

Altech Chemicals Limited (ASX:ATC)

ASX Spotlight Series

Hong Kong 25 Oct 16

Singapore 27 Oct 16

“Meeting a Sapphire Future”

Iggy Tan
Managing Director



Altech Chemicals
Limited



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- **Sapphire & Ruby**
- **Natural form of high purity alumina (HPA)**
- **Formed by mother nature like diamonds**
- **Colour from impurities**
- **Nearly as hard as diamond (Moh 9)**

**Sapphire
Gemstone**





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- Purified alumina (Al_2O_3)
- Greater than 99.99% (4N) purity
- Smelter Grade Alumina (SGA) ~ 99.5% (5,000 ppm impurities mainly sodium)
- Bayer Process uses sodium hydroxide (NaOH)
- Sodium impurity is problem for electronics industry

What is HPA?



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**Smelter Grade
Alumina**
SGA 99.5%
\$400 per t



**High Purity
Alumina**
HPA 99.9% (3N)
\$6,000 per t



**High Purity
Alumina**
HPA 99.99% (4N)
\$23,000 per t



**High Purity
Alumina**
HPA 99.999% (5N)
\$50,000 per t

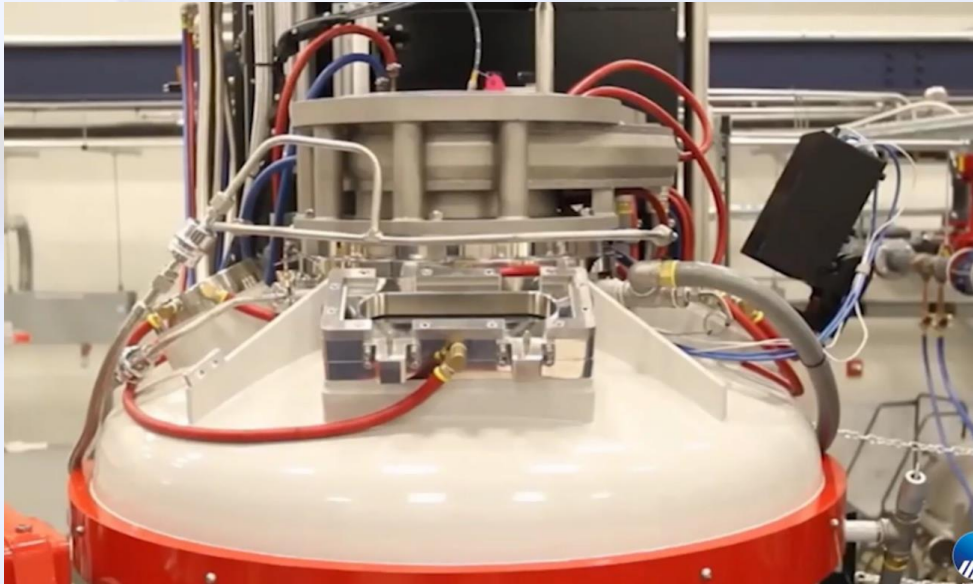
Our Target Business

HPA in Sapphire Crystal Glass

HPA substrate for LEDs

**High Price
for Purity**

Sapphire Production



HPA Furnance



Sapphire crystal boule

Sapphire Wafer Production



Sapphire wafer

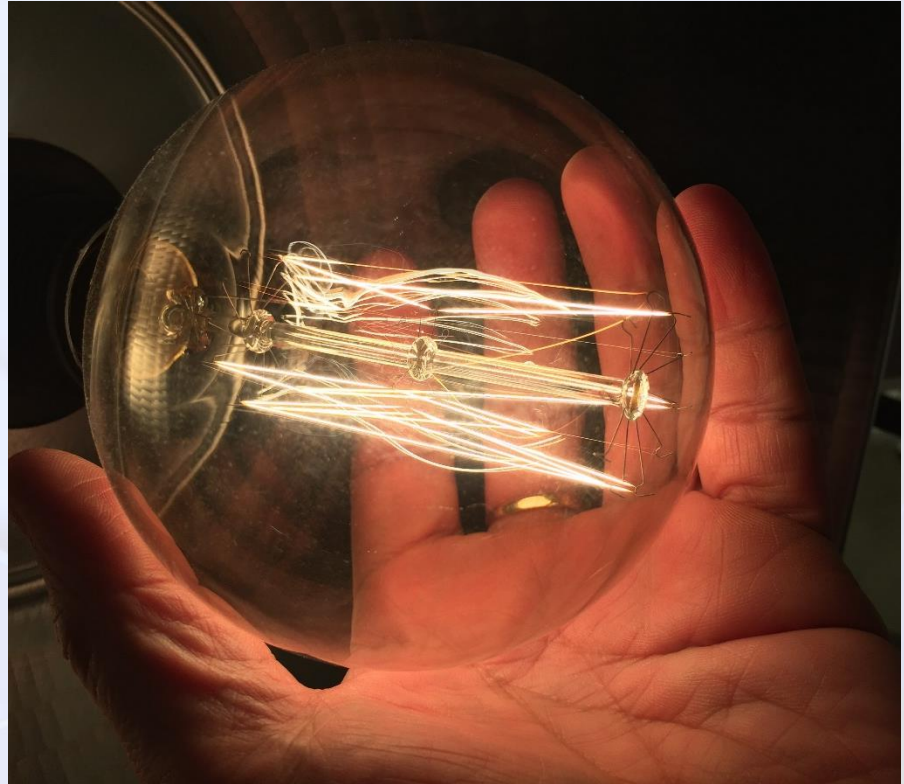


Sapphire glass screen

LEDs lights of the future



Conventional LEDs



New LED products



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High Purity Alumina Applications

LEDs

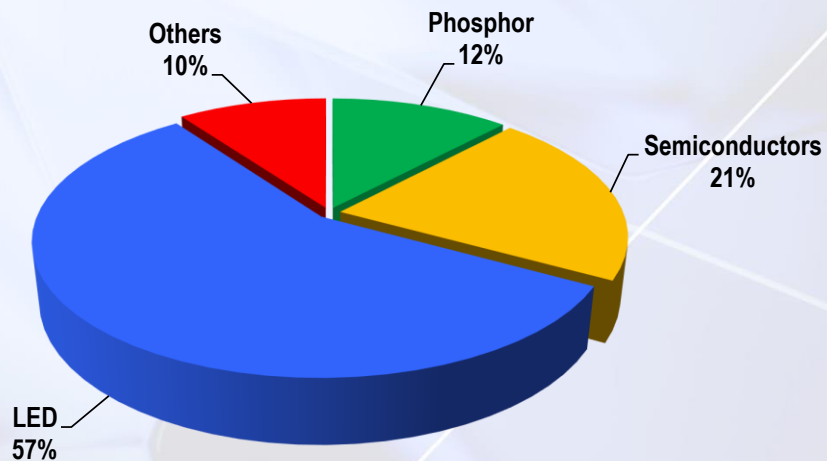
Semi
conductors

Phosphor
Based
Applications

Other
Applications

Uses of HPA
99.99% 4N

Smartphone and
Lithium batteries
are new markets



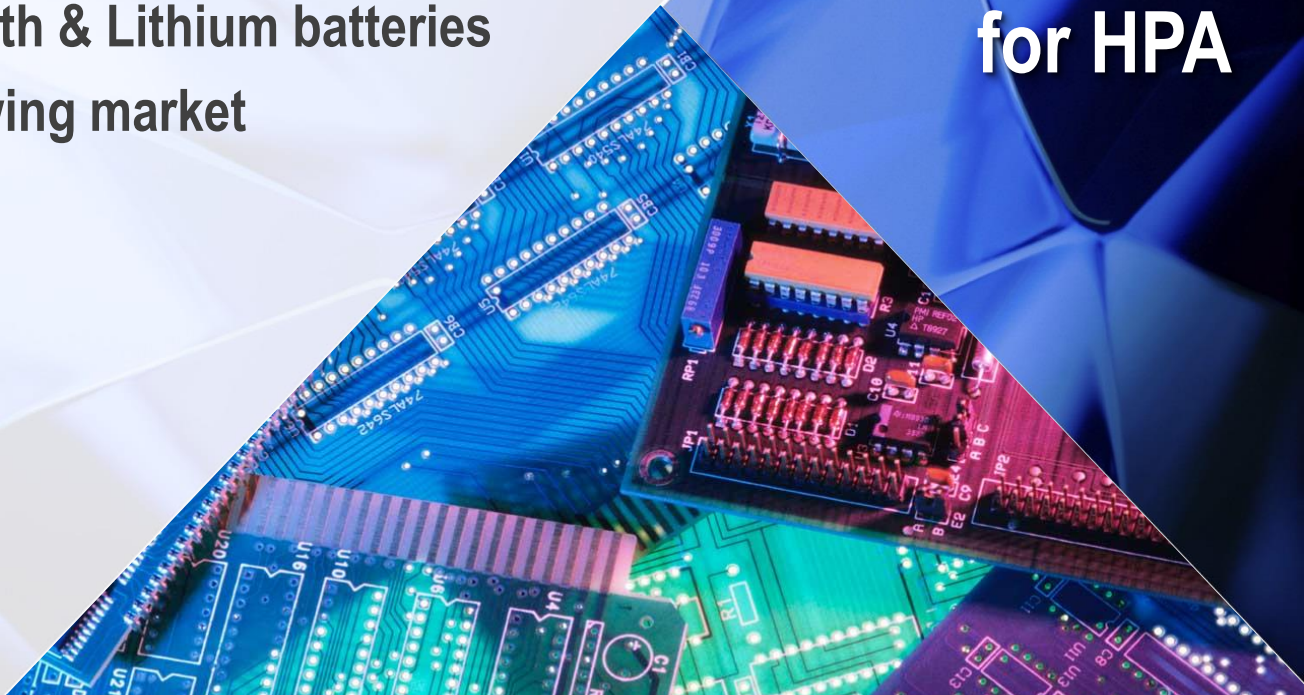


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- Global HPA demand 25,315tpa in 2016 ¹
- Expected to increase to 86,831tpa by 2024 ¹
- Growing at a CAGR of 17%
- Driven by LED growth & Lithium batteries
- Entering a fast growing market

Source: Persistence Research "High Purity
Alumina Market – Global Industry Analysis and
Forecast 2016-2024

**Demand
for HPA**

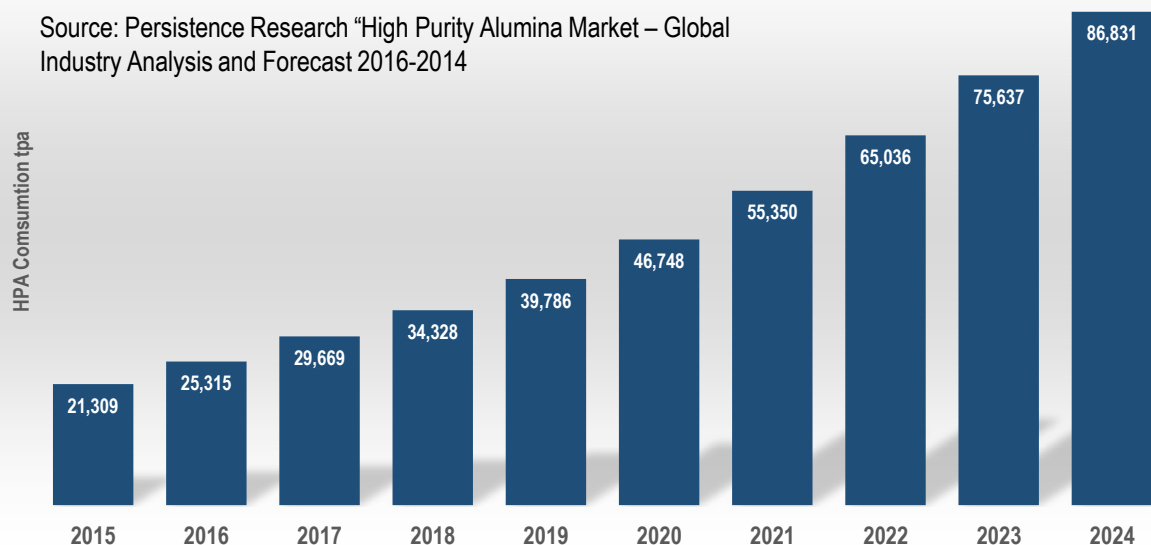




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Global High Purity Alumina Forecast 2015 -2024

Source: Persistence Research "High Purity Alumina Market – Global Industry Analysis and Forecast 2016-2024"



**Demand
for HPA**

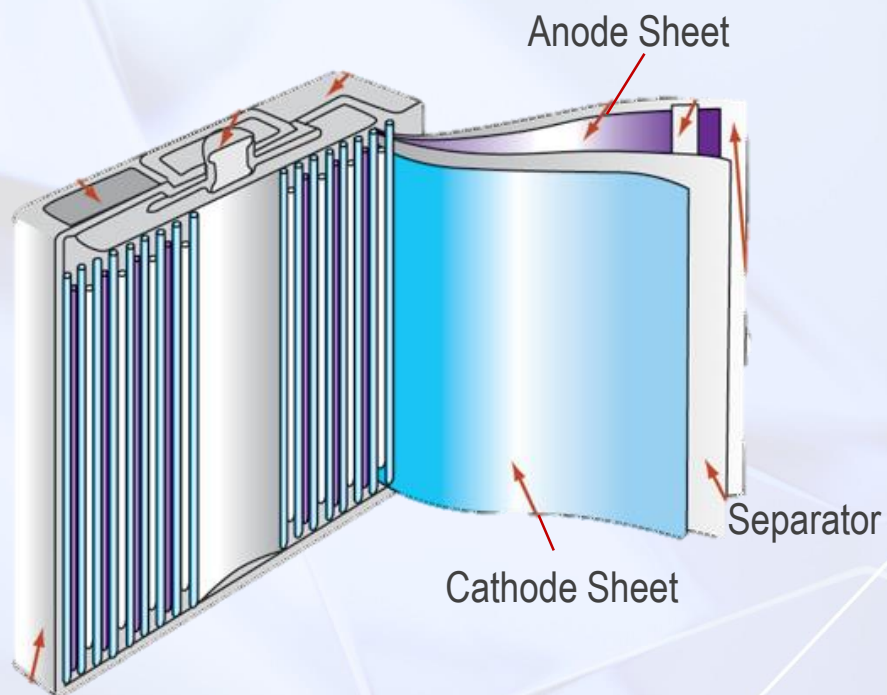
Global LED lamps forecast - 864 million in 2015 to 4.1 billion by 2024

Source: 'LED Lighting: Global Outlook'



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Lithium Battery Separator



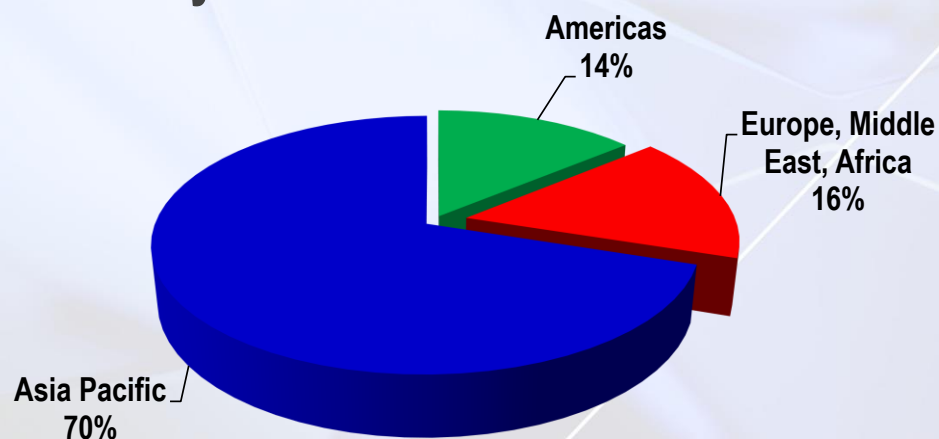
Sapphire Glass Scratch Test





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- 70% of HPA demand - Asia Pacific region (APEC)
- Region for the world's manufacturing
- Altech's HPA plant (Malaysia) well-positioned to service APEC region
- Transport, customer service, technical credibility



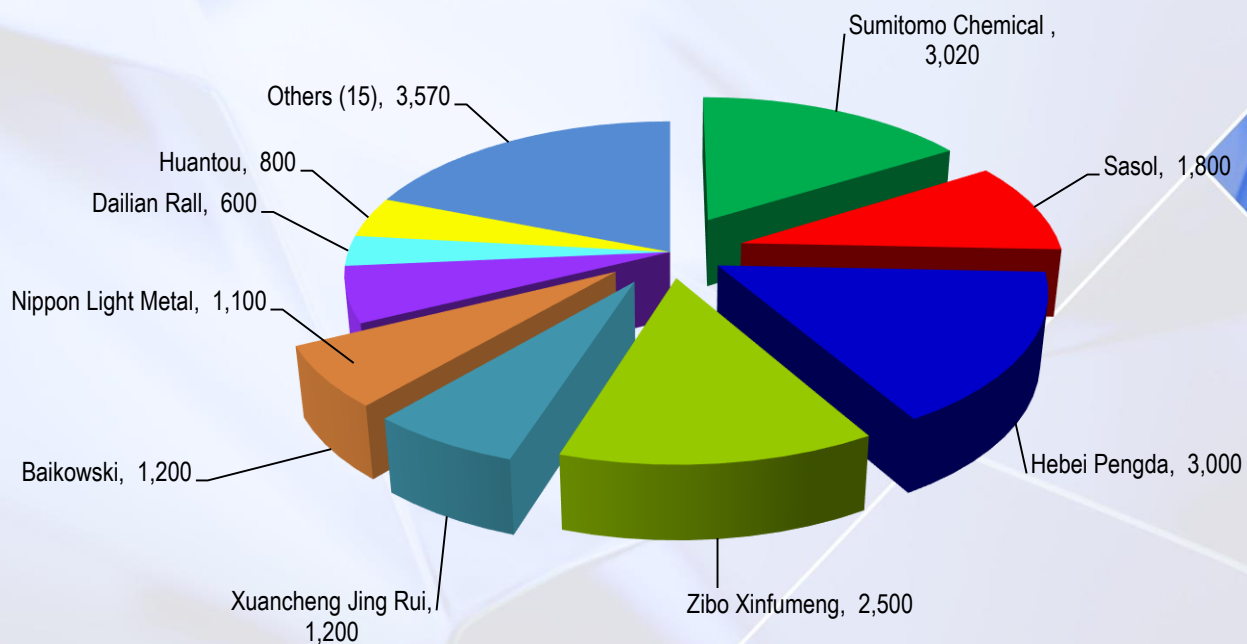
HPA
Geographic
Demand





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- Six largest HPA producers
- 3 Chinese, 1 Japanese, 1 Sth African, 1 French



Current HPA Producers



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Altech's Differentiation

Current HPA Producers



Bauxite

**Alumina
Refinery**



Smelter Grade Alumina 99.8%

**Alumina
Smelter**



Aluminium Metal

US\$3,000 per tonne

**Aluminium
Dissolution**



99.99% HPA



Aluminous Clay

ALTECH HPA PLANT

One Single Process Step



99.99% HPA



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- Processed by mother nature
- Very low Iron (Fe) due to weathering
- Silica is non reactive – easily removed

	Bauxite Darling Range *	Canadian HPA Project	Altech HPA Project
Al ₂ O ₃ (%)	34.5	22.77	30.5
SiO ₂ (%)	21.5	53.29	56.3
Fe ₂ O ₃ (%)	21.2	8.36	0.7
TiO ₂ (%)	2.00	0.98	0.7
K ₂ O (%)	0.24	3.41	0.1
NaO (%)	0.005	1.42	0.1

Typical Mean Analysis

Typical bauxite deposit

Altech aluminous clay deposit

**Low-impurity
Aluminous Clay
Feedstock**



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- **Altech owns 100% of deposit in W Aust**
- **Low environmental impact**
- **12 Mt JORC Resource**
- **> 250 year mine life**
- **130kms from Fremantle Port**
- **Mining lease granted**

Meckering Kaolin Deposit

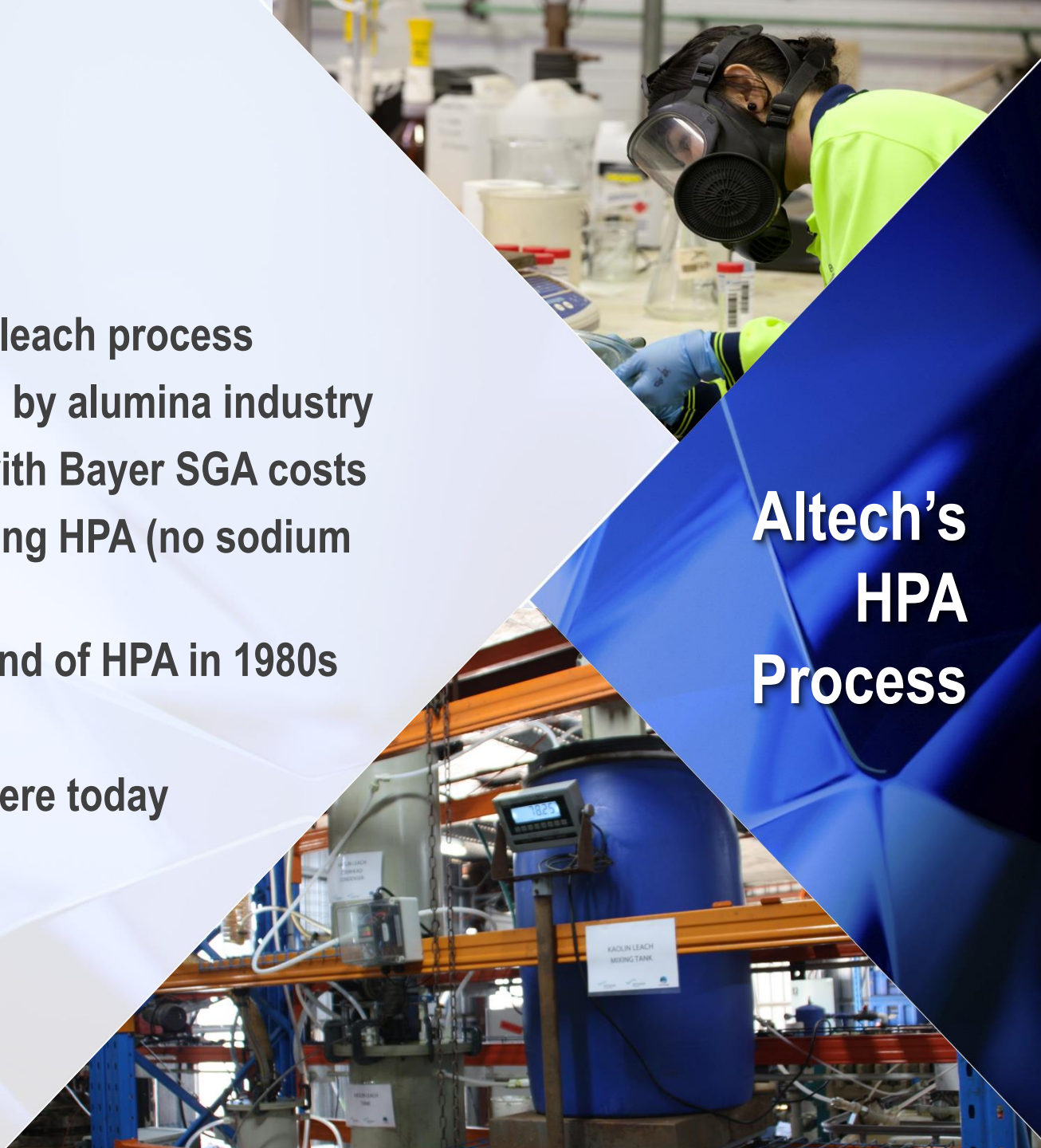




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- Use a standard HCl leach process
- Developed in 1980's by alumina industry
- Couldn't compete with Bayer SGA costs
- But great at producing HPA (no sodium ions)
- However little demand of HPA in 1980s
- Demand of HPA is here today

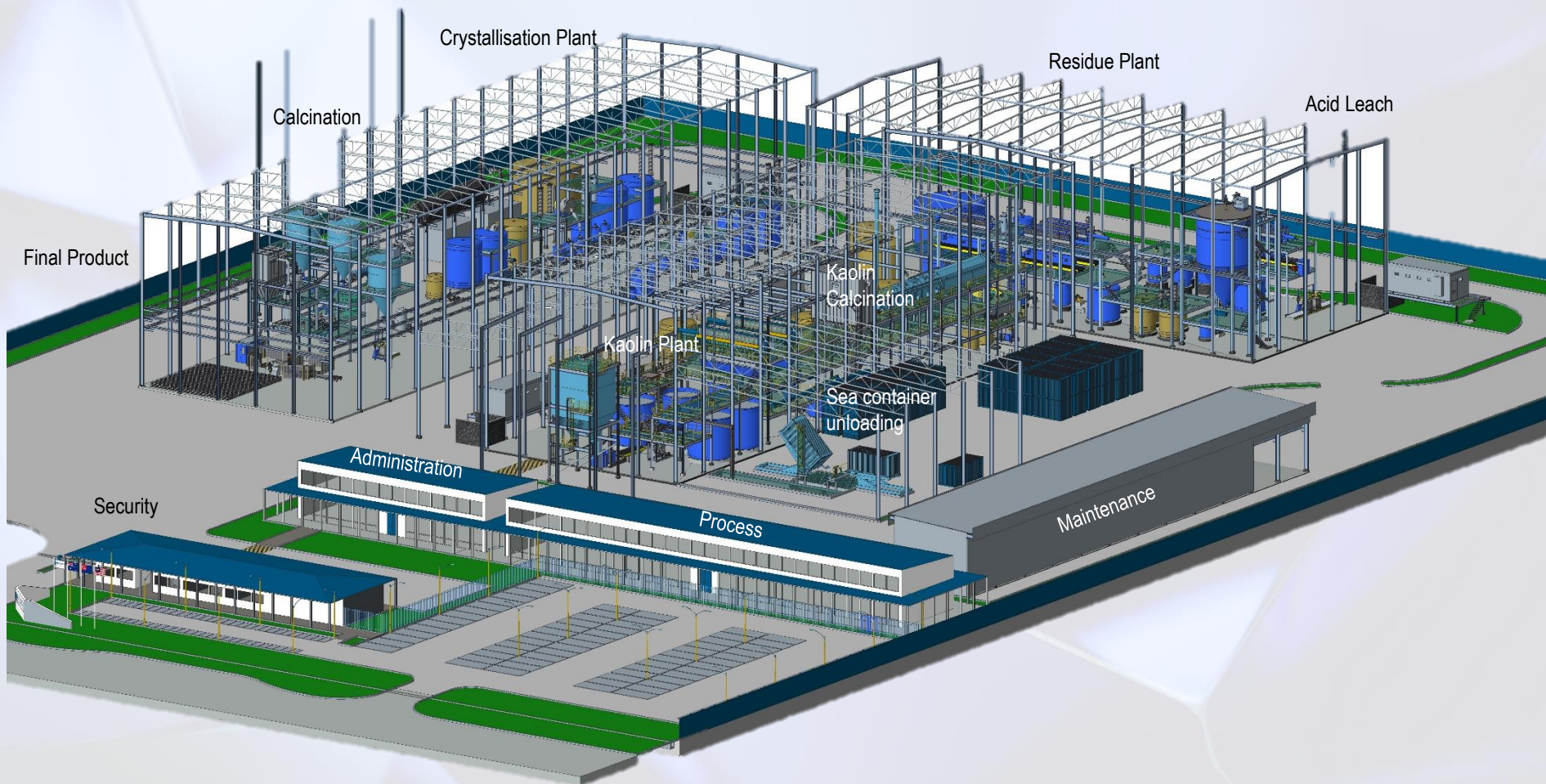
Altech's HPA Process





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Altech's HPA Plant - Malaysia



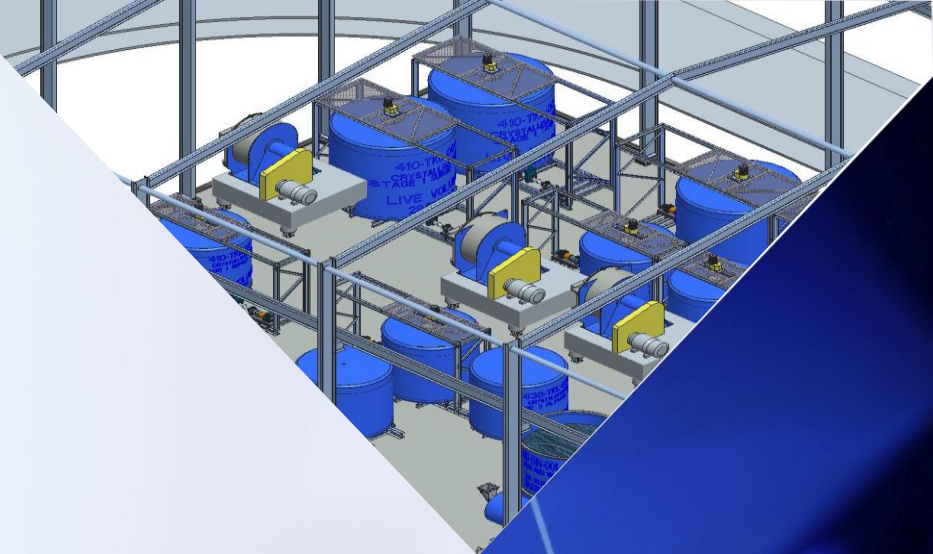


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- Capital cost estimate US\$78.7m
- Payback period 3.7 years
- Pre-tax NPV₉ of US\$357.5m
- Highly attractive IRR of 33.3%
- Operating cost of US\$9,070/t
- Sale price of US\$23,000/t
- Margin of US\$13,930/t
- EBITDA US\$55.7m pa

Last updated March 2016

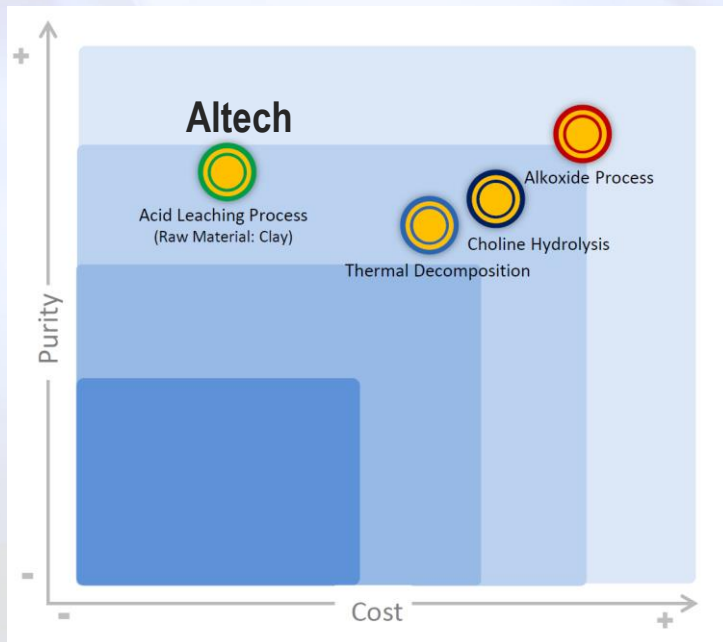
**Highly
Attractive
BFS**





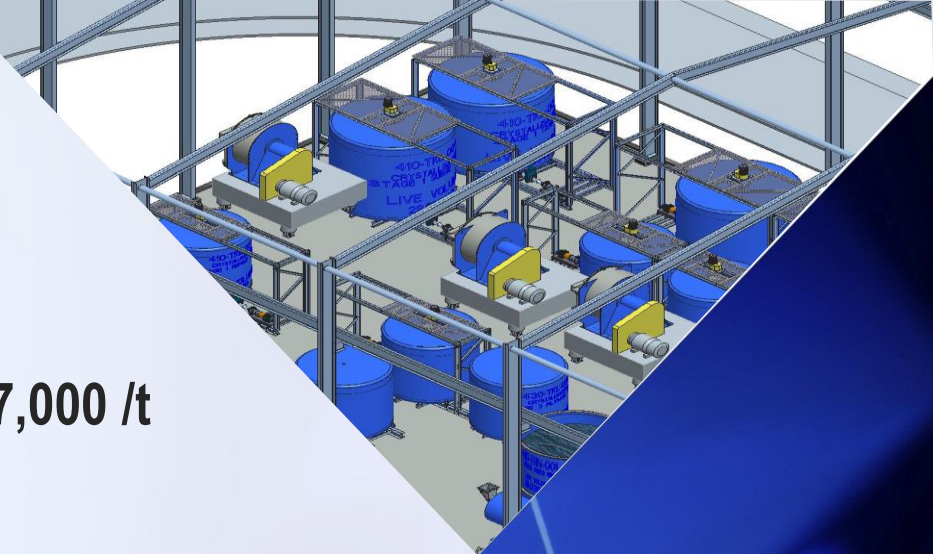
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- Breakaway - competitors US\$14-17,000 /t
 1. We own our feedstock
 2. Main reactant HCl re-used
 3. Plant in low cost country (Malaysia)



**Bottom
Quartile
for Op Costs**

Source: Persistence Research "High Purity
Alumina Market – Global Industry Analysis and
Forecast 2016-2024





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- Off take sales with Mitsubishi
- First ten years of HPA operations
- Secures sales for 100% of 4,000tpa HPA production
- Exclusive global distributor with well established global customer base

Contract Year	Forecast Production	Contracted Sales
Year 1	2,700t	2,700t
Year 2	3,000t	3,000t
Year 3	3,400t	3,400t
Year 4	3,800t	3,800t
Year 5	4,000t	4,000t

Contract Year	Forecast Production	Contracted Sales
Year 6	4,000t	4,000t
Year 7	4,000t	4,000t
Year 8	4,000t	4,000t
Year 9	4,000t	4,000t
Year 10	4,000t	4,000t

**Mitsubishi
signs full
off take**





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- Debt funding with KfW IPEX Bank
- 60% of plant – German suppliers
- Target of US\$70m
- Export Credit cover of \$60m
- Target sole lender – KfW IPEX Bank
- M+W Group as general contractor

**We are at the
funding
stage**

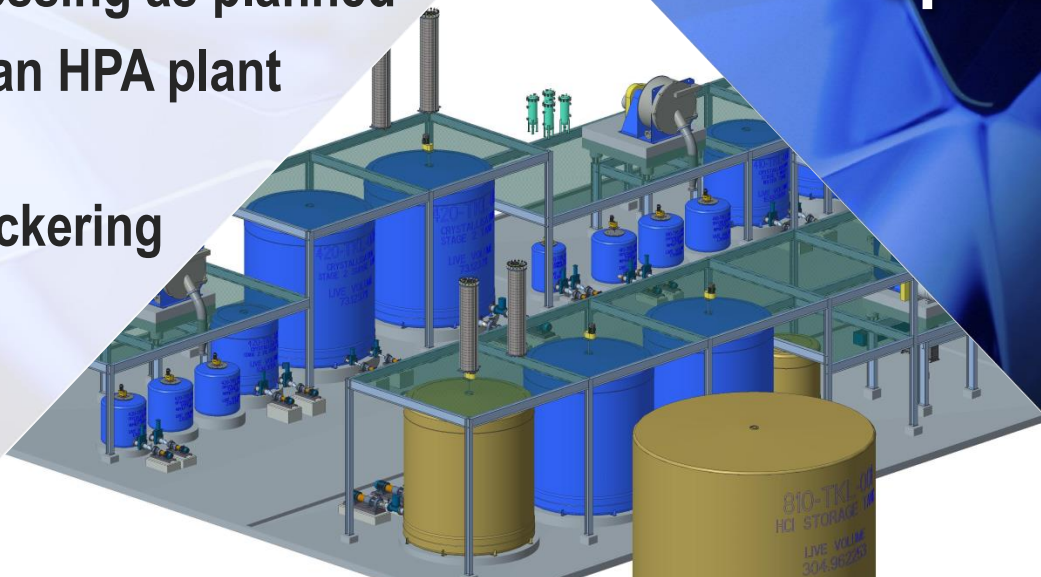




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- **HPA bank due diligence nearing completion**
- **No fatal flaws identified**
- **Positive pre-assessment German inter-ministerial committee**
- **Detailed design progressing as planned**
- **Permitting for Malaysian HPA plant commenced**
- **Mining proposal at Meckering**

**Project
Update**





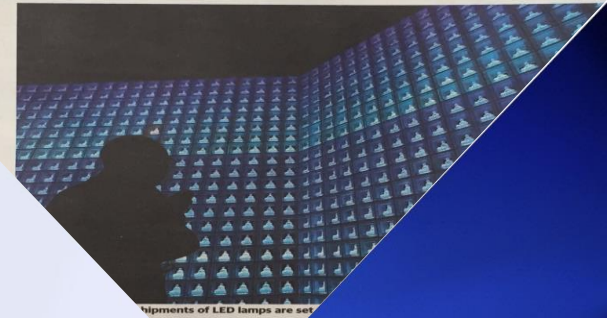
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- Raise \$10m in oversubscribed placement
- Market cap ▲ 470% in last 12 months
- Shareholders ▲ 600 → 1,500
- Liquidity daily trade ▲ \$3k → \$200k /day

**Altech
Chemicals**

**LEDs light way to cash
in on efficiency boom**

NIFEX
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Shipments of LED lamps are set

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- Debt funding term sheet agreed Q1 2017
- Capital cost estimate avail half way through detailed design phase
- Project equity Q2 2017
- Site works commencing Q2 2017
- 18 months construction
- First product due early 2019

**Timeframe to
market**





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Forward-looking Statements

This announcement contains forward-looking statements which are identified by words such as 'anticipates', 'forecasts', 'may', 'will', 'could', 'believes', 'estimates', 'targets', 'expects', 'plan' or 'intends' and other similar words that involve risks and uncertainties. Indications of, and guidelines or outlook on, future earnings, distributions or financial position or performance and targets, estimates and assumptions in respect of production, prices, operating costs, results, capital expenditures, reserves and resources are also forward looking statements. These statements are based on an assessment of present economic and operating conditions, and on a number of assumptions and estimates regarding future events and actions that, while considered reasonable as at the date of this announcement and are expected to take place, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies. Such forward-looking statements are not guarantees of future performance and involve known and unknown risks, uncertainties, assumptions and other important factors, many of which are beyond the control of our Company, the Directors and management. We cannot and do not give any assurance that the results, performance or achievements expressed or implied by the forward-looking statements contained in this announcement will actually occur and readers are cautioned not to place undue reliance on these forward-looking statements. These forward looking statements are subject to various risk factors that could cause actual events or results to differ materially from the events or results estimated, expressed or anticipated in these statements.

Competent Person Statement

Competent Persons Statement – Meckering Kaolin Deposit

The Competent Person for the Ore Reserve statement is Mr Carel Moormann who is employed by Orelogy Consulting Pty Ltd as a Principal Consultant. Orelogy Consulting Pty Ltd is an independent mine planning consultancy based in Perth, Western Australia. Orelogy was requested by Altech Chemicals Ltd to prepare a reserve estimate for the Meckering kaolin deposit to provide feedstock for High Purity Alumina production. Mr Moormann is a Fellow of the Australasian Institute of Mining and Metallurgy and a Competent Person as defined by the 2012 JORC Code. Mr Moorman has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 JORC Code. Mr Carel Moorman consents to the inclusion in this release of the matters based on his information in the form and context in which it appears.

Competent Persons Statement – Meckering Kaolin Deposit

The information in this release that relates to Exploration Results and Mineral Resources are based on information compiled by Sue Border, a Competent Person who is a Fellow of The Australasian Institute of Mining and Metallurgy and Fellow of the Australian Institute of Geoscientists. Sue Border has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the exploration activity being undertaken 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'. Mrs Border consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.