fyi Resources Limited

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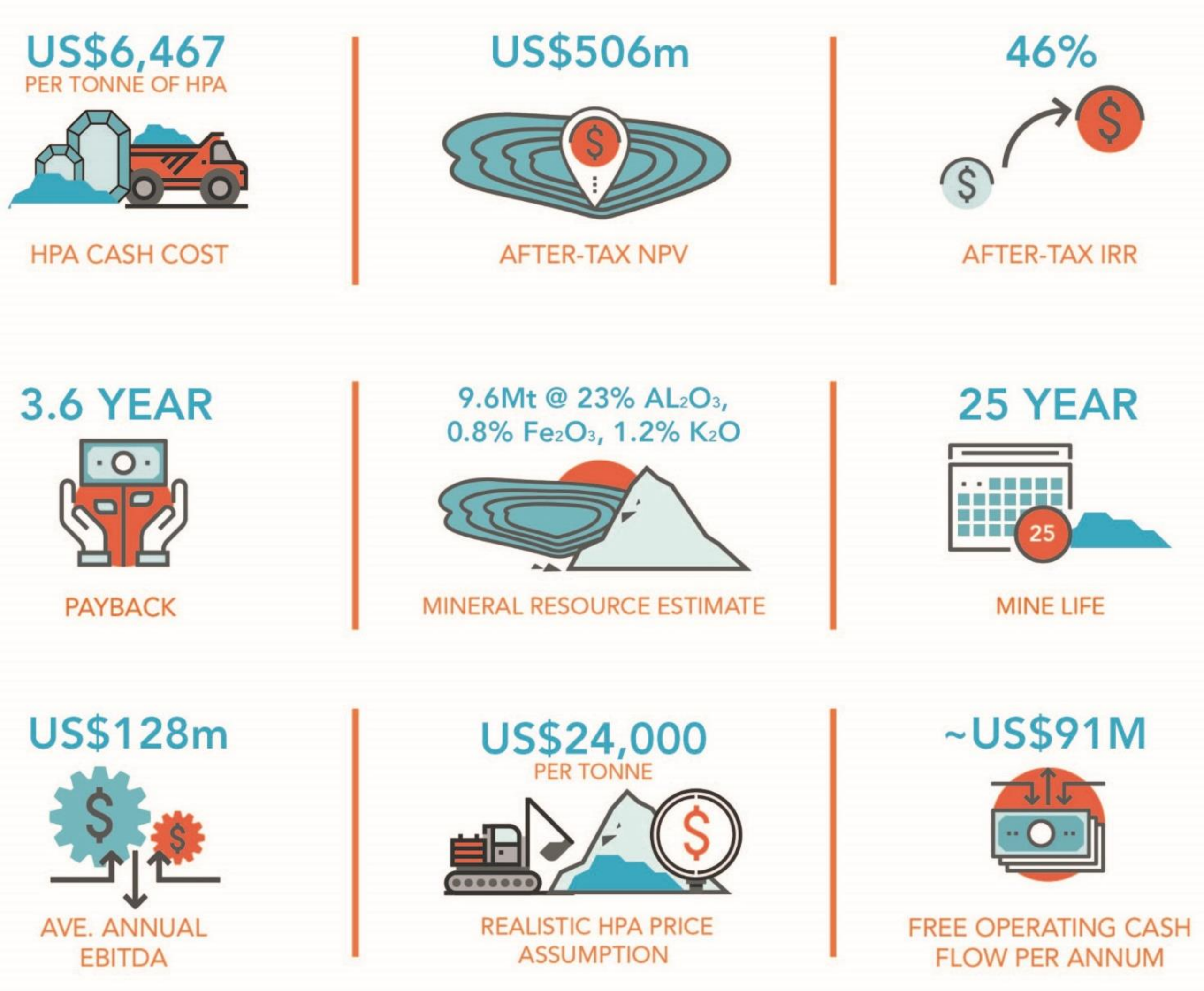
Outstanding PFS results support HPA development

High purity alumina developer FYI Resources Limited (ASX: FYI) ("FYI" or "the Company") is pleased to announce the successful completion of its Preliminary Feasibility Study ("PFS") for its 100%-owned Cadoux Kaolin Project ("the Project"), in Western Australia. The PFS has confirmed the Company's intention to become a predominant vertically-integrated, long life producer of high quality, sought after high purity alumina ("HPA").

The PFS indicates that the Project could produce up to 8,000 tonnes per annum of HPA with both low capital and operating costs, delivering an $NPV_{(10\%)}$ of US$506 million for a 25 year project life from >50-year kaolin supply at an attractive IRR of 46%.



The PFS economic forecasts are based on a revised Cadoux Mineral Resource Estimate (MRE) that was specifically estimated for the delivery of premium quality feedstock to the integrated HPA refining process. The mining and financial modelling is based on using 94% Indicated and 6% Inferred material. The revised MRE is detailed in section 7 of the detailed PFS report.

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The PFS demonstrates the economics of the Cadoux Project through key metrics including:

- Integrated beneficiation and refining project targeting production of 8,000 tonnes per year of HPA, with processing of Cadoux feedstock to be completed at the proposed new battery metals centre in Kwinana, where kaolin will be directly refined into high purity alumina, all in Western Australia.
- **After-tax NPV$_{(10\%)}$ US$506 million, IRR of 46%, payback period of 3.6 years**
- **Steady state EBITDA of US$128 million annually with average annual after-tax cash flow of US$90.7 million**
- **A capital intensity of US$22,344/t capacity installed**
- PFS modelled on a 25 year project life modelled off a combined Mineral Resource of 9.6Mt @ 23% Al_2O_3, 0.8% Fe_2O_3, 1.2% K_2O, based on the mining of 94% Indicated and 6% Inferred Resource (refer to sections 7 and 8 of the detailed PFS report).
- Competitively positioned total project capex of US$179 million (including owners costs and contingencies)
- Capital intensity of $22,300/t of HPA produced
- HPA operating costs of US$6,467/t
- Production profile designed to meet the forecast industry demand growth of ~ 17% CAGR
- Sale price assumption of US$24,000 per tonne delivering an operating margin of ~US$17,500 per tonne
- Proposed construction to commence in Q4 CY2019, with a construction period of 18 months
- Exceptional metallurgical test work with a low risk flow sheet and conventional technology selected for beneficiation
- Upside opportunities include potential to produce 5N which should receive a premium to 4N price and the addition of High Purity Quartz (**HPQ**) by-product production which may improve project economics for limited additional capital.
- With regards to the future funding of the Project, the Company is in discussions with industry participants with potential to provide financing as part of an offtake, in addition to traditional means of debt and equity financing
- The Company plans to initiate a Bankable Feasibility Study (**BFS**) whilst progressing negotiations with industry participants for potential offtake as a part of de-risking its production profile. The Company should benefit from a number of activities already completed during the PFS including a more detailed Mining Study, Environmental and Permitting commenced, potential resource upgrade, initial HPQ studies

FYI Resources Managing Director, Mr Roland Hill, commented: "The PFS demonstrates FYI Resources is in the attractive position with the potential of becoming a long-life, low cost and high margin HPA producer. The positive economics are a result of realistic basket pricing and a production profile that is expected to meet the forecasted industry demand growth over the coming years as a result of the EV revolution. Importantly, we believe we should sit within the lowest operating cost quartile generating significant margins, demonstrated in the average annual EBITDA at steady state of US$128m.

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"On the back of our recent trips to Japan, China and Korea, we now look forward to advancing discussions with industry players for potential offtake and financing and progressing the Project towards the completion of a BFS in the first half of 2019 for which we are fully funded."

FYI Resources – High Purity Alumina Summary

Cadoux is a high-grade kaolin resource that will provide an initial supply of up to >50 years of HPA production, in the first phase of operations, of feedstock material to a proposed Kwinana refinery.

The headline parameters of FYI's comprehensive prefeasibility study are summarised below:

Item	unit	Amount
HPA production	tpa	8,000 (with capacity to expand)
Production grade	Al_2O_3	> 99.99%
Capital cost	US$m	178.8
Capital cost / t	US$/t	22,344
Forecast average cost of production (C1)	US$/t	6,467
Assumed HPA selling price / t	US$/t	24,000
Exchange rate	A$:US$	0.75
Average annual EBITDA	US$m	128
First phase of operations - total revenue (> 50 years)	US$m	11,376
First phase of operation - annual revenue	US$m	190
Project NPV	@10%	506
Project IRR	%	46
Project payback	yrs	3.6

HPA Development Strategy Objective

FYI Resources is focused on developing a vertically integrated high purity alumina (**HPA**) production and refining strategy utilising its 100% owned Cadoux kaolin project as a feedstock source.

The foundation of FYI's HPA strategy is the fundamental revolutionising of the traditional processing and production of alumina (sourced from bauxite) to a non-traditional processing route using aluminous clay (kaolin). The objective of this is two-fold:

1. To lower the cost of production (both Capex and Opex) to be more competitive
2. To address a rapidly growing market that current traditional production, through increasing global supply disruptions and environmental pressures, may not meet

PFS Study Overview

The completion of the Cadoux HPA project PFS outlines a high quality, long life straight forward development program for a project that demonstrates strong financials and sound business case.

The PFS is an aggregation of high quality and detailed work by specialist study managers culminating in an excellent result that demonstrates the support of developing the Cadoux HPA project.

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Study Area / Discipline	Study Managers / Contributors
Geology / Resource	CSA Global
Metallurgy / process engineering and design	Independent Metallurgical Operations
Process engineering and design	GR Engineering Services
Mine Design / scheduling /cost estimates	Orelogy
Environmental assessment / Baseline studies / Heritage	Botanica Consulting
Hydrological review and Baseline Study	Hyd20
Market Research	CRU, Allied Market Research, FYI
Risk assessment	CSA, GRES, Orelogy, IMO, FYI
Financial analysis	CSA, GRES, Orelogy, FYI

HPA Business Case Summary
FYI Resources is building a strong business case around the following factors:

- A "unique" high grade, superior quality and characteristic kaolin orebody that is well suited to HPA refining
- Excellent geological understanding and definition of the kaolin resource
- A revised MRE to provide optimal feedstock for HPA production – providing many decades of feedstock production
- Exceptional metallurgical test work and development of flow sheet
- Outstanding process engineering design
- Strong project financials (low Opex and Capex / attractive NPV, IRR and capital intensity)
- Timing of entry into a rapidly growing market
- Realistic commodity pricing forecast

Future Value Catalysts
Based on the positive outcome of the PFS and progressing with the HPA strategy, FYI could expect a number of events that may impact the Company's valuation in a positive manner. These events include:

- Commencement of Bankable Feasibility Study (BFS)
- Instigation of metallurgical studies towards an additional revenue stream product which should have an increased positive impact to the economic case (generating increased revenues with very little capital)
- Pilot plant studies
- Strengthening marketing relationships
- Continued developments in the EV market

Environmental Credentials
FYI's HPA strategy includes the ethos of achieving and maintaining high levels of environmental standards. The Company has a culture and commitment to reducing environmental impact associated with mining activity.

Additionally, our carbon footprint and environmental impact is minimal in comparison to traditional supply of HPA sourced from Aluminium.

Please refer to the full detailed PFS report for further information.

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About FYI Resources Limited

FYI's is positioning itself to be a significant producer of high purity alumina (4N or HPA) in a rapidly developing: LED, electric vehicle, smartphone and television screen as well as other associated high-tech product markets.

The foundation of the HPA strategy is the superior quality aluminous clay (kaolin) deposit at Cadoux and positive response that the feedstock has to the Company's moderate temperature, atmospheric pressure HCl flowsheet. The strategy's quality attributes combine resulting in world class HPA project potential.

Cautionary Statement

Substance of PFS

The PFS referred to in this announcement is a study of the potential viability of the Cadoux Project. It has been undertaken to understand the technical and economic viability of the Project.

The PFS is more than a preliminary technical and economic study given the work undertaken for the PFS but is not advanced enough to support the estimation of Ore Reserves and further evaluation work and appropriate studies are required before the Company will be in a position to estimate Ore Reserves or to provide any assurance of an economic development case.

Within the designed final pit inventory, the Mineral Resource tonnages include Indicated Resources of 94% and Inferred Resources of 6%. Only Indicated Resource material was considered as potential ore material with Inferred mineralisation treated as waste.

In respect of the Inferred Resources, there is a lower level of geological confidence associated with the Inferred Resources and there is no certainty that further exploration work will result in the determination of Indicated Resources. The Company confirms the use of Inferred Resources is not a determining factor to the Project's viability as set out in this PFS.

The PFS is based on the material assumptions outlined elsewhere in this announcement and summarised in the Summary of Material Assumptions and Modifying Factors description and tables (appendix 2 and 3) attached to this PFS document. These include assumptions about the availability of funding. While the Company considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by this PFS will be achieved.

To achieve the range of outcomes indicated in the PFS funding in the order of US$197 million will likely be required. Investors should note that there is no certainty that the Company will be able to raise

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the amount of funding when needed. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of the Company's existing shares.

It is also possible that the Company could pursue other "*value realisation*" strategies such as a sale, partial sale or joint venture of the Project. If it does, this could materially reduce the Company's proportionate ownership of the Project.

Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the PFS.

General and forward-looking statements

The contents of this announcement reflect various technical and economic conditions, assumptions and contingencies which are based on interpretations of current market conditions at the time of writing. Given the nature of the resources industry, these conditions can change significantly and without notice over relatively short periods of time. Consequently, actual results may vary from those detailed in this announcement.

Some statements in this announcement regarding estimates or future events are forward-looking statements. They include indications of, and guidance on, future earnings, cash flow, costs and financial performance. Such forward-looking statements are provided as a general guide only and should not be relied on as a guarantee of future performance. When used in this announcement, words such as, but are not limited to, "*could*", "*planned*", "*estimated*", "*expect*", "*intend*", "*may*", "*potential*", "*should*", "*projected*", "*scheduled*", "*anticipates*", "*believes*", "*predict*", "*foresee*", "*proposed*", "*aim*", "*target*", "*opportunity*", "*nominal*", "*conceptual*" and similar expressions are forward-looking statements. Although the Company believes that the expectations reflected in these forward-looking statements are reasonable, such statements involve risks and uncertainties, and no assurance can be given that actual results will be consistent with these forward-looking statements.

The contents of this release are also subject to significant risks and uncertainties that include but are not limited those inherent in mine development and production, geological, mining, metallurgical and processing technical problems, the inability to obtain and maintain mine licences, permits and other regulatory approvals required in connection with mining and processing operations, competition for among other things, capital, acquisitions of reserves, undeveloped lands and skilled personnel, incorrect assessments of the value of projects and acquisitions, changes in commodity prices and exchange rates, currency and interest rate fluctuations and other adverse economic conditions, the potential inability to market and sell products, various events which could disrupt operations and/or the transportation of mineral products, including labour stoppages and severe weather conditions, the demand for and availability of transportation services, environmental, native title, heritage, taxation and other legal problems, the potential inability to secure adequate financing and management's potential inability to anticipate and manage the foregoing factors and risks.

All persons should consider seeking appropriate professional legal, financial and taxation advice in reviewing this announcement and all other information with respect to the Company and evaluating the business, financial performance and operations of the Company. Neither the provision of this announcement nor any information contained in this announcement or subsequently communicated to any person in connection with this announcement is, or should be taken as, constituting the giving of investment or financial advice to any person. This announcement does not take into account the individual investment objective, financial or tax situation or particular needs of any person.

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Competent Persons Statements

Mineral Resources

The information in this report that relates to Mineral Resources is based on information compiled by Mr Grant Louw, under the direction and supervision of Dr Andrew Scogings, who are both full-time employees of CSA Global. Dr Scogings is a Member of the Australasian Institute of Mining and Metallurgy and a Member of the Australian Institute of Geoscientists. He is a Registered Professional Geologist in Industrial Minerals. Dr Scogings has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as Competent Person as defined in the 2012 Edition of the Australasian Code for the Reporting of Exploration Results, Mineral Resources, and Ore Reserves (JORC Code). Dr Scogings consents to the disclosure of information in this report in the form and context in which it appears.

Metallurgy

The information in this report that relates to metallurgy and metallurgical test work is based on information reviewed and compiled by Mr Daryl Evans, a Competent Person who is a Fellow of the Australian Institute of Mining and Metallurgy (AusIMM). Announcements in respect to metallurgical results are available to view on the Company's website at www.fyiresources.com.au . Mr Evans is an employee of Independent Metallurgical Operations Pty Ltd, and is a contractor to FYI. Mr Evans has sufficient experience that is relevant to this style of processing and type of deposit under consideration, and to the activity that he has undertaken to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code). Mr Evans consents to the inclusion of the information in the form and context in which they appear. The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and that all material assumptions and technical parameters underpinning the findings in the relevant market announcements continue to apply and have not materially changed.

Cadoux HPA Pre-Feasibility Study

Contents

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1. PFS Findings and Summary

FYI Resources' Pre-Feasibility Study (**PFS**) result confirms that the Cadoux Kaolin Project (**Project**) could become a predominant vertically-integrated, long life producer of high quality, sought after high purity alumina (**HPA**) products.

The Company's PFS is based on the revised Mineral Resource Estimate (MRE) for the Project and supporting metallurgical test work and process design and engineering undertaken over the PFS review period.

The comprehensive PFS review assumes a 25-year life of project for a Hydrochloric Acid Leach (**HCl**) and Precipitation plant for production of HPA commencing Q2 2021.

The PFS demonstrates the compelling economics of the Cadoux project through the key metrics that include:

- **Integrated beneficiation and refining project producing 8,000 tonnes per year of HPA**
- **Designed to meet the forecast industry demand growth of ~ 17% CAGR**
- **Initial mine life of more than 50 years / PFS is modelled on 25 years project life**
- **Conventional technology and equipment selection of beneficiation plant and refinery**
- **Forecast after-tax results: NPV (@10%) of US$506m, IRR 46% and a total project payback of 3.6 years**
- **Total operating cash cost of US$6,467 per tonne HPA produced**
- **Competitively positioned project capex of US$179m or US$22,344/t installed capacity**

PFS summary key inputs / results	Unit	Amount
Key inputs		
HPA production	tpa	8,000
Production grade	Al2O3	>99.99%
Capital cost	US$ m	179
Capital cost / t	US$ / t	22,344
Forecast average operating costs	US$ / t	6,467
Forecast revenue / t	US$ / t	24,000
Discount rate	%	10%
Key Results		
NPV	US$ m	506
IRR	%	46%
Project payback	yrs	3.6
Annual EBITDA (avg)	US$ m	128
Total project net operation cash flow (25 years)	US$ m	2,266
Annual revenue (avg)	US$ m	190
Life of Mine - total revenue	US$ m	11,376

2. Executive Overview

FYI Resources Limited (**FYI** or **Company**) has a corporate objective of becoming a world class, integrated, high purity alumina producer.

High purity alumina is an aluminum oxide (**Al_2O_3**) powder with a purity equal or greater than 99.99% and is used in the production of many high-tech products, including light-emitting diodes, rechargeable batteries and artificial sapphire glass.

The Company holds a 100% interest in the Cadoux Kaolin Project (Project) located in Western Australia.

FYI's HPA strategy is structured into two main integrated operating components:

1. the mining and beneficiation of kaolin on site at Cadoux to produce high grade aluminous clay feedstock which will then be transported to Kwinana for HPA refining; and

2. the processing of the Cadoux feedstock at the proposed Kwinana refining facility to refine the kaolin directly into high purity alumina, all in Western Australia.

The Company engaged expert technical consultants to assist with the production of a pre-feasibility study of the Project highlights of the PFS include:

- Rigorous, high quality review process to establish an independent and decisive study
- Partnership with experienced consultants for robust engineering and process development
- Proposed processing plant location at highly regarded Kwinana, Australia's new battery metals center
- Low capital and operating costs
- Premium quality kaolin supply from Cadoux for over 50 years (in the first phase of mining)
- Realistic product pricing based on insightful independent market research

The PFS is based on a revised MRE from which planned mining would be undertaken on 94% of the Indicated Resource and 6% of the Inferred Resource.

As per figure below, the Project is highly sensitive to changes in the adopted pricing of HPA, throughput and less sensitive to changes in operating and capital expenditure. A decrease in the sales price and or throughput of 20% will deduct US$175 million or US$125 million respectively from the NPV.

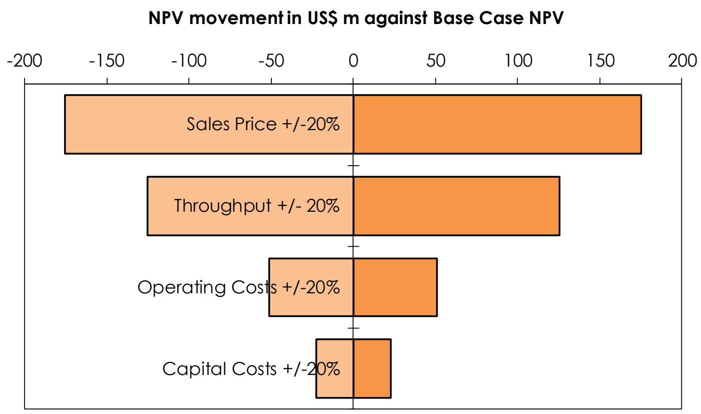


Figure 1.1 Sensitivity tornado

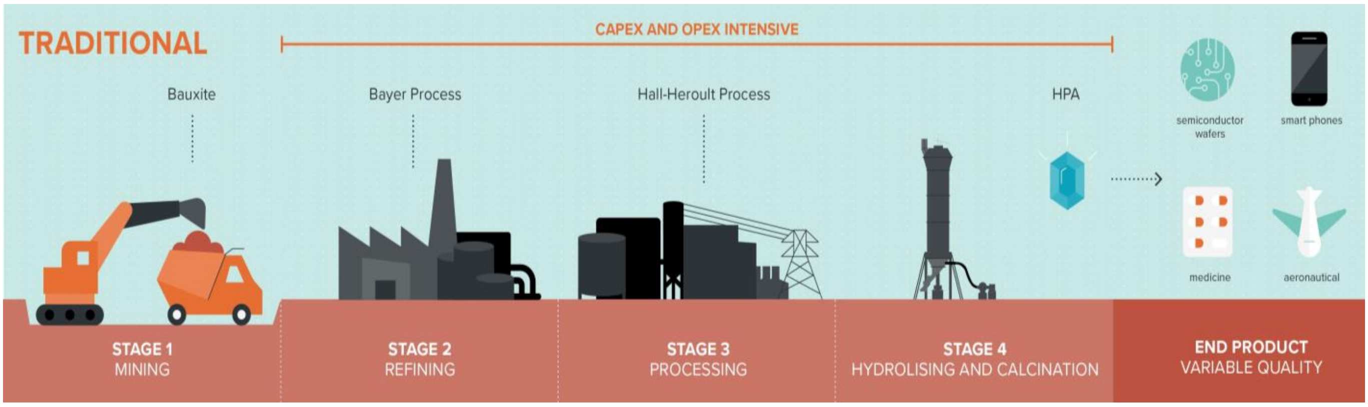
3. Introduction

The major challenges in the current processing of HPA are the rising costs of production, high environmental impact and increasing supply disruptions. The traditional manufacturing of HPA involves a 100-year-old dual process (Bayer - refining and Hall–Héroult - smelting, see diagram below) that requires multiple stages of processing and expensive feedstock (already refined aluminium metal), is capital intensive, high operating costs, including intensive labour and energy costs and, depending on the jurisdiction in which the HPA is processed, a restrictive overlay of environmental conditions and stringent government regulations.

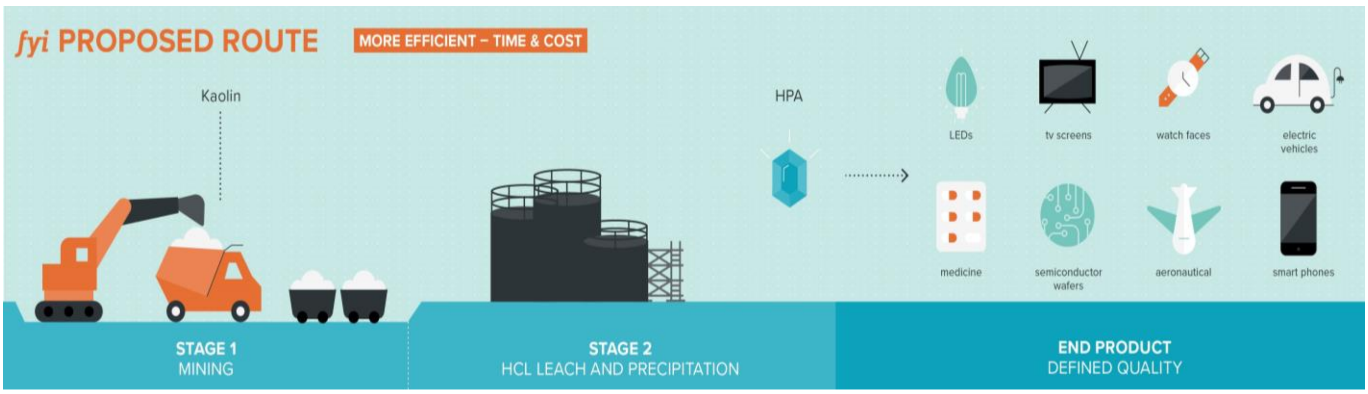
In the traditional process, expensive refined aluminium metal and alcohol is synthesised to produce high purity aluminium alkoxide, which is then hydrolysised to produce hydrated alumina. HPA is then obtained by calcination.

FYI intends to transform the manufacture of HPA by using high grade aluminous clay (kaolin) in a hydrochloric acid leach and precipitation process developed specifically for the Cadoux beneficiated ore (feedstock).

The FYI adapted, and refined process design flowsheet will result in in the production of more commercially reliable HPA at a fraction of the capital and operating costs of current traditional production methods.



Traditional bauxite sourced process route (multistage, capital intensive/high opex, high environmental impact)



FYI kaolin sourced process route (2 stage, Lower capital and operating expenditure, lower environmental impact)

Pre-Feasibility Study

The objective of the PFS was to evaluate the technical and economic viability of the Project. A range of field studies, sampling and test work programs and surveys were undertaken regionally and locally by a team of selected experts in various disciplines to define the Project design criteria. The PFS has developed operating and capital costs to an accuracy level of between -10% to +25% and determined the financial parameters of the Project through detailed financial analysis.

The Company aims to develop a high purity alumina production operation with a production capacity of 8,000 tons per annum, through the beneficiation of kaolin into concentrate and then refining the concentrate into high purity alumina.

The PFS's scope addresses the:

- mining and beneficiation of Kaolin at Cadoux
- transport of kaolin concentrates from Cadoux to the refinery in Kwinana
- refining kaolin concentrate into high purity alumina (>4N) in Kwinana
- sales and shipping of high purity alumina to the market
- associated approvals and permitting
- environmental and sustainable processes
- organisational structure including corporate office

Contributors

The PFS has been prepared by the Company in conjunction with selected industry specialists:

Company	Expertise
Independent Metallurgical Operations	Metallurgical test work and flow sheet design
GR Engineering Services	Process Engineering design and costing
CSA Global	Independent geological studies and Mineral Resource Estimate
Orelogy	Mining Study, pit optimisation and scheduling, costings
Botanica Consulting	Environmental base line review, approvals and permitting
Hydr2O Pty Ltd	Cadoux Hydrology review and baseline study
Bureau Veritas	Independent final product XRF and Laser Ablation assay verification
Intertek Laboratories	Assaying and Sampling
McLintock International	Shipping agent, International freight
CRU	HPA in-depth market studies and price discovery
Allied Market Research	HPA market studies – 2016 to 2022

Table 1.1: HPA PFS expert service providers

4. HPA Strategy Objective

Strategy

The Company's corporate objective is to become one of the world's leading producers of HPA by developing a vertically integrated HPA business to address the growing global demand for the next generation of high specification industrial materials. FYI plans to own and control the HPA entire production chain from high quality feedstock through to refining, thus allowing the Company to meet the increasing volume, quality and assurance demands of the market whilst operating in the lowest quintile of costs. The Company plans to meet the market's requirements through conventional chemistry but via a non-traditional processing route.

HPA

High-purity alumina is a processed premium non-metallurgical alumina product characterised by its purity level – i.e. 99.99% (**4N**), 99.999% (**5N**). The market price, application and performance of HPA varies widely according to its degree of purity.

Increasing adoption of LED lighting over traditional light bulbs coupled with technological advancements and increasing investment in end use industries drives the world market for HPA. However, factors such as increasing HPA prices and presence of alternate treatment may restrain the market growth. These product sectors are all high-end markets that are expected to show continued strong year on year growth.

HPA is primarily sought after for the unique combination of its properties and characteristics, which include low-friction, high wear-resistance, hardness, thermal and electrical insulating abilities, non-corrosive and broad chemical compatibility. HPA is used in applications such as:

- light emitting diodes (**LEDs**)
- battery technologies and energy storage (cell linings / separators)
- electric vehicle (**EV**) components
- semiconductor wafers
- artificial gemstones (sapphires)
- sapphire glass for smart phones, television screens and watch faces
- high-strength ceramic tools
- space and aeronautics industry components
- high tensile light weight fabrication applications
- fine abrasives and industrial applications
- fire-retardant insulation for electrical circuitry

5. Project

Location and tenure

Cadoux Location and access

The kaolin resource and proposed mine site is located approximately 10 km north-northeast of the township of Cadoux, Western Australia. Cadoux is a small township in the northeastern Wheatbelt region approximately 210 kilometers northeast of Perth, within the Shire of Wongan-Ballidu. The project can be accessed by sealed road on the Dowerin – Kilannie Rd.

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The Cadoux Kaolin Project lies within Exploration Licence E70/4673 which comprises 16 graticular blocks. The tenement was granted on 21 January 2015 with an expiry of 20 January 2020. The Lease is presently held by Kokardine Kaolin Pty Ltd, a wholly-owned subsidiary of the Company.

Tenement number	Licence	No of blocks	Granted	Expiry	Direct holder	Ultimate holder
E70/4673	Exploration	16	21/01/2015	20/01/2020	Kokardine Kaolin Pty Ltd	FYI Resources Ltd

Cadoux tenement outline (E70/4673)

Topography

The general landform that includes the Cadoux kaolin project (E70/4673) could be described as gentle undulating and open farm land and is typically under wheat cropping when in season. The property is easily accessible by sealed road and rail and traversable having little native vegetation.

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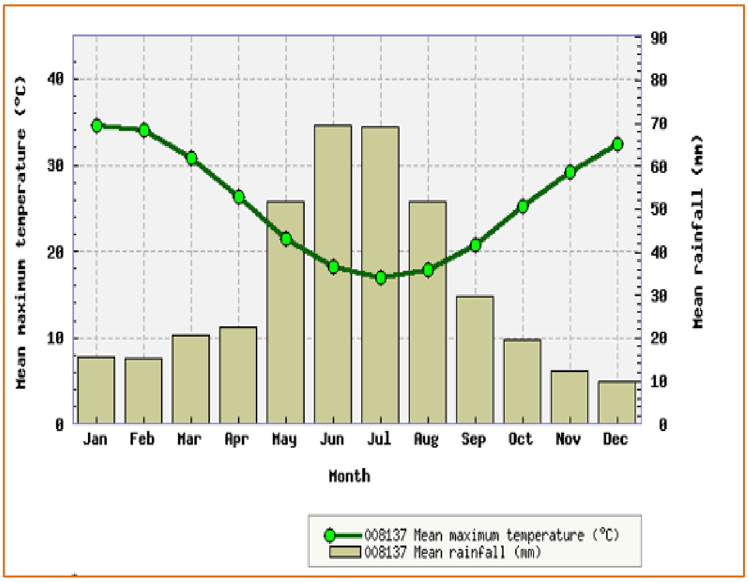
Images of Cadoux project area

Climate

Cadoux has a long-term average of 8.5 rain days a year for an average rainfall of 400 mm per year. The temperature ranges from the hottest months in December, January and February with an average of 33°C/17°C to the winter months averaging 17°C /7°C in July, August and September.



Wongan Hills average rain fall and temperature range

Infrastructure

Processing water

Potable water supply from the mains pipeline distribution runs along the road that marks the southern boundary of the project area – approximately 1 kilometre to the mine site. The pipeline has sufficient capacity to supply the mine and associated services.

Power Supply and Distribution

A 33KVA power line runs along the western boundary of the tenement – less than 1 kilometre from the proposed mine site. The mains power supply will provide most of the power to the mine site. Diesel power generation will be installed on site as back-up.

Transport

Transport of beneficiated intermediate product bound for Kwinana for processing will via Truck. Easy access from site to Kwinana will be along the Dowerin-Kilannie Road to Midland and then to Kwinana.

Rail remains a transport option, with a gazetted rail siding approximately one kilometre from the Western tenement boundary.

Images of infrastructure assets at Cadoux project – all within 1 kilometre of the tenement boundary (not assets of the company)

Kwinana – refinery

FYI's HPA refinery is proposed to be located in Western Australia's Kwinana Strategic Industrial Area (**KSIA**). The Company is in discussions with Landcorp and the Department of Jobs, Tourism, Science and Innovation (**JTSI**) for Western Australia with regard to securing a six (6) hectare development site. The company is planning to secure the site via a two (2) year option to lease. During this option period, the Company has two (2) years to exercise the option and enter in a long-term lease.

Kwinana, as Australia's new battery metals center, is attractive due to its proximity to skilled engineering services, labor, export facilities (e.g. Fremantle port) and reliable access to required consumables such as hydrochloric acid, water, power and natural gas as well as central facilities such as emergency services and dedicated chemicals incident response teams.

6. Marketing

Fundamental to the success of Project, is the pricing and marketing of the product. FYI has mandated independent sector and industry research from Commodity Research Unit (CRU) and Allied Market Research as well as undertaken separate in-house marketing studies.

The following marketing highlights are based on independent research groups findings and FYI's internal research:

- HPA has a strong demand outlook with the HPA global market expected to increase from around 35,000t in 2017 to 125,000t in 2025, driven primarily by strong growth in demand for HPA as a lithium-ion battery (LIB) separator coating.
- The Company is developing a consistent, high quality product delivered by a reliable quality and assurance process.
- HPA pricing is determined by product purity, the physical characteristics of the products, ability to deliver consistent product quality and the end-use application of the HPA.
- The strong demand outlook and rising cost inputs are expected to place upwards pressure on prices. The main downside risks are increased competition from Chinese producers and changes to technology which reduce HPA intensity in manufacturing processes. Chinese material tends to be of lower quality than that produced by the established companies outside of China.
- Considering the above, for the purposes of the PFS, the Company uses the conservative forecast price of US$ 24,000 (Free on Board – FOB-, ex-Fremantle) per tonne HPA.
- FYI is promoting positive market engagement with potential customers. The Company will produce sufficient market samples in Q4 2018 to share with potential customers with a view to secure off-take agreements to support the Project.

Description of High Purity Alumina and key uses
High-purity alumina is a crystalline white powder made from almost pure aluminum oxide (Al_2O_3). Commonly, HPA is defined as Al_2O_3 which is >99.99% pure. HPA products are generally classified by purity:

- 99.99% = 4N (equivalent to ≤100ppm impurities)
- 99.999% = 5N (equivalent to ≤10ppm impurities)
- 99.9999% = 6N (equivalent to ≤1ppm)

HPA is produced, as a final product, in powder, pellet or granular form, depending upon the end-use. Various end-use applications have different physical and chemical tolerances and requirements.

HPA is a versatile product with many broad uses. Some of the more common traditional uses include as a ceramic for producing substrates used in LED lighting and electronic applications, high strength scratch-resistant glass, as a fire retardant and as a fine polishing agent.

As HPA becomes more accessible and specifications of certain applications increase – with demands on higher quality, HPA has found uses in new high-tech applications such as batteries and energy storage and high-grade ceramic applications.

HPA Product Forms
HPA pellets are used in the production of synthetic sapphire for LEDs and sapphire glass – since the pellet properties are more favorable for the melting process; they are also used in semiconductor applications.
HPA powder is generally used for coating applications (battery separators and phosphor applications), which often require the product to undergo further grinding and pasting, in order to achieve uniform coating coverage. For synthetic sapphire production, overall purity and impurity distribution is the key consideration for manufacturers. Conversely, physical characteristics of the product, including average particle size, particle size distribution and surface area, are of primary importance to consumers of HPA.

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Demand

Drivers of demand

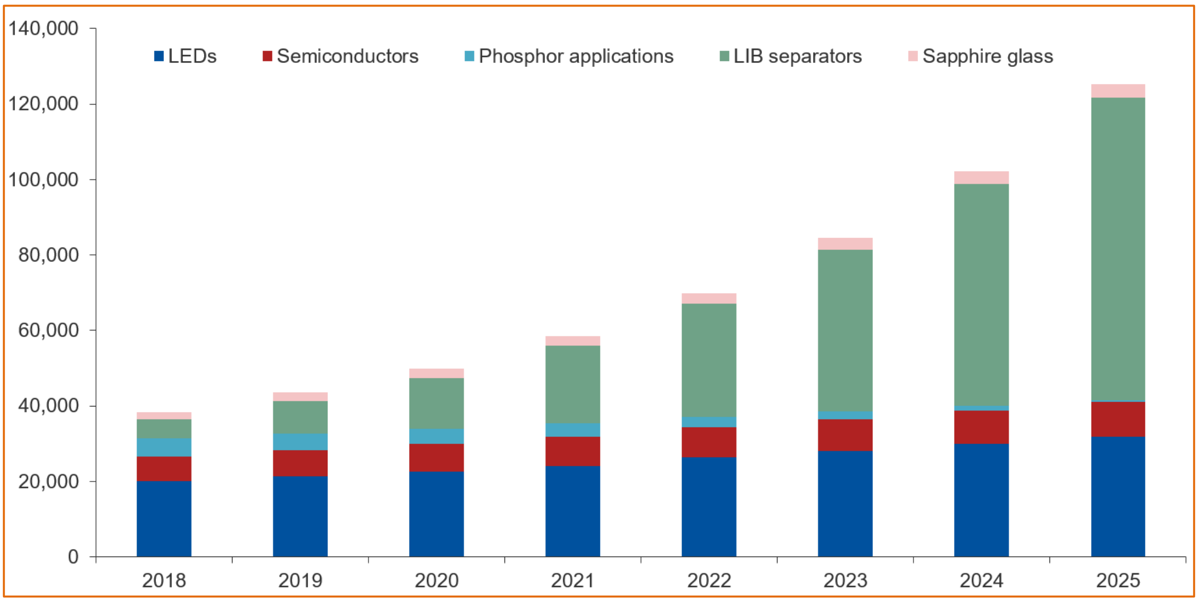
Market demand	Production process	End-use application	End-use sectors
HPA demand	Synthetic sapphire production	LED & semiconductor substrates Scratch-proof glass	Lighting, automotive, signs, electronics, tablets, smart phones, watch faces
	Direct use in manufacturing process	Lithium-ion battery Separator coating	Electric vehicles Consumer goods
		Phosphor coating	Fluorescent lighting

Table 6.1 Market Demand

4N HPA accounts for the largest share of the HPA market demand, although more specialist applications, such as high-quality microscope glass, are likely to utilise higher-specification HPA products, such as 5N

Forecast HPA demand by end-use

The HPA global market is expected to increase from around 35,000t in 2017 to 125,000t in 2025, driven primarily by strong growth in demand for LIB separator coating 2018-07-03 [source: CRU High Purity Alumina Market Study - FYI Resources].



Total HPA demand by end-use sector (tonnes) – CRU HPA market study 2018

In 2018, LEDs account for the largest share of HPA demand, totaling 20,000t, equivalent to 52% of global demand. The fastest growing end-use demand sector in recent years has been LIB battery separators, which grew at a CAGR of 25.7%, reaching 5,000t in 2018. Demand from phosphors has been gradually declining, as fluorescent lighting has increasingly been replaced by LED alternatives. Sapphire glass accounts for a relatively small share of the overall market, totaling around 2,000t in 2018.

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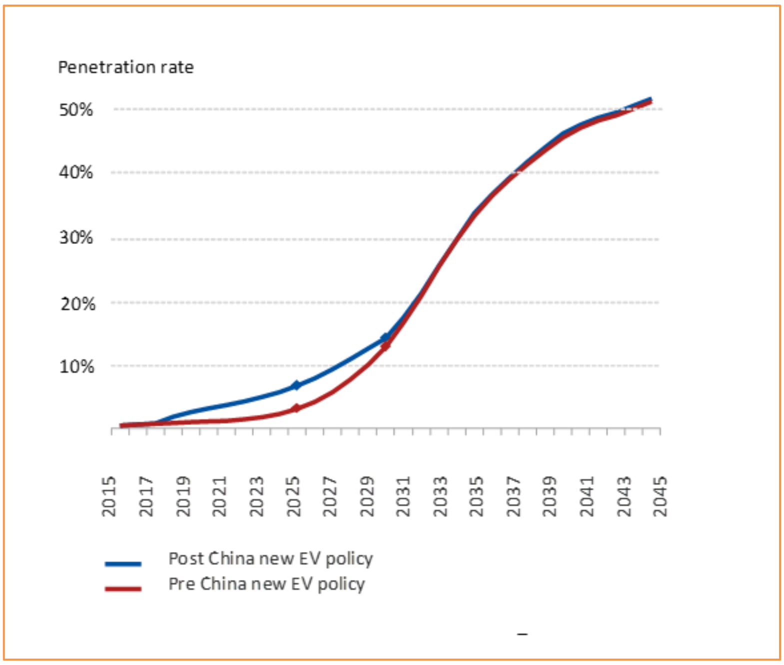
LIB separator demand growth

- Outstanding growth is forecast in the LIB separator market – a 49% CAGR, from 5,000t in 2018 to 80,000t in 2025 – drives the majority of HPA demand growth: Underpinning this forecast is the market share of cylinder, prismatic and polymer/pouch separators for batteries being produced. It is expected that cylindrical separators will grow strongly (29% CAGR) and climb from a 64% market share of separators to 87% by 2025.
- The average cell volume of batteries is also growing, as LIBs tend more towards EVs rather than consumer handheld electronics.
- Ceramic separators offer the highest combination of temperature performance, safety and life cycle – as a result, in the forecast period, they are expected to achieve mass commercialisation in EVs.

The share of coated separators is forecast to rise from 36% in 2018 to ~80% by 2025, of this, HPA coating is expected to marginally increase market share. Overall, it is forecast that HPA-coated separators will rise from 21% of the current market to 60% by 2025.

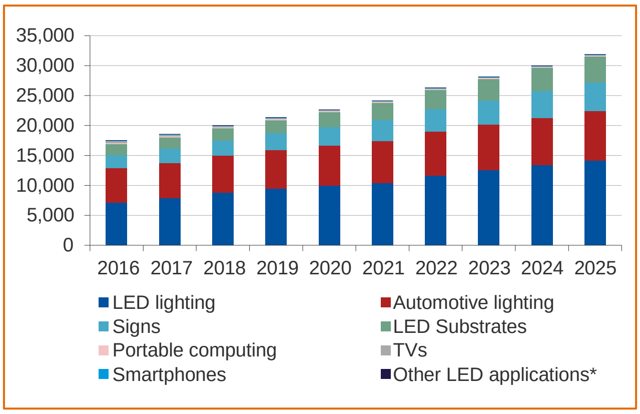
One of the drivers of the LIB separator growth is the growth of electric vehicles. Acceleration of the EV growth is expected as a result of China's 2-Credit Policy (announced in September 2017 and introduced in April 2018) and China's Battery Manufacturing Legislation, which was announced late 2017. The policy stipulates that manufacturers must sell a certain proportion of EV vehicles, rated according to a credit system and the legislation stipulates that battery manufacturers must create batteries with a minimum charge density, scale, maximum price, etc. The impact of China's policy and legislation change is highlighted in the below graph.

EV penetration rate in China Light Duty Vehicle (LDV) market

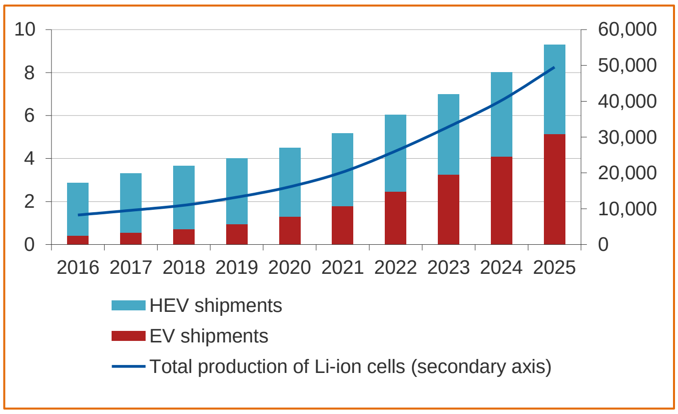


Source: CRU Perth Tech Metals Briefing – June 2018

Outlook for key drivers of HPA demand



Breakdown of LED usage – tonnes per annum
(CRU 2018 HPA Industry Report)



HEV / EV shipments & total production of Li-ion battery cells (millions of vehicles, total # of cells)
(CRU 2018 HPA Industry Report)

Static lighting makes up the largest end-user sector for LEDs with 44% of consumption (2018), followed by automotive with 31%. LED usage in signs is expected to grow fastest, with a 2018-25 CAGR of 9.2%.

Electric vehicles (EV) and hybrid vehicle (HEV) shipments are set to grow strongly over the forecast period, more than doubling between 2017 and 2025.

Substitute products and alternative technologies

The Company is mindful of the threat of substitute products and alternative technologies.

LED substrates substitutes including: silicon carbide, gallium nitrate, silicon
Silicon carbide and gallium nitrate are more expensive than synthetic sapphire, however offer performance advantages (such as lower lattice mismatches). Silicon is significantly cheaper but does not offer the same reliability and performance in LEDs.

Screen technology substitutes: OLED
Organic light emitting diode (**OLED**) technology uses organic diodes to produce each different color within the display, resulting in sharper contrast. The diodes can be mounted on cheap substrates, such as plastic, rather than requiring ceramic. Companies such as Samsung and LG have invested significantly in the technology for TVs and some smartphones screens. However, OLED remains more expensive. It is assumed that OLED gains up to a 30% market share in TVs and signs but achieves little penetration in automotive or static lighting.

Smartphone / watch glass substitutes: gorilla glass and other high strength glasses
Gorilla glass is the predominant choice for some selected smartphone screens currently (e.g. iPhone). Gorilla glass is marginally less scratch- resistant than sapphire glass, but also less brittle, lighter and lower cost. Sapphire glass is currently the primary choice for smartphone home buttons, camera lenses and high-end smartwatches (e.g. Apple Watch). It is expected that sapphire glass will double its share of the smartphone screen market from 2.5% to 5% by 2025 and will account for a 90% share of smartwatches by 2025.

LIB separators substitutes: plastics, nanomaterials
Currently around 20% of LIB separators are coated with alumina ceramic; however, this is expected to increase to 60% by 2025, due to the growth in battery production for EVs, where coated separators are an essential safety feature that help to prevent thermal runaway. There are a few potential alternatives to alumina ceramic coatings, but most of these are far from being commercially available and, therefore, alumina ceramic is expected to remain the dominant separator coating material out to 2025.

Supply

HPA industry structure and competition
Historically, the HPA market has been relatively stable, experiencing modest annual growth rates as end-use sectors broadly tracked global economic growth trends. The main consumers of HPA were high-tech firms, primarily located in Japan, South Korea, Europe and the USA. Consequently, the established long-term suppliers of HPA are also located in these countries.

LED technology became increasingly commercialised in the 2000s, at the same time that China was undergoing significant economic growth and moving into production of many electronic components. Encouraged by the Chinese government, which provided subsidies on the metal organic vapour phase epitaxy (**MOVCD**) equipment used to produce LEDs, there has been a rapid expansion of LED production capacity within China over the past decade.

Product quality

LIB separator quality
LIB separator manufacturers place higher value on physical properties (providing purity is met), targeting:

- Smaller particle size
- Even size distribution
- A high specific surface area
- Physical morphology considerations
- Sometimes, loss-on-ignition (**LOI**)

Manufacturers producing separators for high-quality batteries, such as for EVs, are more likely to pay premiums than those making low to medium-quality batteries. High-quality producers typically require products with particle size around 0.5µm with an even size distribution. For medium-quality, products with a particle size of around 0.5µm are also required, but size distribution restrictions are less tight. For low-quality products, particle size is generally around 0.8µm. There is currently a high degree of competition in the low- to medium-quality LIB separator market, making that section of the market primarily cost driven. In contrast, the high-quality section of the LIB separator market is primarily demand driven, as fewer producers compete in this space.

Sapphire quality
Sapphire producers (LEDs and sapphire glass) are primarily focused on the purity levels of the products being purchased, with physical characteristics being valued less highly than in the separator market. Impurities can affect the crystal growing process and lead to defaults in wafers.

As with separators, the Sapphire sector is divided between those producers seeking to serve the low-/mid-power LED markets and those targeting high-/super-high-power LED.

Some low-quality LED producers have been using sub-4N products to produce wafers for LED substrates, a result of fierce price competition at the lower end of the market.

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Pricing

The different manufacturing processes in which HPA is used mean that product characteristics and producer profiles are important in establishing value. The following factors are important in determining the value of HPA:

Opaque market

There are a limited number of producers in the market and nearly all are private companies, meaning there is limited publicly available information regarding pricing and completed transactions. Accordingly, there is also no recognised benchmark price for HPA.

Heterogeneity of products

Although impurity levels are largely comparable between products, the distribution of impurities, physical characteristics and consistency of supply are equally important factors in determining product value.

Chinese products and industry dynamics

Fierce competition in the Chinese LED industry has seen producers seek to cut production costs by using lower quality products. This has resulted in some Chinese producers using sub-4N HPA products to produce sapphire substrates, although such material is often still advertised as 4N. Thus, effectively a two-tier market has evolved, with quality and prices inside China much lower than those outside of China.

Product specifications

Bulk density of pellets must by at least 2.2g/cm3 for use in making synthetic sapphire, while silicon must not exceed 20ppm and iron 10ppm. Furthermore, for powdered products used in high quality applications, such as for LIB separators, mean particle size should be around 0.5μm, with tight grain size distribution. However, product specifications are highly dependent upon end-use application, with prices changing accordingly.

Relationship building

A key component of the HPA industry is establishing long-term relationships between suppliers and consumers. The tight tolerances in manufacturing processes mean that consumers need to ensure a quality product can be delivered consistently to specification, particularly where there are safety implications, such as in LIB separator coating applications. Consumers are generally prepared to pay higher prices if consistency of supply can be guaranteed. FYI has commenced this relationship building with a number of groups in Japan, Korea and China.

Outlook for prices

Price drivers

The primary drivers of upward price pressure are (a) increasing production costs, particularly in China where electricity and environmental costs are rising, (b) intermittent supply, and (c) a strong demand outlook. Further volumes coming out of the market will help to support prices.

Outlook

Over the medium to long term, we believe that the strong outlook for demand is likely to drive prices well above current levels.

The limited ability of Chinese producers to compete in the higher quality 4N market should allow for stronger prices here, on the back of its positive outlook for demand growth.

EV market growth in particular is likely to drive strong premiums for high-quality 4N with consistent physical properties in the near to medium term, and this should provide strong price support to high quality 4N product.

Risks and caveats

Experience in other industries has shown that Chinese producers have the desire and resources to push into the production of technologically-advanced materials and can often close knowledge gaps quickly. Should Chinese producers increasingly seek to participate in the high-power LED market, prices could decline sharply if there is a repeat of the situation observed in low- and medium-power LEDs.

Manufacturers often over-engineer new technology, but over time find ways to cut back on input quality or reduce material use without compromising product quality over the longer term.

Market Engagement

In the first half of 2018, Company representatives met with potential customers and reputable current producers, key traders in mainland China, Japan and South Korea to discuss the project and potential cooperation. The feedback was excellent, and the Company is following up on the feedback and will produce market samples in Q4 2018, which will be shared with interested parties.

It is expected that the provision of market samples will lead to off-take agreements and/or investment in the asset (via a Joint Venture) or indeed, in the Company.

Adopted pricing for the PFS

FYI has developed a methodology to establish a realistic sales price for HPA, which is used in the PFS financial model.

This methodology includes sourcing of price indications from:

1. independent price forecasts and price revealing by industry research experts CRU and Allied Market Research (**AMR**);
2. web-based commodity trading platforms;
3. purchasing of product from an established commodity retailer / trader; and
4. FYI's own market intelligence studies - having direct face to face meetings with small and large manufacturers and traders in China, Japan and South Korea.

Pricing information used for the PFS was derived from:

1. CRU and AMR research reports and presentations including price forecasts for the period 2019 to 2026;
2. September 2018 pricing on commodity trading platforms for HPA was evidenced in retail spot prices for 4N ranging from US$53,000/t to US$ 60,000/t;
3. Invoiced price for HPA (used in independent metallurgical test work and verification of purity) – US$100,000/t; and
4. Canvassing of approximately 30 separate groups indicated the price range for 99.99% HPA was between US$22,000/t (China) and US$37,000/t (South Korea).

In order to calculate the HPA price for the PFS, the Company allowed for an adjustment of spot pricing versus contract, end-user versus trader and applied an error margin to be on the safe side. This and a projected decline of 10% for the period until the Company sells its first HPA results is a price of US$24,000/t HPA.

This adopted price is in line with the pricing from the Company's market forecasters, which is on average US$24,400/t. The pricing methodology takes in account the price difference of HPA between diverse countries such as China, South Korea/Japan and markets, such as end-users versus traders.

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7. Geology and Resource Estimation

Highlights

- **The updated Mineral Resource Estimate (MRE) provides the Project with multiple years of high-quality feedstock**
- **The revised MRE focuses on a sub-set of the larger Cadoux resource**
- **Targeting higher quality feedstock and optimized costs reductions**
- **Environmental and base-line assessments have not found any constraints to project development.**

Geology

The Project area is underlain by weathered Archaean granitoids of the Yilgarn Craton. The granitoids are mostly composed of variably porphyritic to seriate textured biotite adamellite. Outcrops of weathered granites are scarce; most of the area is covered by sands, sheet wash sandy and clay-rich loam, alluvial clay and silt (Figure 7.1). Overburden is commonly 5 m thick in the Mineral Resource area.

A nodular lateritic unit underlies the overburden, followed by white kaolinitic clays, weathered partially oxidised granitoid and then by fresh granitoids at depth. The white kaolin zone is up to about 20 m thick grading into orange to yellow kaolin and then into sandy and mottled clays. The thickness of the weathering profile varies from less than 1 m to a maximum of 22 m. Fresh granitoids are found at variable depths of between 10 m and 30 m.

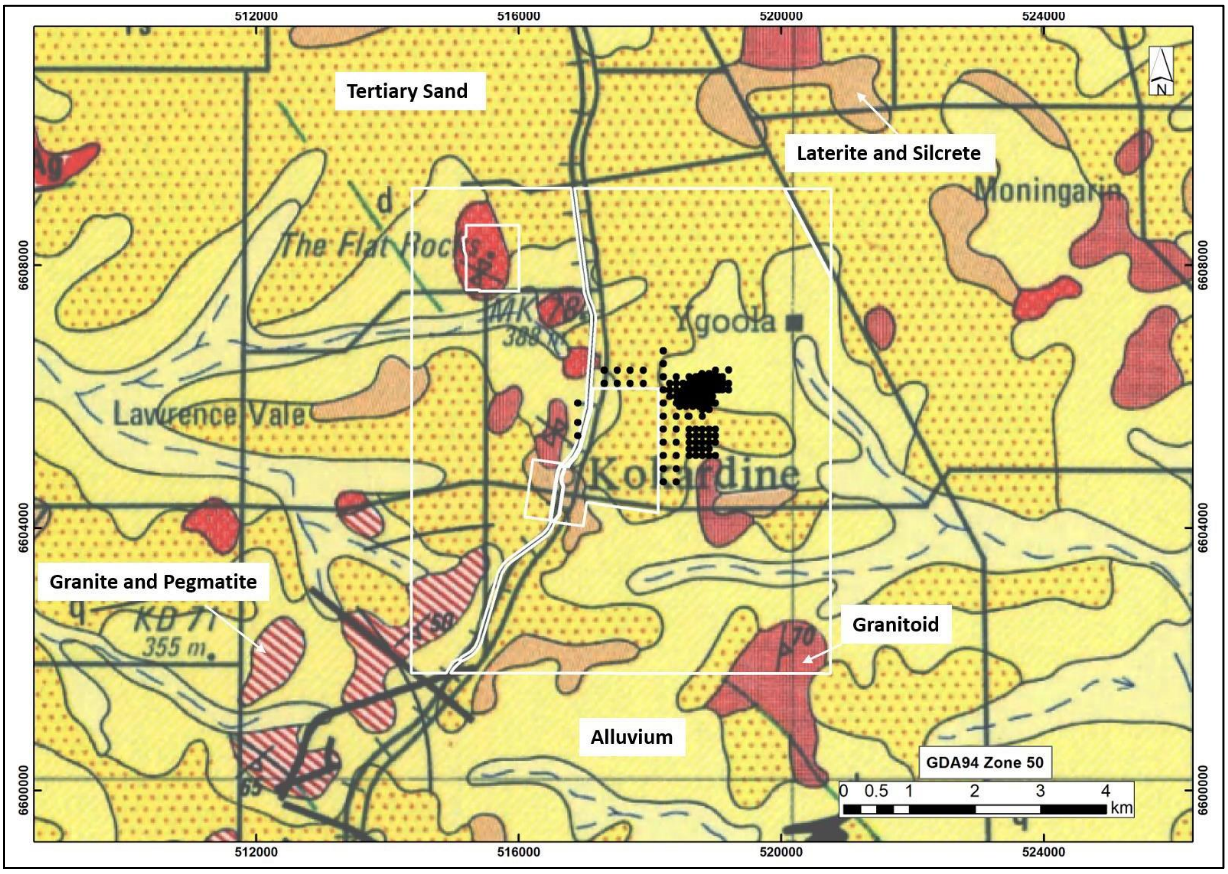

Figure 7.1: Local geology map, showing drill hole positions and the E70/4673 outline (white polygon)

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Mineral Resource Estimate (MRE)

- Revised MRE focuses on a targeted subset of the larger Cadoux Indicated Resource reported in July 2017
- The targeted area is selected for optimal mining and economic return parameters for the HPA strategy
- Current MRE will provide premium feedstock to HPA operations for many decades
- Resource remains open and upgradeable

The updated Mineral Resource Estimate is tabled below.

Domain	Classification	Million	AL_2O_3%	Fe_2O_3%	K_2O%
Low K_2O	Indicated	2.1	25.9	1.0	0.2
	Inferred	4.3	23.3	0.7	0.3
	Indicated + Inferred	**6.5**	**24.1**	**0.8**	**0.3**
High K_2O	Indicated	1.1	21.6	0.9	2.6
	Inferred	2.0	20.1	0.8	3.0
	Indicated + Inferred	**3.1**	**20.6**	**0.9**	**2.8**
Combined	**Indicated + Inferred**	**9.6**	**23.0**	**0.8**	**1.1**
Combined	Indicated	3.2	24.4	1.0	1.0
	Inferred	6.3	22.3	0.7	1.2
	Indicated + Inferred	**9.6**	**23.0**	**0.8**	**1.1**

Table 7.2: Mineral Resource estimate results for Cadoux HPA Project as at September 2018

Note: The Mineral Resource was estimated within a constraining wireframe solid defined by the logged and assayed white kaolin, separated into two domains based on a nominal cut-off of 1% K_2O. The Mineral Resource is reported from all blocks within these wireframe solids. Differences may occur due to rounding

This MRE has combined the recent 2018 reverse circulation percussion (**RCP**) drilling program with the previous aircore (**AC**) drilling programs and has focused on defining a high-quality sub-set of the greater Cadoux resource for use as the initial feedstock in the HPA refining process. This focus should flow on to a high-quality feedstock, reduced cost and complexity in the beneficiation / processing.

The MRE technical report compiled by CSA Global is based on the following fair and balanced representation of information:

- Kaolin mineralisation occurs within deeply weathered granitoid rocks at the Cadoux project;
- Samples were obtained from RCP and AC drilling;
- Quality of drilling/sampling and analysis, as assessed by the Competent Person, is of an acceptable standard for use in a Mineral Resource estimate publicly reported in accordance with the JORC Code;
- Major elements were analysed using total fusion X-Ray Fluorescence (XRF) and Loss on Ignition (**LOI**) for the 2018 samples and Inductively Coupled Plasma (**ICP**) for the 2017 and earlier samples at an Australian laboratory;
- Quantitative mineralogy from nine composite samples analysed by X-Ray diffraction (**XRD**) in 2017 and semi-quantitative data from twenty-nine samples from selected drill intersections were analysed by XRD in 2018 were used to verify the presence of kaolinite and associated minerals such as quartz and feldspar;
- Normative mineralogy was calculated from XRF major element data using a least squares method and compared with XRD mineralogical data. The XRF, LOI, XRD and Normative data were used as a guide for geological domaining;
- The Mineral Resources were estimated within constraining wireframe solids based on geological boundaries defined by logged white kaolin;
- Grade estimation was completed using Ordinary Kriging;

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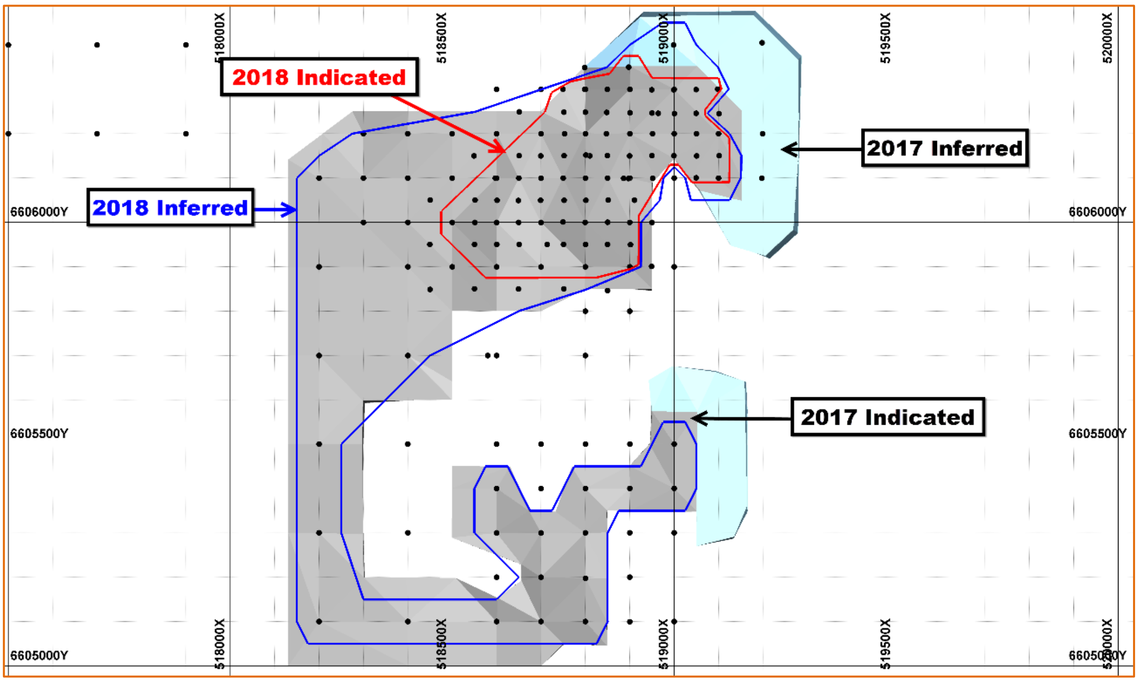
- The Mineral Resource is quoted from all classified blocks within these wireframe solids;
- The Mineral Resource was classified as Indicated and Inferred based on drill hole logging, drill hole sample analytical results, drill spacing and geostatistical analysis; and
- Roughly 5% of the interpreted mineralisation is considered to be extrapolated.

Operations focus

The revised MRE was designed to deliver maximum project margins to FYI's HPA operations for the first phase of mining. The targeted area within the larger Cadoux resource is the area depicted within the redline shown below (2018 Indicated Resource). This zone was selected on the basis of containing the highest aluminum grade, lowest deleterious material.



2018 MRE estimated by CSA outlining premium grade Indicated zone of initial mining phase

Drilling

The Mineral Resource estimate is based upon geological and analytical data obtained from 98 AC and 75 RCP drill holes. The 75 RCP drill holes for 1,613 m were completed from the 23th of April to the 4th of May 2018. All the holes were vertical and drilled to depths of 12 to 36 m. The drilling comprised:

- Forty-six holes were completed to infill a portion of the existing Mineral Resource at 50 x 50 m drill spacing.
- Twenty fence holes were drilled around the existing resource beyond the previously tested area.
- Six twin holes were completed to check the results of the previous phase AC drilling.

Geological logging

The majority of the RCP drilling was completed over the existing Mineral Resource. Most drill holes intersected a kaolin unit overlain by transported overburden and silcrete lateritic cap. The full rock sequence includes (from top to bottom):

- Ferruginous sand generally 2–4 m thick with a few thicker, up to 11 m in drill hole intersections;
- Creamy-brown clay with trace amounts of ferruginous nodules, commonly 1–4 m;
- Nodular laterite or ferricrete observed in several holes, the clay unit is underlain by a silcrete layer in most holes;

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- Silcrete-cemented sands, clays and lateritic materials gradually change downwards to massive silcrete; commonly 3–6 m thick;
- Kaolin – there is sharp contact of pale white-grey kaolinite clay unit with the silcrete above. Kaolin contains small amounts of quartz grains; commonly 2–8 m thick. Examples of white kaolin intersected in drill hole CXRC028 is shown in Figure 5.3 below;
- Clay saprolite – white kaolin downwards gradually changes in color to creamy and then brown clay with slightly increased amount of weathered granite fragments;
- Saprolite and saprock encountered in several holes; commonly drilling terminates in this unit or in the clay saprolite above; and
- Fresh granite documented in several holes; mafic rocks were also intersected.

Figure 7.3: Chip trays showing white kaolin intersected from 6–31 m depth in CXRC028

Sampling

For the RC drilling program, the drill sample spoils were collected in large plastic sample bags to facilitate sampling and weighing. Additionally, small sub-samples were collected at 2m intervals from a rig mounted cone splitter fitted with a 12.5% split chute with a calico bag attached. 2m composite samples were collected into pre-numbered calico bags covering the kaolinite-rich intervals and 2m thick zones above and below the higher grade mineralisation. Sample recovery was estimated visually and, for 10 drill holes, based on weighing the 1m samples using bath room type scales.

Mineral Resource modelling

The Mineral Resource estimate is based upon a wireframed solid envelope, generated by joining sectional interpretation polygon strings, enclosing the logged and assayed white kaolin material, and with reference to a nominal lower cut-off grade of 15% Al_2O_3 and the Normative mineralogy. Within this kaolin envelope, CSA Global, based on consultations with the Company's metallurgical consultant (IMO) and the detailed statistical analysis of the K_2O grade population distribution, has generated a wireframe surface separating an upper lower K_2O zone from a basal higher K_2O zone, using a nominal 1% K_2O cut-off. This boundary is based on metallurgical test work that indicates that while there is minimal to no impact in processing for the primary product across this boundary, the low K_2O material appears to be more amenable to production of a high purity silica byproduct. The maximum extrapolation of the interpretation beyond known data points is up to 50m. A topographic surface has been generated from surveyed point file provided by the Company, with survey points nominally 50m apart over the deposit area.

Quality Assurance / Quality Control

For the RCP drilling the 591 samples in calico bags selected for assaying, were placed into large poly- weave sacks and delivered to Intertek Genalysis laboratory in Perth. The samples were analysed by borate fusion/XRF method for 12 major elements. They were also digested by a four-acid digest and analysed by ICP-MS for 61 trace elements. The chemical analyses were also accompanied by lab internal repeat checks.

Thirty field duplicates (1 per 20 samples) were collected during the drilling programme process based on logging. The duplicates were placed in new pre-numbered calico bags and dispatched to the lab within the whole sample batch. A total of 22 samples of a commercially available kaolin product were used as an internal standard for this drilling program. In addition, 21 blank samples composed of commercial grade quartz sand were inserted randomly into the sampling sequence.

Density

A downhole wireline geophysics survey was completed by Surtech Systems (Surtech) immediately following the drilling programme. Surtech used a Century 0032 density instrument capable of measuring Short Spaced (SS) and Long Space (**LS**) density and fitted with a Caesium Cs137 gamma ray source. An average of 15% moisture was applied to the mean CDL density of 1.98 t/m3 for the readings from within the interpreted mineralisation domains, arriving at a dry in-situ bulk density value of 1.68 t/m3. This value has been rounded to 1.7 t/m3 and been applied to all mineralised material in the model.

A block model was constructed using Datamine Studio software with a parent cell size of 25m (E) by 25m (N) by 5m (RL). Sub blocks down to 5m (E) by 5m (N) by 1m (RL) were used for domain volume resolution. The model is flagged in the same way as the drill hole samples based on the interpreted "low" and "high" K_2O white kaolin mineralisation domain zones and limited by the topographic surface.

Hydrological

Physical Environment

The proposed project area is generally cleared and used for agricultural pursuits. Small farm dams have been constructed in the landscape to capture flows in wet periods. The topography of the area is undulating between 400 mAHD and 360 mAHD. The soil landscape zone is this region is generally characterised by sandy earths, loamy earths, sandy duplexes, loamy duplexes, deep sands and ironstone gravelly soils.

Surface Water

The site is located within the upper reaches of the Swan Avon Mortlock catchment and ultimately draining towards the Swan Avon River system. The site sits on a catchment divide with the high point at Kokardine Rail Siding immediately to the west of Dowerin-Kalannie Rd. The water flow travelling west goes towards the upper reaches of Mortlock Creek which discharges to Lake Hinds (60 km to the west).

The mining footprint is located on the eastern side of the divide in the surface water catchment. Flows travel east and ultimately drain towards a salt-lake system. There is a waterway located to the north of the proposed 'open-cut' mine, which is dry during the summer months.

With the mining operation proposed in the upper reaches of the catchment it is unlikely that any regular flooding would occur, mapping indicates that there is a less than 3% chance of the area having a flood hazard which is the lowest risk category provided.

Best catchment management practice approaches for the development of the proposal will ensure that downstream water quality will not be impacted by the proposal.

Groundwater

The site is located within the Avon Wheatbelt Ancient Drainage sub-region. Mapping indicates that the area has up to a 10% risk of waterlogging which is the lowest risk category provided.

During the different generations of drilling programmes, groundwater was never encountered beneath the site at depths of 38m below ground surface. The proposed mine operations are not expected to surpass 36m below ground surface and therefore are unlikely to intersect the groundwater table.

Hydrology conclusion

This assessment of the sites hydrological characteristics has not found any constraints to the development of the proposal. The key issue for the development of the proposal will be related to surface drainage layouts with the aim to adopt the philosophy of separating the rainfall from the mine-site and the remainder of the catchment. Bunding and drainage diversion works will be constructed to prevent natural runoff from entering the site mixing with internal site runoff.

The site is in an un-proclaimed surface water area and no permits are required to modify bed and banks of any existing water course.

Runoff generated from within the site will need to be appropriately treated for water quality in a sedimentation/detention basin to maintain the integrity of water quality downstream.

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8. Mining

Summary

- **Mine plan and scheduling are based on Indicated material only and are purposefully designed to maximise cashflows and margin**
- **Mining is relatively simple, conventional open cut mining with no drilling and blasting**
- **Pit optimisation based on > 50 years mine life**
- **Final mine inventory contains 94% Indicated and 6% Inferred material. Only the Indicated material is processed and used in financial calculations**

Mining activities at Cadoux are planned on a campaign basis by contract miners. Each campaign generates 3 years of ore supply in a 3-month period. The ore is placed on a stockpile and the contractor demobilises after completion of the campaign. Backfilling with commence during the second campaign.

Pit Optimisation

Mining Method

Conventional open cut mining was adopted due to the shallow depth of the orebody. Because of its nature it is suitable for free digging (i.e. no drilling and blasting) and backfilling to keep the footprint of the operation small (which will support approvals).

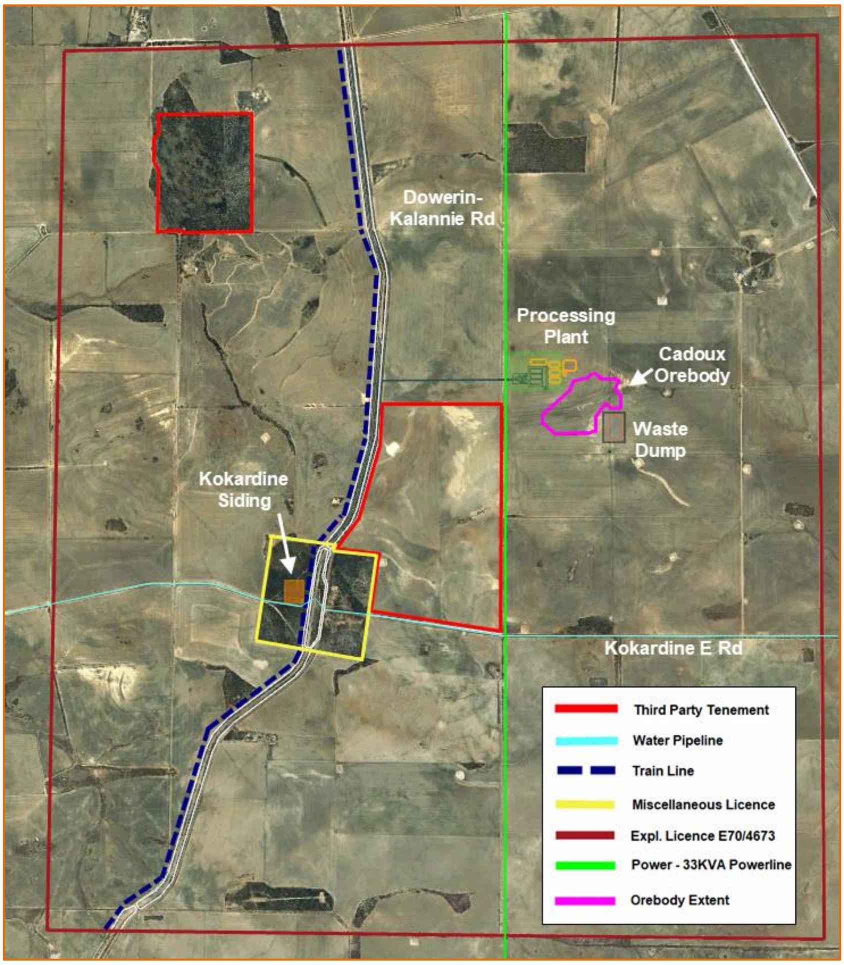

Figure 8.1: Cadoux project layout and infrastructure

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Inputs and Assumptions

The following inputs and assumptions were used in the pit optimisation process:

- the September 2018 Mineral Resource Estimate prepared by CSA Global;
- only Indicated resource materials can be converted to ore reserves;
- ore loss of 10% with zero dilution to minimise contamination from overburden, basement materials and ramp and bench sheeting materials;
- pit slopes of 35 degrees;
- Cadoux mining and beneficiation rates at 50,000dtpa;
- kaolin concentrate transport and HPA feed rates of 24,500dtpa;
- HPA production rate of 8,000tpa of 99.99% Al_2O_3 (4N);
- total Al_2O_3 recovery (ore mined to finished product) at Cadoux and Kwinana of 65%;
- mining cost A$7.60/t mined (inclusive of mining costs, mobilisation and demobilisation costs);
- product sale price US$24,000/t HPA;
- royalties 5% of product revenue;
- exchange rate A$:US$ of 0.75, and
- discount rate of 10%.

Results and Shell Selection

The pit optimisation results have been summarised in table 8.2. The table shows that:

- The mining inventory consists of Indicated (94%) and Inferred (6%) resource
- The mining waste associated with the pit shell is Inferred material
- the size of the shell and the cashflows are insensitive to different revenue factors;
- the revenue stream associated with the high grade concentrate far outweighs the costs associated with mining, beneficiating and refining, hence even at low revenue factors, all of the Indicated ore is mined and continues to produce positive cashflows;
- due to the long mine life the discounted cashflow is much lower than the undiscounted cashflow;
- mining costs are a fraction of the total costs; and
- shell 8, which has a revenue factor of 1.0, was selected as a basis for pit designs.

Revenue Factor	Material Mined					Financials					
	Ore		Waste	Total	Strip Ratio	Costs			Revenue	Cashflow	Discounted Cashflow
						Mining	Processing	Selling			
-	Mt	% Al_2O_3	Mt	Mt	-	$M	$M	$M	$M	$M	$M
0.60	2.89	24.4	5.92	8.81	2.05	-66	-3,865	-664	13,276	8,681	1,583
0.62	2.89	24.4	5.94	8.83	2.05	-66	-3,866	-664	13,277	8,681	1,583
0.64	2.89	24.4	5.96	8.85	2.06	-66	-3,866	-664	13,277	8,681	1,583
0.72	2.89	24.4	5.97	8.86	2.07	-66	-3,866	-664	13,277	8,681	1,583
0.74	2.89	24.4	5.98	8.87	2.07	-67	-3,866	-664	13,278	8,681	1,583
0.78	2.89	24.4	5.98	8.87	2.07	-67	-3,866	-664	13,278	8,681	1,583
0.80	2.89	24.4	5.99	8.88	2.07	-67	-3,866	-664	13,278	8,681	1,583
1.00	2.89	24.4	6.00	8.89	2.07	-67	-3,866	-664	13,278	8,681	1,583
1.24	2.89	24.4	6.01	8.90	2.08	-67	-3,866	-664	13,278	8,681	1,583
1.30	2.89	24.4	6.03	8.92	2.08	-67	-3,866	-664	13,278	8,681	1,583

Table 8.2 Pit optimisation results - summary

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Mine Design

Mine design was based on the optimisation Shell 8 and the size of the anticipated trucks and excavators with considerations for:

- Minimum mining width.
- Bench height.
- Berm and batter configuration.
- Haulroad width.
- Backfilling.

A fleet of 40t articulate dump trucks and a 65t excavator were assumed for the project.

Minimum mining width considerations aim to avoid situations where future stages are too narrow to be mined (and hence the ore in such stage will be sterilised) and to ensure that mining equipment can be operated efficiently and safely at the bottom of each stage.

Where possible, the bench height was 5m. But near the bottom of the pit, the bench height was reduced to 1m in order to be able to selectively mine the ore along the ore/waste boundary. The 5m wide berms were designed every 2 benches (10m) with 45-degree batter angles. This results in an overall slope angle of 35 degrees matching the optimisation assumption.

Haul roads were designed in accordance with industry standards of a multiple of 3 times the truck width. Backfill slope angles were designed at 35 degrees and with a swell factor of 20%.

The Cadoux ultimate pit design is shown in Figure 8.3. Stages were designed in accordance with the mining campaigns (i.e. one stage for each mining campaign).

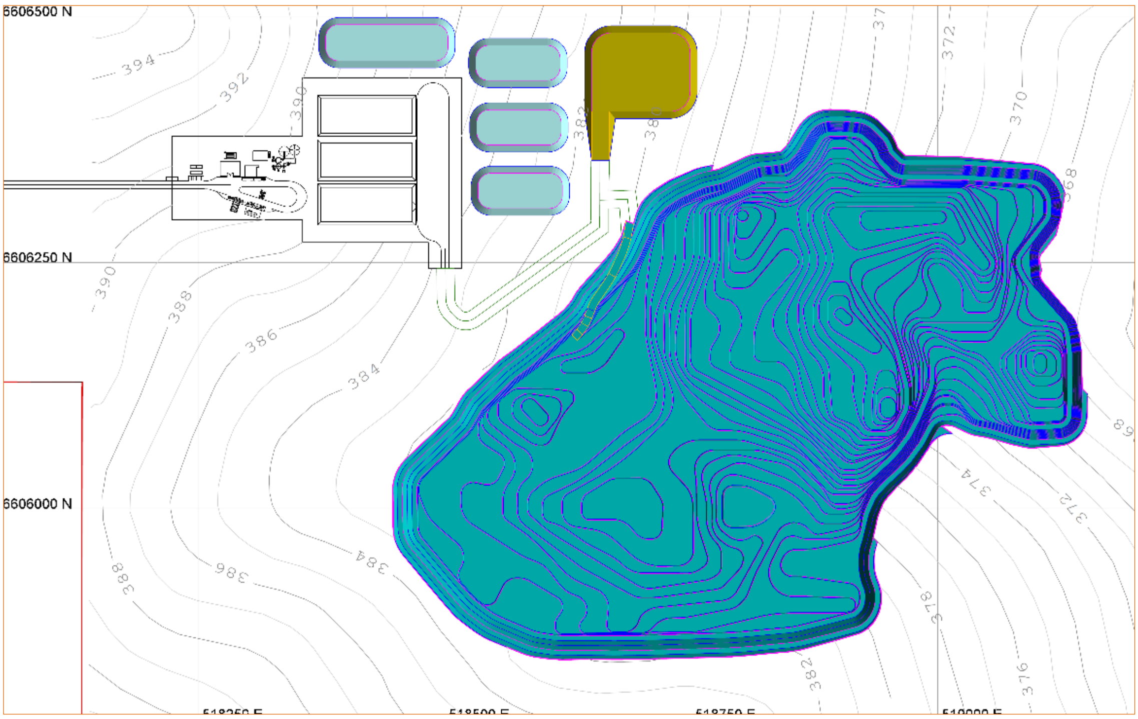

Figure 8.3 Cadoux final pit design

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Mining Schedule

The mining schedule is summarised in Figure 8.4, and is based on mining campaigns commencing every 3 years with total mining being on average 430kt per campaign. A high stockpile balance at the end of each mining campaign, reducing over the next 3 years as ore is reclaimed and fed to the beneficiation plant.

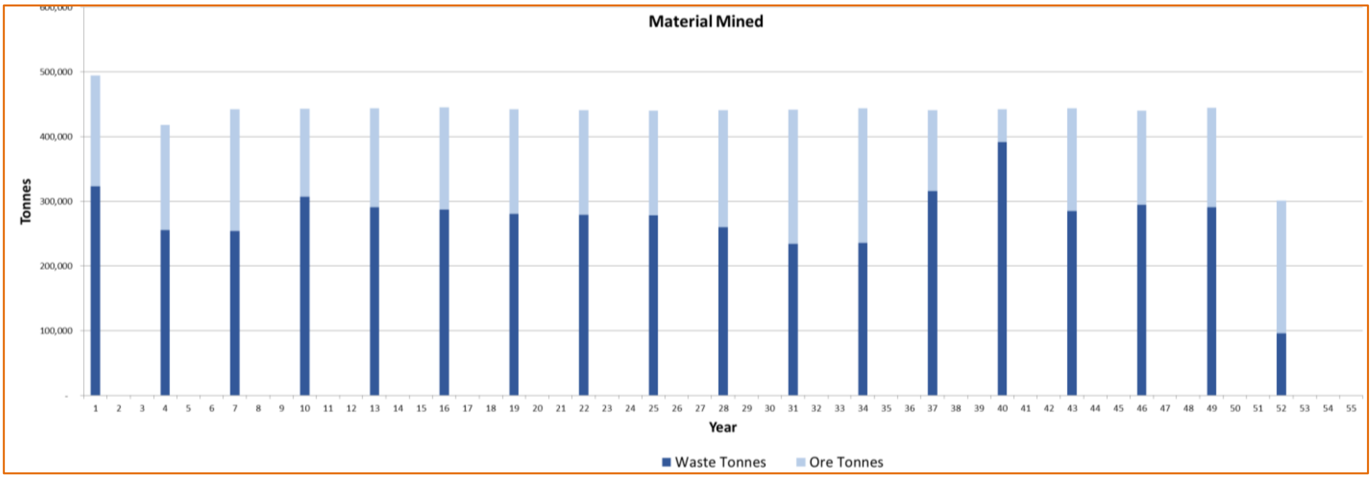

Figure 8.4 Mining schedule

The following figures show the Cadoux Site Layout as at the end of Mining Campaign 1 and as at the end of Life of Mine.

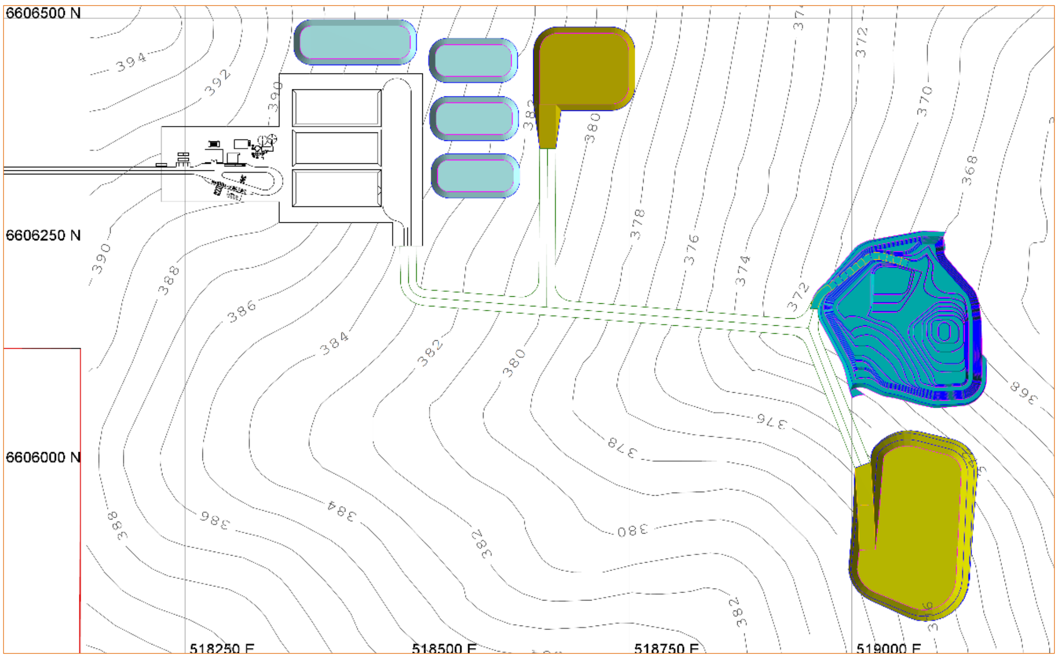

Figure 8.5 Cadoux site layout – end of mining campaign 1

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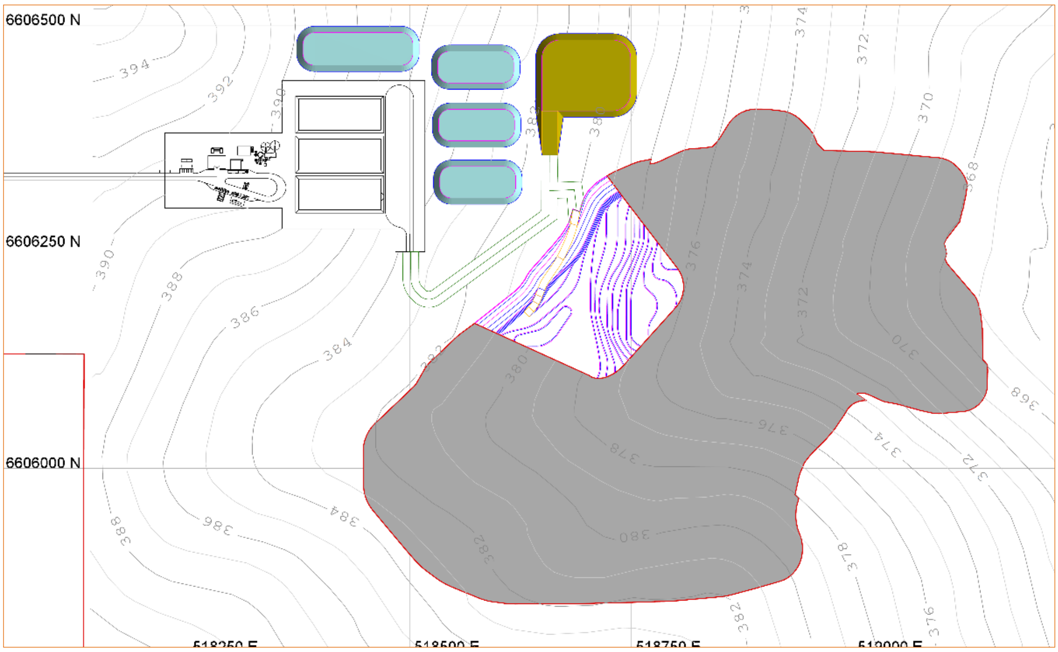

Figure 8.6 Cadoux site layout – end of last mining campaign (Life of Mine)

Mining Costs Estimate

Mining costs were estimated from Orelogy's internal database and experience with similar projects. All equipment and supporting facilities such as workshop, oil storage, fuel storage, store, office, lunch room and ablutions are assumed to be mobilised and demobilised for each mining campaign. Mining unit costs are summarised in Table 8.7.

Unit Mining Costs (AU$/t material)	AU$/t
Fixed Costs + Supervision - campaign	0.62
Grade Contol	1.35
Excavating and Haulage (Total)	2.98
Mobilisation/Demobilisation	0.12
Topsoil stripping and storage	0.12
Road Construction	0.05
Sheeting	0.24
Dump Rehabilitation	0.02
Pit Dewatering	0.02
Pit Bund Establishment	0.01
Diesel	1.39
Plant Rejects/Tailings Rehandle	0.68
Total Mining Unit Costs	**7.60**

Table 8.7 Mining Cost Estimate

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9. Metallurgy

Highlights

- **Extensive metallurgical testwork undertaken on Cadoux's superior kaolin characteristics**
- **Metallurgical flow sheet specifically designed for Cadoux kaolin feedstock**
- **Exceptional HPA recoveries of 99.997% Al2O3 independently verified**

Adequate metallurgical testwork is an essential part in the preparation of a PFS or BFS, which is used as the technical basis for the successful development of a mining project and supporting financing.

Many metallurgical processes are simple in concept and are well known for the processing of specific metal-bearing ores. The process that FYI is proposing to transform the traditional processing route for HPA, whilst straightforward in a technical sense, requires a high degree of testwork to achieve the target grade and economic recoveries of alumina to ensure excellent project economics.

Image 9.1 99.997% High purity Alumina

Extensive metallurgical testwork specific to FYI's HPA scope was completed during the PFS with outstanding results. The testwork was then utilised to develop model processing parameters for equipment selection, consumables, flow sheet, production, and a development schedule.

The PFS work performed by Independent Metallurgy Operations Pty Ltd (**IMO**) involved the generation and testing of two master composite samples and nine variability composites with the objective to design the Company's kaolin-to-HPA flowsheet and associated water, heat and mass balances as input for the basis of engineering design. The test work has been completed successfully and results confirmed a consistent HPA grade that can deliver an intermediate product ranging from 99.996% to 99.997% Al_2O_3.

These results exceeded the Company's target grade of 99.99% Al_2O_3 (**4N**) and will become the standard benchmark grade. Independent verification was undertaken by independent metallurgical laboratory, Bureau Veritas.

The testwork completed for the PFS, indicated that a purity of 99.997% Al_2O_3 could be achieved consistently and reliably.

The metallurgical testwork process comprised the following summary steps:

- re-beneficiation by attritioning and screening to reject coarse silica (quartz);
- activation by calcining;
- hydrochloric acid leaching initially at autogenous reaction temperature with the temperature controlled and maintained for a leach duration of 180 minutes resulting in an Al-rich liquor;
- precipitation of aluminium chloride by sparging (gas flushing) with hydrogen chloride gas to recover aluminium chloride.
- calcination of the dried aluminium chlorides.
- the final product was analysed via XRF and laser ablation reporting a final grade of 99.997% Al_2O_3.

The metallurgy study work highlights the potential for further upgrading to higher grade product such as 5N HPA.

Based on the completed metallurgical test work, the following studies will be included in conducting a Bankable Feasibility Study (**BFS**):

- additional variability samples tested, encompassing composites selected based on spatial, depth and grade variations;
- further attrition test work on feed samples excluding the siliceous cap existing within the deposit;
- further test work surrounding the impact of the number of precipitation stages on the final high purity alumina product;
- test work surrounding the impact of the final calcination temperature on the final high purity
- alumina product and its crystal structure composition; and
- locked-cycle test work allowing determination of the impact of recycle streams within the leaching and precipitation stages on the rejection of impurities to the final product.

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10. Kaolin beneficiation - Cadoux

Highlights

- **Efficient plant designed to optimise the kaolin beneficiation quality specifications**
- **Well-engineered with design capacity for increased throughput**
- **Simple and effective and low-cost operation**

The Company's integrated HPA production is segmented into two operating sites; one being the beneficiation at Cadoux and the second being the refining at Kwinana.

The planned site layout for Cadoux is simple and located close to the mine.

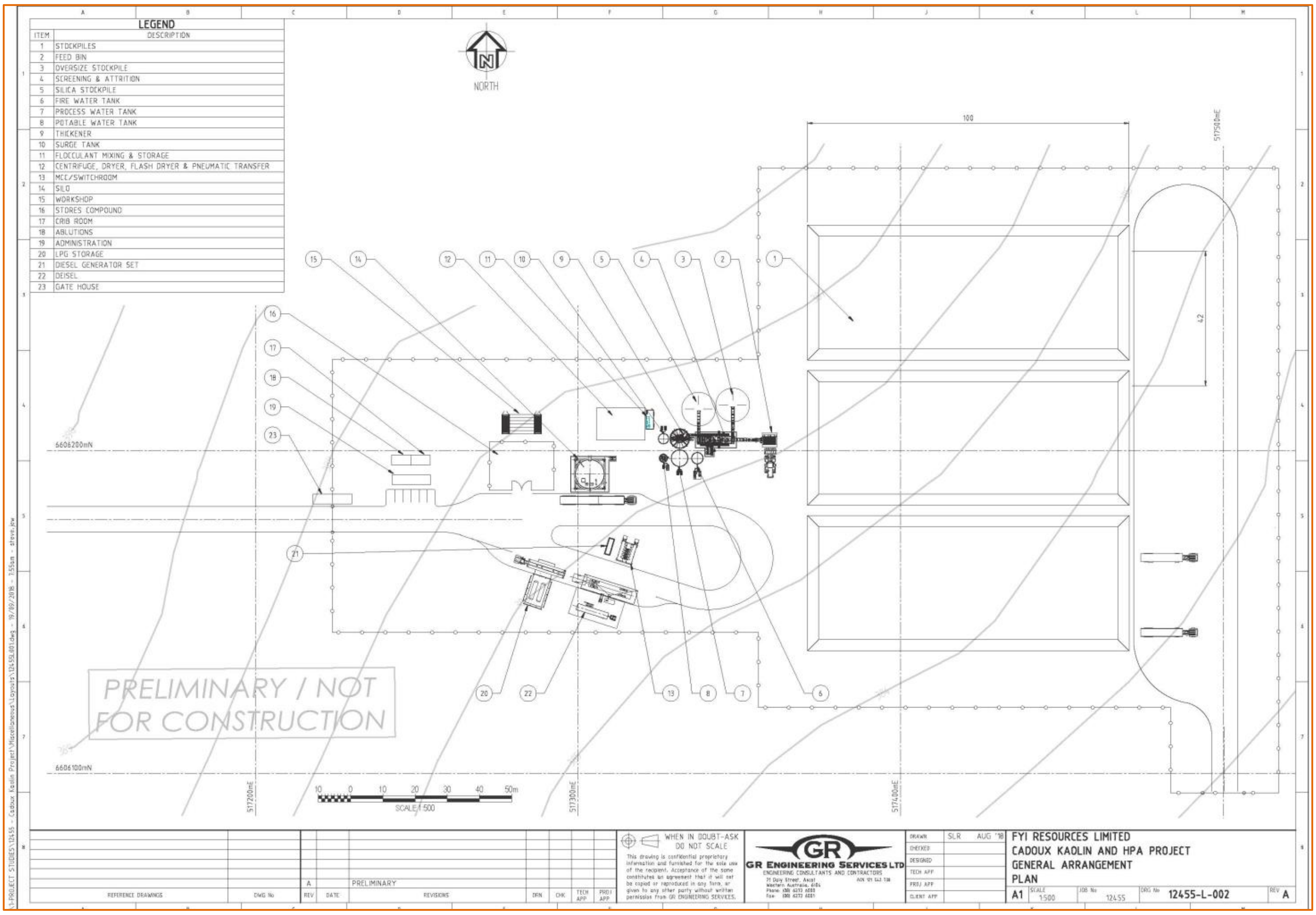

Image 10.1 Preliminary site layout Cadoux - Beneficiation

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11. High purity alumina refining – Kwinana

Highlights

- **HPA refining facility site proposed to be located in the Kwinana Strategic Industrial Area**
- **Efficient, well-engineered long-life plant with triple redundancies and scope for increased production**
- **Utilising well understood process flowsheet and "off the shelf" plant and equipment**

The HPA refining is the second, and the most significant, operation in the Company's integrated production model. Proposed to be located at the KSIA, a selected 6ha industrial site, provides excellent access from Cadoux and to the port of Fremantle (25kms). The KSIA also accommodates a number of other proponents that can service a HPA refinery.

The extensive HPA test work study focused providing the best processing and flowsheet design to maximise the project economics utilizing the Cadoux kaolin as feedstock (beneficiated ore).

The Kwinana refinery engineering design was designed around a proven process flowsheet (achieving 99.997% Al_2O_3 grade) and upon reasonably standardised and "off-the shelf" technologies and equipment. A special emphasis has been placed on process efficiencies, appropriate capital control, environmental sensitivity, safety and quality long duty life components.

The PFS study contemplates an initial 24,500 tpa of beneficiated ore being received from Cadoux and an output of 8,000 tpa of final product (HPA). The HPA will be packaged to the markets requirements and then transported to Fremantle port for export. It is anticipated that commissioning will take place ahead of production commencement forecast to be in CYQ2 2021. A three-quarter ramp up period in production is expected until nameplate capacity is achieved. This ramp up is reflected in the Company's financial forecast.

The plant design is extremely efficient and is also engineered for increases in capacity – both through production efficiencies and also modular expansion. This production increase is not included in the Company's financial modelling and forecast.

The proposed site layout is pictured below.

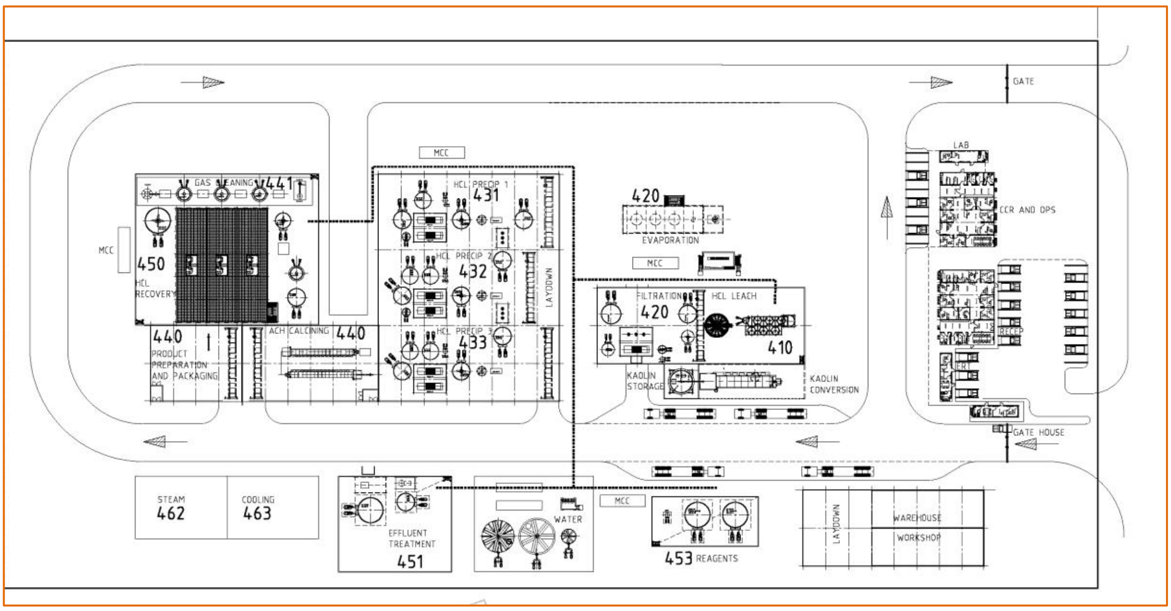

Image 11.1 Kwinana site layout

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12. Permitting and environmental

Highlights

- **Environmental and approval assessment for Cadoux and Kwinana completed;**
- **Company expects permit completion well before construction commencement;**
- **Cadoux is not located within an Environmentally Sensitive Area;**
- **Low impact and excellent review outcome assessment for Cadoux;**
- **Findings are well within industry guidelines.**

Cadoux – deposit & mine site

The primary and secondary environmental approvals required for the development/operation of the Cadoux mine site are provided in Table 12.1.

Approval/Process	Legislation	Government Department	Works Required	Approximate Assessment Timeframe
Primary Approvals				
Mining Proposal and Mine Closure Plan	Mining Act	DMIRS	Submission of Mining Proposal and Mine Closure Plan	3-6 months
Secondary Approvals				
Works Approval and Operating Licences	Part V EP Act	DWER	Submission of works approval and licence applications Required if: • Dewatering >50,000 KL • Processing > 50,000 tonnes/ year • Mineral sands screening > 5,000 tonnes / year • Screening of other material > 50,000 tonne / year	3 months
Groundwater Licences	RIWI Act	DWER	Submission of 5C GW licence application (if water requirement is greater than 25,000 KL)	3 months

Table 12.1: Approvals Required for Cadoux mine site

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Existing Environment

Regional setting

The Project's proposed mine will be in the Avon Wheatbelt (AVW) bioregion, as defined by the interim biogeographic regionalisation for Australia (IBRA) classification system. The region is characterized by gently undulating landscapes of low relief; proteaceous scrub heaths on residual lateritic uplands and mixed woodlands on quaternary alluvial soils. The project locality is dominated by mixed woodland of Mallee and Eucalyptus species.

The region has been extensively cleared for agriculture and grazed by stock since the late 1890's.

Climate

The climate of the Merredin subregion is characterised as semi-arid warm Mediterranean and is characterised by hot dry summers and wet winters. The area receives a mean maximum annual rainfall of approximately 388.5mm. Mean daily maximum temperatures range from 34.6°C in January to 17.0°C in July. Mean daily minimum temperatures range from 18.2 °C in February to 6.6°C in July.

Topography and soils

The Avon Wheatbelt is an area of active drainage dissecting a Tertiary plateau in Yilgarn Craton. Within this region the Avon Wheatbelt is an ancient peneplain with low relief, gently undulating landscape.

The project lies within the Avon Province, which consists of a laterised plateau (dissected at fringes and with saline drainage lines inland) on deeply weathered mantle and alluvium over granitic rocks of the Yilgarn Craton (and Albany-Fraser Orogen). Soils comprise of sandy duplexes soils and ironstone gravelly soils with loamy earths, loamy duplexes, sandy earths, deep sands and wet soils. Vegetation comprises of York gum-wandoo-salmon gum-morrel gimlet woodland and jarrah-marri-karri-wandoo woodlands/forests (with some mallee scrub, tammar-wodjil thickets and scrub-heath).

The Avon province is further divided into two soil-landscape zones, with the Project located within the Northern Zone of Ancient Drainage. This zone is characterised by gently undulating terrain (with some sandplains and salt lakes chains) on deeply weathered mantle and alluvium over granitic rocks of the Yilgarn Craton. Soils comprise of sandy earths (mostly yellow and red), loamy earths (often calcareous), sandy duplexes, loamy duplexes, deep sands and ironstone gravelly soils. Vegetation comprises of Salmon gum-gimlet-morrel-wandoo-York gum woodlands with mallee scrub (and some acacia-casuarina thickets, scrub-heath and samphire flats).

Material characterisation

The waste overburden ranges between 1 m and 8 m thick averaging 4.6 m. This waste varies from stained kaolin through to lightly lateritic and sandy clay and soils.

Surface material

Soil samples were taken from various areas on exploration tenement E70/4673 to determine physical and chemical characterisation of the surface soils in the Project area. 9 soil samples were taken at a depth of between 0 - 4 metres (0 – 2 m topsoil, 2 – 4 m subsoil) and analysed by the Chem Centre (2018). The results are available on request.

Subsurface materials

13 waste and ore samples (subsurface materials below 4 meters) obtained from the exploration tenement E70/4673 were assessed for both their potential to generate Acid Mine Drainage (**AMD**) and their potential for dispersion (sodicity). These samples were taken from drill samples located within the proposed site layout and represent varied depths to incorporate the different lithology. The results are available on request.

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Surface hydrology

The Project area is generally flat with a relief of less than 1-2 meters therefore, surface flow is overland following the topography which in the district is generally north-west to south-east towards small saline ephemeral ponds.
There are no permanent surface water sources on the Project site. The exploration tenement intersects two non-perennial / intermittent streams in the south which feed into small saline ephemeral ponds. Based on draft site plans these streams will not be affected by the project site layout.

Surface drainage lines are dry for most of the year and only flow following periods of heavy rainfall. Usually runoff occurs only after heavy or prolonged rainfall which tends to be associated with tropical cyclones or thunderstorms of the summer months. Flood potential at the site is minimal.

No nationally important wetlands occur within the Project area. None of the non-perennial/intermittent streams within the Project area drain into any nationally important wetlands.

Groundwater

No groundwater has been intercepted to date during the exploration drilling campaigns, indicating that the groundwater table is below 40m, which was the depth of drilling. The preliminary pit depth will be 36 m which is well above the water table, therefore no seepage is expected during mining of the pit. Dewatering of the pit will not be required pre or during operations. Some dewatering may be required following periods of high rainfall.

Vegetation and flora

Much of the vegetation of the Avon province has been cleared for agricultural development as is the case for this project. In their natural state, the northern sandplains support acacia-casuarina-melaleuca thickets. In the south is a proteaceous scrub-heath of Dryandra, Allocasuarina, Banksia, Hakea, Grevillea and Acacia.

The Project area is cleared cropping land and small pockets of native vegetation can be found along nearby boundary fences, water courses and along road verges.

Flora of conservation significance

Species of flora are defined as threatened or of priority conservation status where their populations are restricted geographically or threatened by local processes.

No "Priority Flora", as listed by Department of Biodiversity, Conservation and Attractions (**DBCA**) were identified within the Project. Two flora of conservation significance listed under the State WC Act 1950 have the potential to occur within 5 km of the Project, i.e. Grevillea bracteosa subsp. bracteosa (**T**) and Caladenia cristata .

Communities of conservation significance

Communities of plants are described as "Threatened Ecological Communities" (**TECs**) if they have been defined by the Western Australian Threatened Ecological Communities Scientific Advisory Committee and gazetted under the WC Act. No TEC's are known to occur have been identified in the Project.

Conservation areas

The Project area is not located within an Environmentally Sensitive Area (**ESA**) listed under the Environmental Protection (EP) Act 1986. The Project area is not located within a listed or proposed conservation area managed by DBCA.

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Fauna

The native fauna population is limited and generally confined to the isolated small pockets of native vegetation in the region. None of these pockets of native vegetation will be affected by the proposed mining operations.

Fauna of conservation significance

Species of fauna are defined as rare or of priority conservation status where their populations are restricted geographically or threatened by local processes. Rare fauna species are gazetted under the WC Act 1950 and therefore it is an offence to impact rare fauna without Ministerial approval. Priority fauna are under consideration for declaration as rare fauna.

No "Priority Fauna", pursuant to the State Wildlife Conservation Act 1950 were identified within the Project area.

Social environment

There are no registered Aboriginal sites or other heritage places within the Project area. There are no European heritage sites located within the project area and the Project is a greenfield project site with no existing mining infrastructure on site. The Project is on freehold land with the owners consulted in regard to the exploration drilling. There are no water reserves located within the Project.

Mine closure

A Mine Closure Plan (**MCP**) must be prepared by the proponent to demonstrate to regulators, based on reliable science-based and appropriate site-specific information, that ecologically sustainable closure can be achieved. Closure planning is progressive and an MCP will continue to be adapted as necessary throughout the life of a mine. A preliminary closure plan will be prepared and submitted with the Mining Proposal as part of the approval process for assessment by the DMIRS under the Mining Act.

As part of the mine closure planning process, financial provisioning for rehabilitation/mine closure must be considered. Preliminary provisioning for closure costs will be based on the rehabilitation liability for mining development/infrastructure.

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Kwinana – proposed refinery area

A desktop study has been completed and there are no immediate concerns at this point in the PFS.

Nature of Authorisation	Trigger for referral and/or assessment	Comment
Ministerial Statement –this is a primary environmental approval required for 'environmentally significant proposals'. It follows on from an assessment of the proposal by the WA Environmental Protection Authority (EPA). Referral of a proposal to EPA for possible assessment under Part IV of the Environmental Protection Act 1986 is not compulsory, but it provides an improved level of certainty (and prevents referral by a third party). Secondary consents may be applied for, but cannot be granted, while the "Part IV" process is in progress.	No quantitative trigger defined.	Referral to the EPA may not be required: project could probably be permitted under Part V of the Environmental Protection Act 1986.
Approval under the *Environment Protection and Biodiversity Conservation Act 1999* ('EPBC Act') – this is a Commonwealth authorisation which is only required if the project is assessed at a federal level because it has the potential to impact "Matters of National Environmental Significance". (Usually, this means protected or animals.)	Depends on species or community potentially affected by proposed activity. In the case of black cockatoos, for example, referral is recommended if clearing of more than 1 ha of 'quality foraging habitat' is proposed.	Under some circumstances the EPBC assessment can be conducted as an 'accredited process' under the bilateral agreement with the state of Western Australia. If the bilateral process is followed the Commonwealth will recognise the assessment carried out by the State agency but will issue its own approval (usually including some additional implementation conditions). The Threatened Ecological Community 'Sedgelands in Holocene dune swale', which is protected under federal legislation, may occur on the proposed plant site.
Clearing permit (Part V of the Environmental Protection Act 1986) to authorise clearing of native vegetation.	No minimum quantity specified.	The Threatened Ecological Community 'Sedgelands in Holocene dune swale', which is protected under state legislation, may occur on the proposed plant site.
Licence to take protected flora or fauna. Allows removal/ clearing of rare flora or fauna.	No minimum quantity specified.	Protected flora or fauna may occur on the proposed HPA site.

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Licence to construct a bore (Section 26D of Rights in Water & Irrigation Act 1914)	All bores except monitoring bores must be covered by a 26D permit.	Unlikely to be required (assumes plant will use scheme water).
Licence to take water (from surface water or groundwater) (Section 5C of Rights in Water & Irrigation Act 1914)	Stock and domestic bores are exempt from licensing.	
Works approval and licence for prescribed premises under Part V of the Environmental Protection Act 1986, potentially including the categories listed below.		Works approval allows construction and commissioning of facilities. Licence allows operations of facilities. The proposed plant site lies within and are subject to the Environmental Protection (Kwinana) (Atmospheric Wastes) Policy Approval Order 1999. Permitting of processing activities is likely to include as strong focus on atmospheric emissions, especially particulates and acid gases. Management of process residues and acidic wastes will most likely attract close regulatory scrutiny.
• Category 5 (Processing or beneficiation of metallic or non-metallic ore and / or storage of	50,000 tonnes or more per year	
• Category 31 (Chemical manufacturing)	100 tonnes or more per year	
• Category 67 or 87 (Burning of gaseous, liquid or solid fuel in a boiler for the supply of steam or in power generation equipment)	>500 kg/hour (for fuel with S content <0.25%)	
• Category 73 (bulk storage of acids and other specified chemicals)	1000 m3 or more in aggregate	
Approval for storage / handling of dangerous goods under the Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007.	Varies according to stored substance	Depending upon the quantity of reagents stored, the site may also be regulated as a Major Hazard Facility. Consultation with the Department of Mines Industry Regulation and Safety will be required.
Consent to disturb Aboriginal site: Section 18 of the Aboriginal Heritage Act 1972.	No minimum quantity specified.	May not be required: no registered heritage sites are listed in government databases at the proposed plant site. The nearest land-based registered Aboriginal heritage site is located approximately 1.6 km ESE of the site. Botanica notes that the proposed plant site lies within the proposed Gnaala Karla Booja People Indigenous Land Use Agreement (ILUA) area.
Notification of site contamination under the Contaminated Sites Act 2003	Reporting is required within 21 days of becoming aware of the contamination.	The proposed plant site is not listed on government databases of contaminated sites (status current as at 13 September 2018).

Planning and development approvals for construction and use of new buildings and infrastructure, industrial processing activities, waste management.		Separate to any environmental approvals, it will be necessary to consult with local planning authorities about any constraints arising from local planning policies on the proposed development.

Table 12.2: Potential Approvals Required for the Kwinana refinery

13. Project Implementation

Highlights

- **The Project Schedule main deliverables are:**
    1. **BFS Completion** **Q2 2019**
    2. **Approvals and permitting completed** **Q4 2019**
    3. **Off-take agreements completed** **Q4 2019**
    4. **Financing commences** **Q1 2019**
    5. **Construction commencement** **Q4 2019**
    6. **Operations commence** **Q2 2021**
- **Project execution using a traditional Engineering, Procurement and Construction (EPC) approach;**
- **The Company is committed to the recruitment, training and development of a locally based workforce using local service providers / contractors;**

In formulating the project implementation plan and targeting the shortest possible construction period, consideration was made without compromising safety, quality or schedule. The design and implementation of the Project will conform to all statutory laws and regulations.

To ensure the best safety record possible during implementation, all Project personnel will be required to adhere to defined safety standards developed by the Company, in conjunction with the Engineer, specifically for the Project.

Development Methodology

The Project can be divided into three major areas: the (1) development of the open pit mine and its associated haul roads; the access road, waste dump and preparation for in-pit waste disposal, the (2) design, construction and commissioning of the beneficiation facility and surrounding infrastructure required to support the beneficiation facility in Cadoux and the (3) design, construction and commissioning of the refinery and surrounding infrastructure required to support the refinery in Kwinana.

Both processing facilities are:

- Technically complex;
- Multi-discipline;
- Design intensive; and
- Interconnected.

As such, the processing facility (proposed at Kwinana) contributes significantly to the technical risk and by nature of the complex schedule interconnections, a large proportion of the project's risk is in the efficient scheduling (of each component).

The Cadoux mine infrastructure (access road, waste dump, TSF and buildings) portion of the Project consists of a number of essentially standalone tasks which are:

- Technically less complex;
- Generally single discipline (e.g. earthworks);
- Have independent and relatively straight forward schedules; and
- Will be suitable for vertical construction or design and construction contracting strategies.

The Project capital cost estimate has been developed on the basis that the process plant and infrastructure areas of the project will be executed using an Engineering, Procurement and Construction (EPC) approach. Consistent with this methodology, materials, equipment and labor costs have been input at cost price and a contingency, based on the level of scope definition, has been included to cover errors, input variations and omissions. A head contract margin, representing the cost to the head contractor of covering the contract risk associated with providing guarantees for cost, schedule and performance of the finished facility has also been included on the total predicted cost of the project.

The development methodology for the Project should provide a mechanism for the transfer of a significant portion of the process facility and infrastructure technical and schedule risk to a competent and experienced engineering organisation. This is best achieved through the use of a contract with an integrated design and construction organisation able to competently control design, procurement and construction activities to drive cost and time outcomes that correlate to the Project budget and schedule. It is critical for the success of such a contract that the scope of work (defined by the equipment and instrument list, layout drawings and process description) be well defined so that both the principal and contractor have a clear understanding of the desired outcomes. The PFS report deliverables provide a suitable basis for the definition of the final scope of work.

Insurances

FYI will adopt a "Principal Controlled" approach to the Projects construction insurance program. This means that where there are shared risks between the stakeholders associated with the Project, these are insured by the Company.

With any project, there are shared risks and singular risks. Under a Principal "Arranged" or "Controlled" insurance program where there are shared risks, these are insured by the owner or principal of the Project. Where risks relate to each singular party, these risks are be insured by that contracting party.

In essence, the Project will place and own the major policies such as construction, marine cargo and third-party liability on behalf of itself and all designers, engineers, contractors, suppliers and other interested parties including financiers. This ensures access by the Principal to insurance coverage at all times, particularly post construction completion when latent claims can surface. Importantly, the principal has control over the cover to ensure it matches the risks faced by the Project.

The contractors will be responsible for arranging covers for their own singular risks, such as construction plant, motor vehicle and workers compensation.

While each owner has a different view of what insurance program needs to be placed to cover the Project risks this should be based on exposures identified through risk assessment. The advocated Principal Controlled program is comprised of core and optional covers. The core cover generally will be mandatory if there are financing arrangements. Some of the optional covers may be desirable depending on the exposures identified and sensitivity to loss of the Project.

The advantages of this approach are that the Principal or Owner who has control of the decision-making process. The Owner is able to exercise control and options on matters such as:

- type(s) of insurance covers to be purchased;
- limits of liability to be purchased scope of cover, broad or narrow deductible levels, low or high;
- premium levels, offsets for scope of cover, deductible and risk mitigation;
- underwriter's security/claims paying ability; and
- ownership of the insurances in the event that any of the Contractor(s) default.

The vast majority of construction projects throughout the world are now insured on this basis as it is the Owner who has most to lose if protection measures are not adequate or the contractor(s) fail.

Contracting Plan

Subsequent to the selection of the development methodology for the Project, a contracting plan for implementing the various Project works was formulated.

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EPC Contract Services

The EPC Engineer will provide the following services associated with the development of the Project:

- finalise geotechnical engineering for the plant site, site and plant access roads;
- design and construction of the site access road;
- design and construction of the TSF;
- design and construction of plant power distribution system including coordination with power supply contractors;
- design and installation of project buildings;
- surveying services during construction;
- process Engineering;
- design Engineering and Drafting - for earthworks, civil works, structural works, etc.;
- project Services – including, cost control, scheduling, reporting, claims processing;
- quality control and management;
- safety management;
- preparation of Installation and Maintenance manuals and documentation;
- procurement – including materials, equipment and fabricated items including tendering, purchasing, expediting and contract preparation and administration;
- logistics (Transport) co-ordination – including overview of all aspects of the logistics services;
- construction Management – including site management, control and inspection of all construction activities, safety management;
- commissioning – including pre-commissioning and testing, dry commissioning, wet commissioning, operator training and operational assistance until handover;
- overall site management until completion of commissioning.

These specialist services will be provided by the Engineer's staff or will be provided to the Engineer on subcontract.
The Engineer will execute most of the engineering, design and procurement from its home office and will maintain direct construction management from the site office at the plant site. Key members of the Project team will be resident in the Engineer's office during detailed design, to review and approve engineering design and equipment selection and will then relocate to site during construction.

Overall site management and administration will be managed by the Company, including community relations and overall site safety.

The Company will be responsible for Owner's Costs, which include mining, government liaison, permitting, insurances and all operating and pre-production related activities such as personnel recruitment and training.

Mining Supply and Service Contracts

The PFS has assumed that:

- Mining operations will be contracted out; and
- Mining contractor will supply and manage the supply of diesel fuel.

To ensure sufficient lead time for specification, tendering and award of the mining contract, this process will need to commence soon after formal Project go-ahead. Both processing plants in Cadoux and Kwinana will be operated by the Company.

Construction Packages

Horizontal packages will be utilised for the construction of major works associated with the Project managed under an EPC contract. These packages will generally be single discipline construction packages competitively bid by construction organisations with substantial track record of successfully completing similar works in the area.

Consideration will be made during the tender process regarding breaking each of the disciplines into separate work packages to match the capability of supply companies with the size of the work. For example, the civil works may be logically split in several areas with appropriately sized organisations working simultaneously on concrete work at the crusher, process plant and buildings

Use of local resources is envisaged for most of the site-based contracts. Experience has proven that local contractors are both capable and economical in earthworks, concrete and building disciplines.

Equipment and Material Supplies

The Engineer will be responsible for the procurement and delivery to site of all new equipment and materials required for the Project.

Generally, all equipment and materials will be competitively bid, to the international markets. Award of supply packages will be made on the basis of technical compliance, price and delivery period. Supply packages will be tailored to suit individual supplier's capacity to optimise schedule, cost and risk.

Individual packages (i.e. steelwork fabrication, plate work fabrication) will be structured to suit an individual contractor's production capacity such that the optimum schedule, cost and risk balance is achieved.

The use of local suppliers and contractors will be encouraged at all times.

Implementation Employment and Training

The Company is committed to the recruitment, training and development of a locally based workforce.

Logistics

The Engineer will engage a logistics contractor (freight forwarder) with local and international representation specifically for the Project. All equipment and materials will be stored on site in laydown areas or the plant warehouse prior to installation. Construction contractors will be responsible for off-loading and re-handling.

Construction Services

The various services and facilities required to enable construction activities to commence will be established at the commencement of construction, including:

- The establishment of the Engineer's site facilities, inclusive of offices, meeting rooms, kitchen facilities and meals area, ablutions etc.;
- The establishment of all site ablutions and associated wastewater collection, treatment and
- disposal systems;
- The establishment of the plant communications system to allow phone, fax and email correspondence;
- The establishment of an approved construction waste disposal system, in accordance with the local statutory requirements and Company's environmental permit;
- The establishment of a well-equipped and resourced first aid facility, emergency response equipment and trained personnel;
- Construction water for earthworks and concrete with water treatment as necessary.

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Project Activities

An overview of the major activities is presented below:
Engineer's activities

- Engineering / design;
- Drafting;
- Purchasing;
- Contract preparation;
- Project management;
- Inspection and expediting (as required).

Europe / Australia / South East Asia Activities

- Structural steel and plate work fabrication;
- Tankage fabrication (for site erection);
- Procurement of mechanical & electrical equipment;
- Shipping, including;
    - Consolidation and packing;
    - Freight (land and sea);
    - Loading onto vessel and / or truck (as required).

Cadoux / Kwinana Site Activities

- Site management;
- Receival and storage of offshore equipment;
- Earthworks / concrete works;
- Installation of structural steel, mechanical plate work, mechanical equipment, pipework and electrical / instrumentation works;
- Construction of site buildings, services, roads, water supply, power lines and tailings disposal facility;
- Commissioning.

Organisational Structure

The EPC Engineer will undertake the detailed design, procure equipment and services, manage the Project, and contract the construction and commissioning of the process plant, associated infrastructure and services. This will ensure that there is a constant transfer of information and knowledge from the design phase through to construction and commissioning. It also provides the Company with the confidence of having a single organisation responsible and accountable for all aspects of the Project development. An organisational chart has been developed, encompassing all phases of Project execution

When the processing plant is practically complete, it will be handed over to the Commissioning Manager who will oversee the plant commissioning, operator training and plant performance trials (as required). The Commissioning Manager will be supported by both the Project Manager and Construction Manager until the plant is successfully commissioned and handed over to the Company's operators.

Owner's Management

The Company will establish a team to manage all aspects of Project development and implementation consisting of the following key personnel:

- Project Manager;
- General Manager;
- Mining Manager;
- Process Consultant;
- Cost Controller / Accounts.

The Company's team will manage the Engineer in the provision of the EPC services during construction and will also implement the various preproduction activities not included in the Engineer's scope, including:

- Implementation of the Contract Mining Operation;
- Implementation of fuel supply;
- Recruitment of all operational personnel;
- Establishment of operating systems and procedures;
- Training of operations personnel;
- Permitting and statutory liaison.

The Company will provide specific support in the areas outside the scope of the head contract including; permitting, community liaison, compensation and relocation.

In addition, the Process Manager, other senior geological and mining personnel and associated support staff will be recruited progressively during the development phase and will have responsibility for establishing operating systems, recruitment and training of the operating teams.

Project schedule

The Company forecast to complete the BFS in Q2 2019 and subject to Approvals and completion Financing to commence construction Q4 2019. First HPA produced is planned for Q2 2021.

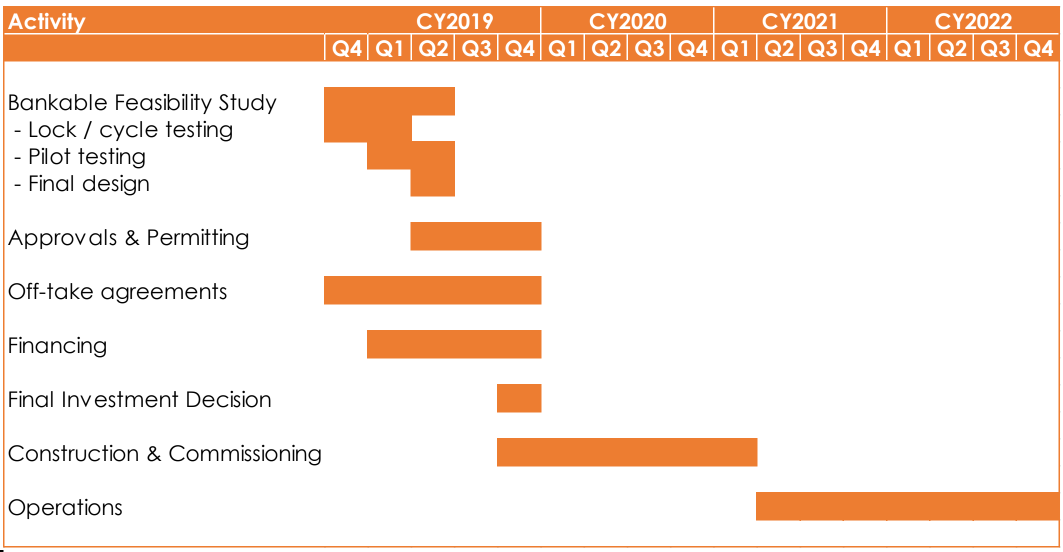

Figure 13.1 Project timetable

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14. Capital Cost Estimate

Summary

- **Total capital estimate is competitive at US$179m, resulting in capital intensity of US$22,344/t**
- **The capital cost estimate has been costed to an accuracy -15% / +25% as per recommended practice 18R-97 for process industries set out by AACE International for Class 3 estimates**
- **Sustaining capital over Life of Project US$2.7m, or 1.5% of capital estimate**

The Project capital cost estimate developed for the PFS is based upon an Engineering, Procurement and Construction (**EPC**) approach for the beneficiation plant and refinery and therefore is inclusive of contractor's margin. The mine establishment will be executed by the mining contractor under direct contract to the Company.

The capital cost estimate includes all labor, EPC and consultants' services, equipment, materials, taxes, fees, duties, mining establishment, freight, first fills of plant reagents and consumables, spare parts and working capital required to design, procure, construct and commission all of the facilities required to establish the Project.

The capital cost estimate compiled for the processing plant and infrastructure facilities is based on the design criteria and flowsheets developed from the latest metallurgical testwork results and discussions with Company personnel or appointed consultants.

Preliminary plant equipment selections were made based on the developed flow sheets and updated site layouts were developed. Sufficient engineering design has been undertaken to ensure the feasibility of the layouts, the accuracy of equipment selections and to enable material quantities to be estimated.

The Project capital cost estimate has been costed to an accuracy -15% / +25% as per recommended practice 18R-97 for process industries set out by AACE International for Class 3 estimate and based on the following:

- developed engineering quantities from calculations and design drawings;
- budget quotations obtained for major items and site-based contract works;
- the capital cost estimate was broken down using a conventional Work Breakdown Structure (**WBS**) with plant areas (i.e. beneficiation, refining, infrastructure, waste disposal and product handling) as sub-categories; and
- in addition, the capital cost estimate was broken down into commodity components (i.e. equipment, steel, concrete etc.).

A summary of the capital cost estimate for the Project is provided in Table 14.1.

Capital Costs Estimate	US$	%
Cadoux Site Preparation	120,843	0%
Cadoux Plant	9,301,576	5%
Kwinana Site Preparation	3,490,048	2%
Kwinana Process Refinery	86,452,538	48%
Kwinana Process Services	16,829,728	9%
Kwinana Admin and Infrastructure	2,447,044	1%
Project EPCM	22,287,907	12%
Owners Project Costs	15,101,831	8%
Project Contingency	22,719,429	13%
Project Total	**178,750,945**	**100%**

14.1 Capital cost estimate

The detailed capital costs for Cadoux and Kwinana is tabled below.

Capital Costs Estimate WBS Level 1	Costs before contingency US$	Contingency US$	Total Project Costs US$
Earthworks	80,348	16,070	96,418
Fencing	40,495	8,099	48,594
Attritioning, Classification and Thickenin	1,572,754	157,275	1,730,030
Kaolin Centrifuge, Product Drying & Sto	2,624,169	262,417	2,886,586
Fuel, Water & Air Services	430,273	46,941	477,214
Plant Buildings & Offices	353,224	35,322	388,547
Power Reticulation - Plant & Infrastruct	1,198,596	119,860	1,318,455
Power Generation	303,813	30,381	334,195
Plant Piping	538,821	66,291	605,113
Project Management	161,328	16,133	177,461
Engineering and Drafting	770,076	77,008	847,084
Site Supervision and Management	1,282,856	128,286	1,411,142
Site Construction Cranes & Equipment	500,003	50,000	550,003
Site Construction Facilities	272,596	27,260	299,856
Commissioning	105,788	10,579	116,367
Owners Project Costs / Mobile Equipm	2,531,644	253,164	2,784,808
Initial Fills	427,875	42,788	470,663
Spare Parts	245,561	24,556	270,117
Mobilisation & Demobilisation	175,137	17,514	192,650
Contractor Indirect Costs	658,753	65,875	724,628
Total Cadoux Plant	**14,274,112**	**1,455,819**	**15,729,931**
		10%	

14.2 Detailed capital cost estimate for Cadoux

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Capital Costs Estimate WBS Level 1	Costs before contingency US$	Contingency US$	Total Project Costs US$
Earthworks	3,435,475	515,321	3,950,796
Fencing	54,574	8,186	62,760
Power Reticulation - Plant & Infrastruct	10,173,873	1,526,081	11,699,954
Kaolin Storage and Conversion	3,480,286	522,043	4,002,329
HCL Leaching & Filtration	4,310,688	646,603	4,957,291
HCL Precipitation - Stage 1	3,163,818	474,573	3,638,391
HCL Precipitation - Stage 2	3,301,863	495,279	3,797,142
Precipitation - Stage 3	4,024,379	603,657	4,628,036
HPA Roasting, Calcination & Packagin	9,385,203	1,407,780	10,792,984
Offgas Scrubbing & Cleaning	6,488,991	973,349	7,462,340
HCL Gas Generation	21,836,663	3,275,499	25,112,162
Effluent Neutralisation	1,019,078	152,862	1,171,940
Reagent Mixing & Distribution	858,920	128,838	987,758
Water Storage & Reticulation	946,592	141,989	1,088,580
Steam Supply & Reticulation	5,177,603	776,641	5,954,244
Cooling Water	3,911,257	586,688	4,497,945
Air Services Supply & Reticulation	257,038	38,556	295,594
Plant Buildings & Offices	1,313,954	197,093	1,511,048
Plant Workshop / Stores	482,775	72,416	555,191
Laboratory	650,314	97,547	747,861
Plant Piping	18,927,730	2,839,160	21,766,890
Project Management	4,964,155	744,623	5,708,779
Engineering and Drafting	10,312,388	1,546,858	11,859,246
Site Supervision and Management	4,027,121	604,068	4,631,189
Site Construction Cranes & Equipment	3,199,347	479,902	3,679,249
Site Construction Facilities	248,483	37,272	285,755
Commissioning	664,195	99,629	763,824
Mobile Equipment	597,938	89,691	687,628
Initial Fills	1,350,750	202,613	1,553,363
Spare Parts	403,736	60,560	464,296
owners Project Costs	11,972,250	1,795,838	13,768,088
Mobilisation & Demobilisation	242,024	36,304	278,327
Site Indirect Costs	573,945	86,092	660,037
Total Kwinana Plant	**141,757,404**	**21,263,611**	**163,021,014**
		15%	

14.3 Detailed capital cost estimate for Kwinana

Capital cost adjustment to pre-PFS estimate

The PFS capital estimate extended slightly from the pre-PFS estimate for the following reasons:

- change in design scope of approximately ~25% to original study proposal
- increase in targeted production to 8,000tpa
- tighter estimation range and scrutiny on costs
- is engineered for long life and includes triple redundancies
- includes high level of structural protection (steel and concrete) and in-built safety equipment
- an All-in estimation of capital items – rather than scoped
- All-in Costs i.e. civils, mobile fleets, Owners costs (corporate), service connection fees etc.
- Exchange rate fluctuations of Euro and US$

In the capital cost estimate, no allowances have been made for, escalation of prices, financing costs or interest, currency exchange rate variations and GST.

In addition to WBS, process plant direct costs have been separated into logical processing circuits or areas that follow the process flowsheet. Each area has been further divided into the major commodity types such as equipment purchases, structural steel, plate work, concrete works, electrical works and piping works.

Indirect costs have been similarly broken down into logical functional areas and then further distributed across the individual cost centers.

In addition to direct and indirect capital costs, provisions have been made for operating and commissioning spares and initial fills, EPC expenditure and contingency.

There is no mining capital expenditure. The mining contractor will be paid based on a rate per tonnes mined/moved. The rate includes the usage of capital equipment.

Payback period

The All-in Payback period for the project is estimated at 3.6 years. The payback period is calculated on the after-tax free cash flow generated from the operations and including Owners costs (corporate costs).

Sustaining capital expenditure

In addition to the general maintenance provisions addressed in the operating cost estimate, there is also a requirement for "sustaining" capital expenditure over the life of the Project. The estimated sustaining capital or deferred costs are based on industry experience and are US$ 106,000 per annum, or 1.5% of the capital estimate. Total sustaining capital expenditure over the life of the Project is projected to be US$ 2.7m.

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15. Operating Cost Estimate

Summary

- **Operating costs over the life of the Project is a competitive US$6,467/t HPA produced**
- **The costs estimates have been developed from first principles with an accuracy of -15% / +25%**

Project operating costs have been developed from first principles using a range of sources. Costs are presented in US dollars and are based on prices for the 3rd quarter of 2018 (3Q18). The costs estimates are considered to have an accuracy of -15% / +25 %.

The following throughput parameters have been used for all costs estimates.

Throughput & Production	Unit	Amount
Throughput	tpa dry	50,000
Head Grade	wt% Al2O3	24.4%
Kaolin Yield to Cadoux Product	%ROM	49.1%
Kaolin Product Feeding HPA Refinery	tpa dry	24,500
Overall Al2O3 Recovery, %	%	65.6%
99.99% HPA Product, tpa	tpa	8,000

Table 15.1 Throughput & Production

Processing operating costs have been determined based on the beneficiation of 24,500 tpa of kaolin concentrate and production of 8,000 tpa HPA 4N.

The operating costs have been compiled from a variety of sources, including:

- budget quotations received from suppliers;
- engineer database of prices for consumables;
- manning levels, wages and salaries based on current market;
- administration costs derived from information provided by the Company;
- reagent consumptions, process consumables derived from test work results;
- engineering data base on similar sized operations; and
- first principle estimates based on typical operating data.

The life of project operating unit cost summary appearing below (Table 15.2) is based on parameters derived from the process design criteria and include all processing costs associated with producing kaolin concentrate from Run of Mine (**ROM**) ore and refining high purity alumina from kaolin concentrate.

Operating Costs / tonne	US$ /t HPA
Mining	107
Beneficiation - Cadoux	769
Refining - Kwinana	5,591
Operating Costs	**6,467**

15.2 Operating cost unit summary – by activity/cost centre

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Processing Costs by Category	Annual		
	AUD	US$ / t ore	US$ / t hpa
Labour	12,010,050	246	1,501
Reagents & Consumables	2,665,395	55	333
Maintenance Materials	8,783,667	180	1,098
Electrical Power	5,094,735	104	637
LPG & Natural Gas	13,932,889	286	1,742
Diesel - Vehicles	418,182	9	52
Product Transport	992,701	20	124
Waste Transport & Treatment	2,517,114	52	315
General & Administrative	4,464,345	92	558
Total Operating Costs	**50,879,079**	**1,043**	**6,360**

15.3 Processing cost unit summary – by category

16. Financial Analysis

Summary

- **Attractive returns Base Case**
  1. **Project NPV of US$ 506 million**
  2. **Project IRR of 46%**
  3. **Free operating cashflow of US$ 90 million per annum**
  4. **Project net operating cash flow in excess of US$2 billion.**
- **Upside Case: capacity increase to 10,000 tpa will increase NPV to US$675 million**

Parameters

The Project's base case financial projections (**Base Case**) have been modeled with a conservative average sales price of US$24,000 per tonne of high purity alumina produced. The Project's net present value is derived on a post royalty, post-tax, 70% debt and 30% equity-funded, with real cash flows, and a 10% discount rate.

The Base Case analysis incorporates the current reserve and metallurgical recoveries as discussed in other sections of this PFS and a project life of 25 years. All projections in this PFS are based on studies performed by CSA Global, Orelogy and GRES. In the first year it is assumed that the Company will produce and sell 70% (5,600t HPA) of the annual capacity.

The Project will generate approximately US$90 million of free cash flow per year after all operating costs, royalties and corporate taxes but prior to amortization of capital costs. The analytical parameters are noted below.

Key – Financials – Base Case

The Base Case financial demonstrates that the Project is economically viable. The NPV post tax is US$506 million, the IRR 46% and the payback period 3.6 years.

Project Returns		
Post Tax Outcomes		
Valuation - NPV - 10%	US$ m	506.0
Project IRR	%	46.3%
Payback period	Yrs	3.6

Table 16.1 Project Returns

The summary economics table shows that the Net Operating Cashflow is US$ 2.3 billion and the average annual EBITDA is US$128 million.

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Summary Economics		
Financials		
Revenue (Total)	US$ m	4,742
Net Operating Cashflow (Total)	US$ m	2,266
Annual EBITDA (Avg)	US$ m/a	128
Operations		
Ore Mined	Mt	1.3
Strip ratio	W:O	1.7
Ore Processed	Mt	0.6
Production	ktpa	8.0
Production	kt	198
High purnity alumina sold	kt	198
Operating costs	US$ / t	6,467
All in sustaining cash cost	US$ / t	7,807

Table 16.2 Summary Economics

The Project's Base Case outcome for cash operating costs and all in sustaining costs (**AISC**) for the first 12 years of operation is shown in Figure 16.3.

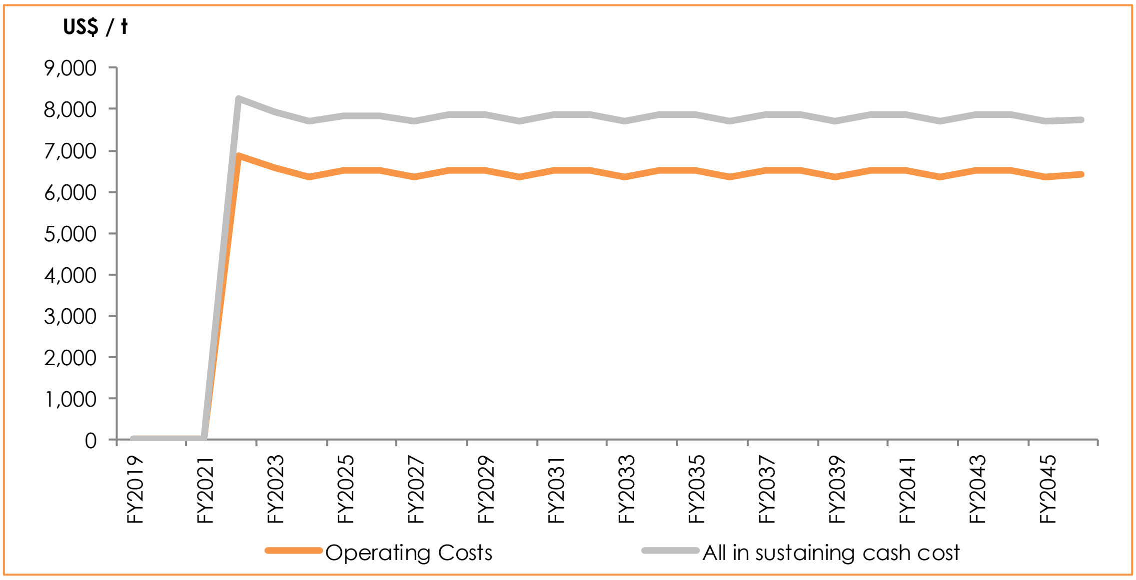

Figure 16.3 Base case operating costs

Cash Flow

Cashflow forecasts are calculated on an annual basis. The Project will generate approximately US$90 million of free cash flow per year after all operating costs, royalties and corporate taxes but prior to amortization of capital costs.

The Project free cash flow on an annual basis is shown below in Figure 16.4.

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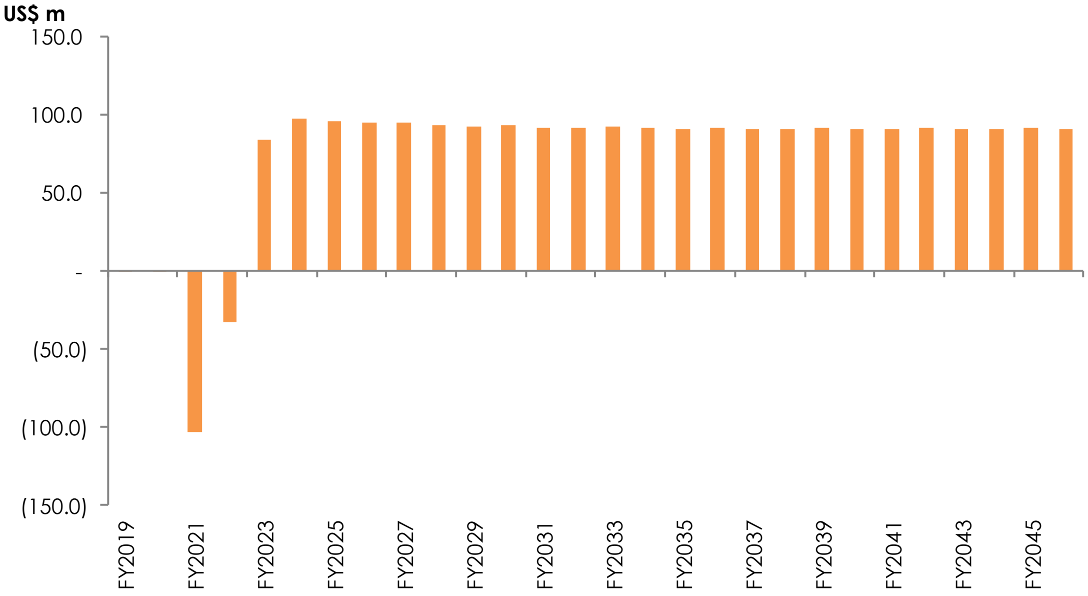

Figure 16.4 Free cash flow after costs

Upside Case

In the flow sheet design and engineering, a potential efficiency capacity increase of 2,000 tpa to 10,000tpa from 8.000tpa has been allowed for. The increase in capacity will require an additional capital expenditure of US$40 million to install a third HCl leaching circuit. The NPV will increase by US$169 million to US$675 million. Operating expenditure per tonne will reduce by 5% to US$ 6,144/t.

Sensitivities

The effects of varying a number of key drivers of cost and revenue have been modeled to assess their effects on the project value.

The Project's sensitivity analysis, at 10% discount rate, and changes to input by +/- 20%, is shown below represented in a Tornado Graph. The Project is highly sensitive to the sales price, throughput and less to Operating and Capital Costs.

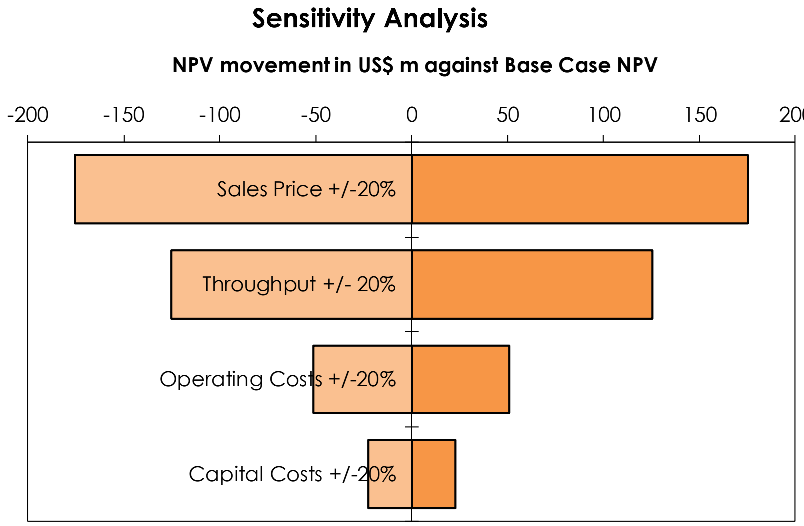

Figure 16.5 Sensitivity – Tornado graph

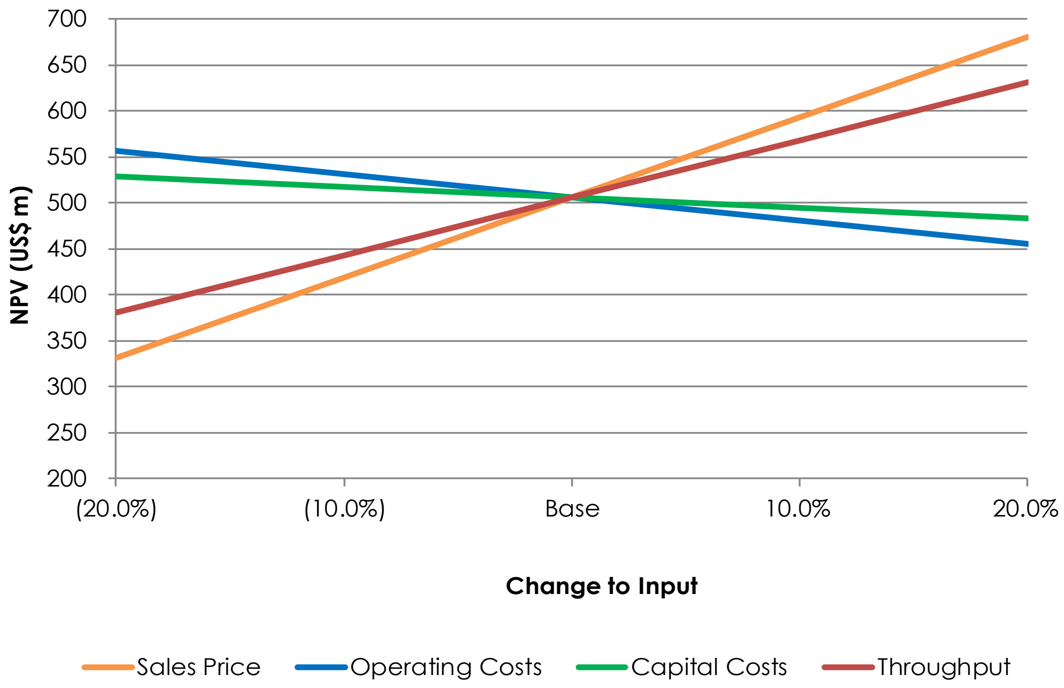

Figure 16.6 Sensitivity – Spider graph

Sensitivity Table - Post Tax NPV 10%				
% Delta	Sales Price	Thoughput	Capital Costs	Operating Costs
-20%	331	381	529	557
-10%	418	443	517	532
Base	506	506	506	506
10%	594	569	495	480
20%	681	631	483	455

Figure 16.7 Sensitivity Table

17. Development Financing

Currently there is a high level of market interest in the battery and associated power storage industries – largely driven by the EV market. Additionally, the HPA sector specifically is experiencing increased demand from EV related growth as well as from its broader, more traditional markets that are also experiencing quality and specification "creep".

Cadoux's compelling financial case outlined in the PFS coupled with the demonstrated high quality and grade with long mine life should be a clear attraction to investors as they typically seek superior investment opportunities with high supporting returns.

FYI's funding alternatives for Cadoux's moderate capital include traditional and non-traditional methods. Options currently being considered by FYI in financing the Cadoux HPA project include one or more of the following: equity, traditional debt, off-take financing, Joint Venture, strategic partners.

These options, and potentially other avenues of financing, will be investigated further under the BFS.

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18. Risks and Opportunities

Opportunities

By-products revenue stream

Testing of the kaolin in Cadoux has shown that the Project will produce material volumes of high purity quartz (**HPQ**) from the beneficiation at the mine site as well as inert silica from the refining of concentrate in Kwinana as by-products. In the BFS, the Company will evaluate potential revenue streams from these products as they have the potential to add to the project economics considerably.

5N purity product

Based on our recent metallurgical process testing, which resulted in a purity of 99.997%, the Company is encouraged to explore the 5N product in the BFS phase. The Company sees the next phase metallurgical test work as an opportunity to de-risk and optimize its developed process and potentially produce 5N HPA as an additional product. The Company will ensure that sufficient resources are provided for the Lock-cycle testing and setup and operation of the pilot test plant. A 5N product produces greater margins, and there is a growing market to warrant the additional capex.

Increased operational efficiencies

A higher throughput may be achieved following the commissioning phase through operational efficiencies that might be achieved, both at Cadoux and Kwinana, due to the engineering capacity allowances and operational fine tuning.

Industry engagement

In view of the projected growth of the LIB separators market, the Company has joined the Future Battery Industries Cooperative Research Centre's industry research program (**FBICRC**). FBICRC program will enable Australian industry, governments and academics to optimise the cost competitiveness and productivity of the Australian energy storage metals, materials and systems industry to meet growth in markets, companies and exports. It will enable value creation, sustainability and global competitiveness through the battery value chain.

Pilot Plant

The Company is considering the strategy to implement a pilot plant study for the two-fold purpose of 1) to provide additional confidence in the scale-up of the design process and 2) to de-risk the process by allowing further testwork under a range of variable operating conditions – including achieving 5N material.

The HPA produced will have a further use in providing marketable material in off-take testwork and discussions.

Environmental benefits

An important objective for the Company is to develop the Project sustainably and through environmentally friendly methods. In the BFS, the Company will incorporate a life cycle assessment (**LCA**) of its HPA production process and the value chain. The LCA is an important tool in environmental management by identifying energy and materials consumed and wastes released into the environment. It uses a system approach to understand the potential environmental consequences of the product, process, and/or activity from initial extraction of raw materials from the earth until the point when the end products are returned to the earth. The results of the LCA will enable the Company to promote the Project's unique HPA production process as a substantial improvement for the environment from the traditional HPA double-refining production methods.

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Further reduction of capital expenditure

During the BFS, the Company will investigate the further reduction of capital expenditure. As part of the design process and prior to the peer review, the Company will conduct a value engineering process with the aim the reduce the capital expenditure without compromising the process and / or product quality by using substitution materials and methods with less expensive alternatives. Lowest industry capital and operating expenditure is critical for the Company in achieving its objective.

Risks

The company is committed to a risk management framework and a set of processes which effectively manages risk in the business.

These processes include:

- Identification of risks
- Assessment of risks to determine their severity and potential impact
- Evaluation of risk to determine risk retention or mitigation
- Treatment of risks deemed unacceptable to the business
- Communication and consultation of risk management activities
- Review of risks, mitigation strategies, actions and the risk management process.

The Project Risk Management Plan will be aligned with the AS/NZS ISO 31000:2009 - Risk Management - Principles and Guidelines.

Internal controls to manage risks will be developed and these will be monitored on an on-going basis. Further, a management reporting system will be in place to ensure risks and risk issues are reported on a regular basis and are escalated where necessary. Risks with levels higher than that acceptable to the business will be mitigated through the development of appropriate risk treatment actions and plans.

It is the responsibility of all persons in the business to engage in risk management practices and refrain from acting in such a way as to impact negatively on our relationship with stakeholders, customers and employees. All employees are responsible for ensuring the Risk Management Policy and procedures are adhered to and that their activities enhance the value of the company. Employees are also provided with appropriate guidance from the company in making sound commercial decisions.

The Company is committed to continual improvement of the risk management processes and procedures to ensure the highest return to its shareholders.

During the next study phase a comprehensive set of hazard identification (**HAZID**) and risk assessment workshops will be completed to identify the risks and opportunities in the Project. These encompass both broad, high level project wide assessments and more focused assessments on key project components to help assure identification and proper consideration of all risks and opportunities inherent in the project at the appropriate level of granularity

A risk treatment action plan for each identified risk or opportunity will be generated from each individual HAZID study detailing the action/s to be taken, by whom and by when. All risks and any associated actions will be subsequently reviewed and updated by the designated responsible individuals and management team in accordance with the risk review process detailed in the project Risk Management Plan.

Three separate risk registers will be created in relation to the project to log and manage identified risks and opportunities:

- a corporate risk register that incorporates all higher-level risks identified in each of the above studies pertaining to the project that are controlled or managed at the corporate level rather than at the project level such as finance and insurance;

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- a preliminary operations risk register that incorporates all operational risks and opportunities identified in the above studies that require management by operations for the life of the operation; and
- a project risk register that incorporates the project related risks and opportunities identified in each of the above studies that should be managed by the project.

In relation to the Project, the following higher-level risks are identified.

Funding

This is the risk of obtaining the funds to commence the project. The Company has assumed traditional funding and that 70% of the capital required for the Project will be debt funded and the remaining 30% via the equity market. Based on the indicative amount required and the value the Company's will create by advancing studies and de-risking the Project, the Company will mitigate the risk by seeking early involvement of financiers and investors. During the BFS, the Company will ensure that traditional financier's requirements such as construction contract, reserve and off-take parameters are met.

Off-take

An important risk for the Project is whether it will generate the expected revenues or, at least, sufficient revenues to service the debt and pay the project company's expenses and generate a return for the shareholders. A common financier's requirement is that a certain percentage of the sales is covered by off-take agreements. The Company has started discussions with potential customers. In the fourth quarter of 2018, marketing samples will be available to start off-take discussions. The Company will also consider minimum credit rating for customers, export insurance and hedge agreements to ensure that the forecast project revenue is met.

Resource

The majority of the value in this project is generated by refining kaolin concentrate into high purity alumina by using only a distinct quality part of the resource (feedstock). Of the current Mineral Resource Estimate totaling 9.6mt, the Company has only used, for mine design and scheduling the Indicated resource portion which is 3.2Mt @ 24.40% Al203. Based on the Company's annual capacity of 8,000tpa HPA, this Indicated resource will generate more than 50 years of revenue. However, for the PFS, the Company uses a life of project of 25 years. Due to the geology of the deposit, the first 25 years of the deposit generates a higher grade. Total ore mined, used for project evaluation purposes is only 1.6Mt @ 25.15% $Al_2 0_3$. The Company will discuss with financiers the minimum resource classification and percentage required for funding. During the PFS, the Company will conduct the work to ensure compliance for funding.

Design – engineering / technology

To produce HPA, the Company is using a "disruptive" technology (which includes the use (and re-use) of hydrochloric acid – **HCl**) Although the Company's flow sheet is relatively simple and uses well understood chemical processes, the challenge is to produce HPA on a commercial scale. HCl is strongly corrosive and equipment needs to be designed to withstand the constant circulation and re-use of HCl. The Company is aware of where the design of a key portion of a plant was inadequate resulting in process failure. FYI will use a basis of design that includes correct lining / coating of equipment to withstand the chemical corrosive process.

The Company acknowledges the importance of metallurgical testwork and input for the process and plant design and will conduct thorough lock cycle and pilot plant testing in the next study phase which will further de-risk the process from a design point of view. The Company is focused on the fact that the current engineering, process development and metallurgical partnership is a critical success factor in the Project. Extensive peer review will take place in the next study phase.

Permitting risk

The environmental assessment of the sites in Cadoux and Kwinana has not highlighted any concerns. The Company will commence the approval and permitting process in the next study phase to ensure that the approvals & permitting is in place as condition precedent for funding and start on construction.

19. Next steps

FYI has outlined a comprehensive work program, based on the positive outcome of the PFS, the Company intends to proceed to a Bankable Feasibility phase of review which will allow greater degree of confidence towards considering a development decision on the Cadoux integrated HPA project.

A detailed future works program has been developed which will focus on the progressing of the BFS as well as investigating some of the near-term opportunities that have been identified by the Company to improve the project economics.

20. Conclusions

FYI is pleased to provide the results of the Cadoux Pre-Feasibility Study that clearly demonstrates the quality of the HPA strategy through the outstanding economic metrics and outlines the clear and logical pathway forward to developing an integrated HPA business in a favourable operating jurisdiction such as Western Australia.

The Project has the potential to develop into a material global supplier of HPA. The development of the project is ideally timed to be in production to meet the uplift in demand as a result of the EV growth inflection point in the 2022-24 period.

According to the initial PFS economic case, FYI offers investors an alternative and diversification to the EV growth industry.

APPENDIX 1: JORC (2012) TABLE 1

Sections 1 and 2 were extracted from previous FYI announcements.

Section 1: Sampling Techniques and Data

Criteria	Commentary
Sampling techniques	Aircore (AC) samples were collected at 1 m intervals from a rig mounted riffle or cone splitter. 75% of each metre sample was collected in a 900 mm x 600 mm green plastic bag, and the remaining 25% (split sample) was collected in a 610 mm x 405 mm green plastic bag. The split samples were collected directly from the cyclone because the samples for assay were to be collected in plastic rather than calico bags (% moisture needs to be measured, and fine dust (red) can get into the calico). Reverse circulation (RC) chip samples were collected at 1 m intervals from a cone splitter mounted on the side of the RC rig. 75% of the sample volume from each drilled metre was collected in a 900 mm x 600 mm green plastic bag, and the remaining 25% of volume is used to generate a split sample which is collected in a 200 mm x 150 mm calico bag and then placed into a green plastic bag and sealed to retain sample moisture. The split samples were collected directly from the cyclone/splitter because the samples for assay are also measured for in situ moisture. The samples were composited into 2 m samples (generated from the drill rig cone splitter) and sent to Intertek for sampling analysis + moisture testing.
Drilling techniques	AC drilling using a Mantis 100 drill rig with an NQ AC sand bit. The RC drilling program used a 450 Schramm drill rig with KL rod handler, auto maker/breaker slips table, rig-mounted cone sampling system and with hammer and blade bit capabilities. Both hammer and blade drilling were employed on various selected holes to gauge variability and quality of sample return as well as to compare with repeat holes from previous drilling.
Drill sample recovery	Actual recoveries from AC drilling were not measured; however, it is demonstrated from core sample photos of each hole that samples were even sized and reported that recovery of drill samples from all holes were of an acceptable standard. Sample recoveries from the RC drilling were weighed and measured and sizes recorded demonstrating that sample recovery from all holes was of an acceptable standard. Photos of separate chip (cuttings) trays were also taken to demonstrate the lithology profile of the hole. Selected samples were also tested for moisture content – allowing a greater confidence in sample return quality and for specific gravity testing.
Logging	AC: Chip tray samples were taken along with usual logging and the chip tray samples were non-sieved and dry. All holes were field logged by 1 m intervals by a qualified geologist for geological characteristics. RC: Chip tray samples were taken along with normal logging procedures and protocols. Two sets of logging and sample correlation was conducted on site during the drilling and sampling program. The chip tray samples were non-sieved and dry and photographed on a whole hole basis. All holes were field logged by 1 m intervals by a qualified geologist for a variety of geological qualities, characteristics and definition.
Subsampling techniques and sample preparation	All sampling procedures for the AC drilling have been reviewed by a qualified geologist and are considered to be of a high standard. AC drilling procedure was 1 m samples split using a rig mounted cone splitter and collected in marked plastic bags. 1–2 kg was collected in small green plastic bags and 4–6 kg was collected in large green plastic bags. All samples were dry. 1–2 kg samples totalling 824 m were brought back to Perth and sorted into composites. Seventy 2 m composite samples were made up from the 824 m that intercepted the kaolin material. The composites were made using a spear making sure equal amounts were collected from each metre, thus giving a homogeneous of each metre amount in the composites. Samples were submitted to ALS laboratories in Perth (using ICP analysis methods), Western Australia. Also using a spear technique, 27 bulk samples were taken of the Kaolin material intercepted in 27 out of a total of 47 holes. Samples were sent to the Bureau Veritas Australia Laboratories for x-ray fluorescence (XRF) analysis on a range of elements and kaolin parameters. The quality assurance and quality control (QAQC) information of the laboratory was used to determine the QAQC of the samples because commercial standards for kaolin are not readily available. All sampling procedures for the RC drilling have been reviewed by a qualified geologist and is considered to be of a high standard. The RC drilling sampling procedure was 1 m samples split using a rig mounted cone splitter and collected in marked plastic bags. A 2 m composite sample was

Criteria	Commentary
	generated from 1–2 kg collected in small calico bags which were then placed in small green plastic bags. These were marked with corresponding sample numbers. At regular and ad-hoc intervals, repeat samples were taken and noted as well as interspersed standard samples of quartz (blank) and kaolin (standard) were also included at a 1:9 interval as sample checks for QAQC. All samples were sent to Perth to Intertek for laboratory sampling interspersed with the RC drilling program samples. Larger (5–10 kg) samples were collected in large green plastic bags on a 1 m sample basis and sent to Independent Metallurgical Operations (IMO) for further metallurgical testwork purposes. All samples were dry. 715 1–2 kg samples (including repeats and standards) totalling 1,613 m of drilling were brought back to Perth for testing. Total sample returns were measured by weighing and estimating return volume percentages. All samples were "dry" other than the occasional sample that may have been affected by water introduced by the driller to remove pipe blockages. The 2 m composite samples were generated from the rig mounted cone splitter ensuring equal amounts were collected from each metre, thus giving a homogeneous volume for each metre in the composites. Samples were submitted to Intertek laboratories in Perth, Western Australia for XRF analysis methods on a range of elements and kaolin parameters as well as testing for in-situ moisture.
Quality of analytical data and laboratory tests	AC: Analysis for sizing, SiO_2, Al_2O_3, Fe_2O_3, TiO_2, CaO, MgO, K_2O, Na_2O, P_2O_5, Mn_3O_4, V_2O_5, Cr_2O_3, BaO, ZrO_2, ZnO, SrO and LOI, was completed using XRF. Majority of duplicates are within tolerance of the original assay and without bias. RC: Analysis for sizing, SiO_2, Al_2O_3, Fe_2O_3, TiO_2, CaO, MgO, K_2O, Na_2O, P_2O_5, Mn_3O_4, Cr_2O_3 and LOI, was completed using XRF methods in a globally recognised analysis laboratory. All the inserted repeat samples, duplicates, blanks and standards are within tolerance of the original assay and without significant bias. The internal standard, blank and duplicate results are within acceptable limits and indicate that the field and laboratory sample preparation was under control.
Verification of sampling and analyses	AC: Geological personnel supervised the sampling, and infill drillholes were completed. Primary data are captured on paper in the field and then re-entered into spreadsheet format by the supervising geologist, to then be loaded into the company's database. No adjustments are made to any assay data. The RC drilling program also included verification drilling and sampling of the previous AC drilling program that was completed in May 2017. The verification included six repeat RC holes against the previous AC holes. Analysis of the chemical analysis results indicated that there was minimal bias between the two drilling types and mean grades are very similar indicating that the previous AC drilling could reasonably be used in a Mineral Resource estimate (MRE). Sample information is recorded at the time of sampling on field logging sheets using standard logging codes and then re-entered into spreadsheet format for loading to the company's database.
Location of data points	AC: All drillholes have been surveyed using Garmin GPSMAP 62s equipment (±5 m accuracy) by the geologist on site. No down hole surveys have been conducted however all holes are drilled vertically. RC: All drillholes have been accurately surveyed by a licensed contract surveyor (±10 cm accuracy). The collar locations were also checked by the site geologist using a Garmin GPS at site. All holes are vertically drilled up to a maximum of 34 m and were followed up with downhole surveying by Surtech Geophysical Services.
Data spacing and distribution	AC: 98 AC drillholes for 1,840.5 m, with hole depths ranged from 6 m to 36 m depending on the depth of kaolin and granite weathering. The drilling generated 27 bulk samples and 220 samples ranging intervals from 1 m to 6 m. Hole spacing ranges from a 100 m x 50 m to 200 m x 200 m grid spacing. RC: 75 holes were drilled in approximately 1 km square at approximately 50 m spacings or 100 m spacing between the previous AC drilling. This resulted in a generally 50 m x 50 m coverage of the northern main deposit area which is considered sufficient for classification of Inferred and/or Indicated Mineral Resources in terms of establishing confidence in geological, grade and quality continuity. RC sampling is a 2 m interval composite from individual 1 m sample intervals.
Orientation of data in relation to geological structure	Drillholes were vertical given the horizontal nature of deposit. The risk of sample bias is considered to be low.

Criteria	Commentary
Sample security	All samples were under supervision from the rig to the laboratory. All residual sample material is stored securely in sealed bags.
Audits or reviews	Representatives of the Competent Person (CP) from CSA Global were responsible for the execution of the RC drilling program. The CP's representative examined the mineralisation occurrence and were responsible for logging of the RC drilling intervals. The geological data is deemed fit for use in the MRE. CSA Global has reviewed the data internally.

Section 2: Reporting of Exploration Results

Criteria	Commentary
Mineral tenement and land tenure status	The granted exploration licence 70/4673 in Western Australia, covering an area of 59 km^2.
Exploration done by other parties	White Gold Kaolin (WGK) carried out all the previous prospecting and drilling work that is on the tenement EL 70/4673. The AC drilling comprises of 47 drillholes for 824 m. The exploration work was carried out from 2011 to 2014.
Geology	The project area is underlain by weathered granitoid Archaean rock of the Yilgarn Granites is the likely parent material for the kaolin. Here, deep weathering of the feldspathic and ferromagnesian minerals within the metamorphosed granitic has resulted in the formation of kaolinite. There is no outcrop but recognisable granitoid fragmental rocks are sometimes present just below surface. The crust of the overburden comprises gravel and sands over reddish to off-white clay. White kaolin underlies the overburden followed by weathered, partial oxidised and then fresh granitoids at depth. The recent drilling at the property has revealed a weathering profile which is very common in Western Australia with the granitoid rocks, deeply weathered forming a leached, kaolinized zone under a lateritic crust. Analysis at the Laboratory shows particle size distributions are typical of "primary style" kaolins produced from weathered granites. The crust of overburden comprises gravel and sands over reddish to off-white clay to an average depth of 5 m. White kaolin then averages approximately 16 m before orange to yellow sandy and mottled clays are intersected which are followed by recognisable rounded granitoid material. The thickness of the kaolin profile varies from less than 1 m to a maximum of 22 m. Fresh granitoids are found at depths of between 10 m and 30 m. All kaolin resources are within 4 m to 11 m of the surface. 47 AC drillholes were completed with a total of 824 m drilled in May 2017 with a further RC drilling program conducted in April 2018 consisting of 75 RC drillholes totalling 1,613 m resulting in 715 2 m composite samples. All holes were drilled vertically. Intersected kaolin thickness ranged from 1 m to 28 m.
Drillhole information	Not relevant. Exploration results are not being reported. Mineral Resources are being disclosed (see Section 3). Sample and drillhole coordinates are provided in previous market announcements.
Data aggregation methods	Not relevant. Exploration results are not being reported. Mineral Resources are being disclosed (see Section 3).
Relationship between mineralisation widths and intercept lengths	Not relevant. Exploration results are not being reported. Mineral Resources are being disclosed (see Section 3).
Diagrams	Refer to figures within the main body of this report.
Balanced reporting	Not relevant. Exploration results are not being reported. Mineral Resources are being disclosed (see Section 3).
Other substantive exploration data	Nothing material to report.
Further work	Metallurgical testwork is continuing to optimise processes.

Section 3: Estimation and Reporting of Mineral Resources

Criteria	Commentary
Database integrity	Data used in the MRE is sourced from a Microsoft Access database export from the primary Datashed database, which is a fully relational geological database. Relevant tables from the Microsoft Access database are exported to Microsoft Excel format and converted to csv format for import into Datamine Studio 3 software.

Criteria	Commentary
	Validation of the data imported comprises checks for overlapping intervals, missing survey data, missing analytical data, missing lithological data, and missing collars.
Site visits	Representatives of the CP from CSA Global were responsible for the execution of the RC drilling program. The CP's representative examined the mineralisation occurrence and were responsible for logging of the RC drilling intervals. The geological data is deemed fit for use in the MRE.
Geological interpretation	The geology and mineral distribution of the system appears to be reasonably consistent. The geology and mineral distribution of the system appears to be reasonably consistent, though affected by variable depths/thicknesses of kaolinisation. Closer spaced than the current drilling grid variations are not expected to significantly alter the volume of mineralised material interpreted. The high-quality white kaolin zone is interpreted to grade through a fully kaolinised low K_2O upper zone (Zone 1), to a higher K_2O less fully kaolinised lower zone (Zone 2) with higher K_2O with the cut-off between the two zones defined at a nominal 1% K_2O cut-off. The higher K_2O content in the lower part of the kaolinised material is interpreted, based on the Normative mineralogy study, to represent a feldspathic component that has not fully weathered to kaolinite. Drill hole intercept logging, chip tray and sample pile photographs, chemical analysis results and Normative mineralogy calculations have formed the basis for the mineralisation domain interpretations. Assumptions have been made on the extents of the mineralisation based on drilling information. Approximately 5% of the modelled mineralisation zones can be considered to be extrapolated. The extents of the modelled zones are constrained by the information obtained from the AC and RC drilling campaigns. Alternative interpretations are considered unlikely to have a significant influence on the global MRE. The white kaolin mineralisation has been interpreted based on the geological logging of white kaolin in concert with a nominal lower Al_2O_3 cut-off grade of 15% and with reference to the Normative mineralogy, with two individual layers being modelled based on a nominal cut-off of 1% K_2O. Normative mineralogy was calculated from total fusion XRF major element data using a least squares method (MINSQ). The normative calculations were compared to x-ray diffraction (XRD) quantitative mineralogy from nine composite samples analysed in 2017, as well as semi-quantitative XRD mineralogy from an additional 29 sample pulps selected from five representative drillholes and analysed in 2018. Normative estimates of kaolinite are similar to those obtained in the original nine quantitative XRD results provided the amorphous material (probably a kaolinite phase) identified using an internal standard during XRD analysis in those samples, which ranges between 12% and 24%, is included as kaolinite. A linear correlation also exists between the Al_2O_3 content of these samples and the amount of kaolinite plus amorphous material. There is less agreement between the normative estimates of kaolinite and the 2018 semi-quantitative XRD estimates as these analyses do not include an estimate of the amount of amorphous material in the samples. This potentially leads to an over-estimation of the kaolinite in the sample where the amount of amorphous material is significant (i.e. >10%). The normative calculations over-estimate the amount of kaolinite compared to the XRD estimates for kaolinite contents <50%, and under-estimate the amount of kaolinite compared to the XRD estimates for kaolinite contents >50%. This suggests that there may be a significant component of amorphous material in samples with >50% kaolinite. However, in the CP's opinion this discrepancy is not material to the MRE, as the normative and XRD mineralogy results were used purely as a guide to geological domaining, and to verify the presence of kaolinite. The calculation of normative mineralogy using major element geochemistry was only possible for those samples analysed by XRF. Kaolinite was estimated using the relationship between Al_2O_3 and kaolinite established from the XRD data in those samples for which only four-acid digestion data were available. Continuity of geology and grade can be identified and traced between drillholes by visual and geochemical characteristics. Confidence in the grade and geological continuity is reflected in the Mineral Resource classification.
Dimensions	The upper zone (Zone 1) is generally thicker up to roughly 20 m than the lower zone (Zone 2) which is up to roughly 10 m thick.

Criteria	Commentary
	The mineralisation is roughly horizontal, dipping on average about 1° towards 070°. The strike extent is roughly 1 km and across strike width is roughly 500 m for the bulk northern/central part of the deposit, with the total north south dimension being ~1.4 km including the un-mineralised central/south portion (see plan view diagram in body of report). The combined thickness of the mineralisation zones is greatest in the north-eastern part of the deposit (~15 m to 25 m), thinning to the northwest (~4m) and southwest (~4 m to 12 m).
Estimation and modelling techniques	Ordinary Kriging (OK) was the selected interpolation method, with Inverse distance squared (IDS) used as a check estimate. Grade estimation was carried out at the parent cell scale, with sub-blocks assigned parent block grades. Grade estimation was carried out using hard boundaries between the two zones. Statistical analysis on the 2 m downhole composited drillhole data to check grade population distributions using histograms, probability plots and summary statistics and the co-efficient of variation, was completed on each zone for the estimated grade variables. The checks showed there were no significant outlier grades in the interpreted mineralisation Zones that required top-cutting. In addition to Al_2O_3, K_2O, Fe_2O_3, LOI, SiO_2 and TiO_2 are estimated into the model to assist in downstream mine planning and production scheduling work. A volume block model was constructed in Datamine constrained by the topography, mineralisation zones and model limiting wireframes. Analysis of the drill spacing shows that the nominal average drill section spacing is 50 m to 100 m with drill holes nominally between 50 m and 100 m apart on each section over majority of the modelled area. The greatest drill density is in the north-eastern part of the deposit. Spatial (variogram) analysis was completed on Al_2O_3 in the 2 m drill composite samples from the upper “low” K_2O zone as this zone has the most samples. The resultant two spherical structure modelled variograms showed a low nugget of 10%. The modelling was horizontal with no preferred dip or dip direction and the range to the first structure was 60 m for both directions 1 and 2, and 6 m for direction 3. The range to the second structure (sill) was 175 (direction 1), 140 m (direction 2) and 25 m (direction 3). The variogram parameters obtained from this modelling are applied to all grade variables in both zones. Based on the sample spacing and validated by means of a kriging neighbourhood analysis (KNA), a parent block size of 25 m(E) x 25 m(N) x 5 m(RL) or nominally half the average drill section spacing in the better informed part of the model, was selected for the model. Sub-cells down to 5 m(E) x 5 m(N) x 1 m(RL) were used to honour the geometric shapes of the modelled mineralisation. The search ellipse orientations were defined as being horizontal based on the overall geometry of the mineralisation and with reference to the variogram modelling study. The search ellipse was doubled for the second search volume and then increased ten-fold for the third search volume to ensure all blocks found sufficient samples to be estimated. The search ellipse dimensions of 120 m x 120 m x 10 m, have been optimised by means of the KNA. A minimum of 18 and a maximum of 36 samples, based on the KNA results, were used to estimate each parent block for both zones. These numbers were reduced for the second search volume to 15 and 27 samples and in the third search volume to 12 and 18 samples. A maximum number of five samples per drillhole were allowed. Based on the results from the KNA, cell discretisation was 4 E x 4 N x 4 Z and no octant-based searching was utilised. Model validation was carried out visually, graphically and statistically to ensure that the block model grade reasonably represents the drillhole data. Cross sections, long sections and plan views were initially examined visually to ensure that the model grades honour the local composite drillhole grade trends. These visual checks confirm the model reflects the trends of grades in the drillholes. Statistical comparison of the mean drillhole grades with the block model grade shows reasonably similar mean grades. The IDS check estimate shows similar grades to the OK model, adding confidence that the grade estimate has performed well. The model grades and drill grades were then plotted on histograms and probability plots to compare the grade population distributions. This showed reasonably similar distributions with the expected smoothing effect from the estimation taken into account. Swath or trend plots were generated to compare drillhole and block model with Al_2O_3% grades compared at 50 m E, 50 m N and 4 m RL intervals. The trend plots generally demonstrate reasonable spatial correlation between the model estimate and drillhole grades after consideration of drill coverage, volume variance effects and expected smoothing.

Criteria	Commentary
	No reconciliation data is available as no mining has taken place.
Moisture	Tonnages have been estimated on a dry, *in situ,* basis. No moisture values could be reviewed as these have not been measured by the laboratory as was planned.
Cut-off parameters	Visual analysis of the drill analytical results demonstrated that the grade cut-off interpretation of 1% K_2O defining the upper and lower zones corresponds to natural break in the grade population distribution. Analysis of the chip photographs compared to the analytical grade results indicate that a slightly more granular appearance of the chips can generally be detected above the nominal 1% K_2O cut-off.
Mining factors or assumptions	It has been assumed that these deposits will be amenable to open cut mining methods and are economic to exploit to the depths currently modelled. No assumptions regarding minimum mining widths and dilution have been made. No mining has yet taken place.
Metallurgical factors or assumptions	FYI reported the results of precipitation and calcination testwork on 3 September 2018, indicating that a purity of 99.997% Al_2O_3 could be achieved. This was considered to confirm the "amenability of the Cadoux kaolin project for HPA extraction." The process comprised pre-beneficiation by attritioning and screening to reject coarse silica (quartz), activation by calcining at 700°C for one hour. Hydrochloric acid leaching initially at autogenous reaction temperature with the temperature controlled and maintained at 80°C for a leach duration of 180 minutes resulting in an Al-rich liquor. Precipitation of aluminium chloride by sparging (gas flushing) with hydrogen chloride gas to recover aluminium chloride. Calcination of the dried aluminium chloride at 1,200°C for four hours. The final product was analysed via XRF and laser ablation reporting a final grade of 99.997% Al_2O_3.
Environmental factors or assumptions	No assumptions regarding waste and process residue disposal options have been made. It is assumed that such disposal will not present a significant hurdle to exploitation of the deposit and that any disposal and potential environmental impacts would be correctly managed as required under the regulatory permitting conditions.
Bulk density	Density measurements were obtained by means of a downhole wireline geophysics survey of 45 holes using a Century 0032 density instrument capable of short-spaced and long-spaced density fitted with a Caesium Cs137 gamma ray source. The compensated density log (CDL) data have been used for further analysis. The raw data was filtered to remove zero values, drill diameter out of bounds (based on calliper readings) and outlier values. The filtered data set contains a total of 25,753 records which have been flagged based on the mineralisation zones for further analysis. The laboratory did not measure the moisture values of the samples as planned and hence no detailed downhole analysis of density corrected based on moisture factor was possible. The metallurgical testing mass balance calculations showed that the average moisture content of the in-situ material was roughly 15%. This value was applied to the mean CDL density to arrive at a mean density to apply to the mineralisation zones in the model. The mean CDL density for mineralised material measured was 2.0 t/m^3 and the moisture correction factor of 15% was applied to give a mean dry in-situ bulk density value of 1.7 t/m^3 which is applied to all mineralised material. A conservative density value of 2.1 t/m^3 was applied for the waste material in the model based on applying a reduced moisture factor of 10% to the mean waste material CDL of 2.3 t/m^3.
Classification	Classification of the MRE was carried out accounting for the level of geological understanding of the deposit, quality of samples, density data and drillhole spacing. The MRE has been classified in accordance with the JORC Code (2012 Edition) using a qualitative approach. All factors that have been considered have been adequately communicated in Section 1 and Section 3 of this Table. Overall the mineralisation trends are reasonably consistent over the drill sections. The MRE appropriately reflects the view of the Competent Person.

Criteria	Commentary
Audits or reviews	Internal audits were completed by CSA Global, which verified the technical inputs, methodology, parameters and results of the estimate. No external audits have been undertaken.
Discussion of relative accuracy/ confidence	The relative accuracy of the MRE is reflected in the reporting of the Mineral Resource as per the guidelines of the JORC Code (2012). The Mineral Resource statement relates to global estimates of *in situ* tonnes and grade.

Appendix 2

FYI Resources PFS Material Assumptions

Project Start Date (Construction)	Q4 2019
Cost and Pricing Basis	2018 Dollars
Currency	US Dollars (US$)
Cost Escalation	0%
Revenue Escalation	0%
Study Accuracy	-15% / +25%
Capex Contingency (Beneficiation - Cadoux)	10%
Capex Contingency (Refinery - Kwinana)	15%
Mining	
Mineral Resource	9.6Mt (3.2Mt Indicated, 6.4Mt Inferred)
Portion of Production Target – Indicated	94%
Portion of Production Target - Inferred	6%
Annual Production (steady state)	50,000 ktpy
Grade LOM	24.40% Al_2O_3
Life of mine	>50 Years
Ore Loss	10%
Dilution	0%
Mining Recovery	95%
Mining Cost Base ($/t)	US$5.70/t
Total Ore Mined	2,891,000 tonnes
Total Waste Rock	4,961,000 tonnes
LOM average strip ratio	1.7:1 waste:ore
Beneficiation - Cadoux	
Production per Year	24,500 tonnes
Average quality	38.13% Al_2O_3
Total Kaolin Concentrate Production	605,150 tonnes
Refining - Kwinana	
Annual Production High Purity Alumina (HPA)	8,000 tonnes
Overall Al_2O_3 Recovery	65.6%
Average grade Al_2O_3	> 99.99%
Total High Purity Alumina Produced	197,600 tonnes
Pricing	
High Purity Alumina Avg. Price	US$24,000/t
Other	
Direct Capital - Beneficiation - Cadoux	US$10 million
Direct capital – Refinery - Kwinana	US$109 million
Owner's costs	US$15 million
EPCM	US$22 million
Contingency	US$23 million
Sustaining and deferred capital	US$2.7 million
Operating Costs	US$6,467/t average per ton HPA
Royalties	5% of product revenue
Corporate tax rate	30% Federal
Discount rate (NPV)	10%

Appendix 3

SUMMARY OF MODIFYING FACTORS

The Modifying Factors included in the JORC Code (2012) have been assessed as part of the Company's Pre-feasibility Studies (PFS), including mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and Government factors. The Company has received the advice from suitable experts when assessing each Modifying Factor.

A summary of each of the Modifying Factors is tabled below. Please see the Pre-feasibility study summary for further details.

SUMMARY OF MODIFYING FACTORS AND MATERIAL ASSUMPTIONS	
Criteria	**Commentary**
Mineral Resource estimate	The Mineral Resource Estimate was provided by Mr Grant Louw, employee of CSA Global, as the Competent Person. At a zero percent cut-off grade, this total Mineral Resource includes 9.6Mt of Indicated and Inferred materials with an average grade of 23.0% Al_2O_3.
Study status	FYI has completed a Pre-Feasibility Study (PFS) for the Cadoux High Purity Alumina (HPA) project which indicates that the project is technically achievable and economically viable, was compiled with the input services from specialist consultants. The PFS was underpinned by a mine plan. The mine plan produces high-grade alumina material for on-site beneficiation. An intermediate concentrate is transported to the HPA processing plant in Kwinana. The Al_2O_3 grade and the mining rate are in line with the feed requirements of the beneficiation and HPA processing plants. The mine planning activities included final and interim stage pit designs, mine scheduling including backfilling, and mining cost estimations. Modifying factors considered during the mine planning process included slope design criteria, mining dilution and loss. The activities and findings of all other disciplines were summarised in the PFS document, and detail derivation of other modifying factors such as processing recoveries, costs, revenue factors, environmental and social. Overall the results of the PFS demonstrate that the HPA project is technically achievable and economically viable.

Mining factors or assumptions	Only Indicated resource materials were considered as potential mineable material. A 7.5% Al_2O_3 cut-off grade was utilised in the pit optimisation process. No other quality parameters were applied during the Mineral Resource estimation. As part of the PFS, a detailed mine design and annual schedule was produced. This study indicated that: • The Mineral Resource can easily meet the processing feed requirements for the production targets of the project. • The mineable Mineral resource material presents near surface and is easily accessible by conventional open pit mining methods. • The pit optimisation, design and schedule process indicate a project life of +50-years at a mining rate of approximately 50,000t per annum, targeting HPA production of 8,000tpa. • The cost of the Cadoux mining operation accounts for only 2% of the total HPA production cost. .A conventional open pit mine method was chosen as the basis of the PFS due to the near surface presentation of the mineralisation. Mining and backfilling of pit voids is to occur on a campaign basis. Overburden and beneficiation rejects are backfilled into the pit to minimise the foot print of the operation. Due to the relatively small quantities extracted, and to maintain adequate efficiencies, mining will be undertaken in 2 to 3 month campaigns, sufficient to excavate and stockpile three (3) years supply on the Run of Mine (RoM) stockpile pad. Mine design criteria include: minimum mining width, ramp width and gradient, pit exit location and slope design parameters. No site-specific geotechnical assessment was available. The basis of the pit slopes and backfill slope angles were based on assumptions from other similar kaolin mining operations. The overall pit and backfill slope angles were set at 35˚. The pit optimisation process indicated that the optimal pit selection was not sensitive to slope angles. Further grade control drilling programs will be considered in the next phase of studies. The Mineral Resource–overburden boundary is defined by the Mineral Resource solid (wireframe) provided with the resource model. Delineation of this boundary during mining operations will utilise survey control. Visual checks will then be undertaken by the equipment operators as the visual differentiation between Mineral Resource and waste is clear. This will ensure that any material that is not perfectly bright white will be directed to the overburden dump. RoM dumping strategies can be adopted to blend materials and manage short interval grade variations. The proposed mining method will not require drilling and blasting activities due to the weathered nature of the materials. Only Indicated material were categorised as mineable material for the optimisation process. Inferred mineralisation was treated as waste. Mining dilution will need to be avoided as this may affect the performance of the processing plant. Dilution has been set at 0% on the basis that appropriate procedures and processes will be developed to eliminate dilutants from the Mineral resource during the mining phase. This can be achieved through survey control and visual checks when excavating. Mining recovery has been set at 90% reflecting the need to provide clean, undiluted material to the beneficiation plant. The Mineral Resource loss is accepted at Mineral resource/waste boundaries in order to eliminate dilution. Loss will also occur at bench floors due to the requirement to remove road sheeting materials. Pit designs and interim cutbacks have been designed to suit a 65t excavator and 40t payload articulated dump trucks. The parameters used were: • A minimum mining width of 20m. • One-way ramp width of 8m. • Ramp gradient 12.5%. No inferred Mineral Resources have been included in the production schedule. Within the designed final pit inventory, the Mineral Resource tonnages are: • 3,212kt Indicated. 94% of Mineral Resource within final design pit • 211kt Inferred. 6% of Mineral Resource within final design pit The PFS considers the proposed open cut mine plan and schedule, and includes waste and overburden removal, ROM pads based on domained Mineral, haul roads to beneficiation plant, haulage loading facilities, water management, workshops, administration buildings, traffic management and other associated mine and facility infrastructure. It is planned to conduct mining on a contract basis to produce three (3) years of Mineral Resource supply using 2-3 month mining campaigns.

Processing **(including Metallurgical factors or assumptions)**	The proposed process flow comprises the following key unit processes – • Wet attritioning and screening of whole kaolin feed to produce a low Silica screen undersize stream for downstream processing and a by-product Silica rich screen oversize stream. • Drying and calcination of attritioning screen undersize to activate Kaolin in preparation for acid leaching. • Staged Hydrochloric Acid leaching to extract Aluminium as Aluminium Chloride into solution. • Staged precipitation of Aluminium Chloride concentrates via Hydrogen Chloride gas phase sparging. • Aluminium Chloride concentrate recovery, filtration and washing. • Final high temperature Aluminium Chloride calcination and conversion to High Purity Alumina (HPA). Historically the proposed process flow has been tested successfully for production of Alumina from Kaolin feed stock. The proposed process flow is considered appropriate for the recovery of HPA from Kaolin as evidenced in recent results reporting an HPA product grade exceeding 99.99% Al_2O_3. The direct and variable testwork was based on blended and master composites that were constructed to be representative of the kaolin deposit. Test sample product were derived from RC holes that were approximate to the average resource grade and deleterious element average. Extensive variation work on grade and deleterious elements were also conducted to understand the outliers to the metallurgical response Detailed testwork confirmed excellent amenability to leaching and precipitation stages. Recoveries achieved were 99.997% Al_2O_3. Supporting metallurgical testwork has been conducted to date based on batch testing and processing; further stages of work are scheduled for bulk product generation. The testwork completed to date has been conducted based on resource representative composites, including allowance for separate variability sample testing. Alumina recoveries and grades corresponding to Alumina and potential deleterious elements are consistent with values established based directly on the testwork. IMO have undertaken large scale representative sampling of the Cadoux kaolin deposit that is considered appropriate for the commodity being studied. IMO have prior experience with this commodity and relate that to addressing the minerology requirements for the PFS testwork and review. The minerals that define the Indicated Mineral Resource are not based on a specification other than Alumina grade.
Environmental	Botanica Consulting Pty Ltd has undertaken baseline studies as well as flora, fauna and other essential permitting studies at both the Cadoux and Kwinana project sites and have found no major impacts on the environment or on mining. Please see body of PFS for further details. Hydr2o Pty Ltd conducted a hydrology survey at the Cadoux project site and found that the project was not in a water reserve or sensitive area. No major surface or subterranean water issues were identified that would impact the environment or the HPA operations. Cadoux kaolin and waste rock are characterised as non-acid forming (NAF) and does not pose a threat to water courses or subterranean water sources. The mining operation is small, so the footprint and disturbance area are small. The operations will be progressively back filling and rehabilitating the open pits.
Infrastructure	Cadoux is located 220km north east of Perth with the project area having access to major arterial roads, rail, mains water, telephone line and a 33KVA power line – all within 1km of the project. Labour, utilities, services, accommodation and transport is very accessible as there are a number of small towns in the area, the major regional town of Wongan Hills is 60kms in distance and Perth is in easy driving distance of approximately 2 hours

Economics	Please refer to section titled "Economics" in the PFS long form document for further detail All project costs (capital, operating, consumables, labour, freight etc) have been identified, assessed and calculated by the various expert study managers responsible for the various sections of the PFS. The study managers include GR Engineering Services (GRES), Independent Metallurgical Operations (IMO), CSA Global (CSA) and Orelogy Consulting Pty Ltd. These groups have utilised detailed studies, indexed prices, public reference prices etc to calculate the various costs used as inputs into the PFS. Please see the PFS report for further information. All costs are based on market rates as of the Q3 2018 are to a ±25% accuracy Detailed studies by respective study managers have identified and accounted for deleterious content within the deposit as well as in the process and refining of the HPA. The deleterious element has also been accounted for in the financial modelling. All mining recovery, metallurgical, recovery and other technical concerns regarding the commodity price for HPA have been considered by appropriately qualified individuals and groups in respect to the PFS requirements. FYI has used a number of sources and different service providers in estimating and calculating its transportation costs. FYI believes that the freight cost estimation is accurate and appropriate to the PFS. Further transportation charge details are included in the PFS. Extensive studies have been undertaken to understand and estimate operating costs and charges as well as penalties for off-specification product. IMO and GRES have particularly focused on this area of the PFS. Further detail is highlighted in the PFS. Under the operations and financial modelling, full allowances are made for state royalties, duties, taxes, compensation etc. The project financial model details the particular financial cost, the percentage and the amount. A 5% state royalty has been allowed for. The economic assumptions used in the financial modelling are: • 0.75 USD:AUD exchange rate • 10% discount rate • Contingency of 10% on Cadoux and 15% for Kwinana capital and operating costs The financial summary and base case NPV demonstrates a positive result. Sensitivities and discounting ranges have been applied to understand the economic tolerance to various key inputs to the base case. The sensitivities are generally ±20% and despite this, the financial result still demonstrates a positive economic case and profit margin to support the development of Cadoux The Cadoux PFS financial model provides for an array of project assumptions, including costs, cost escalations, grade variations, production variation, exchange rates, etc. These assumptions have been modelled on variations and sensitivities to a range of +/- 20% on major input factors such as grade, operating cost, capital cost and revenue. The assumed price in the financial modelling has been derived from a number of sources and then discounted. The sources include independent market research (CRU and Allied Market Research)
Marketing	The market assessment for price and volume/demand has been supported by: • 2 independent research groups (CRU & Allied Market Research) • IMO achieving a reference price – by purchasing HPA for independent testing • FYI's own market research and direct meetings with market participants (producers, manufacturers and traders) in China, Japan and South Korea • Web-based commodity trading platform references.
Social, legal and Governmental	The Company has taken legal advice in relation to the relevant Modifying Factors. The Company owns EL70/4673 100% and is up to date with statutory expenditures. The project is located on private land. There are no existing Native Title claims on the Cadoux project tenements. Broader stakeholder and community engagement will be ongoing over the development of the project. The Company is not aware of any major impediments to the project development.