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Australian Securities Exchange
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Sydney NSW 2000

ASX RELEASE

Proof-of-Concept Study on Alternative Nickel-Cobalt Laterite Ore Processing

Australian Mines Limited (“Australian Mines” or “the Company”) is pleased to advise it has completed a Proof-of-Concept Study (“Study”)¹ investigating an innovative, low-capex, scalable, and environmentally benign (non-HPAL)² processing technology targeting the extraction of nickel, cobalt, and scandium from the lateritic ores at its Bell Creek–Minnamoolka (QLD) and Flemington (NSW) Projects.

Background

Australian Mines recently commissioned a Study (Stage 1) conducted by UK-based research and development (R&D) partner Descycle³ investigating the potential to unlock value in both its Bell Creek–Minnamoolka and Flemington Projects using deep eutectic solvents (DES), targeting the extraction of nickel, cobalt, and scandium from lateritic ores.

The Study was carried out by UK-based clean tech company Descycle and covered, at a concept level, incorporating a DES leaching technology as a potential alternative to existing treatment and recovery processes (such as HPAL) in the extraction of target metals from nickel and cobalt lateritic ores (see Figure 1 of this report).

¹ Descycle, *Investigation of the potential for processing Ni-laterite ore with Deep Eutectic Solvents* (28 February 2022).

² ‘HPAL’ means high pressure acid leach, a hydrometallurgical process used to extract nickel and cobalt from lateritic ores.

³ www.descycle.com

Conventional and Alternative Processing Flowsheets

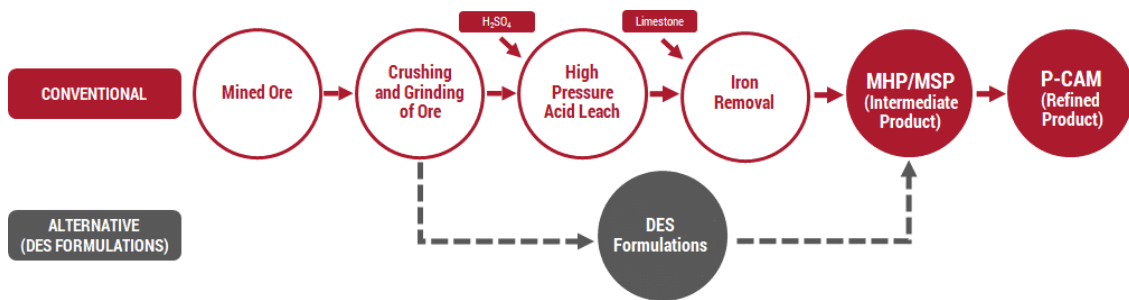


Figure 1: Conventional and Alternative Nickel and Cobalt Processing Flowsheets

DES leaching technology has the following potential benefits, including:

- Significantly lower capital expenditure (compared to other existing process flowsheets, such as HPAL),
- A scalable processing plant, through the modular design and construct approach (with the ability to start small and expand over time),
- Environmental benefits, given DES are environmentally benign, biodegradable, and non-aqueous, with the potential for significantly reduced water usage, and low CO₂ emissions; and
- High recovery rates of nickel, cobalt, and scandium.

Sampling and Leach Tests

The Study for DES leaching utilised samples from Sconi⁴ and Flemington⁵ Project ores (~10 kg for each bulk sample) – see Figure 2 of this report.

⁴ The Bell Creek–Minnamoolka deposits are 100% owned by Australian Mines and are located within the Company's Sconi Project. These nickel-cobalt deposits, however, sit outside the Offtake Agreement with LG Energy Solution, which only concerns the Sconi Project's Greenvale, Lucknow, and Kokomo deposits.

The Mineral Resource Estimate for the Bell Creek deposit is reported under JORC 2012 Guidelines and was reported by Australian Mines on 29 April 2019. There has been no Material Change or Re-estimation of the Mineral Resource since this 29 April 2019 announcement by Australian Mines.

The Mineral Resource Estimate for the Minnamoolka deposit is reported under JORC 2012 Guidelines and was reported by Australian Mines on 21 October 2019. There has been no Material Change or Re-estimation of the Mineral Resource since this 21 October 2019 announcement by Australian Mines.

⁵ The Mineral Resource Estimate for the Flemington Cobalt-Nickel-Scandium Project is reported under JORC 2012 Guidelines and was reported by Australian Mines Limited on 31 October 2017. There has been no

Sconi Ore Sample



Flemington Ore Sample



Figure 2: Sconi and Flemington ore samples as received, prior to processing and sampling

Three experimental series (Phase 1-3) were conducted on the Sconi and Flemington ore samples to investigate and establish the leaching characteristics of nickel laterite in DES, including:

- Phase 1 – Initial screening of DES, single stage bulk leach,
- Phase 2 – Advanced screening of DES, single stage bulk leach, and
- Phase 3 – Multi-stage leach.

Material Change or Re-estimation of the Mineral Resource since this 31 October 2017 announcement by Australian Mines.

A range of operational conditions were explored using a broad range of DES formulations and tested on both (Sconi and Flemington) ore types.

These DES formulations were compared against a range of aqueous acid mixtures that are commonly associated with laterite leaching.

Solid residues from each of the three leach test phases were sent to and analysed by ALS⁶ geochemistry laboratory in Galway Ireland, a laboratory accredited to international standard ISO/IEC 17025 for testing laboratories.

Results

The results from the Study highlighted the potential for the economic processing of two low-grade oxide nickel laterites and other metal laterites and recovery of by-products, including cobalt and scandium from Sconi and Flemington ores.

Phase 1 and 2 highlights from the testing program, include:

- Sconi ore – In the single-stage leach (Phase 2), DES was found to be effective, leaching **up to 89% nickel, 96% cobalt, and 75% scandium**,⁷
- Flemington ore – In the single-stage leach (Phase 2), DES was effective, in leaching **up to 97% nickel, 100% cobalt, and 94% scandium** (see Figure 3 of this report).

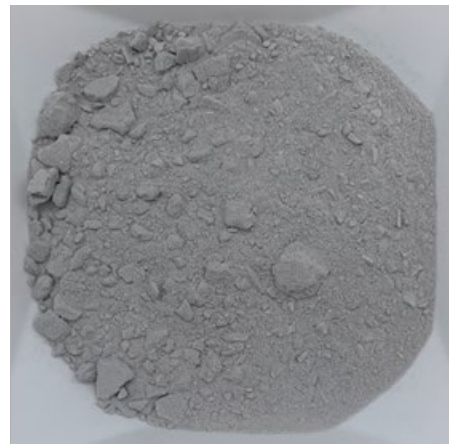
Phase 3 highlights from the testing program, include:

- Sconi ore – In the multi-stage leach, the best performing DES formulation was able to leach **97% nickel and 96% cobalt**, higher than the single stage leach (see Figure 3 of this report).

⁶ www.alsglobal.com

⁷ Industry standards for HPAL nickel and cobalt recovery rates are typically between 93% and 95%.

Sconi Ore Samples – Pregnant DES Liquid and Solid Residue



Flemington Ore Samples – Pregnant DES Liquid and Solid Residue



Figure 3: Images of both the recovered lixiviant and cleaned and dried solid residues post leach from Sconi and Flemington ores

In summary, leaching rates from the Sconi and Flemington ores tested in this Study were seen as high as 100% cobalt, 97% nickel, and 94% scandium.

Designer DES formulations can outperform aqueous mineral acids under the same conditions and show significant potential for leaching of nickel and by-products from laterites.

Commercialisation process

Following the positive results from this Study (Stage 1), Australian Mines intends on undertaking further work as part of the commercialisation process, including:

- Stage 2 (Pre-Feasibility Study) – over the next 3-6 months, which will focus on metal recovery from the DES formulations and front-end optimisations,
- Stage 3 (Full Feasibility and Pilot Design) – over a 12-month period, and
- Stage 4 (Pilot Plant) – over a 3–6-month period of operation, as well as a construction period.

The costings for Stage 2 (Pre-Feasibility Study) of the commercialisation process are relatively modest and have been factored into the current 2022 and 2023 financial year budgets.

The decision to investigate an alternative processing flowsheet for the Bell Creek–Minnamoolka and Flemington Projects does not alter Australian Mines commitment to its flagship Sconi Nickel-Cobalt-Scandium Project in North Queensland, nor its offtake agreement with LG Energy Solution⁸ (which currently excludes ore from Bell Creek, Minnamoolka, and Flemington).

Commenting on the Proof-of-Concept Study, Australian Mines' Managing Director, Mr Benjamin Bell, said, "We are pleased to be partnering with Descycle on this innovative R&D study. The initial results are very encouraging and have the potential to unlock significant value at our Bell Creek–Minnamoolka and Flemington Projects."

Descycle Chief Technical Officer, Dr Rob Harris, added, "The results highlight a real potential game changing technology in the form of DES, for the recovery of critical metals such as nickel and cobalt from low grade lateritic ores. While further test work is required, we anticipate the DES leaching process can be further improved upon to increase process efficiency and reduce cost for the recovery of these critical metals."

ENDS

⁸ Australian Mines Limited, *Binding offtake agreement with LG Energy Solution for supply of mixed nickel-cobalt hydroxide from the Sconi Project, Queensland* (ASX: 16 August 2021).



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Authorised for release by the Board of Directors of Australian Mines Limited



Australian Mines Limited supports the vision of a world where the mining industry respects the human rights and aspirations of affected communities, provides safe, healthy, and supportive workplaces, minimises harm to the environment, and leaves positive legacies.

Appendix 1: Forward Looking Statements

This announcement contains forward looking statements. Forward looking statements can generally be identified by the use of forward looking words such as, 'expect', 'anticipate', 'likely', 'intend', 'should', 'could', 'may', 'predict', 'plan', 'propose', 'will', 'believe', 'forecast', 'estimate', 'target', 'outlook', 'guidance', 'potential' and other similar expressions within the meaning of securities laws of applicable jurisdictions.

Any forward looking statements in this document relating to the outcomes of the Sconi Project Feasibility Studies and ongoing refinement work as outlined in this report. Actual results and developments of projects and the market development may differ materially from those expressed or implied by these forward looking statements. These, and all other forward looking statements contained in this announcement are subject to uncertainties, risks and contingencies and other factors, including risk factors associated with exploration, mining, and production businesses. It is believed that the expectations represented in the forward looking statements are reasonable but they may be affected by a variety of variables and changes in underlying assumptions which could cause actual results or trends to differ materially, including but not limited to price fluctuations, actual demand, currency fluctuations, drilling and productions results, resource estimations, loss of market, industry competition, environmental risks, physical risks, legislative, fiscal and regulatory changes, economic and financial market conditions in various countries and regions, political risks, project delay or advancement, approvals and cost estimates.

Any forward looking statement is included as a general guide only and speak only as of the date of this document. No reliance can be placed for any purpose whatsoever on the information contained in this document or its completeness. No representation or warranty, express or implied, is made as to the accuracy, likelihood or achievement or reasonableness of any forecasts, prospects, returns or statements in relation to future matters contained in this document. Australian Mines does not undertake to update or revised forward looking statements, or to publish prospective financial information in the future, regardless of whether new information, future events or any other factors affect the information contained in this announcement, except where required by applicable law and stock exchange listing requirements.

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