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Alpha HPA

ASX: **A4N**
ASX Announcement
20 October 2020

The Manager Companies
ASX Limited
20 Bridge Street
Sydney NSW 2000

REPORT ON ACTIVITIES FOR THE QUARTER ENDED 30 SEPTEMBER 2020

HIGHLIGHTS

DEMONSTRATION SCALE PILOT PLANT ACTIVATED TO CATER FOR LARGER TEST ORDERS

- **Increased scale operation of the Pilot Plant facility in Brisbane QLD, to meet larger scale HPA test orders, particularly from sapphire glass/LED manufacturers.**

OFFTAKE, MARKETING AND FINANCING MOU WITH TRAXYS

- **Multi-faceted Memorandum of Understanding (MoU) encompassing HPA offtake/marketing, working capital financing and logistics and potential direct investment.**

MANUFACTURE OF HIGH-PURITY (5N) ALUMINA PRE-CURSOR FOR Li-ION ELECTRODE COATING

- **Successful manufacture of 5N purity (99.999%) pre-cursor product suitable for particle level alumina coating of cathode and anode particles inside lithium-ion batteries.**
- **Particle scale alumina coating of cathode active materials is now being more widely employed inside lithium-ion cells to stabilise increasingly nickel-rich cathode chemistries.**

MANUFACTURE OF HIGH-PURITY (99.995%) LITHIUM-ION CATHODE PRE-CURSOR

- **Successful manufacture of second pre-cursor product suitable for the synthesis of aluminium-bearing cathode active material for NCA and NMCA cathode chemistries in lithium-ion batteries.**

MARKET OUTREACH PROGRAM EXTENDED TO INCLUDE HIGH-PURITY PRE-CURSOR PRODUCTS

- **Market outreach extended in co-ordination with Traxys to include high-purity precursors**
- **Increased end-user focus on supply-chain security and carbon footprint constructive to Alpha HPA's market outreach program.**
- **Additional HPA test orders received from Taiwanese and Japanese end users.**

PROJECT PERMITTING AND FINANCING ACTIVITIES ADVANCED

- **Active engagement with Government lenders and short-listed commercial lending institutions for the HPA First Project financing.**
- **Nearing finalisation of the HPA First Project permitting applications in co-ordination with AECOM consultants.**

CHEMICAL COUNTERPARTY MOU EXCLUSIVITY PERIOD EXTENDED

- **The Company and Orica mutually agree to extend the exclusivity arrangement within the MoU to 31 October 2020.**
- **Significant progress made on key engineering and project interface aspects of the HPA First Project.**

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OPERATIONS OVERVIEW

TECHNICAL

DEMO SCALE PILOT PLANT PRODUCTION

During the quarter, Alpha HPA upscaled its Pilot Plant facility in Brisbane QLD and commenced larger volume demonstration scale operation of the plant, to meet larger scale test orders being received, particularly from sapphire glass/LED manufacturers.

Plant capital upgrade completed

All required capital equipment to facilitate the demonstration-scale operations were installed and tested during the quarter. Additional capital equipment included the installation of the high-purity, positive pressure pre-cursor room, pellet press and sintering oven. In addition, the Company's dedicated jet-mill, which had been operating at C4V laboratories in NY, USA, was relocated back Brisbane to a allow single-site, end-to-end production of jet-milled powder and pellets per customer requirements.

The two images below show the demonstration scale Pre-Cursor and Pelleting rooms at the Brisbane Pilot Plant facility.





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Following two short validation runs of the solvent extraction ('SX') circuit at double the previous flow rates, the first SX plus Al-salt crystallisation stage campaign of the demonstration-scale Pilot Plant operation commenced with production rates generating the intermediate high-purity salt at 2-3kg per hour. Across three 'double-flow' SX and Al-salt crystallisation campaigns >500kg of high-grade intermediary Al-salt were produced which were progressively converted into ~250kg HPA pre-cursor before final calcination into ~60kg of HPA.

Initial HPA production was directed at commissioning the HPA pellet press and sintering oven (see below).

Following this brief commissioning phase, the Company has now commenced manufacture of HPA pellets of the desired size and density to match sapphire glass customer requirements (see photo below).



HPA pellets for sapphire glass end-users (~45 x 45 x 20mm)

HIGH-PURITY PRE-CURSORS

As part of its extended market outreach program in co-operation with marketing/offtake partner Traxys, Alpha HPA recognised a key market opportunity to utilise the HPA First Process to manufacture high-purity lithium-ion battery pre-cursor materials for application in:

1. the particle scale alumina (Al_2O_3) coating of high-nickel cathode active material (e.g.: 8:1:1 NCM), and
2. the synthesis of aluminium bearing cathode active materials (e.g.: NCA and NCMA)

Successful production high-purity pre-cursor material for particle scale alumina coating

As Part 1 of the development of high-purity pre-cursors, Alpha HPA successfully manufactured >20kg of high purity alumina coating pre-cursor material at 5N purity (99.999%). Alpha HPA has confirmed that this pre-cursor material is already in commercial application for particle scale alumina coating of anode materials and NCM cathode active materials.

The cathode coating application in particular is considered a significant growth opportunity, as the cathode material manufacturers look to stabilise high nickel cathode chemistries (e.g. 8:1:1 NCM).

The pre-cursor material is readily produced within the existing HPA First Process flow sheet with no significant alterations, and no interruption to current demonstration plant activities. In addition, the product is produced at the highest purity point in the process, generating 5N (99.999%) purity (refer Appendix 1). Of note is that Phosphorus represents approximately 90% of impurities, and that Phosphorous significantly volatilises (gasifies) in the calcination step for the cathode active material, rendering close to an effective 6N (99.9999%) purity pre-cursor product.

In response to this development, and in co-operation with Traxys, Alpha HPA has expanded its market outreach with pre-cursor material available for immediate shipment from its Brisbane demonstration-scale Pilot Plant.



A centrifuge batch of high-purity pre-cursor product (approx. 2kg) produced at Alpha HPA's demonstration facility

Successful production high-purity pre-cursor material for Li-ion battery cathode synthesis

As Part 2 of the development of high-purity pre-cursors, Alpha HPA successfully manufactured a bench scale sample of a high purity, aluminium bearing pre-cursor material at >4N purity (99.995%), using the HPA First Process. The pre-cursor was produced using analytical grade reagents.

This pre-cursor material is currently utilised in the commercial scale synthesis of aluminium bearing cathode materials used in lithium-ion batteries, most notably NCA* and NCMA** cathode chemistries.

The pre-cursor material can be readily produced with only modest adjustments to the existing HPA First Process flow sheet, with the Company now mobilising additional equipment to the Brisbane plant in anticipation of receiving end-user sample orders for this pre-cursor. In co-operation with Traxys, Alpha HPA has expanded its market outreach activities accordingly.



High-purity (99.995%), lithium-ion cathode pre-cursor

*NCA = Lithium:Nickel:Cobalt:Aluminium
**NCMA = Lithium:Nickel:Cobalt:Manganese:Aluminium

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COMMERCIAL

TRAXYS MOU

In August 2020 the Company was pleased to announce it had executed an MOU with Traxys North America ("Traxys") regarding a series of potential agreements in support of the commercialisation of the HPA First Project.

The MoU provides the framework for Alpha HPA and Traxys to progress discussions towards definitive agreements on the following:

1. **Product Marketing and Offtake**
   Joint engagement with respect to prospective customers, with a view to engaging in a long-term offtake and/or marketing agreement.

2. **Finance and Logistics Support**
   To jointly develop credit and logistics solutions to assist in closing commercial agreements with Alpha HPA's customers.

3. **Working Capital Facilities**
   The provision of working capital and/or pre-payment facilities in consultation with, and in support of, potential senior lenders to the Project, including Australian Government and commercial lenders.

4. **Direct Investment**
   The potential direct investment in Alpha HPA by Traxys and/or its affiliates, including debt, equity or quasi-equity.

Since the execution of the MoU, Alpha HPA and Traxys have been working closely together in identifying and contacting potential end-user customers across the lithium-ion battery market promoting the Company's suite of high-purity aluminium-based products.

MARKET OUTREACH

Over the course of the quarter, Alpha HPA's market outreach program remained very active in several jurisdictions, including Taiwan and Japan. The Company has noted a number of businesses are re-visiting the security and carbon footprint of their existing supply chains and considers this theme to be constructive to Alpha HPA's outreach program. On this basis, Alpha HPA expects further end-user orders in the coming months, as well test-work feedback from end-users who are completing test-work on the Company's HPA and precursor products.

Additional HPA test orders received from Taiwan and Japan

During the quarter Alpha HPA received an additional order of HPA from Taiwan to complete test work for a specialised high-purity abrasives application. The Company also received an additional test order from a Japanese customer for milled HPA powder. Both orders were able to be filled from the Company's existing HPA stockpile at C4V laboratories in NY, USA.

CHEMICAL COUNTERPARTY MOU EXTENDED

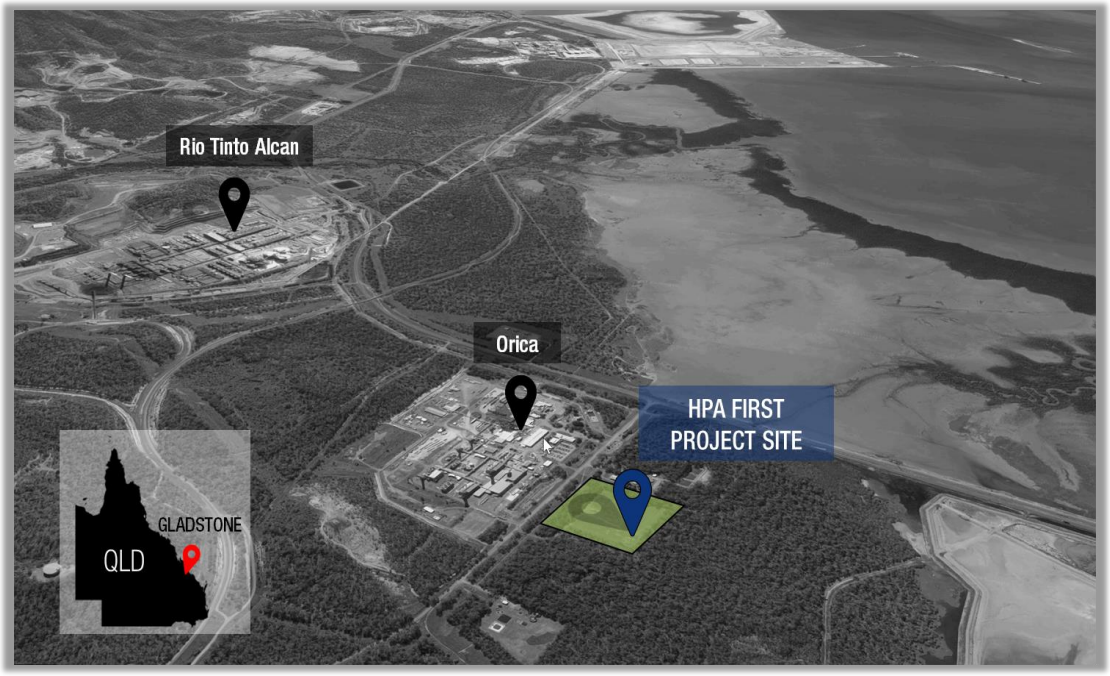
The HPA First Project is being progressed on the basis of the Project located within the Gladstone State Development Area ('GSDA'), where Alpha HPA has secured a contract for a 9.2 hectare land parcel immediately opposite the chemical facility operated by Orica Australia (refer map below). In March 2020, the Company signed a MoU with Orica Australia Pty Ltd ('Orica') which sets out the volumes and pricing mechanisms for the supply of key process reagents and the offtake of by-product from the HPA First Project subject to the negotiation and finalisation of a more definitive Supply and Offtake Agreement ('Agreement').

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The MoU also sets out the scope and commitment for the formation of an Engineering Co-operation Group ('ECG') with representatives from each party to review and advise on the engineering requirements of supply, offtake and project interface.

Under the terms of the MoU, Alpha HPA and Orica Australia have been co-operating on numerous workflows relating to Project interface including by-product test work and quality assurance as well as scoping level engineering studies on by-product concentration and piping locations.

Both Orica and the Company are pleased with the progress to date and accordingly mutually agreed to extend the exclusivity arrangement within the MoU through to 31 October 2020.



HPA First Project Site – Gladstone State Development Area, North Queensland

PROJECT FINANCING

Alpha HPA is working actively with support from its advisors (KPMG DAT) on the HPA First Project Financing. The Company has supplied initial Project information to a number of Australian Commonwealth Government lenders and continues to progress a number of their requests for information. In addition, the Company has received confirmations of preliminary interest from a number of both domestic and international commercial lenders.

PROJECT PERMITTING

During the quarter, Alpha HPA, in co-ordination with AECOM consultants completed all relevant consultants reports in support of the Material Change of Use ('MCU') application, to be submitted to the Queensland Government as the primary project approval within the Gladstone State Development Area. These reports include:

- Air quality and noise impact studies
- Traffic impact studies
- Water and storm water modelling
- On-site ecology studies
- Quantitative Risk Assessment

Lodgement of all Project permit applications is expected early in the December 2020 quarter.

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ALPHA HPA OFFICE ESTABLISHED IN BRISBANE

During the quarter, Alpha HPA established a new Brisbane office which will house the HPA First Project delivery team ahead of Project establishment in Gladstone.

RELATED PARTY EXPENDITURES

During the September quarter the aggregate amount of payment to related parties and their associates totalled $300,500 comprising $178,000 of payments to Directors or Director related entities for Directors' consulting fees and$122,500 in fees was paid to MIS Corporate Pty Limited ('MIS'), an entity in which Directors Norman Seckold and Peter Nightingale have a controlling interest. MIS provides full administrative services, including administrative, accounting and investor relations staff both within Australia and Indonesia, rental accommodation, services and supplies, to the Group.

COLLERINA PROJECT – NSW (100% Alpha HPA and subject to commodity split agreement)

In line with the Company's plans to focus on advancing the HPA First Project, no exploration activities were undertaken at the Collerina project during the quarter.

WONOGIRI PROJECT – INDONESIA (45% Alpha HPA)

No exploration activities were undertaken at the Wonogiri Project during the quarter.

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About the HPA First Project

The Company's HPA First Project represents the evaluation and intended commercialisation of the production of ~10,000tpa equivalent of high purity alumina (HPA) and related products using the Company's proprietary licenced solvent extraction and HPA refining technology. The technology provides for the extraction and purification of aluminium from an industrial feedstock to produce 4N (>99.99% purity) alumina for the intended use within the lithium ion battery and LED lighting industry. Following a successful testwork program and completion of a Pre-Feasibility Study (PFS), updated in March 2019, Alpha HPA has now completed Definitive Feasibility Study (DFS) based on the successful completion of its Pilot Plant program at its dedicated laboratory facility in Brisbane.

The Company has commenced full permitting, market outreach and project financing processes, with the expectation of positioning the HPA First Project to Final investment Decision.

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Competent Persons Statement (Process Development Testwork)

Information in this announcement that relates to metallurgical results is based on information compiled by or under the supervision of Dr Stuart Leary, an Independent Consultant trading as Delta Consulting Group. Dr Leary is a Member of The Australasian Institute of Mining and Metallurgy (AusIMM). Dr Leary has sufficient experience to the activity which he is undertaking to qualify as a Competent Persons under the 2012 Edition of the 'Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves'. Dr Leary consents to the inclusion of the technical data in the form and context in which it appears.

For further information on testwork results and processes see ASX announcements dated:
8 October 2020, 28 September 2020, 8 September 2020, 20 August 2020, 28 July, 2020, 19 June 2020, 23 April 2020, 25 March 2020, 17 March 2020, 10 March 2020, 23 December 2019, 10 December 2019, 10 October 2019, 23 September 2019, 28 August 2019, 5 August 2019, 25 July 2019, 2 July 2019, 1 July 2019, 3 June 2019, 17 April 2019, 7 March 2019, 4 December 2018, 20 November 2018, 6 September 2018, 31 August 2018, 9 July 2018, 30 April 2018, 26 April 2018, 21 March 2018, 6 March 2018, 21 February 2018, 8 December 2017, 30 November 2017, 29 November 2017, 24 November 2017 and 13 November 2017.

Cautionary Statement

The Definitive Feasibility Study (DFS) referred to in this announcement has been undertaken to assess the technical and financial viability of the HPA First project. The DFS is based on the material assumptions about the availability of funding and the pricing received for HPA. 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 outcomes indicated by this DFS will be achieved. To achieve the range of outcomes indicated in the DFS, additional funding will be required. Investors should note that there is no certainty that the Company will be able to raise 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 HPA First project. If it does, this could materially reduce the Company's proportionate ownership of the HPA First project. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the DFS.

Forward Looking Statements

The DFS contains certain forward-looking statements with respect to the financial condition, results of operations, business of the Company and certain plans and objectives of the management of the Company. These forward-looking statements involve known and unknown risks, uncertainties and other factors which are subject to change without notice and may involve significant elements of subjective judgement and assumptions as to future events which may or may not occur. Forward-looking statements are provided as a general guide only and there can be no assurance that actual outcomes will not differ materially from these statements. Neither the Company nor any other person give any representation, warranty, assurance or guarantee that the occurrence of the events expressed or implied in any forward-looking statement will actually occur. In particular, those forward-looking statements are subject to significant uncertainties and contingencies, many of which are outside the control of the Company. A number of important factors could cause actual results or performance to differ materially from the forward looking statements. Investors should consider the forward looking statements contained in the DFS in light of those disclosures.

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