Investor
Presentation
Oct 2019



## The Andromeda Story

Transformed to industrial minerals developer from gold-copper explorer **Primary Project Focus** 

- Poochera Halloysite-Kaolin Project, JV with Minotaur Exploration
- Halloysite-Kaolin Explorer, Developer and Producer
- High Purity Alumina (HPA) and Nanotube technologies

#### **Additional Assets**

- JV with Evolution Mining Gold in Qld
- JV with Environmental Copper Recovery Copper in SA
- JV with Cobra Resources PLC Gold in SA
- Gold tenements in Pilbara Opportunities being investigated





## **Company Snapshot**

#### **Rhod Grivas - Non-Executive Chairman**

- Geologist with 30 years experience
- 16 years of corporate/board experience
- Taken projects from exploration to production
- Ex MD of Dioro Exploration
- Chair of Golden Mile Resources (ASX:G88)

### James Marsh - Managing Director

- 30+ years industrial minerals experience
- Specialised in all aspects of the kaolin industry
- Previous first hand experience with the Poochera Project
- A qualified industrial chemist
- Wide experience in R&D, product development, operations and global marketing/sales

## **Nick Harding - Executive Director**

- Accountant and company secretary with 30+ years mining experience
- Extensive experience in commercial and resource project management
- 5 years as CFO for Olympic Dam

#### **Andrew Shearer - Non Executive Director**

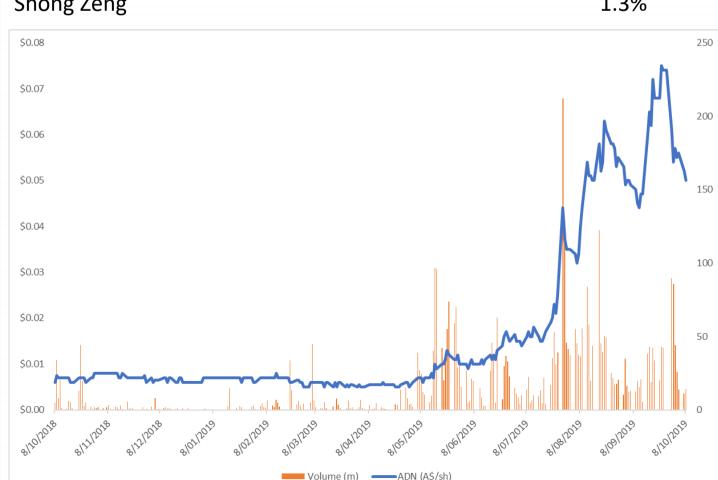
- Geologist/Geophysicist with 23 years experience in the mining and finance industries
- Currently a Resources Analyst with PAC Partners
- NED with Northern Cobalt (ASX:N27)





#### METALS

Capital Structure (26/09/2019)	
Shares on Issue	1,357m
Listed Options (\$0.012/sh, exp 30/11/2020)	702m
Unlisted Options (\$0.012/sh, exp 15/11/2021)	20m
Cash (30/06/2019)	\$1.669M
Market Capitalisation (Fully Diluted 08/10/2019)	\$104M
<b>Top 5 Shareholders (24/09/2019)</b>	
Buratu Pty Limited (Connolly Super Fund A/C)	9.7%
Debuscey Pty Ltd	2.2%
Citicorp Nominees Pty Ltd	2.2%
Peter Andrew Proksa	1.9%
Shong Zeng	1.3%

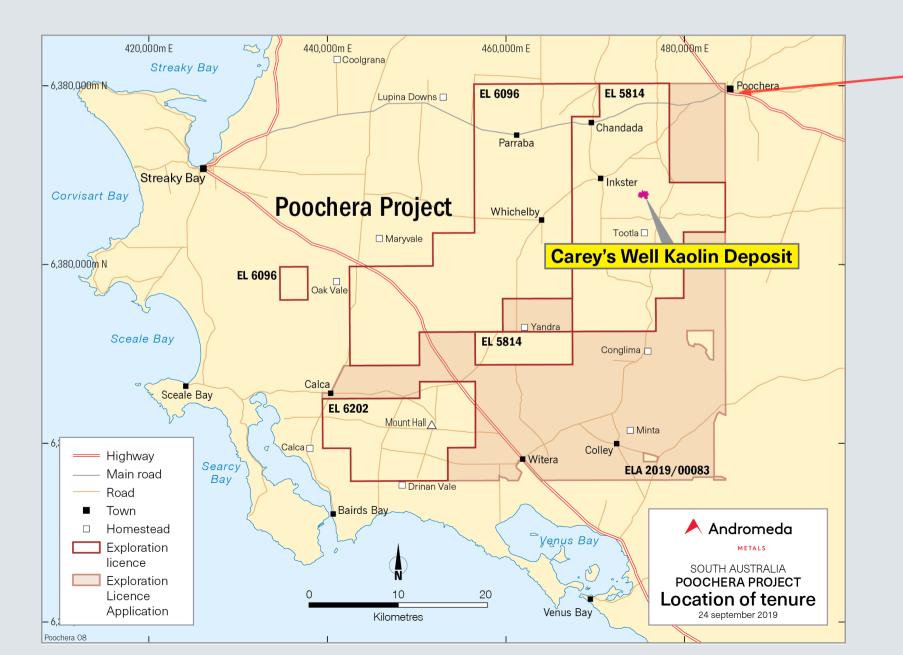


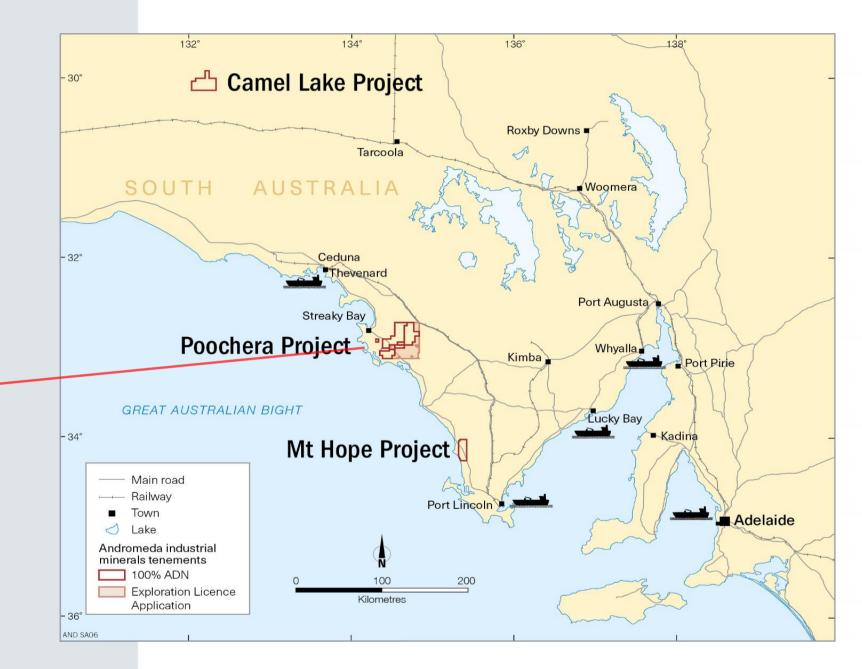


METALS

Andromeda

- World class halloysite-kaolin deposit
- Estimated short timeframe to production, with long mine life
- Agreements signed for ~1mtpa of three product forms:
  - 1. Direct Shipping Ore (DSO)
  - 2. Dry-processed mineral
  - 3. Wet-refined mineral
- High Purity Alumina (HPA) testwork proved a 99.99% (4N) feedstock in a single stage
- Numerous opportunities for halloysite in emerging nanotechnology applications





## **Defined Resource**

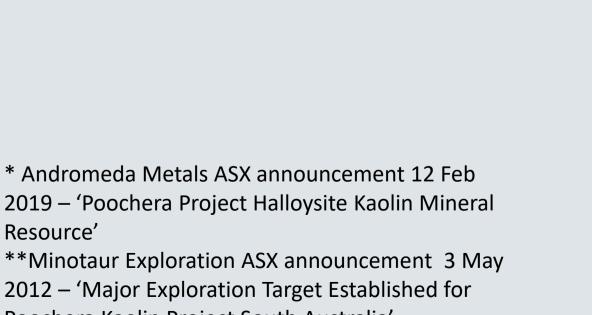
#### **JORC 2012 Resource Estimate for Carey's Well**

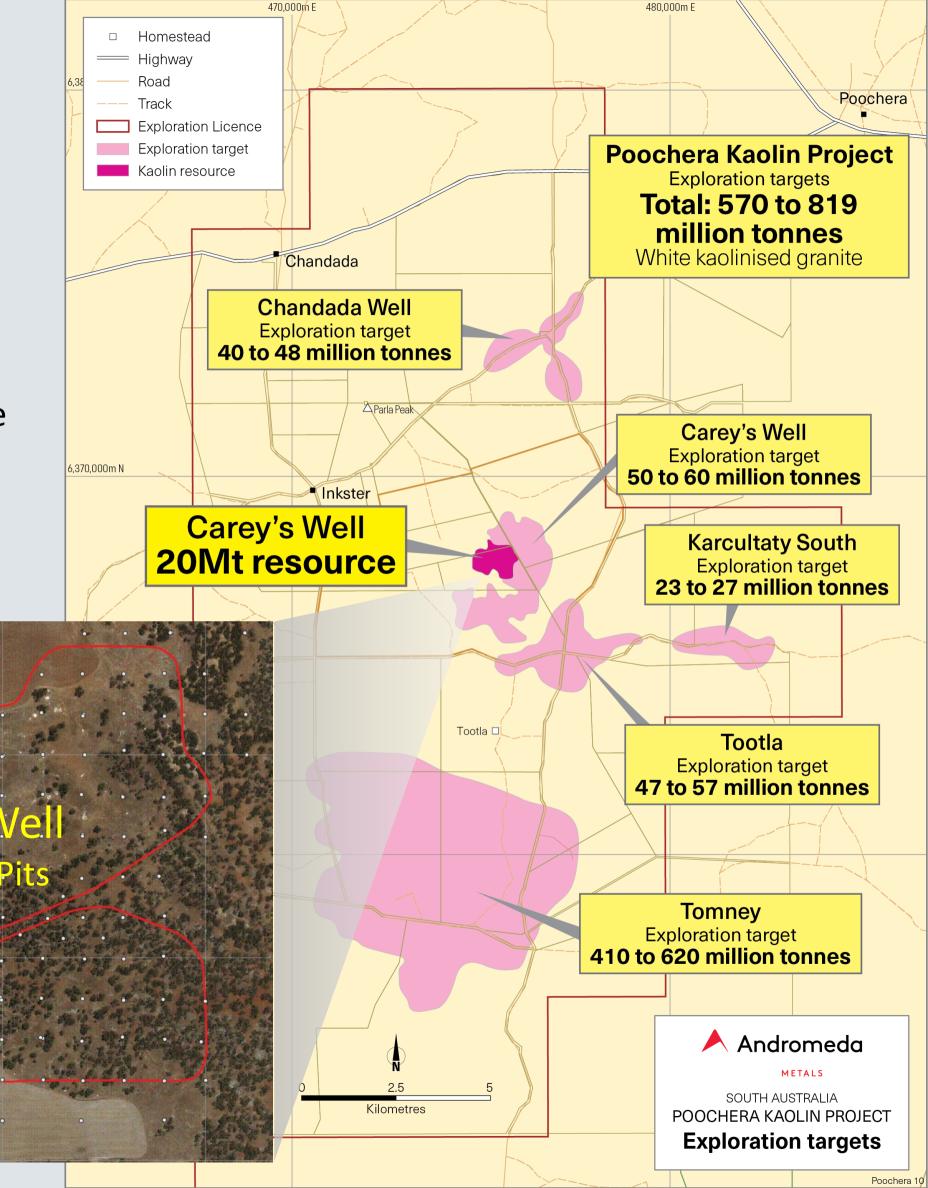
- Total 20Mt of "bright white" kaolinised granite
- Halloysite component of 9.7Mt\*

Resource'

Poochera Kaolin Project South Australia'

- Drilling campaign recently completed sample analysis almost complete
- Exploration targets indicate 570 810 million tonnes\*\*





## What is Halloysite Kaolin?

- Halloysite is a rare 'tubular shaped' derivative of kaolin
- The Poochera Resource is a naturally occurring blend of halloysite and kaolin

## Where is Halloysite-Kaolin Used?

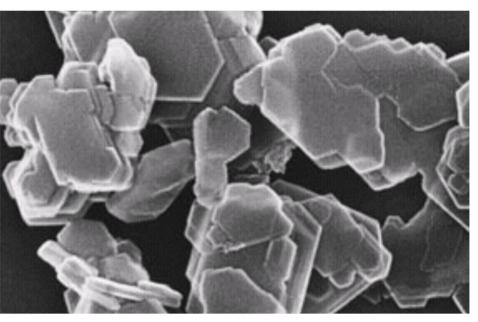
#### **Mature Established Markets**

- Ceramics for high-quality porcelain
- Catalysts for Fluid Catalytic Cracking (FCC)
   New and Emerging Markets
- High Purity Alumina production (HPA)
- Halloysite Nanotube Technologies

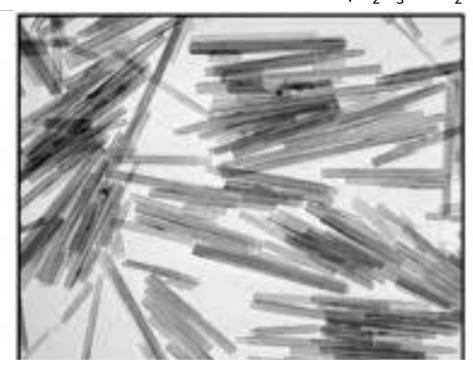
## **Indicative Relative Commercial Values**

- DSO (50% sand) AU\$115 AU\$140/t
- Refined Kaolin/Halloysite Hybrid AU\$350 AU\$1000/t
- Pure Halloysite AU\$5000/t
- HPA 4N(99.99%) AU\$35,000/t upwards
- Halloysite Nanotechnology AU\$huge

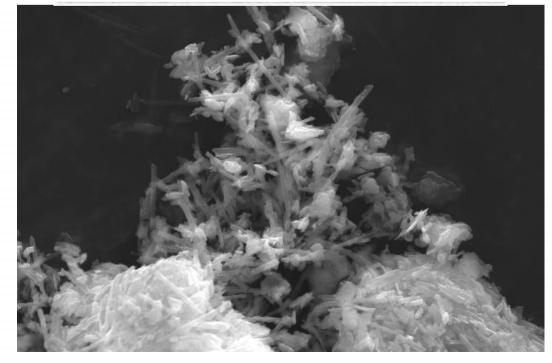




Typical Kaolin - Plate-Like Structure (Al<sub>2</sub>O<sub>3</sub> 2SiO<sub>2</sub>.2H<sub>2</sub>O)



Pure Halloysite - Tubular Structure (Al<sub>2</sub>O<sub>3</sub> 2SiO<sub>2</sub>.2H<sub>2</sub>O)

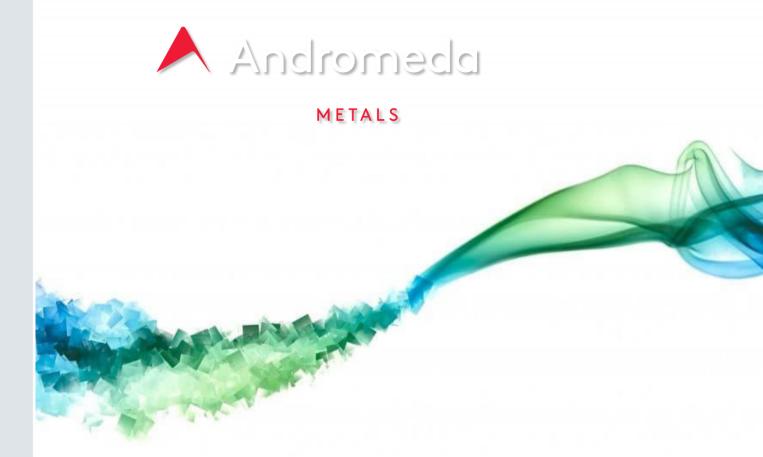


Halloysite Kaolin Hybrid

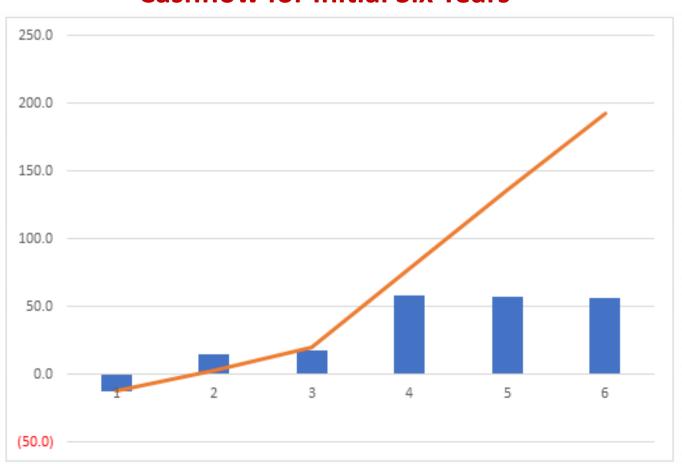
## **Scoping Study Highlights**

#### Andromeda Metals announces Scoping Study technically sound with excellent financial results

- An initial mine life of 15 years at 500ktpa
- Early shallow open-cut mining operations to focus on Direct Shipping Ore (DSO) and toll wet-refining in China
- Dry-processing on site during the second year of operation to give a 'Concentrate'
- LOM projected cashflow A\$800M
- Net Present Value of A\$413M at a discount rate of 8%
- Internal Rate of Return of 174%
- All in Sustaining Cost (AISC) averages A\$396/t, with an anticipated selling price of A\$700/t
- Pre-production capital cost A\$9M
- Maximum cash requirement of A\$25M prior to DSO operation/revenues received
- Breakeven payback 15 months from the start of site works
- Construction of the dry-processing plant (projected cost of A\$28M) to be funded from cashflow

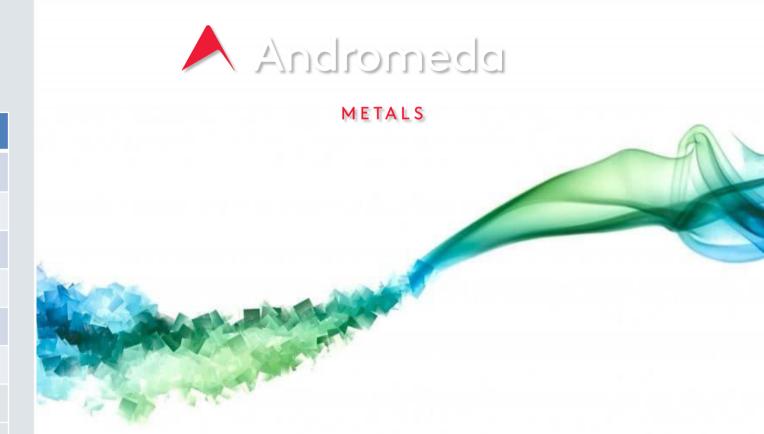


#### **Cashflow for Initial Six Years**



## Poochera Project – Scoping Study

Mine Plan – Production Target	
From Measured Resources	4.2 Mt
From Indicated Resources	3.4 Mt
From Inferred Resources	0 Mt
Total Production Target	7.6 Mt
<b>Capital Costs</b>	
Initial Capital Costs, Year 0	\$9 M
Working Capital to Month 3 in year 1	\$16 M
Maximum Cash required	\$25 M
Processing Plant, funded by internal cashflow, year 2	\$28 M
Sustaining Capital Costs (years 3-15@ \$600 k/yr)	\$9 M
<b>Production Summary</b>	
Life of Mine (LOM) (years)	15 years
Processing Rate (ktpa) of kaolinized granite	500 ktpa
Strip Ratio (Waste:Ore)	2.3
Premium Refined Kaolin Produced (LOM average)	187 ktpa
Average yield of refined kaolin (LOM average) (%)	37%
Project Economics	
Kaolin Price – Premium Wet Refined (A\$/ t ex Asian Works)	\$700/t
Revenue (A\$M)	\$1,953 M
AISC equivalent (A\$/t Wet-Refined Premium kaolin)	\$396/t
EBITDA LOM (A\$)	\$844 M
Cashflow	\$798 M
NPV8% pre-tax	\$413 M
IRR pre-tax (%)	174 %
Payback from start of site works	15 Months



## Start up and Operating costs

## **Marketing Strategy**

#### **Opportunities**

#### Short Term- early cash flow

- Direct Shipping Ore
- Wet Refining Toll Process (China/Japan) premium product

#### **Medium Term**

- Dry or Wet Process at Mine Site 50-60% waste reduction
- Wet Refining Toll Process (China/Japan) premium product

#### Long Term

- Premium HPA feedstock partnership opportunities
- Nanotechnology research partnerships





## **Mine Plan**

- Open cut quarry
- Low stripping ratio
- Stockpile at site and/or near port facility
- Pit backfill and progressive mine rehabilitation

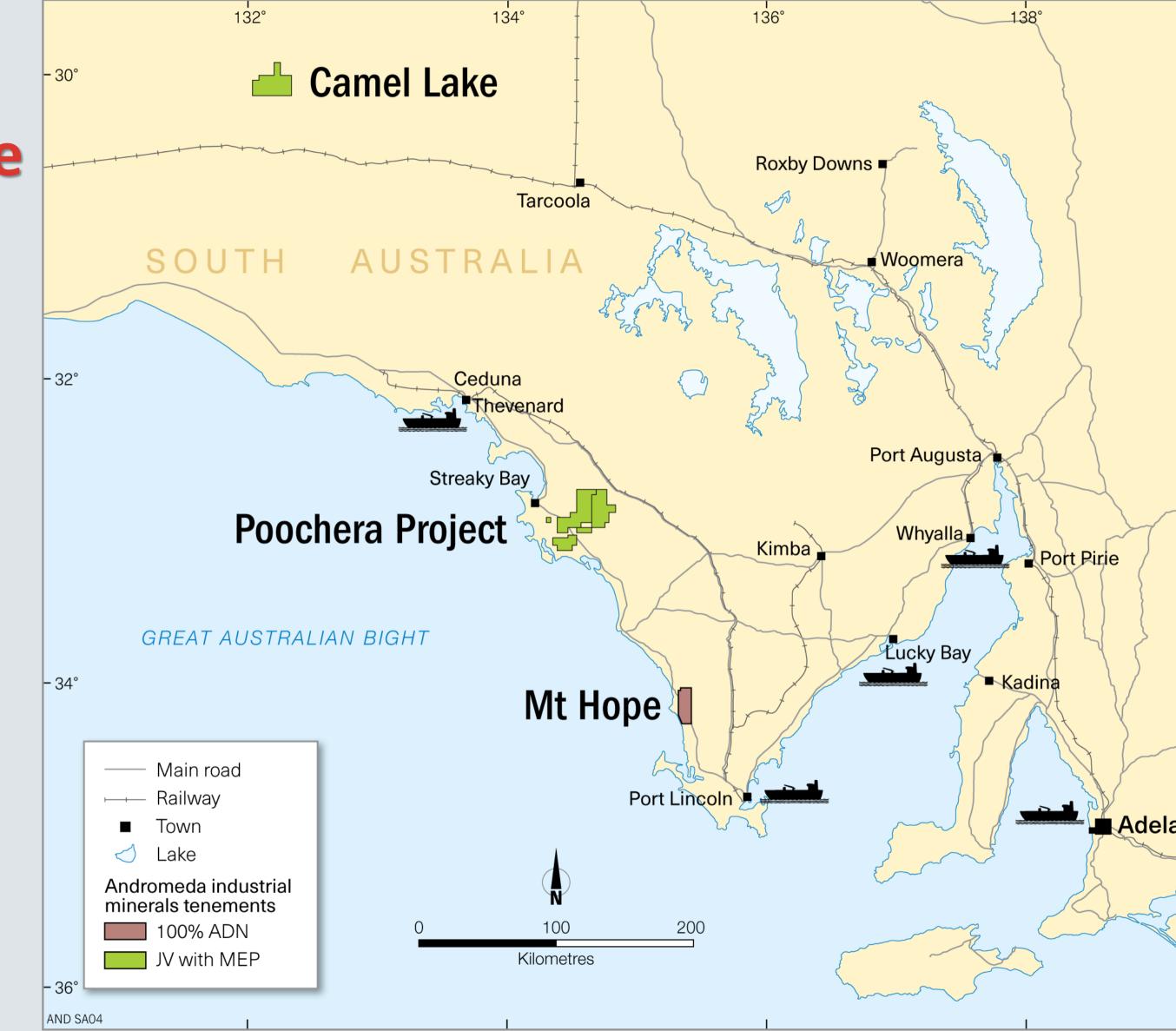






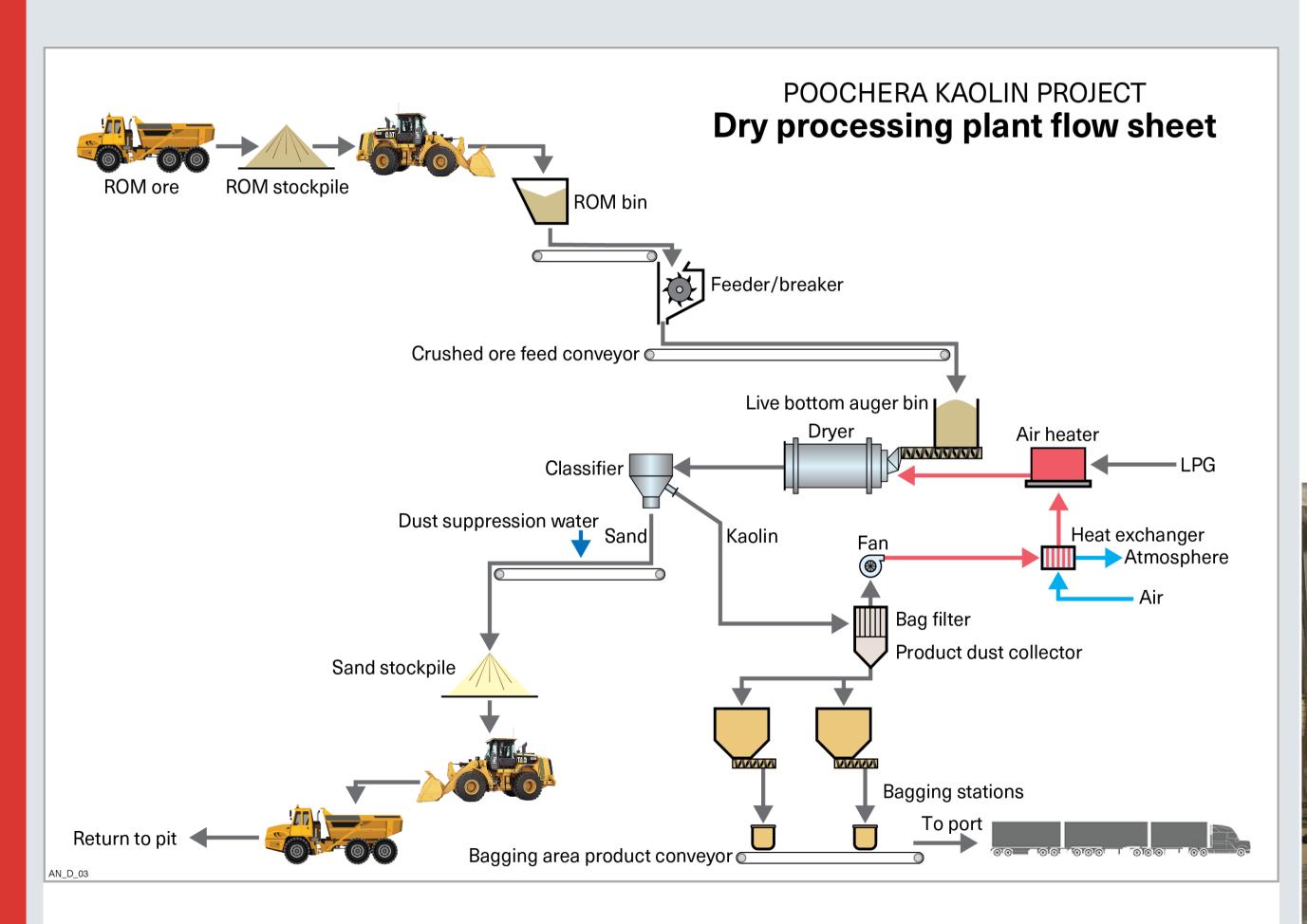
## **Existing Infrastructure**

- Adjacent to Streaky Bay, SA
- Ports at Ceduna and Lucky Bay have capacity and offer suitable shipping options





## **Processing Options**





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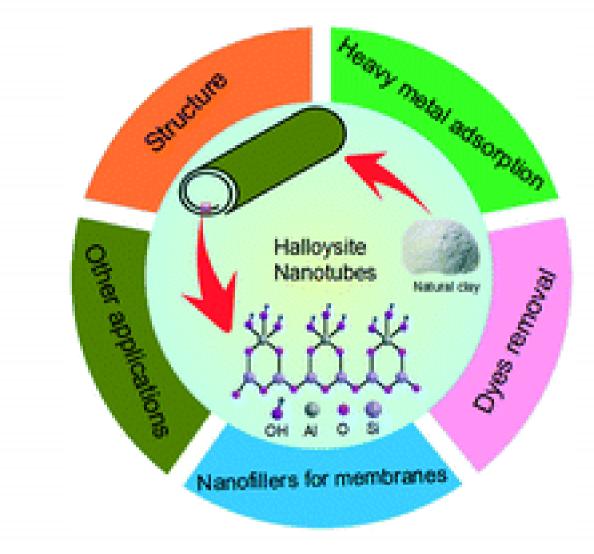
- Dry-processing to remove 50% waste (sand) and 10% moisture
- Transport cost reduced > half
- Potential to give market ready products (Offtakes signed for dry-processed)
- Potential to toll wet-refining overseas



# The World of Halloysite Nanotechnology

### **Emerging Applications:**

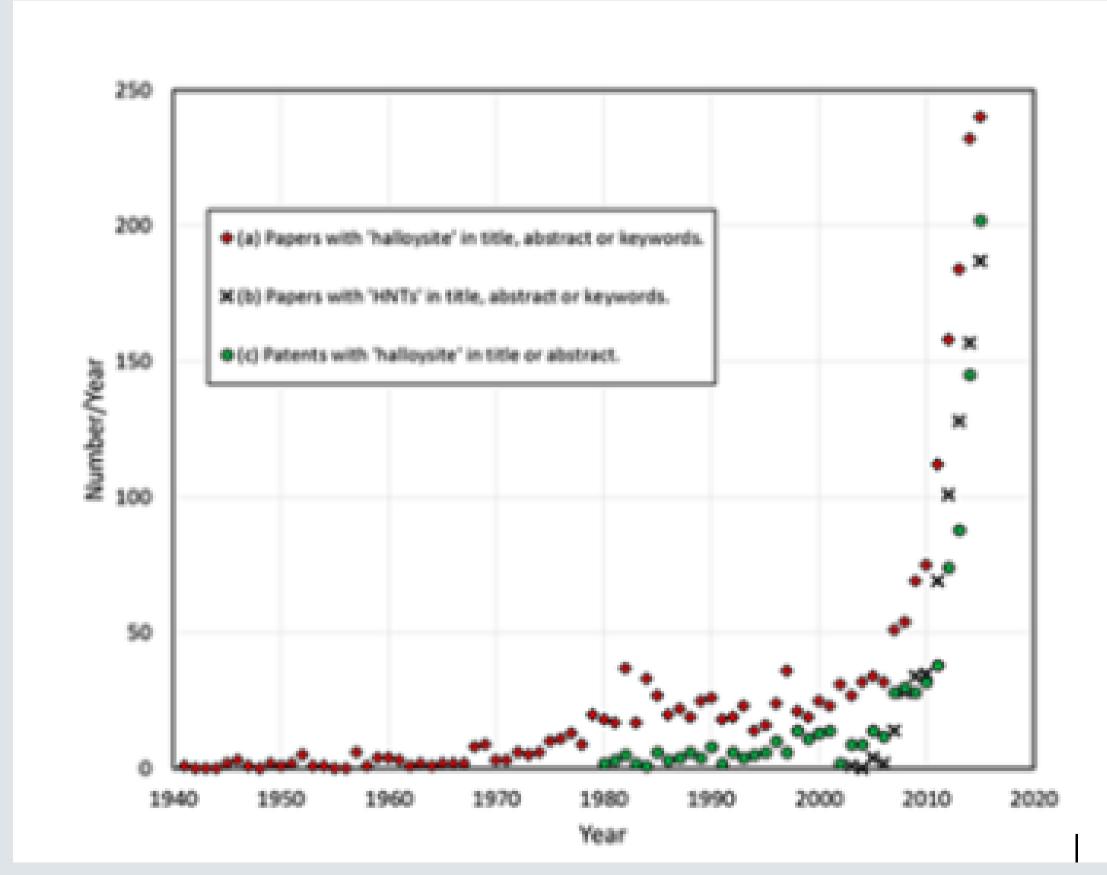
- Hydrogen Storage and Transport
- Batteries and Super-Capacitors
- Water Purification
- Carbon Dioxide Capture Storage and Conversion to Fuel
- Medical Delivery of Drugs
- Construction Delivery of Biocides
- Agriculture Delivery of Pesticides and Fertilisers
- Polymers and Coatings reinforcement and fire-retardancy







## **Exponential Research into Halloysite Nanotechnology**



## This is a Potential Game Changer

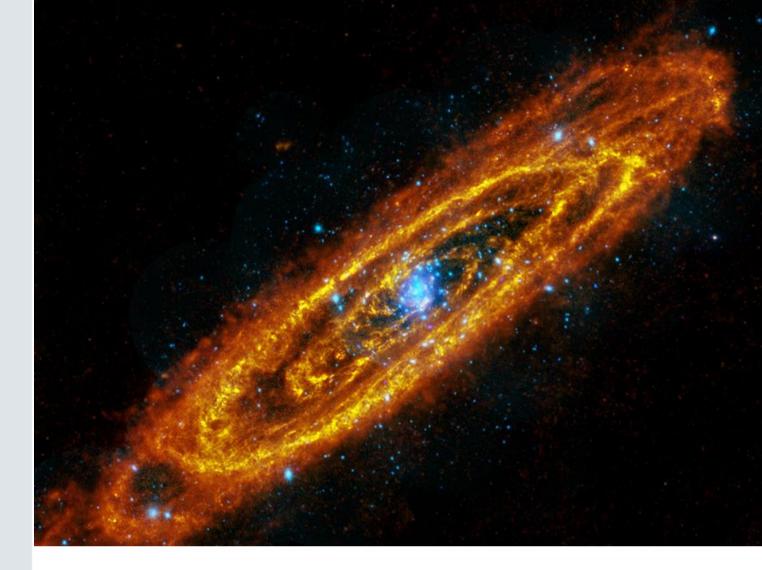
- Over 7000 current research papers
- 70 new patents granted last year alone
- No significant commercial supply
- ADN has high-purity halloysite
- Carey's Well hybrid (20% halloysite) can be purified



## In Summary

- South Australia has one of the world's largest resources of halloysite kaolin
- This is a relatively high value industrial mineral
- Global demand is increasing\*and production is decreasing
- Right product, at the right time, in the right place
- Andromeda is well positioned to become the world's leading producer of this mineral
- Huge blue-sky potential in HPA and nano-technology





## **Thank You**

James Marsh Managing Director james.marsh@andromet.com.au

<sup>\*</sup>Global Market Insights - Growth Projections 2016 to 2024 & Zion Market Research - Global Kaolin Market

#### **Cautionary Statements**

The Scoping Study referred to in this announcement has been undertaken to determine the potential viability of a direct shipping and dry-processing operation to produce high-quality halloysite-kaolin product at Poochera in South Australia that will provide Andromeda Metals with the confidence to undertake further and more detailed feasibility studies for the project. It is a preliminary technical and economic study of the potential viability of the Poochera Halloysite-Kaolin Project. It is based on low level technical and economic assessments that are not sufficient to support the estimation of ore reserves. Further exploration and evaluation work and appropriate studies are required before Andromeda Metals will be in a position to estimate any ore reserves or to provide any assurance of an economic development case.

The Production Target referred to in this announcement is based on Measured and Indicated Resources for the mine life. Andromeda Metals has concluded that it has reasonable grounds for disclosing a Production Target, however there is no certainty that the Production Target or preliminary economic assessment will be realised.

The Scoping Study is based on the material assumptions outlined elsewhere in this announcement. These include assumptions about the availability of funding. While Andromeda Metals 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 the Scoping Study will be achieved.

To achieve the range of outcomes indicated in the Scoping Study, funding in the order of AUD 13 million, inclusive of working capital, will likely be required. Investors should note that there is no certainty that Andromeda Metals will be able to raise that 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 Andromeda Metals' existing shares. It is also possible that Andromeda Metals could pursue other 'value realisation' strategies to provide alternative funding options. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Scoping Study.

These materials include forward looking statements. For further information on forward looking statements please refer to the end of this release.

#### **Forward Looking Statements**

Some of the statements contained in this report are forward looking statements. Forward looking statements, include, but are not limited to, statements concerning estimates of tonnages, expected costs, statements relating to the continued advancement of Andromeda's projects and other statements that are not historical facts. When used in this report, and on other published information of Andromeda, the words such as 'aim', 'could', 'estimate', 'expect', 'intend', 'may', 'potential', 'should' and similar expressions are forward looking statements. Although Andromeda believes that its expectations reflected in the 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. Various factors could cause actual results to differ from these forward looking statements include the potential that Andromeda's project may experience technical, geological, metallurgical and mechanical problems, changes in market prices and other risks not anticipated by Andromeda. Andromeda is pleased to report this summary of the Study in a fair and balanced way and believes that it has a reasonable basis for making the forward-looking statements in this announcement, including with respect to any mining of mineralised material, modifying factors, production targets and operating cost estimates.

This announcement has been compiled by Andromeda from the information provided by the various contributors to the Study. All financial assumptions and estimates are quoted in Australian Dollars ('A\$' or 'AUD') only, unless indicated otherwise.

