



## ASX ANNOUNCEMENT

13 November 2017

### AUSTRALIAN BAUXITE LIMITED

ASX: ABX

#### Heads of Agreement for ALCORE project to produce Aluminium Fluoride from bauxite

Bauxite producer, Australian Bauxite Limited (ABx) is pleased to announce that it has finalised a Heads of Agreement (HoA) with technology provider, Refined Ore Industries Limited (ROIL) for the ALCORE project which is the development of bauxite beneficiation and refining technology to produce from bauxite Aluminium Fluoride which is used in aluminium production and in lithium ion batteries.

ABx has assisted ROIL's commercial and technological development over the past 3 years and has subsequently been offered the licence from ROIL for the refining of bauxite, on the following terms:

1. Exclusive global rights for the refining of bauxite, to produce Aluminium Fluoride ( $\text{AlF}_3$ ), and coproduct oxides of aluminium, silicon, iron, titanium from the bauxite;
2. Production of Corethane Gas from the refining of coal to provide electrical power, heating and cooling for the bauxite refining plant so that it has energy security; and,
3. Exclusive global marketing rights for all Aluminium Fluoride ( $\text{AlF}_3$ ) and related coproducts produced by other ROIL technology projects unrelated to ABx in Australasia and Asia.

ABx is to issue 1.4 million ABx shares to ROIL on completion of the Full Agreement.

#### Patent

ROIL is the owner of the technology intellectual property company, Berkeley Process Technologies Pty. Ltd. which owns the patent application N<sup>o</sup>. 2017902627 dated 5 June 2017 for the "Ores to Elements" process (the CORE process) that involves the refining of various ore types using a combination of fluorine acids and related thermal energy process steps. ABx assisted ROIL to finalise and lodge this patent application so that the ALCORE project could proceed.

#### ALCORE Project

The ALCORE project will apply the CORE Process to refine bauxite ore containing aluminium, iron, silica and titanium for the low energy, low emissions production of Aluminium Fluoride ( $\text{AlF}_3$ ) and coproducts including very pure forms of silica  $\text{SiO}_2$ , iron oxide  $\text{Fe}_2\text{O}_3$  and titanium oxide pigment  $\text{TiO}_2$ .

**2 Stages:** ROIL personnel will undertake high-technology engineering projects focused on the CORE Process. ABx will work with ROIL to develop ALCORE in the following 2-stage process:

**Stage 1:** Engineering Evaluation Plant (EV Plant) A\$12.5m to A\$16m (being costed)

**Stage 2:** 50,000 tonnes per year production plant "ALF 1" for approximately A\$50m

**Timetable** Design & costing of EV Plant underway now and due by end February 2018

Shareholder consultation, approvals & funding strategy – from now until end Q1 2018

Funding – during Q1 & Q2 2018

Marketing samples for offtake contracts - in September & November 2018

Bankable feasibility study of ALF 1 production plant - by end Q1 2019

Commissioning ALF 1 Production Plant - by end 2019

**Summary:** Bauxite refining converts Tasmanian bauxite valued at approximately US\$50 per tonne into a suite of products worth in excess of **US\$800 per tonne of bauxite**. This represents a more than **10-times** increase in value per tonne.

**Advantage:** ABx bauxite is a clean ore, ideally suited to this type of refining because it is free of radioactive elements and base metals. This gives ALCORE two key advantages:

- (1) The  $\text{AlF}_3$  product and all coproducts can be produced at very high purity; and,
- (2) No residues means no need for costly waste disposal.

## ALCORE's Bauxite Refining technology adds US\$600 to US\$1,000/tonne in value to bauxite

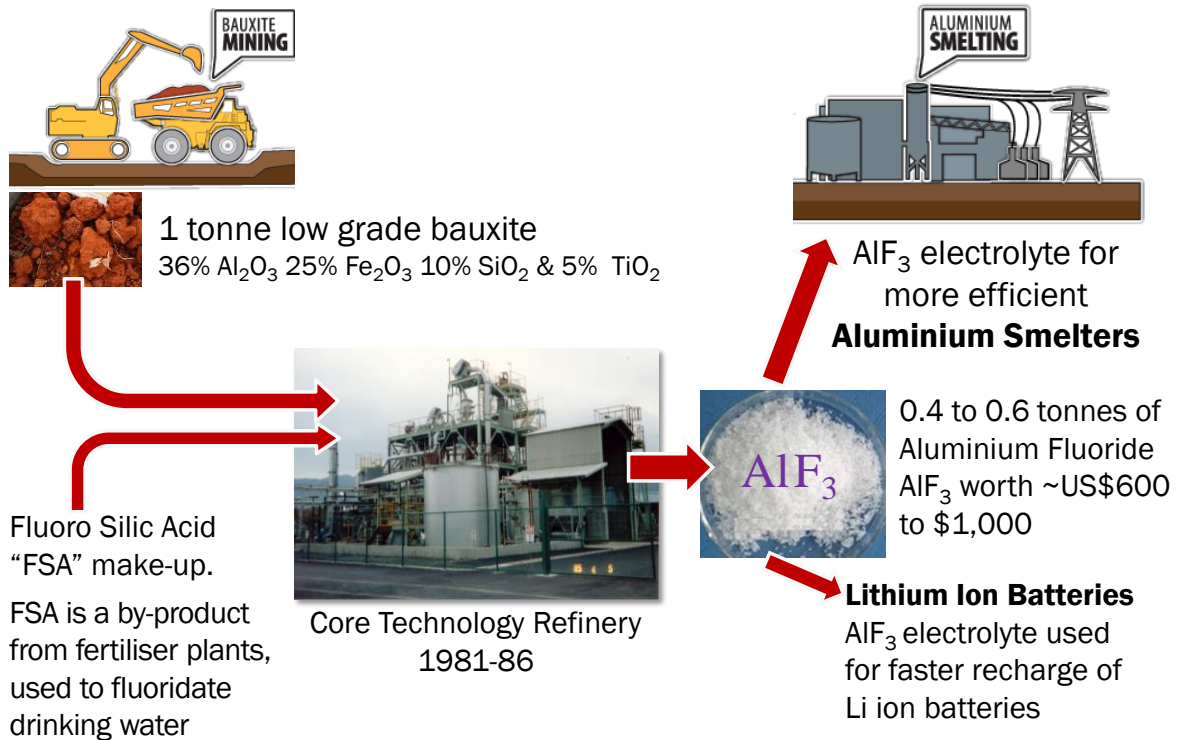


Figure 1: Summary of the ALCORE process inputs and AlF<sub>3</sub> markets

## ALCORE Bauxite Refining Process : all by-products saleable

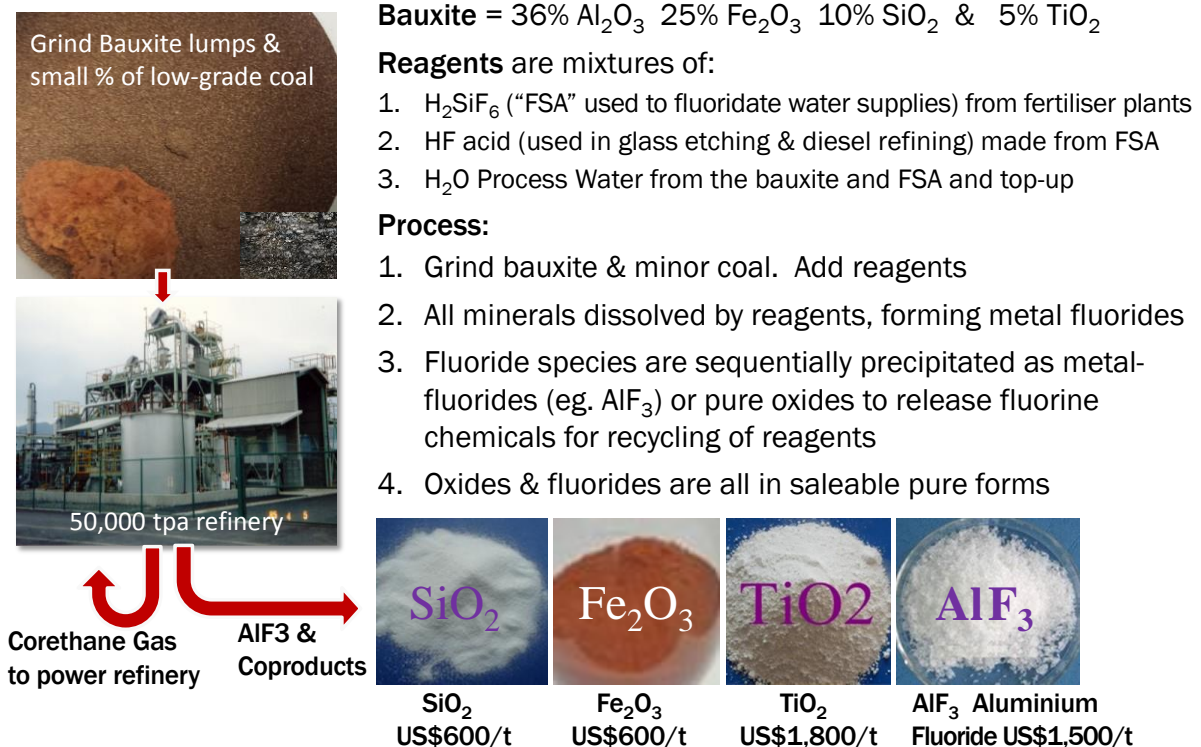


Figure 2: Summary of the ALCORE process inputs, AlF<sub>3</sub> products and coproducts, including Corethane Gas

### Why Bell Bay in Northern Tasmania or Townsville in Northern Queensland?

1. Large resources of clean-chemistry bauxite;
2. Available key chemical reagents, all of which are by-products from fertiliser plants and nearby zinc refineries;
3. Skilled workforces experienced in high-technology refineries and/or smelter operations;
4. Nearby coal supply for production of Corethane Gas for reliable energy security; and
5. Nearby export ports with ample available capacity for efficient shipping.

Figure 3 below shows these advantages, using Bell Bay in Tasmania as a more specific example.

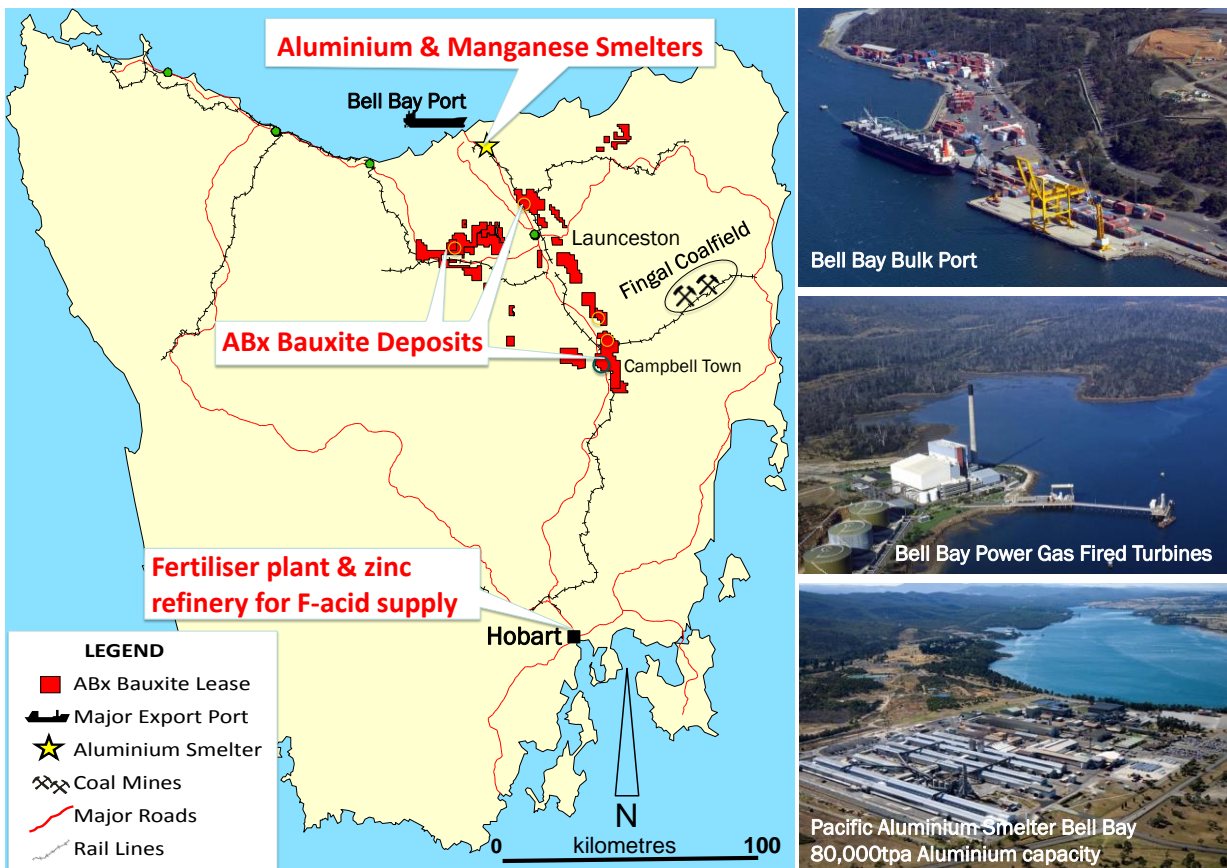


Figure 3: Summary of the advantages of an ALCORE process plant located at Bell Bay, Tasmania.

- Ample bauxite resources controlled by ABx located along major transport corridors leading directly to Bell Bay;
- Zinc refinery & fertiliser plant at Hobart that produce reagent by-products, especially fluoro-silic acid (FSA) that is the main make-up reagent to provide the fluorine to make aluminium fluoride  $\text{AlF}_3$ ;
- Bell Bay's two smelters, including an aluminium smelter that may be a customer for ALCORE's  $\text{AlF}_3$  production;
- Tasmania has an experienced workforce accustomed to the disciplines needed to operate industrial & chemical plants;
- Coal is available from Fingal Valley coal to produce Corethane Gas that can provide electricity and heat for the bauxite refining plant, and can supply coal for producing extra tonnages of Corethane Gas if needed;
- Bell Bay power station has gas turbines connected to the national grid with spare turbine capacity. Northern Tasmania has many industries requiring low-cost heating that may be supplied by Corethane Gas if needed;
- Bell Bay Port is an efficient export port with available industrial land sites and spare port capacity for exports.



## Generalised economics

1.  $\text{AlF}_3$  prices have risen strongly from US\$800 to above US\$1,600 per tonne in 5 years (extra demand from Li ion batteries)
2. Aluminium smelters use 30kgs of  $\text{AlF}_3$  per tonne of aluminium (ie. 3%)
3. Global demand exceeds 1.5 million tonnes of  $\text{AlF}_3$  per year
4. ALCORE to target Australasian aluminium smelters as main customers
5. Lithium Ion Battery market will be a significant upside for ALCORE
6. ALCORE production is ~30% cheaper in operating costs than traditional  $\text{AlF}_3$  production – and has a lower capital cost due to simpler process
7. Payback of major production plant capital cost less than 3 years
8. Upside is additional production plants to supply SE Asia, India & Middle East

Figure 4: Economic factors affecting an ALCORE process plant.



## Environmental Benefits

### No smoke-stack, no emissions, no waste products, value adding

1. Alcore Production Process uses waste acids from zinc refineries and fertiliser plants for reagent make-up.
2. Reagents are all recycled except for fluoro-silicic acid “FSA” make-up to supply additional fluorine to make  $\text{AlF}_3$
3. No emissions, particulates or waste generated
4.  $\text{AlF}_3$  improves aluminium smelting efficiency - saves electricity
5. Lithium Ion Battery recharge rates improved by  $\text{AlF}_3$
6. Can be self-sufficient for heating & electricity (co-product Corethane gas)

Figure 5: Environmental benefits of an ALCORE process plant.

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**About Australian Bauxite Limited**

**ASX Code ABX** Web: [www.australianbauxite.com.au](http://www.australianbauxite.com.au)

Australian Bauxite Limited (ABx) has its first bauxite mine in Tasmania & holds the core of the Eastern Australian Bauxite Province. ABx's 22 bauxite tenements in Queensland, New South Wales & Tasmania exceed 1,975 km<sup>2</sup> & were selected for (1) good quality bauxite; (2) near infrastructure connected to export ports; & (3) free of socio-environmental constraints. All tenements are 100% owned, unencumbered & free of third-party royalties.

ABx's discovery rate is increasing as knowledge, technology & expertise grows. The Company's bauxite is high quality gibbsite trihydrate (THA) bauxite that can be processed into alumina at low temperature.

ABx has declared large Mineral Resources at Inverell & Guyra in northern NSW, Taralga in southern NSW, Binjour in central QLD & in Tasmania, confirming that ABx has discovered significant bauxite deposits including some of outstandingly high quality.

ABx's first mine commenced at Bald Hill near Campbell Town, Tasmania in December 2014 – the first new Australian bauxite mine for more than 35 years.

ABx aspires to identify large bauxite resources in the Eastern Australian Bauxite Province, which is a globally significant bauxite province. ABx has created significant bauxite developments in 3 states - Queensland, New South Wales and Tasmania. Its bauxite deposits are favourably located for direct shipping of bauxite to both local and export customers.

**ABx endorses best practices on agricultural land, strives to leave land and environment better than we find it. We only operate where welcomed.**

**Directors & Officers**

Paul Lennon	Chairman
Ken Boundy	Director
Ian Levy	CEO & MD
Henry Kinstlinger	Company Secretary
Leon Hawker	Chief Operating Officer
Jacob Rebek	Chief Geologist
Paul Glover	Logistics & Exploration Manager

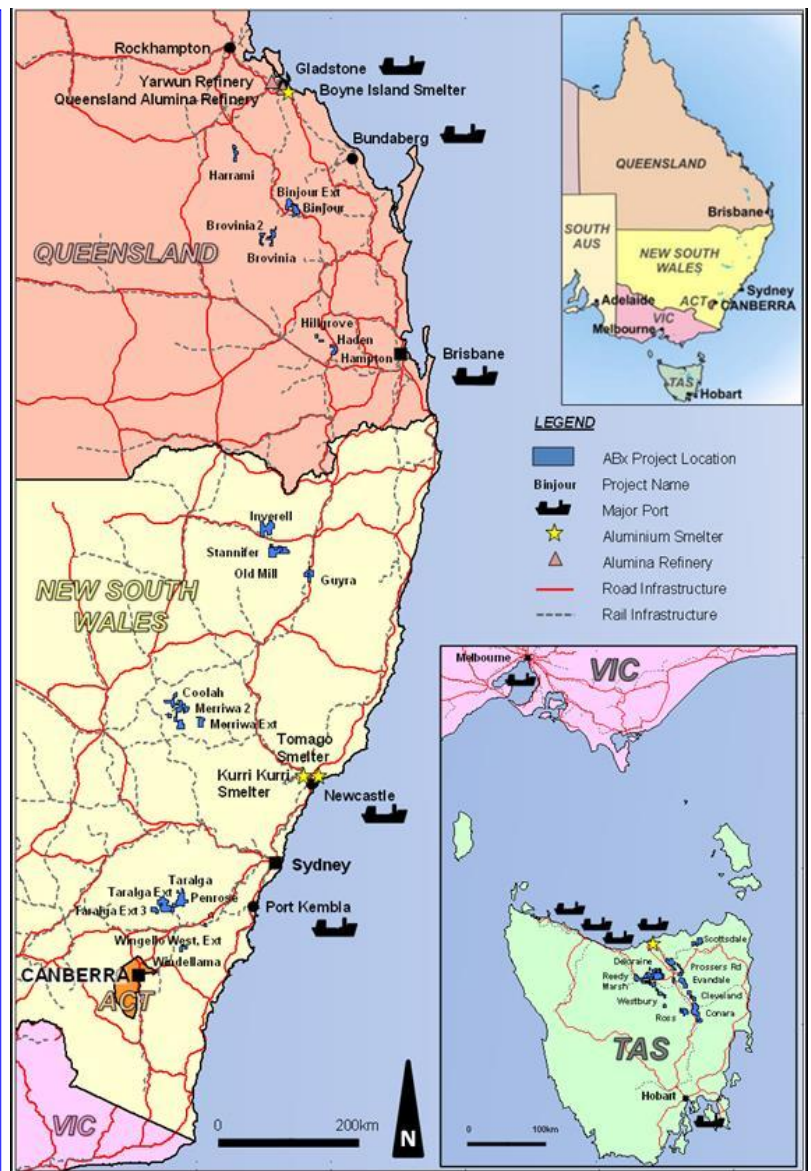


Figure 6 (above): ABx Project Tenements & Major Infrastructure in Tasmania, NSW & QLD, Eastern Australia