



The Company Announcements Officer

Australian Securities Exchange Ltd  
via electronic lodgement

**The following is an *Inside Briefing* interview with  
Hill End Gold Managing Director Martin McFarlane**

**In this interview, Martin McFarlane discusses the outlook for Hill End’s flagship Yendon High Purity Alumina Project in Victoria. Key points in this interview include:**

- *The findings of the recently-announced Pre-feasibility Study on Hill End’s Yendon High Purity Alumina (HPA) Project in Victoria;*
- *The key uses of HPA, the main demand drivers for the product and why the market outlook is strong;*
- *The next steps in Hill End’s strategy to capitalise on its opportunity to become a leading supplier of HPA, including construction of a pilot plant to enable commercial samples of Yendon HPA to be trialled by potential customers.*

*The Text from this interview, draws on and refers to an announcement titled, “PFS Results,” dated 14 June 2018. HEG confirms that all material assumptions and risks underpinning the pre-feasibility study continue to apply and have not materially changed.*

***Inside Briefing: Firstly, what is HPA and what is it used for?***

**Martin McFarlane:** HPA, or High Purity Alumina, is aluminium oxide that has been purified to 99.99% or better. It sells from US\$25,000 per tonne to more than US\$50,000 per tonne, depending on the purity and other properties.

The major uses of HPA are:

- Lithium Ion batteries, where it is coated on the separator between the anode and cathode. HPA’s key role is a safety feature, managing overheating in the battery to prevent battery fires such as those recently experienced in some mobile phones. This segment of the HPA market is expected to grow significantly as electric vehicles replace internal combustion engines and lithium batteries become widely used for energy storage in houses and industry.
- Conversion into synthetic sapphire, which is used in the technology industry for LED lighting, semiconductor manufacture, laser and fibre optics components, camera lenses and finger print readers on mobile phones and numerous other uses. LED lighting accounts for more than 50% of HPA demand and is a rapidly growing segment.

By comparison, HPA’s more common cousin, smelter grade alumina, which is converted into aluminium metal, is typically 98.5% purity and sells for US\$400-500/tonne.

*Inside Briefing: Can you provide a brief overview of the Yendon HPA Project?*

**Martin McFarlane:** Yendon uses a disruptive technology which will significantly lower the cost of producing HPA compared with today’s processes.

Yendon’s process takes high-quality kaolin sourced near Ballarat in Victoria and purifies it into HPA. Kaolin is a low-cost feed material. By contrast, the current processes all start with expensive aluminium metal that costs US\$2,200/tonne and convert this to HPA.

The Yendon project is based on an open source process developed in the USA in the 1940s. We have customised this process for our Yendon kaolin, utilising mainly off-the-shelf equipment. The fine-grained nature of Yendon kaolin means the process are rapid and operating conditions are moderate all of which keeps costs down.

Extensive processing test work has produced HPA which exceeded the 99.99% specification that customers are seeking.

*Inside Briefing: The Yendon Pre-feasibility Study was completed just last month. Can you outline its key findings?*

We were extremely pleased with the outstanding financial outcomes delivered by the Yendon Pre-feasibility Study. Producing 8,000 tonnes per annum of HPA at a low cost of US\$7,668/tonne is expected to generate an average of US\$133 million of EBITDA per annum. This translates to a project NPV of US\$692 million, or 34% IRR.

Just as importantly, we believe that the Yendon PFS results are very robust due to the conservative approach taken, so we are not expecting any major surprises as we move forward. In fact, we have identified numerous opportunities to reduce opex and capex or enhance revenue, which we will pursue in the next phase.

All major elements of the capex and opex costs were sourced from supplier quotes and the assumed HPA price was at the bottom end of the range of forecast prices.

Annual HPA Production	8,000 tpa +99.99% Al <sub>2</sub> O <sub>3</sub>
Capital Cost	\$271 million (incl contingencies of \$53m)
Capital Cost per t of HPA	\$33,875 based on 8,000 tpa HPA
Average Cost of Production	\$7,668 /tonne of HPA
Forecast Sale Price	\$25,200 /tonne
Average EBITDA	\$133m per annum
Payback Period	4.1 years
Project NPV @ 10%	\$692m
IRR	34%

*All monetary amounts are in US dollars.*

**PFS Risks and Assumptions**

Refer to announcement titled, “PFS Results,” dated 14 June 2018. HEG confirms that all material assumptions and risks underpinning the pre-feasibility study continue to apply and have not materially changed.

Risk includes, Resource, Technology, Market, Permitting and Financing Risk. HEGL currently does not have sufficient funds to construct and commission the Yendon HPA project. Due to the strong economic results from the PFS, HEGL believes there are reasonable grounds to expect that sufficient funding will be available to finance the A\$271M capital development cost of the project. A number of funding sources may be available to HEGL, including but not limited to: access to debt finance facilities; access to equity funding from capital markets; and funding from other sources such as potential off-take agreements, equipment suppliers and / or government business development financing. Securing funding is not normally contemplated at the PFS stage of a project.

HEGL’s funding requirements depend on numerous factors, including the completion of a Definitive Feasibility Study.

***Inside Briefing: What are the next steps in Hill End's strategy to unlock the value of Yendon?***

The Yendon PFS successfully demonstrated the viability of the project, giving us the confidence to forge ahead with a Definitive Feasibility Study. This will involve detailed design and optimisation, a pilot plant to manage the risk in moving from the laboratory to commercial production and production of commercial samples of HPA to support our marketing effort and generate offtake agreements with HPA customers.

***Inside Briefing: Why do you believe Yendon is ideally-placed to become a leading global supplier of HPA?***

Once in operation, Yendon is expected to deliver a consistent, high-quality HPA product designed to exceed customer requirements via a technology that is disruptive for the HPA industry but well understood in other markets.

***Inside Briefing: What is the demand and supply outlook for HPA?***

The demand outlook for HPA is extremely strong. This has been driven over the past 15 years by the development of LED lighting. This market is still growing strongly, with current usage of LED lights sitting at around 20% of lighting capacity.

But the real growth story for HPA over the next decade is the development of lithium ion batteries, particularly for Electric Vehicles (EV's). HPA is used as a coating on the separator between the anode and cathode in lithium batteries, managing the safety risk from overheating and improving battery efficiency by increasing cell cycle life and reducing self-discharge.

HPA demand stemming from the growth of the EV market alone will outstrip the current and planned capacity of HPA producers. Together with growth in the LED and related markets, demand is expected to keep prices strong.

***Inside Briefing: Hill End also owns some gold assets. What are they and what does the Company plan to do with them?***

Hill End also owns the Hill End Gold project, which is located approximately 50km north of Bathurst in NSW. The project has outlined some 570,000 ounces of gold in an area that still has considerable exploration potential. The gold is a quartz vein-hosted nuggetty style of mineralisation that results in very high recovery levels via clean and low-cost gravity processing. In addition, there is extensive development including drives and shafts and a small gravity process circuit.

Following a strategic review of the gold assets and the results of the Yendon PFS, HEG has elected to put the gold assets up for sale and PCF Capital in Perth is assisting us with that process, which is now underway.

**Inside Briefing: Can you outline Hill End's corporate position, including its key shareholders and financial status?**

Hill End is currently in a solid position to undertake the Definitive Feasibility Study. The Hill End gold assets are currently undergoing a sale process and recent gold asset transactions give us confidence that we could realise enough from this to meet the cost of the DFS. We are expecting indicative offers to be received in early August and will have a better idea of their market value at that point.

Our largest shareholder is well-known resources investor Tolga Komova, who has a very good understanding of the battery materials market and is very supportive of our development plans. Our other major shareholders are institutions and high net worth investors who are excited about the opportunity that Hill End's Yendon HPA Project has to become a significant player in the significant growth of the HPA market.

We currently have in excess of \$1.5 million in cash after meeting all the PFS costs and subject to the result of the gold asset sale process, we may not need to raise any additional equity until the DFS has been finalized.

**ENDS**

**Further information:**

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**COMPETENT PERSONS STATEMENT**

The information in this statement that relates to the Mineral Resource estimates is based on work done by Rod Brown of SRK Consulting (Australasia) Pty Ltd. Rod Brown is a member of The Australasian Institute of Mining and Metallurgy and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as a Competent Person in terms of The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code 2012 edition).

The information in this statement that relates to the geology, drilling, and sampling is based on work done by Mike Ware. Mike Ware is a fellow of The Australasian Institute of Mining and Metallurgy and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as a Competent Person in terms of The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code 2012 edition).

**Important Notice:**

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**Forward-Looking Statements:**

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

**PFS Assumptions**

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