

ASX ANNOUNCEMENT

ANDROMEDA METALS LTD (Andromeda, ASX: ADN)



22 March 2023

Andromeda Metals Limited

ABN: 75 061 503 375

Corporate details:

ASX Code: ADN

Cash (31 Dec 2022): \$23.9m

Issued Capital:

3,110,270,932 ordinary shares

24,760,000 unlisted options

18,596,711 performance rights

Directors:

Mick Wilkes

Non-Executive Chair

James Marsh

Managing Director

Melissa Holzberger

Non-Executive Director

Austen Perrin

Non-Executive Director

Company Secretary

Sarah Clarke

Contact details:

Level 10

431 King William Street,
Adelaide, South Australia
5000

PO Box 1210

Unley BC SA 5061

Tel: +61 8 7089 9800

ir@andromet.com.au

www.andromet.com.au

Study Finds

Great White HRM™ Offers a Cost-Effective Solution to Decarbonise Concrete

Andromeda Metals Limited (ASX: **ADN**) (**Andromeda**) is pleased to announce the results of an independent study demonstrating the environmental and cost benefits of using the Great White HRM™ concrete additive product sourced from its Great White Project (the **Project**).

Highlights

- The study detailed the following benefits of using Great White HRM™ in concrete:
 - Global Warming Potential (GWPⁱ) reduction of over 7% for standard commercial concrete mix designs of 32MPa and 40MPa
 - By comparison, the Global Cement and Concrete Association (GCCA) is targeting an 11% reduction in GWP by altering the mix design of concrete as part of their "Road Map to Net Zero 2050"
 - Only 1kg of Great White HRM™ required per m³ of concrete
 - Potential cost savings of between \$2/m³ and \$3/m³ depending on concrete mix design
 - Concrete properties are materially unaffected
 - The total global (excluding China) market for Great White HRM™ based on the concrete grades tested is over 1.8 billion/m³ of concrete pa
 - Great White HRM™ is a refined kaolin product that is certified for use in concrete under Australian Standardsⁱⁱ(AS 1478.1 – 2000)

The study's results will be used by Andromeda, to promote usage of Great White HRM™ across the cement and concrete industries in Australia and New Zealand, through its exclusive offtake partner IMCD, and other regions globally.

Andromeda's Managing Director, James Marsh, said: *"This study quantifies the carbon reductions possible through using our patent pending Great White HRM™ product in commercial concrete, in addition to providing cost savings and improvements in handling and performance."*

Concrete is the most used artificial product on the planet and includes cement binder representing 8% of total global carbon emissions. Andromeda's unique product offers an easy solution to reduce this whilst also cutting costs which presents a huge market opportunity for our highest-margin product.

According to the roadmap to achieving Net zero published by the Global Cement and Concrete Association, altering the mix design of concrete is expected to contribute 11% of the total CO₂ emission reductions^{vi}. Therefore, by reducing the global warming potentialⁱ in the concrete by over 7%, as found in this study, the use of Great White HRM™ presents a major opportunity for the industry to achieve net zero by 2050."

Mr Niki Jackson MSc (Eng) ACT, MICT, DFSS, from Sustainable Future by Design, said: *"The study shows substantial reductions of over 7% in Global Warming Potential when using Great White HRM™ in concrete mix designs, highlighting the potential for Great White HRM to provide significant assistance in reducing the carbon footprint of concrete."*

"The unique properties of the halloysite-kaolin contained in Andromeda's allows for concrete mix designs with reductions in binder and coarser particle size distribution, while also controlling any segregation and excessive bleeding."

Industry action on decarbonisation to limit climate change

Many countries and companies have signed up to the United Nations' Net Zero Emissions by 2050 initiative in an effort to keep global warming below 1.5 degrees Celsius. As a pathway to achieving this, the Australian government has set a target of achieving a 43% reduction of greenhouse gas emissions by 2030.ⁱⁱ

With increased awareness of the impact from carbon dioxide and other greenhouse gases emissions and the significant contribution from the cement industry, research efforts are being advanced to reduce the impacts associated with concrete production and consumption.

In early October 2021, the Global Cement and Concrete industry declared its "ambition to reduce their CO₂ footprint and deliver society with net zero carbon concrete by 2050"ⁱⁱⁱ.

Concrete is the most commonly used building material in the world with an annual production of approximately 10 billion cubic metres^{iv}, with associated carbon emissions contributing 8% of global emissions of carbon dioxide (CO₂)^v.

Global demand for 'green' cement is currently estimated at US\$ 31.1 billion with the market expected to grow by 12.3% p.a. to reach US\$ 63.3 billion by 2028^{vi}.

To support Andromeda's global product marketing efforts for its Great White HRM™ concrete additive product sourced from its Great White Project, a detailed study was commissioned into the cost and decarbonisation benefits of using Great White HRM™ in standard concrete mixes commonly used in Australia.

The independent study was conducted by internationally recognised concrete expert Niki Jackson MSc (Eng) ACT, MICT, DFSS. Mr Jackson is a Material and Concrete Technology specialist with extensive mining and civil construction experience specialising in concrete decarbonisation, sustainability, and durability.

In addition to identifying the cost and decarbonisation benefits of using Andromeda's Great White HRM™ concrete additive, the study measured various physical properties and mechanical performance aspects of widely used, standard commercial concrete mix designs.

A copy of the independent study can be found on Andromeda's website at the following location:
www.andromet.com.au/investors/asx-releases

This ASX announcement has been approved for release by the Board of Directors of Andromeda Metals Limited.

For more information about the Company and its projects, please visit our website, www.andromet.com.au or contact:

Manager, Investor Relations & Corporate Affairs

Patrick Sinclair

T: 08 7089 9819

M: 0403 708 431

E: Patrick.Sinclair@andromet.com.au

Assumptions and qualifications

It is noted that the conclusions of the study were based on the materials used for the trial work and the results may not be fully achieved with other raw materials or locations within and abroad of Australia. Further work with other materials and designs would need to be investigated to ensure that the methodology of lowering the global warming potential is repeatable. The study does not consider any comparison of Great White HRM™ with other concrete additives that may be available in the market.

Independence declaration – Mr. Niki Jackson MSc (Eng) ACT, MICT, DFSS (Sustainable Future by Design)

The study's author declares receipt of the following financial support for the research, authorship, and publication of this report: This work was supported by Andromeda Metals Ltd. The author also declares that Andromeda Metals Ltd did not have any role in the design of the study, in the analysis and interpretation of the data. The results and views are completely independently reported by the author.

Disclaimer

This study is an independent study and as such, Andromeda Metals Ltd does not warrant the accuracy, reliability or completeness, or the opinions and conclusions, of the study. Regard should be had to the assumptions and qualifications on which the study is based. Andromeda Metals Ltd believes that the value of its products to customers will be determined by various factors including the industry, use and location of the customer.

About Andromeda

Andromeda Metals (ASX: ADN) is an ASX-listed emerging industrial minerals producer. Our vision is to lead the world in the sustainable supply of superior quality industrial minerals and advancement of nanotechnologies.

We see 2023 as a transformational year for Andromeda. Following which we anticipate becoming a globally significant producer of halloysite-kaolin products. Having received all major regulatory approvals, we are progressing towards early-stage-construction of the Stage 1A Starter Plant, while also advancing funding discussions aimed at enabling a final investment decision to be made.

From there, we aim to leverage the uniqueness of our Great White Project resources to grow through meeting the growing long-term demand for kaolin, expand our range of high-margin kaolin-based products and develop many new technologies at the forefront of science, and essential to building a more sustainable future.

Andromeda's kaolin deposits are located in South Australia's Eyre Peninsula, a Tier 1 mining jurisdiction, and contain some of the highest purity kaolin ever discovered. Kaolin has been used in ceramics production for centuries because of its unique properties as a bright white inert mineral with very fine particle size. In addition to ceramics, today, kaolin can be found in a range of everyday products, including cosmetics, paint, rubber, medicines, paper, pesticides, orthodontics, orthopedics, and plastics. Every modern home and car contains

kaolin in some form.

Using a novel flowsheet, we are also researching using kaolin to produce the critical mineral High-purity Alumina (HPA).

Our large, high-quality deposits also contain a rare form of kaolin called halloysite, a naturally occurring nanotube. Halloysite is highly desirable in some applications where it attracts a premium price. Halloysite-kaolin can be used in emerging high-tech nanotechnologies and applications, such as carbon capture, soil remediation, water purification, hydrogen storage, medicine delivery and renewable energy.

Forward Looking Statements

This document contains or may contain certain "forward-looking statements" and comments about future events, that are based on Andromeda management's beliefs, assumptions and expectations and on information currently available to management as at the date of this document. Often, but not always, forward-looking statements can generally be identified by the use of forward looking words such as "may", "will", "expect", "plan", "believes", "estimate", "anticipate", "outlook", and "guidance", or similar expressions, and may include, without limitation, statements regarding plans, strategies and objectives of management, anticipated production and production potential.

Where Andromeda expresses or implies an expectation or belief as to future events or results, such expectation or belief is expressed in good faith and on a reasonable basis.

Forward-looking statements are only predictions and are subject to known and unknown risks, uncertainties, assumptions and other important factors that could cause the actual results, performances or achievements to differ materially from future results, performances or achievements expressed, projected or implied by such forward-looking statements. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date thereof. Such risks and factors include, but are not limited to: changes in markets and product demand, exchange rate assumptions; changes in product pricing assumptions; major changes in mine plans and/or resources; changes in equipment life or capability; emergence of previously underestimated technical challenges; increased costs and demand for production inputs; and environmental or social factors which may affect a licence to operate, including political risk.

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- I. Global warming potential (GWP) is a value that allows direct comparison of the impact of different greenhouse gases in the atmosphere by comparing how much energy one tonne of a gas will absorb compared to one tonne of carbon dioxide (Australian Government Clean Energy Regulator).
 - II. Chemical admixtures for concrete, mortars and grout
 - III. *Australia NDC 2022 Update* provided to United Nations Framework Convention on Climate Change, 16 June 2022.
 - IV. Joint Media Release, Cement Industry Federation and Cement Concrete & Aggregates Australia, *Cement and concrete industry ambition for Net Zero by 2050*, October 2021.
 - V. S. A. Miller, A. Horvath, P. J. M. Monteiro, and C. P. Ostertag, *Greenhouse gas emissions from concrete can be reduced by using mix proportions, geometric aspects, and age as design factors*, 2015.
 - VI. *Sustainable Future by Design*, Niki Jackson MSc (Eng) ACT, MICT, DFSS, *Product Evaluation of Great White Halloysite Kaolin Clay (Great White HRM) for Andromeda Metals Ltd* February 2023.
 - VII. IMARC Group research, *Green Cement Market: Global Industry Trends, Share, Size, Growth, Opportunity and Forecast 2023-2028*.
 - VIII. GCCA. Global Cement and Concrete Association. *Getting to net zero*. [Online] 2022. [Cited: 05 March 2023.] <https://gccassociation.org/concretefuture/getting-to-net-zero/>.