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Ardea Resources Limited

Goldfields Esperance Major Projects Conference

21 September 2022

Kalgoorlie Nickel Project

*Sustainable and ethical **nickel-cobalt** for the battery mineral supply chain*

Australian Federal Government - Major Project Status

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Important notice

This presentation contains general information only and is, or is based upon, information which has been released to ASX or is contained in the Ardea Resources Limited (Ardea or the Company) prospectus dated 9 November 2016 (including supplementary prospectuses dated 18 November 2016 and 6 January 2017), the Goongarrie Nickel Cobalt Project Pre-Feasibility Study (dated 28 March 2018) the Goongarrie Expansion Study (24 July 2018), Goongarrie Pilot Plant trial produces battery grade crystals (31 October 2018), Goongarrie Nickel Cobalt Project Update (8 April 2019), Ardea Quarterly Operations Report, for the quarter ended 31 March 2020 (9 April 2020), Quarterly Activities Report - June 2020 (23 July 2020), Nickel Sulphide Targets within the Ardea Tenement Portfolio including KNP (30 September 2020), Quarterly Activities Report - September 2020 (27 October 2020), Quarterly Activities Report - December 2020 (21 January 2021), GNCP High Grade Resource - 60 million tonnes at 1.0% nickel (15 February 2021), Quarterly Activities Report - March 2021 (21 April 2021), Basal contact nickel sulphide intersected at Ardea's Emu Lake (27 April 2021), CSIRO/Ardea research at Goongarrie BTZ – insights for nickel sulphide and gold targets (27 May 2021), Kalgoorlie Nickel Project – Feasibility Study Underway (31 May 2021), Semi-massive nickel sulphide intercept at Emu Lake (10 June 2021), Highway Nickel Deposit - Mineral Resource Estimate (16 June 2021), Nickel Sulphide Exploration Update – Emu Lake (13 July 2021), Ardea Quarterly Operations Report, for the quarter ended 30 June 2021 (27 July 2021), Ardea Annual Report 2021 (24 September 2021), FBICRC signs contract for $18M flagship Cathode Precursor Production Pilot Plant (22 October 2021), Quarterly Activities Report - September 2021 (27 October 2021), Goongarrie Hub Feasibility Study Update (15 November 2021), Emu Lake Discovery (3 December 2021, 14 January 2022, 7 February 2022), Goongarrie Hub Feasibility Study Update (25 January 2022) Quarterly Activities Report – December 2021 (28 January 2022), Successful A$21.5 Million Capital Raising (22 February 2022), High-grade Nickel-Cobalt Confirmed at Kalpini with Scandium and Rare Earth Elements (14 March 2022), Kalgoorlie Nickel Project Recognition on All Tiers of Australian Government (21 March 2022), Quarterly Activities Report – March 2022 (28 April 2022) Confirmation of High-Grade Nickel-Cobalt from Goongarrie South Metallurgical Drilling (16 May 2022), Kalgoorlie Nickel Project Feasibility Study Update (14 June 2022) Quarterly Activities Report – June 2022 (19 July 2022) and Kalgoorlie Nickel Project Strategy Update (9 September 2022).

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The Goongarrie Project has completed the Pre-Feasibility Study phase and has commenced programs that are part of the Definitive Feasibility Study. Though reasonable care has been taken to ensure that the facts are accurate and/or that the opinions expressed are fair and reasonable, no reliance can be placed for any purpose whatsoever on the information contained in this document or on its completeness. Actual results and developments of projects and the market development may differ materially from those expressed or implied by these forward looking statements depending on a variety of factors. A key conclusion of the Pre-Feasibility Study and Expansion Study, which is based on forward looking statements, is that the Goongarrie Project is considered to have positive economic potential.

No stock exchange, regulation services provider, securities commission or other regulatory authority has approved or disapproved the information contained in this news release.

Kalgoorlie Nickel Project (KNP) Highlights

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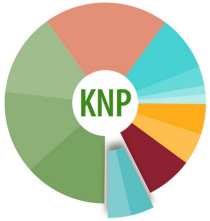
World Class Nickel-Cobalt Mineral Resource

5.9Mt contained nickel, 384kt contained cobalt
plus Sc & other Critical Minerals*

Includes:

Goongarrie Hub High grade component: 784kt contained nickel, 54kt contained cobalt

* See Appendix for resource breakdown and ASX release 16 June 2021

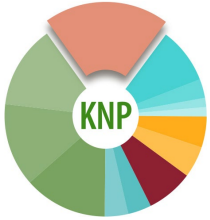


GEOLOGY

Premier location

For jurisdiction, infrastructure and technical expertise

- WA is the premier global destination for development of minerals operations
- Well established health, safety and environmental policies
- Over 125 years of continuous mining with strong stake holder support
- Access to skilled professionals in an infrastructure rich region
- Semi-arid Great Western Woodlands environment, and historic mining jurisdiction conducive to best practice safe tailings management/rehabilitation

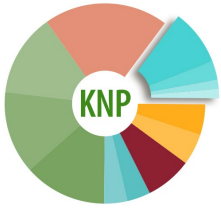


JURISDICTION

100% Ardea

High level of confidence and control behind resource

- The KNP database contains 19,308 drill holes with 454,730 samples and 512,167 sample assays with QAQC
- Detailed geological logging has resulted in a robust and repeatable model
- All KNP Goongarrie Hub resources are on Granted Mining Leases with a Native Title agreement in place
- Ardea has full custody of all aspects of the KNP development
- **100% off-take still available** linked to project funding

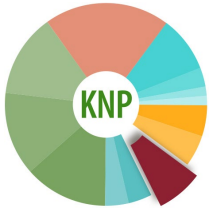


CONFIDENCE

Proven flowsheet

MHP production with industry leading low carbon emissions

- Premium goethite ore (excellent comminution, less abrasive, low consumable consumption, lower maintenance)
- MHP or PCAM product to meet Strategic Partner requirements
- FBICRC membership
- Ni:Co:Mn ratio well suited to NCM811 battery technology
- Additional Critical Mineral by-products (current test work)
- Sustainable and ethical supply of nickel and Critical Minerals for a low carbon future



ENGINEERING/METALLURGY

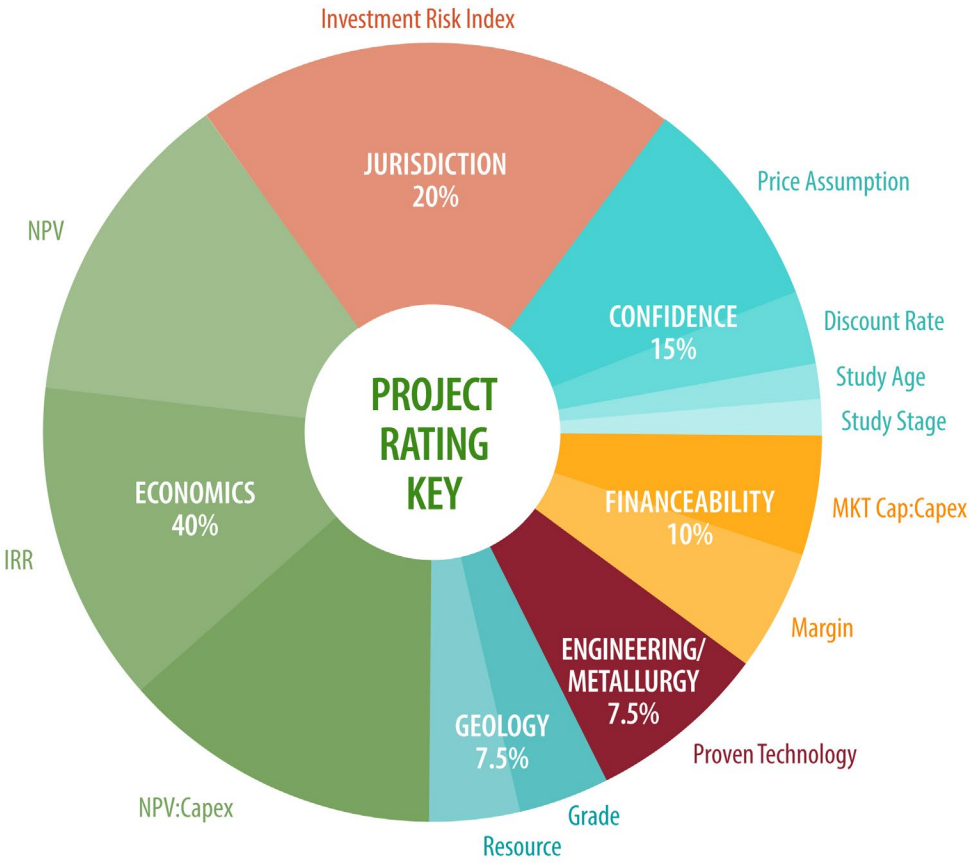
Economics

KNP gains national recognition to fast track permitting & funding

- Awarded Major Project Status by Australian Federal Government.
- Streamlined support, approvals, and funding options
- KNP is ranked #1 in the WA Geological Survey Nickel Resource table (>100kt Ni) (Feb22)
- Metallurgical test work in progress with encouraging AL feed material studies
- FS work streams underway to deliver a world leading nickel-cobalt-scandium producer
- Committed to nickel sulphide exploration / discovery success

ECONOMICS/FINANCING

Standard metrics to look at when rating a project



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Why KNP rates highly in all metrics

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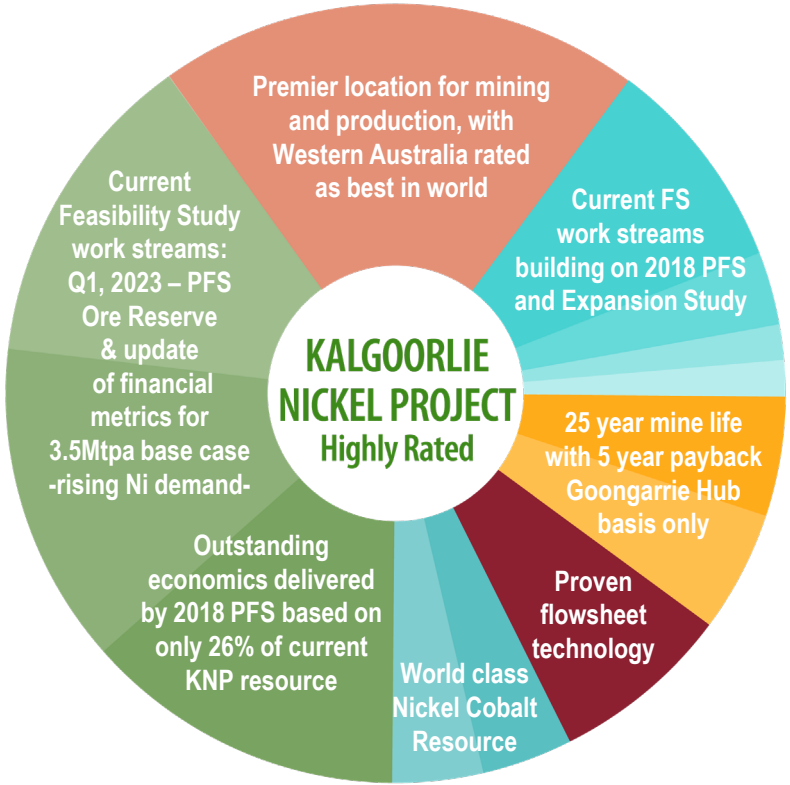

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Kalgoorlie Nickel Project

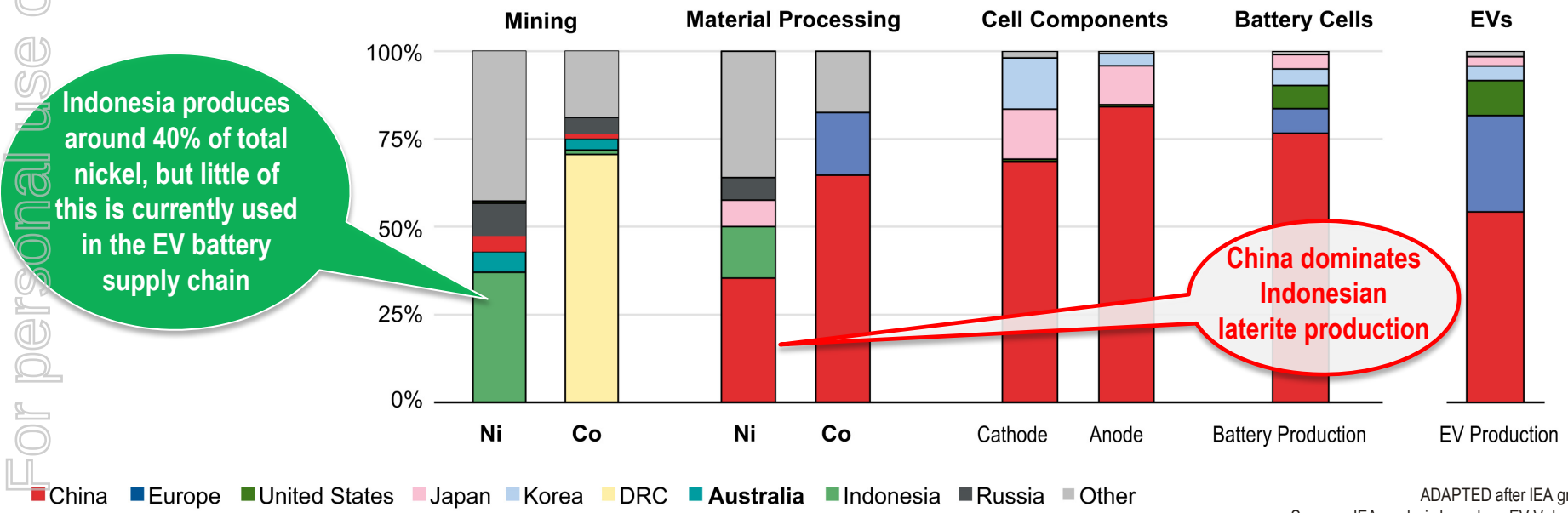
Sustainable and ethical ***nickel-cobalt*** *for the battery mineral supply chain*

Australian Federal Government - Major Project Status

China dominates through long term strategic planning

China dominates the entire downstream EV battery suppy chain

Geographical distribution of the global EV battery supply chain



ADAPTED after IEA graph
Sources: IEA analysis based on: EV Volumes; US Geological Survey (2022); Benchmark Mineral Intelligence; Bloomberg NEF.

Notes: Ni = nickel; Co = cobalt; DRC = Democratic Republic of Congo. Geographical breakdown refers to the country where the production occurs. Mining is based on production data. Material processing is based on refining production capacity data. Cell component production is based on cathode and anode material production capacity data. Battery cell production is based on battery cell production capacity data. EV production is based on EV production data.

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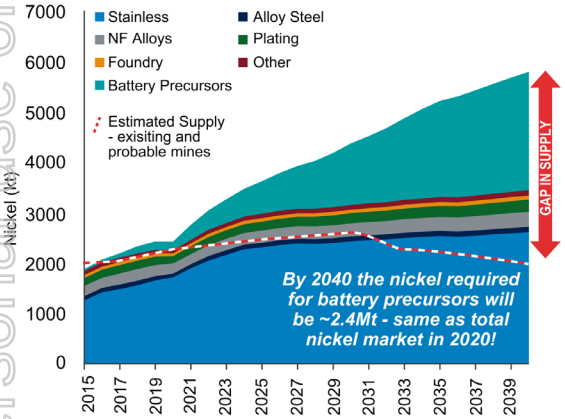
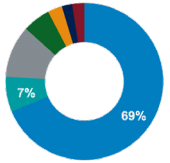
Nickel use, rapidly growing demand and declining stockpiles

Global nickel demand by first use

Nickel use in Battery Precursors continues to rise at record levels with demand expected to outstrip supply

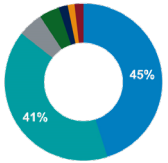


after source Wood Mackenzie



2021

battery precursors to use greater share first use of nickel by 2040

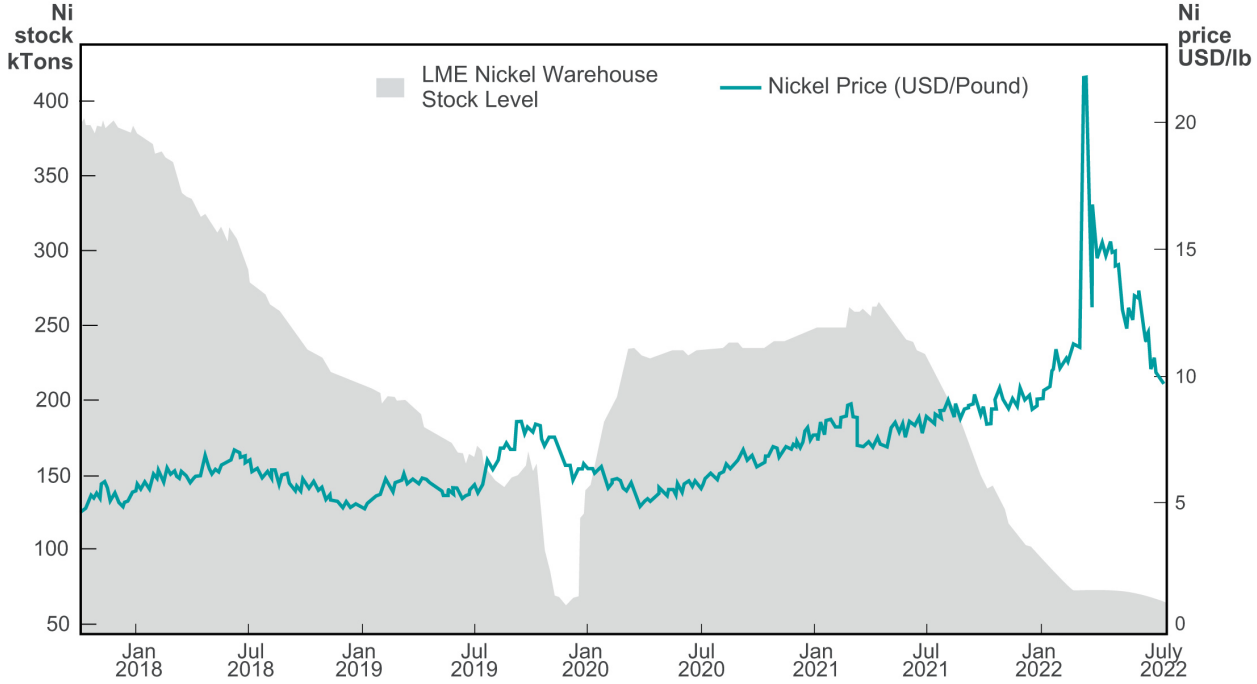


2040

Stainless
Alloy Steel
NF Alloys
Plating
Foundry
Other
Battery Precursors

after source Wood Mackenzie

Nickel Price relative to LME Warehouse stock levels 2017 to 2022



adapted from Kitco LME Stock charts and dailymetalprice.com

The future is nickel rich batteries…

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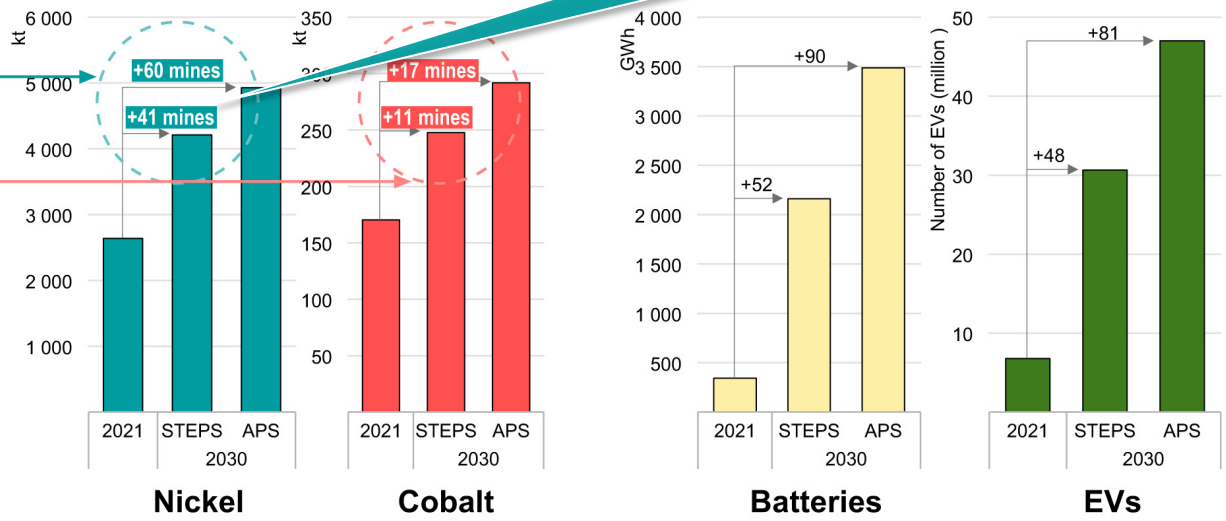
More Nickel and Cobalt mines needed

All elements of EV battery supply chains expand significantly to meet projected demand

Number of mines to produce required levels of Ni-Co to meet projected demand in 2030 relative to 2021

Kalgoorlie Nickel Project's nickel-cobalt production is essential to help meet demand



Notes: STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario. Number of additional mines/plants/factories required to meet projected demand from the 2021 demand level is shown by the arrows. Projected demand is annual. Metal demand is total demand including EV and non-EV demand. Assumes the average annual production capacities: **nickel mine - 38 kt; cobalt mine - 7 kt**; battery gigafactory
- 35 GWh; and EV production plant - 0.5 million vehicles. Nickel demand does not distinguish between Class 1 and Class 2 nickel.

ADAPTED after IEA graph
Sources: IEA analysis based on S&P Global; Bloomberg NEF; Benchmark Mineral Intelligence.

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Lithium-ion battery sector leads nickel demand growth

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Lithium-ion battery supply chain

- China dominates the lithium-ion battery (**LIB**) supply chain through long term strategic planning
- The rest of the world is rapidly trying to catch up
- Billions of dollars are being invested in LIB plants, but where will the battery mineral supply come from?
- ESG policies continue to reaffirm governments and companies' commitments to sustainable and ethical supply chains
- The supply response must include all nickel resources
- Especially those that can provide **sustainable and ethical supply** = **Australia**
- Especially those with **supportive Government and communities** = **Western Australia**
- Large scale deposits that can guarantee long term supply = **Kalgoorlie Nickel Project**

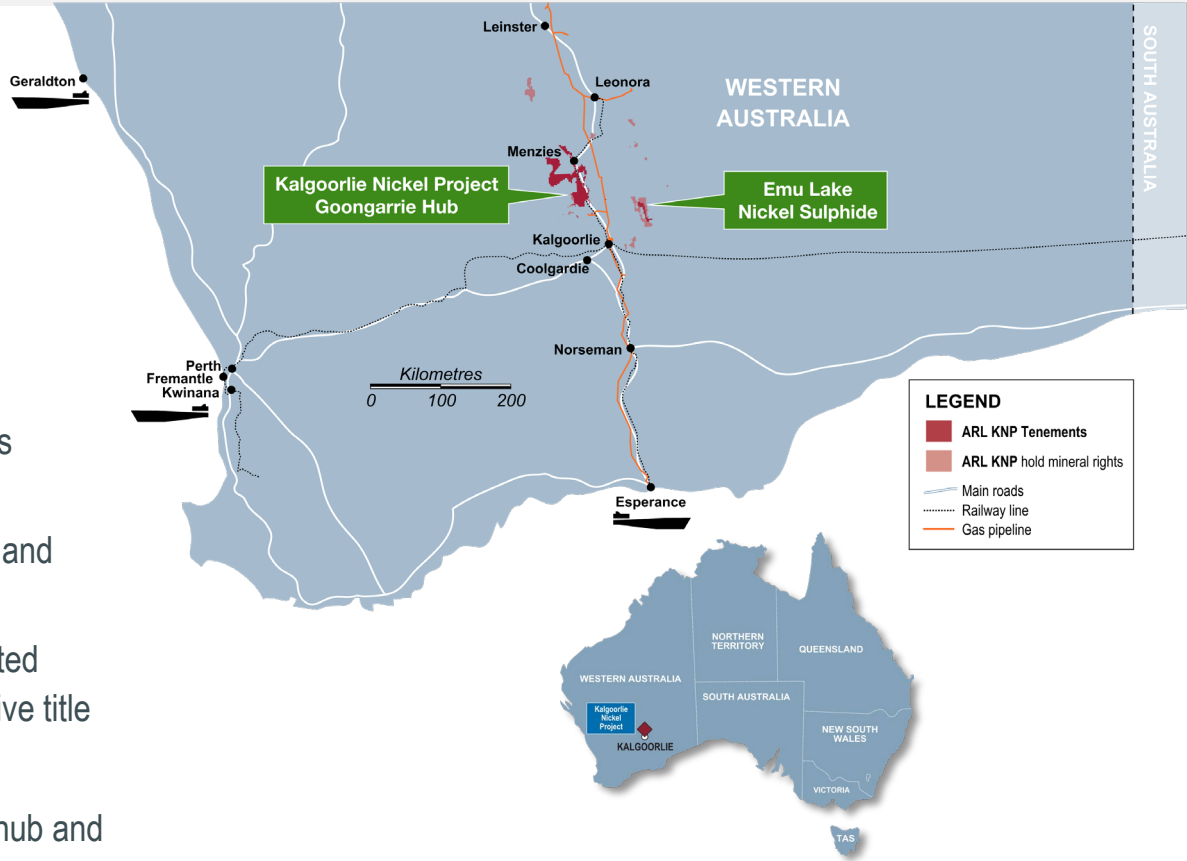
US grants 'preferred status for Australian mineral exports

John Thomson, 22 Aug 2022, www.miningmagazine.com.au

Under the US' recently passed *Inflation Reduction Act*, 40 per cent of critical minerals value must be sourced from countries with pre-existing free trade agreements with the US, increasing to 80 per cent by 2027.
Minerals Council for Australia Chief Executive Officer, Tania Constable, said the Act would underpin future demand for Australian critical minerals.
"The *Inflation Reduction Act* is a major step forward for the Australian Government's manufacturing agenda and will help underpin demand for high-quality Australian battery minerals," Ms Constable said. (*Extract*)

World's best operating jurisdiction

- All Projects located in Western Australia (WA)
- 4,271km^2 ground position in Eastern Goldfields
- City of Kalgoorlie-Boulder is the prime resource development and operating destination within WA
  - ✓ Very strong mining support from Local Government and Community
  - ✓ Multitude of world-class mining operations serviced from the City
  - ✓ Ardea maintains a local operations office and active stake holder engagement
  - ✓ Road and rail network pass through granted Goongarrie Hub mining leases with a native title agreement in place
- Direct infrastructure links to key Kwinana battery hub and Southern Ports - Esperance



Australian Federal Government - Major Project Status

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Optimum Location - sustainable and ethical mineral supply

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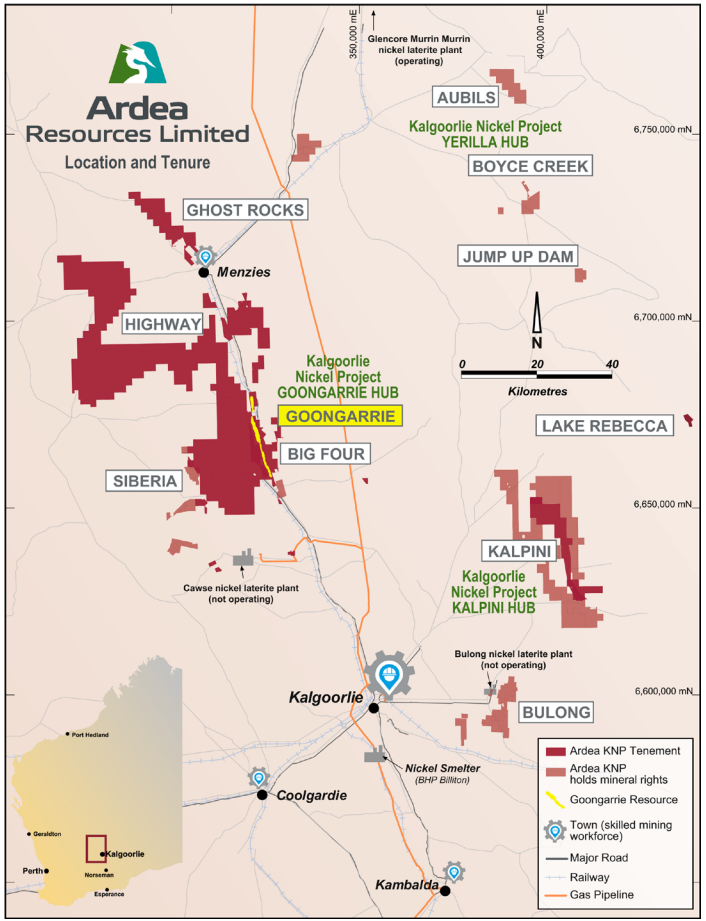
- Large contiguous KNP land holding allows unimpeded site planning to minimise ultimate site footprint
- Open Mediterranean woodland highly amenable to low-impact development and rehabilitation
- Semi-arid environment, facilitates well managed tailings disposal
  - ✓ Rehabilitation procedures well established over last four decades in Kalgoorlie open pit gold sector
  - ✓ No ocean submarine tailings disposal
  - ✓ No valley-fill tailings dams
  - ✓ No active seismicity issues
  - ✓ No tropical high rainfall
- No conflicting land use demands
  - ✓ KNP purely a mining jurisdiction
  - ✓ No competing land use, such as food production activity (as in Eastern Australia laterite districts)
- Low carbon future
  - ✓ **KNP HPAL plant steam, heating and power generated off grid** through using elemental sulphur
  - ✓ KNP HPAL neutraliser includes Ni-enriched non-carbonate options
  - ✓ Waste landform regeneration facilitates significant agroforestry throughout the KNP

The **KNP** is a **Globally Significant** Resource….



and Australia's largest nickel-cobalt resource

- ✓ Globally significant Mineral Resource **5.9Mt contained nickel & 348kt contained cobalt**
  - ✓ Sustainable & ethical supply of nickel & Critical Minerals for low carbon future

Goongarrie Hub - High grade component:

78Mt at 1.0% Ni and 0.069% Co*

784kt contained **Nickel, 54kt** contained **Cobalt**

- Kalgoorlie Nickel Project (**KNP**) Feasibility Study (**FS**) scope covering **Goongarrie Hub** including satellite pits at Highway and Siberia North
- Two 1.5 Mtpa High Pressure Acid Leach (**HPAL**) trains, supplemented with a 0.5Mtpa Atmospheric Leach (**AL**) processing operation (**3.5Mtpa**) focused on treating +1.0% Ni and 0.07% Co and subject to a reserve update as part of the in-progress feasibility study (FS)
- FS evaluating the potential revenue contributions from mineralised neutraliser

* See Appendix for resource breakdown and ASX release 16 June 2021

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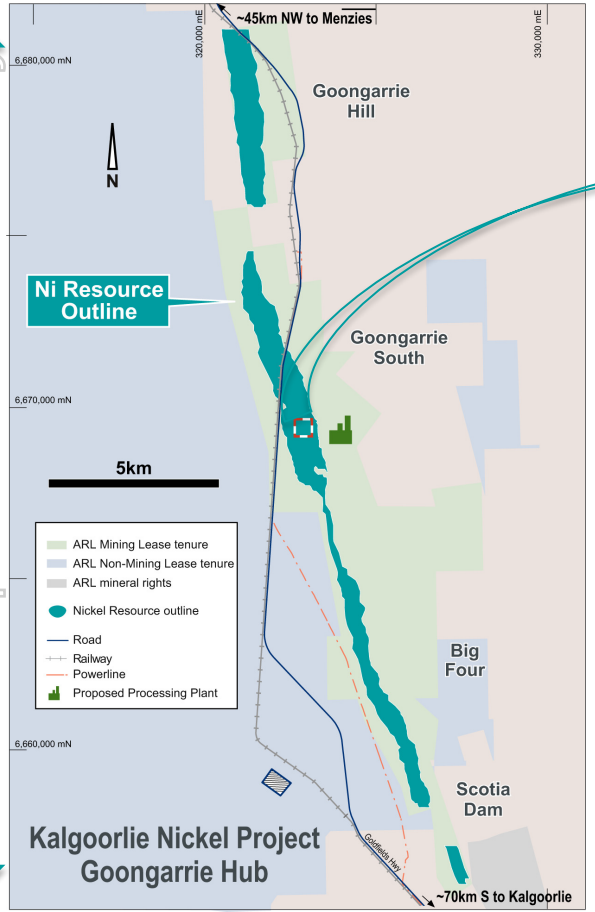
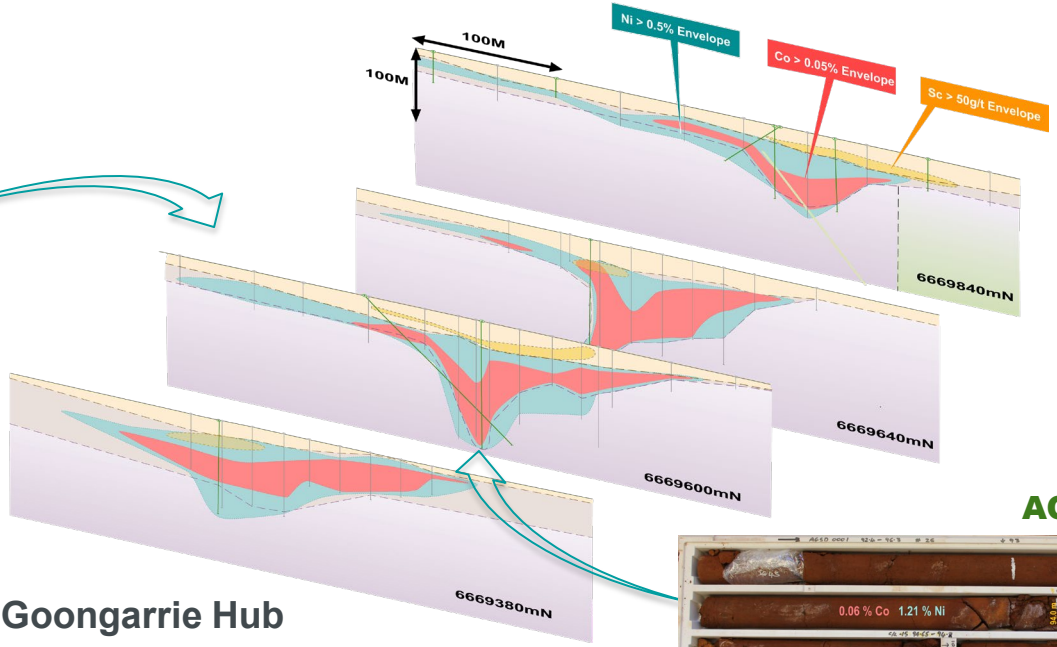
Simple Mining Characteristics





Goongarrie Hub

- 25km strike - Uniform Ni-Co laterite mineralisation dominated by **goethite**
- **Goethite** is 'Best in Class' plant feed
- Soft, mainly **free-digging** open-pit mining
- Low strip ratio expected with resource optimisation in progress to define updated Ore Reserve

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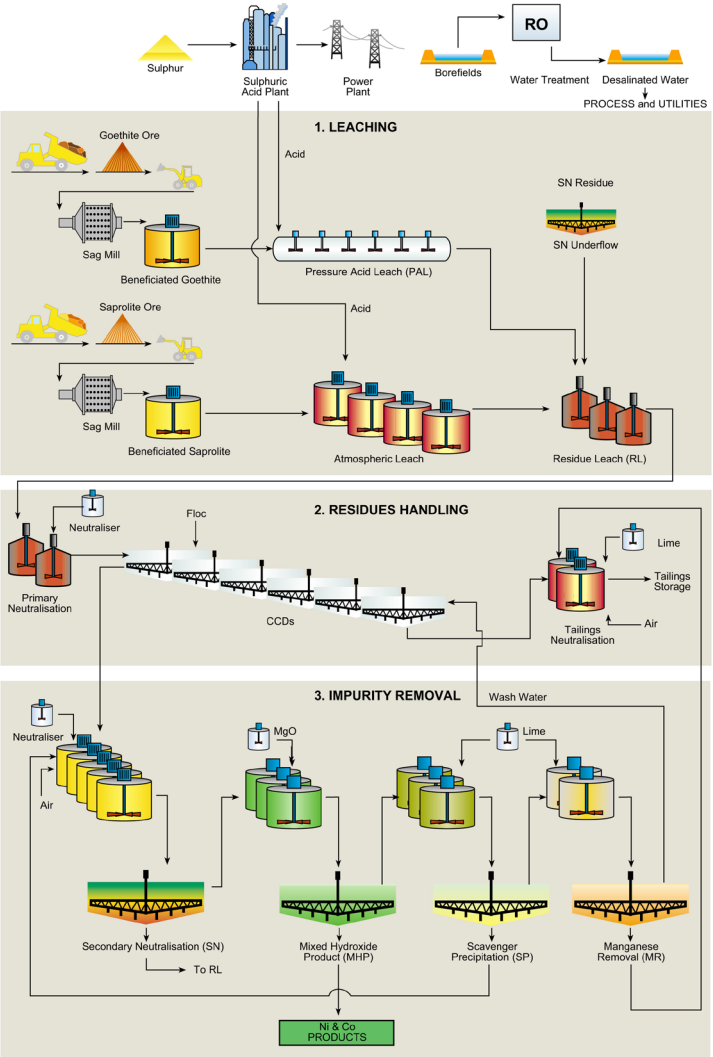
Enhanced flow sheet

- ✓ Premium goethite ore (excellent comminution, less abrasive, lower maintenance)
- ✓ MHP sale product during ramp up, in high demand and is the new Class 1 nickel
- ✓ Evaluating PCAM production through FBICRC membership
- ✓ Additional Critical Mineral by-products (current bench-scale metallurgy)

Process Metallurgy

- ✓ High ore grade + slurry density = Optimised Capex & Opex (best in Australia*)
- ✓ Proven HPAL Ni-Co Extraction = Efficient, low energy intensity, proven "off-the-shelf"
- ✓ Atmospheric Leach (AL) viable Ni extraction demonstrated in Vale Inco 2009 PFS
- ✓ AL = Stability for acid plant (energy generation), maximises resource utilisation
- ✓ Water Options = Using pit drainage + licensed borefields
- ✓ MHP = Known technology and chosen feedstock for lithium-ion batteries
- ✓ PCAM optionality for additional value add within Australia = Supply chain diversity
- ✓ Potential for significant by-product credits from Sc, in addition to base case Ni-Co



* See Appendix, KNP Superior HPAL Intensity slide, for data.

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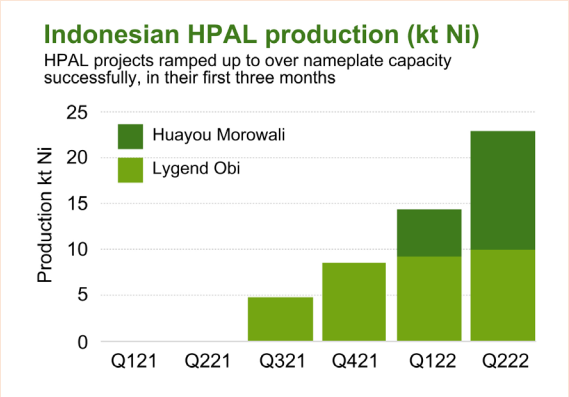
Learning from other HPAL operations

Ardea's KNP project scale has been set at 3.5Mtpa comprising 2 x 1.5Mtpa HPAL + 0.5Mtpa AL circuit

We have selected this combination by learning from other HPAL operations around the world, including the successful Coral Bay and Ravensthorpe operations and some Indonesian producers.

What recent Indonesian HPAL is doing well:

- Fast ramp up
- Reliable HPAL technology



Why **Kalgoorlie Nickel Project** is a more desirable source of nickel than Indonesia:

- Ardea flowsheet incorporates best lessons from the operating and proven operations using HPAL and AL technologies.
- Fast ramp up with lessons learned
- The KNP is in Western Australia's Eastern Goldfields which is the premier location in the world for jurisdiction, infrastructure, and skills which guarantees ethical and sustainable production – contrast to poor ESG credentials of most other jurisdictions.
- The KNP flow sheet with the AL circuit will reduce CO2 emissions to 10-15kg/kg – which is less than a quarter of the weighted average of Indonesian Matte producers

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KNP Development Plan

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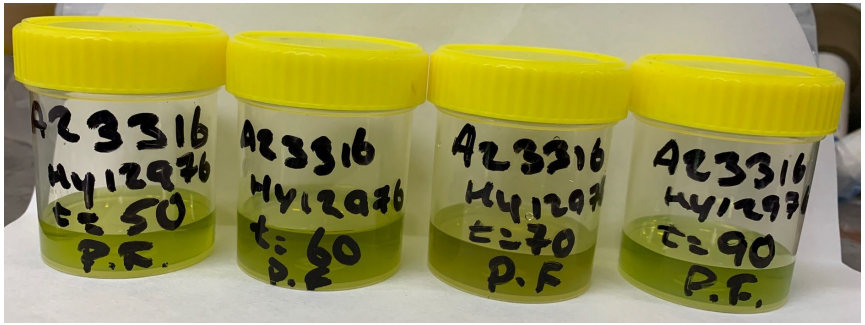
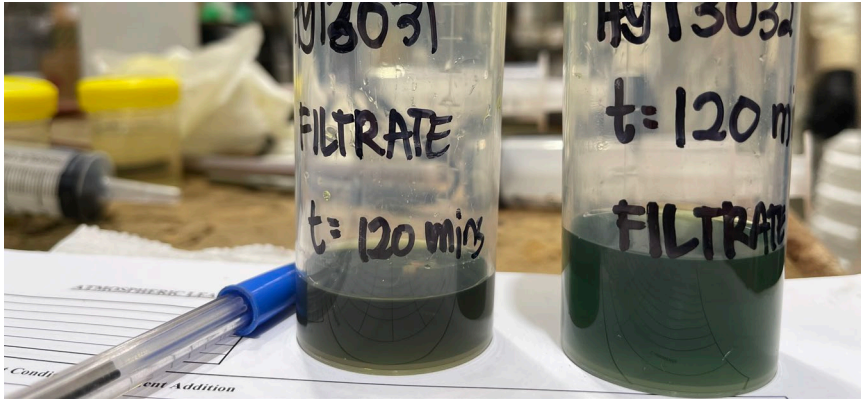
Experienced team working with quality partners

- ✓ Industry leading HPAL and AL practitioner, Mike Miller (previously technical management at the operating Ravensthorpe HPAL operation) leading KNP FS
- ✓ PFS in progress on 3.5Mtpa base case producing MHP - Completion Q1, 2023
- ✓ Feed grade is 1% Ni and 0.07% Co, reflecting the 0.8% Ni cut-off resource*
- ✓ Industry leading partners working with Ardea team on FS include ALS, Orelogy, Wood and Rockwater
- ✓ Previous $35M Vale Inco PFS has already addressed multiple FS work streams
- ✓ Completion of DFS linked to Strategic Partner process, so that partner can have input into project scale and end product specification
- ✓ Accelerated engagement with potential project development funders
- ✓ Ongoing engagement with key stake holders, such as the City of Kalgoorlie-Boulder, Shire of Menzies and Southern Ports Esperance





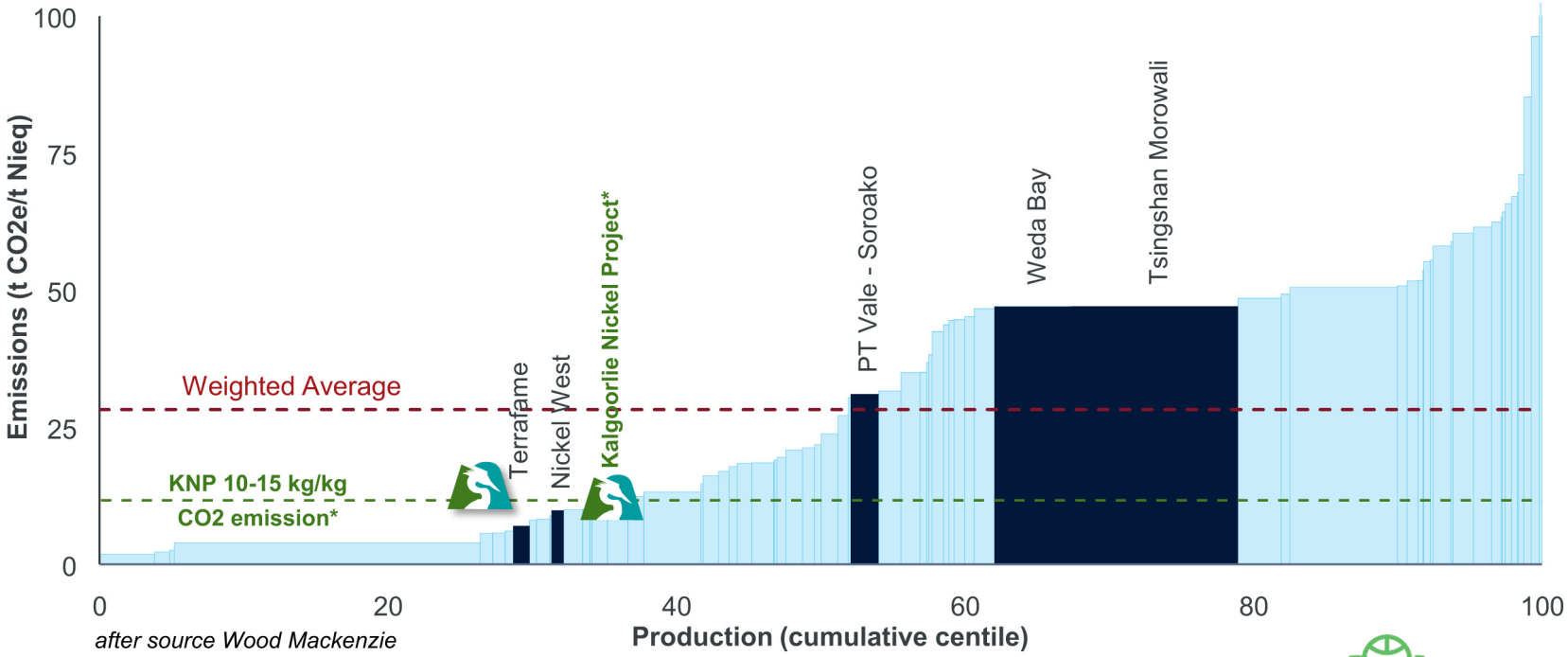
Top photo: Leach tests have been conducted to demonstrate leach efficiency as a function of time and acid dosage. Bottom photo: 2022 metallurgical testwork has demonstrated the effectiveness of flowsheet developments, such as Atmospheric Leaching.

* See Appendix for resource breakdown and ASX release 16 June 2021

KNP sustainable and ethical production

Nickel industry CO2e curve (Scope 1 and 2 only) for 2021

Ardea's provisional CO2 emission calculations sit at less than half the weighted average and less than a quarter of Indonesia Matte production



after source Wood Mackenzie

- *These figures are provisional, based on the most recent mass balances but subject to changes in mine plan and other metrics for comparison*

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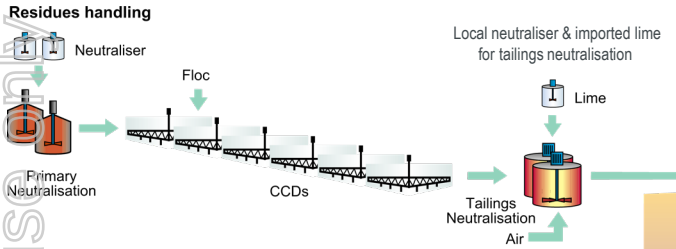
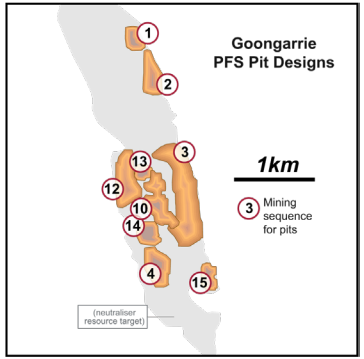
Tailings Storage **in pit disposal** and **progressive rehabilitation**



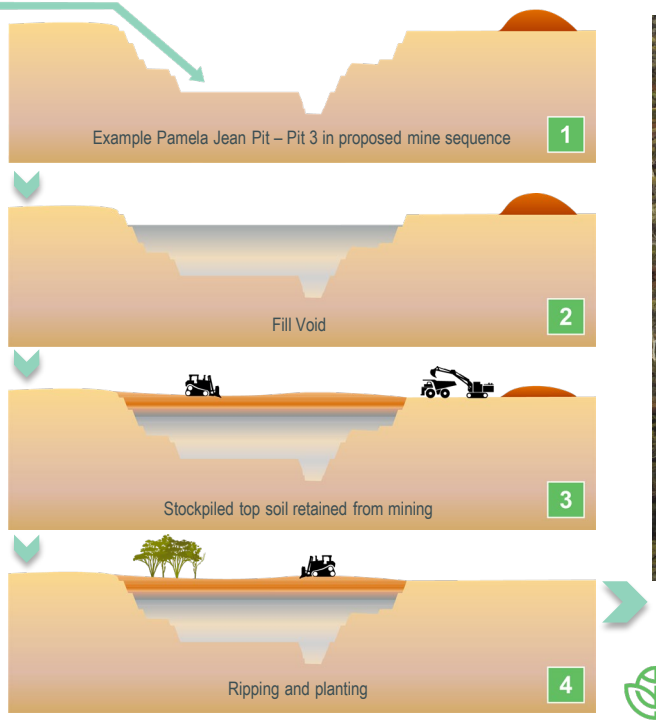


Multiple shallow pits mined in sequence, provide an ideal platform for sequential in pit tailings disposal.

This allows progressive rehabilitation to occur concurrent with sustainable nickel-cobalt production.

Neutralised tailings aggregate pumped into exhausted open pit void

Waste material from previous mining can be blended in



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Projected local workforce – **KNP Goongarrie Hub**

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2022

Management, technical, financial and administration workforce of **18** based in Perth and Kalgoorlie

Ardea

CONSTRUCTION

> 1500 estimated workforce

The estimates presented on this slide are based on past and current studies, and other industry examples. It is planned the KNP workforce will be predominantly residential in the Eastern Goldfields of WA, with FIFO option also offered to attract and retain the best team. The estimates do not include indirect employment from local industries (e.g. site services, equipment maintenance & logistics). Final numbers will be defined by in progress Feasibility Study.

KNP IN PRODUCTION

Ardea Labour	
Production	**350**
Maintenance	**100**
Admin	**100**
Contractors	
Production	**200**
Maintenance	**70**
Total Projected Workforce	**820**

Nickel Sulphide **Upside**

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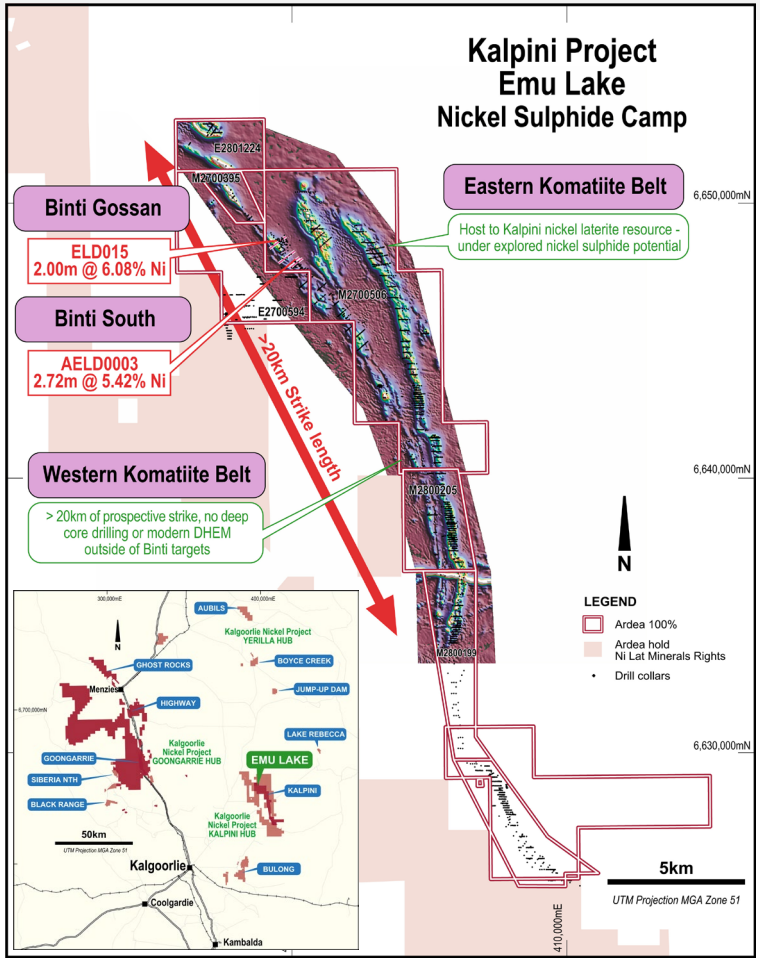
Nickel Sulphide discovery at Emu Lake

- ✓ 70km north-east of Kalgoorlie on a granted mining lease within KNP Kalpini Hub.
- ✓ Exploration at **Binti South Prospect** confirms high-grade massive nickel-copper-PGE sulphide discovery on the Western Ultramafic (WU):
  - ✓ AELD0003: **2.72m at 5.42% Ni** and 0.85% Cu from 391.04m incl **1.23m at 8.22% Ni** and 0.56% Cu from 391.04m*.
  - ✓ AELD0002: 4.8m at 1.44% Ni and 0.16% Cu from 365.9m incl 1.10m at 4.78% Ni and 0.16% Cu from 366.9m.
  - ✓ **Discovery confirmed on an intact felsic footwall demonstrating thermal erosion textures analogous with the Silver Swan nickel deposit 35km west.**
- ✓ Historic exploration at the **Binti Gossan Prospect** located 1km northwest along strike from Binti South within an intact felsic footwall contact of the Central Ultramafic (CU):
  - ✓ ELD015: **2.0m at 6.08% Ni** and 1.82% Cu from 336.0m incl **0.6m at 18.82% Ni** and 5.57% Cu from 336.3m^
- ✓ Multiple flow surfaces identified and all **prospective for hosting nickel sulphide**.
- ✓ **20km of fertile komatiite strike at Emu Lake**.
- ✓ Significant **scope to extend** the Binti Gossan and Binti South discoveries **and make additional nickel sulphide discoveries**.
- ✓ The **discovery of massive nickel-copper-PGE sulphides in the highly underexplored Kurnalpi terrane is very significant**



*ARL ASX 14 Jan 2022. ^ HRR ASX 26 Nov 2013

Emu Lake Nickel Sulphide **Discovery**

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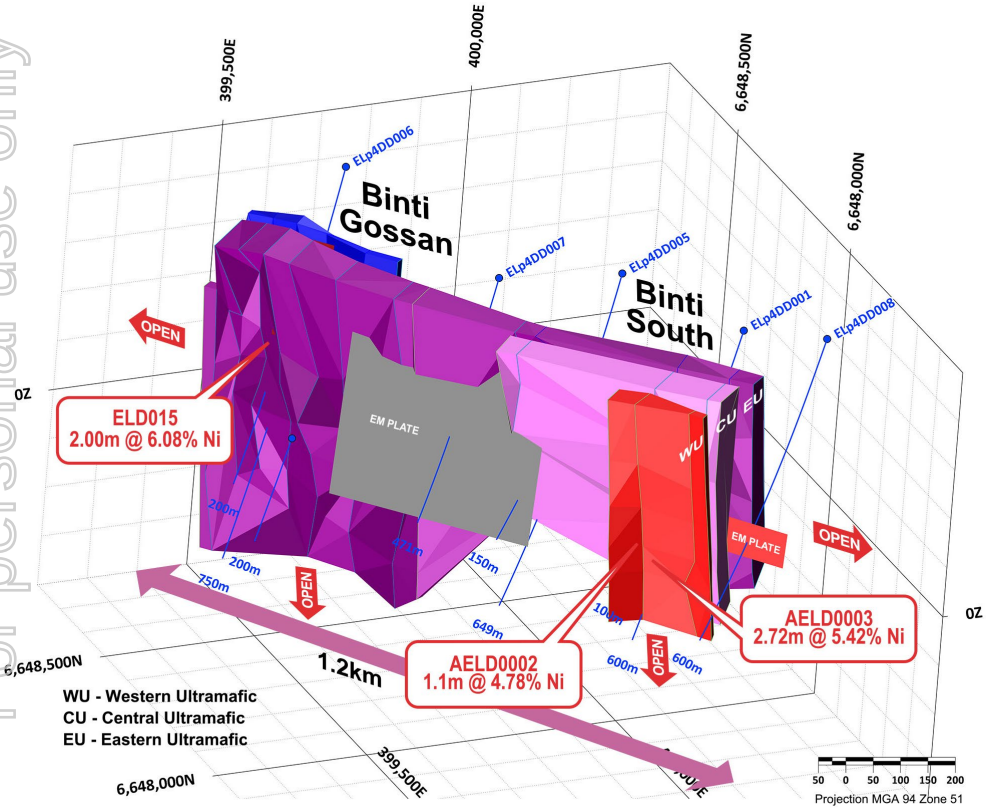
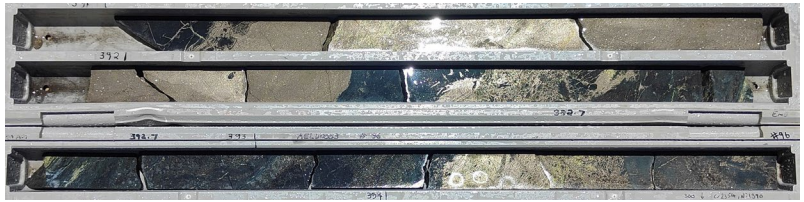


ELp - currently proposed Emu Lake follow-up core drill hole, subject to modification based on progressive results



Geological model confirmed

Extensive exploration underway, including:

- Drilling and DHEM and interpretation of results for
  - Binti South Prospect
  - Binti Gossan Prospect
  - New target 6km south of Binti Gossan
- 3D geological model to locate where the Western Ultramafic is untested
- Developing technical ranking system to generate pipeline of priority NiS targets over 20km strike

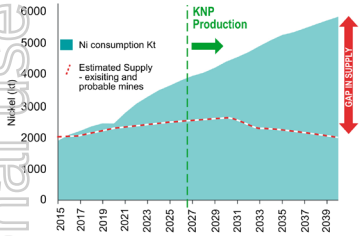
An emerging nickel sulphide camp

Why invest in Ardea - The **fundamentals** are **compelling**…

Market strength

KNP to fill gap between growing nickel demand and diminishing supply

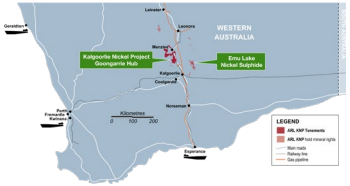
Nickel demand vs supply



after source Wood Mackenzie

Premier location

For leading ESG standards, jurisdiction, infrastructure and technical expertise

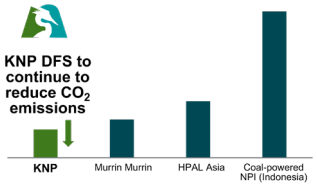


Nickel resource

5.9Mt contained nickel, 384kt contained cobalt plus Sc and other Critical Minerals*

Proven flowsheet

Desirable MHP production with PCAM optionality and industry leading low carbon emissions



Indicative relative CO_2 emissions intensity for laterite nickel production per kg of nickel production.
After WoodMac Nickel Industry Costs and Ardea internal analysis.

Successful local team

All Board members have lived and worked in the Eastern Goldfields of WA

All staff based in WA

Board and management skill set covers technical and corporate

From discovery through to project development and operations

~40kg of Nickel^

Powering the typical NCM811 Electric Vehicle (EV)

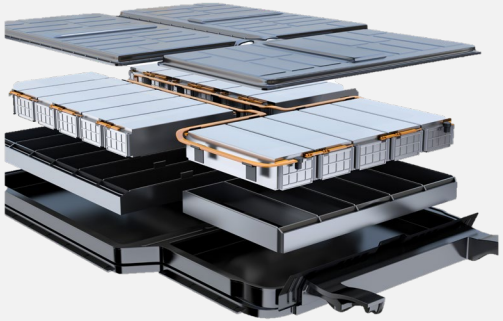
5.9Mt

contained Nickel in the KNP*

Enough for

>147,000,000

Electric Vehicles



^ 12/07/2021 UBS – Battery Material Value Chain
* See Appendix for resource breakdown and ASX release 16 June 2021

Australian Federal Government - Major Project Status

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For further information

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Ardea Resources Limited

Appendices

Kalgoorlie Nickel Project

*Ethical and sustainable **nickel-cobalt** for the battery mineral chain*

Australian Federal Government - Major Project Status

Ardea Resources Corporate Overview

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Board

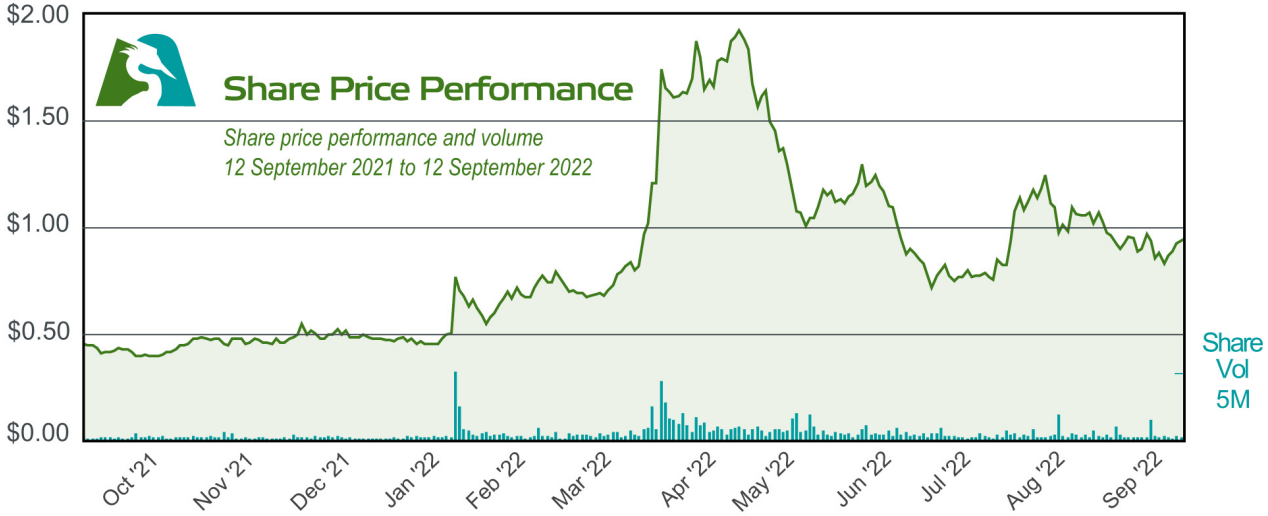
Mathew Longworth	Non-Executive Chair
Andrew Penkethman	Managing Director & CEO
Ian Buchhorn	Executive Director

Executive Management Team

Sam Middlemas	Company Secretary
Rebecca Moylan	CFO
Matthew McCarthy	GM - Exploration
Alex Mukherji	GM - Land Access & Compliance
Mike Miller	GM - Technical Services

Listed on ASX (ARL)

Shares on Issue	169,737,772
Performance Rights	4,542,000
Options	4,000,000
Share Price (12 Sep 2022)	$0.945
52 week high / low	$2.05 / $0.43
Cash (as at 30 June 2022)	$22 million
Market Capitalisation	$160 million
Board and Management	~11% equity
Top 40 Shareholders	~64% equity



Strong **ESG** – Environment, Social and Governance

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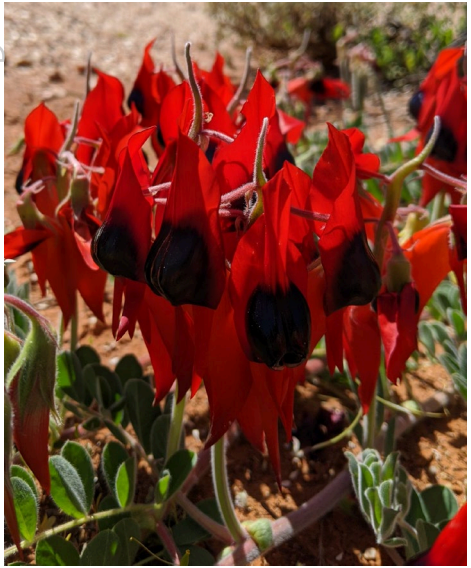

Ethically Sustainable

- Project designs and work practices based on ensuring the Company minimises green-house gas emission to demonstrate responsible sourcing of nickel and Critical Minerals
- A low carbon future is possible through proven KNP HPAL and AL flowsheet
- Waste landforms will benefit from regeneration agroforestry at KNP
- Semi-arid environment, and historic mining jurisdiction conducive to best practice safe tailings management

Socially Minded

- Strong support from the communities in which we operate a local office
- Native Title Agreement in place for development of KNP
- Ardea has initiated an education fund to assist children in the Eastern Goldfields of WA
- The Ardea team comprises over 31% female participation
- Ardea advocates fair representation for all community groups

Strong Governance

- Values are based on respect, integrity, empathy, inclusion and teamwork
- Employer of choice
- Environmental Social and Governance (ESG) considerations are at the forefront of the way in which Ardea does business
- Ardea's Board continue to strengthen and document policies to underline ESG
- ESG compliance inherent in flowsheet and project development

Experienced team working with **quality partners**

Board and Executive Management Personnel

✓ **Balanced financial and corporate experience, strong technical expertise in exploration, discovery, project development, metallurgical optimisation, compliance and operational management**

Mathew Longworth Non-Executive Chair

33 years' experience across exploration, project evaluation/development, operations and corporate management. Invaluable experience on the key Ardea exploration and development projects, being the KNP nickel-cobalt-scandium deposits.

Andrew Penkethman Managing Director, CEO

Resources sector executive with over 27 years' experience, including project evaluation, exploration, discovery, resource development, feasibility study management, permitting, stakeholder engagement, mine development and operations management. Extensive ASX, TSX and AIM experience.

Ian Buchhorn Executive Director

Mineral Economist and Geologist with over 40 years' experience. Lived and worked in the Eastern Goldfields for over 20 years undertaking exploration, project evaluation and development. Operated as Registered Mine Manager in the Kalgoorlie Goldfields, City Councilor 1992 – 2006.

Sam Middlemas Company Secretary

Chartered Accountant (CA) with more than 30 years' experience providing financial and corporate secretarial services.

Rebecca Moylan CFO

Experienced CFO with expertise in financial and corporate management, accounting, project financing and contract negotiation including 12 years in the mining industry. This has included positions as CFO and Company Secretary of several ASX-listed companies.

Matthew McCarthy General Manager - Exploration

Geologist with over 20 years experience in minerals exploration and business development in all stages of the exploration process across several commodities, with a focus on nickel exploration. Has been involved in major greenfields and brownfields nickel sulphide and gold discoveries, and completed resource definition programs, scoping and feasibility studies.

Alex Mukherji General Manager - Land Access & Compliance

Geologist with over 25 years mining industry experience including compliance reporting, drafting and negotiating Native Title, land access, commercial agreements with assessment of business development opportunities. Corporate representation with stakeholders, including State and Commonwealth agencies.

Mike Miller General Manager - Technical Services

Process Engineer with over 30 years' experience in hydrometallurgical operations with a primary focus on nickel-cobalt production. Extensive study management experience with leading engineering firms.

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KNP Superior HPAL Intensity

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- ✓ Good ore grade + good slurry density = Lower Capex & Opex $$
- ✓ Atmospheric leach = stable operation, utilizes saprolite resource
- ✓ MHP Product = known technology & good market acceptance

Operating data from Australian HPAL Producers

Performance Driver	Ardea	Bulong#	Cawse#	Murrin	RNO^	Metric	Ardea Rank	Comment
Atmospheric Leach	Yes	No	No	No	Yes	-	#1	Stable operation and full resource utilisation
HPAL Feed Density	45%	31%	35%	38%	42%	% Solids	#1	The higher the better = Maximises plant throughput
Residence Time	70	75	105	90	60	minutes	#2	The lower the better = Maximises plant throughput
Slurry Grade Ni	7.55	2.89	3.07	3.87	7.39	Ni kg/m3	#1	The higher the better = Increased revenue stream
Slurry Grade Co	0.59	0.23	0.24	0.34	0.31	Co kg/m3	#1	The higher the better = Strategic Co-Product credits

Data Sources
Ardea – Goongarrie Hub testwork results from PFS and Expansion Study, ASX release 28 March 2018 & Goongarrie Expansion Study, 24 July 2018 and ongoing project assessment as part of completing the DFS.
Bulong, Cawse, Murrin - ALTA 1999, An Engineering Comparison of the Three Treatment Flowsheets In WA Nickel Laterite Projects.
RNO – ALTA 2001, Observations from the RNO Pilot Plant at Lakefield Research, 2000 AD.

^Ravensthorpe Nickel Operation (RNO) figures based on design numbers on upgraded beneficiated ore from the Halleys Deposit which has since been mined out. # Bulong & Cawse – care and maintenance

Ardea data is based on non-beneficiated material (with always an option to beneficiate selected KNP geo-met types, notably at Highway & Goongarrie Hill).

A high-quality nickel and cobalt project

Outstanding results delivered from 2018 PFS* and Expansion Studies

Flow sheet enhanced and project scale increased for in progress Feasibility Study

	1.0Mtpa	1.5Mtpa	2.25Mtpa
Status	PFS	PFS	**ES**
No. Trains	1	1	**1**
Pre Tax NPV_8	US$ 1.13 billion	US$ 1.52 billion	**US$ 2.4 billion**
Pre Tax IRR	29 %	29 %	**31%**
CAPEX	US$ 472 million	US$ 588 million	**US$918 million**
C1 cash cost	US$ 0.42 / lb	US$ 0.45 / lb	**US$ (0.34) / lb**
Payback	5.3 years	5.6 years	**5.1 years**
Cobalt sulphate	5,500tpa	6,900tpa	**10,000tpa**
Nickel sulphate	41,500tpa	55,300tpa	**81,000tpa**

- ✓ 2018 PFS of 1Mtpa and 1.5Mtpa base case over a 25-year mine life completed (one autoclave)
- ✓ 2018 Expansion study of 2.25Mtpa with a 25-year mine life completed (one autoclave)
- ✓ 94.5% nickel and 95.5% cobalt recovery – life of mine
- ✓ Pre-cobalt credit C1 costs in line with current worldwide operators
- ✓ High Pressure Acid Leach (HPAL) 5th generation plant is a proven design, successfully operated in other laterite projects globally
- ✓ 2.25Mtpa case based on only 26% of Goongarrie Resource
- ✓ **2022 Base case for in progress feasibility study is 3.5Mtpa, with two HPAL autoclaves + AL circuit for improved operations stability and increased production. PFS due Q1, 2023**
- ✓ Scandium by-product credit and nickel and cobalt recovery from mineralised neutraliser not factored in, so offers additional up-side

The information shown on this slide has been previously released on the ASX platform by Ardea in ASX releases, *Goongarrie Nickel Cobalt Project, PFS study, 28 March 2018 and Goongarrie Expansion Study, 24 July 2018. All the material assumptions underpinning the forecast financial information derived from a production target, in the initial public report referred to in rule 5.17 continue to apply and have not materially changed.

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KNP Mineral Resource

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Kalgoorlie Nickel Project nickel-cobalt JORC Code (2012) Mineral Resource Estimate

Camp	Prospect	Resource Category	Size (Mt)	Ni (%)	Co (%)	Contained Metal Ni (kt)	Contained Metal Co (kt)
KNP TOTAL		Measured	22	0.94	0.079	207	17
		Indicated	357	0.72	0.047	2,584	168
		Inferred	452	0.68	0.044	3,088	199
	GRAND TOTAL	***Combined***	***830***	***0.71***	***0.046***	***5,879***	***384***

Note: 0.5% nickel cutoff grade used to report resources. Note figures are rounded to reflect degree of certainty and may not tally.
The information shown on this slide has been previously released on the ASX platform by Ardea in ASX release 16 June 2021.

In accordance with the Australian Securities Exchange Limited Listing Rules Appendix 5A:

The information in this report that relates to KNP Exploration Results is based on information originally compiled by previous full time employees of Heron Resources Limited and or Vale Inco. The Exploration Results and data collection processes have been reviewed, verified and re-interpreted by Mr Ian Buchhorn who is a Member of the Australasian Institute of Mining and Metallurgy and currently an executive director of Ardea Resources Limited. Mr Buchhorn has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the exploration activities undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Buchhorn consents to the inclusion in this report of the matters based on his information in the form and context that it appears.

The information in this report that relates to Mineral Resources for the Goongarrie Hill, Goongarrie South, Big Four, Scotia Dam and Highway nickel-cobalt deposits that comprise the Goongarrie Hub is based on information compiled by Mr James Ridley who is a Member of the Australasian Institute of Mining and Metallurgy, a full time employee of Ardea Resources and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Ridley consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

Goongarrie Hub Mineral Resource (0.8% Ni cut-off)

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Summary of Mineral Resource Estimate from the Goongarrie Hub, based on a 0.8% Ni cut-off grade, comprising resources at Goongarrie Hill, Goongarrie South, Highway, Big Four, Scotia Dam and Highway (ASX release 16 June 2021).

Deposit	Resource Category	Tonnes (Mt)	Ni %	Co %	Contained Metal Ni (kt)	Contained Metal Co (kt)
Goongarrie Hill	Indicated	5.3	0.92	0.050	49	2.6
	Inferred	1.9	0.92	0.034	17	0.6
	Subtotal	7.2	0.92	0.046	66	3.3
Goongarrie South	Measured	11.0	1.13	0.106	125	11.6
	Indicated	21.1	0.99	0.071	208	15.0
	Inferred	1.2	0.92	0.043	11	0.5
	Subtotal	33.3	1.03	0.081	344	27.1
Big Four	Indicated	12.1	0.97	0.068	118	8.3
	Inferred	2.7	0.94	0.062	25	1.7
	Subtotal	14.7	0.97	0.067	143	9.9
Scotia Dam	Indicated	2.9	0.98	0.108	29	3.2
	Inferred	1.4	1.02	0.057	14	0.8
	Subtotal	4.3	0.99	0.091	43	4.0
Highway	Indicated	15.1	1.01	0.053	152	8.0
	Inferred	3.7	0.98	0.053	36	2.0
	Subtotal	18.8	1.00	0.053	188	10.0
Combined Deposits	Measured	11.0	1.13	0.106	125	11.6
	Indicated	56.5	0.98	0.066	556	37.1
	Inferred	10.8	0.95	0.051	103	5.6
	Grand Total	**78.3**	**1.00**	**0.069**	**784**	**54.3**

Note figures are rounded to reflect degree of certainty and may not tally.

Goongarrie Hub Mineral Resources inc Sc (0.5% Ni cut-off)

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Summary of Mineral Resource Estimate from the Goongarrie deposits based on a 0.5% Ni cut-off grade (ASX release 15 February 2021).

Deposit	Resource Category	Tonnes (Mt)	Ni %	Co %	Contained Metal Ni (kt)	Contained Metal Co (kt)	Sc Resources Mt	Sc Resources Sc ppm
Goongarrie Hill	Indicated	40	0.65	0.037	260	14.7	10.5	16
	Inferred	29	0.60	0.025	178	7.3	2.0	16
	Subtotal	69	0.63	0.032	438	21.9	12.5	16
Goongarrie South	Measured	18	0.94	0.085	172	15.4	18.2	40
	Indicated	82	0.71	0.049	587	40.2	53.1	23
	Inferred	10	0.64	0.033	61	3.1	5.5	24
	Subtotal	110	0.75	0.053	820	58.7	76.8	27
Big Four	Indicated	49	0.71	0.047	345	22.9	31.9	24
	Inferred	14	0.68	0.043	95	6.1	2.9	24
	Subtotal	63	0.70	0.046	440	28.9	34.8	24
Scotia Dam	Indicated	12	0.71	0.065	82	7.4	11.2	25
	Inferred	5	0.72	0.043	37	2.2	0.6	22
	Subtotal	17	0.72	0.058	118	9.6	11.7	25
GNCP Total	Measured	18	0.94	0.085	172	15.4	18.2	40
	Indicated	182	0.70	0.047	1,274	85.1	106.6	23
	Inferred	58	0.64	0.032	371	18.6	11.0	23
	Grand Total	**259**	**0.70**	**0.046**	**1,817**	**119.2**	**135.8**	**25**

Note figures are rounded to reflect degree of certainty and may not tally.

Kalgoorlie Nickel Project

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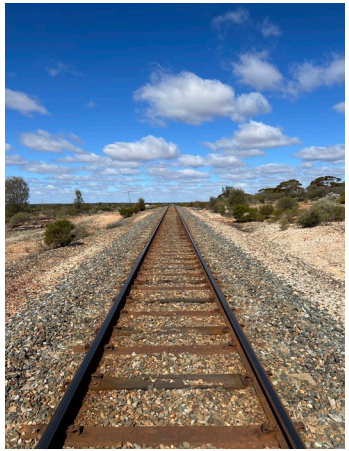

Australian Federal Government - Major Project Status