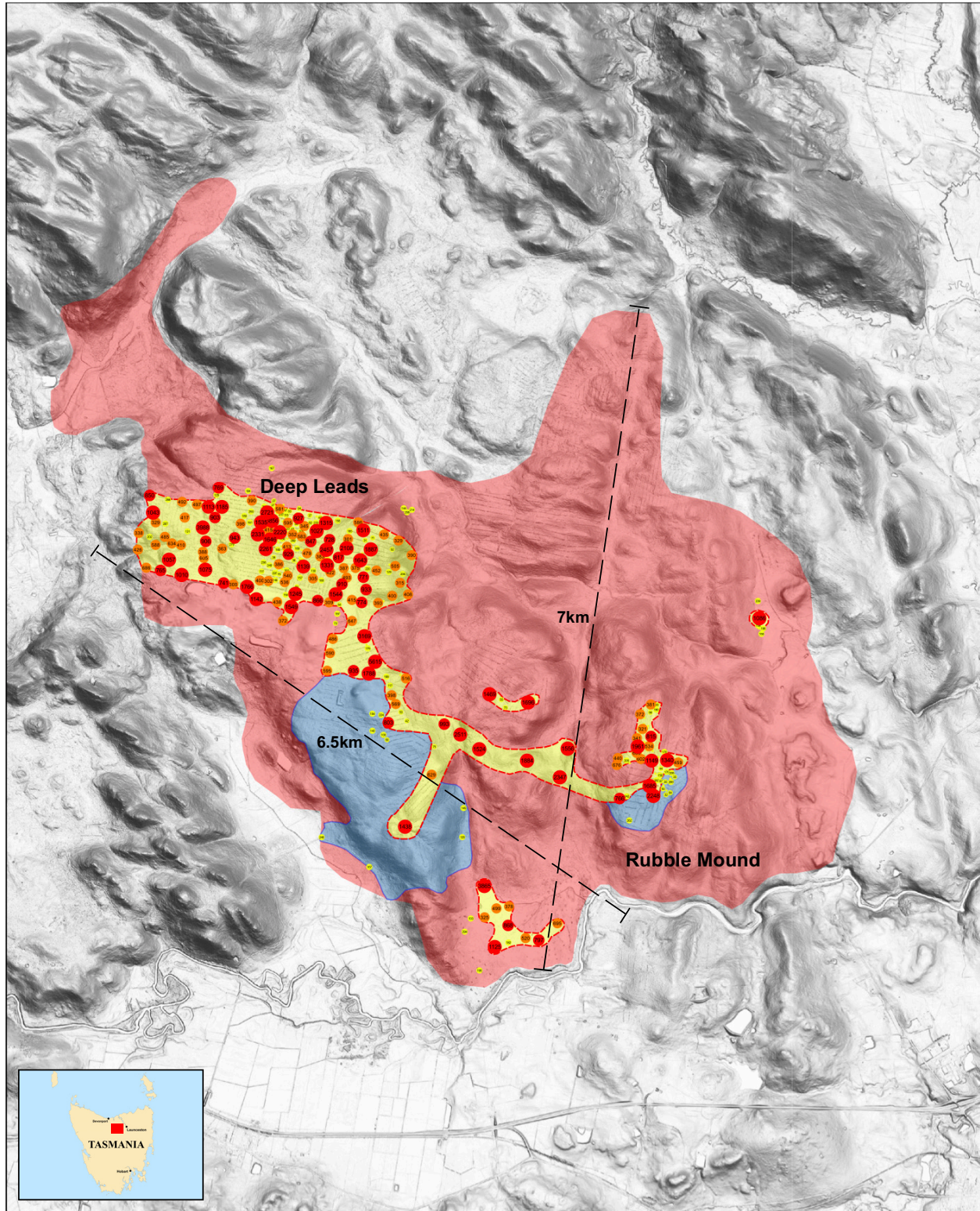
Group available cash at quarter end was \$2.98 million

ABx securities total 223,590,814 ordinary shares and 78,820,500 quoted options

ABx Group (ASX:ABX) is a uniquely positioned, high-tech Australian company at the cutting-edge of creating new sources and technologies for strategic minerals and chemicals.

#### Rare Earth Elements (REE) Exploration: major expansion of discovery

- ABx's successful 150-hole drilling campaign extended REE mineralisation 6.5 km eastwards, amalgamated the original discovery at Deep Leads with the Rubble Mound discovery, and extended the prospective area to 7 km north-south. The combined REE project area has more than tripled to 36.6 km<sup>2</sup> (Figure 1)
- A new 70-hole drilling campaign is underway, starting in the south and then heading north



**Deep Leads Project**  
Rare Earth Element Exploration

**Rare Earth Element Exploration**

- Proven REE Mineralisation Zone
- Additional Drill Completed - Assay's Pending
- Additional Exploration Drilling Underway

**Total Rare Earth Oxide Grades (TREO)**

- Greater than 700ppm
- Between 300 and 700ppm
- Less than 300ppm

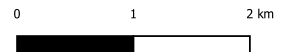


Figure 1: 6.5 km x 7 km REE mineralised areas at the Deep Leads-Rubble Mound REE discovery. Proven mineralisation zone (yellow) = 5.1 km<sup>2</sup>, Assays pending zone (blue) = 2.9 km<sup>2</sup>, Additional exploration zone (red) = 28.6 km<sup>2</sup>. Total = 36.6 km<sup>2</sup>

- **High grades, thick and shallow intercepts:** Exceptionally thick, shallow zones of strong REE mineralisation were encountered in the drillholes that were drilled during the quarter, with highlights including<sup>1</sup>:

Hole	From (m)	To (m)	Metres (m)	TREO <sup>1</sup> avg (ppm)	TREO-CeO <sub>2</sub> <sup>2</sup> (ppm)	TREO max (ppm)
<b>RM217</b>	2	23	<b>21</b>	<b>564</b>	<b>475</b>	<b>2511</b>
Includes	2	4	<b>2</b>	<b>2092</b>	<b>1794</b>	<b>2511</b>
<b>RM218</b>	4	9	<b>5</b>	<b>987</b>	<b>804</b>	<b>1524</b>
Includes	6	9	<b>3</b>	<b>1349</b>	<b>1099</b>	<b>1524</b>
<b>RM220</b>	1	5	<b>4</b>	<b>1059</b>	<b>534</b>	<b>2347</b>
<b>RM221</b>	2	10	<b>8</b>	<b>750</b>	<b>652</b>	<b>1556</b>
Includes	4	8	<b>4</b>	<b>1138</b>	<b>1030</b>	<b>1556</b>
<b>RM222</b>	2	15	<b>13</b>	<b>621</b>	<b>451</b>	<b>993</b>

<sup>1</sup> Total rare earth oxides

<sup>2</sup> TREO minus cerium oxide

- These holes between Deep Leads and Rubble Mound confirmed that the REE mineralisation is extensively distributed over a large area, and that the two REE discoveries at Deep Leads and at Rubble Mound are part of a single, combined mineralised zone
- Pending assays will allow the finalisation of a maiden resource estimate

### ABx Rare Earths Strategy

Rare earths have many applications in a wide variety of industries. Permanent magnets are the most valuable application, representing over 90% of the total value of rare earths consumption. Permanent magnets are used in electric vehicles, wind turbines, smart phones and military applications. The four most important rare earths for permanent magnets are neodymium, praseodymium, dysprosium and terbium. Furthermore, the demand for these four 'supermagnet' rare earths is predicted to grow faster than for other rare earths. Prices for these rare earths have risen significantly in the last two years (Figure 2).

Globally, most rare earths are sourced from hard-rock mines. These typically require large, costly processing plants and a significant lead time to reach production.

A less common source of rare earths is ionic adsorption clay (IAC) deposits. Historically, these have only been mined in southern China. A major advantage of IAC deposits is that the rare earths can be extracted from the clay via a simple leaching process, enabling a project to be developed rapidly and at lower cost. A second advantage of IAC deposits is that they are relatively richer in the four main rare earths needed for permanent magnets.

For these reasons, ABx has explored for IAC rare earth deposits, and we have discovered rare earth accumulations within our bauxite tenements in northern Tasmania (Figure 3). ABx is the first company to discover rare earths in Tasmania. This IAC type of deposit is rare, with commercial production only occurring in China. ABx will conduct exploration on several other target areas within its tenements that have the geological features that ABx considers to be prospective for rare earths.

<sup>1</sup> See ASX release 20 September 2022

The ABx strategy is to produce an intermediate rare earth concentrate that can be sold to existing processing plants. ABx's rare earths are low in radioactive elements and so our concentrates will be attractive to many rare earth processing plants.

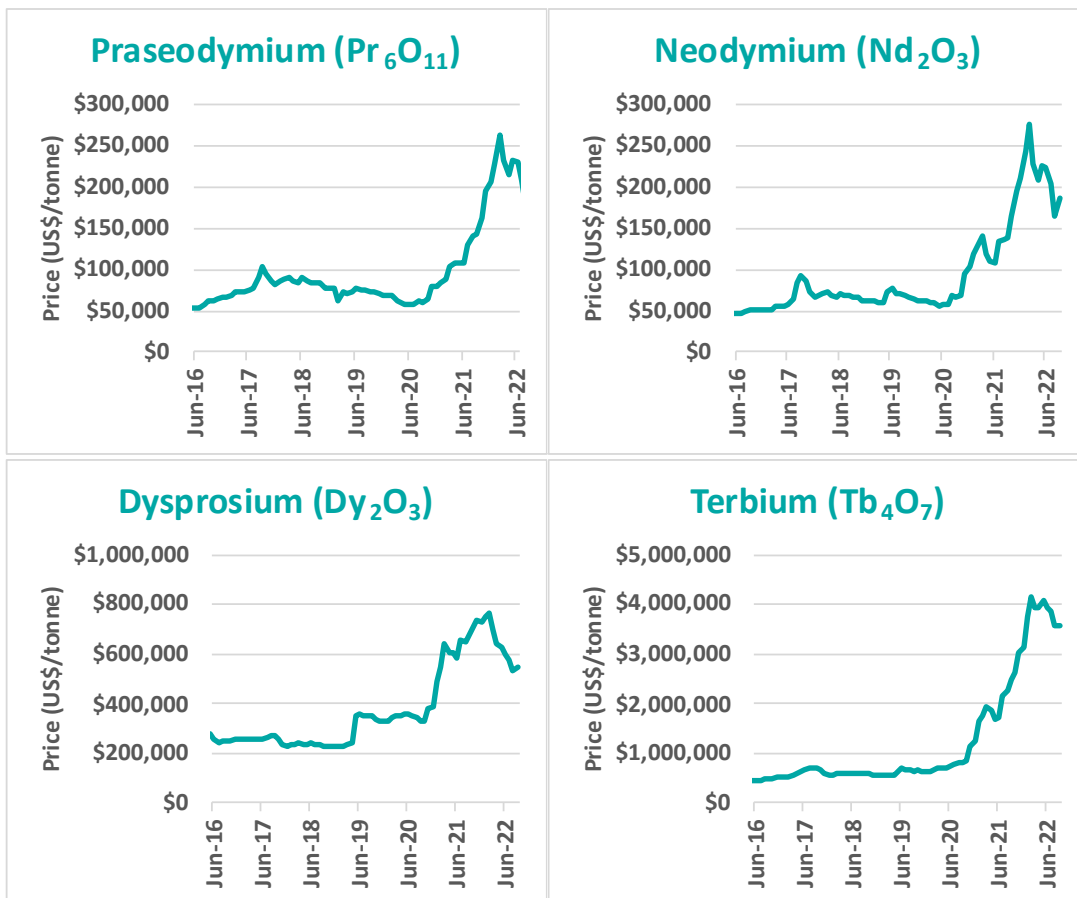


Figure 2: Prices for permanent magnet rare earths have increased significantly in the last two years (source: Kitco)

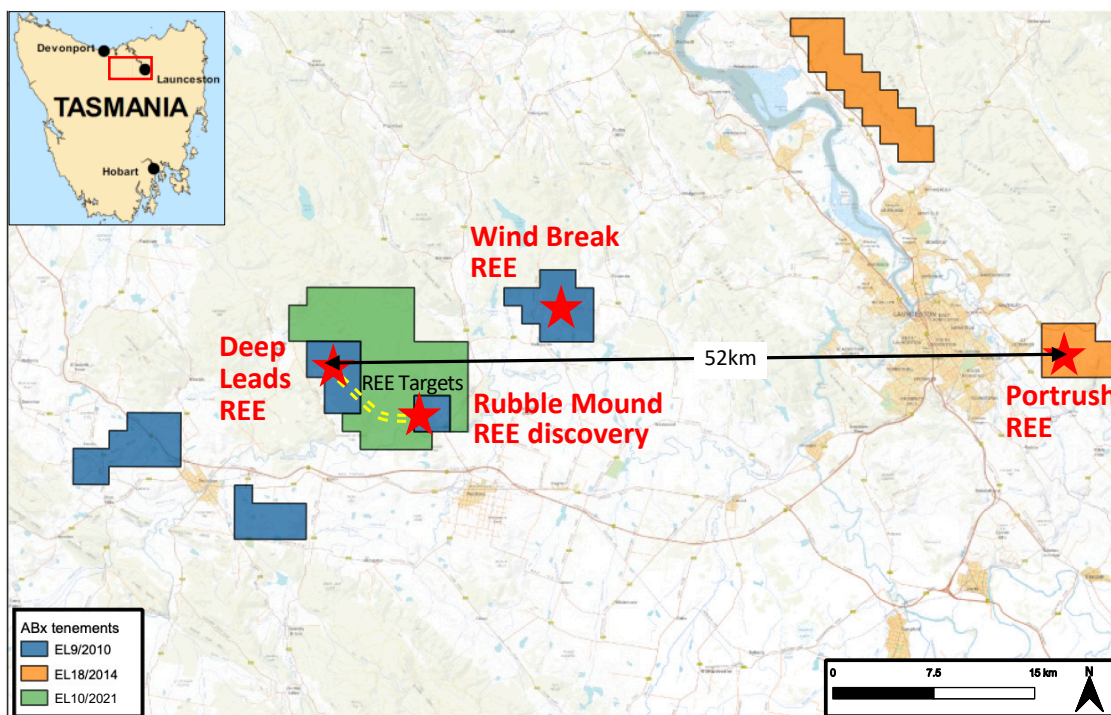


Figure 3: ABx leases in the 52 km wide REE province.

## **ALCORE (83%-owned by ABx): Awarded grant and pilot plant program continuing**

- Extensive tests were conducted, using the specialised laboratory reactor commissioned in the previous quarter, to investigate the reaction of bath with oleum to produce hydrogen fluoride (Figure 4). The results of these tests, combined with literature data and thermodynamic modelling, are used to determine the preferred operating conditions (e.g. temperature, residence time, amount of acid) for the larger pilot plant reactor.
- The results from the tests were positive, and it is expected that the initial operating conditions for the pilot plant reactor will be determined early in the next quarter.
- The design of the continuous pilot plant bath reactor, which is intended to process 20 kg per hour of bath, was further refined, based on the knowledge described above.
- The design and layout of the pilot plant was further developed. It involves several unit operations, including feed material preparation and materials handling of products. The pilot plant is planned to occupy one section of the Alcore Technology Centre. It is anticipated that pilot plant construction will commence in the next quarter.
- Alcore commenced assessing several potential site locations for the commercial hydrogen fluoride and aluminium fluoride plants at Bell Bay.

### **Alcore Strategy**

Aluminium fluoride is a strategically important mineral that is an essential ingredient for aluminium smelting and is being investigated for advanced lithium-ion batteries. Australia is the largest producer of primary aluminium metal without its own domestic aluminium fluoride production, so Australian aluminium smelters rely entirely on imported aluminium fluoride. This is typically more than 70% from China, but this proportion reduced by more than 50% in 2021, illustrating the supply risks (Figure 5). Aluminium fluoride prices have been above US\$1,400/t for the last 11 months (Figure 6).

Most modern aluminium smelters produce excess bath, for which the only meaningful market is new smelters, which require bath to commence operations. Aluminium industry forecasts suggest that the global bath market will increasingly be in surplus, because far fewer new smelters are being constructed. All of the major global aluminium producers are eager for alternative applications for bath, to avoid the unpalatable options of on-site storage or landfill.

Alcore has developed a world-first process to recover hydrogen fluoride from aluminium smelter bath. This is combined with aluminium hydroxide to produce aluminium fluoride. Alcore is also investigating the use of dross (another aluminium smelter waste) and bauxite as alternatives to aluminium hydroxide as the source of aluminium. The use of dross or bauxite would further lower the production cost.



Figure 4: ALCORE specialised laboratory reactor test work

Alcore intends to construct commercial hydrogen fluoride and aluminium fluoride plants in Bell Bay, Tasmania. The aluminium source for the initial aluminium fluoride production is likely to be aluminium hydroxide, as this is less risk and allows a faster path to production. Subsequent production may use aluminium from dross or bauxite to further improve the financial and environmental outcomes.

The initial plant is proposed to transform 1,600 tonnes per year of aluminium smelter bath into hydrogen fluoride and other industrial chemicals. Most of the hydrogen fluoride will be further processed to aluminium fluoride. Alcore's longer term plan is to expand the plant by 15 times, which will process all of Australia's aluminium smelter bath, and supply more than 80% of Australia's aluminium fluoride requirements.

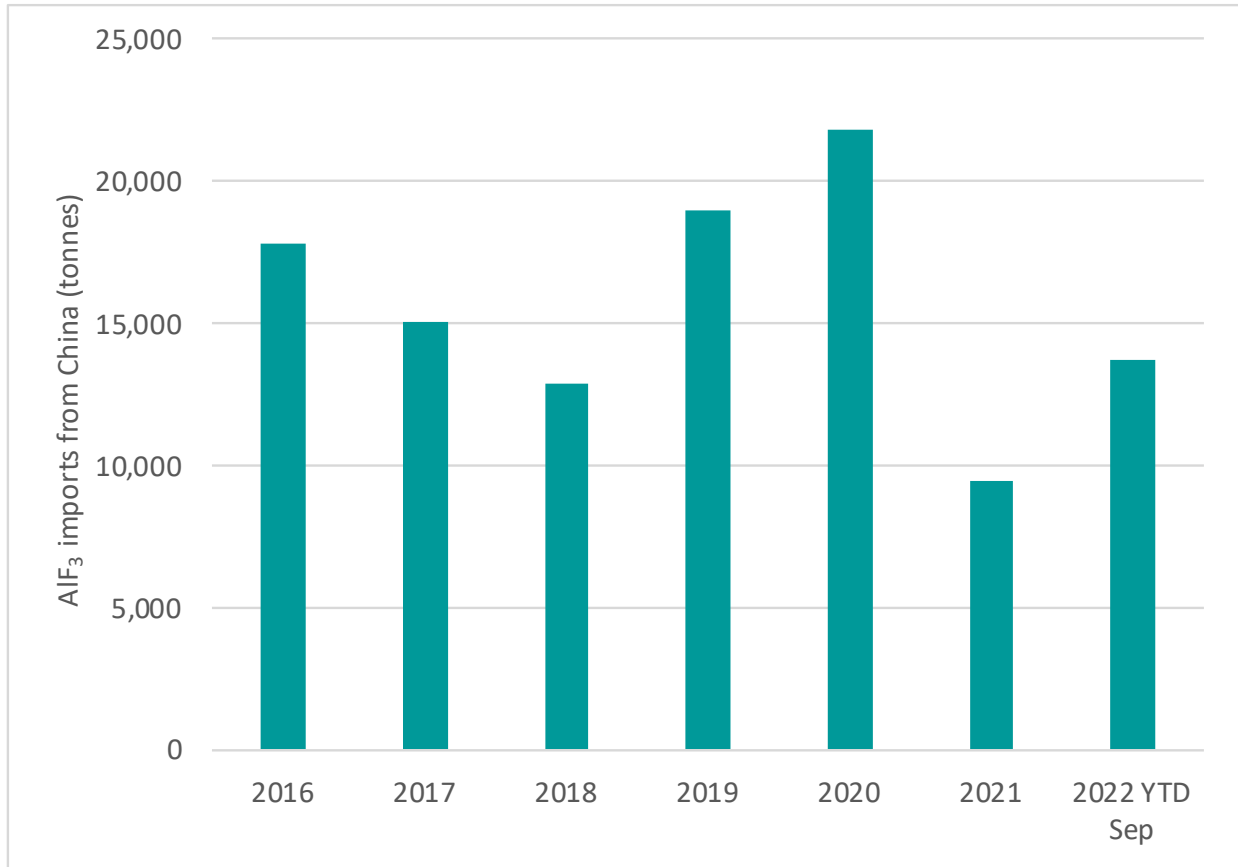


Figure 5: Imports of aluminium fluoride from China into Australia (source: China Customs Statistics)

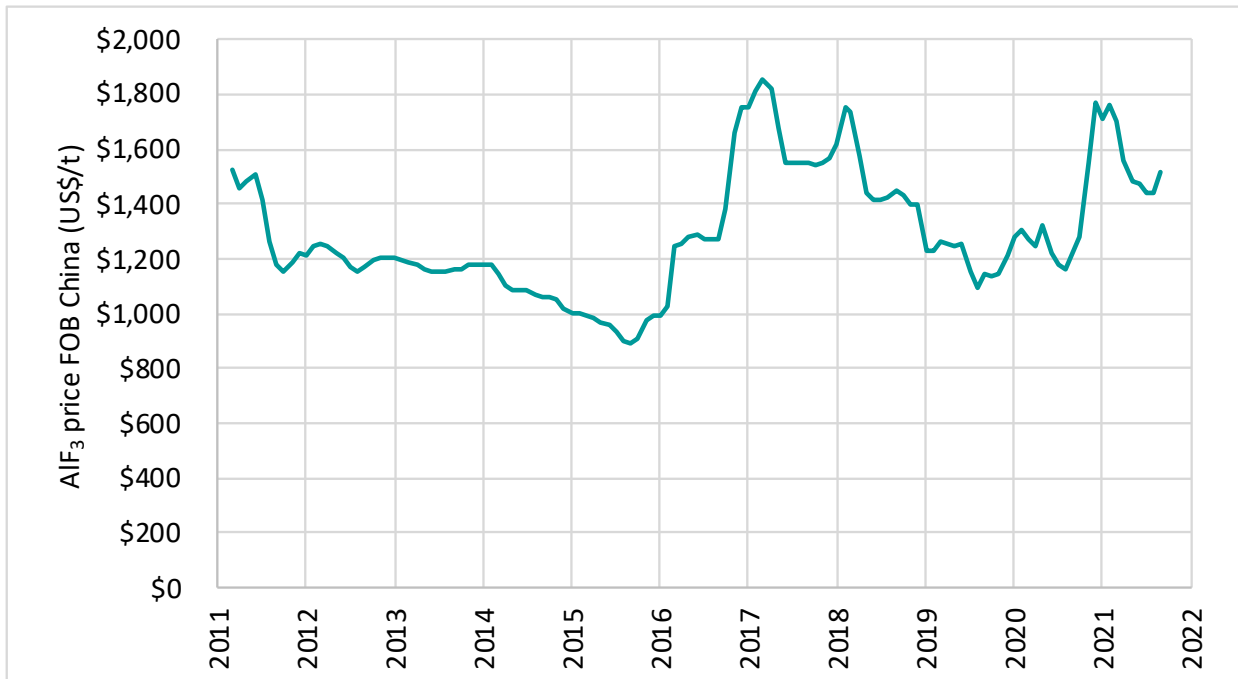


Figure 6: Aluminium fluoride monthly prices FOB China (source: China Customs Statistics)

## **Bauxite Operations**

### **Sunrise Bauxite Project: Binjour, Queensland**

- The stage two terrestrial ecology studies and groundwater monitoring of the Binjour mine and Bundaberg port operational sites were scheduled
- The tender and selection process for engineering studies to be conducted on the mine, port, and transshipping operations were completed
- The tender process commenced for the road freight logistics route from the Binjour mine to Bundaberg port

ABx plans to begin exporting product in Q3, 2023, with a JORC compliant resource of 37 million tonnes, supporting 20-25 years production. It is anticipated that the mine at Binjour will export 500,000 tonnes per year of metallurgical grade bauxite in its first year of production, then scale up to full operational capacity of 2 million tonnes per year.

Alumin is an Australian special purpose vehicle company associated with our strategic marketing partner, Rawmin India, having extensive experience in funding long term sustainable investments in projects involving mining and bulk-shipping of metallurgical grade bauxite to end users around the world.

### **Tasmania**

- DL130, west of Launceston, was selected as the preferred location for the next bauxite mining operation
- The flora & fauna and cultural heritage surveys were conducted
- The Notice of Intent and other documentation for EPA Tasmania and MRT Tasmania are being finalised, as part of the mine lease application

ABx plans to recommence bauxite mining in Tasmania in Q3 2023. The primary products are likely to be cement grade and fertiliser grade bauxite.

An updated Business Plan presentation has been placed on the ABx website [www.abxgroup.com.au](http://www.abxgroup.com.au).

This announcement is approved for release by the board of directors.

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

**Dr Mark Cooksey**

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**ABx Group**

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## Qualifying statements

**General:** The information in this report that relate to Exploration Information and Mineral Resources are based on information compiled by Jacob Rebek and Ian Levy who are members of The Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists. Mr Rebek and Mr Levy are qualified geologists and Mr Levy is a director of Australian Bauxite Limited.

**Mainland:** The information relating to Mineral Resources on the Mainland was prepared and first disclosed under the JORC Code 2004. It has not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported. Mr Rebek and Mr Levy have 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 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Rebek and Mr Levy have consented in writing to the inclusion in this report of the Exploration Information in the form and context in which it appears.

**Tasmania:** The information relating to Exploration Information and Mineral Resources in Tasmania has been prepared or updated under the JORC Code 2012. Mr Rebek and Mr Levy have 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 Rebek and Mr Levy have consented in writing to the inclusion in this report of the Exploration Information in the form and context in which it appears.

## Disclaimer Regarding Forward Looking Statements

This ASX announcement (Announcement) contains various forward-looking statements. All statements other than statements of historical fact are forward-looking statements. Forward-looking statements are inherently subject to uncertainties in that they may be affected by a variety of known and unknown risks, variables and factors which could cause actual values or results, performance or achievements to differ materially from the expectations described in such forward-looking statements.

ABx does not give any assurance that the anticipated results, performance or achievements expressed or implied in those forward-looking statements will be achieved.

## Patent

Refined Ore Industries Ltd (ROIL) was the owner of the CORE process technology via ROIL's intellectual property company, Berkeley Process Technologies Pty. Ltd which issued a global exclusive licence for the aluminium-related portion of the CORE process technology to ABx in November 2017 and ABx has issued a global exclusive sub-licence to ALCORE when ALCORE was incorporated on 1 July 2018.

After a company restructure and expansion of the patent definition to cover isolation and extraction of mineral compounds, metals, metalloids, alloys and elements from waste streams, mineral ores, recyclable commodities, industrial by-products and mixed substances, the holding company is now named Core Refining Limited (CRL) and the intellectual property company is Core Intelligence Australia Pty Ltd (CIAL) which holds the Patent Application No. 2019904311 and the global exclusive licences to ABx and ALCORE continue in force.

CRL's CORE process technology involves the refining of a wide range of ore types using a combination of fluorine acids and related thermal energy process steps. The technology that is licensed to ABx and ALCORE by CRL is part of CRL's broader Core technology.

**Table 1: Tenement information required under LR 5.3.3**

Tenement No.	Location
<b>New South Wales</b>	
EL 6997	Inverell
EL 7357	Taralga
EL 8600	Penrose Quarry
<b>Queensland</b>	
MLA 100277	Sunrise ML application
EPM 27787	Binjour
ML 80126	Toondoon ML
<b>Tasmania</b>	
EL 7/2010	Conara
EL 9/2010	Deloraine
EL 18/2014	Prosser's Road
EL 10/2021	Rubble Mound

Notes:

No tenements were relinquished or granted. All tenements are in good standing, 100% owned and not subject to any third-party royalties nor are they encumbered in any way.

**Information required under Listing Rule 5.3.1:** Exploration expenditure reported during the quarter related to the REE program development (\$527,000), research conducted by Alcore with respect to its reported advancements (\$386,000).

**Information required under Listing Rule 5.3.2:** No mining production was conducted during the quarter.

**Information required under Listing Rules 5.3.5:** For services rendered to an associate of, or a related party of the entity during the quarter: Mark Cooksey was paid \$25,783 for the period he acted as director (he was appointed director on 1/9/2022 and previously his remuneration was only as CEO); \$32,375 was paid to Paul Lennon, the Company Chairman.

## Appendix 5B

### Mining exploration entity or oil and gas exploration entity quarterly cash flow report

Name of entity

ABx Group Limited

ABN

14 139 494 885

Quarter ended ("current quarter")

30 September 2022

<b>Consolidated statement of cash flows</b>	<b>Current quarter \$A'000</b>	<b>Year to date ( 9 months) \$A'000</b>
<b>1. Cash flows from operating activities</b>		
1.1 Receipts from customers	-	56
1.2 Payments for		
(a) exploration & evaluation	(527)	(1,461)
(b) development	(386)	(1,180)
(c) production	-	-
(d) staff costs	(106)	(467)
(e) administration and corporate costs	(275)	(612)
1.3 Dividends received (see note 3)	-	-
1.4 Interest received	2	7
1.5 Interest and other costs of finance paid	-	-
1.6 Income taxes paid	-	-
1.7 Government grants and tax incentives	-	-
1.8 Other (Government RD/Innovation Grant)	-	486
<b>1.9 Net cash from / (used in) operating activities</b>	<b>(1,292)</b>	<b>(3,171)</b>

<b>2. Cash flows from investing activities</b>		
2.1 Payments to acquire or for:		
(a) entities	-	-
(b) tenements	-	-
(c) property, plant and equipment	(23)	(95)
(d) exploration & evaluation	-	-
(e) investments	-	-
(f) other non-current assets	-	-

## Mining exploration entity or oil and gas exploration entity quarterly cash flow report

Consolidated statement of cash flows		Current quarter \$A'000	Year to date ( 9 months) \$A'000
2.2	Proceeds from the disposal of:		
	(a) entities	-	-
	(b) tenements	-	-
	(c) property, plant and equipment	-	-
	(d) investments	-	-
	(e) other non-current assets	-	-
2.3	Cash flows from loans to other entities	-	-
2.4	Dividends received (see note 3)	-	-
2.5	Other (provide details if material)	-	-
<b>2.6</b>	<b>Net cash from / (used in) investing activities</b>	<b>(23)</b>	<b>(95)</b>

<b>3.</b>	<b>Cash flows from financing activities</b>		
3.1	Proceeds from issues of equity securities (excluding convertible debt securities)	-	-
3.2	Proceeds from issue of convertible debt securities	-	-
3.3	Proceeds from exercise of options	-	-
3.4	Transaction costs related to issues of equity securities or convertible debt securities	-	-
3.5	Proceeds from borrowings	-	-
3.6	Repayment of borrowings	-	-
3.7	Transaction costs related to loans and borrowings	-	-
3.8	Dividends paid	-	-
3.9	Other (Net proceed from issuing of equity securities – controlled entity)	-	-
<b>3.10</b>	<b>Net cash from / (used in) financing activities</b>	<b>-</b>	<b>-</b>

<b>4.</b>	<b>Net increase / (decrease) in cash and cash equivalents for the period</b>		
4.1	Cash and cash equivalents at beginning of period	4,144	6,095
4.2	Net cash from / (used in) operating activities (item 1.9 above)	(1,292)	(3,171)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(23)	(95)
4.4	Net cash from / (used in) financing activities (item 3.10 above)	-	-

## Mining exploration entity or oil and gas exploration entity quarterly cash flow report

<b>Consolidated statement of cash flows</b>		<b>Current quarter \$A'000</b>	<b>Year to date ( 9 months) \$A'000</b>
4.5	Effect of movement in exchange rates on cash held	-	-
<b>4.6</b>	<b>Cash and cash equivalents at end of period</b>	<b>2,829</b>	<b>2,829</b>

<b>5.</b>	<b>Reconciliation of cash and cash equivalents</b> at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts	<b>Current quarter \$A'000</b>	<b>Previous quarter \$A'000</b>
5.1	Bank balances	401	428
5.2	Call deposits	2,398	3,686
5.3	Bank overdrafts	-	-
5.4	Other (Held in trust)	30	30
<b>5.5</b>	<b>Cash and cash equivalents at end of quarter (should equal item 4.6 above)</b>	<b>2,829</b>	<b>4,144</b>

<b>6.</b>	<b>Payments to related parties of the entity and their associates</b>	<b>Current quarter \$A'000</b>
6.1	Aggregate amount of payments to related parties and their associates included in item 1	58
6.2	Aggregate amount of payments to related parties and their associates included in item 2	-
6.3	Include below any explanation necessary to under the transactions included in items 6.1 and 6.2  \$32,375 director fee was paid to Paul Lennon and \$25,783 was paid to Mark Cooksey for their services rendered.	
<i>Note: if any amounts are shown in items 6.1 or 6.2, your quarterly activity report must include a description of, and an explanation for, such payments.</i>		

## Mining exploration entity or oil and gas exploration entity quarterly cash flow report

<b>7. Financing facilities</b>	<b>Total facility amount at quarter end \$A'000</b>	<b>Amount drawn at quarter end \$A'000</b>
<i>Note: the term "facility" includes all forms of financing arrangements available to the entity. Add notes as necessary for an understanding of the sources of finance available to the entity.</i>		
7.1 Loan facilities	-	-
7.2 Credit standby arrangements	-	-
7.3 Other (please specify)	-	-
7.4 <b>Total financing facilities</b>	-	-
7.5 <b>Unused financing facilities available at quarter end</b>		-
7.6 Include in the box below a description of each facility above, including the lender, interest rate, maturity date and whether it is secured or unsecured. If any additional financing facilities have been entered into or are proposed to be entered into after quarter end, include a note providing details of those facilities as well.		

<b>8. Estimated cash available for future operating activities</b>	<b>\$A'000</b>
8.1 Net cash from / (used in) operating activities (item 1.9)	(1,292)
8.2 (Payments for exploration & evaluation classified as investing activities) (item 2.1(d))	-
8.3 Total relevant outgoings (item 8.1 + item 8.2)	(1,292)
8.4 Cash and cash equivalents at quarter end (item 4.6)	2,829
8.5 Unused finance facilities available at quarter end (item 7.5)	-
8.6 Total available funding (item 8.4 + item 8.5)	2,829
8.7 <b>Estimated quarters of funding available (item 8.6 divided by item 8.3)</b>	2.1
<i>Note: if the entity has reported positive relevant outgoings (ie a net cash inflow) in item 8.3, answer item 8.7 as "N/A". Otherwise, a figure for the estimated quarters of funding available must be included in item 8.7.</i>	
8.8 If item 8.7 is less than 2 quarters, please provide answers to the following questions:	
8.8.1 Does the entity expect that it will continue to have the current level of net operating cash flows for the time being and, if not, why not?	
Answer:	
N/A	
8.8.2 Has the entity taken any steps, or does it propose to take any steps, to raise further cash to fund its operations and, if so, what are those steps and how likely does it believe that they will be successful?	
Answer:	
N/A	

## Mining exploration entity or oil and gas exploration entity quarterly cash flow report

8.8.3 Does the entity expect to be able to continue its operations and to meet its business objectives and, if so, on what basis?

Answer:

N/A

Note: where item 8.7 is less than 2 quarters, all of questions 8.8.1, 8.8.2 and 8.8.3 above must be answered.

## Compliance statement

- 1 This statement has been prepared in accordance with accounting standards and policies which comply with Listing Rule 19.11A.
- 2 This statement gives a true and fair view of the matters disclosed.

Date: .....21 October 2022.....

Authorised by: .....Mark Cooksey, CEO.....  
(Name of body or officer authorising release – see note 4)

## Notes

1. This quarterly cash flow report and the accompanying activity report provide a basis for informing the market about the entity's activities for the past quarter, how they have been financed and the effect this has had on its cash position. An entity that wishes to disclose additional information over and above the minimum required under the Listing Rules is encouraged to do so.
2. If this quarterly cash flow report has been prepared in accordance with Australian Accounting Standards, the definitions in, and provisions of, *AASB 6: Exploration for and Evaluation of Mineral Resources* and *AASB 107: Statement of Cash Flows* apply to this report. If this quarterly cash flow report has been prepared in accordance with other accounting standards agreed by ASX pursuant to Listing Rule 19.11A, the corresponding equivalent standards apply to this report.
3. Dividends received may be classified either as cash flows from operating activities or cash flows from investing activities, depending on the accounting policy of the entity.
4. If this report has been authorised for release to the market by your board of directors, you can insert here: "By the board". If it has been authorised for release to the market by a committee of your board of directors, you can insert here: "By the [name of board committee – eg Audit and Risk Committee]". If it has been authorised for release to the market by a disclosure committee, you can insert here: "By the Disclosure Committee".
5. If this report has been authorised for release to the market by your board of directors and you wish to hold yourself out as complying with recommendation 4.2 of the ASX Corporate Governance Council's *Corporate Governance Principles and Recommendations*, the board should have received a declaration from its CEO and CFO that, in their opinion, the financial records of the entity have been properly maintained, that this report complies with the appropriate accounting standards and gives a true and fair view of the cash flows of the entity, and that their opinion has been formed on the basis of a sound system of risk management and internal control which is operating effectively.